7011 POWERstation and POWERserver

Operator Guide

7011 POWERstation and POWERserver

Operator Guide

Seventh Edition (August 1994)

This edition notice applies to the *7011 POWERstation and POWERserver Operator Guide.* This edition obsoletes all previous editions.

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law: THIS PUBLICATION IS PRINTED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO. THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication.

It is possible that this publication may contain reference to, or information about, products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that such products, programming, or services intend to be announced in your country. Any reference to a licensed program in this publication is not intended to state or imply that you can use only the licensed program mentioned. You can use any functionally equivalent program instead.

Note to U.S. Government Users – Documentation and programs related to restricted rights – Use duplication, or disclosure is subject to the restrictions set forth in the GSA ADP Schedule Contract

Medeco is a trademark of the Medeco Company.

Trinitron is a trademark of the Sony Corporation.

PowerPC is a trademark of International Business Machines Corporation.

Table of Contents

Communications Statements

The following statements apply to this product when *not* using the system Ethernet function (local area network). The system standard I/O Ethernet port is FCC Class A. 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 B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult an authorized dealer or service representative for help.

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

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

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.

International Electrotechnical Commission (IEC) Statement

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

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.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe B d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Réglement sur le brouillage radioélectrique établi par le ministère des Communications du Canada.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class B limits for radio noise emissions for digital apparatus, set out in Radio Interference Regulation of the Canadian Department of Communications.

VCCI Statement

この装置は，第二種情報装置（住宅地域又はその隣接した地域において使

用されるべき情報装置）で住宅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。

しかし，本装置をラジオ，テレビジョン受信機に近接してご使用になると，

受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

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

This equipment is in the Class 2 category (information equipment to be used in a residential area or an adjacent area thereto) 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 such residential area.
When used near a radio or TV receiver, it may become the cause of radio interference.
Read the instructions for correct handling. VCCI–2.

Radio Protection for Germany

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

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

The following statements apply to this product when using the system Ethernet function (local area network). 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 équipement ne dépasse pas les limites de Classe A d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Réglement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class A limits for radio noise emissions for digital apparatus, set out in Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps necessary to correct the interference.

VCCI Statement

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。

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.

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
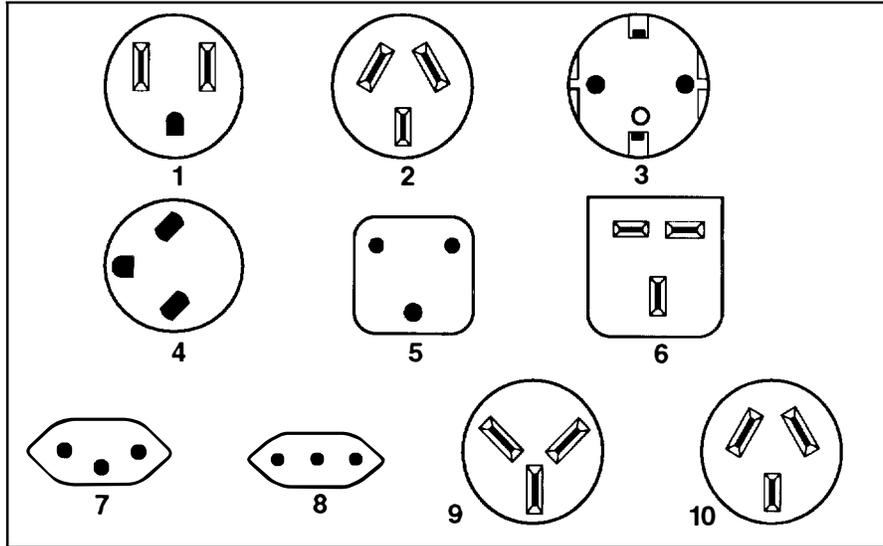
Part Number	Country	Index
62X0663	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras. Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, 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 guide provides information about the setup, operation, and devices installed in the 7011 system unit.

This book refers to three different models of the 7011 system unit: the Model 220, Model 230, and Model 250. Statements about the Model 220 apply to all 220 systems, such as 22S, 22W, and 22T. Similarly, all statements about the Model 230 apply to the 23S, 23W, and 23T; all statements about the Model 250 apply to the 25S, 25W, 25T, 25E, and 25F. The Model 250 may use a 60Mhz 601 PowerPC™ processor or an 80Mhz PowerPC processor (which can be ordered as Feature Code 8000).

Related Information

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

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

The *7011 POWERstation and POWERserver Hardware Setup Procedure*, Order Number SA23-2701, is a pictorial guide designed to help you quickly set up your 7011 system unit if no internal modifications are needed.

The *7011 POWERstation and POWERserver Service Guide*, Order Number SA23-2665, provides 7011 maintenance procedures and service information for trained service personnel.

Chapter 1. System Startup

Before starting the procedures in this chapter:

- If you have any additional memory, optional adapters, a graphics adapter, disk drives, or a diskette drive, ensure that they are all installed.

- If you wish to enable or disable the external SCSI connector, ensure that you have done so. (The system unit arrives from the factory with the SCSI connector *enabled*)

- If you will attach a display that did not come with your POWERstation or POWERserver, ensure that you have changed the settings of the graphics adapter in your system unit to work with the display.

If any of these requirements are not completed, go to Chapter 2.

After you have made sure all optional features and configuration changes are complete, make sure all external devices are connected. If they are not, go to the *7011 POWERstation and POWERserver Hardware Setup Procedure*, Order Number SA23-2701.

Step 1. Preparation

1. Make sure that the proper level of AIX is available (plus any updates current at the time the system is in use):

   - The 7011 Model 220 requires AIX Version 3.2.1 or higher.

   - The 7011 Model 230 requires AIX Version 3.2.4 or higher.

   - The 7011 Model 250 requires AIX Version 3.2.5 or higher.

2. Decide which type of system you will create:

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

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

3. Open the door.

Key Mode Switch   **Door**   **Power Switch**
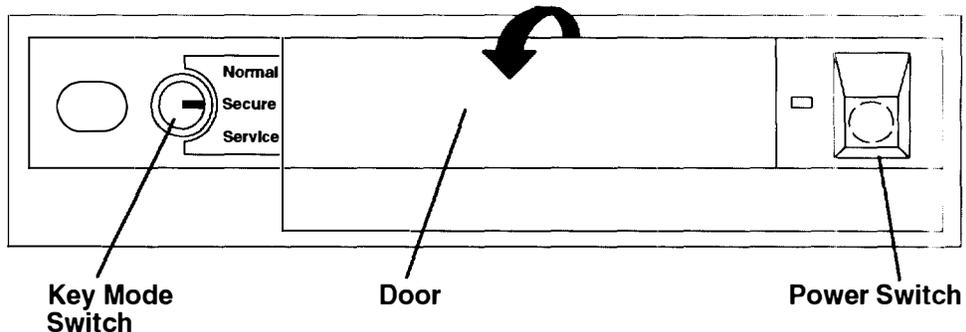
4. Set the system unit power switch to the Off position. The switch is on when pushed in and off when even with the front cover.

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, you must install AIX.

   To install an AIX Version lower than 4.1, go to the AIX *Installation Guide.* To install AIX Version 4.1 or later versions, go to the AIX *Quick Installation Guide* instead.

   Afterward, if you want to run diagnostics, return to Chapter 6 of this book.

7. If you will create a **diskless or dataless** system, go to Step 3, "Setting up a Diskless or Dataless System."

Step 2. Starting the System

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

Three-Digit Display   **Power Switch**

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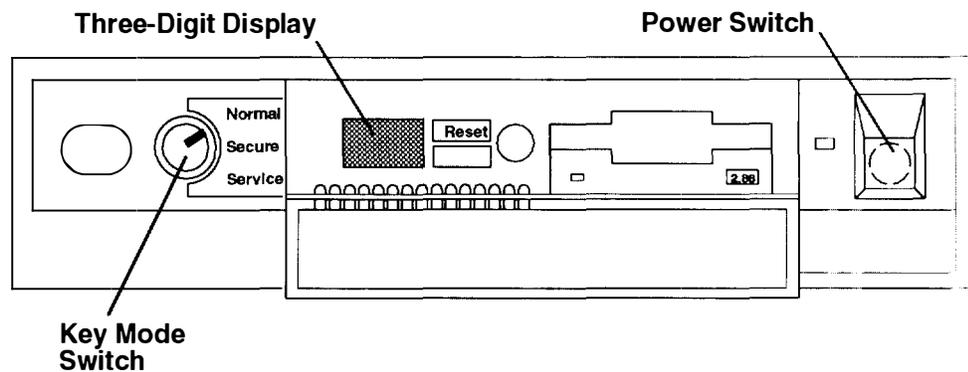
2. Turn on the system unit. If the power indicator does not light, make sure the power cord is connected to the system unit and to a working, grounded outlet. If the power indicator still does not light, go to Step 6 on page 7-2.

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

   - 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 4-7 and "Additional Communication Attributes" on page 4-9.

   - 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 version of the AIX *Problem Solving Guide* that corresponds to your operating system

4. Your POWERstation or POWERserver is now ready to use.

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

   - If you want to run diagnostics, go to "Using the System Verification Procedure" on page 6-1.

Step 3. Setting Up a Diskless or Dataless System

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

Three-Digit Display   **Power Switch**

**Key Mode
Switch**
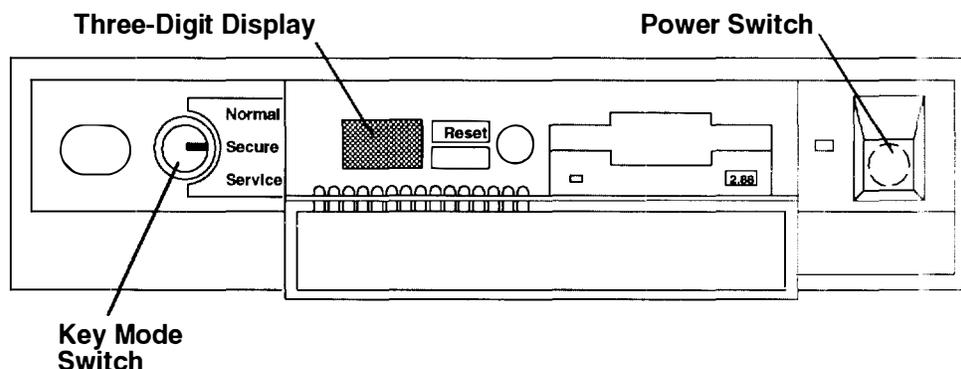
2. Set the system unit power switch to the On position (pushed in). If the power indicator does not light, make sure the power cord is connected to the system unit and to a working, grounded outlet. If the power indicator still does not light, go to Step 6 on page 7-2.

3. Wait for 200 to appear in the three-digit display and then continue with substep 4.

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

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," on page 1-4.

   - 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 working, grounded electrical outlet. If this does not solve the problem, consult your AIX *Problem Solving Guide*.

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: 16M-bit or 4M-bit data rates.

   Note: It is very important that you select the correct data rate. An incorrect data rate may cause 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. (To determine the slot number of the adapter, refer to the *About Your Machine* document or ask your system administrator.)

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."

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."

YES   Go to "Diskless Systems Installation," in the software *AIX Version 4 1 Installation Guide* or later versions.

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 1-6).

- 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. When your server administrator informs you the client is registered, continue with Step 6, "Booting the Diskless or Dataless Client."

- If your administrator cannot add your machine to the server right away and you do not want to leave this machine turned 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 or Dataless Client."

Step 6. Booting the Diskless or 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 will begin booting. This first boot will take a number of minutes; please be patient, subsequent boots will be faster. At times, you may not see any indication of activity on your screen, but the numbers in your three-digit display will be changing as the boot progresses. Eventually, your screen will go blank. Then after several minutes, `c 1` will appear in the three-digit display.

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

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

5. The system will display 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 *AIX Version 4.1 Problem Solving Guide and Reference* or later versions.

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 setup for this machine.

   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 proper version of 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. Proceed to Step 7, "Running the System Verification Procedure"

   - 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 Chassis Assembly and Chassis Cover" on page 2-3, 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.**
>
> **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 electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.**

Handling Static-Sensitive Devices

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

Take the following precautions:

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

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

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

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

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

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

Antistatic Bag
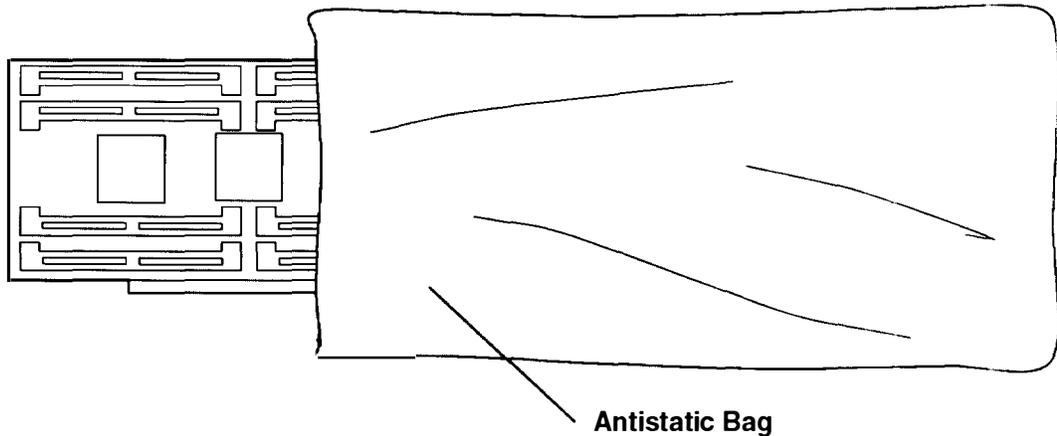
Removing the Chassis Assembly and Chassis Cover

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

2. Set the power switch of the system unit to Off (switch out).

Key Mode Switch   **Power Switch**
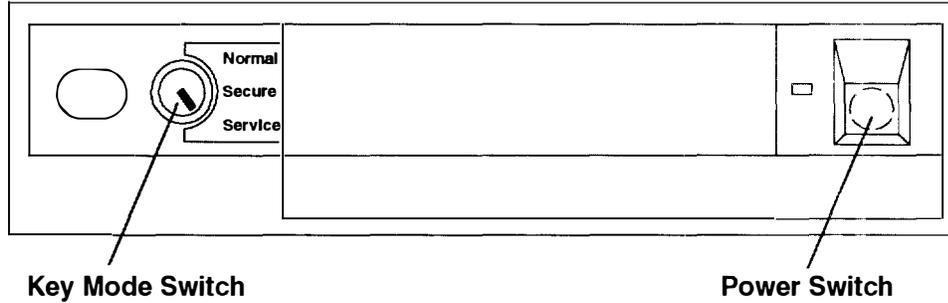
3. Set the key mode switch to the Service position.

4. Remove the key from the key mode switch.

5. Be sure to unplug the system unit power cable, display power cable, and attached device power cables from electrical outlets.

Warning: Position the system unit so that the chassis assembly cannot drop when removing it from the system unit.

6. To remove the system unit cover:

   a. Press down on the plastic tab at the top of the rear of the chassis until the chassis disengages from the cover.

Plastic Tab

Rear of Chassis
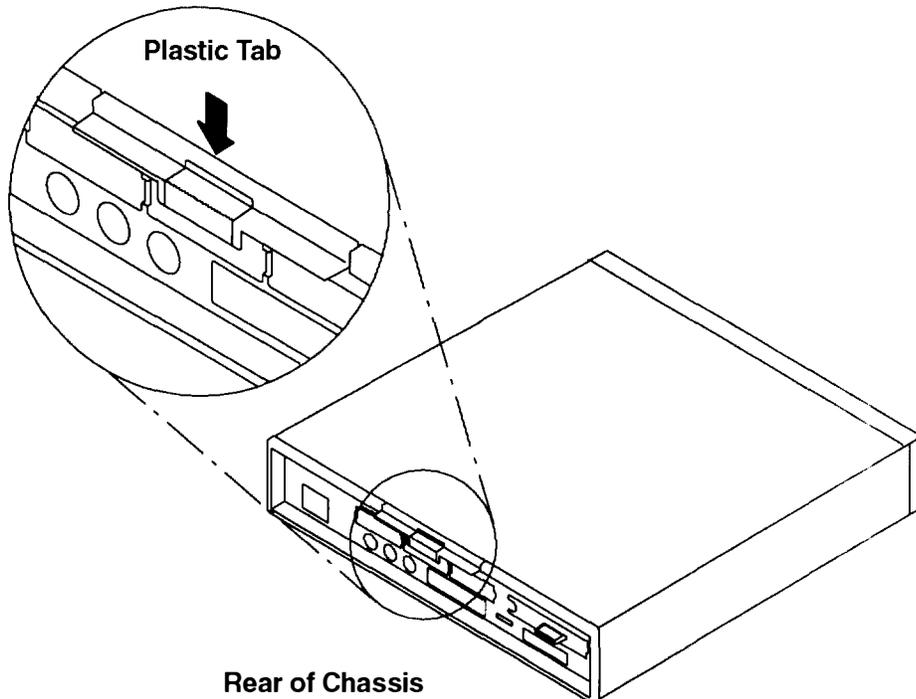
b. Slide the chassis assembly out of the cover by pulling on the plastic tab.
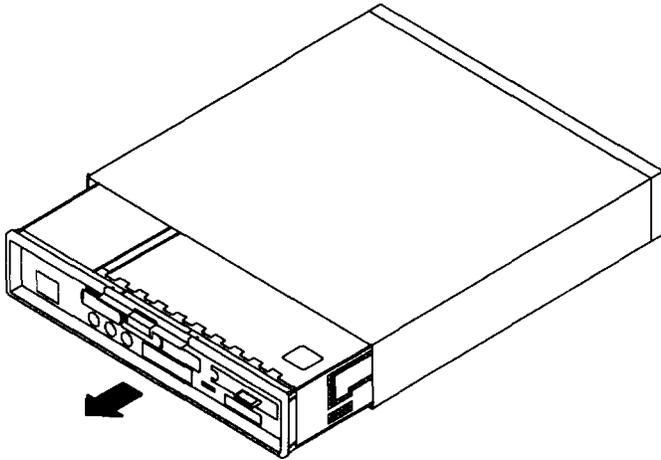
7. Remove two screws from the chassis cover.

**Rear of
Chassis**

**Chassis Cover
Screws**
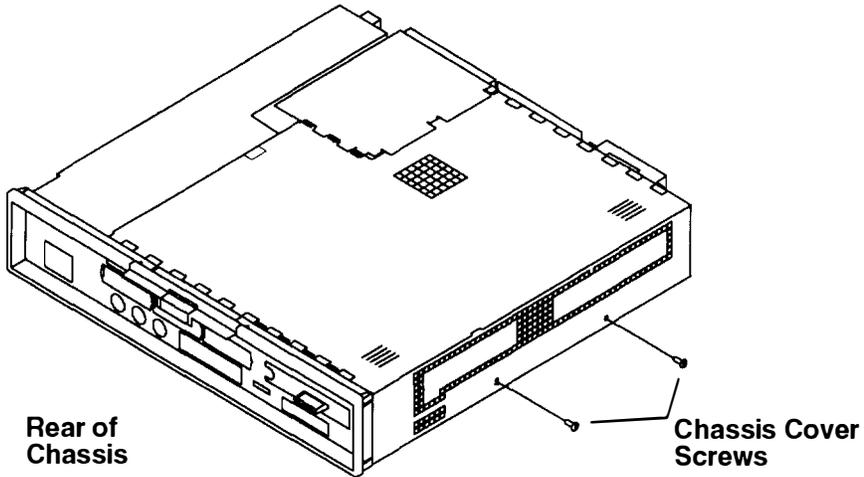
8. Place a coin or screwdriver in the cover slot and pry cover in direction of arrow.

Cover Slot

**Rear of
Chassis**
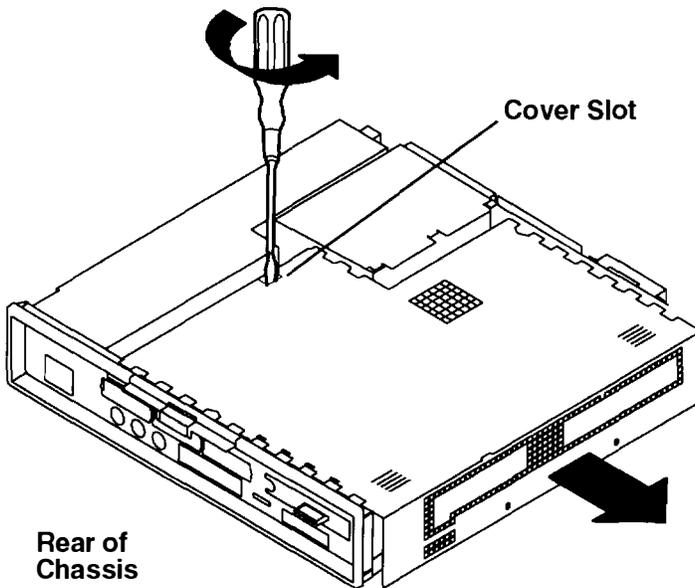
9. Place thumbs on chassis cover thumb grips and grip bottom of chassis cover with fingers.

  a. Cover movement is approximately 13 mm (1/2 inch).

  b. Ensure that the arrow shaped cutouts align with the arrow shaped tabs on the chassis.

Cutout

Tab

Cover Slot

Rear of Chassis
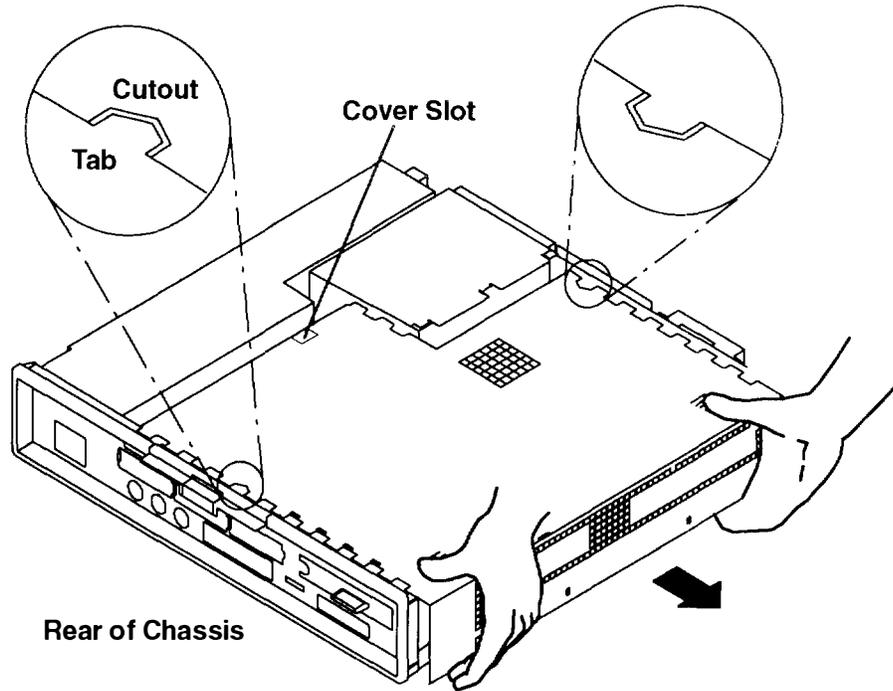
10. Lift chassis cover off.

Rear of Chassis
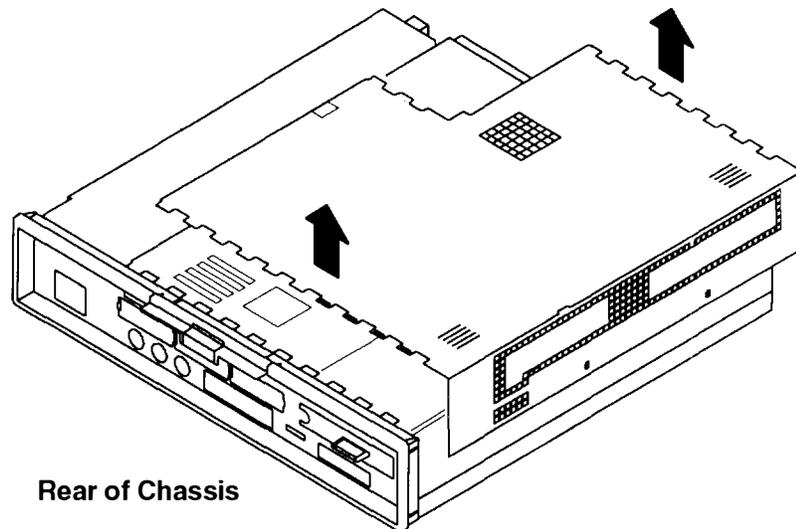
11. If you are only changing the SCSI enable/disable settings on a Model 230 or 250, or installing a Micro Channel adapter in any model, then you do not need to remove the riser card support. Skip to step 12.

To perform any other configuration change or option installation, remove the riser card support:

a. With both hands, pinch the squeeze-release handles to release the riser card support.

b. Lift the end of the riser card support.

c. Lift the entire riser card support from the system unit.

Squeeze-Release Handles

Riser Card Support

Front of Chassis
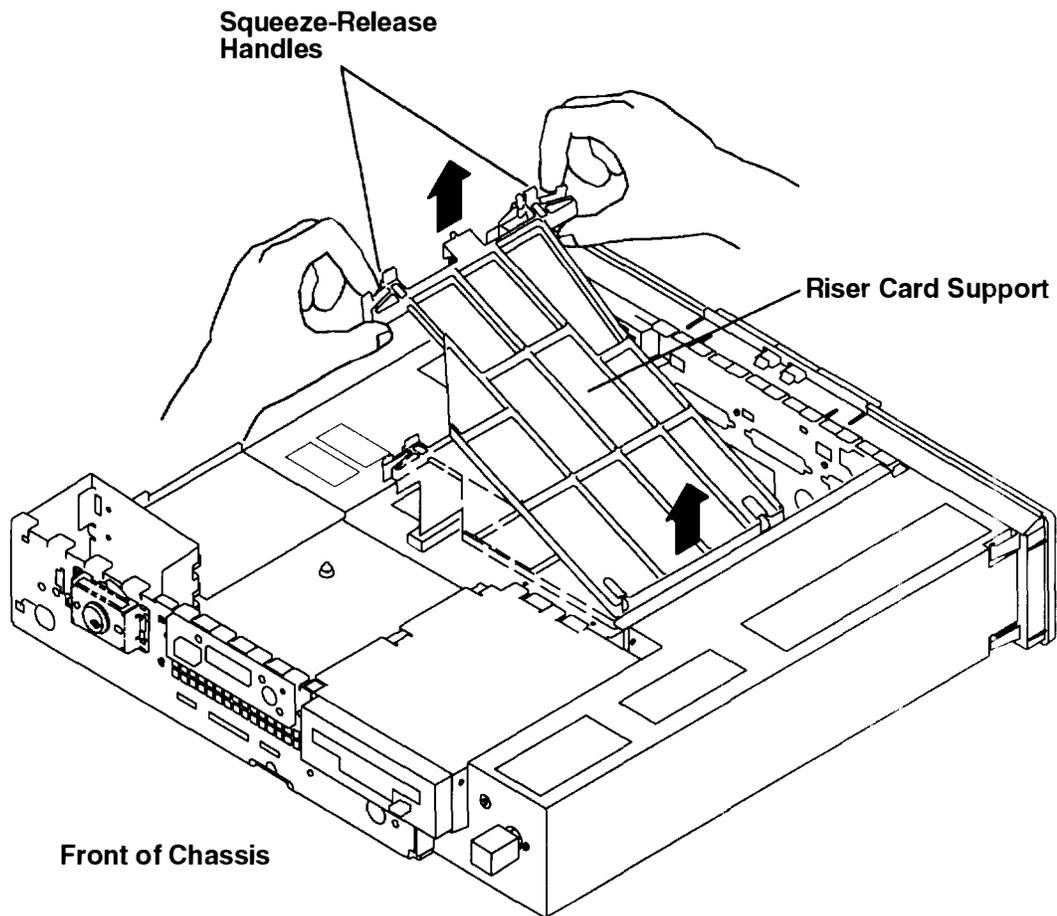
12. To install optional features or change configuration, refer to the "Option List" on page 2-7.

System Unit Locations
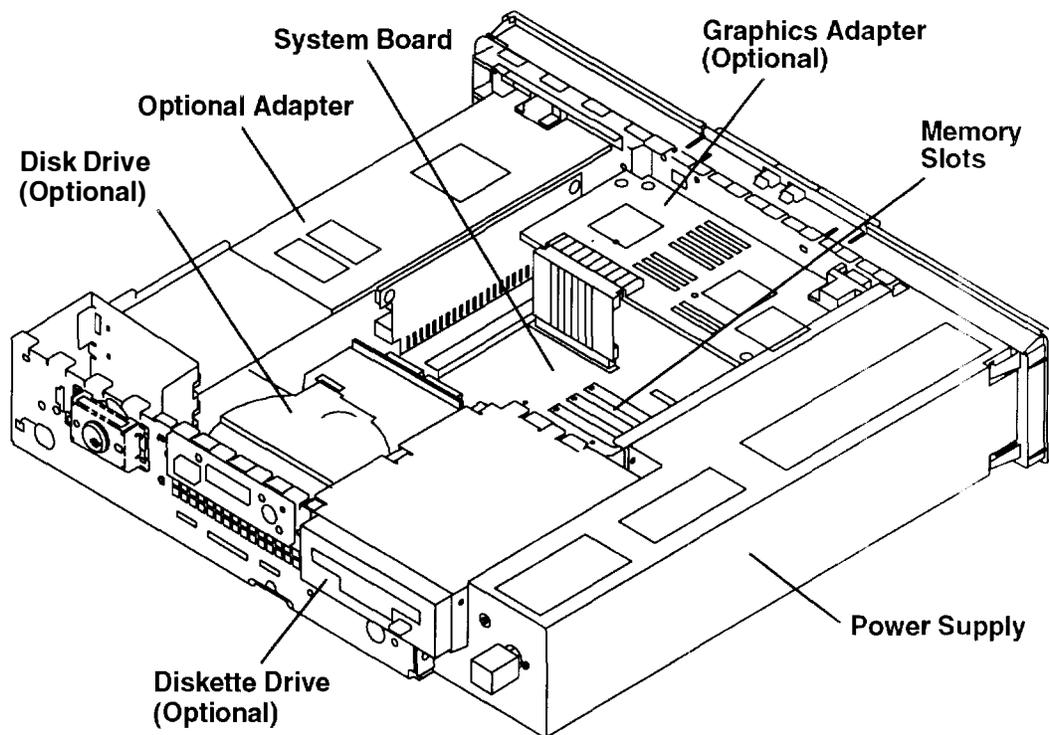
Option List

If you have more than one of the following procedures to perform, do them in the order listed.

- "Installing Memory" on page 2-8.

- "Disabling or Enabling the SCSI Connector" on page 2-13.

- "Installing a Diskette Drive" on page 2-19.

- "Installing a Disk Drive" on page 2-22.

- "Installing a VRAM Upgrade for a Graphics Adapter" on page 2-46.

- "Installing a POWER Graphics Adapter" on page 2-49.

- "Setting the Display Jumpers" on page 2-54.

- "Installing an Optional Adapter" (for example, Token-Ring or 8-Port EIA-232) on page 2-62.

Installing Memory

1. If you have not already done so, remove the chassis assembly and chassis cover as described in "Removing the Chassis Assembly and Chassis Cover" on page 2-3

2. To install SIMMs in a Model 220 or 230, go to "Model 220 or 230 SIMMs" on page 2-8

   To install SIMMs in a Model 250, go to "Model 250 SIMMs" on page 2-10.

Model 220 and 230 SIMMs

The 7011 Models 220 and 230 support 4M-byte and 8M-byte Single Inline Memory Modules (SIMMs).

Note: SIMMs must be installed in matching pairs.

1. If you do *not* need to remove any previously installed SIMMs, go to Step 2 on page 2-9.

   To remove previously installed SIMMs, perform the following steps:

   a. Locate the SIMM sockets on the system board.
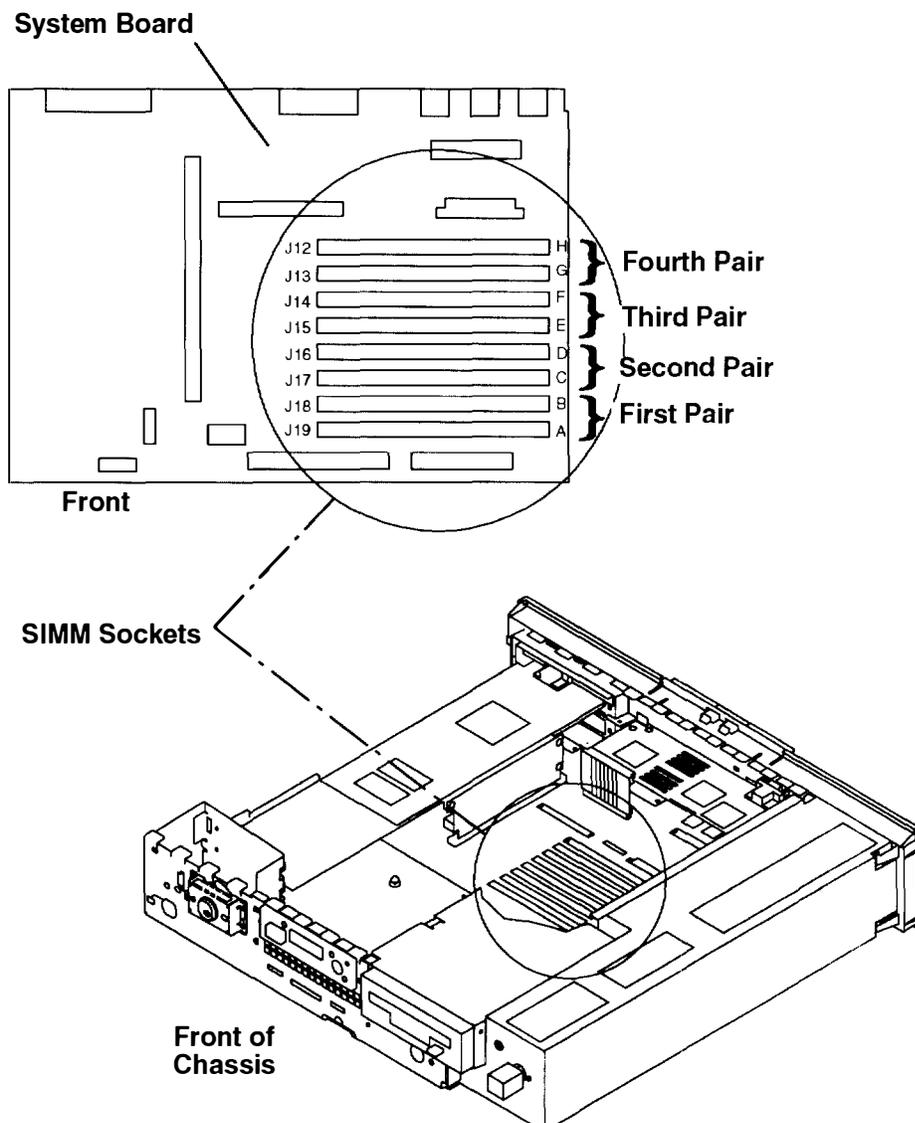
b. While pressing the locking tabs outward, tilt the SIMM toward the rear of the chassis, and pull it out of the socket.

Tilt toward rear

Push Locking Tabs Out to Release SIMM
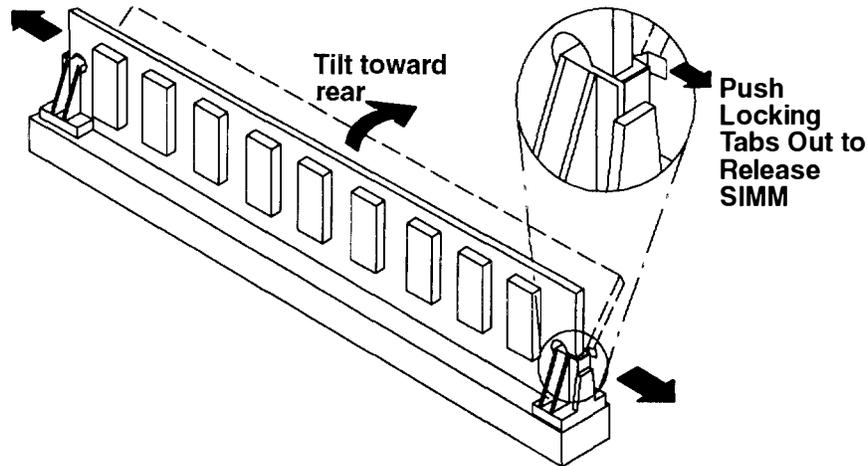
2. To install new SIMMs, turn the SIMM so that the notch is to the right when you view it from the front of the system unit chassis.

SIMM

Notch to Right
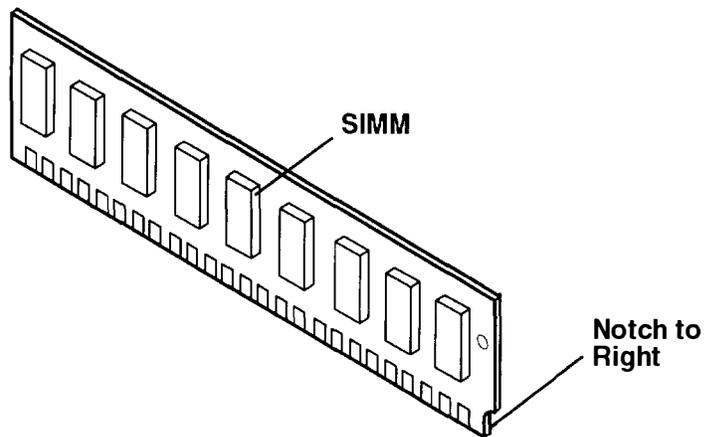
3. Insert the SIMMs at an angle in the first unused socket pair (J19 through J12) and pull the SIMMs forward to a vertical position. When the SIMMs are at the proper upright position, the locking tabs snap into place behind the SIMM.

Tilt Toward Front
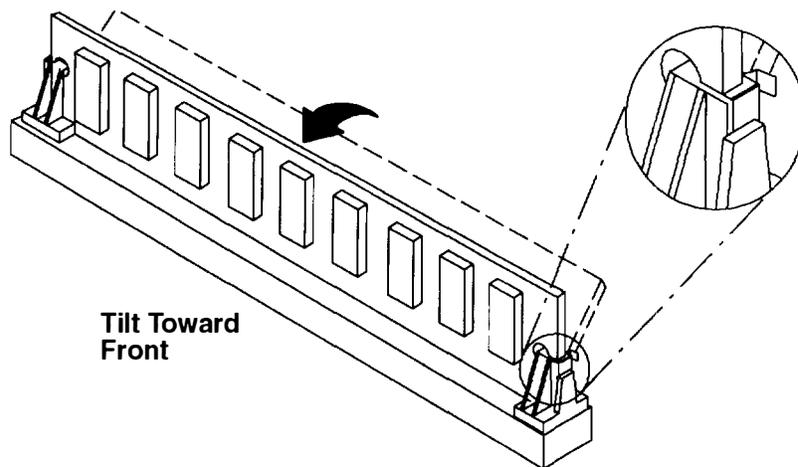
4. In the Models 220 and 230, SIMMs must be installed in pairs; see the illustration on page 2-8.

5. If you have other procedures to perform, refer to "Option List" on page 2-7.

6. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Model 250 SIMMs

The 7011 Model 250 supports 2M-byte, 4M-byte, 8M-byte, 16M-byte, and 32M-byte Single Inline Memory Modules (SIMMs).

Note: SIMMs must be installed in matching sets of four.

1. If you do *not* need to remove any previously installed SIMMs, go to Step 2 on page 2-11.

   To remove previously installed SIMMs, perform the following steps:

   a. Locate the SIMM sockets on the system board.
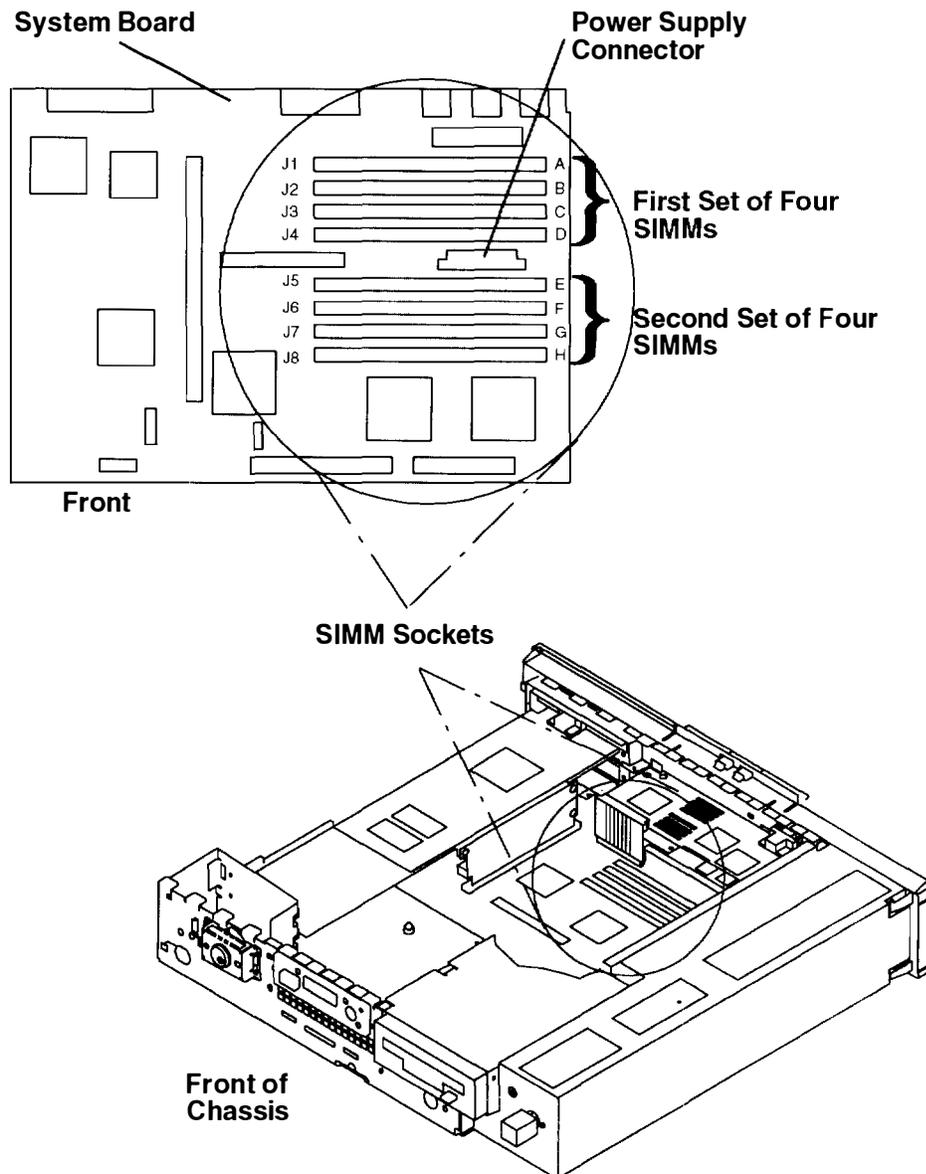
b. If it is necessary to remove or install SIMMs in the first set of four SIMMs, you must first:

- Remove the power supply cable from the supply connector on the system board.

- Remove the graphics adapter (if installed). For graphics adapter removal and installation instructions, refer to page 2-46.

c. While pressing the locking tabs outward, tilt the SIMM toward the front of the chassis, and pull it out of the socket.

Tilt Toward Front

Push Locking Tabs Out to Release SIMM
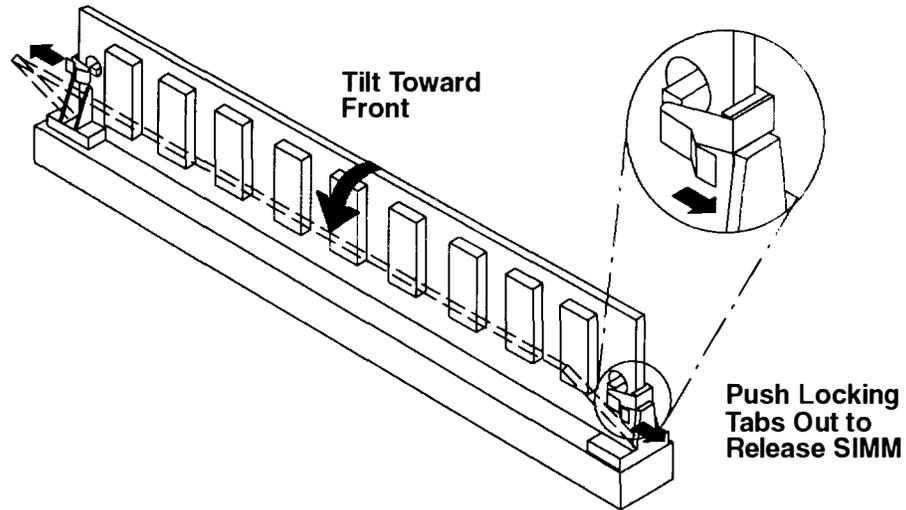
2. To install new SIMMs, turn the SIMM so that the notch is to the left when you view it from the front of the system unit chassis.

SIMM

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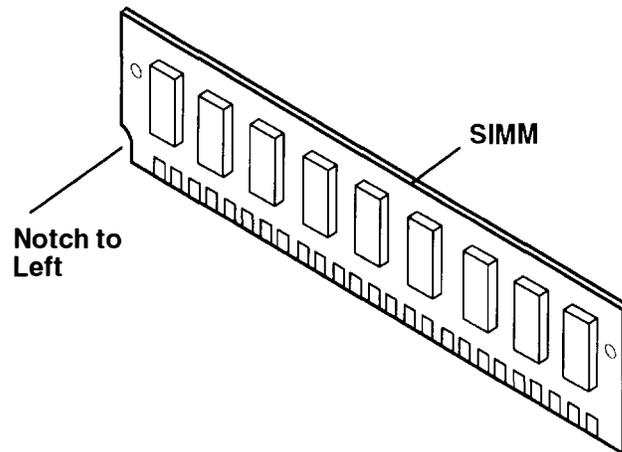
3. Starting with the rearmost slot in the set of four SIMMs, insert a SIMM at an angle and tilt the SIMM upright until the locking tabs snap into place to hold the SIMM.

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

Tilt toward rear

Notched End of SIMM
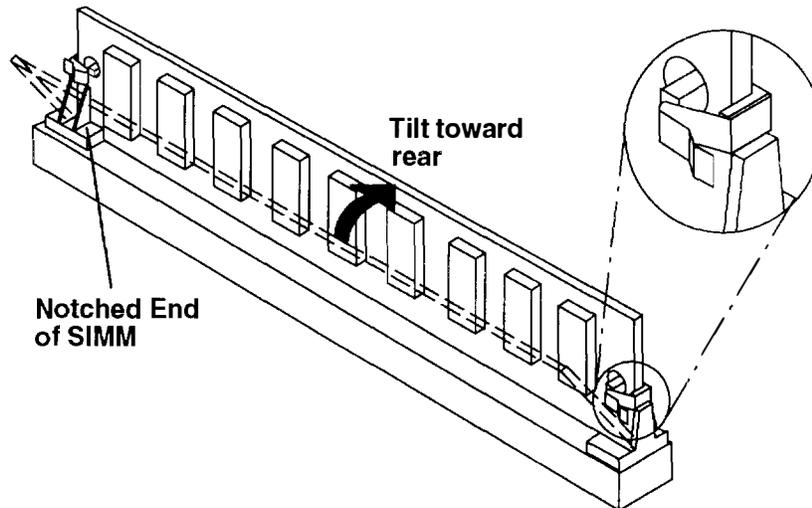
4. SIMMs must be installed in matching sets of four; refer to the illustration on page 2-10

5. If you have disconnected the power supply cable, reconnect it to the power supply connector on the system board. See the illustration on page 2-10.

6. If you have removed the graphics adapter, reinstall it now. Refer to page 2-46 for installation instructions.

7. If you have other procedures to perform, refer to "Option List" on page 2-7.

8. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Disabling or Enabling the SCSI Connector

Optional security for SCSI is provided by five jumpers (JP1) on the system board. These jumpers (when set to the disabled position) prevent communication through the external SCSI connector. The default setting of the jumpers from the manufacturer is SCSI connector *enabled*.

If you have not already done so, remove the chassis assembly and chassis cover as described in "Removing the Chassis Assembly and Chassis Cover" on page 2-3.

Model 220

1. If a disk drive is installed in your system, you must remove the disk drive to change the SCSI enable/disable setting. To remove the disk drive:

   a. Disconnect the disk drive signal cable from connector J22 on the system board.

   b. Disconnect the disk drive power cable from connector J24 on the system board.

   c. Press down on the release latch located on the front of the disk drive and slide the disk drive to the rear.

Release Latch
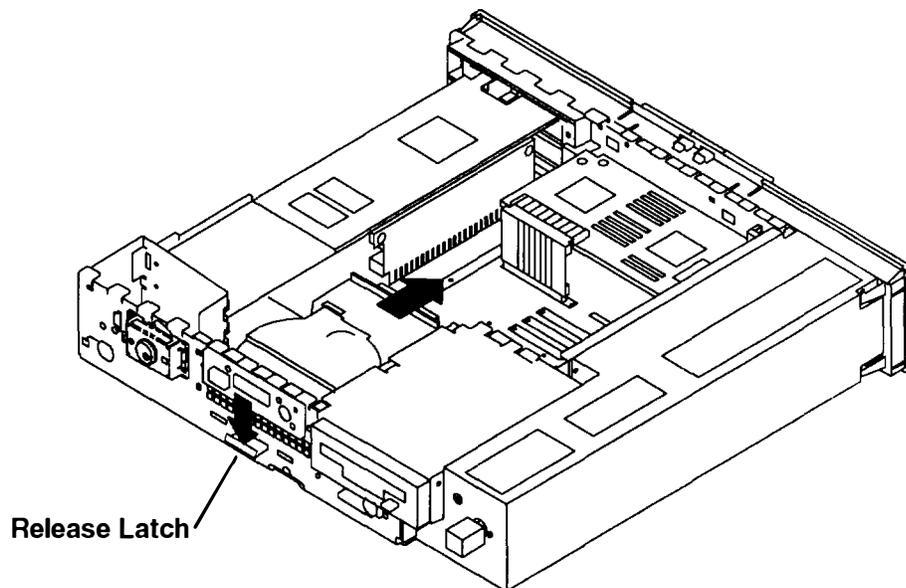
   d. Lift disk drive up from the mounting studs.

2. Locate the SCSI enable/disable jumpers on the system board. Remove the jumpers and replace them all in the disabled or enabled position.

System Board
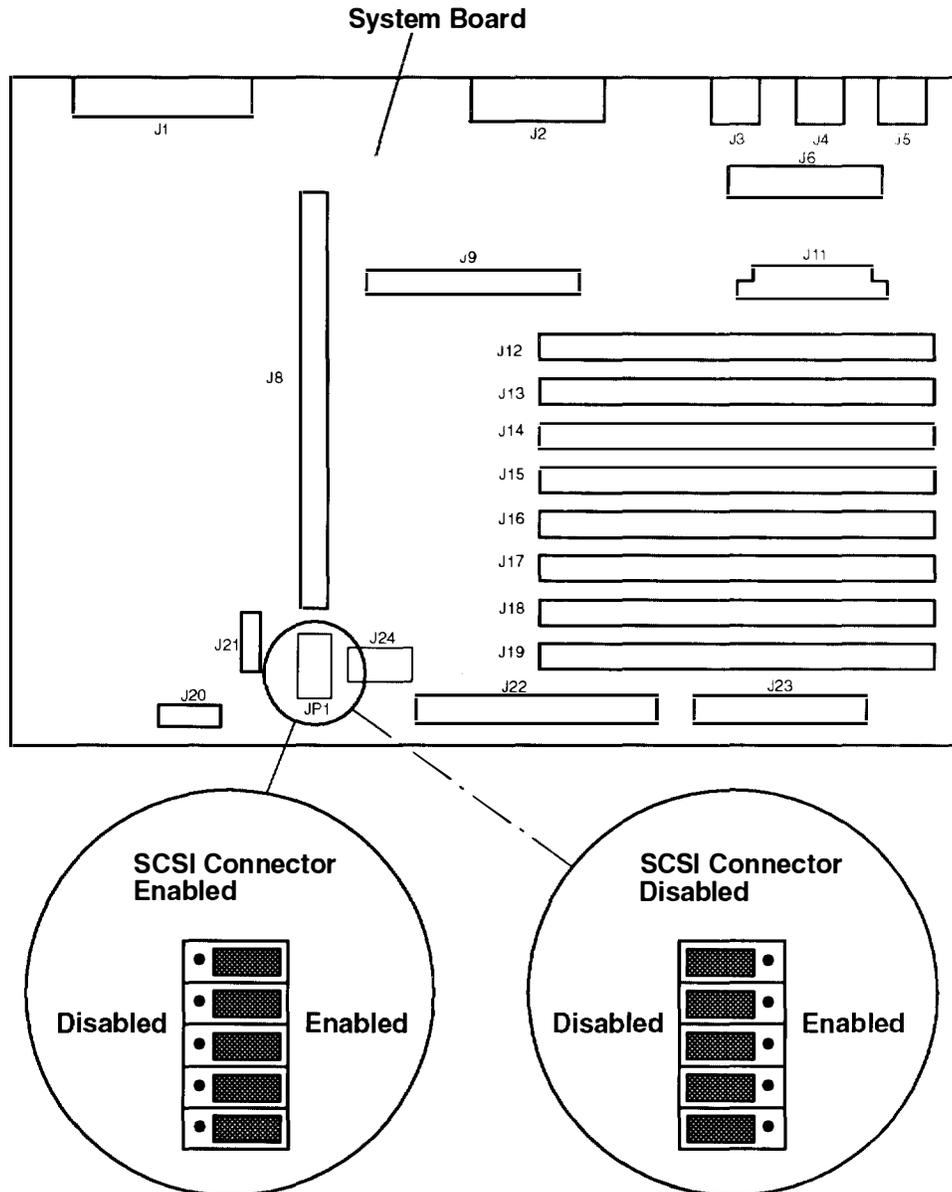
3. If you have removed a disk drive, replace it now. For disk drive installation instructions, refer to "Installing a Disk Drive" on page 2-22.

4. If you have other procedures to perform, refer to "Option List" on page 2-7.

5. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Models 230 and 250

To enable or disable the SCSI connectors in a Model 230 or 250, perform the following steps.

1. If any optional adapters are installed in slot 1 and 2 in the system unit, remove all optional adapters now:

   a. Make sure that the riser card support is installed.

   b. Disconnect the adapter cable from the adapter.

Optional Adapter

Riser Card Support
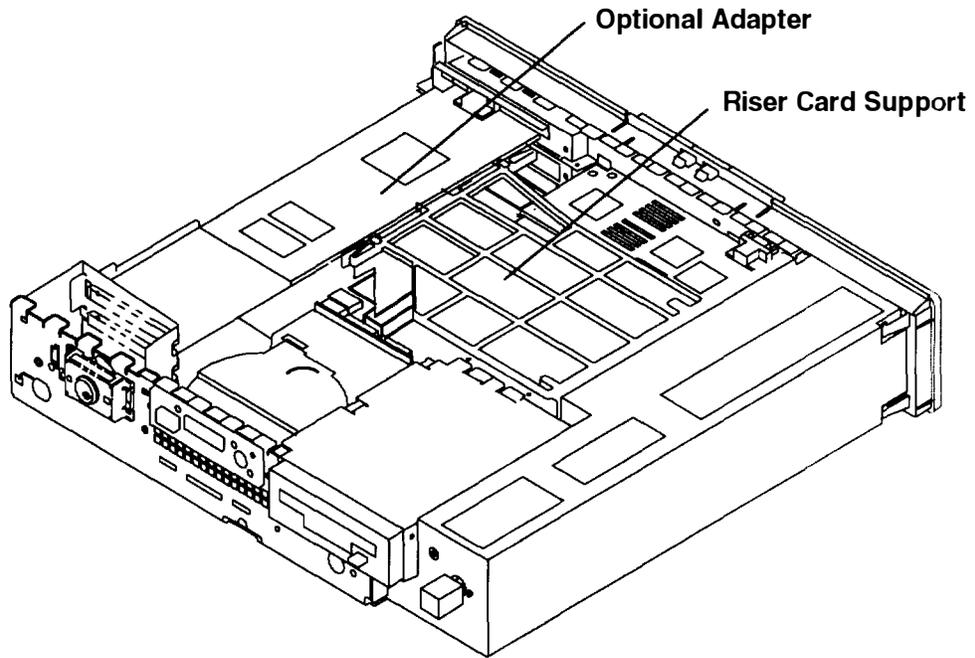
   c. Loosen the serrated knobs that secure the adapters to the rear cover.

Serrated Knobs
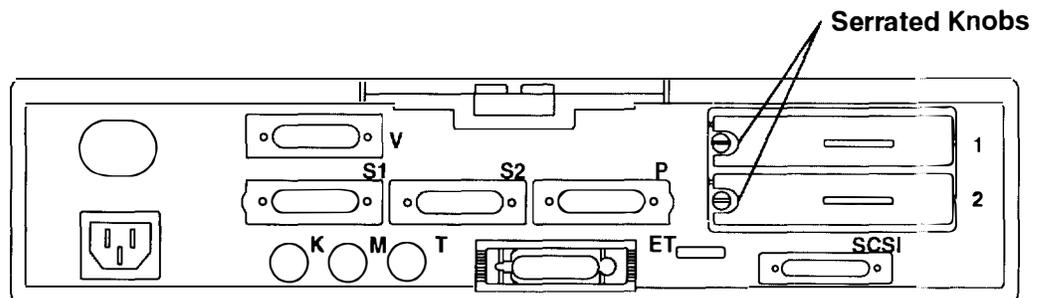
d. Press down on the adapter retainer and lock it behind the side cover

Press

Adapter Retainer
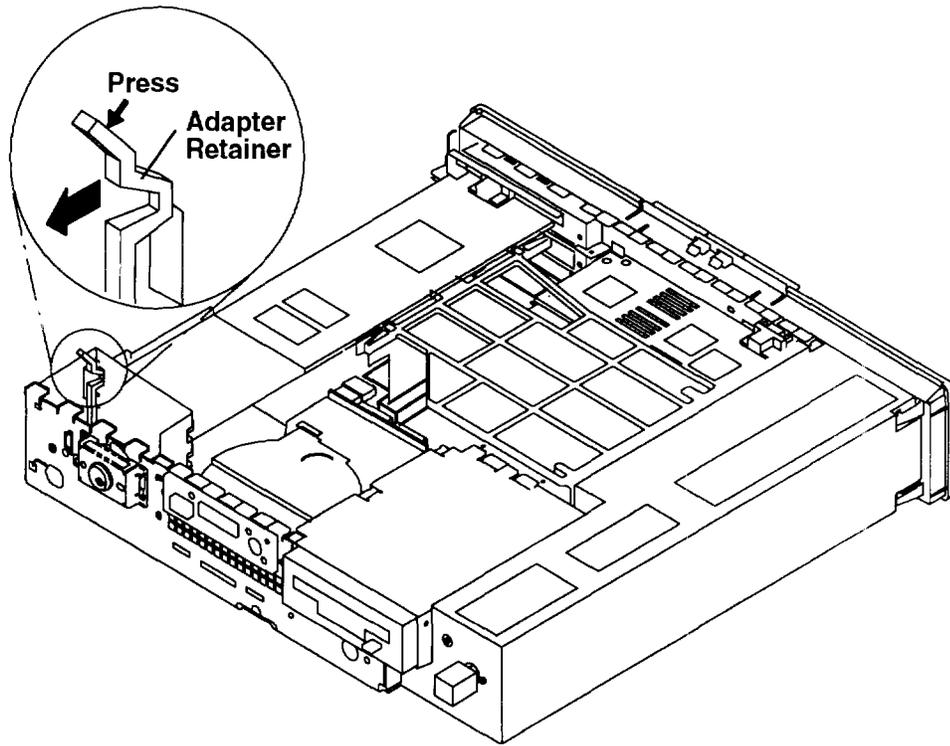
e. Slide the adapter out of the guide rails by grasping the adapter by the blue grips

Grips

Guide Rails
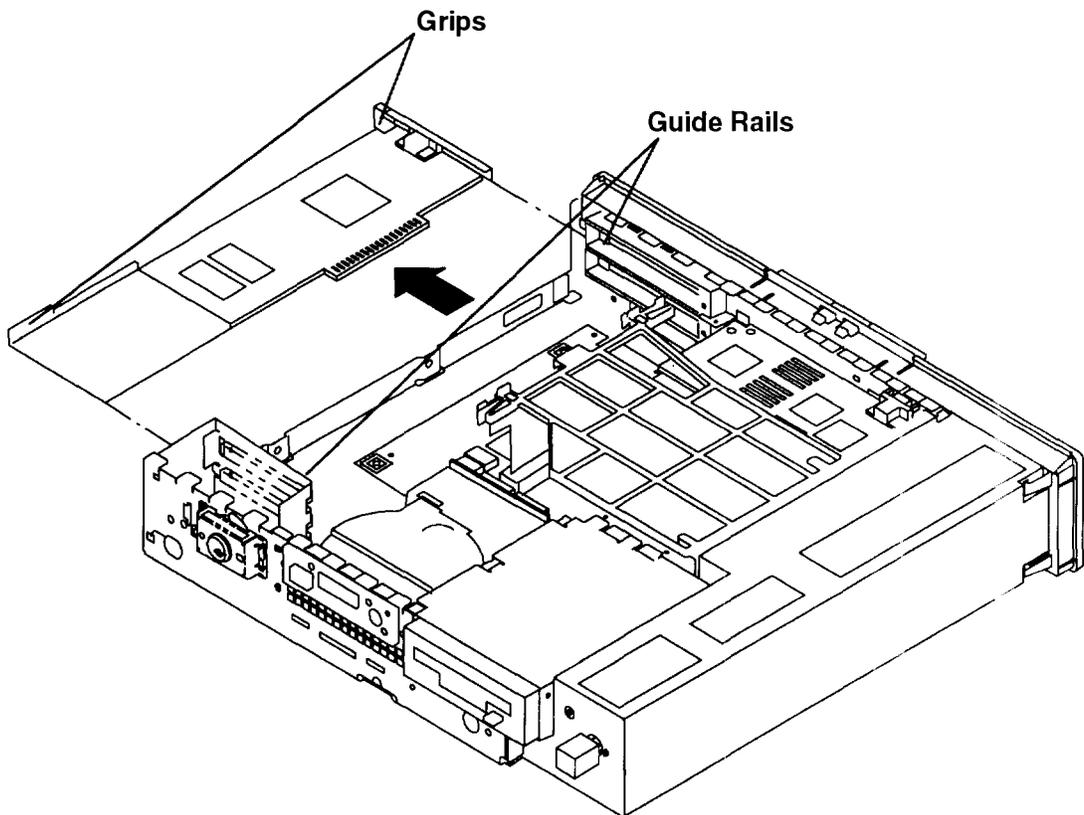
2. Locate the SCSI enable/disable jumpers on the system board. If you have a Model 250, substep 2b on page 2-18 describes the Model 250 SCSI enable/disable jumper locations.

   a. For the Model 230, the SCSI enable/disable jumpers are in the location shown below. Remove the jumpers and replace them all in the disabled or enabled position When you have finished, go to Step 3 on page 2-18.
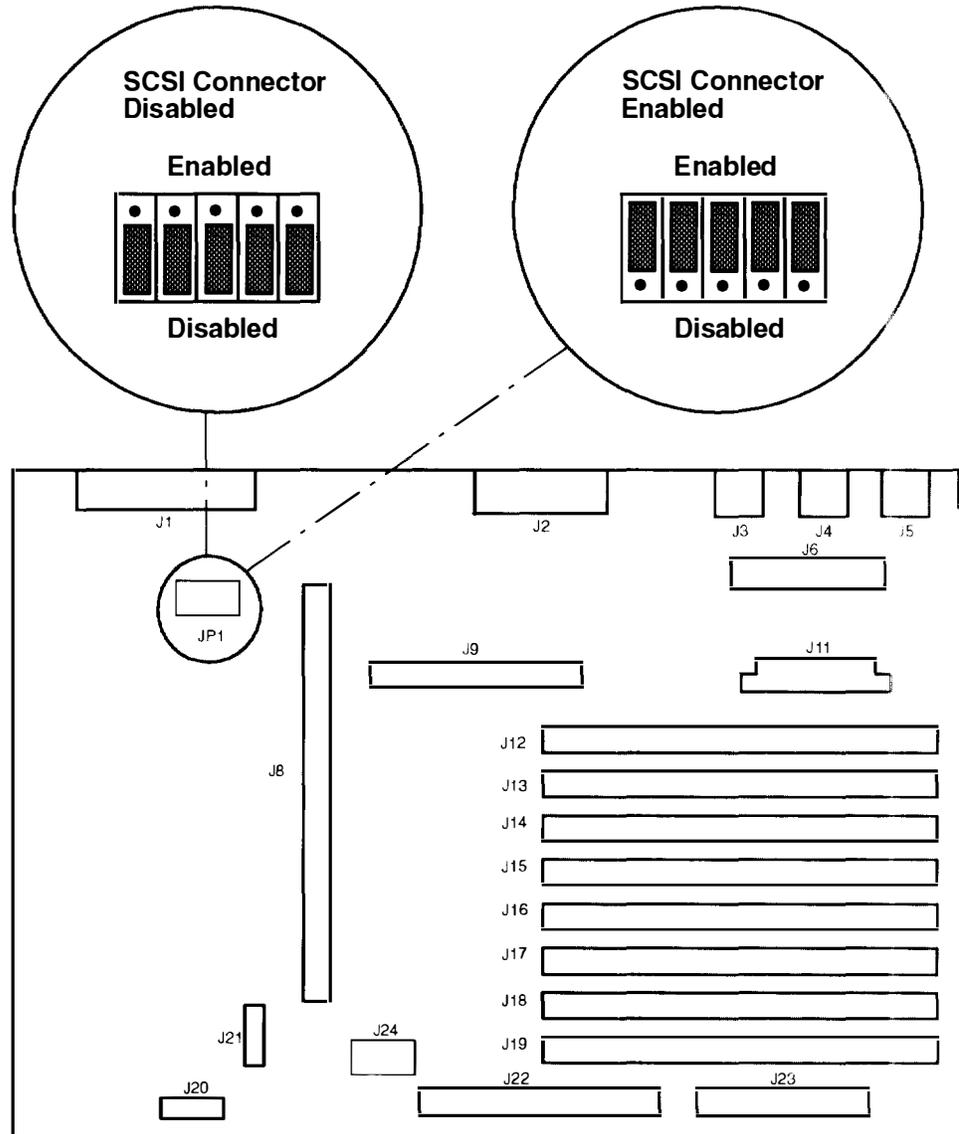
b. For the Model 250, the jumpers are in the location shown. Remove the jumpers and replace them all in the disabled or enabled position.
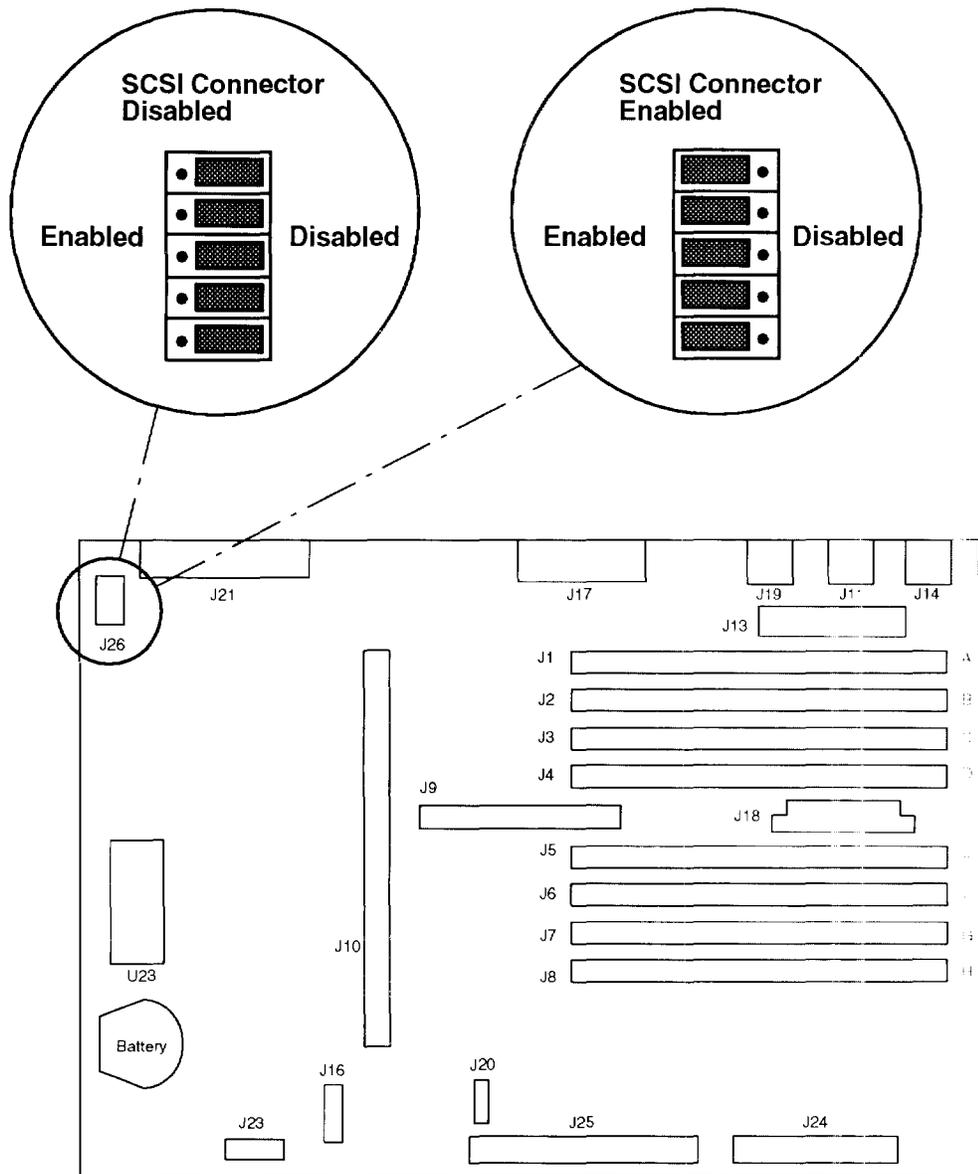
3. If you have removed any optional adapters, replace them now. For adapter installation instructions, refer to "Installing an Optional Adapter" on page 2-62.

4. If you have other procedures to perform, refer to "Option List" on page 2-7.

5. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66

Installing a Diskette Drive

Use the following instructions for installing a diskette drive.

1. If you have not already done so, remove the chassis assembly and chassis cover as described in "Removing the Chassis Assembly and Chassis Cover" on page 2-3.

2. On the front of the cover, open the operator panel door and use a coin or screwdriver to remove the diskette drive breakout panel from the front cover.

Breakout Panel
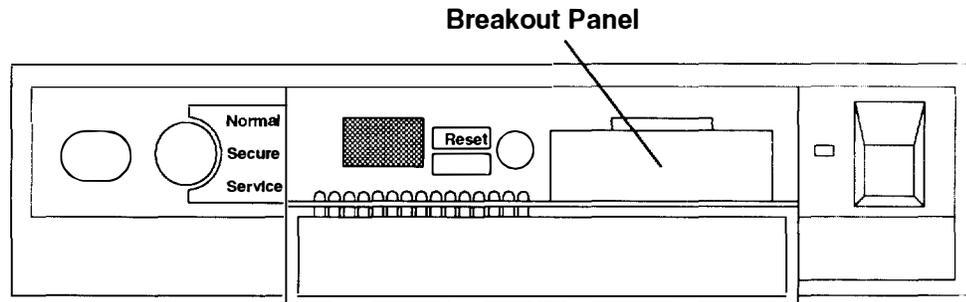
3. Connect one end of the signal cable to the connector on the rear of the diskette drive.

Signal Cable
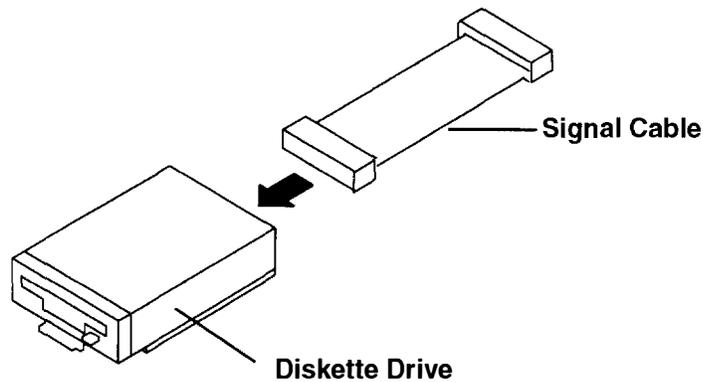
Diskette Drive

4. Place the diskette drive on its bracket and slide toward the rear, making sure the diskette drive slides into diskette guide rails and is not resting on top of the guide rails.

Slide the diskette drive toward the rear until the release tab on the front of the diskette drive snaps down to latch into place.

Diskette Guide Rails

Front of Chassis

Diskette Drive Bracket

Diskette Drive

Release Tab
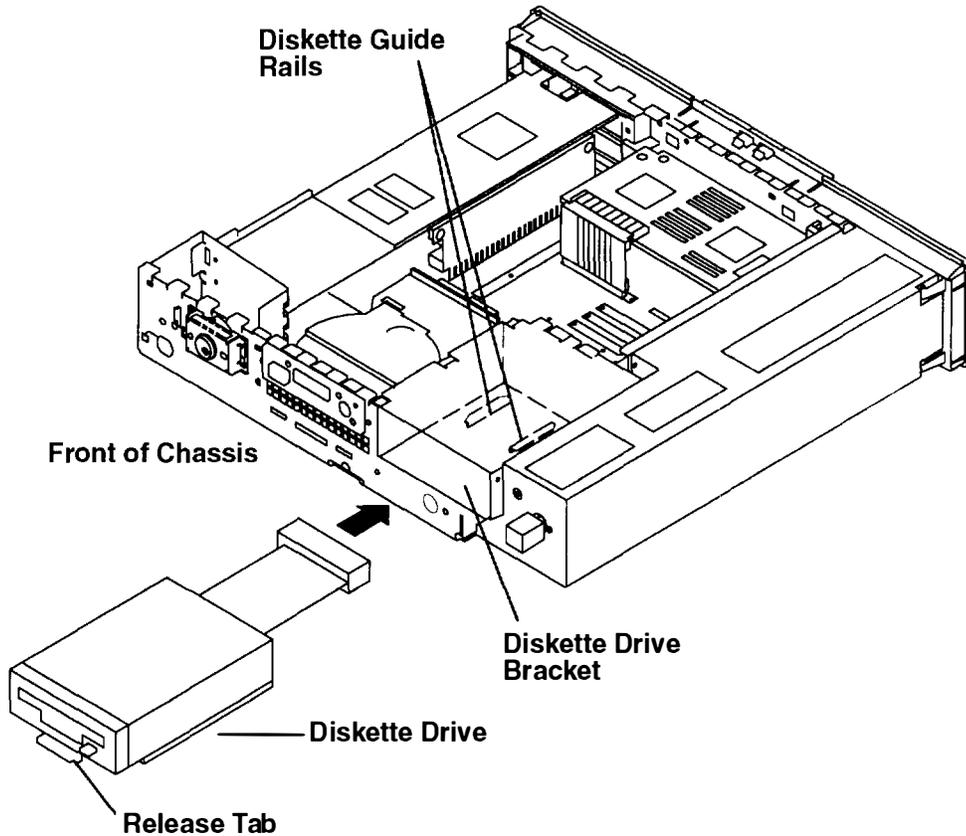
5. Check to make sure the diskette drive is locked into place. You should not be able to move the diskette drive around if it is installed properly.

6. Connect the other end of the signal cable to the system board.

a. For the Models 220 and 230, connect the other end of the signal cable to connector J23 on the system board.

Diskette Connector
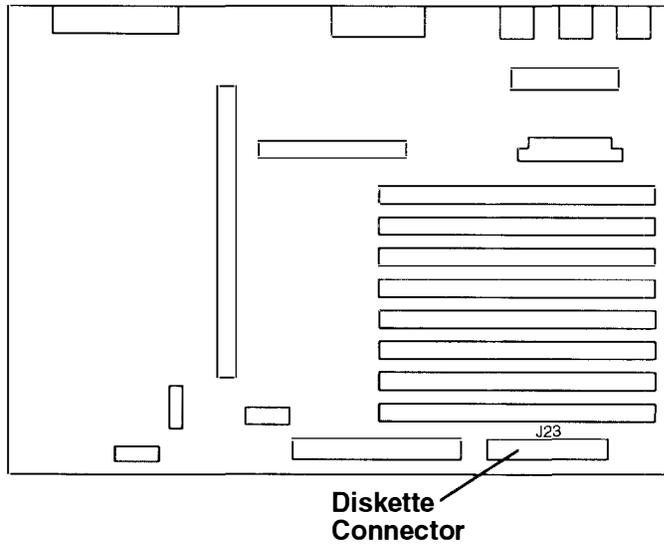
b. For the Model 250, connect the other end of the signal cable to connector J24 on the system board.
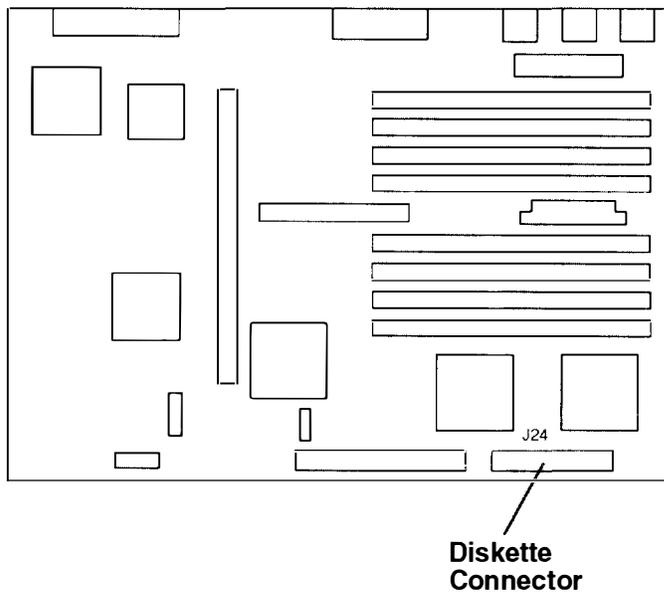
Diskette Connector

7. If you have other procedures to perform, refer to "Option List" on page 2-7.

8. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Installing a Disk Drive

Use the following instructions to install a disk drive.

1. If you have not already done so, remove the chassis assembly and chassis cover as described in "Removing the Chassis Assembly and Chassis Cover" on page 2-3

2. To install the following drives, go to the indicated page.

   The first 200M-byte disk drive   Page 2-22.

   The second 200M-byte disk drive   Page 2-27.

   540M-byte disk drive   Page 2-33.

   1G-byte disk drive   Page 2-38.

   One-Inch High 1G-byte disk drive   Page 2-42.

Installing the First 200M-byte Disk Drive

1. To set the first 200M-byte disk drive address:

   a. Remove all terminators from terminator blocks J2, J3, and J5. To remove the resistors, slide the metal bar to the left, and then pry the resistor module out of the block and discard.

   b. Remove all address jumpers from the jumper block.

Terminating Resistor Blocks (J2, J3, J5)

Bottom View of Disk Drive

Address Jumpers

If you later need to change the SCSI address of this disk drive, use the following table to help you set the address. Record any changes in the SCSI address record in Appendix A.

SCSI Address	Jumper 1	Jumper 2	Jumper 3
0	off	off	off
1	on	off	off
2	off	on	off
3	on	on	off
4	off	off	on
5	on	off	on
6	off	on	on

2. Connect the power cable to the connector on the back of the disk drive.

3. Connect the signal cable to the connector on the back of the disk drive.
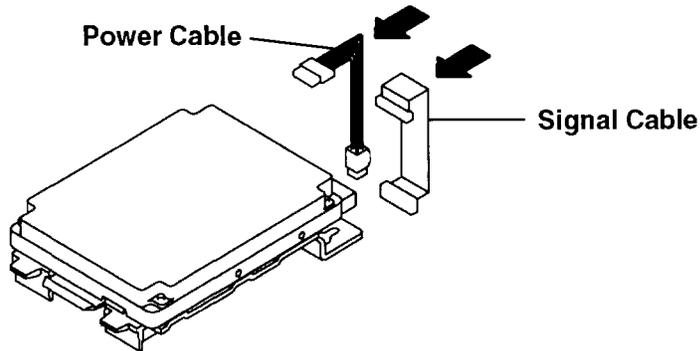
Power Cable

Signal Cable

4. Place the disk drive keyhole slots on the mounting studs.

Keyhole Slot

Latch

Mounting Studs

Latch Slot
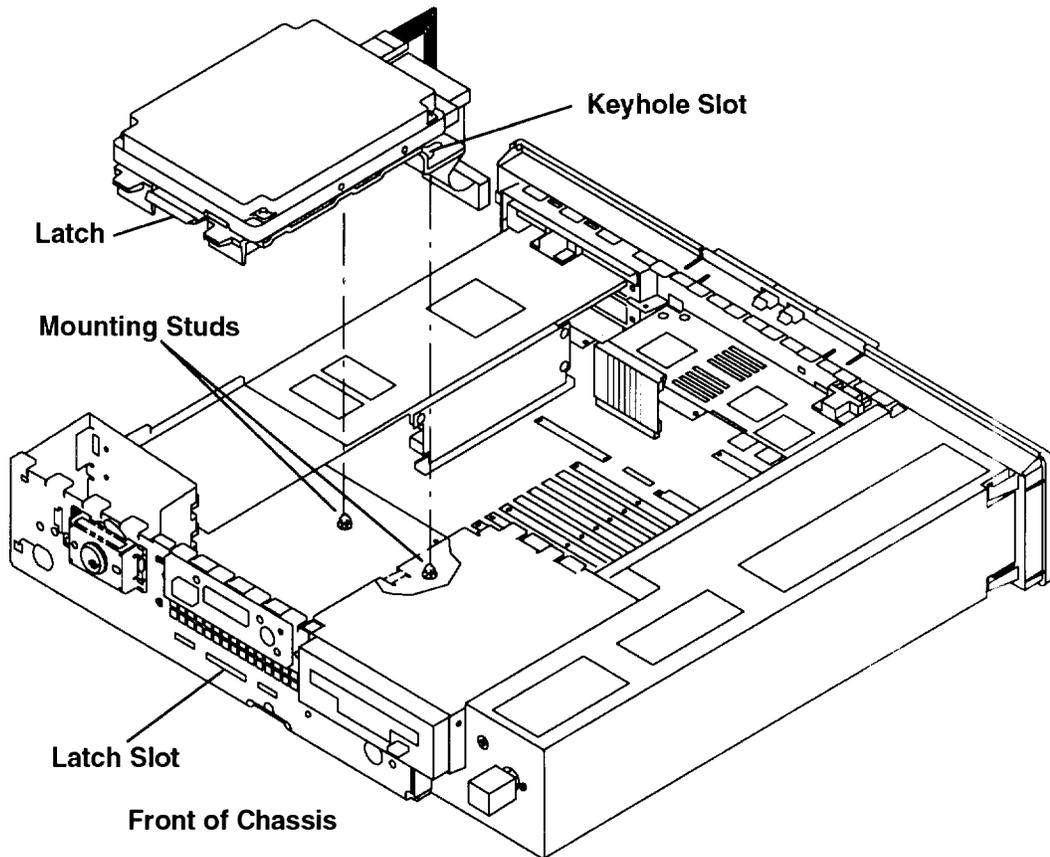
Front of Chassis

5. Slide the drive toward the front of the chassis until it snaps into the latch slot. You should hear a click when the disk drive snaps into place.

6. Check to make sure the disk drive is fully pushed through the latch slot. You should not be able to move the disk drive around if it is installed properly.

7. Connect the disk drive signal cable and power cable to the connectors on the system board.

   a. For the Model 220 or Model 230, connect the disk drive signal cable to J22 and the disk drive power cable to J24.

Disk Drive Power Connector   **Disk Drive Signal Connector**

   b. For the Model 250, connect the disk drive signal cable to J25 and the disk drive power cable to J20.

Disk Drive Power Connector   **Disk Drive Signal Connector**

8. Connect the SCSI terminator shipped with the disk drive to the SCSI connector on the rear panel.

Rear Panel

SCSI Terminator

SCSI Connector

9. If you have other procedures to perform, refer to "Option List" on page 2-7.

10. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Installing the Second 200M-byte Disk Drive

Before installing a second 200M-byte disk drive, it is necessary to remove the first 200M-byte disk drive and install two mounting brackets. These mounting brackets allow you to mount the second disk drive above the first. Refer to the following instructions for information on how to install the mounting brackets and the second 200M-byte disk drive.

1. For the Model 220 or Model 230, disconnect the disk drive signal cable from J22 and the disk drive power cable from J24.

**Disk Drive
Power Connector**

**Disk Drive Signal
Connector**

2. For the Model 250, disconnect the disk drive signal cable from J25 and the disk drive power cable from J20.

**Disk Drive
Power Connector**

**Disk Drive Signal
Connector**
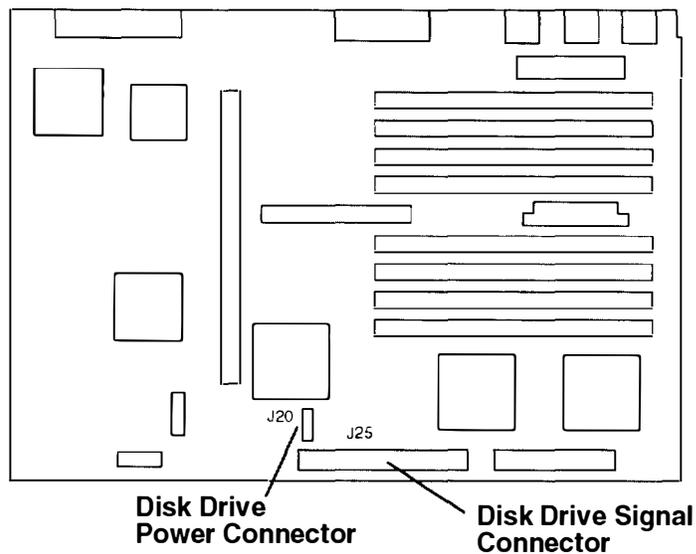
3. Press down on the release latch located on the front of the disk drive and slide the disk drive to the rear.

Release Latch
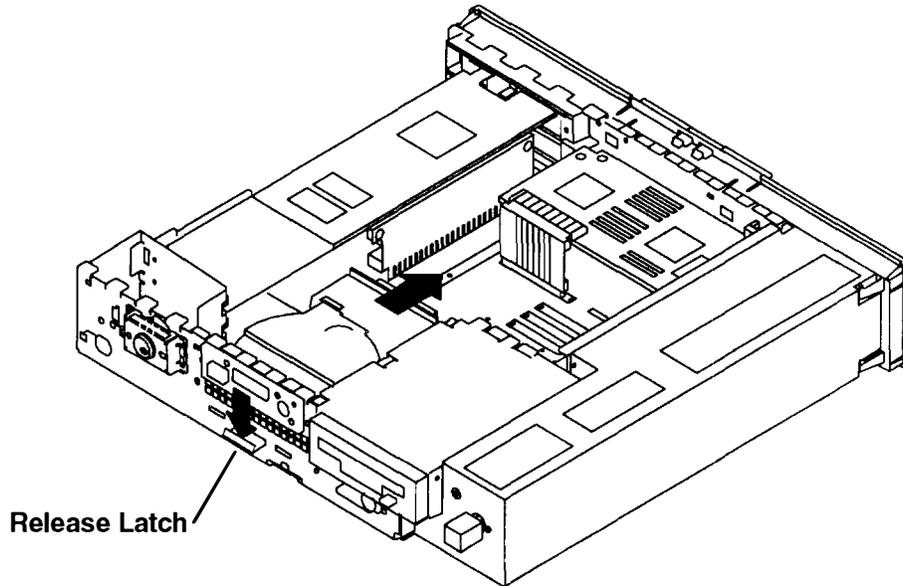
4. Lift the disk drive up from the mounting studs.

5. Remove the signal and power cables from the disk drive.

6. Install the first mounting bracket using the following procedure.

   a. Remove the four screws holding the disk drive to the base mounting plate.

First Disk Drive

Base Mounting Plate
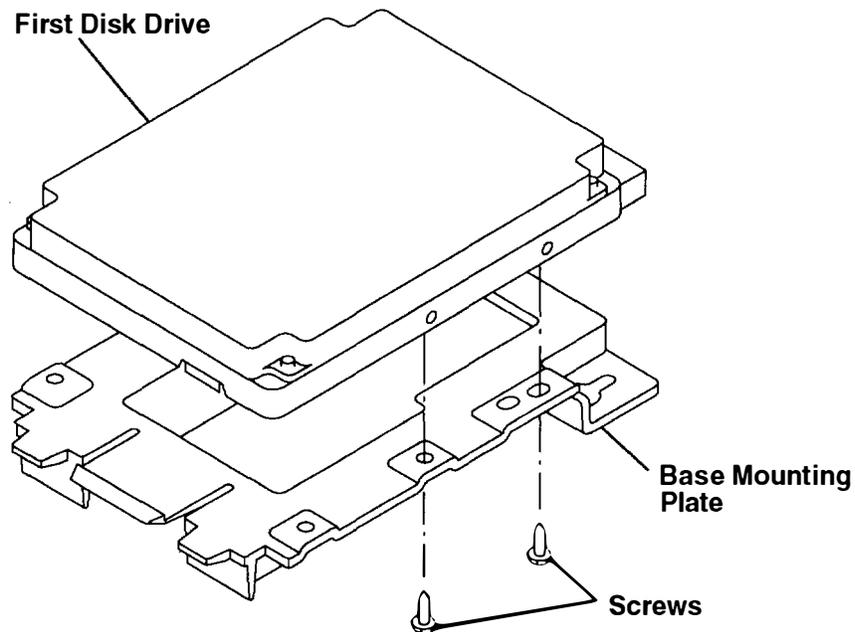
Screws

b. Place the first mounting bracket so the mounting holes line up with the holes on the base mounting plate from which the screws were removed in substep 6a.

c. Install the screws removed in substep 6a. These screws will pass through the first bracket, through the base mounting plate. and into the first disk drive.

First Disk Drive

Base Mounting Plate

Mounting bracket

Screws
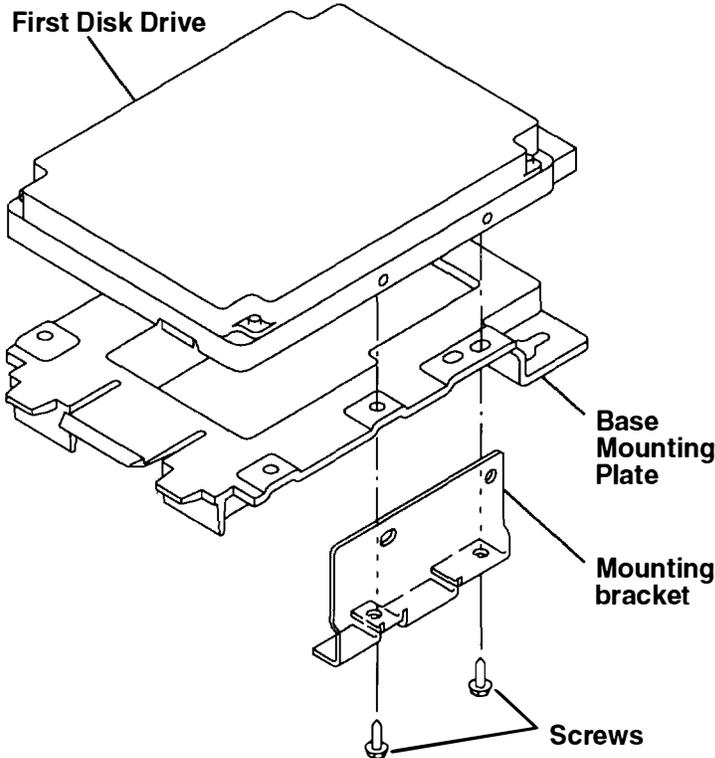
7. Repeat Step 6 to install the second mounting bracket.

8. On the second 200M-byte disk drive, do the following:

a. Remove all terminators from terminator blocks J2, J3, and J5. To remove the resistors, slide the metal bar to the left, and then pry the resistor module out of the block and discard.

J5 J3 J2

Bottom View of Disk Drive

Terminating Resistor Blocks (J2, J3, J5)

1 2 3 4 5 6

Address Jumpers

(Setting Shown Produces SCSI Address 1)
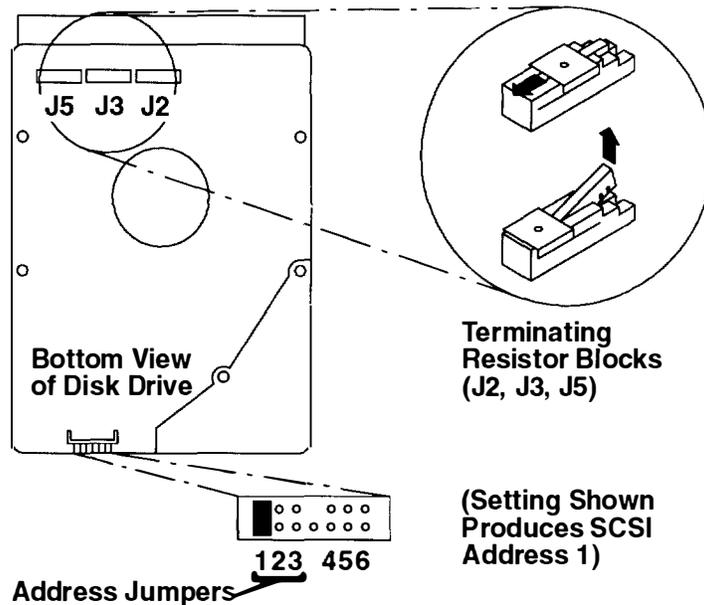
b. Install an address jumper on position 1 as indicated in the illustration.

c. If you later need to change the SCSI address of this disk drive, use the following table to help you set the address. Record any changes in the SCSI address record in Appendix A.

SCSI Address	Jumper 1	Jumper 2	Jumper 3
0	off	off	off
1	on	off	off
2	off	on	off
3	on	on	off
4	off	off	on
5	on	off	on
6	off	on	on

9. Position the second disk drive between the mounting brackets above the first drive. Ensure both drives are oriented with their connectors facing the same direction. Line up the holes in the brackets with the holes in the disk drive.

Second Disk Drive

Screws

First Disk Drive

Screws

Mounting bracket
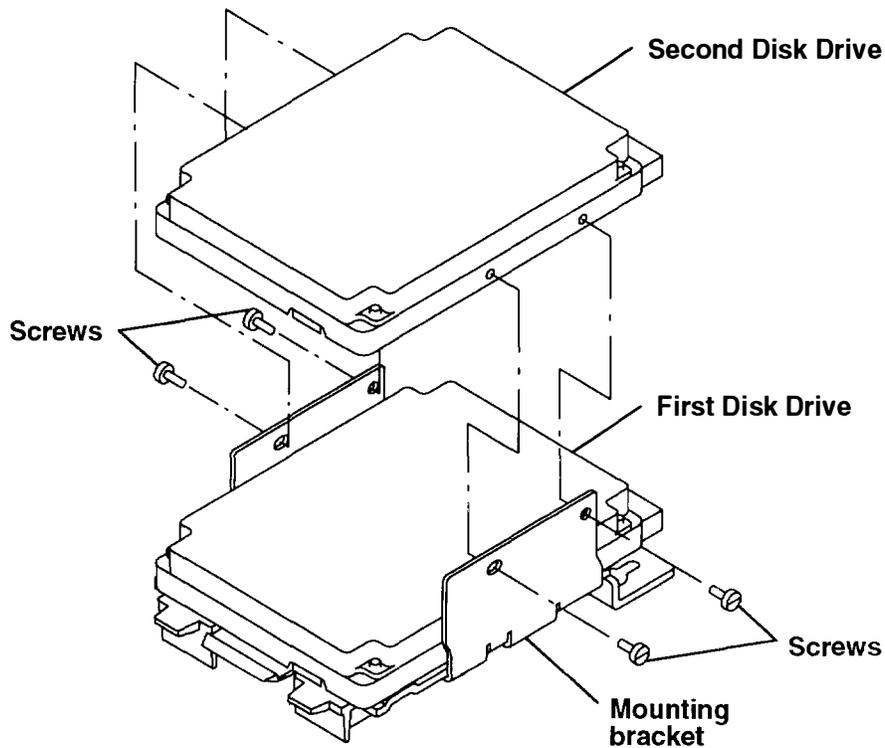
10. Install the four screws to mount the second drive. Do not tighten the screws until all four are started.

11. Connect one end of each power cable to the connectors on the back of the disk drives.

12. Connect one end of each signal cable to the connectors on the back of the disk drives.
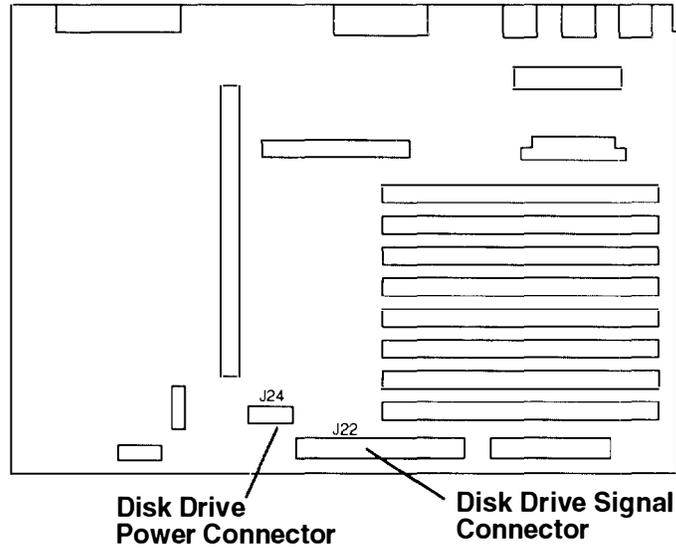
Power Cable ————

Signal Cable

13. Place the disk drive keyhole slots on the mounting studs.
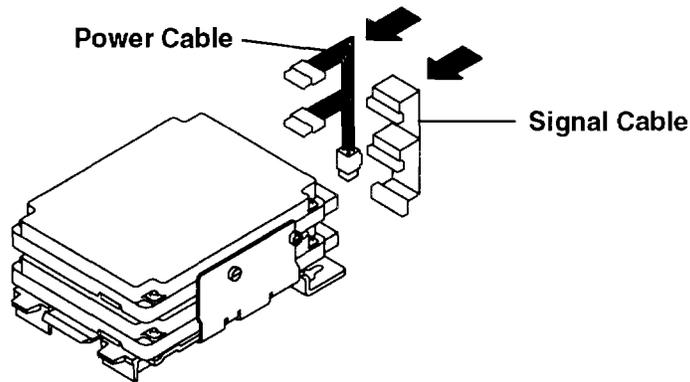
Keyhole Slot

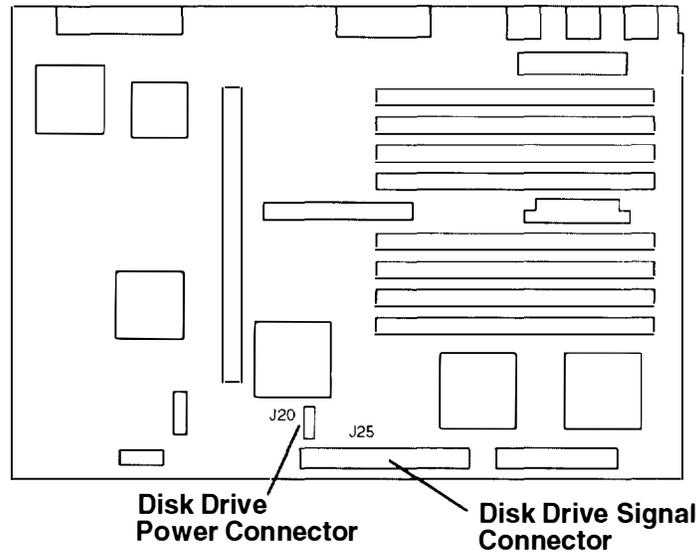Latch————

Mounting Studs

Latch Slot
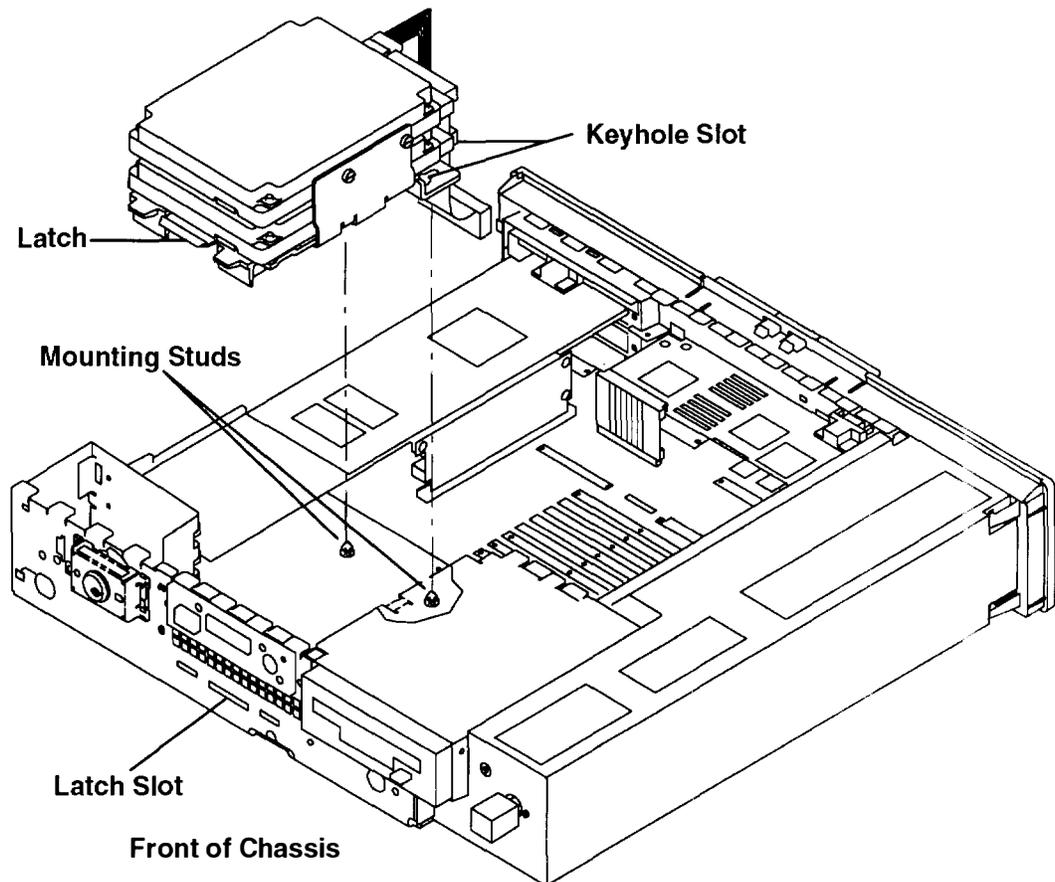
Front of Chassis

14. Slide the drive toward the front of the chassis until it snaps into the latch slot. You should hear a click when the disk drive snaps into place.

15. Check to make sure the disk drive is fully pushed through the latch slot. You should not be able to move the disk drive around if it is installed properly.
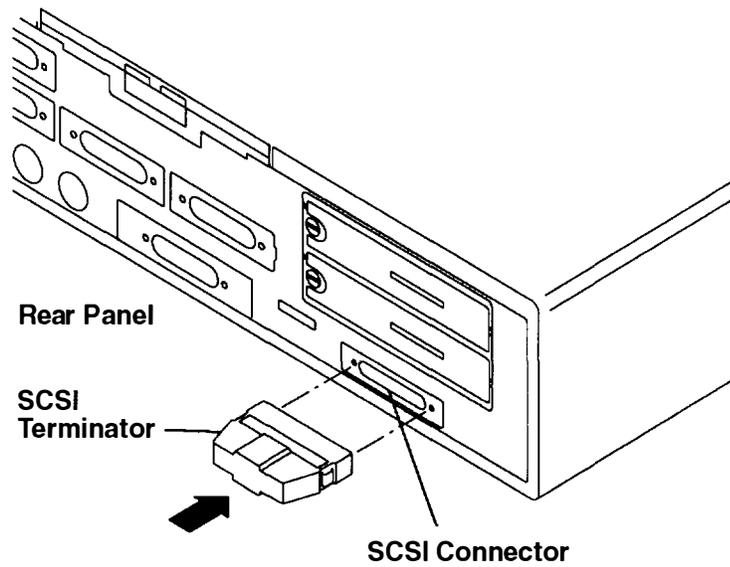
16. Connect the disk drive signal cable and power cable to the connectors on the system board.

  a. For the Model 220 or Model 230, connect the disk drive signal cable to J22 and the disk drive power cable to J24.

J24

J22

Disk Drive Power Connector

Disk Drive Signal Connector

  b. For the Model 250, connect the disk drive signal cable to J25 and the disk drive power cable to J20.

J20

J25

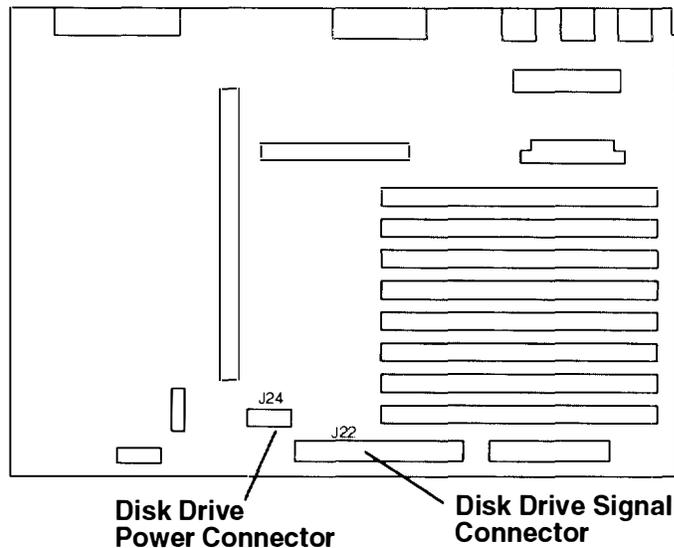**Disk Drive Power Connector**

Disk Drive Signal Connector
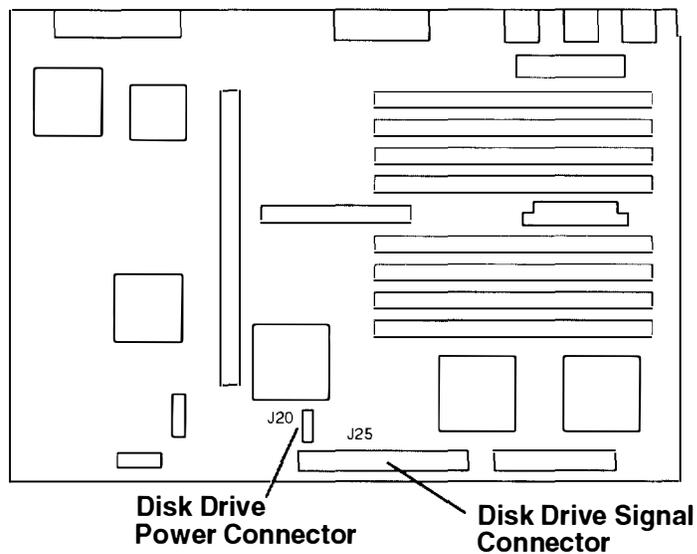
17. If you have other procedures to perform, refer to "Option List" on page 2-7.

18. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Installing a 540M-byte Disk Drive

1. The SCSI address of the 540M-byte disk drive is set by jumpers located on the disk drive's logic card (J6).
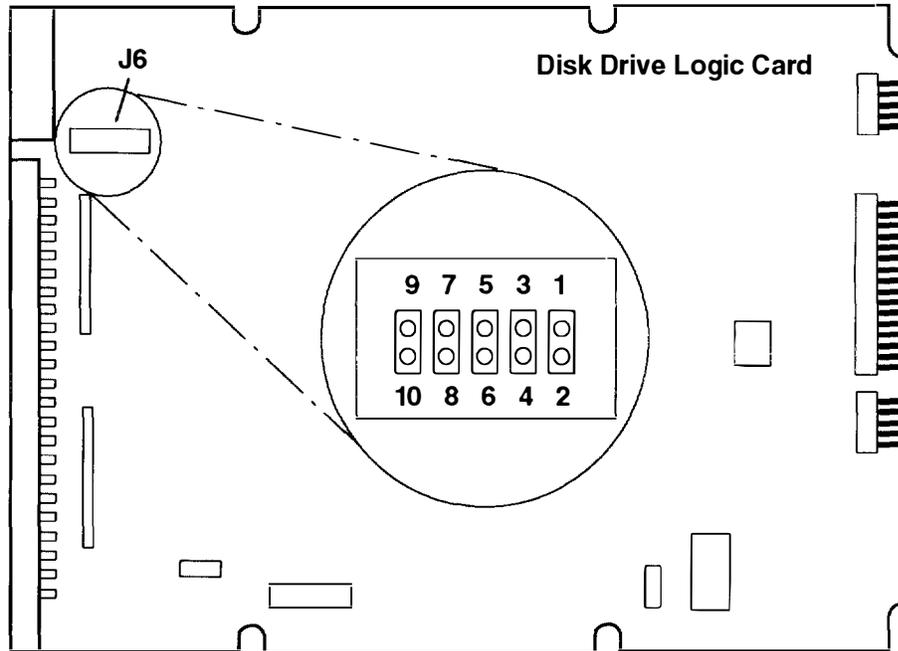
Note: When the 540M-byte disk drive is installed inside the 7011, all jumpers (J6) must be removed from the 540M–byte disk drive.

If you later need to change the SCSI address of this disk drive, use the following table to help you set the address. Record any changes in the SCSI address record in Appendix A.

SCSI Address	Jumper 1-2	Jumper 3-4	Jumper 5-6
0	off	off	off
1	on	off	off
2	off	on	off
3	on	on	off
4	off	off	on
5	on	off	on
6	off	on	on

2. Attach the base mounting plate to the disk drive using the four screws provided (Part Number 0010170).

Disk Drive

Base Mounting Plate

Screws
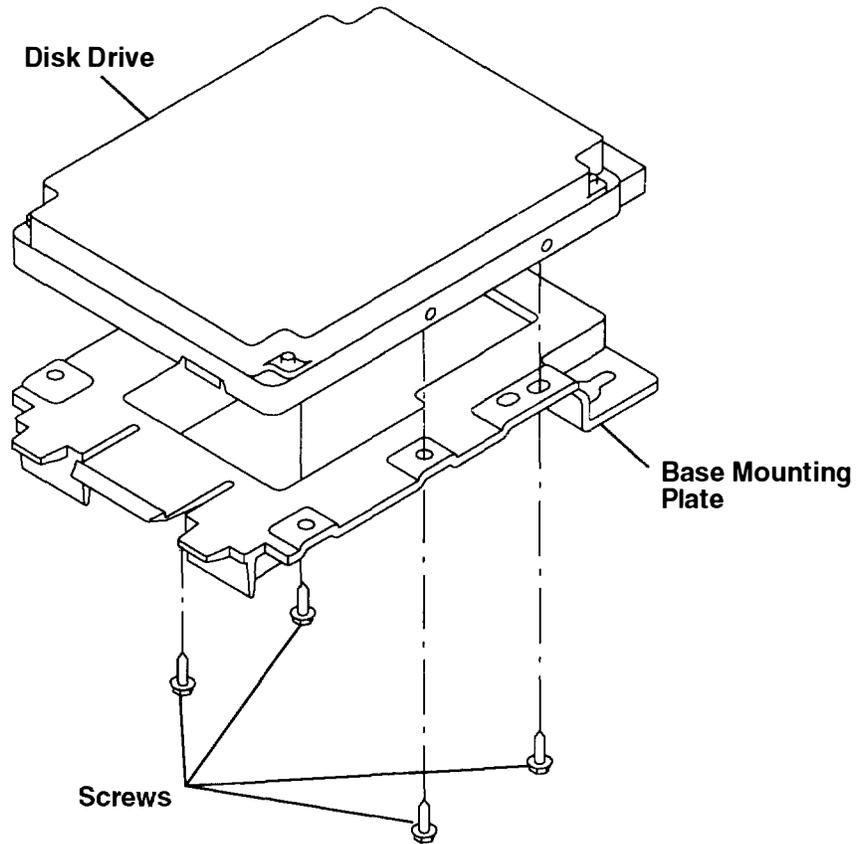
3. Connect the power cable to the connector on the back of the disk drive.
4. Connect the signal cable to the connector on the back of the disk drive.

Power Cable

Signal Cable

5. Place the disk drive keyhole slots on the mounting studs.
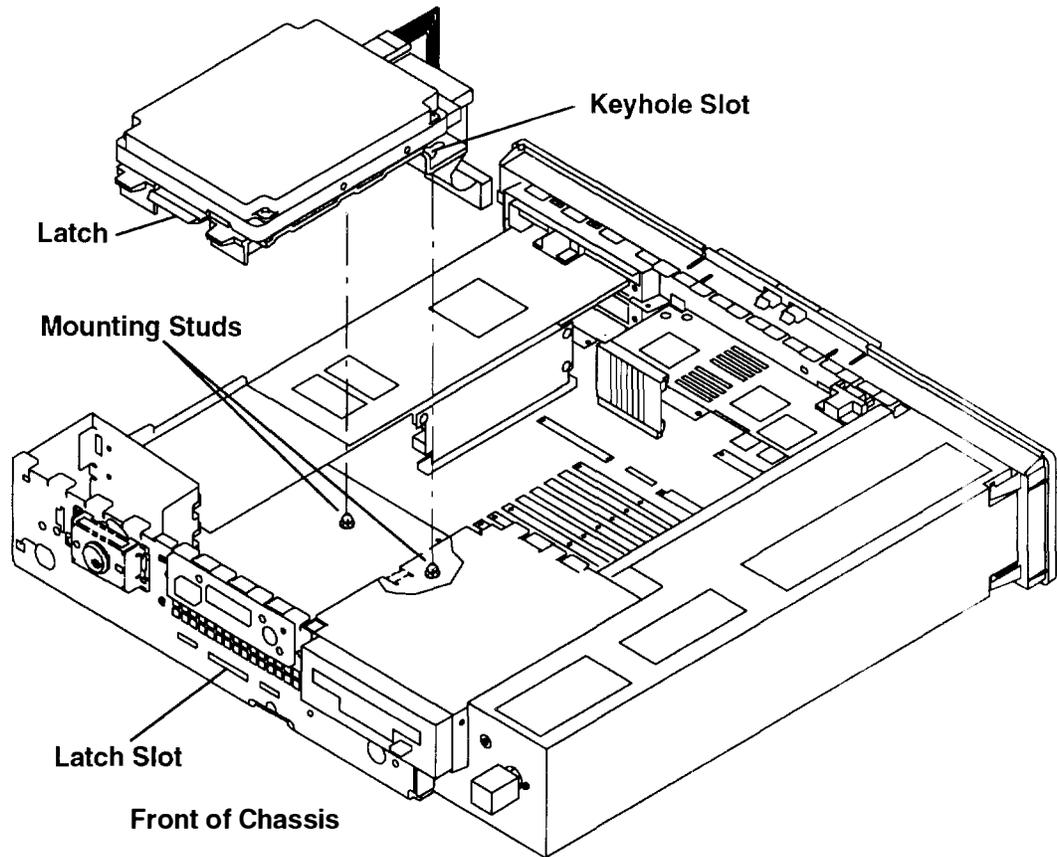
6. Slide the drive toward the front of the chassis until it snaps into the latch slot. You should hear a click when the drive snaps into place.

7. Check to make sure the disk drive is fully pushed through the latch slot. If the disk drive is installed properly, you should not be able to move the disk drive around.

8. Connect the disk drive signal cable and power cable to the connectors on the system board.

   a. For the Model 220 or Model 230, connect the disk drive signal cable to J22 and the disk drive power cable to J24.

**Disk Drive Power Connector**

Disk Drive Signal Connector

   b. For the Model 250, connect the disk drive signal cable to J25 and the disk drive power cable to J20.
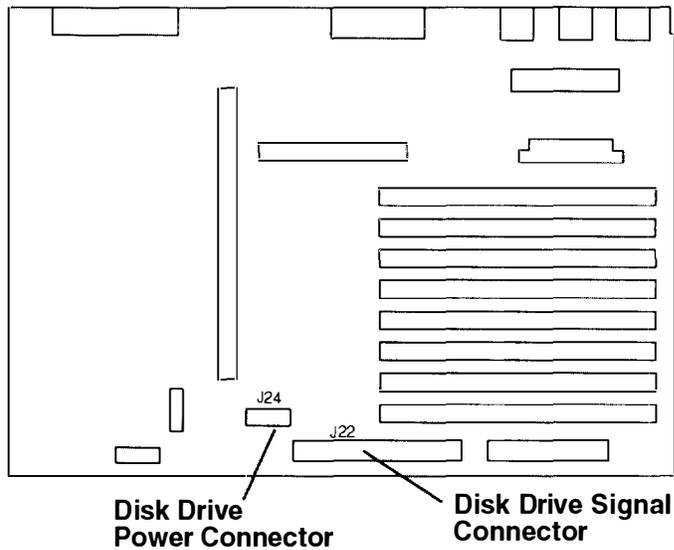
Disk Drive Power Connector

Disk Drive Signal Connector

9. Connect the SCSI terminator shipped with the disk drive to the SCSI connector on the rear panel.
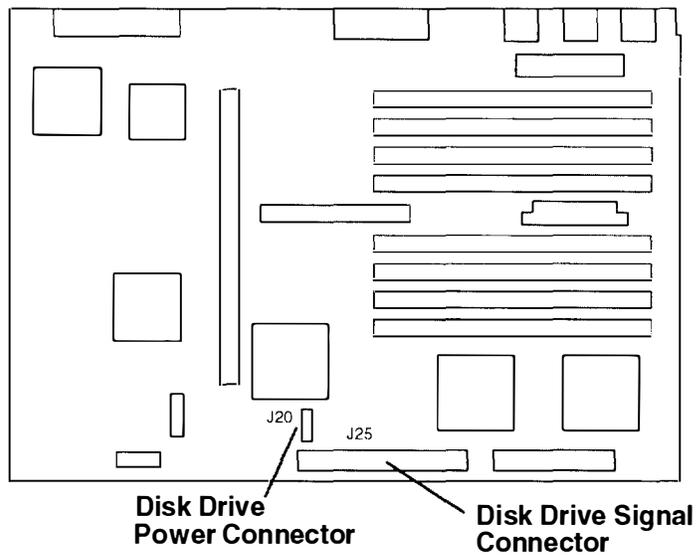
Rear Panel

SCSI Terminator

SCSI Connector
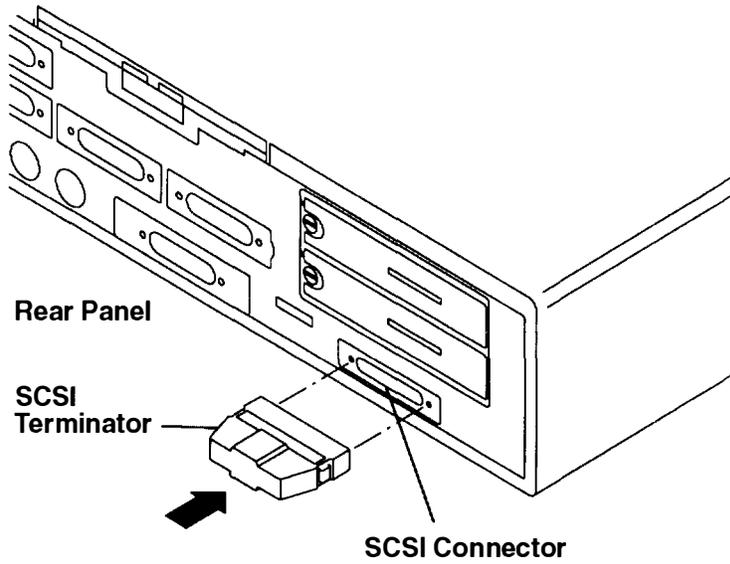
10. If you have other procedures to perform, refer to "Option List" on page 2-7.

11. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Installing a 1G-byte Disk Drive

1. The SCSI address of the 1G-byte disk drive is set by jumpers on the back of the disk drive.

Note: When the 1G-byte disk drive is installed inside the 7011, all jumpers must be removed from the 1G-byte drive.

If you later need to change the SCSI address of this disk drive, use the following table to help you set the address. Record any changes in the SCSI address record in Appendix A.

SCSI Address	Jumper 1	Jumper 2	Jumper 3
0	off	off	off
1	on	off	off
2	off	on	off
3	on	on	off
4	off	off	on
5	on	off	on
6	off	on	on

2. Connect one end of the power cable to the connector on the back of the disk drive.

3. Connect one end of the signal cable to the connector on the back of the disk drive.
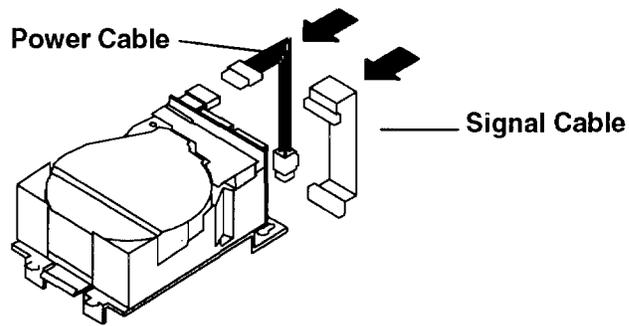
4. Place the disk drive keyhole slots on the mounting studs.

5. Slide the drive toward the front of the chassis until it snaps into the latch slot. You should hear a click when the disk drive snaps into place.

6. Check to make sure the disk drive is fully pushed through the latch slot. If the disk drive is installed properly, you should not be able to move the disk drive around.

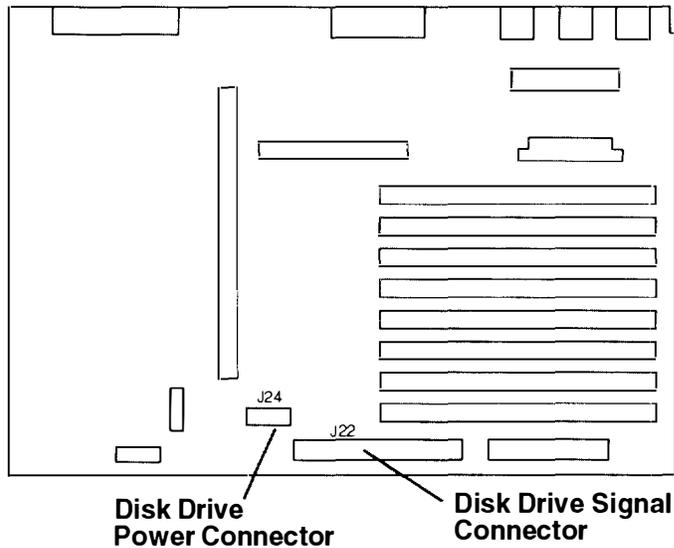7. Connect the disk drive signal cable and power cable to the connectors on the system board.

   a. For the Model 220 or Model 230, connect the disk drive signal cable to J22 and the disk drive power cable to J24.

Disk Drive Power Connector

Disk Drive Signal Connector

   b. For the Model 250, connect the disk drive signal cable to J25 and the disk drive power cable to J20.

Disk Drive Power Connector

Disk Drive Signal Connector

8. Connect the SCSI terminator shipped with the disk drive to the SCSI connector on the rear panel.

Rear Panel

SCSI Terminator

SCSI Connector

9. If you have other procedures to perform, refer to "Option List" on page 2-7.

10. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Installing a One-Inch High 1G-byte Disk Drive

1. The SCSI address of the 1G-byte disk drive is determined by jumpers on the front of the disk drive.

Front of Disk Drive

Address Jumpers

3 2 1

Note: When the 1G-byte disk drive is installed inside the 7011, all jumpers must be removed from the 1G-byte drive.

If you later need to change the SCSI address of this disk drive, use the following table to help you set the address. Record any changes in the SCSI address record in Appendix A.

SCSI Address	Jumper 1	Jumper 2	Jumper 3
0	off	off	off
1	on	off	off
2	off	on	off
3	on	on	off
4	off	off	on
5	on	off	on
6	off	on	on

2. Connect the signal cable to the connector on the back of the disk drive.

3. Connect the power cable to the connector on the back of the disk drive.

Power Cable

Signal Cable

4. Place the disk drive keyhole slots on the mounting studs.

Keyhole Slot

Latch

Mounting Studs

Latch Slot

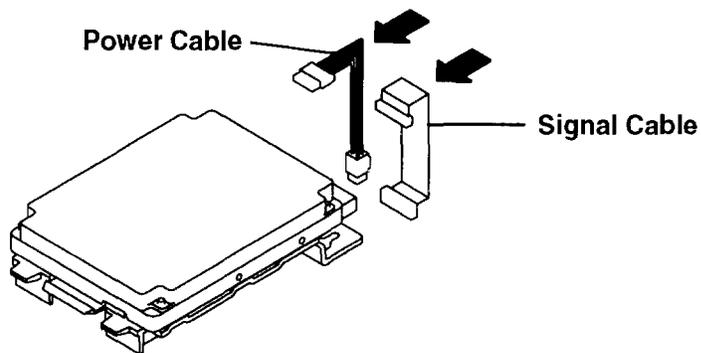**Front of Chassis**

5. Slide the drive toward the front of the chassis until it snaps into the latch slot. You should hear a click when the drive snaps into place.

6. Check to make sure the disk drive is fully pushed through the latch slot. If the disk drive is installed properly, you should not be able to move the disk drive around.

7. Connect the disk drive signal cable and power cable to the connectors on the system board.

   a. For the Model 220 or Model 230, connect the disk drive signal cable to J22 and the disk drive power cable to J24

   Disk Drive Power Connector   **Disk Drive Signal Connector**

   b. For the Model 250, connect the disk drive signal cable to J25 and the disk drive power cable to J20.

   Disk Drive Power Connector   **Disk Drive Signal Connector**

8. Connect the SCSI terminator shipped with the disk drive to the SCSI connector on the rear panel.

Rear Panel

SCSI Terminator

SCSI Connector

9. If you have other procedures to perform, refer to "Option List" on page 2-7.

10. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Installing a VRAM Upgrade for a Graphics Adapter

Use the following instructions for installing a video random access memory (VRAM) upgrade for a POWER Gt1 or POWER Gt1B graphics adapter.

1. If you have not already done so, remove the chassis assembly and chassis cover as described in "Removing the Chassis Assembly and Chassis Cover" on page 2-3

2. If you are upgrading VRAM on a POWER Gt1 or POWER Gt1B graphics adapter that is already installed in your system, go to Step 3 on page 2-46.

   If the POWER Gt1 or POWER Gt1B graphics adapter is not already installed, go to Step 8 on page 2-47.

POWER
Graphics Adapter
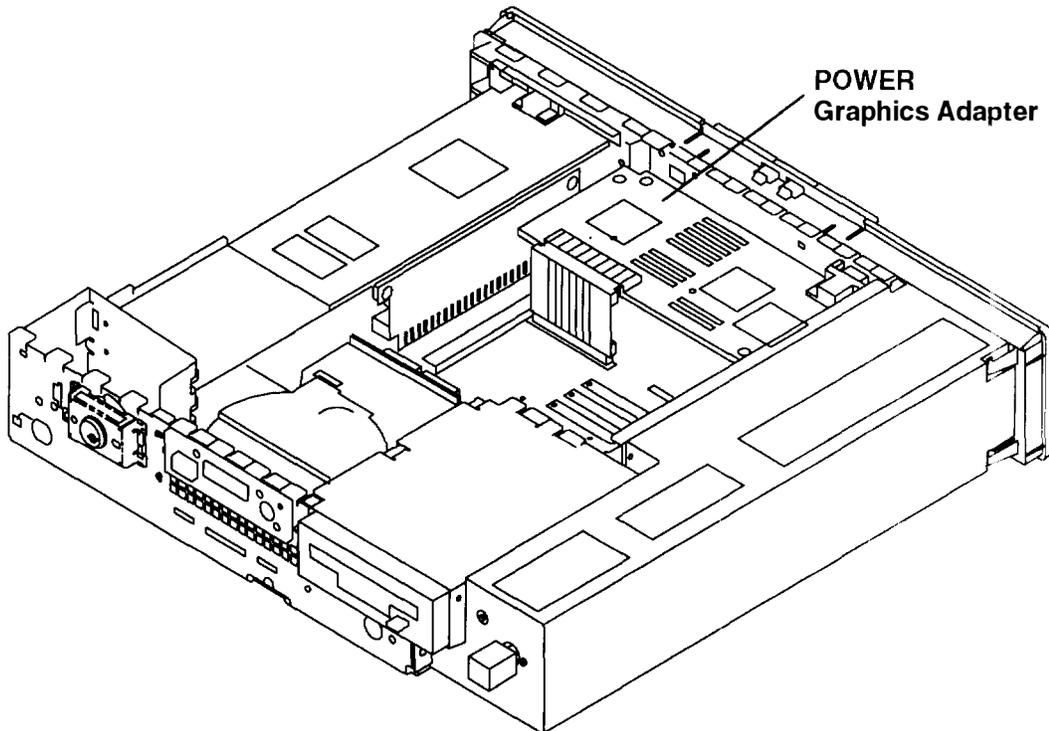
3. Remove the display cable from the video connector (V).

Video Connector
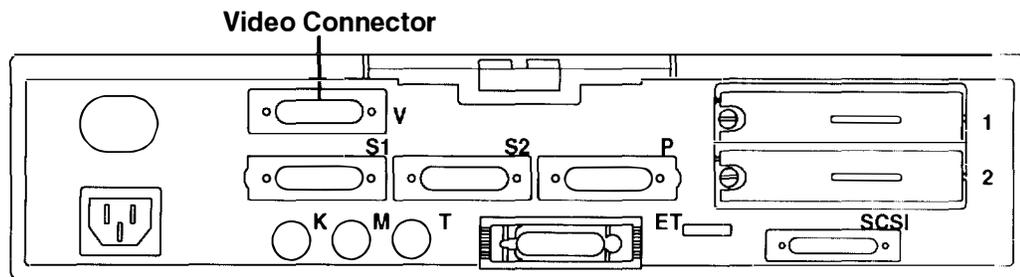
Rear of Chassis

4. Remove two screws from the adapter.

POWER Graphics Adapter

Signal Connector Card

J9
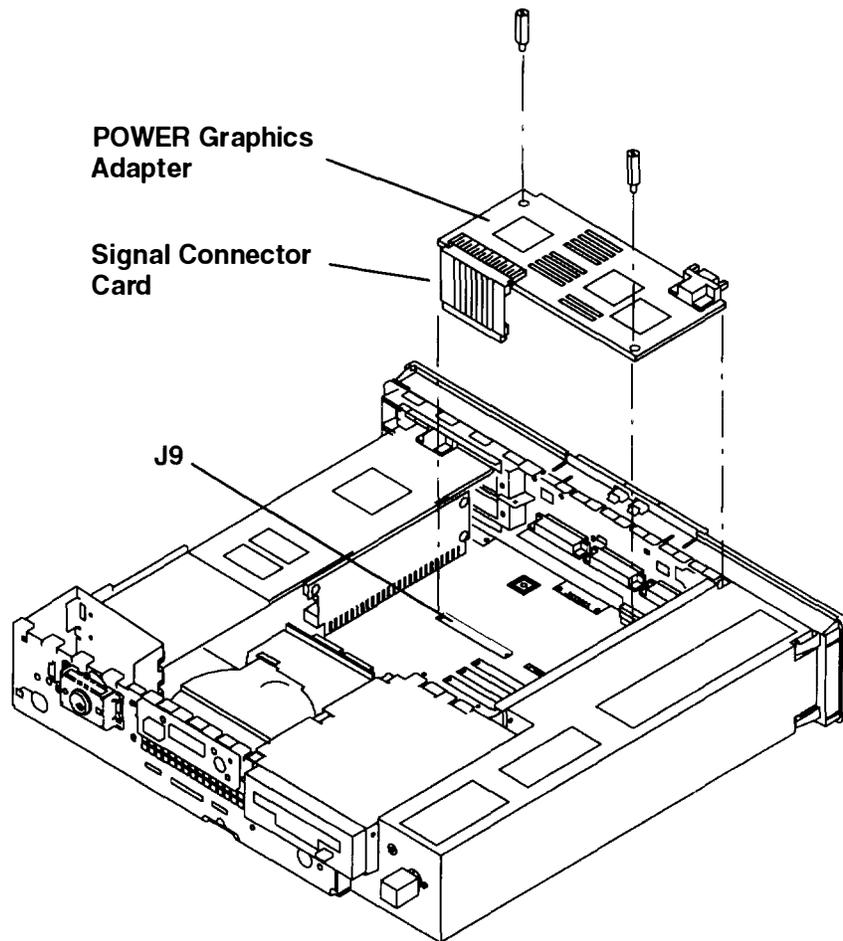
5. Disconnect the signal connector card from the system board connector J9.

6. Remove the adapter and signal connector card.

7. Separate the signal connector card from the adapter.

8. Place the adapter on a hard, rigid surface.

9. Place the module insertion guide (Part Number 07F2518) over an empty module socket. Use the following table to determine the location in which the modules will be inserted.

Display Type	Memory Size	Number of VRAM Modules	VRAM Sockets
Monochrome	256K bytes	2	J, K
Greyscale	768K bytes	6	E, F, G, H, J, K
Color	1280K bytes	10	A, B, C, D, E, F, G, H, J, K

10. With one hand, momentarily touch any metal surface on the chassis to minimize static electrical charges, and then pick up a VRAM module.

11. Visually check that the VRAM module pins are straight and in line.

12. Place the VRAM module into the module insertion guide *with the beveled end to the right* as viewed from the front of the adapter.

13. With the module insertion guide in place, use both thumbs to press down simultaneously on both ends of the VRAM module until it is firmly seated in the socket.

   Note: You will encounter resistance as you press the VRAM module down. You will hear a snapping sound when the VRAM module seats in the socket.
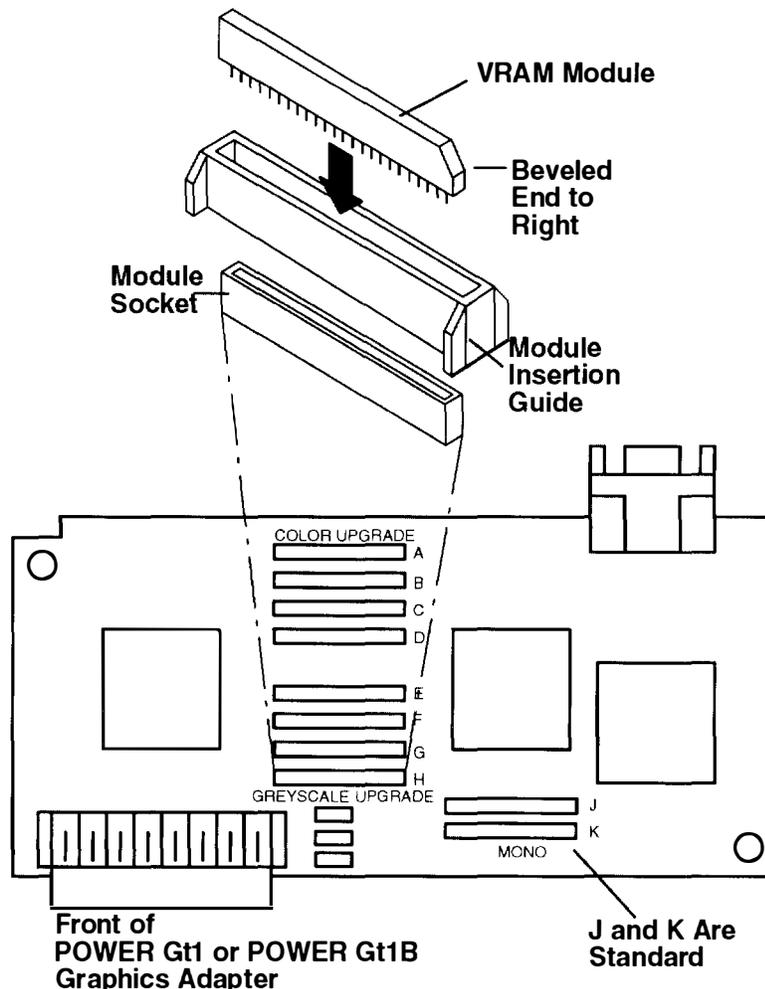
14. Remove the insertion guide, and visually inspect the module pins for proper seating.

15. Proceed to "Installing a POWER Graphics Adapter" on page 2-49.

Installing a POWER Graphics Adapter

1. If the graphics adapter was previously installed in your system, go to Step 4.

   If the graphics adapter was *not* previously installed in your system, proceed to Step 2.

2. Locate the video connector cover.

**Video Connector
Cover Pull Tab**

Front of Chassis
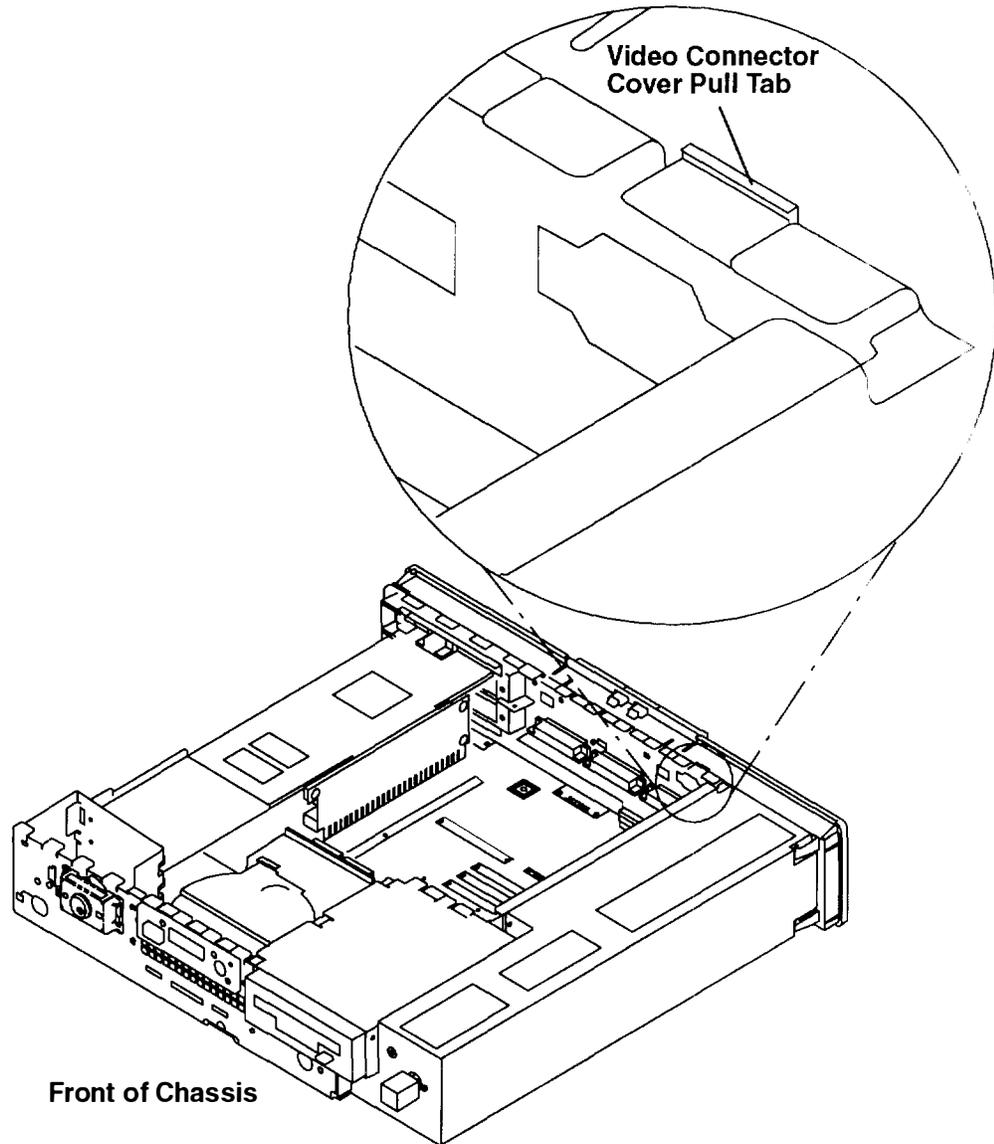
3. Remove the video connector cover.

Video Connector Cover

Front of Chassis
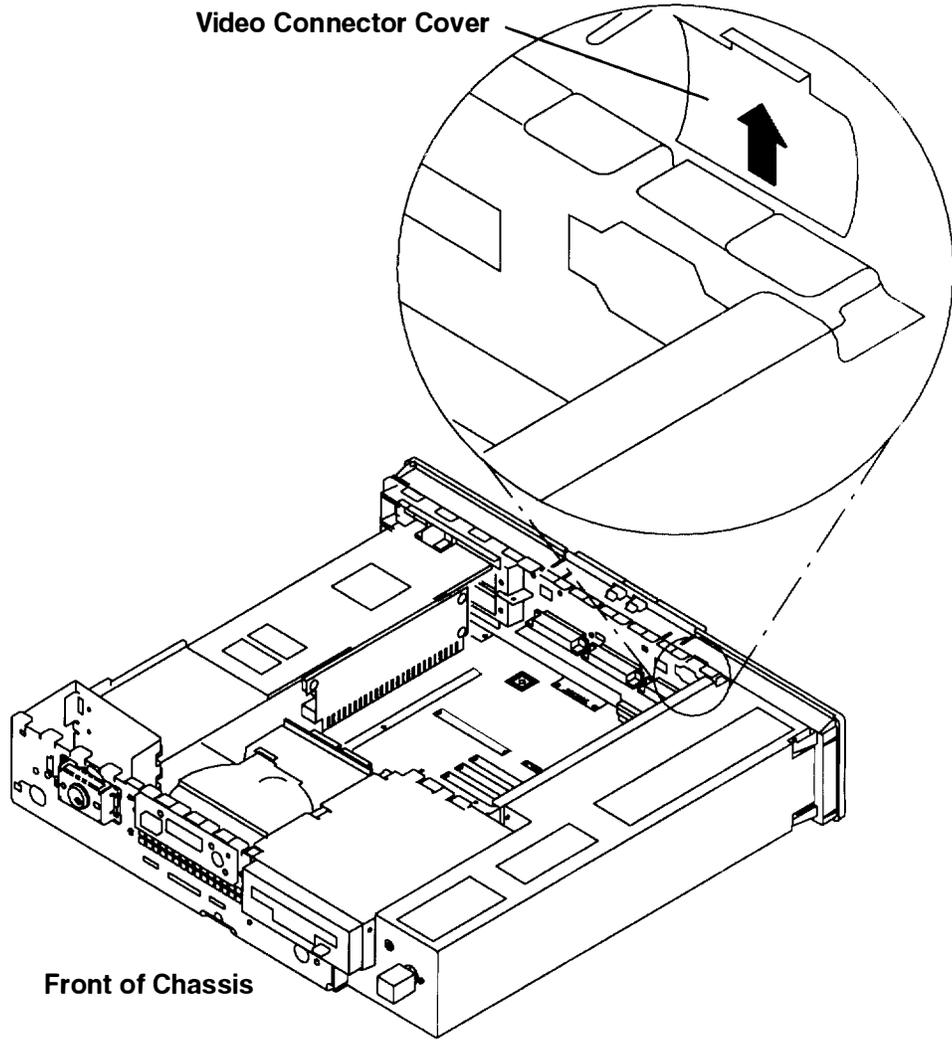
4. If you are installing a POWER GXT100 or POWER GXT150 graphics adapter do the following:

   a. Locate the rubber bumper included with the POWER GXT100 or POWER GXT150 graphics adapter. Remove the label covering the adhesive side of the rubber bumper, then attach the rubber bumper to the graphics adapter in the location shown.
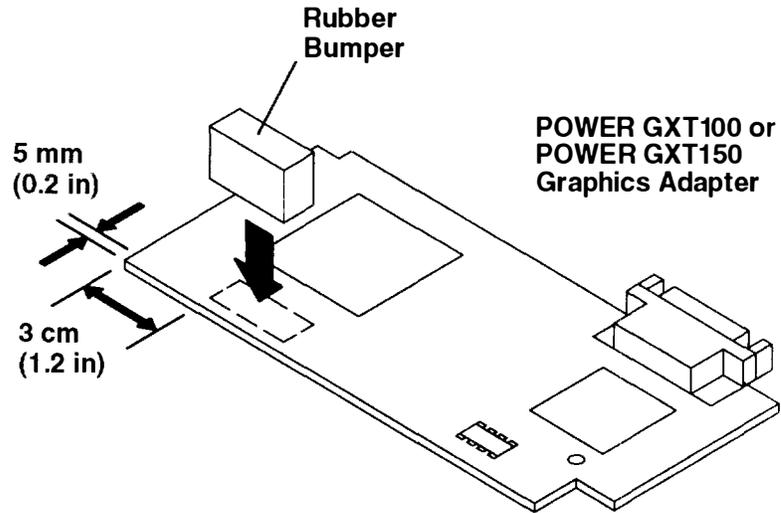
   b. Attach the signal connector card to the system board, then attach the POWER GXT100 or POWER GXT150 to the signal connector card.

      Note: Make sure the signal connector card is turned so that the arrows printed on the card point upward, and the side with two arrows faces the front of the system unit as shown.
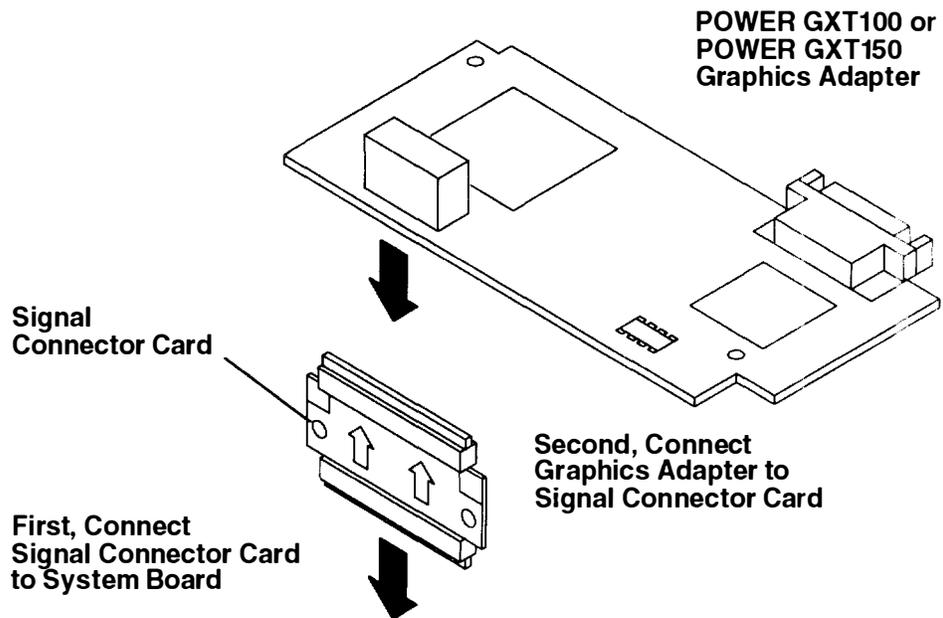
5. Place the adapter on the mounts provided. Make sure the adapter is seated between the guide rails located on the rear cover.

POWER Graphics Adapter

Guide Rails (on Models 220 and 230)

Front of Chassis

Guide Rails (on Model 250)
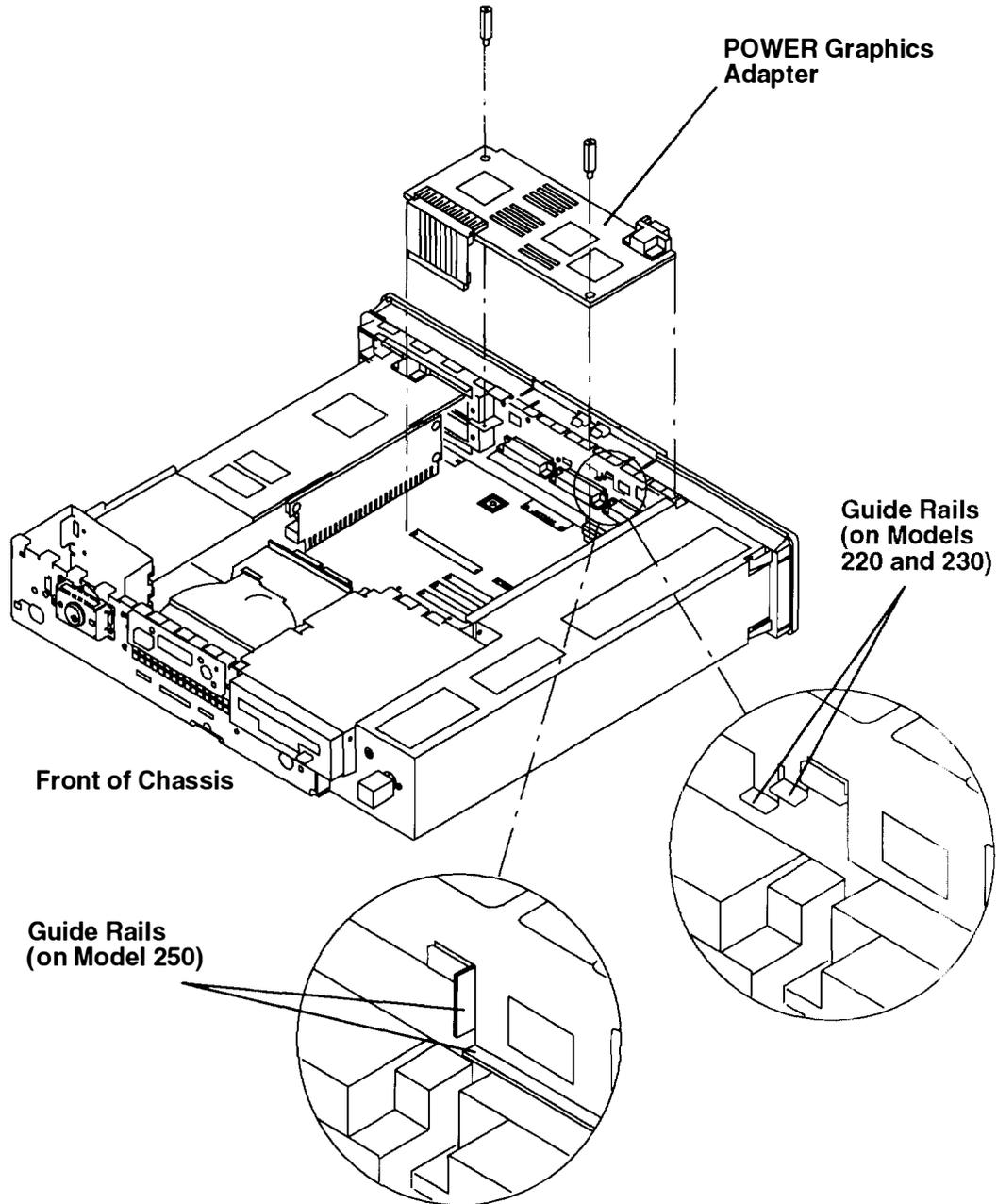
6. Connect the signal connector card to the system board connector.

    a. To install a POWER Gt1, POWER Gt1B, or POWER Gt1x in a Model 220 or a POWER Gt1x in a Model 230, connect the adapter signal connector card to the indicated system board connector (J9).

**POWER Graphics
Adapter Connector**
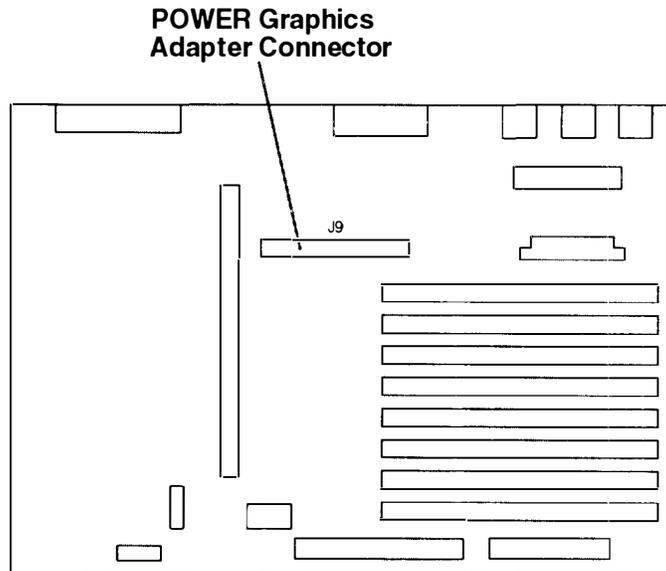
    b. To install a POWER GXT100 or POWER GXT150 in a Model 250, connect the signal connector card to the indicated system board connector (J9).

**POWER Graphics
Adapter Connector**
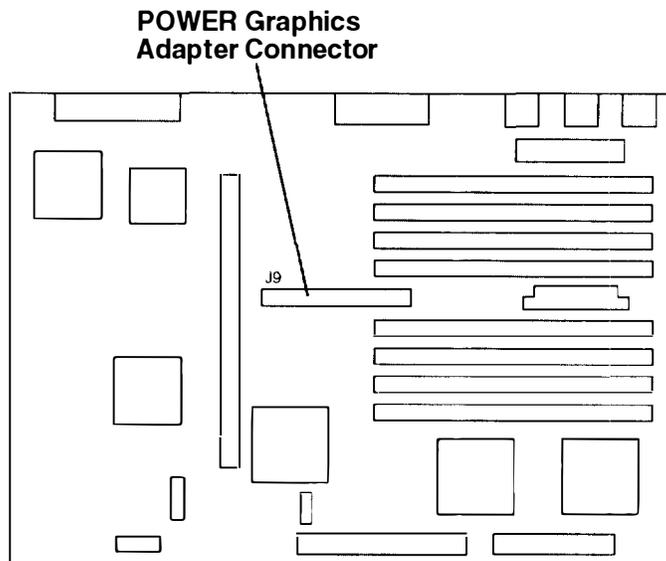
7. Install two screws in the adapter card and tighten with a screwdriver.

8. Go to "Setting the Display Jumpers or Switches" on page 2-54 and verify that the jumpers are set correctly.

Setting the Display Jumpers or Switches

1. If you have not already done so, remove the chassis assembly and chassis cover as described in "Removing the Chassis Assembly and Chassis Cover" on page 2-3

2. Locate the POWER graphics adapter.

**POWER Graphics
Adapter**
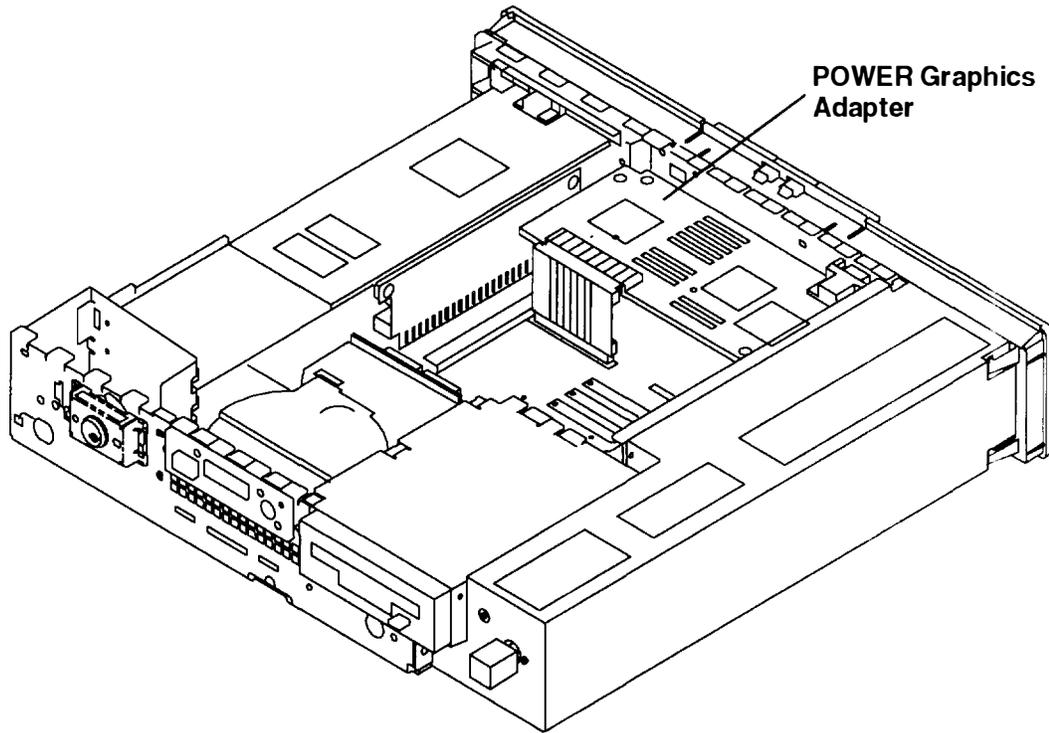
3. If you are using a POWER Gt1x graphics adapter, go to Step 6 on page 2-57.

   If you are using a POWER GXT100 or POWER GXT150 graphics adapter, go to Step 9 on page 2-59.

4. The following table describes how to set the jumpers on the POWER Gt1 and POWER Gt1B graphics adapters for use with various displays.

The default setting of the jumpers from the manufacturer is `111`.

Display Type	Screen Resolution	Refresh Freq (Hz)	Pixel Freq (MHz)	Display Jumper 0 1 2
8507 Mono	1024 x 768	43.5	44.9	1 1 1
8508 Mono	1280 x 1024	67	128	1 1 1
8514 Color 6314 Color 6317 Color 6319 Color 6324 Color 6325 Color 6327 Color 9521 Color 9524 Color 9525 Color 9527 Color	1024 x 768 (See Notes)	43.5	44.9	1 1 1
8515 Color	1024 x 768	43.5	44.9	1 1 1
8517 Color	1024 x 768	69.96	78	1 1 1
	1280 x 1024	51.48	103	0 1 1
1091–051 Color	1280 x 1024	72	128	1 1 1
5081–16 Color	1280 x 1024	60	111	1 1 1
6091–16 Color	1280 x 1024	60	111	1 1 1
	1024 x 768	75.8	86	0 1 1
6091–19 Color	1280 x 1024	60	111	1 1 1
		67	120	1 1 0
6091–19i Color	1280 x 1024	60	111	1 1 1
POWERdisplay 20	1280 x 1024	60	111	1 1 1
6091–23 Color	1280 x 1024	60	111	1 1 1
Other Displays	1280 x 1024	60	108	1 0 1
	1024 x 768	60	64	0 0 1
		70.4	75	0 0 0

Notes:

1. The POWER Gt1B graphics adapter (FCC Class B) has only two display jumpers (0 and 1). Display jumper 2 is permanently set to `1`. This limits the upper pixel frequency to 111 MHz.

2. All of the displays in the table listed with the 8514 display require device drivers included in AIX Version 4.1 or higher to operate in noninterlaced mode

3. The POWERdisplay 20 is not supported by the POWER Gt1B adapter
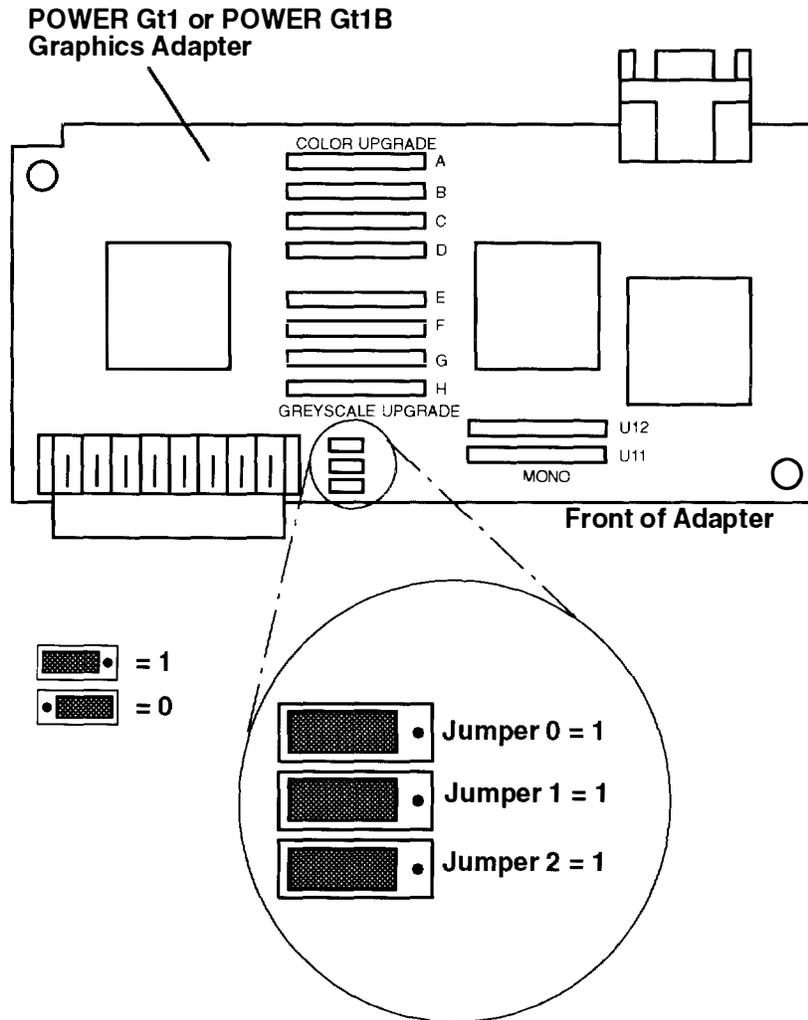
**POWER Gt1 or POWER Gt1B
Graphics Adapter**

COLOR UPGRADE
A
B
C
D
E
F
G
H
GREYSCALE UPGRADE

U12
U11
MONO

Front of Adapter

= 1
= 0

Jumper 0 = 1

Jumper 1 = 1

Jumper 2 = 1

4. If you have other procedures to perform, refer to "Option List" on page 2-7.

5. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

6. The following table describes how to set the jumpers on the POWER Gt1x graphics adapter for use with the various displays. Find your display type in the table and look up the correct jumper settings in the Display Jumper column.

   The default setting of the jumpers from the manufacturer is 1111.

Display Type	Screen Resolution (Noninterlaced)	Refresh Freq (Hz)	Display Jumper 0 1 2 3	Display Cable	Display Mode Switch
8508 Mono	1280 x 1024	67	1 1 1 1	51G7826	–
8517 Color	1024 x 768	70	1 1 1 1	51G7826	–
6314 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
6317 Color 6324 Color 6325 Color 6327 Color 9524 Color 9525 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
		75.8	1 0 1 1	51G7826	
	1280 x 1024	60	1 0 1 0	51G7826	–
6319 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
9521 Color 9527 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
		75.8	1 0 1 1	51G7826	
	1280 x 1024	60	1 0 1 0	51G7826	–
		77	1 1 0 1	51G7826	
1091–051 Color POWERdisplay 16S	1280 x 1024	72	1 1 1 1	09G3589	–
5081–16 Color	1280 x 1024	60	1 1 1 1	09G3539	–
6091–16 Color POWERdisplay 16	1280 x 1024	60	1 1 1 1	09G3539	out (1)
		77	1 1 0 1	09G3539	in (2)
6091–19 Color	1280 x 1024	60	1 1 1 1	09G3539	2
		67	1 1 1 0	09G3539	3
6091–19i Color POWERdisplay 19	1280 x 1024	60	1 1 1 1	09G3539	2
		77	1 1 0 1	09G3539	–
6091–23 Color	1280 x 1024	60	1 1 1 1	09G3539	–
POWERdisplay 17 POWERdisplay 20 Color	1280 x 1024	60	1 1 1 1	09G3539	
		77	1 1 0 1	09G3539	
		74	0 1 1 0	09G3539	
	1024 x 768	70	0 0 1 0	09G3539	

Display Type	Screen Resolution (Noninterlaced)	Refresh Freq (Hz)	Display Jumper 0 1 2 3	Display Cable	Display Mode Switch
Other Displays	1280 x 1024	60	0 1 1 1	09G3539	–
		74	0 1 1 0	09G3539	–
	1024 x 768	60	0 0 1 1	09G3539	–
		60	1 1 0 1	51G7827	–
		70	0 0 1 0	09G3539	–
		75.8	0 0 0 1	09G3539	–
	1152 x 900	66	0 1 0 0	51G8563	–
		76	0 1 0 1	51G8563	–

Front of POWER Gt1x Graphics Adapter

= 1

= 0

Jumper 0 = 1

Jumper 1 = 0

Jumper 2 = 1

Jumper 3 = 1

7. If you have other procedures to perform, refer to "Option List" on page 2-7.

8. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66

9. The following table describes how to set the switches on the POWER GXT100 and POWER GXT150 graphics adapters for use with the various displays. Find your display type in the table and look up the correct switch settings in the Display Switch column.

Note: In the following table, Display Switch position 1 is Off; Display Switch position 0 is On.

Display Type	Screen Resolution (Noninterlaced)	Refresh Freq (Hz)	Display Switch 0 1 2 3	Display Cable– See Note	Display Mode Switch
8508 Mono	1280 x 1024	67	1 1 1 1	51G7826	–
8517 Color	1024 x 768	70	1 1 1 1	51G7826	–
6314 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
6317 Color 6324 Color 6325 Color 6327 Color 9524 Color 9525 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
		75.8	1 0 1 1	51G7826	
	1280 x 1024	60	1 0 1 0	51G7826	–
6319 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
9521 Color 9527 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
		75.8	1 0 1 1	51G7826	
	1280 x 1024	60	1 0 1 0	51G7826	–
		77	1 1 0 1	51G7826	
1091–051 Color POWERdisplay 16S	1280 x 1024	72	1 1 1 1	09G3589	–
5081–16 Color	1280 x 1024	60	1 1 1 1	09G3539	–
6091–16 Color POWERdisplay 16	1280 x 1024	60	1 1 1 1	09G3539	out (1)
		77	1 1 0 1	09G3539	in (2)
6091–19 Color	1280 x 1024	60	1 1 1 1	09G3539	2
		67	1 1 1 0	09G3539	3
6091–19i Color POWERdisplay 19	1280 x 1024	60	1 1 1 1	09G3539	2
		77	1 1 0 1	09G3539	–
6091–23 Color	1280 x 1024	60	1 1 1 1	09G3539	–
POWERdisplay 17 POWERdisplay 20 Color	1280 x 1024	60	1 1 1 1	09G3539	
		77	1 1 0 1	09G3539	
		74	0 1 1 0	09G3539	
	1024 x 768	70	0 0 1 0	09G3539	

Display Type	Screen Resolution (Noninterlaced)	Refresh Freq (Hz)	Display Jumper 0 1 2 3	Display Cable– See Note	Display Mode Switch
Other Displays	1280 x 1024	60	0 1 1 1	09G3539	–
		74	0 1 1 0	09G3539	–
	1024 x 768	60	0 0 1 1	09G3539	–
		60	1 1 0 1	51G7827	–
		70	0 0 1 0	09G3539	–
		75.8	0 0 0 1	09G3539	–
	1152 x 900	66	0 1 0 0	51G8563	–
		76	0 1 0 1	51G8563	–

Notes:

- The POWER GXT100 graphics adapter supports a 1024 by 768 image resolution. The POWER GXT150 supports all resolutions listed.

- Some displays require the listed adapter cable (Part Number 51G7826) for use with the display's attached cable.

10. To set the switches, use a pen or paper clip to slide the switch toward or away from the numbers printed on the switch case. The switches are On (0) when slid away from the numbers and Off (1) when slid toward the numbers.

The default setting of the switches from the manufacturer is `1111`.

Switch Setting Shown:
1101

Front of POWER
GXT100 or POWER
GXT150 Graphics
Adapter

Video Connector
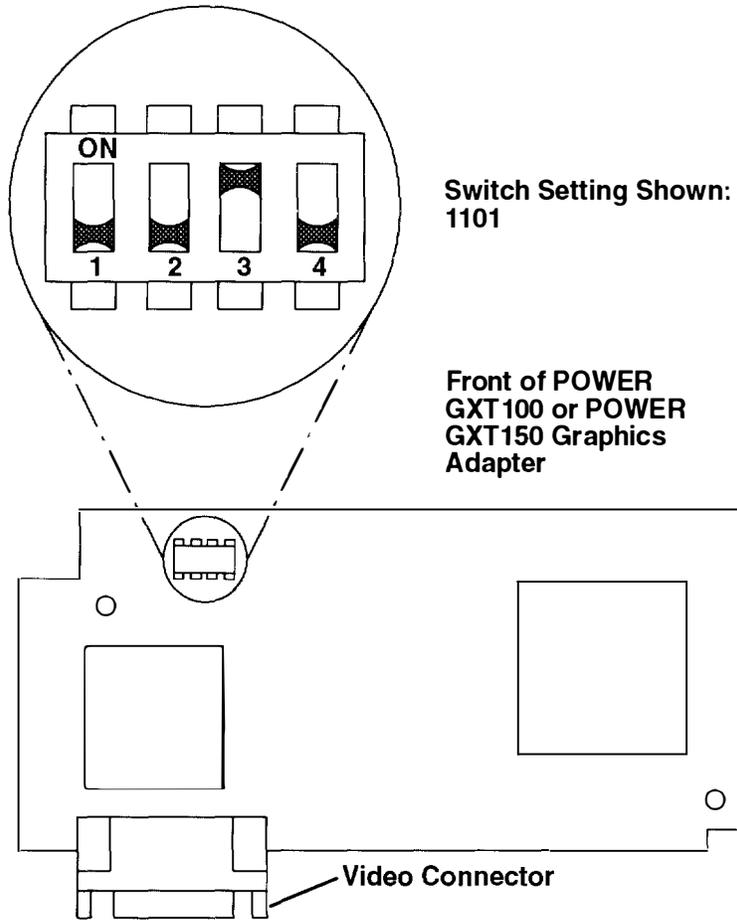
11. If you have other procedures to perform, refer to "Option List" on page 2-7.

12. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66.

Installing an Optional Adapter

1. If you have not already done so, remove the chassis assembly and chassis cover as described in "Removing the Chassis Assembly and Chassis Cover" on page 2-3.

2. Use a screwdriver to pry out one of the plastic breakout panels in the rear cover. Discard the breakout panel.
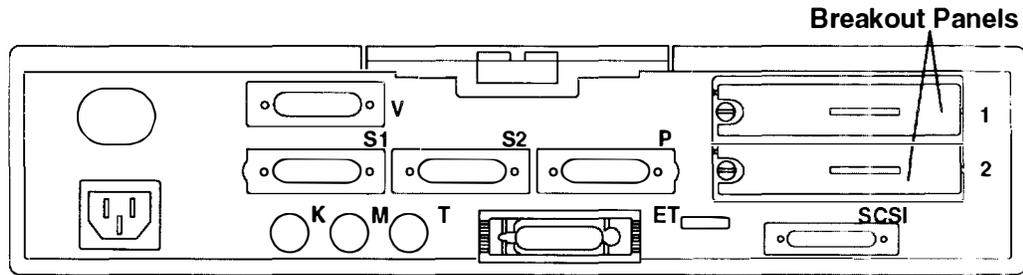
Rear of Chassis

3. Loosen the serrated knob that corresponds to the breakout panel you removed in the previous step. Slide the EMI bracket out and save for possible future use
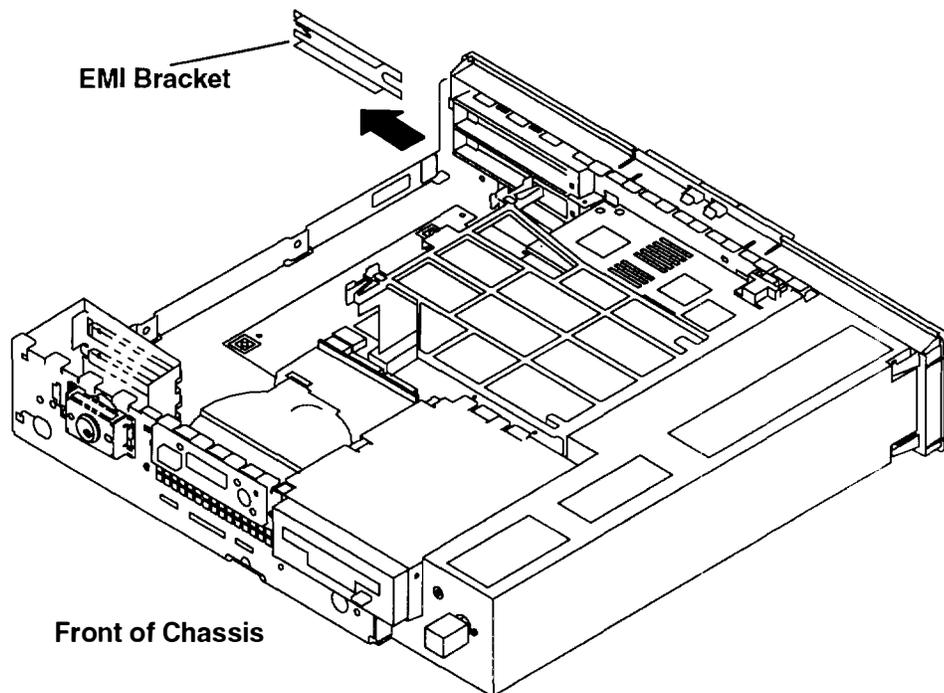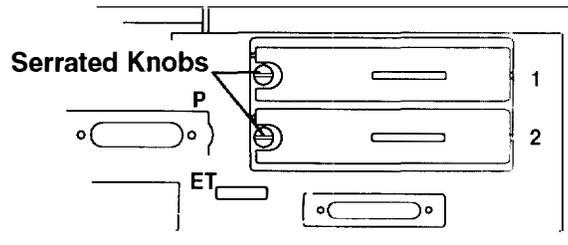
4. Press down on the adapter retainer and lock it behind the side cover.

Press

Adapter Retainer

Front of Chassis

5. Make sure the riser card support is installed.

Riser Card Support

Front of Chassis
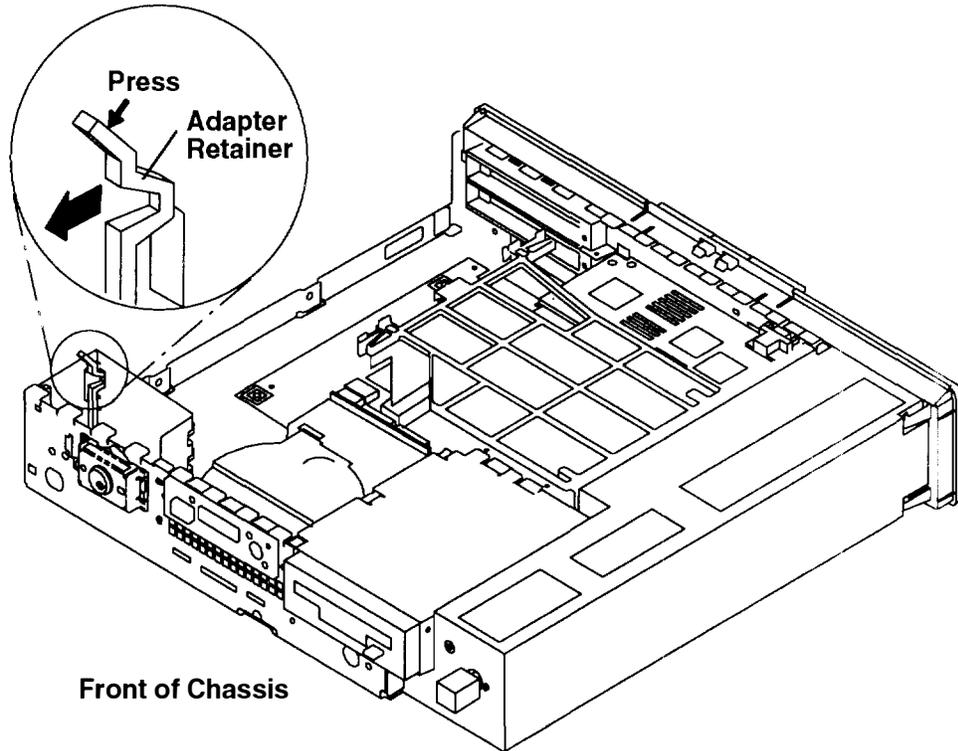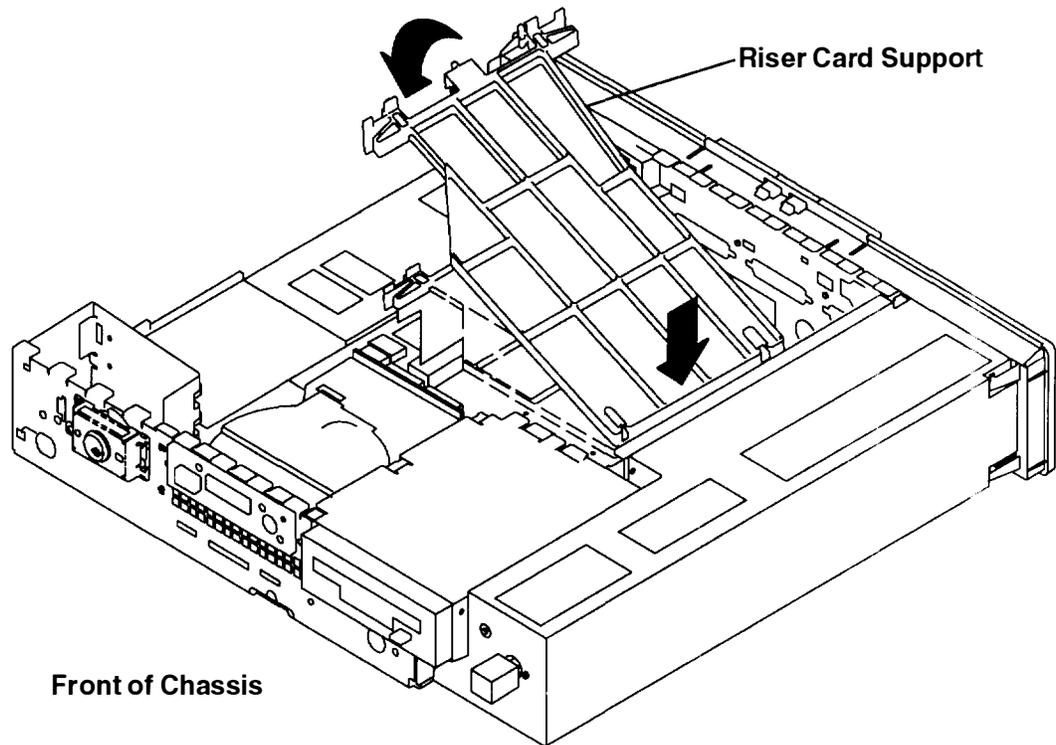
6. Slide the adapter into the front and rear guide rails and push the adapter into the appropriate riser card slot (1 or 2).

   Note: Make sure you push in the adapter so that the adapter connector is completely inside the slot. None of the adapter connector should be visible.
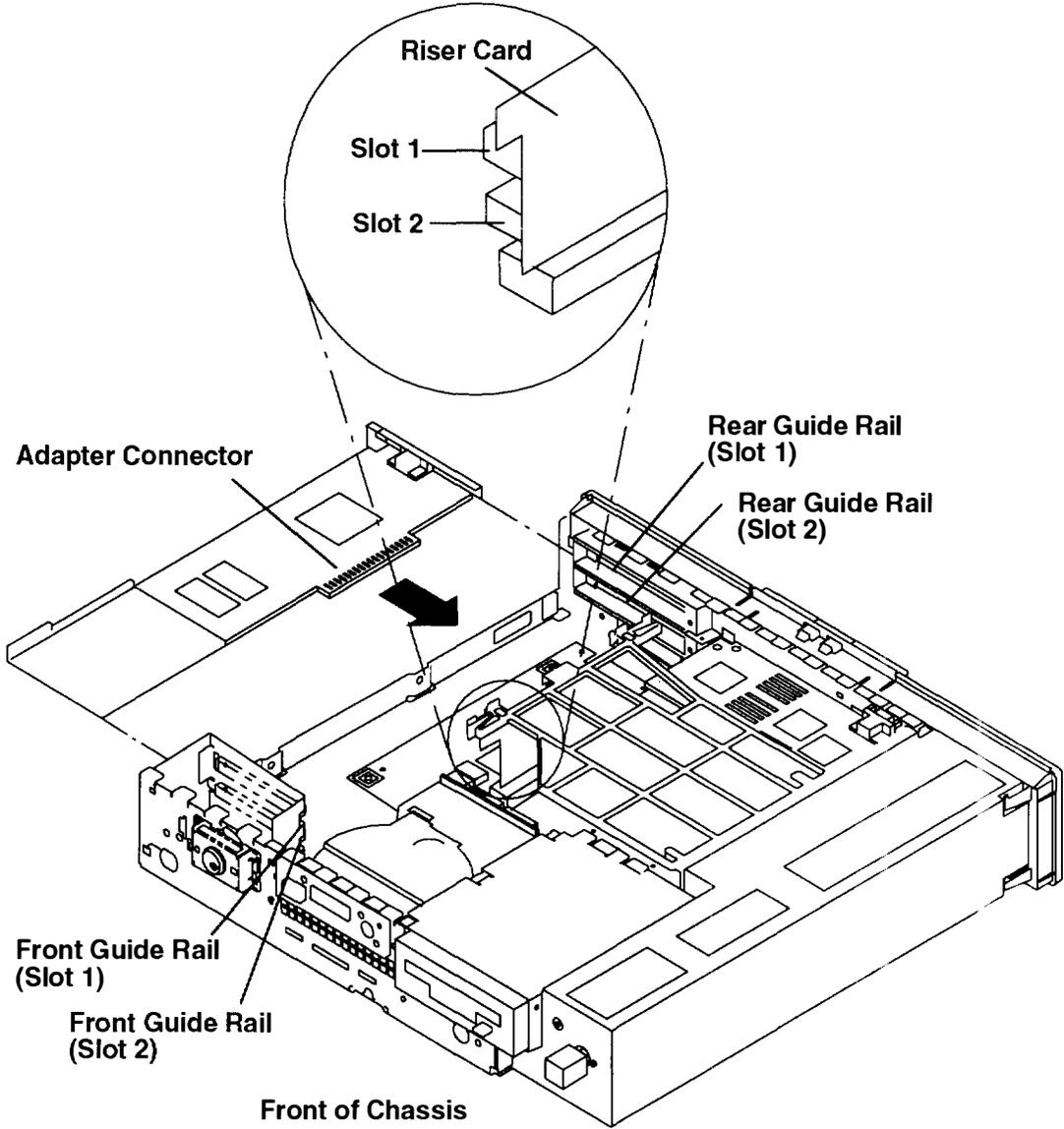
7. After the adapter has been inserted into its slot, press down on the adapter retainer to release it behind the adapter.

Press

Adapter Retainer

Front of Chassis
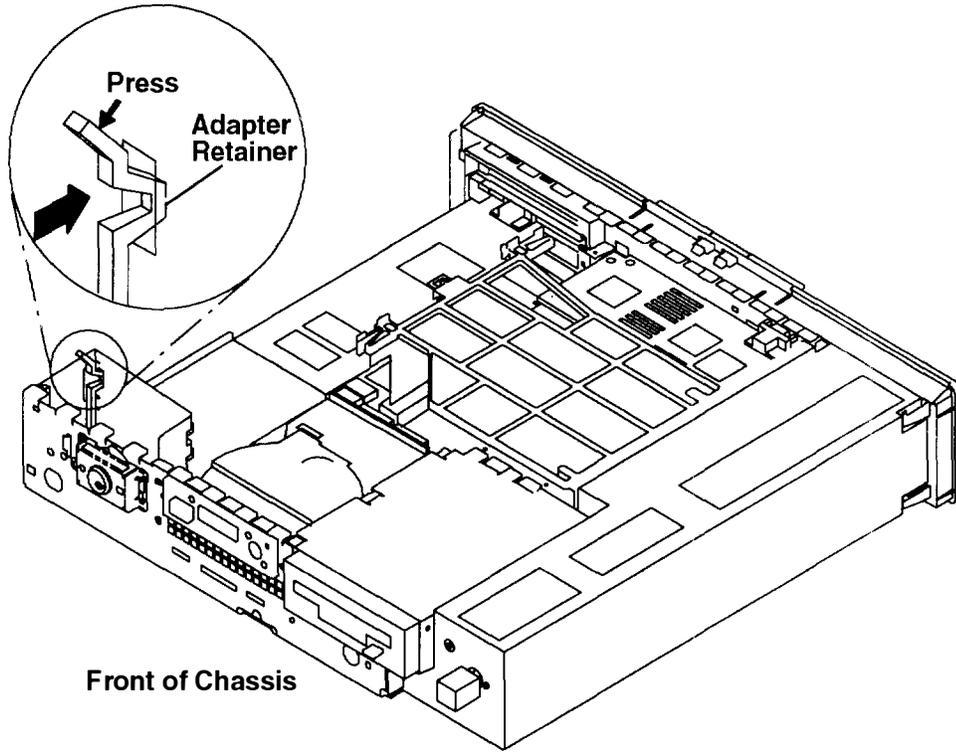
8. Tighten the serrated knob on the rear cover to secure the adapter.
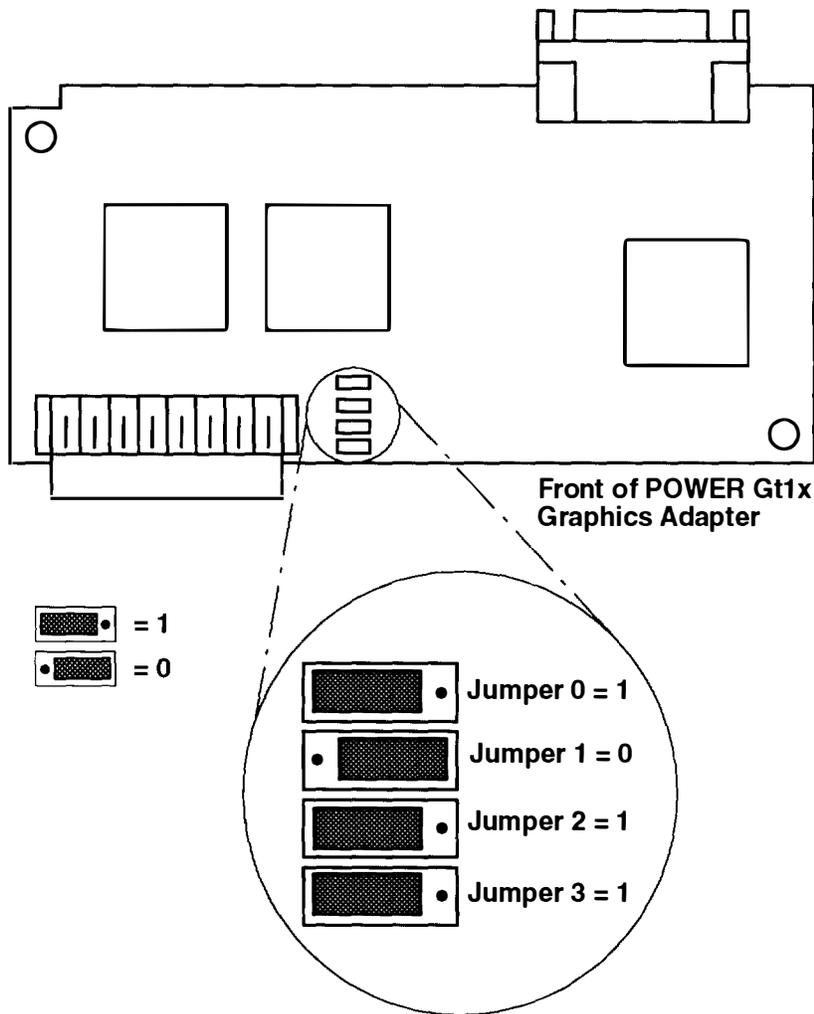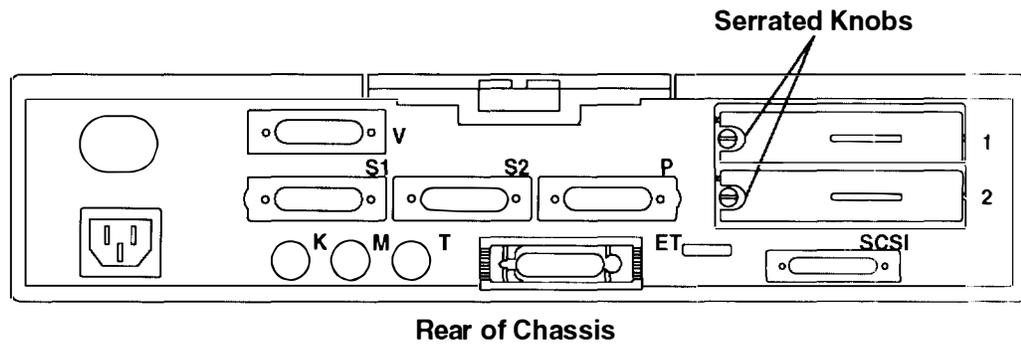

Serrated Knobs

Rear of Chassis

9. If you have other procedures to perform, refer to "Option List" on page 2-7.

10. If you do not have any other procedures to perform, replace the chassis assembly cover as described in "Replacing the Chassis Cover and Chassis Assembly" on page 2-66

Replacing the Chassis Cover and Chassis Assembly

1. Install the riser card support if removed.

Riser Card Support
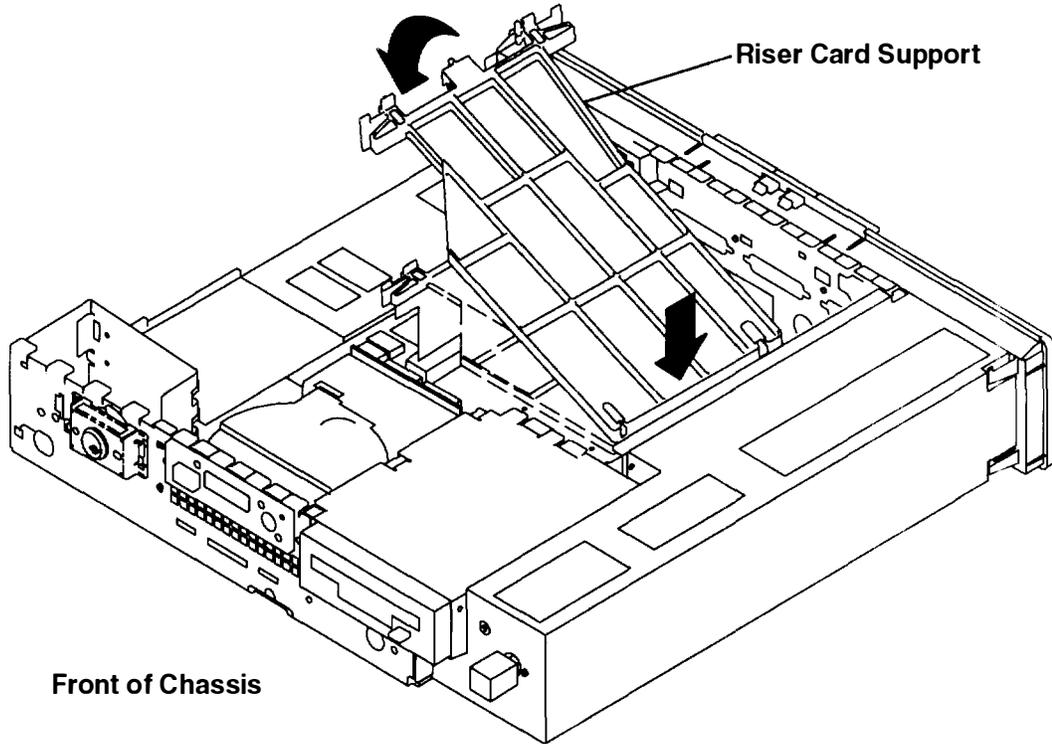
Front of Chassis

2. Place the chassis cover on the chassis.
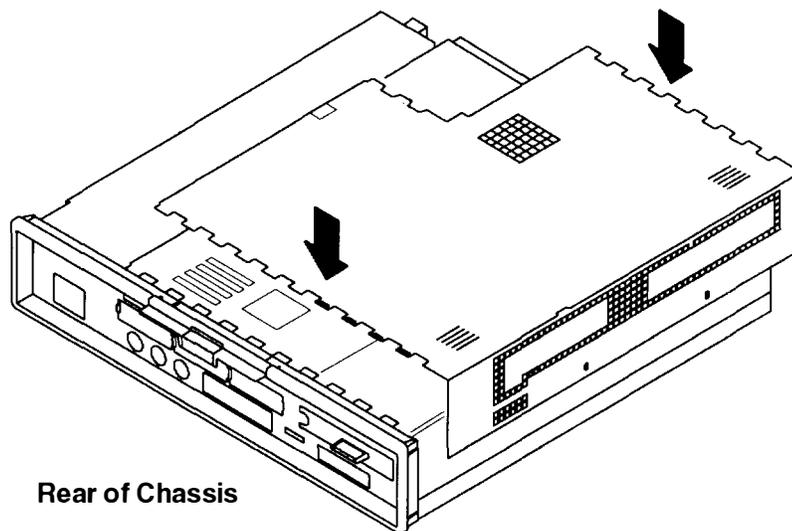
Rear of Chassis

3. Align chassis cover cutouts with tabs.

   a. Ensure that the arrow shaped cutouts align with the arrow shaped tabs on the chassis.

   b. Slide the cover toward the chassis approximately 13 mm (1/2 inch).
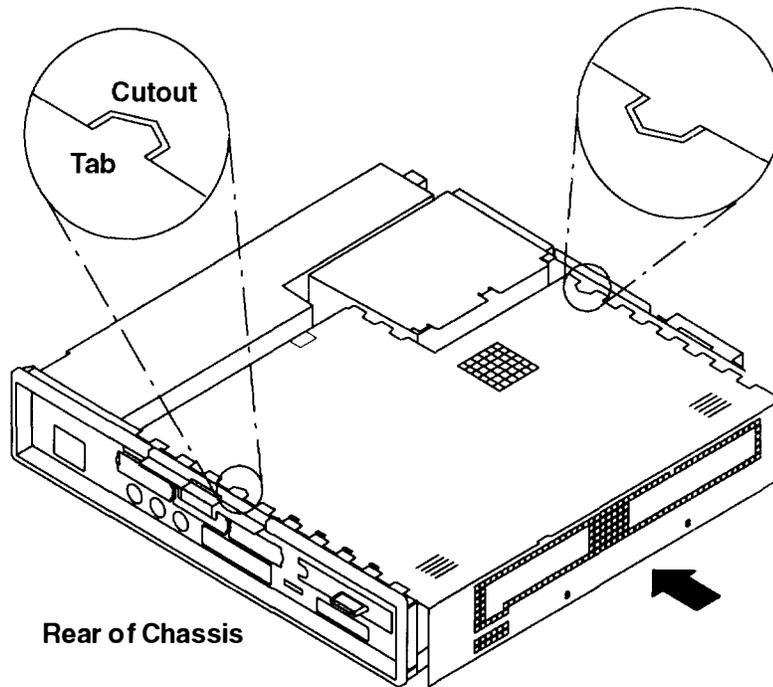
4. Install and tighten the two screws in the chassis cover. Failure to tighten the screws may prevent replacement of the cover.

Rear of Chassis

Chassis Cover Screws
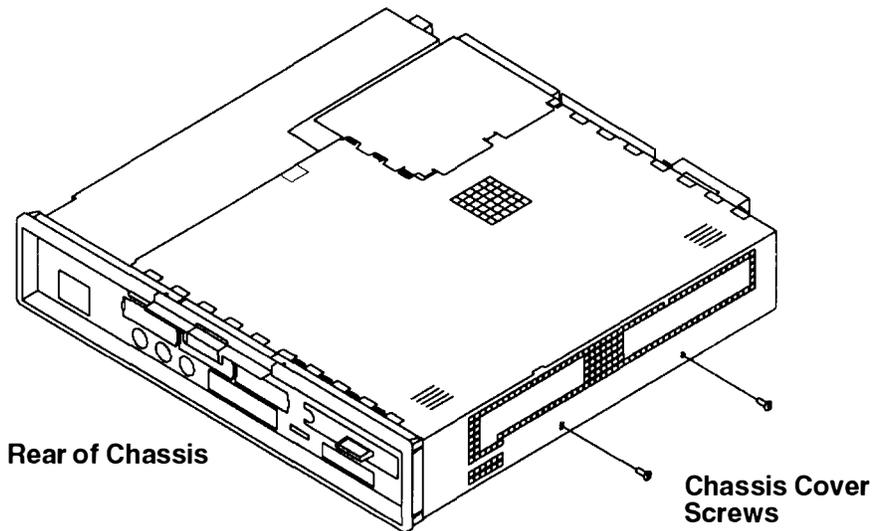
5. Slide the chassis assembly into the cover until it latches. You should hear an audible click. Check that the chassis assembly is properly latched by pulling on the plastic tab. The chassis assembly will not move if it is properly latched inside the cover.

Rear of Chassis
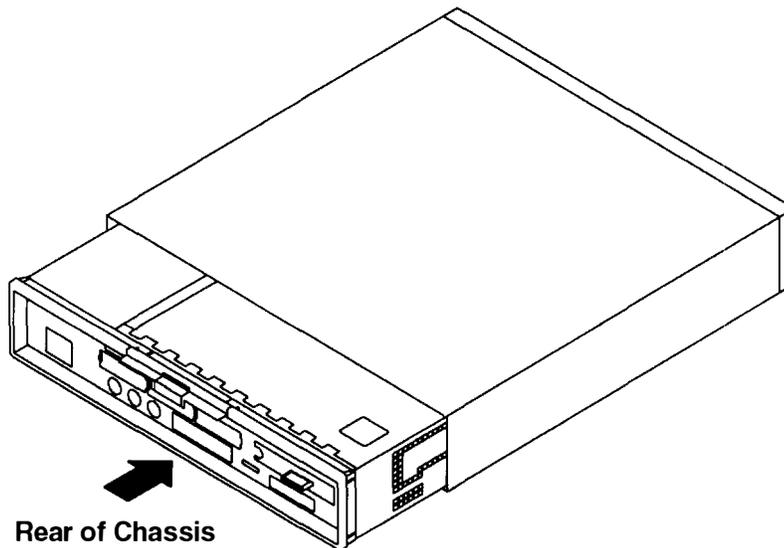
Completing the Hardware Setup

To complete the hardware setup of your system unit, go to the *7011 POWERstation and POWERserver Hardware Setup Procedure*, Order Number SA23-2701.

Chapter 3. Using the System Unit

This chapter describes the controls and operations required during normal operation of your system unit.

Setting the Key Mode Switch

The key mode switch has three positions:

- Normal
- Secure
- Service.

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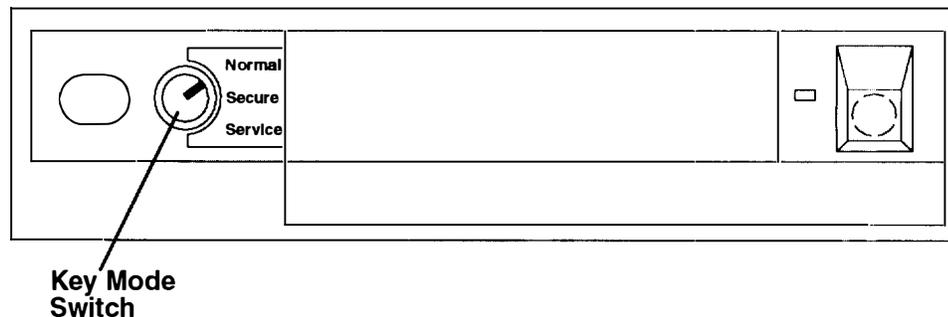
The switch is used to establish the initial program load (IPL) path. The IPL checks the system hardware, loads the system programs, and prepares the system for user operation.

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, see the description of the Reset button operation, in the *AIX Version 4.1 Problem Solving Guide and Reference* or later versions.

- 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 Problem Solving Guide and Reference* before setting the key mode switch to the Service position or pressing the Reset button.

Starting the System Unit

1. Open the door.
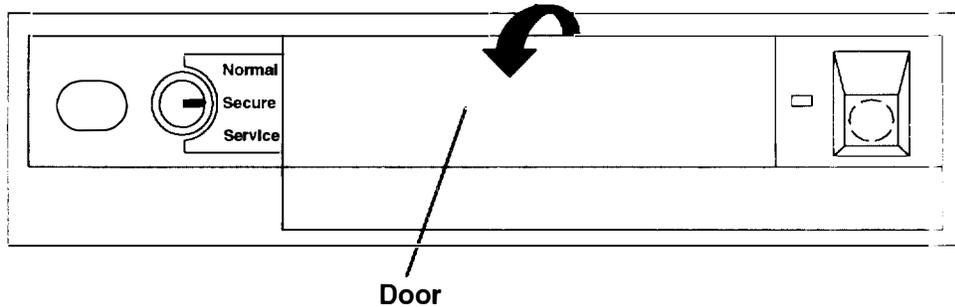
Door

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

Three-Digit Display   **Power Switch**

Key Mode Switch
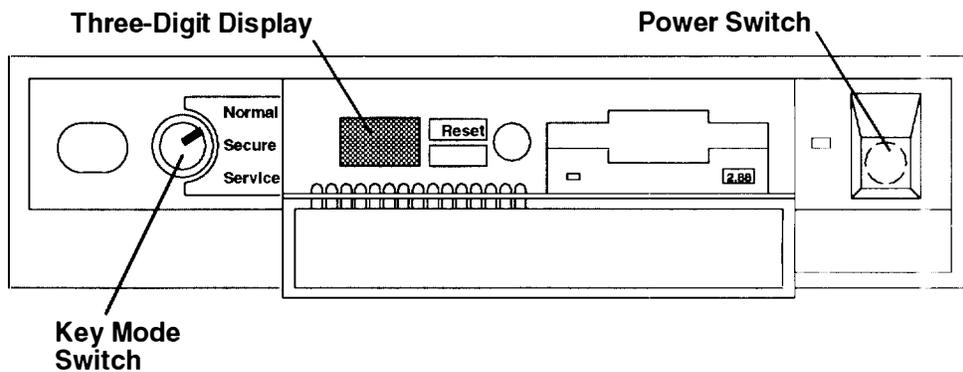
3. Set the power switches of the attached devices to On.

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 Problem Solving Guide and Reference*.

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
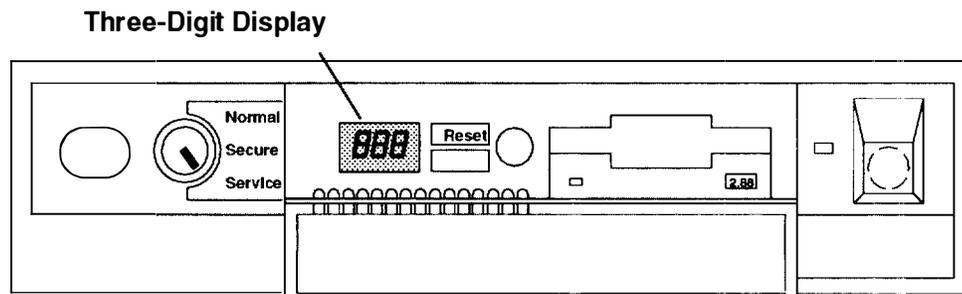
Using the Reset Button
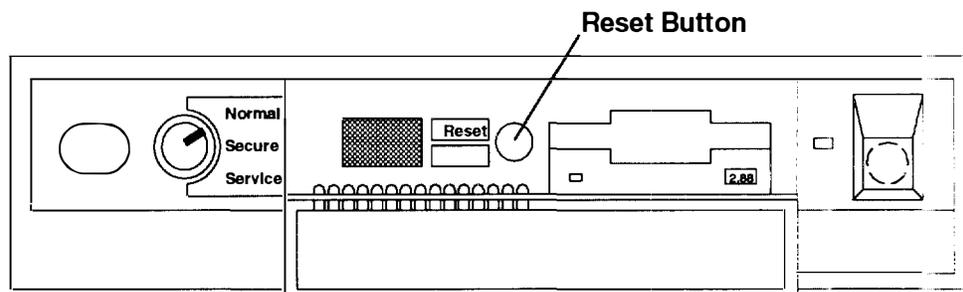
Reset Button

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, "Setting Up a Diskless or Dataless System" 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**
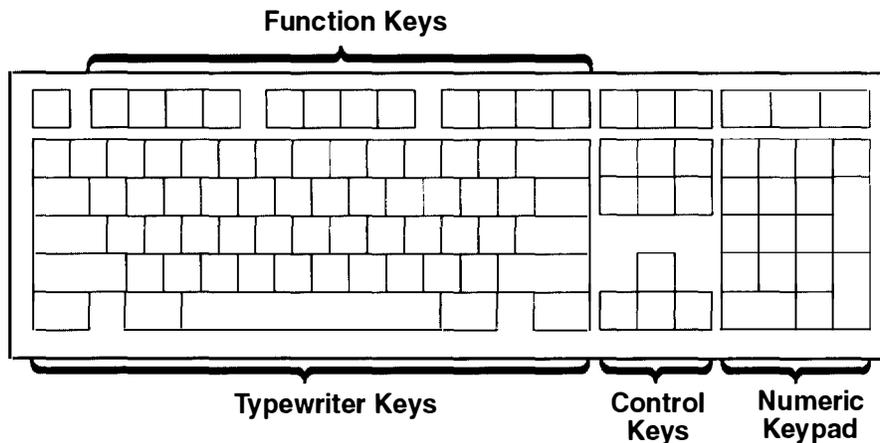
The keyboard is divided into four sections:

* 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
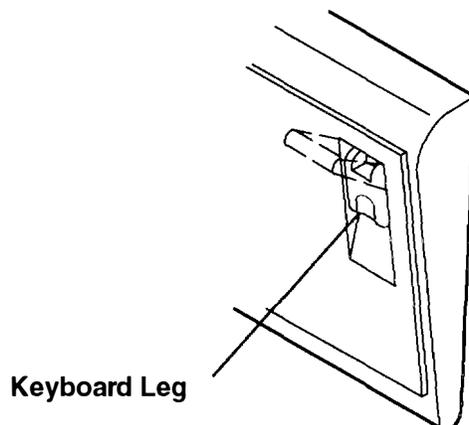
Using the Three-Button Mouse

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.
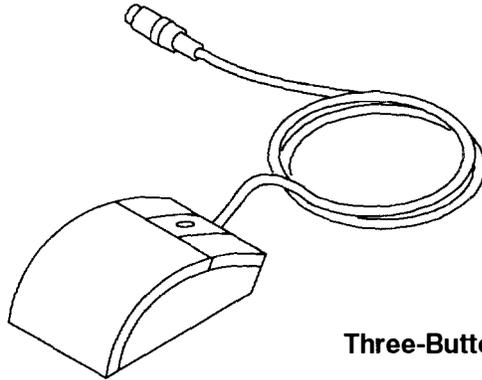
Three-Button Mouse

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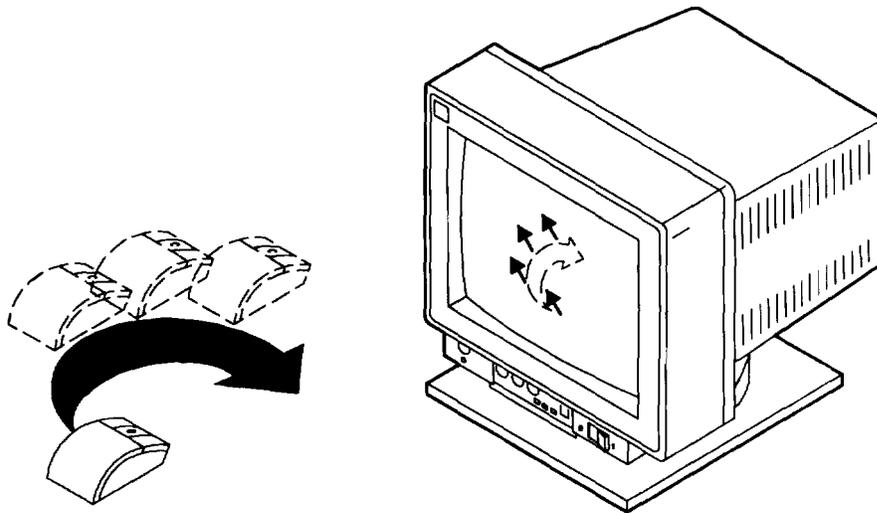
With the mouse buttons, you can perform functions such as selecting and deselecting options, extending your selection, or choosing a command. The precise function of your mouse depends on the software you are using.

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
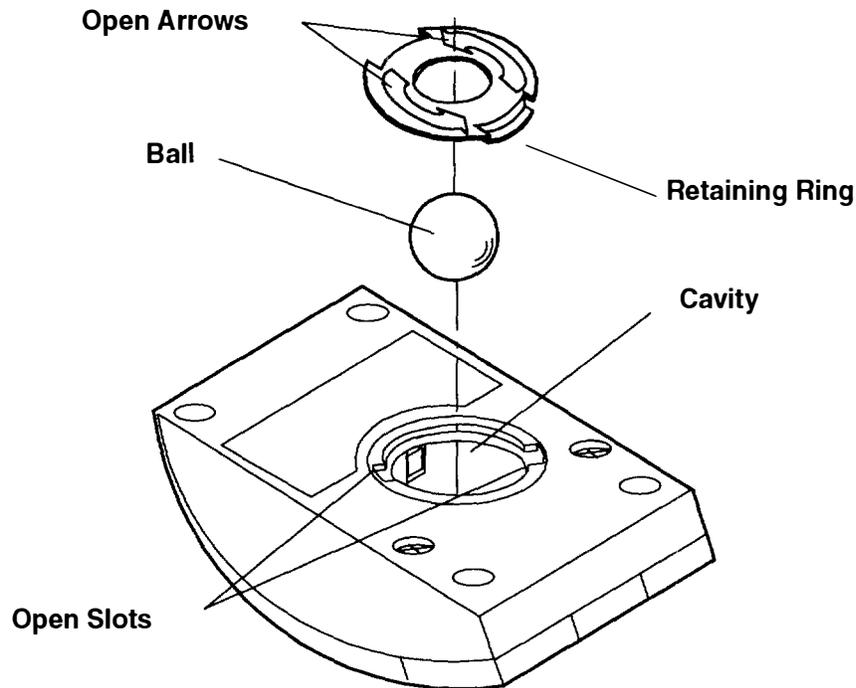
2. Remove the ball.

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 2.88M-byte diskette drive can format, read, and write diskettes compatible with the following diskette drives:

1.0M-byte diskettes with 720K-bytes formatted data capacity.
2.0M-byte diskettes with 1.44M-bytes formatted data capacity.
4.0M-byte diskettes with 2.88M-bytes 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)
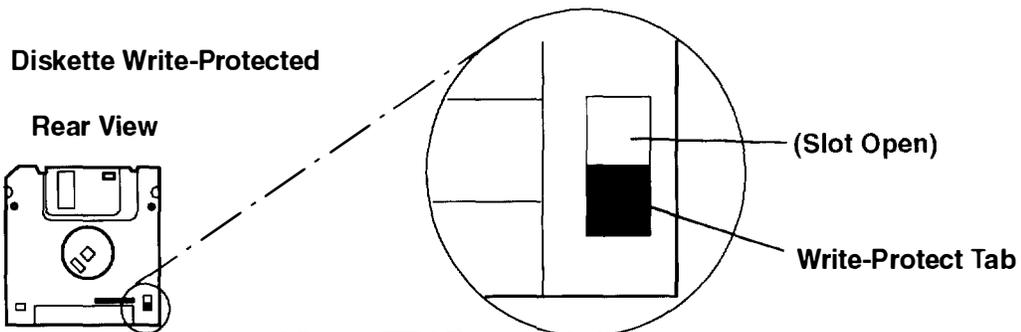
Write-Protect Tab

- 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
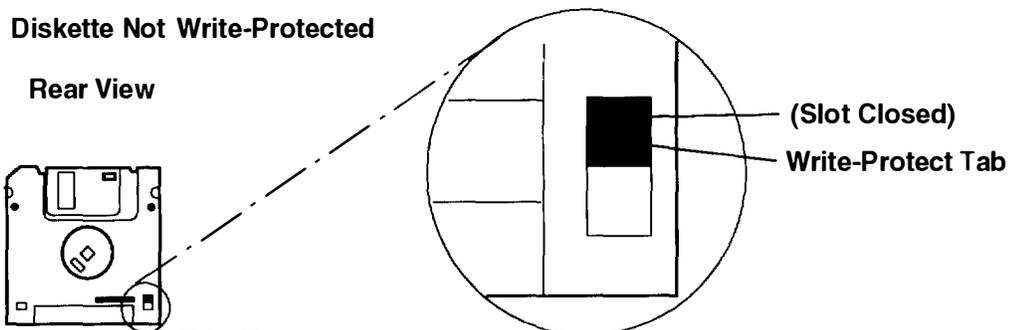
Loading and Unloading the 3.5-Inch Diskette

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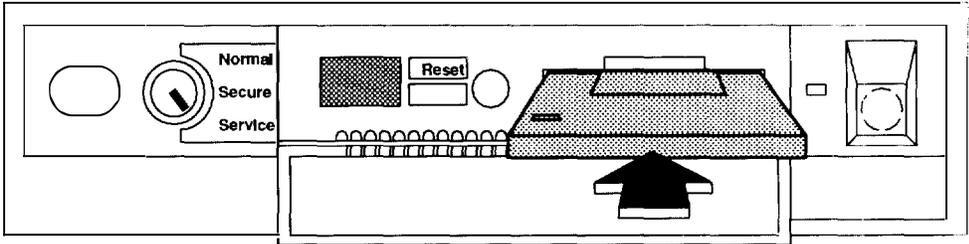
To unload the diskette, push the diskette-unload button. The diskette will unload partially from the drive. Pull the diskette out.

Diskette-Unload Button
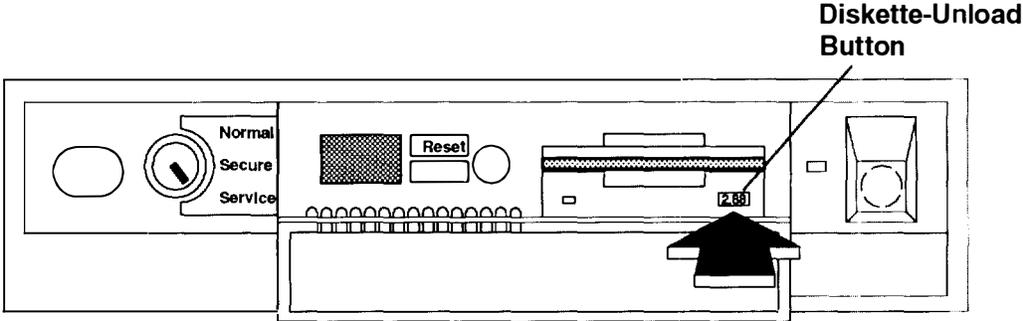
Ordering Keys

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 direct 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 list below to contact the Medeco distributor most convenient to you. Complete a copy of the order form and mail it to the distributor. As a safety precaution, Medeco will not honor orders that do not include both the code tag and the official order form.

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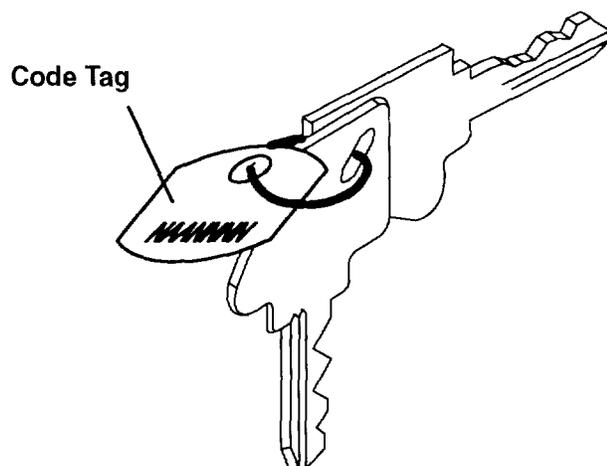
Medeco
Department KLC
P.O. Box 3075
Salem, VA 24153
United States of America

Mary 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: 011-61-075-36-2354

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

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

Y.S. Chae
Geoho Corporation
2nd Fl. Kyung Bldg.
244-7 Poi-Dong
Gangnam-Ku
Seoul, Korea
Tel: 011-82-02-579-1280
FAX: 011-82-02-579-1282

Moshe Rotner
R.M. Rotan Marketing
34 Nordau Street, Herzlia B
P.O. Box 5138, Herzlia
Israel
Tel: 011-972-9-545640
FAX: 011-972-9-584275

Key Reorder Form

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, and mail 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 this form.

Chapter 4. Using the Diagnostics

This chapter described how to load and run diagnostic programs for your system unit.

Sources for the Diagnostic Programs

Diagnostics can be run from:

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

- An internal disk

- A network, if your system unit has been configured to receive initial program load (IPL) 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. The special version of the AIX operating system 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.

Diagnostics on a System Unit Attached to Another System

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

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

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

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

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 three-digit 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 three-digit 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 it is not the correct type for the ASCII terminal being used, the function keys or the Enter key may not operate correctly. 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 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. Use only the 16M-byte diskette.

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

To change this file, take the following steps.

1. Enter:

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

2. Insert Diagnostic Diskette 4 into the diskette drive.

3. Enter:

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

4. To edit the file:

   a. Enter `uncompress consdef`.

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

   c. Enter `compress consdef`.

5. Enter:

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

6. Use the new Diagnostic 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 Version 3.2.5 of 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 shut down the AIX operating system before turning off the system unit to prevent possible damage to disk data. This is done in one of two ways:

  - If the diagnostic programs were loaded in standalone mode, press the F3 key until `DIAGNOSTIC OPERATING INSTRUCTIONS` displays; then press the F3 key once again to shut down the AIX operating system.
  - If the diagnostic programs were loaded in Maintenance or Concurrent mode enter the **shutdown –F** command.

- Under some conditions `c31` may appear in the three-digit 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 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 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:

1. Remove any diskette from the diskette drive.

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

3. Insert the caddy with the diagnostic disc into the CD-ROM drive.

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

5. Turn on the system.

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.

- You system unit must be configured to receive IPL (initial program load) over the network.

To run the diagnostic programs from the network:

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

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

3. Power 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.

- When the system is turned 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 up the combination system.

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*, Order Number GA18-2633. For the 3164, refer to the *3164 ASCII Color Display Station Description*, Order 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 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

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.

General Attributes Always Required (Continued)

General Setup Attributes	3151 /11/31 /41 Settings	3151 /51/61 Settings	3161/3164 Settings	Description
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 100 ms 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 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 stops all activity on the AIX operating system and puts 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 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:

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:

1. Shut down the system unit as described on page 3-4.

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

Note: When the diagnostic programs are run from diskettes or from a CD-ROM disc, the diagnostics do *not* check the error log entries.

3. If you want to load the Standalone diagnostics from diskettes, insert the first diagnostic diskette into the diskette drive.

4. If you want to load the Standalone diagnostics from a CD-ROM disc, insert the CD-ROM diagnostic disc into the CD-ROM drive.

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

6. 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. If your system does not have a console, the diagnostics can be executed without a console. To execute the diagnostics without a console, wait for `c31` to be displayed, then set the key mode switch to the Normal position and then back to the Service position.

When executing diagnostics without a console;

- A `c99` will be displayed at the successful conclusion of testing from disk-based and CD-ROM-based diagnostics.

- A `c07` will be displayed at the successful conclusion of testing from the diskette package. Only those devices supported by the diskette just loaded were tested. To test additional devices, load the diskette supporting those devices when `c07` is displayed.

- If the diagnostics detect a problem, a flashing `888` displays in the three-digit display. See "Reading Flashing `888` Numbers" in this chapter for instructions on reading the message.

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

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

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

8. If a problem is detected while the diagnostics are loading, a flashing `888` displays in the three-digit display. See "Reading Flashing `888` Numbers" in this chapter for instructions on reading the message.

9. Follow the displayed instructions to check out the desired resources.

10. When testing is complete, use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS.

11. 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` pop-up menu that offers two options: continuing with the shutdown by pressing F3 or returning to diagnostics by pressing Enter.

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

12. If you loaded the diagnostics from diskettes or from a CD-ROM disc, turn off the system unit after the shutdown is complete.

Running Built-In Diagnostics

To run the built-in diagnostics:

1. Shut down the system unit as described on page 3-4.

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

3. Set the power switch on the system unit to On, then wait until the number `200` displays in the three-digit display.

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

5. When the `MAIN MENU` displays, select the `Perform Diagnostics` option.

6. Follow the displayed instructions to check out the desired resources.

7. When testing is complete, select option `99` (Return to Main Menu).

8. 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 System Exerciser may test a device more than one time.

Note: If the system contains tape devices, CD-ROM, or diskette drives, you will be asked if 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 current time will be displayed at the top of the screen. The time 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 System 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 System 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 a service request number (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:

- 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

A flashing `888` number indicates that a hardware or software error has occurred, and a diagnostic message is ready to be read.

Step 1. Determine the Type of Message

The three-digit display should be flashing `888`.

1. Get a Problem Summary Form from the *AIX Version 4.1 Problem Solving Guide and Reference* or a blank sheet of paper to record the numbers appearing in the three-digit 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 three-digit 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.

```
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 three-digit display to answer the following question.

Is `888` flashing in the three-digit 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 turn off the system unit 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.

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 the 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 three-digit 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 three-digit 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 turn off the system unit. 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 three-digit 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 three-digit 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 three-digit 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 three-digit 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 turn 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 three-digit display. If you do not get a flashing 888 in the display, you should consider the numbers as *steady* numbers. Go to the *AIX Problem Solving Guide and Reference* and follow the procedures for analyzing three-digit display codes.

2. When the flashing 888 is displayed, go to Step 1.

Location Codes

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

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

Location Code Format for 7135, and 9334

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

Location Code Format for Non-SCSI Devices

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

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

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

AB - CD - EF - GH

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

Connector number on an adapter or planar.

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

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

Always 0.
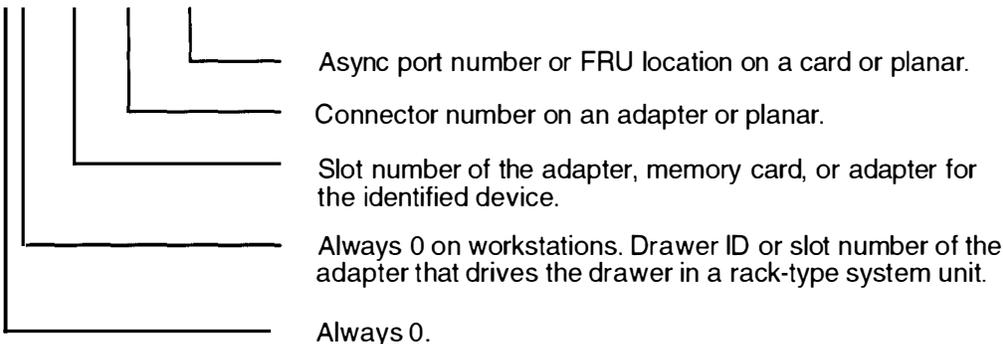
Location Code Format for SCSI Devices

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

AB - CD - EF - GH

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

SCSI address of the device.

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

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

Always 0.

Always 00.

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

Location Code Table

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

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

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

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

Pair	Value	Description
AB	00	Workstation-type system unit
CD	00 00	CPU located on system board A device attached to the planar
	01 02	Adapter in slot 1 of the system board Adapter in slot 2 of the system board
	0J	Graphics adapter slot
	0A 0B 0C 0D 0E 0F 0G 0H	SIMM in slot A SIMM in slot B SIMM in slot C SIMM in slot D SIMM in slot E SIMM in slot F SIMM in slot G SIMM in slot H For illustration, see page 2-8 for Models 220 and 230, page 2-10 for Model 250
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 system board.
	0D 0E 0K 0M 0P 0S 0T	Internal diskette connector on the system board Built-in Ethernet adapter Keyboard connector on the system board Mouse connector on the system board Parallel printer connector on the system board Built-in SCSI adapter Tablet connector on the system board
	S1 S2	Serial port 1 connector on the system board Serial port 2 connector on the system board
Table Continued on Next Page.		

Pair	Value	Description
GH or GHH or G,HHH	00	For devices other than those listed here
	00 thru 15	Port addresses for 8-port async, 16-port async, and 16-port concentrator distribution boxes.
	01	Diskette drive 1
	00 thru FF	SCSI address and logical unit number of the device.
	000 thru FFF	SCSI address and logical unit number of the device shown in hexadecimal.
	0,000 thru F,255	SCSI address and logical unit number of the device shown in decimal. **Note:** When a comma appears between the G and H, digits appearing to the right of the comma are represented in decimal.
	Note: See the Appendix A to determine physical location.	

Chapter 5. Using the Service Aids

Introduction to Service Aids

The diagnostic programs contain the following service aids which display data and do additional testing:

- 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.
- SCSI Bus.
- Display Test Patterns.
- Microcode Download.
- Display or 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.

The service aids are described in the following topics.

Service Hints

This service aid displays CEREADME (CE read me) file information from the source from which the diagnostics were loaded (diskettes, disk, CDROM). 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 or 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 the SRNs that 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 AIX. This information is stored in the **/etc/lpp/diagnostics/data/*.dat** file.

Display or Change Configuration or Vital Product Data (VPD)

Note: The following Version 3 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 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 Version 3 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 (VPD)

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.

Display or Alter VPD

Warning: If this service aid was loaded from diskettes or CD-ROM disc, any changes or additions you make to the VPD data will be lost when you shut down.

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 configuration 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, 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. The next pattern is the written to all blocks, overlaying the previous pattern. A random pattern will be written by selecting the `Write random pattern?` option.

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:

- 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 Test Unit Ready** 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

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.

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

Microcode Download

Microcode Download 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 a list of system-installed devices that can undergo microcode update. Select a device that needs to be updated from the list; download is accomplished by following instructions furnished with the service aid.

Display or 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 Version 3 of the 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 corrects 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 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 show on the diagnostic test list, use this service aid first to configure the device.

Diagnostic Diskette Creation

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

The Create Diagnostic Diskette package service aid requires at least 10000 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 the diagnostics on the disk to the most current level. 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

The Hardware Error Report service aid scans the error log for hardware errors and displays the data to the user. The error report can be optionally directed to format certain error log types into a more meaningful presentation.

Display Test Patterns for the Multimedia Video Capture Adapter

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 Capture Adapter service aid menu.

Chapter 6. Using the System Verification Procedure

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

When you are analyzing a hardware problem, you should use 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" on page 4-7.
   – 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 or higher contains the diagnostic programs. Other operating systems may not contain diagnostic programs.

Is Version 3.2 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 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 295 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 $c\,01$. 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" on page 4-16 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 Terminal` option on the Function Selection menu to initialize the operating system environment before you can continue with the diagnostics. This is a separate and different operation than selecting the console display.

2. Select `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 follow the instructions in the Action Column.

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" on page 4-16 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" on page 4-7 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 are 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 are 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

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

Internally Installed SCSI Device Record

1. Use the *About Your Machine* document to determine which devices are installed in your system unit.
2. Refer to the illustration and circle the device addresses for the internally installed SCSI disk drives in your system unit.
3. Go to "Attached SCSI Device Record" on page A-2.
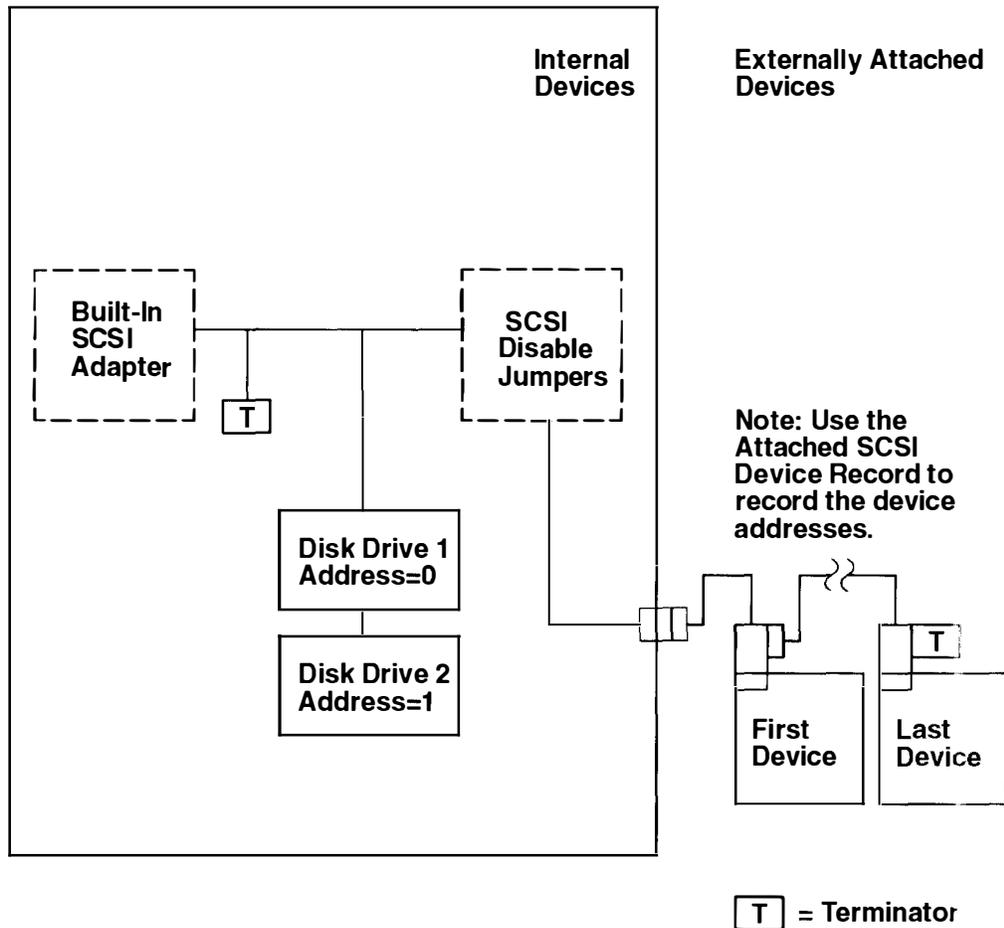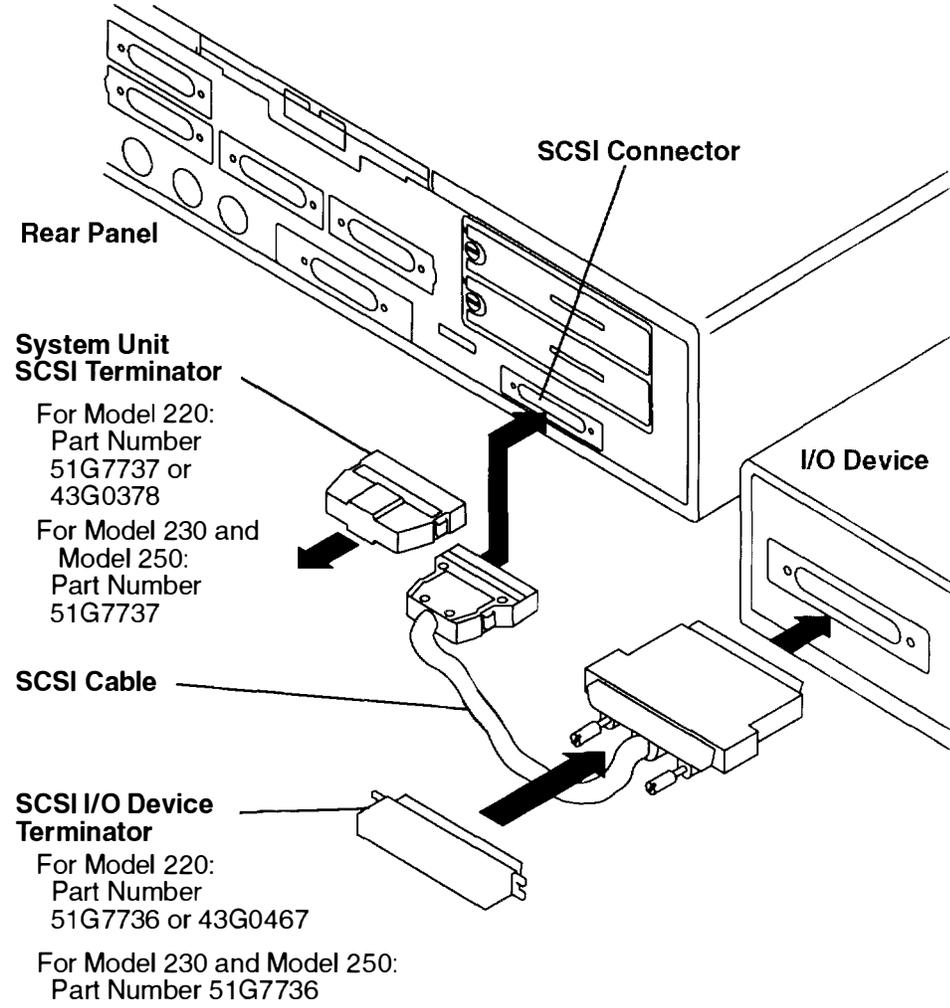
Attached SCSI Device Record

Refer to the following illustration and record the device type and the SCSI address for each attached SCSI device. Each address can only be used by one device.

A total of seven SCSI devices (either internal or external) can be used by the system unit.

Built-In SCSI Adapter

Device ____ ____ ____
Address ____ ____ ____

Device ____ ____ ____
Address ____ ____ ____

Device ____ ____ ____
Address ____ ____ ____

Device ____ ____ ____
Address ____ ____ ____

Device ____ ____ ____
Address ____ ____ ____

Device ____ ____ ____
Address ____ ____ ____

Device ____ ____ ____
Address ____ ____ ____
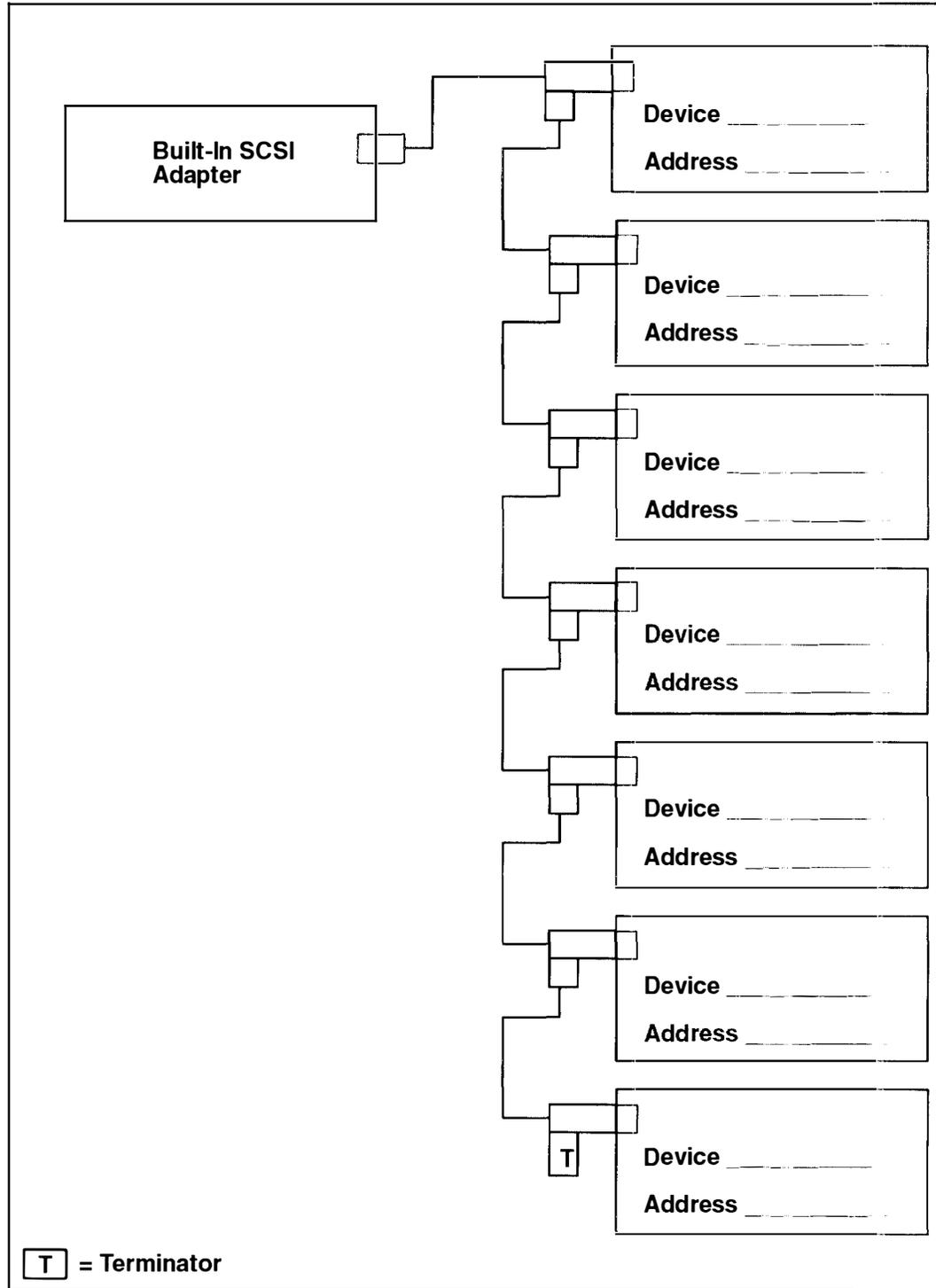
T = Terminator

Using SCSI Terminators

When attaching any external SCSI devices, make sure the last I/O device is properly terminated.

SCSI Connector

Rear Panel

**System Unit
SCSI Terminator**

For Model 220:
Part Number
51G7737 or
43G0378

For Model 230 and
Model 250:
Part Number
51G7737

I/O Device

SCSI Cable

**SCSI I/O Device
Terminator**

For Model 220:
Part Number
51G7736 or 43G0467

For Model 230 and Model 250:
Part Number 51G7736

Notes:

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

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

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.

Check Stop Codes

185	Processor-generated checkstop.
186	System logic-generated checkstop (Model 250 only).
187	Graphics-generated checkstop (Model 250 only).

Power-On Self-Test (POST) Indicators

200	IPL attempted with keylock in the Secure position.
201	IPL ROM test failed or checkstop occurred (irrecoverable).
211	IPL ROM CRC comparison error (irrecoverable).
212	Processor POST.
213	Memory configuration POST.
214	Memory address/data bus test.
215	Memory refresh test.
216	IPL ROM code being uncompressed into memory.
217	ECC logic test.
218	RAM POST is looking for 2M-bytes of good memory.
219	RAM POST bit map is being generated.
21C	L2 Cache detected
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 three-digit 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.

Note: May be caused by incorrect jumper settings for external SCSI devices or by incorrect SCSI terminator; refer to FFC B88.

224	Attempting a Normal mode restart 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 restart from Ethernet specified in NVRAM IPL Devices List.
227	Attempting a Normal mode restart from Token-Ring specified in NVRAM IPL Devices List.
228	Attempting a Normal mode IPL from NVRAM expansion code.
229	Attempting a Normal mode IPL from NVRAM IPL Devices List; cannot IPL from any of the listed devices, or there are no valid entries in the Devices List.

22c	Attempting a normal mode IPL from FDDI specified in NVRAM IPL Device List.
230	Attempting a Normal mode restart from adapter feature ROM specified in IPL ROM Device List.
231	Attempting a Normal mode restart from Ethernet specified by operator.
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 restart from 9333 subsystem device specified in IPL ROM Default Device List.
236	Attempting a Normal mode restart from Ethernet specified in IPL ROM Default Device List.
237	Attempting a Normal mode restart from Token-Ring adapter specified in IPL ROM Default Device List.
238	Attempting a Normal mode restart from Token-Ring adapter specified by the operator.
239	System failed to restart from the Normal mode default.
23c	Attempting a normal mode restart from FDDI specified in IPL ROM Default Device List.
240	Attempting a Service mode restart from adapter feature ROM.
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 restart from 9333 subsystem device specified in the NVRAM IPL Devices List.
246	Attempting a Service mode restart from Ethernet specified in the NVRAM IPL Devices List.
247	Attempting a Service mode restart from Token-Ring specified in the NVRAM Device List.
248	Attempting a Service mode IPL from NVRAM expansion code.
249	Attempting a Service mode IPL from the NVRAM IPL Devices List; cannot IPL from any of the listed devices, or there are no valid entries in the Devices List.
24c	Attempting a Service mode IPL from FDDI specified in NVRAM IPL Device List.
250	Attempting a Service mode restart from adapter feature ROM specified in the IPL ROM Default Device List.
251	Attempting a Service mode restart from Ethernet specified by the operator.
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 restart from 9333 subsystem device specified in the IPL ROM Default Devices List.
256	Attempting a Service mode restart from Ethernet specified in the IPL ROM Default Devices List.
257	Attempting a Service mode restart from Token-Ring specified in the IPL ROM Default Devices List.
258	Attempting a Service mode restart from Token-Ring specified by the operator.
259	Attempting a Service mode restart from FDDI specified by the operator

25c	Attempting a Service mode restart from FDDI specified in IPL ROM Default Device List.
260	Information is being displayed on the display console.
261	No supported local system display adapter was found.
262	A keyboard was not detected as being connected to the system's keyboard port.
Note:	Check for blown planar fuses or for a corrupted boot record on disk drive.
263	Attempting a Normal mode restart from adapter feature ROM specified in the NVRAM Device List.
271	Mouse port POST.
272	Tablet port POST.
278	Video ROM Scan POST.
279	FDDI adapter 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	Gt0 POST.
290	IOCC POST error (irrecoverable).
291	Standard I/O POST running.
292	SCSI POST running.
296	ROM scan.
298	Attempting a software IPL (warm boot).
299	IPL ROM passed control to the loaded program code.

Configuration Program Errors

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	Configuration manager has been invoked with conflicting options (irrecoverable error).

523	Configuration manager is unable to access the ODM database (irrecoverable error).
524	Configuration manager is unable to access the config rules object in the ODM database (irrecoverable error).
525	Configuration manager is unable to get data from a customized device object in the ODM database (irrecoverable error).
526	Configuration manager is unable to get data from a customized device driver object in the ODM database (irrecoverable error).
527	Configuration manager was invoked with the phase 1 flag: running phase 1 at this point is not permitted (irrecoverable error).
528	Configuration manager cannot find sequence rule, or no program name was specified in the ODM database (irrecoverable error).
529	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	Configuration manager could not find a configure method for a device.
534	Configuration manager is unable to acquire database lock (irrecoverable error).
536	Configuration manager encountered more than one sequence rule specified in the same phase (irrecoverable error).
537	Configuration manager encountered an error when invoking the program in the sequence rule.
538	Configuration manager is going to invoke a configuration method.
539	Configuration method has terminated, and control has returned to the configuration manager.
551	IPL varyon 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 varyon.
557	The root filesystem will not mount.
558	There is not enough memory to continue the system restart.
559	Less than 2 M-bytes of good memory are available to load the AIX kernel
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.
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.
711	Unknown adapter being identified or configured.
712	Graphics slot bus configuration is executing.
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 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.
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	NetXcel adapter being identified or 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 Multiport/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 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.
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 Fast/Wide Adapter/A being identified or configured.
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.
912	2.0G-byte SCSI-2 differential disk drive being identified or configured.
913	1.0G-byte differential disk drive being identified or configured.
914	5G-byte 8 mm differential tape drive being identified or configured.
915	4 G-byte 4 mm tape drive being identified or configured.
916	Non-SCSI vendor tape adapter 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.
942	POWER GXT graphics adapter being identified or 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	670M-byte SCSI disk drive being identified or configured
952	355M-byte SCSI disk drive being identified or configured.
953	320M-byte SCSI disk drive being identified or configured
954	400M-byte SCSI disk drive being identified or configured.
955	857M-byte SCSI disk drive being identified or configured.
956	670M-byte SCSI disk drive electronics card being identified or configured.
957	120M-byte DBA disk drive being identified or configured.
958	160M-byte DBA disk drive being identified or configured.
959	160M-byte SCSI disk drive being identified or configured.
960	1.37G-byte SCSI disk drive being identified or configured.
968	1.0G-byte SCSI disk drive being identified or configured.
970	Half-inch, 9-track tape drive being identified or configured.
971	150M-byte quarter-inch tape drive being identified or configured.
972	8mm SCSI tape drive being identified or configured.
973	Other SCSI tape drive being identified or configured.
974	CD-ROM drive being identified or configured.
977	M-Audio capture and playback adapter being identified or configured.
981	540M-byte SCSI-2 single-ended disk drive being identified or configured.
985	M-Video Capture Adapter capture adapter being identified or configured.
986	2.4G-byte SCSI disk drive being identified or configured.
989	200M-byte SCSI disk drive being identified or configured.
990	2.0G-byte SCSI-2 single-ended disk drive being identified or configured.
991	525M-byte 1/4-inch cartridge tape drive being identified or configured.
994	8mm tape drive being identified or configured.
995	1.2G-byte1/4-inch cartridge tape drive being identified or configured.
997	FDDI adapter being identified or configured.
998	4mm tape drive being identified or configured.

Dump Progress Indicators

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	Dump completed successfully.
0c2	A dump, requested by the user, is started.
0c3	Dump is inhibited.
0c4	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	Dump function is disabled.
0c9	Dump is in progress.

Diagnostic Load Progress Indicators

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

c01	Insert the first diagnostic diskette.
c02	Diskettes inserted out of sequence.
c03	Wrong diskette is in diskette drive.
c04	Loading stopped with a nonrecoverable error.
c05	A diskette error occurred.
c07	Insert the next diagnostic diskette.
c09	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	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.
c99	Diagnostics have completed. This code is only used when there is no console.

Debugger Progress Indicators

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

Flashing 888 Message Descriptions

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

Type 102 Message

The message type 102 contains information about a dump. See "Reading Flashing 888 Numbers" on page 4-16 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 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.
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" on page B-7.

Type 103 and 105 Messages

Message types 103 and 105 contain service information. The information should be recorded on the Problem Summary Form or on a blank sheet of paper.

This message contains the SRN and the location codes for up to four FRUs. The SRN is reported to the service organization and the location codes are needed by the service representative. See "Reading Flashing 888 Numbers" on page 4-16 for information about the diagnostic information contained within this message.

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 Sanyo battery CR2032 or equivalent.

Removal

1. Remove the chassis and chassis cover as described in "Removing the Chassis Assembly and Chassis Cover" on page 2-3.

2. Make sure the riser card support is installed.
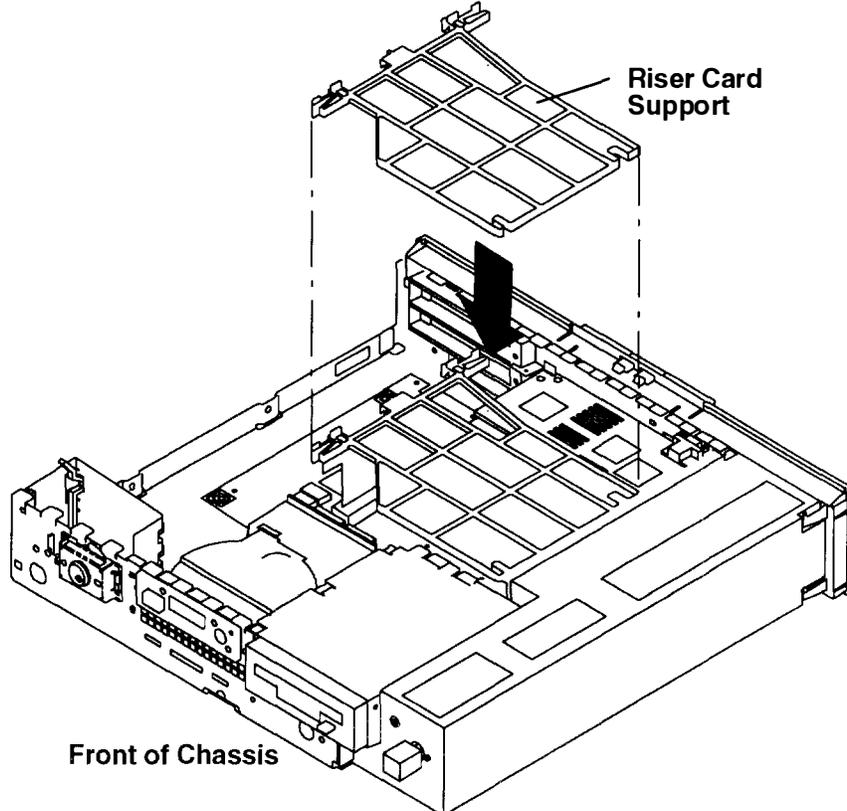
3. Loosen the serrated knobs and remove any installed optional adapters.

Serrated Knobs

Riser Card

Slot 1

Slot 2

Guide Rail (Slot 1)

Guide Rail (Slot 2)

Front of Chassis
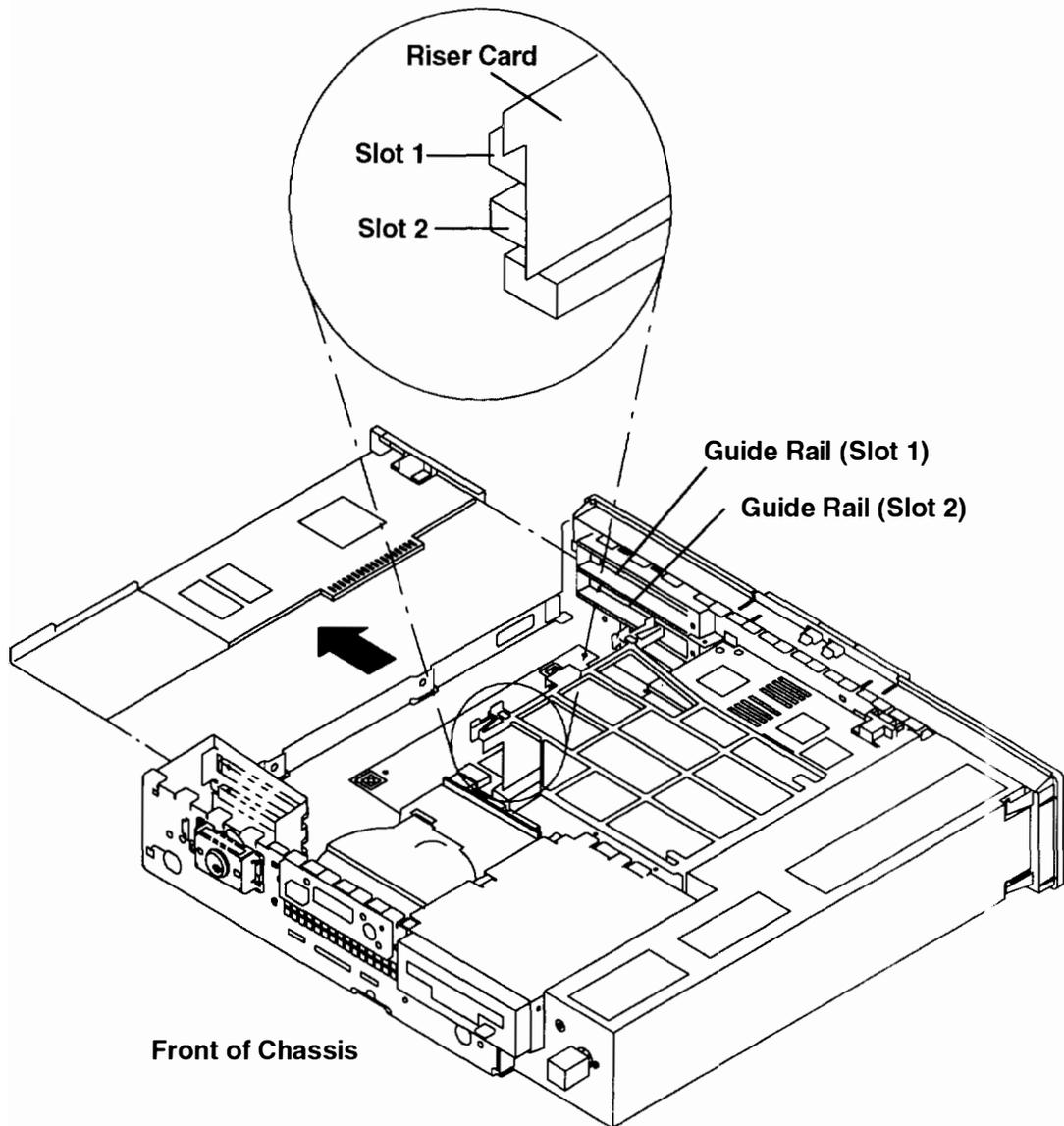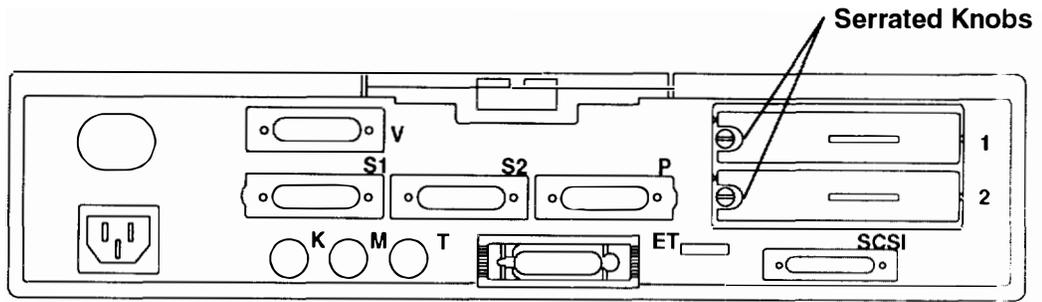
4. Remove the battery.

   a. For Models 220 and 230, lift up on the clip holding the battery and remove the battery.

      Warning: Be careful not to damage the battery holding clip when removing the battery.
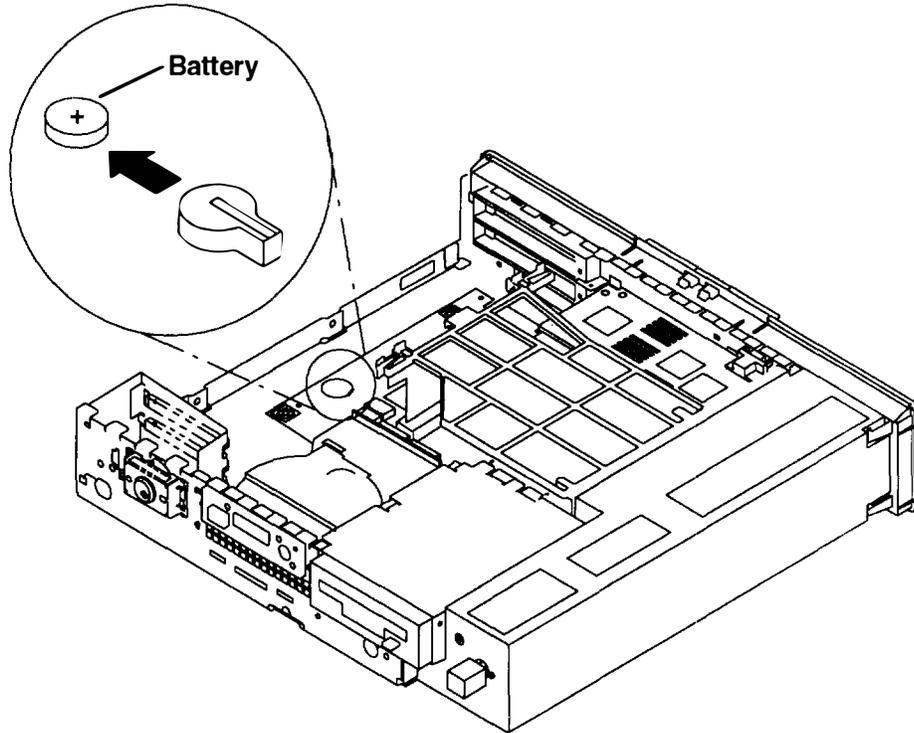
   b. For the Model 250, press down on the edge of the battery, then lift the battery out of the holder.
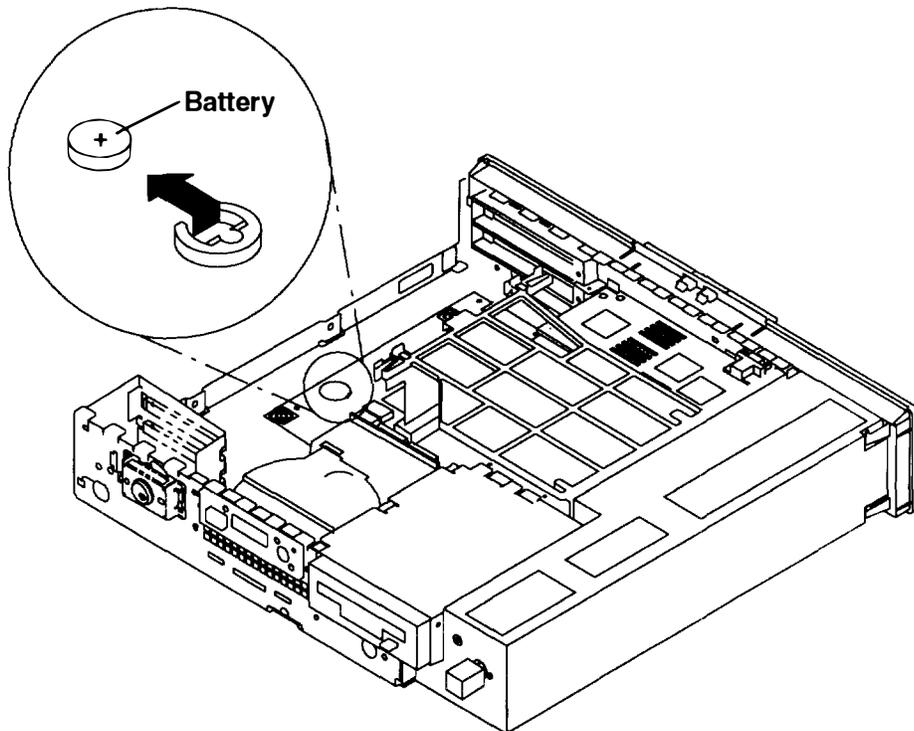
Replacement

1. Install the battery in the holder while being careful to observe correct polarity (positive side up). Use Sanyo battery CR2032 or equivalent.

2. Replace any optional adapters that were removed and tighten the serrated knobs.

3. Replace the chassis and chassis cover as described in "Replacing the Chassis Assembly and Chassis Cover" on page 2-66.

4. 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 1.0M-byte Blank Diskette
6404083	3.5-Inch 2.0M-byte Blank Diskette
72X6111	3.5-Inch 4.0M-byte Blank Diskette
15F8409	Lithium Battery

Appendix E. Display Sizes

The POWERdisplay 20 features a Trinitron™ CRT with a maximum viewable screen size of 486 mm (19.1) inches measured diagonally.

The POWERdisplay 17 features a Trinitron CRT with a maximum viewable screen size of 409 mm (16.1) inches measured diagonally.

The 6091-19i display features a Trinitron CRT that has a fixed screen size of 439 mm (17.3 inches) for the 1280 X 1024 resolution measured diagonally.

The POWERdisplay 19 features a Trinitron CRT that has a fixed screen size of 439 mm (17.3 inches) for the 1280 X 1024 resolution measured diagonally.

The 6091-019 display features a Trinitron CRT that has a fixed screen size of 439 mm (17.3 inches) for the 1280 X 1024 resolution measured diagonally.

The 5081-019 display features a Trinitron CRT that has a fixed screen size of 439 mm (17.3 inches) for the 1280 X 1024 resolution measured diagonally.

The 6091-023 display features a Trinitron CRT that has a fixed screen size of 544 mm (21.4 inches) for the 1280 X 1024 resolution measured diagonally.

The 6091-016 display features a Trinitron CRT that has a fixed screen size of 375 mm (14.8 inches) for the 1280 X 1024 resolution measured diagonally.

The 6091-016 display features a Trinitron CRT that has a fixed screen size of 375 mm (14.8 inches) for the 1280 X 1024 resolution measured diagonally.

The 5081-016 display features a Trinitron CRT that has a fixed screen size of 377 mm (14.9 inches) for the 1280 X 1024 resolution measured diagonally.

The 1091-051 display features a Trinitron CRT that has a fixed screen size of 375 mm (14.8 inches) measured diagonally.

The 8508 display features a screen size of 445 mm (7.5 inches) measured diagonally.

The 8507 display features a screen size of 445 mm (17.5 inches) measured diagonally.

Index

Numbers

Printed in the U.S.A.