

**Expanding and Maintaining
AViiON™ 3000 and 4000 Series
Computer Systems**

Expanding and Maintaining AViiON™ 3000 and 4000 Series Computer Systems

014-001874-00

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Expanding and Maintaining AViiON™ 3000 and 4000 Series Computer Systems
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NOTE

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Preface

This manual is written for the person who is responsible for expanding and maintaining the computer systems. It describes how to unpack, install and remove computer components.

NOTE: This manual does not describe how to insert VMEbus option boards. Refer to the *Setting Up and Installing VMEbus Options in AViiON™ Systems* manual.

This manual is organized as follows:

- Chapter 1** Describes the computer systems and their options, and outlines the reading path for procedures you need to perform to either expand your computer system by adding options or maintain it by replacing customer replaceable units (CRUs). This chapter also describes how to open and close the computer unit, avoid ESD (electrostatic discharge) damage, and how to unpack and inspect CRUs.
- Chapter 2** Explains the rules for configuring a Small Computer Systems Interface (SCSI) bus in your computer, and describes how to add or replace a mass-storage device.
- Chapter 3** Describes how to add or replace memory modules.
- Chapter 4** Describes how to add or replace the second CPU board in a AViiON 4000 series computer system.
- Chapter 5** Describes how to replace the system board and remove and install its PROM component.
- Chapter 6** Describes how to replace the power supply, the tape/disk fuse, and the fan assembly.
- Appendix A** Lists the jumper, switch, and terminator positions for internal mass-storage devices.
- Appendix B** Lists the customer replaceable units that you can order from Data General.
- Appendix C** Lists I/O connections and signals available on the computer system.
- Appendix D** Lists the nominal current required by the system board, the memory modules, the second CPU board, the SCSI adapter board, and the internal mass-storage drives.

Related Documents

If you install, operate, manage, or maintain these computer systems, you will find the following books useful. The comprehensive documentation set for the AViiON™ 3000 and 4000 series computer systems follows the Index at the back of this manual.

Setting Up and Starting AViiON™ 3000 and 4000 Series Computer Systems
(014–001872)

Describes how to unpack and connect system components and optional devices. Explains how to power up the computer systems, and prepare for your operating system installation. Includes operational, physical, electrical, and environmental specifications of the computer systems.

Setting Up and Installing VMEbus Options in AViiON™ Systems (014–001867)

Describes how to jumper VME controllers to operate in an AViiON environment. Explains how to install and remove the controller boards in the system's VME card cage, and how to jumper the VME printed circuit backplane when an empty slot is present. Also supplies instructions for connecting external devices to the controller boards.

Using the AViiON™ System Control Monitor (SCM) (014–001802)

Describes how technical users can use the commands and menus of the firmware monitor program to boot software, control their system environment, and debug programs.

Using AViiON™ System Diagnostics (014–001863)

Describes how technical users can use menu-based utilities to verify system hardware, check for faults in LAN connections, and maintain cartridge tape and diskette media on AViiON hardware models.

AViiON™ 300 and 400 Series Stations: Programming System Control and I/O Registers (014–001800) used in conjunction with *Technical Notice for AViiON™ 3000 and 4000 Series Systems: Programming System Control and I/O Registers* (014–001878)

Describes the system architecture and explains how to program the system control logic, serial and parallel ports, LAN interface, and SCSI port.

Installing and Operating the Model 10565 Peripheral Housing Unit (014–001810)

Describes how to unpack, inspect, install, and power up the peripheral housing unit. Explains how to replace the power supply, line cord, fan, and provides general instructions for replacing a drive. Lists physical, electrical, and environmental specifications of the peripheral housing unit.

Installing and Managing the DG/UX™ System (093–701052)

Tells how to install and manage the DG/UX™ operating system on AViiON hosts that will run as stand-alone, server, or client systems. Aimed at system administrators who are familiar with the UNIX® operating system.

Installing the Model 6562/6563-Series Diskette Drives (014–001921)

Describes how to install, operate, and maintain these diskette drives.

Installing the Model 6491 Disk Drive (014–001460)

Describes how to install, operate, and maintain the full-height, 322-Mbyte disk drive.

Installing Your Model 6554/6555 Series Disk Drive (014–001702)

Describes how to install, operate, and maintain the full-height, 662-Mbyte disk drive.

Installing and Operating Your Model 6590 Series Cartridge Tape Drive (014–001701)

Describes how to install, operate, and maintain the full-height, high capacity cartridge tape drive.

Installing and Operating Your Model 6538/6539 Half-Height Winchester Disk Drive (014–001722)

Describes how to install, operate, and maintain the half-height, 179-Mbyte disk drive.

Installing and Operating Your 150 Mbyte 1/4-Inch Cartridge Tape Drive (014–001699)

Describes how to install, operate, and maintain the half-height, 150-Mbyte cartridge tape drive.

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Manuals

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If you have comments on this manual, please use the prepaid Comment Form that appears at the back. We want to know what you like and dislike about this manual.

Telephone Assistance

If you are unable to solve a problem using any manual you received with your system, and you are within the United States or Canada, contact the Data General Service Center by calling 1-800-DG-HELPS for toll-free telephone support. The center will put you in touch with a member of Data General's telephone assistance staff who can answer your questions.

Free telephone assistance is available with your warranty and with most Data General service options. Lines are open from 8:30 a.m. to 8:30 p.m., Eastern Time, Monday through Friday.

For telephone assistance outside the United States or Canada, ask your Data General sales representative for the appropriate telephone number.

Returning Customer Replaceable Units (CRUs)

The standard AViiON 3000 and 4000 series computer systems warranty gives you free replacement of any failing CRU for 90 days. If at any time during the warranty period a problem occurs, call 1-800-DG-HELPS and a staff member will help you isolate the faulty part(s) by phone. Package the faulty part in its original shipping package with the warranty verification package. If you do not have the original shipping package, a Customer Support Center representative will suggest suitable replacement shipping packages. Mail the package to

Data General Corporation
Route 9
Building 4, Dock 4
Southboro, MA 01772

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End of Preface

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Chapter 1

Getting Started

This chapter describes the AViiON™ 3000 and 4000 series computers, shown in Figure 1–1, and their options. It also tells how to use the rest of the manual to either expand your computer system by adding options or maintain it by replacing failed customer replaceable units (CRUs). In addition, this chapter gives step-by-step procedures for performing the following tasks that are common to both expanding and maintaining your computer system: opening the computer unit, closing the computer unit, avoiding ESD (electrostatic) damage, and unpacking and inspecting options or CRUs.

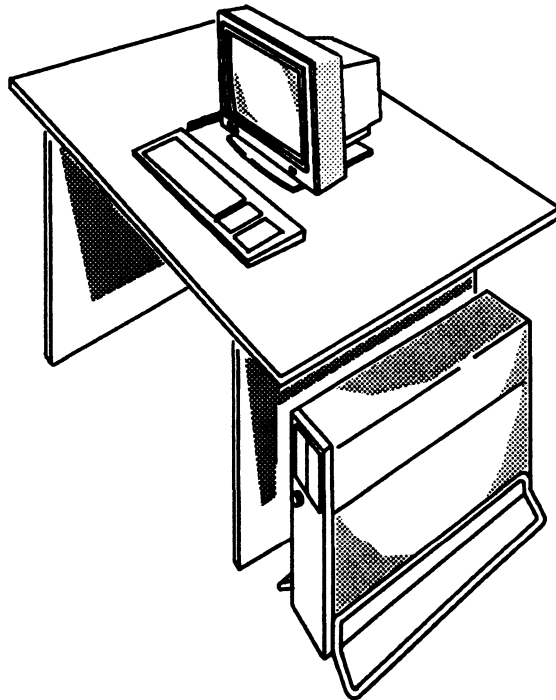


Figure 1–1 AViiON 3000 and 4000 Series Computer

The AViiON 3000 Series Computer

The AViiON 3000 series computer can function as an entry-level server in a client/server environment. It is also can support multiusers in a timeshare or hybrid server/timeshare environment. For these reasons, the AViiON 3000 series computer supports a variety of configurations.

The AViiON 3000 series currently consists of one model, the AViiON 3200.

Computer Unit Components

The AViiON 3000 series desktide computer unit shown in Figure 1-2 supports the standard system components, as well as optional components.

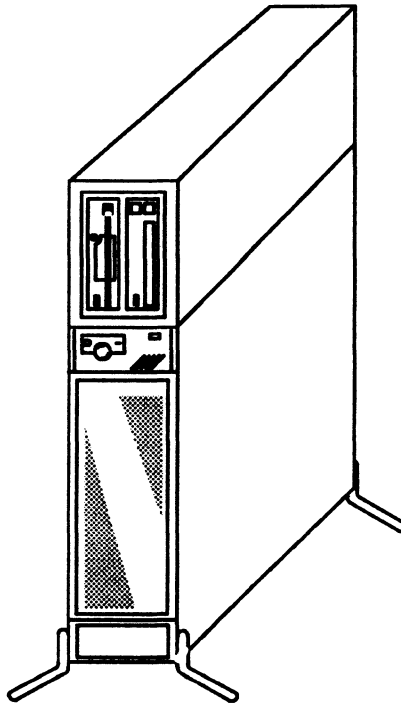


Figure 1-2 AViiON 3000 Series Computer Unit

Standard Computer Unit Components

A standard AViiON 3000 series computer unit includes the following:

- A system processor board that includes
 - One 16-megahertz, Motorola 88100-based central processing unit (CPU).
 - Eight megabytes of memory with byte parity, using two plug-in 4-megabyte memory modules.
 - One asynchronous RS-232-C port for the system console.
 - One asynchronous RS-232-C port for a modem or data terminal device.
 - One parallel printer port, compatible with a Centronics interface.
 - An Ethernet local area network (LAN) interface, compatible with thin or thick Ethernet networks (transceiver not included).
 - One small computer system interface (SCSI) controller for internal SCSI devices; supports maximum of four devices.
 - A VME bus interface.
- On some modules, both of the following mass-storage devices:
 - One 150-megabyte (QIC-150), half-height, SCSI-based cartridge tape drive.
 - One SCSI-based Winchester disk drive, either a 332-megabyte, half-height drive or a 662-megabyte, full-height drive.
- A one-slot, VME card cage with a printed circuit backplane (also called backpanel) board that supplies the VME bus to one optional VME-based communications controller.
- On some models, one of the following VME-based communications controllers:
 - VSC/3, a 3-line synchronous communications controller.
 - VAC/16, a 16-line asynchronous communications controller (includes two 8-line junction boxes for connection of asynchronous data terminal devices with RS-232-C interfaces).
- A 325-watt power supply.

Optional Computer Unit Components

One or more of the following optional components can be added to the standard AViiON 3000 computer unit configuration:

- Additional 4-megabyte memory modules up to the 16-megabytes maximum of system memory.
- When a computer unit contains the standard configuration of mass-storage devices that includes one half-height Winchester disk and one half-height, QIC-150 cartridge tape drive, then you can add either two of the devices listed below or one 662-megabyte, full height Winchester disk drive and one of the devices listed below. In either case, a computer unit cannot contain more than two removable media devices. If the standard configuration of mass-storage devices includes a full-height disk instead of the half-height disk, then you can add one of the devices listed below.

When a computer unit contains no mass-storage devices, you can add either four of the devices listed below or one 662-megabyte, full-height Winchester disk and three of the devices listed below. In either case, a computer unit cannot contain more than two removable media devices.

Disks

- A 179-megabyte, half-height, Winchester disk drive.
- A 332-megabyte, half-height, Winchester disk drive.

Removable media devices

- A second 150-megabyte (QIC-150), half-height, cartridge tape drive.
- A 1.2-megabyte, 5.25-inch diskette drive or a 1.44-megabyte, 3.5-inch diskette drive. The diskette drives are half-height devices and come with a SCSI adapter board.
- A 600-megabyte, half-height CD ROM drive.
- On models without a VSC/3 or a VAC/16 controller, one of the following VME-based communications controllers:
 - VSC/3, a 3-line synchronous communications controller.
 - VAC/16, a 16-line asynchronous communications controller (includes two 8-line junction boxes for connection of asynchronous data terminal devices with RS-232-C interfaces).
 - One VLC Ethernet local area network controller.

External System Devices

AViiON 3000 series computer supports standard and optional external devices. These devices connect to the computer unit via cables that plug into the connectors for the peripheral ports located on the computer unit's rear panel. Figure 1-3 shows the connectors for the peripheral ports.

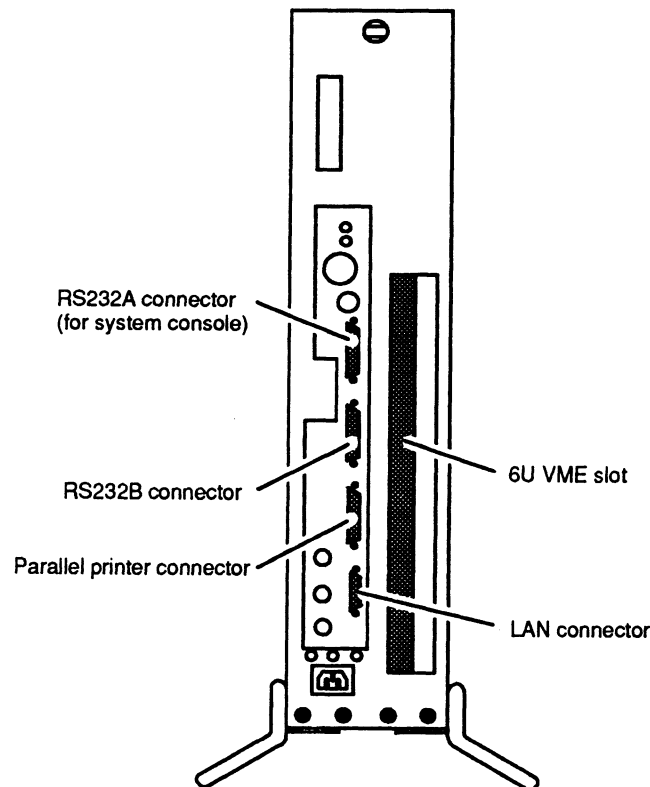


Figure 1-3 AViiON 3000 Series Rear Panel

Standard External Devices

AViiON 3000 series computer requires a local asynchronous terminal with an ASCII character set and an RS-232-C interface to serve as the system console.

Optional External Devices

Based on configuration, the AViiON 3000 series computer system supports one or more of the following devices:

- User terminals, printers, and or modems with RS-232-C interfaces.
- A parallel printer, compatible with a Centronics interface.
- Three synchronous devices with the VSC/3 controller or 16 asynchronous data terminal devices with the VAC/16 controller.

The AViiON 4000 Series Computer

The AViiON 4000 series computer can function as a server in a client/server environment. It can also support multiusers in a timeshare or hybrid server/timeshare environment. For these reasons, the AViiON 4000 series computer supports a variety of configurations.

The AViiON 4000 series currently consists of four models: the AViiON 4000, the AViiON 4020, the AViiON 4100, and the AViiON 4120.

Computer Unit Components

The AViiON 4000 series desktide computer unit shown in Figure 1-4 supports the standard system components, as well as optional components.

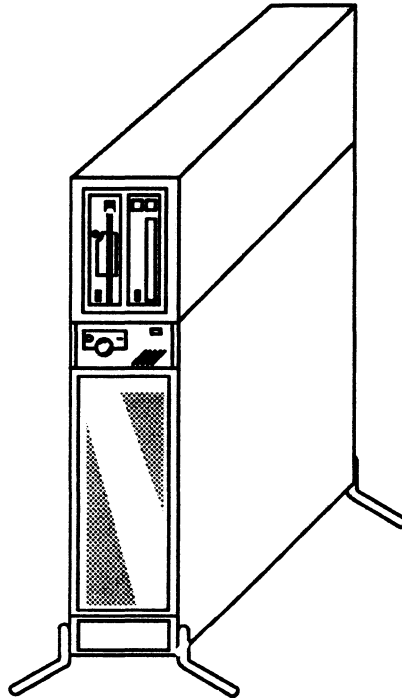


Figure 1-4 AViiON 4000 Series Computer Unit

Standard Computer Unit Components

A standard AViiON 4000 series computer unit includes the following:

- A system processor board that includes
 - One (AViiON 4000) or two (AViiON 4020) 16-megahertz or one (AViiON 4100) or two (AViiON 4120) 20-megahertz, Motorola 88100-based central processing units (CPUs).

- In AViiON 4000 or 4100 computers, 8 megabytes of memory with byte parity, using two plug-in, 4-megabyte memory cards. In AViiON 4020 or 4120 computers, 16 megabytes of memory with byte parity, using four plug-in, 4-megabyte memory modules.
- One asynchronous RS-232-C port for the system console.
- One asynchronous RS-232-C port for a modem or data terminal device.
- One parallel printer port, compatible with a Centronics interface.
- An Ethernet local area network (LAN) interface, compatible with thin or thick Ethernet networks (transceiver not included).
- One small computer system interface (SCSI) controller with an expansion port for externally connected SCSI devices. (The number of external SCSI devices supported depends on the number of SCSI devices housed in the computer unit. The SCSI controller supports a maximum of seven SCSI devices.)
- A VME bus interface.
- One 150-megabyte (QIC-150), half-height, SCSI-based cartridge tape drive.
- One SCSI-based Winchester disk, either a 332-megabyte, half-height drive or a 662-megabyte, full-height drive.
- A two-slot, VME card cage with a printed circuit backplane (also called backpanel) board that supplies the VME bus to two optional VME-based communications controllers.
- A 325-watt power supply.

Optional Computer Unit Components

One or more of the following optional components can be added to the standard AViiON 4000 series computer unit configuration:

- A second 16-megahertz central processing unit (CPU) for an AViiON 4000 or a second 20-megahertz central processing unit (CPU) for an AViiON 4100. This optional CPU resides on a card (called the *second CPU board*) that plugs into the system board.
- Additional 4-megabyte memory modules up to the 32-megabytes maximum of system memory.

- When a computer unit contains the standard configuration of mass-storage devices that includes one half-height Winchester disk and one half-height, QIC-150 cartridge tape drive, then you can add either two of the devices listed below or one 662-megabyte, full height Winchester disk drive and one of the devices listed below. In either case, a computer unit cannot contain more than two removable media devices. If the standard configuration of mass-storage devices includes a full-height disk instead of the half-height disk, then you can add one of the devices listed below.

Disks

- A 179-megabyte, half-height, Winchester disk drive.
- A 332-megabyte, half-height, Winchester disk drive.

Removable media devices

- A second 150-megabyte (QIC-150), half-height, cartridge tape drive.
 - A 1.2-megabyte, 5.25-inch diskette drive, or one 1.44-megabyte, 3.5-inch diskette drive. The diskette drives are half-height devices and come with a SCSI adapter board.
 - A 600-megabyte, half-height, CD ROM drive.
- A maximum of two of the following VME-based communications controllers:
 - One VSC/3 3-line synchronous communications controller.
 - One or two VAC/16 16-line asynchronous communications controllers, each including two 8-line junction boxes for connection of asynchronous data terminal devices with RS-232-C interfaces. (A VAC/16 and a VDA/128 cannot be used in the same computer unit.)
 - One or two VDA/128 asynchronous host adapters, each supporting a maximum of 128 asynchronous data terminal devices with RS-232-C interfaces, using a network of cluster controller units. (A VAC/16 and a VDA/128 cannot be used in the same computer unit.)
 - One VLC Ethernet local area network controller.

External System Devices

AViiON 4000 series computers support standard and optional external devices. These devices connect to the computer unit via cables that plug into connectors for the peripheral ports located on the computer unit's rear panel. Figure 1-5 shows the connectors for the peripheral ports.

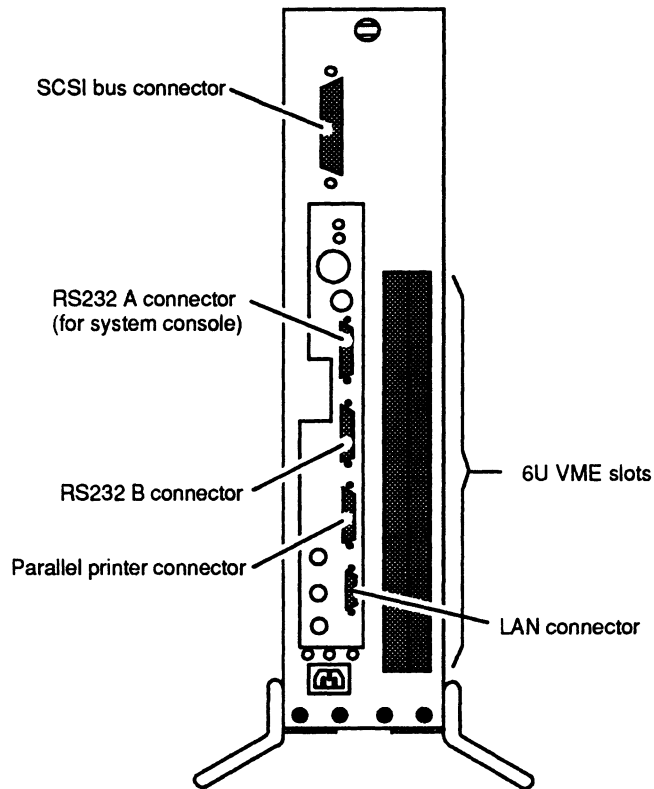


Figure 1-5 AViiON 4000 Series Rear Panel

Standard External Devices

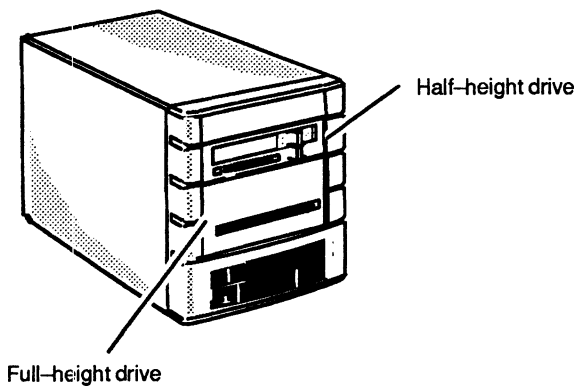
AViiON 4000 series computer require a local asynchronous terminal with an ASCII character set and an RS-232-C interface to serve as the system console.

Optional External Devices

Based on configuration, the AViiON 4000 series computer system supports one or more of the following devices:

- User terminals, printers, and or modems with RS-232-C interfaces.
- A parallel printer, compatible with a Centronics interface.

- A model 10565 Peripheral Housing Unit (PHU), shown in Figure 1–6, that connects to an external SCSI cable. The PHU supports the following configurations of SCSI–based mass storage devices:
 - A maximum of three half–height 5.25–inch devices. Half–height devices include
 - QIC–150 cartridge tape drive
 - 179–megabyte Winchester disk drive.
 - 332–megabyte Winchester disk drive.
 - 1.2–megabyte, 5.25–inch diskette drive.
 - 1.44–megabyte, 3.5–inch diskette drive.
 - 600–megabyte, half–height, CD ROM drive.
 - A maximum of one full–height 5.25–inch device and one half–height device. Full–height devices include
 - 322–megabyte Winchester disk drive.
 - 662–megabyte Winchester disk drive.
 - 2–gigabyte, 8–millimeter, archival cartridge tape drive.
 - 590–megabyte erasable optical disk.



Half–Height Drives

- 150–Mbyte cartridge tape drive
- 179–Mbyte Winchester disk drive
- 332–Mbyte Winchester disk drive
- 1.44–Mbyte 3.5–inch diskette drive
- 1.2–Mbyte 5.25–inch diskette drive
- 600–Mbyte CD ROM

Full–Height Drives

- 662–Mbyte Winchester disk drive
- 322–Mbyte Winchester disk drive
- 2–Gbyte 8–millimeter cartridge tape drive
- 590–megabyte erasable optical disk

Figure 1–6 Peripheral Housing Unit (PHU)

- A selection of the following tabletop, reel–to–reel tape drives:
 - Model 6587–A, 1600 bits per inch (bpi) (single density).
 - Model 6589–A, 6250/1600 bpi (dual density).
 - Model 6589–TA, 6250/1600/800 bpi (triple density).
 All models connect to the system via an external SCSI bus cable.
- Three synchronous devices per VSC/3 controller.
- 16 asynchronous data terminal devices per VAC/16 controller.
- 128 asynchronous data terminal devices per VDA/128 host adapter, controlled by VDC/8P and/or VDC/16 downloadable cluster controller units. Each VDC/8P cluster controller unit supplies eight asynchronous RS–232–C ports for data terminal devices and one parallel printer port with a *Centronics only* interface. Each VDC/16 unit supplies only 16 asynchronous RS–232–C ports for data terminal devices.

Expanding a Computer

To add mass-storage devices, memory modules, or option boards, follow the procedures in the chapter listed below that pertains to the option you are adding. Each of these chapters tells you to unpack and inspect the equipment and open and close the computer unit as described later in this chapter.

Chapter 2, “Adding or Replacing Mass-Storage Devices.”

Chapter 3, “Adding or Replacing Memory Modules.”

Chapter 4, “Adding or Replacing the Second CPU Board.”

Maintaining a Computer

If you have a problem with your computer, first refer to the “Solving Power-up Problems” chapter of the *Setting Up and Starting AViiON™ 3000 and 4000 Series Computer Systems* manual. If you cannot resolve your problem, contact Data General.

If you are within the United States or Canada, contact the Data General Service Center by calling 1-800-DG-HELPS. A staff member will help you isolate the failed part(s) by phone. For more information, refer to the “Telephone Assistance” section of the Preface.

If, after calling the Data General Service Center, you determine that a Customer Replaceable Unit (CRU) needs replacement, follow the instructions in the chapter listed below for the CRU you are replacing. Each of these chapters tells you to open the computer unit, unpack and inspect replacement equipment, and close the computer unit as described later in this chapter.

Chapter 2, “Adding or Replacing Mass-Storage Devices.”

Chapter 3, “Adding or Replacing Memory Modules.”

Chapter 4, “Adding or Replacing the Second CPU Board.”

Chapter 5, “Adding or Replacing the System Board .”

Chapter 6, “Replacing the Power Supply, Fuse, or Fan Assembly.”

Package the failed part in its original shipping package with the warranty verification package and mail it to Data General at the address listed in the Preface. If you do not have the original shipping package, a staff member at the Data General Service Center will advise you how to package the part. Data General will send you a replacement part.

Avoiding Electrostatic Discharge (ESD) Damage

When your computer unit top and side panels are installed, they protect the electronic circuits inside the computer unit from electrostatic discharge (ESD) damage. However, when you remove the panels from the computer unit to install a subassembly, you can inadvertently damage the electronic circuits in the computer unit by simply touching them and discharging any electrostatic charge that has accumulated on your body. This section contains procedures that you *must* follow to prevent ESD damage to the computer unit.

- Provide enough room to work on the equipment. Clear the work site of any unnecessary materials or materials that naturally build up electrostatic charge. These include plastic foam packaging materials and cups, cellophane wrappers, and similar materials.
- Do not remove a subassembly from its antistatic packaging until the exact moment that you are ready to install it.
- Gather all the tools, manuals, an ESD kit (an ESD wrist strap shipped with your computer system), and other materials you will need *before* you remove covers and panels from the equipment. The chapters on adding or replacing a subassembly list required tools and materials at the beginning of the procedures. After you remove the a cover or panel, you should avoid moving away from the work site; otherwise, you may build up an electrostatic charge.
- Use an ESD kit when handling a subassembly or when touching the electronic circuits inside the equipment. (The section on “Opening the Computer Unit” in this chapter tells you how to attach this wrist strap.) If you lose your ESD strap, you can order an ESD kit from Data General. If an emergency arises and an ESD kit is not available, follow the procedures in the section “Emergency Procedures (without an ESD kit).”
- Replace the cover(s) or panels(s) on the equipment as soon as possible so that the electronic circuits are protected.

Emergency Procedures (without an ESD kit)

In an *emergency* when an ESD kit is not available, use the following procedures to reduce the possibility of an electrostatic discharge by ensuring that your body and the subassembly are at the same electrostatic potential.

CAUTION: These procedures are not a substitute for the use of an ESD kit.

- Before touching any electronic circuits or boards inside the equipment, firmly touch a bare (unpainted) surface of the equipment.

- Before removing any replacement or upgrade subassembly from its antistatic bag, place one hand firmly on an unpainted surface of the chassis, and at the same time, pick up the replacement or upgrade subassembly while it is still sealed in the antistatic bag. Once you have done this, *do not* move around the room or contact other furnishings, personnel, or surfaces until you have installed and *secured* the subassembly in the equipment.
- Remove the subassembly from the antistatic bag, handling printed circuit boards by the edges. Avoid touching components and circuits on a printed circuit board.
- If you must move around the room or touch other surfaces before securing the subassembly in the equipment, first place the subassembly back in the antistatic bag. When you are ready again to install the subassembly repeat these procedures.
- Order an ESD kit for the next time you need to add or remove a cover or panel. You can order an ESD kit from Data General.

Unpacking and Inspecting Your Equipment

To unpack your equipment, follow the steps below.

CAUTION: *Handle the equipment carefully as it is fragile. Do not drop or jar it, and do not grasp it by any fragile or delicate surface.*

1. Move the sealed cartons as close to the installation site as possible.
2. Remove the packing slip from the outside of the first shipping carton.
3. Open the carton and remove the equipment.
4. Inspect the equipment carefully for visible, external damage. If a piece of equipment is damaged, contact Data General.

If you are within the United States or Canada, contact the Data General Service Center by calling 1-800-DG-HELPS for toll-free telephone support. For more information, refer to the "Telephone Assistance" section of the Preface.

5. Compare the items you received in the carton with the items listed on the packing slip, including any cables. (Some cables ship in the carton with the equipment and some ship in a separate carton.) Make sure that the model and part numbers on the packing list are what you ordered, and that these part numbers match those on your equipment. If a model or part number is incorrect, contact Data General as described in the Preface.

Your computer unit power cord is packaged with other loose cabling. Table 1-1 lists the part number for each type of power cord.

Table 1-1 Power Cord Specifications

Part Number	Country	Voltage	Frequency
109-996-1	U.S./Canada	100	50/60
109-996-0	U.S./Canada	120	60
109-809-6	Australia	240	50
109-810-0	Switzerland	220	50
109-811-8	Italy	220	50
109-812-7	Europe ¹	220	50
109-813-5	United Kingdom ²	240	50
109-815-9	Denmark	220	50

- 1 Excluding Switzerland, Italy, UK, Denmark.
- 2 Used in Bangladesh, Bermuda, Hong Kong, Nigeria, Pakistan, Singapore, Sri Lanka, United Arab Republics.

Repeat steps 1-5 for each shipping carton.

When you have finished unpacking and inspecting your equipment, you should put the packing materials aside, including the packing list. Do not throw them away. You may need to use the packing materials again if you have to return equipment, or refer to the packing list if you ever have to contact Data General about your system.

Opening the Computer Unit

This section tells how to remove the computer unit's side and top covers and attach an ESD wrist strap. If for some reason you cannot find the ESD wrist strap, you must take the precautions in the "Emergency Procedures (without an ESD Kit)" section earlier in this chapter.

Before you remove any covers from the computer unit, you should power power down the computer unit if it is running by following the procedures in *Setting Up and Starting AViiON™ 3000 and 4000 Series Computer Systems*. If your computer is running the DG/UX™ operating system, refer to the *Installing and Managing the DG/UX™ System* manual for the procedure on shutting down and halting the operating system. If your computer does not include DG/UX, refer to the operating manual for the operating system software for the proper procedure for shutting down and halting the operating system. Then return here and perform the steps that follow.

When the computer unit is powered down, you should unplug the computer unit's power cord from the ac power outlet and from the receptacle at the back of the computer unit.

Next you should move the computer to a clear work space, if necessary, so you can access the left or right side. Be careful not to strain the cables or jar the computer.

Removing the Side Covers

To remove one or both side covers, follow the steps below. You will need a coin or a large flat-blade screwdriver.

WARNING: To avoid electrical shock or equipment damage, always power down the computer unit and unplug the power cord from the ac power outlet and from the receptacle on the back of the computer unit *before* removing the covers from the computer unit.

1. Using a coin or a screwdriver, loosen the two fasteners that attach the side cover to the computer unit by turning them one-quarter turn counterclockwise as shown in Figure 1-7.

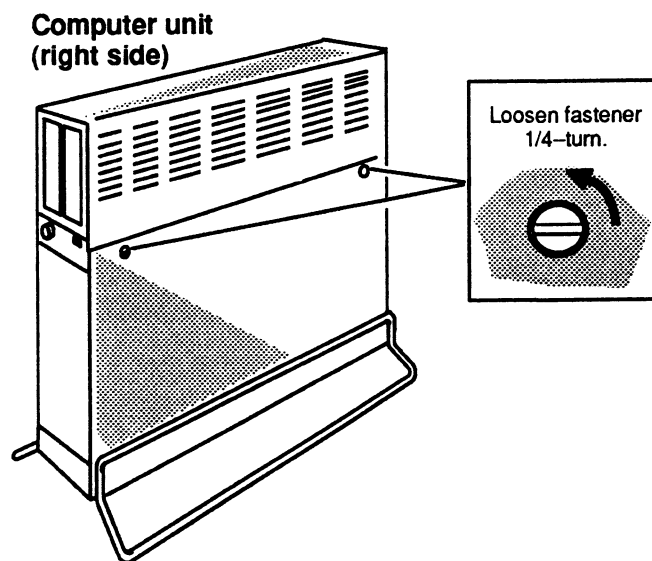


Figure 1-7 Loosening the Side Cover Fasteners

2. While supporting the side cover, lift it up and away from the computer unit as shown in Figure 1-8.

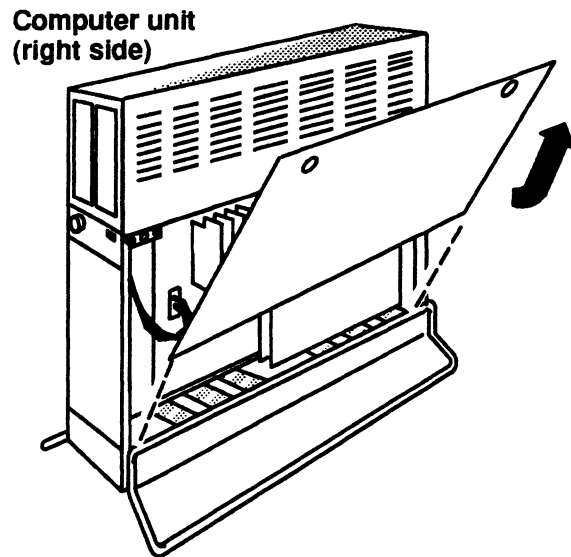


Figure 1-8 Removing the Side Covers

3. Put on the ESD wrist strap and attach the ESD clip to any unpainted metal surface of the chassis as shown in Figure 1-9.

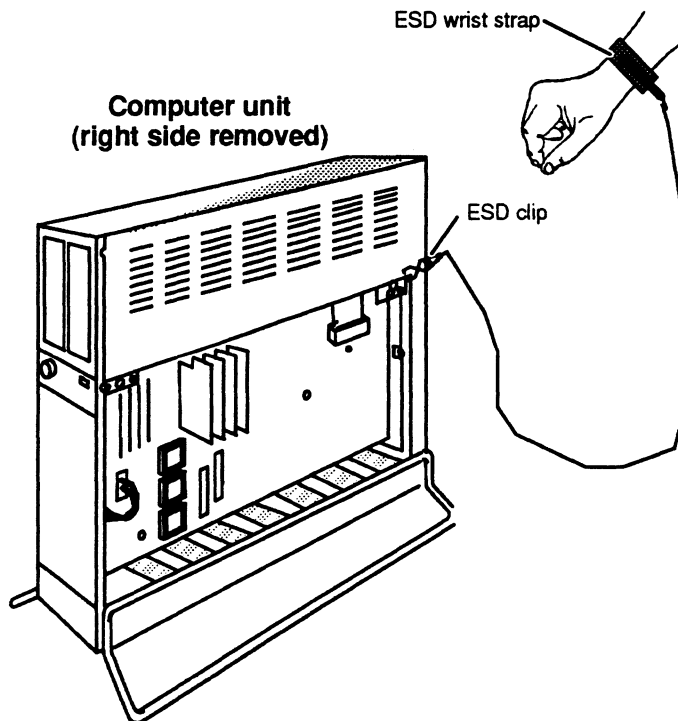


Figure 1-9 Attaching the ESD Wrist Strap and Clip

Removing the Top Cover

To remove the top cover, follow the steps below. You will need a coin or a screwdriver.

WARNING: To avoid electrical shock or equipment damage, always power down the computer unit and unplug the power cord from the ac power outlet and from the receptacle on the back of the computer unit *before* removing the covers from the computer unit.

1. Using a coin or screwdriver, loosen the fastener by turning it one-quarter turn counterclockwise as shown in Figure 1-10.
2. Push the top cover toward the back of the computer unit and remove the cover as shown in Figure 1-10.

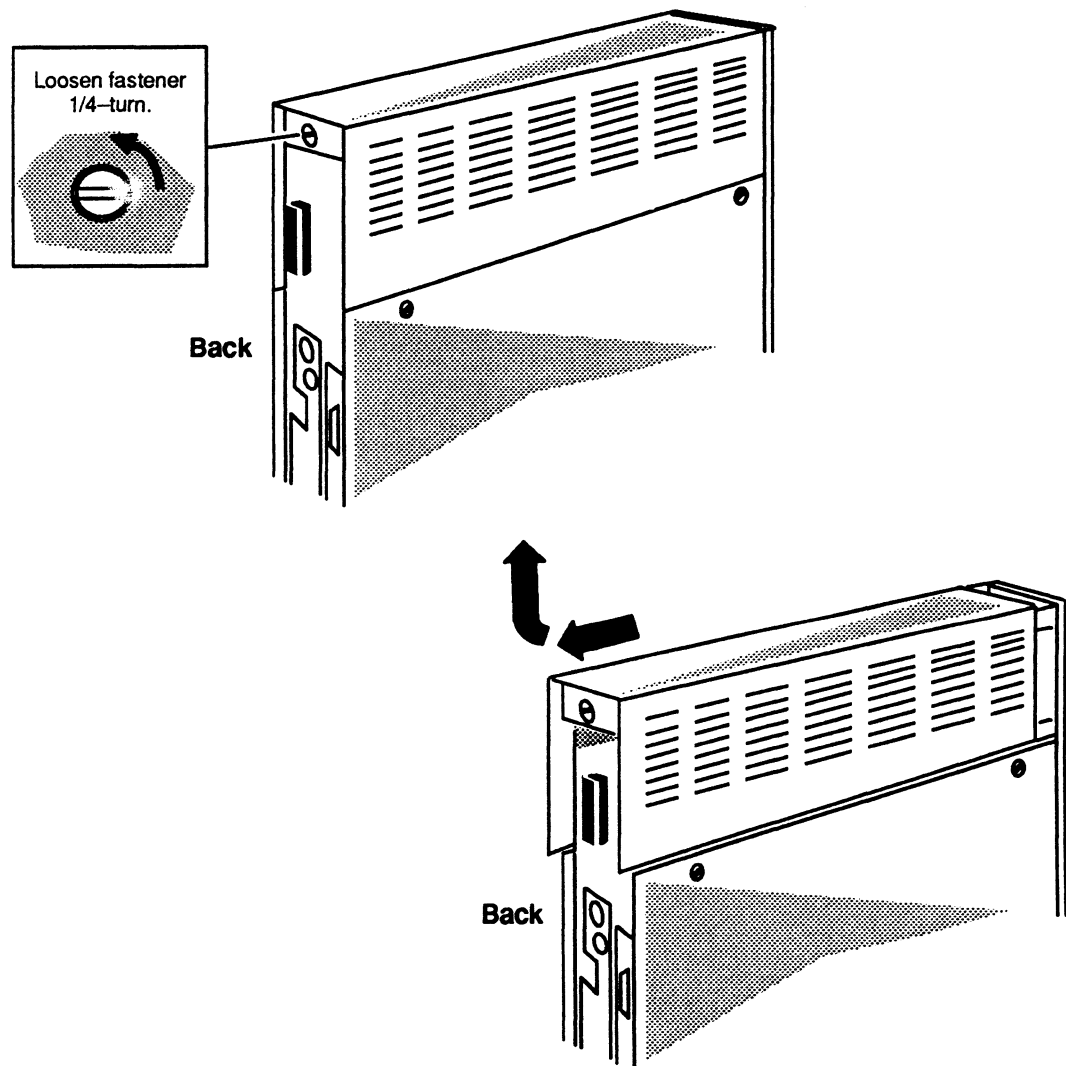


Figure 1-10 Removing the Top Cover

Closing the Computer Unit

This section tells how to reinstall the computer unit's top and side covers. You must install the top cover before you install the side covers.

Installing the Top Cover

To reinstall the top cover, follow the steps below. You will need a coin or a large flat-blade screwdriver.

1. Remove the ESD clip from the computer unit and take off the ESD wrist strap. Store the wrist strap in a safe place for future use.
2. Place the top cover on top of the computer unit.
3. Push the top cover toward the front of the computer unit, as shown in Figure 1-11, until the front edge of the top cover is flush with the front edge of computer unit.
4. Using a coin or screwdriver, tighten the fastener by turning it one-quarter turn clockwise as shown in Figure 1-11.

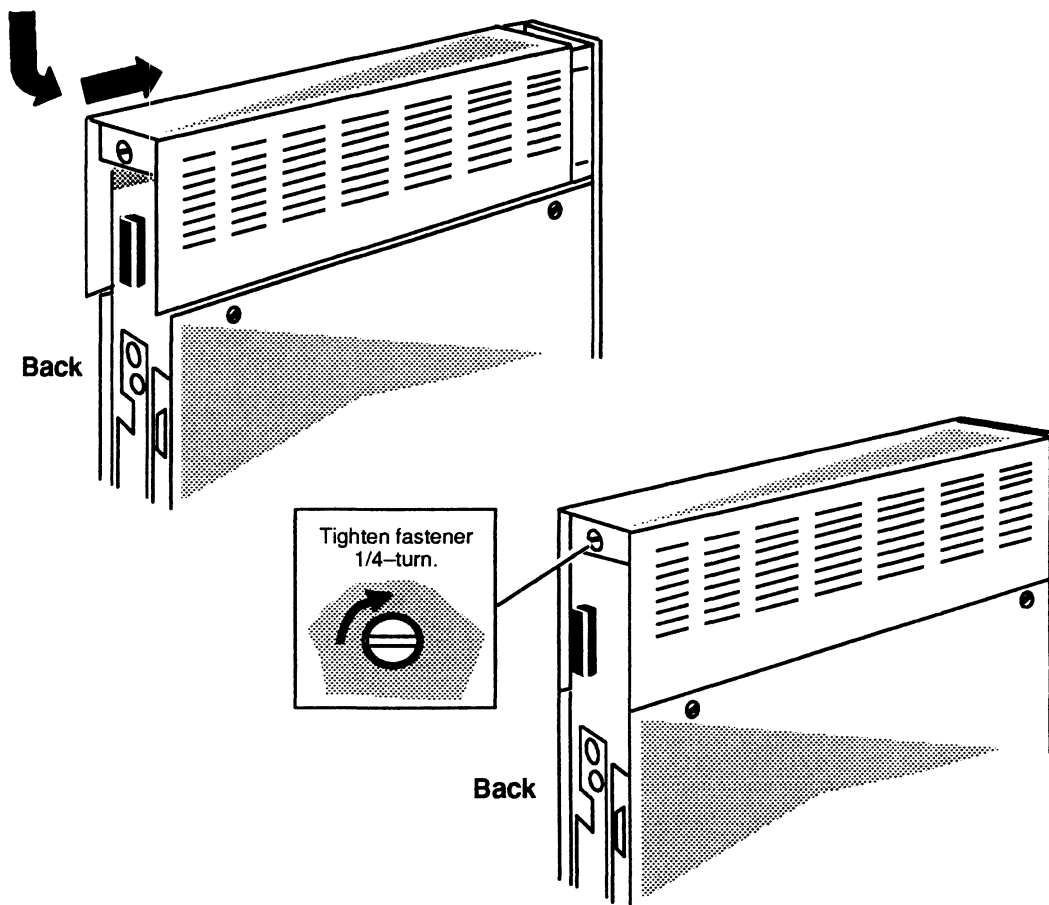


Figure 1-11 Installing the Top Cover

Installing the Side Covers

After installing the top cover, follow the steps below to reinstall the one or both side covers. You will need a coin or a large flat-blade screwdriver.

1. If you have not done so already, remove the ESD clip from the computer unit and take off the ESD wrist strap. Store the wrist strap in a safe place for future use.
2. Insert the three tabs on the cover's bottom edge into the slots at the base of the computer unit as shown in Figure 1-12.

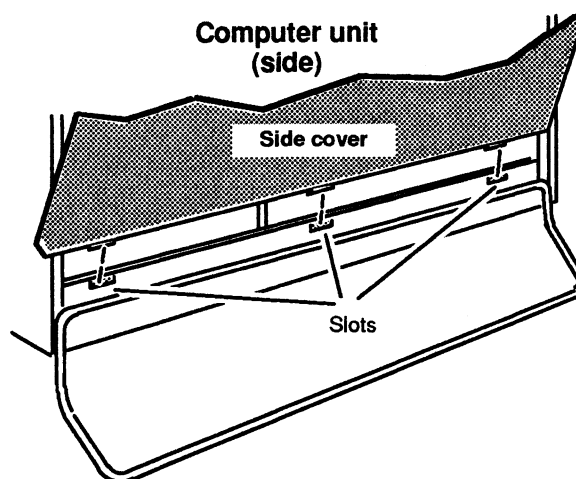


Figure 1-12 Inserting the Cover Tabs into the Computer Unit Slots

3. Rotate the cover as shown in Figure 1-13 so that it is against the side of the computer unit.

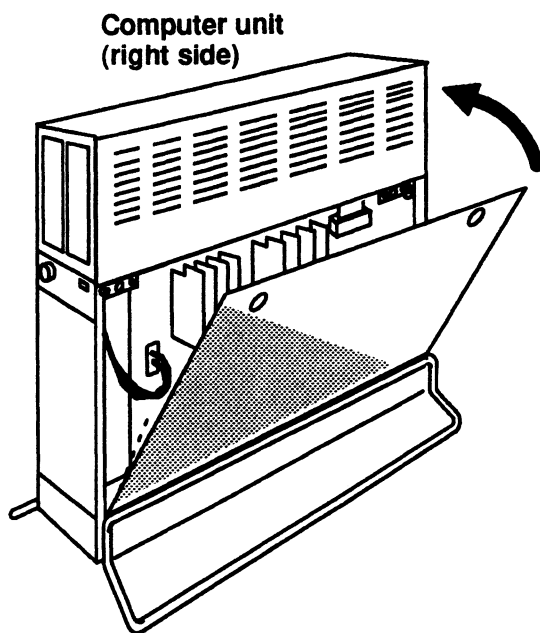


Figure 1-13 Installing the Side Covers

4. Using a coin or screwdriver, turn the two fasteners one-quarter turn clockwise as shown in Figure 1-14 to lock the cover in place.

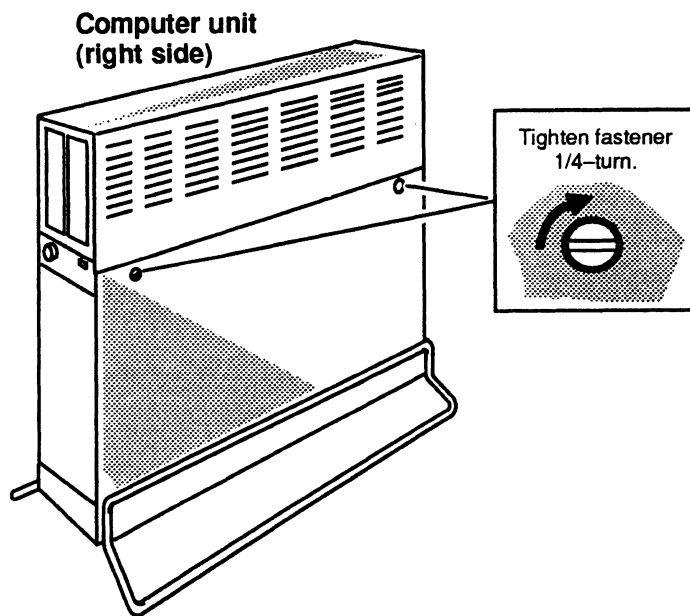


Figure 1-14 Tightening the Side Cover Fasteners

5. If you moved the computer, return it to its original position being careful not to strain the cables or jar the computer.
6. Plug the power cord into the receptacle on the back of the computer unit as shown in Figure 1–15.

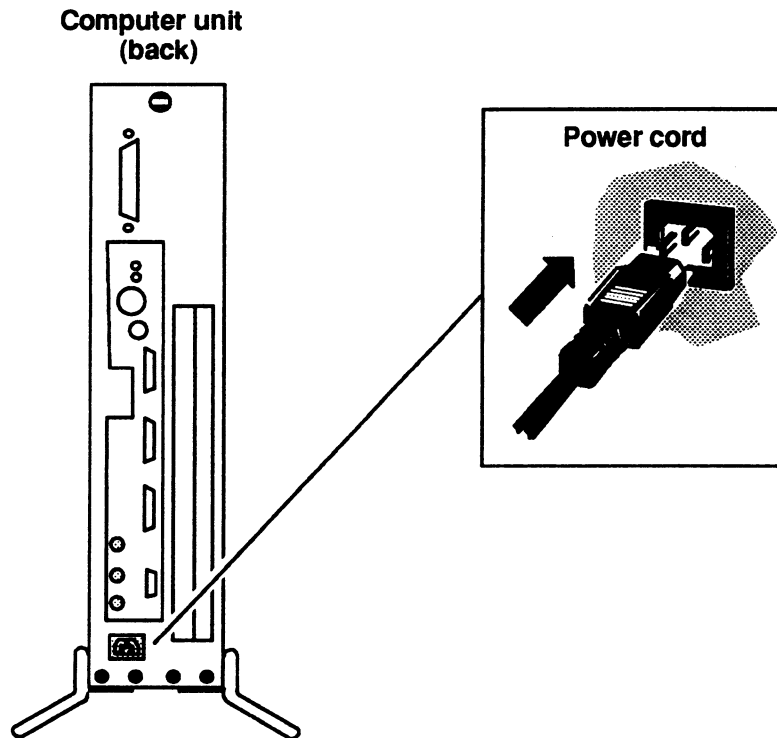


Figure 1–15 Connecting the Computer Unit's Power Cord

7. Plug the other end of the power cord into the installation site's ac power outlet.

End of Chapter

Chapter 2

Adding or Replacing Mass–Storage Devices

This chapter explains the rules for configuring the Small Computer Systems Interface (SCSI) bus that supports the mass–storage devices in your computer system. It also tells how to add a new drive option (disk drive, tape drive, diskette drive with its SCSI adapter board, or CD ROM), and how to replace a failed internal drive, SCSI adapter board, or SCSI terminator plug.

SCSI Bus Configuration Rules

To determine where to add a device to a SCSI bus, you must first know how the SCSI bus in your computer system is configured. The SCSI bus configuration depends on the following:

- SCSI bus cabling rules
- SCSI bus device identification rules

The rest of this section describes the SCSI bus that your computer system supports, the location of SCSI devices within the computer unit, and the SCSI bus devices identification and cabling rules.

AViiON 3000 Series SCSI Bus

An AViiON 3000 series computer has one SCSI bus that supports a maximum of four devices. All four of these devices must be internal mass–storage devices, that is devices that mount in the computer unit. Each individual drive counts toward the four device maximum unless it is connected to a SCSI adapter board as are the diskette drives. In this case, only the SCSI adapter board, and not the drives, counts as a SCSI device. Internal SCSI devices are connected to the SCSI bus by a SCSI bus cable that plugs into the system board's SCSI bus connector and goes from one device to the next in a *daisy chain* fashion.

Only two of the internal drives can be removable media (tape, diskette, or CD ROM) drives. Three of the internal drives can be disk drives.

Table 2–1 lists the mass–storage devices the SCSI bus supports, and Figure 2–1 shows a sample configuration of internal mass–storage devices.

AViiON 4000 Series SCSI Bus

An AViiON 4000 series computer has one SCSI bus that supports a maximum of seven SCSI devices. Four of these seven devices can be internal drives, and the rest of the devices must be in external mass-storage subsystems. Each individual drive counts toward the seven device maximum unless it is connected to a SCSI adapter board as are the diskette drives. In this case, only the SCSI adapter board, and not the drives, counts as a SCSI device. Only two of the internal drives can be removable media (tape, diskette, or CD ROM) drives. All four internal drives can be disk drives.

Internal SCSI devices are connected to the SCSI bus by a SCSI bus cable that plugs into the system board's SCSI bus connector, goes from one device to the next in a *daisy chain* fashion, and ends with the external SCSI bus connector on the back of the computer unit. If the computer system has no external mass-storage subsystems, a terminator plug is plugged into this external connector to terminate the SCSI bus. If the computer system has external mass-storage subsystems, this terminator plug is removed, and an external SCSI bus cable from the first external subsystem is plugged into the external SCSI bus connector. One external subsystem is connected to the next by an external SCSI bus cable. SCSI devices within an external mass-storage subsystem are connected together by an internal SCSI bus cable in a daisy-chain fashion. As a result, all the devices, both internal and external, are connected to the one SCSI bus in a daisy-chain fashion.

Table 2-1 lists the mass-storage devices the SCSI bus supports, and Figure 2-1 shows a sample configuration of internal and external mass-storage devices.

Table 2-1 Mass-Storage Drives

Drives	Size
Disks	
332-Mbyte Winchester	Half-height
662-Mbyte Winchester	Full-height
179-Mbyte Winchester	Half-height
Removable Media	
2-Gbyte tape	Full-height
150-Mbyte QIC tape	Half-height
1.44-Mbyte diskette	Half-height
1.2-Mbyte diskette	Half-height
CD ROM	Half-height

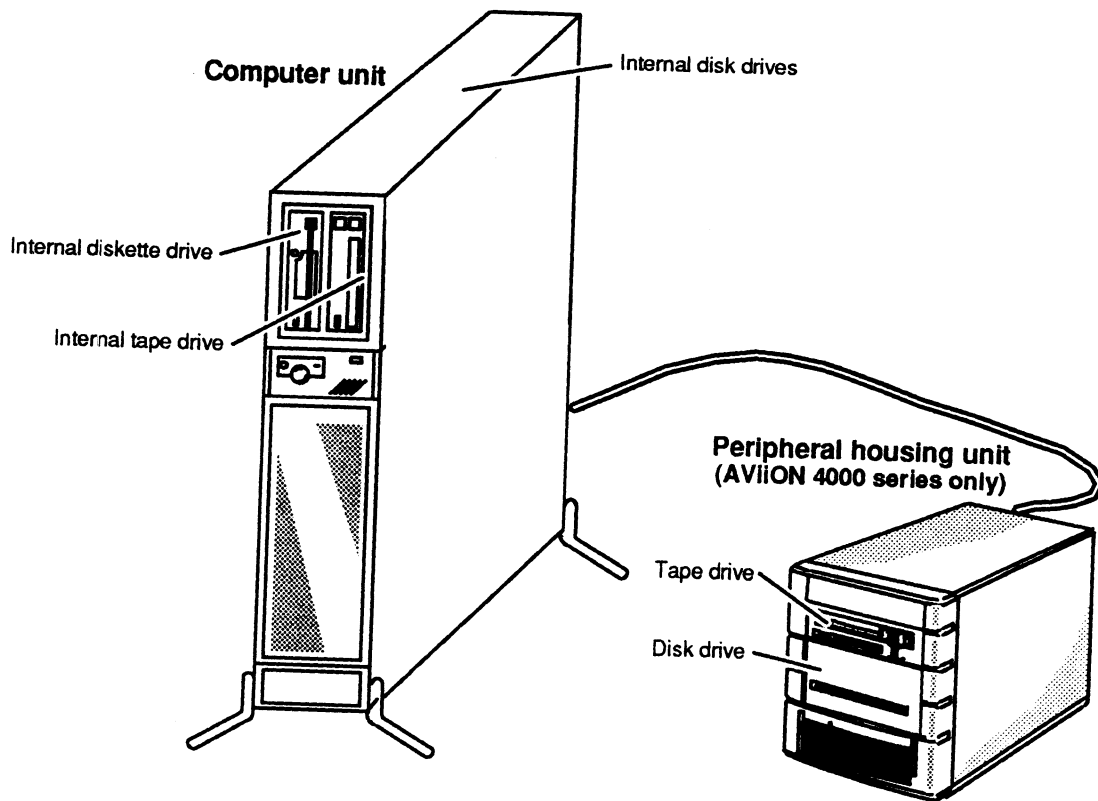


Figure 2-1 Sample Internal and External Mass-Storage Devices

Internal Drive Locations

Your computer unit has the two slots for internal SCSI drives as shown in Figure 2-2. Each slot can hold one drive assembly that contains either one full-height drive or two half-height drives.

NOTE: Drives are mounted vertically in the computer unit. A full-height drive mounted vertically is 3.25 inches wide, and a half-height drive mounted vertically is 1.75 inches wide.

**Computer unit
(view from top looking down)**

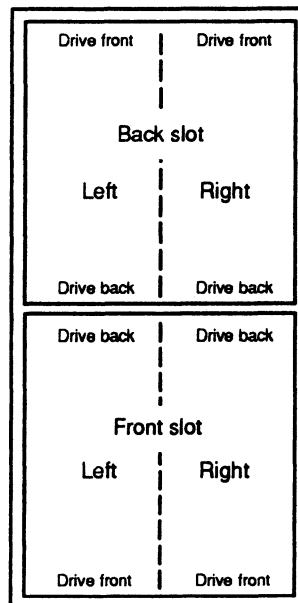


Figure 2-2 Internal Drive Slots

SCSI Bus Cabling Rules (AViiON 4000 series only)

The cabling for a SCSI bus begins inside the computer unit at system board's SCSI bus and connects the mass-storage devices on the bus in a daisy chain. The maximum length of combined internal and external SCSI bus cabling cannot exceed 19.6 feet (5.97 meters). Since the computer unit's internal SCSI bus cable is 4.5 feet (1.37 meters) long, the maximum cable length for the combined external mass-storage subsystems is 15.1 feet (4.60 meters). The external mass-storage subsystems have internal SCSI cabling, which further reduces the length of cable available for connecting external mass-storage subsystems. The Peripheral Housing Unit (PHU) uses 2.25 feet (0.69 meters) of internal SCSI cable. The G6587 reel tape drive uses 0.5 feet (0.15 meters) of internal SCSI cable, and the G6589-A and G6589-TA real tape drives each use 0.34 feet (0.10 meters) of internal SCSI cable.

SCSI Device Identification Rules

Each drive or SCSI adapter board in the computer unit or peripheral housing unit requires a unique identification number called a SCSI device ID number (also referred to as a *SCSI ID* or *Device ID* or *DID*) with a value from 0 through 6. Before you receive your computer unit, the SCSI IDs for your internal drives are preset to the correct values with jumpers/switches on the drives. You may need to reset the jumpers/switches to the SCSI IDs for any drives in external mass-storage subsystems and for any internal drive that you add after you receive the computer unit. Table 2-2 lists the recommended SCSI IDs for internal and external drives, and Figure 2-3 shows SCSI ID assignments for a sample SCSI bus configuration.

NOTE: The CD ROM drive can have any SCSI ID except 0, 3, or 4.

Table 2-2 Recommended SCSI Device Identification Numbers

Drives ¹	ID Number
Disk Drives	
First drive	0
Second drive	1
Third drive	2
Diskette Drives	
Adapter board	3
Tape Drives	
First drive	4
Second drive	5
Third drive	6

¹ A CD ROM drive can have any SCSI ID except 0, 3, or 4.

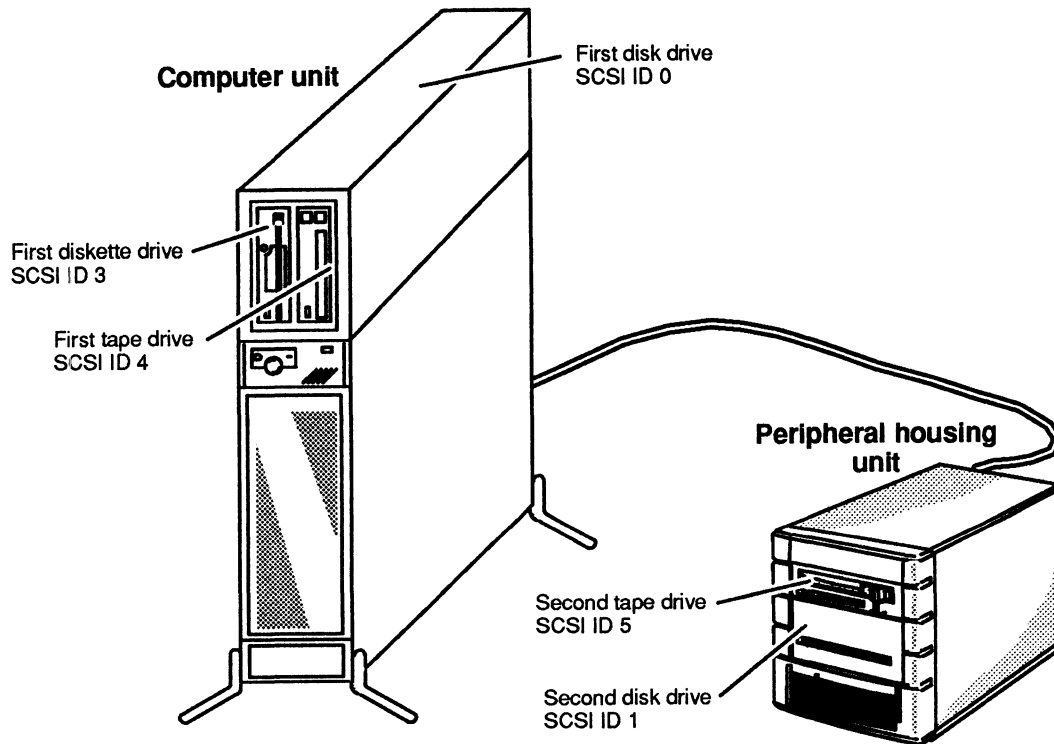


Figure 2-3 Example of Recommended SCSI ID Settings

Removing and Installing a Drive

This section tells how to add a new internal drive option or replace a failed internal drive.

To add a new internal drive option, you need to perform the following tasks:

1. Identify where to install the drive.
2. If you are adding the drive to an existing drive assembly (drive and two brackets), remove the drive assembly from the computer unit.
3. Attach the brackets to the new drive.
4. Reinstall the drive assembly in the computer unit.

To replace a failed internal drive, you need to perform the following tasks:

1. Remove the drive assembly containing the failed drive from the computer unit.
2. Remove the brackets from the failed drive.
3. Attach the brackets to the replacement drive.
4. Reinstall the drive assembly in the computer unit.

The rest of this sections tells how to perform these tasks. If you are adding a new drive option, start with the “Identifying Where to Install a Drive” section. If you are replacing a failed drive, start with the “Removing a Drive Assembly” section.

Identifying Where to Install a Drive

Before you can add a new drive option, you must first determine how the SCSI bus in your computer is configured and where to install the drive. Follow the steps in this section to perform these tasks. These steps require that you fill out one of the SCSI Bus Configuration Worksheets in Figure 2-4.

If you know the type of drive (disk, tape, diskette, or CD ROM) and the SCSI ID number of drive (or SCSI adapter board for diskette drives), then record this information on the SCSI Bus Configuration Worksheet and go to Step 6; otherwise, start with Step 1.

1. Remove the computer unit’s top and side covers and attach the ESD wrist strap as described in the “Opening the Computer Unit” section of Chapter 1.

CAUTION: *Unless you are properly grounded, you can discharge static electricity and damage components in the system.*

AViiON 3000 Series SCSI Bus Configuration Worksheet

Internal Drives		
Slot	Drive Type	SCSI ID
Front <input type="checkbox"/> half-height left <input type="checkbox"/> half-height right		
Back <input type="checkbox"/> half-height left <input type="checkbox"/> half-height right <input type="checkbox"/> full-height		

AViiON 4000 Series SCSI Bus Configuration Worksheet

Internal Drives				
Slot	Drive Type	SCSI ID	Cable Length	
Front <input type="checkbox"/> half-height left <input type="checkbox"/> half-height right			} 4.5 feet	
Back <input type="checkbox"/> half-height left <input type="checkbox"/> half-height right <input type="checkbox"/> full-height				
SCSI Adapter Board				
External Mass-Storage Devices				
Device	Drive Type	SCSI ID	}	
			}	
Total Cable Length (19.6 feet maximum)				

Figure 2-4 SCSI Bus Configuration Worksheets

2. Look at the internal drive slots and determine which ones contain drives. For each drive, determine the type of drive (disk, tape, diskette, or CD ROM) and its SCSI ID number (or for diskette drives, the SCSI ID of the SCSI adapter board) and record it on the SCSI Bus Configuration Worksheet. Figure 2–2, earlier in this chapter, shows the internal drive slots.

To determine the drive's SCSI ID first check the back of the computer unit for a label that lists the SCSI IDs of the drive(s) it contains. If no such label exists, you will have to look at the SCSI ID jumpers/switches in the drives. For information on how to access the SCSI jumpers/switches, refer to the manual on installing the drive listed in the Preface.

3. Assign the new internal drive to a slot on the SCSI bus using the guidelines below, and record the slot position and its SCSI ID on the label attached to the back of the computer unit and the SCSI Bus Configuration Worksheet. Figure 2–2 shows the slot locations.

Either drive slot can hold one drive assembly containing either one full-height drive or one or two half-height drives.

- If you are adding a removable media drive you must assign it to an available space in the front slot.
 - If you are adding a disk drive, assign it to the an available space in the back slot. If there is no available space in the front slot, then assign it to a space in the back slot.
4. Set the SCSI ID jumpers/switches on the new drive or SCSI adapter board to the SCSI ID number you just assigned it, and remove the SCSI bus terminator resistors from the SCSI adapter board if installed. For information on how to access the SCSI jumpers/switches, refer to the manual on installing the drive listed in the Preface.
 5. Configure the new drive as follows:
 - On the disks, set the spindle control option jumper(s)/switch(es) for sequential drive motor start so the drive will delay starting up its spindle motor a number of seconds (a multiple of the SCSI ID number).
 - On all drives, set the terminator power option jumper(s)/switch(es) so the SCSI bus (host system) provides terminator power rather than the drive itself.
 - Set the jumper(s)/switch(es) to *enable* parity checking and arbitration if the drive offers these options.
 - Make sure the bus termination is correct on the new drive. In an AViiON 4000 series computer, *all the internal drives* must have their SCSI bus terminator resistors removed. In an AViiON 3000 series computer, the *first internal* 150-megabyte cartridge tape drive must have its SCSI bus terminator resistors installed, and all other internal drives must have their terminator resistors removed. If the computer unit does not contain a 150-megabyte cartridge tape drive, then *one and only one of the internal drives* must have its SCSI bus terminator resistors installed. For information on how to access the SCSI jumpers/switches and the terminator resistors, refer to the manual on installing the drive listed in the Preface.

If your computer is an AViiON 4000 series computer with any external mass-storage device (peripheral housing units or tabletop tape drives), continue to Step 6. If you are adding the new drive to an *existing* drive assembly, go to the “Removing a Drive Assembly” section. If the new drive comprises a *new* drive assembly, go to the “Attaching Brackets to a Drive” section.

6. If your computer system has any external mass-storage devices, then for each drive in each external device, determine the type of drive (disk, tape, diskette, or CD ROM) and its SCSI ID number (or for diskette drives, the SCSI ID number of the SCSI adapter board), and record this information on the SCSI Bus Configuration Worksheet.

To determine the drive’s SCSI ID first check the back of the external device for a label that lists the SCSI IDs of the drive(s) it contains. If no such label exists, you will have to open the housing and look at the SCSI ID jumpers/switches on the drive(s). For information on how to access and set the jumpers/switches, refer to the manuals for installing the external device and the drive.

7. Check the SCSI Bus Configuration Worksheet to see if any drive or SCSI adapter board in any external device has the same SCSI ID as the internal drive or SCSI adapter board you are adding. If any external drive or SCSI adapter board has the same SCSI ID as an internal drive or SCSI adapter board, you must assign another SCSI ID to that external drive or SCSI adapter board.
8. If any drive and/or SCSI adapter board in any external device is not set to the assigned SCSI ID number, set the SCSI ID jumpers/switches appropriately. For information on the jumpers/switches, refer to the manual on installing the drive or subsystem.

If the you are adding the new drive to an *existing* drive assembly, go to the “Removing a Drive Assembly” section. If the new drive you are adding comprises a *new* drive assembly, go to the “Attaching Brackets to a Drive” section.

Removing a Drive Assembly

Before you can remove a drive assembly, you should remove the computer unit’s top and side covers and attach the ESD wrist strap as described in the “Opening the Computer Unit” section of Chapter 1.

CAUTION: *Unless you are properly grounded, you can discharge static electricity and damage components in the system.*

To remove the drive assembly from the computer unit, follow the steps below. A drive assembly consists of two drive brackets and one or two drives. You will need a medium (#2) Phillips screwdriver.

1. Unplug the power and SCSI bus cables from the drive. If the drive assembly contains two half-height drives, unplug the cables from each drive. For more information on cable connections, refer to the manual for installing the drive listed in the Preface.

If you are removing a diskette drive, unplug the I/O bus cable from the diskette drive you are removing as shown in Figure 2-5.

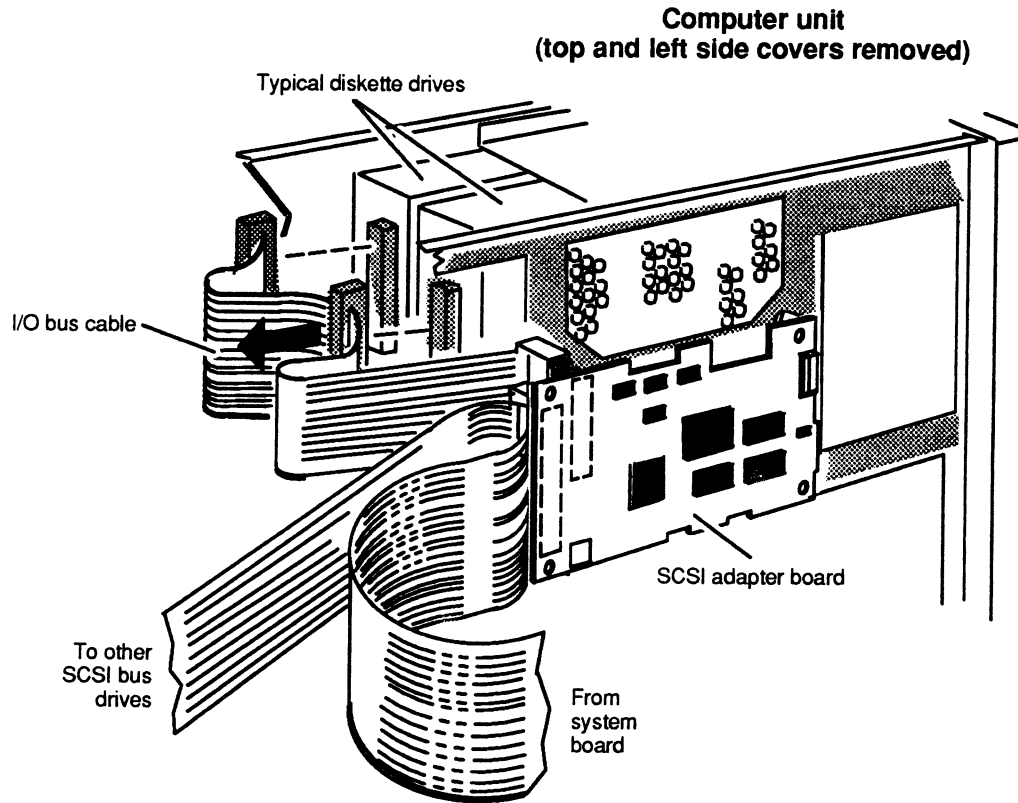


Figure 2-5 Unplugging the I/O Bus Cable from a Diskette Drive

Next unplug the power adapter cable from the diskette drive you are removing as shown in Figure 2-6.

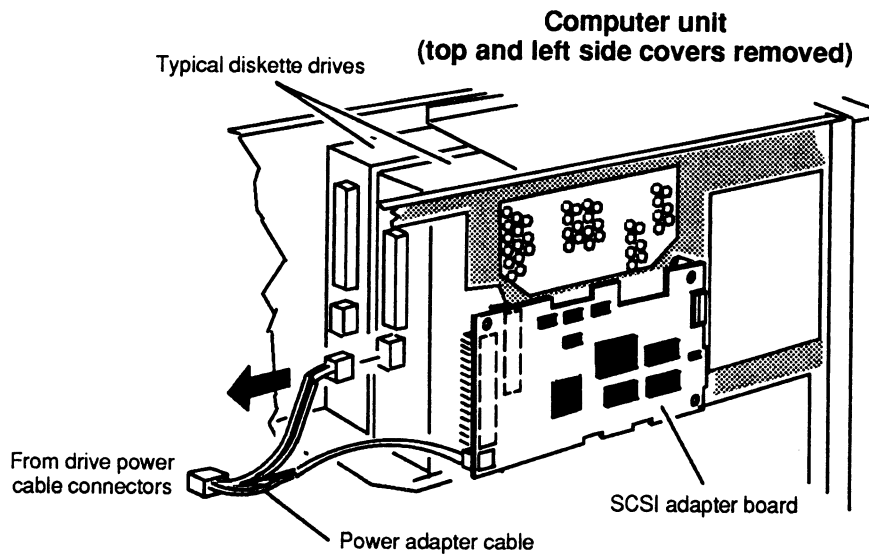


Figure 2-6 Unplugging the Power Adapter Cable from a Diskette Drive

2. Remove the eight screws and washers securing the drive assembly to the computer unit as shown in Figure 2-7.

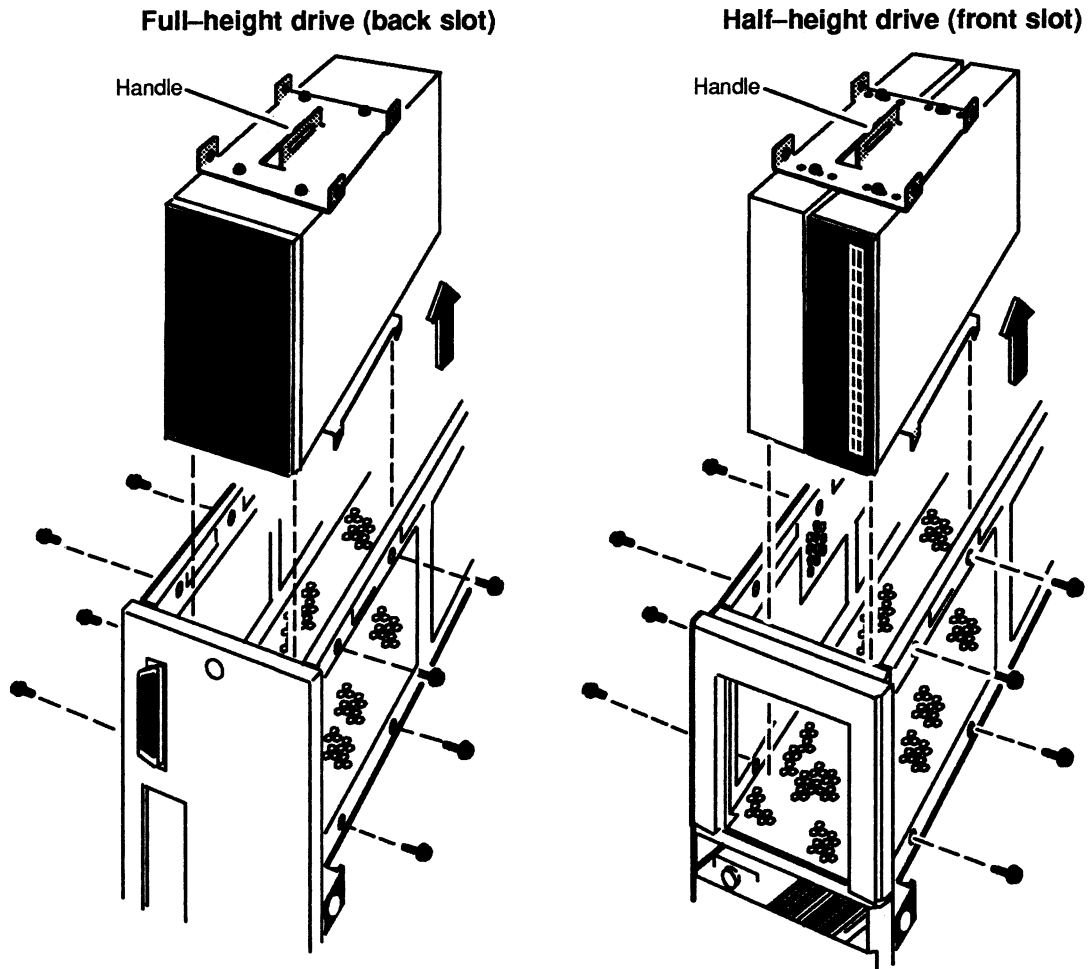


Figure 2-7 Removing a Drive Assembly from the Computer Unit

3. Use the handle on the drive assembly to lift the drive assembly out of the computer unit. If you are removing a drive assembly from the front slot, slide the assembly toward the center of the computer unit first; then lift it out of the computer unit.

If you are removing a drive from the drive assembly, go to the next section, “Removing Brackets from Drives.” If you are adding a drive to the drive assembly, go to the “Attaching Brackets to Drives” section.

Removing Brackets from a Drive

To remove the brackets from the drive(s) you are replacing, follow the steps below. You will need a medium (#2) Phillips screwdriver.

1. Remove the eight screws and washers (four for each bracket) that secure the drive unit to the brackets. If you are only removing one half-height drive from the brackets, you only need to remove four screws and washers (two for each bracket). Figure 2-8 shows how to remove the brackets from full-height and half-height drives.

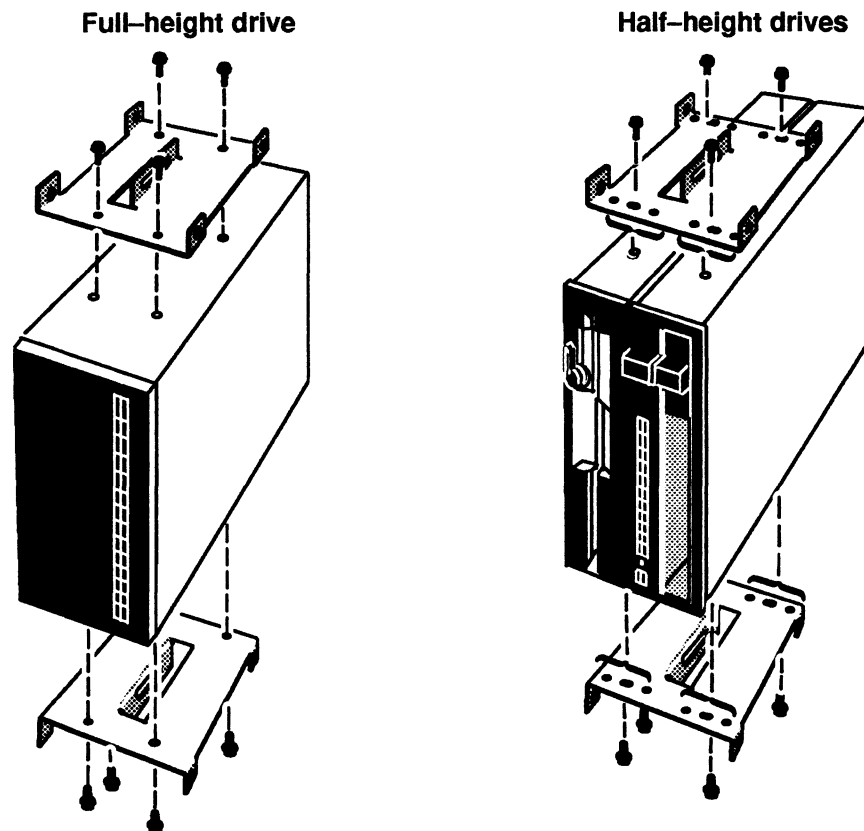


Figure 2-8 Removing Brackets from Drives

2. Grasping the drive(s) by its edges, gently place the drive(s) and brackets on a work surface.

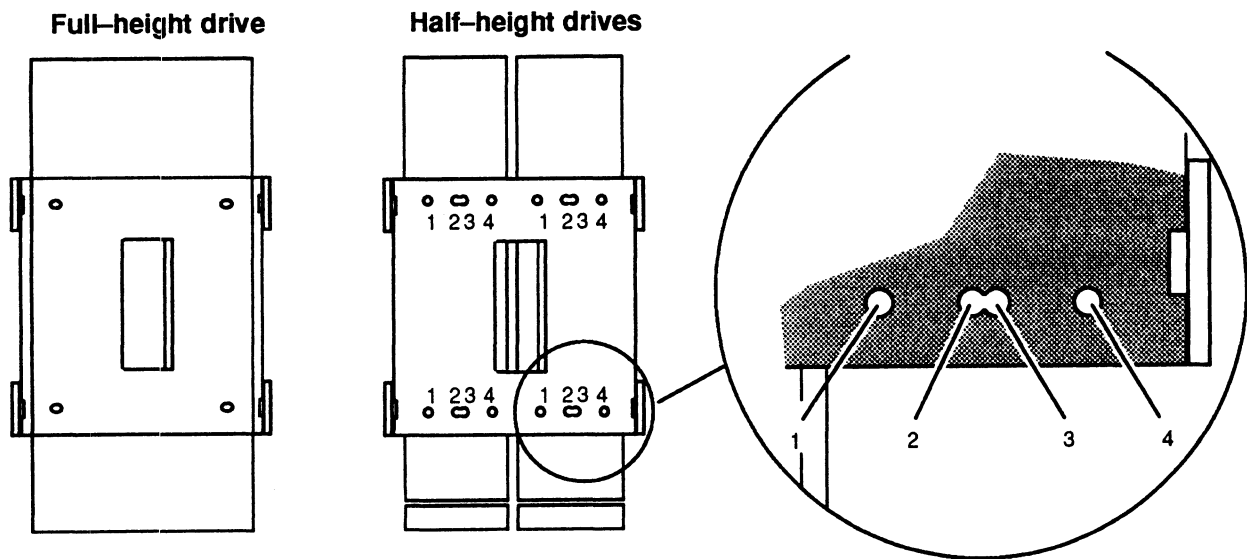
If you removed a failed drive, insert it in an antistatic bag and return it to Data General. For more information, refer to the “Returning Customer Replaceable Units (CRUs)” section of the Preface.

To install a replacement drive, go to the next section, “Attaching Brackets to a Drive.”

Attaching Brackets to a Drive

To attach the brackets to the new drive, follow the steps below. You will need a medium (#2) Phillips screwdriver.

1. Grasping the new drive by its edges, align the appropriate mounting holes in the bracket with the holes in the side of the drive. A half-height drive fills half of the bracket. Figure 2-9 shows the mounting holes for for each type of drive.



Half-Height Drives	Mounting Hole Numbers
179-Mbyte disk	3
332-Mbyte disk	2
600-Mbyte CD ROM	2
150-Mbyte QIC cartridge tape	1
1.2-Mbyte diskette	2
1.44-Mbyte diskette	4

Figure 2-9 Bracket Mounting Holes for Drives

2. Attach the two brackets to the new drive with the eight mounting screws and washers (four for each bracket) as shown in Figure 2-10. If you are only adding one half-height drive to the brackets, you only need to use four screws and washers (two for each bracket).

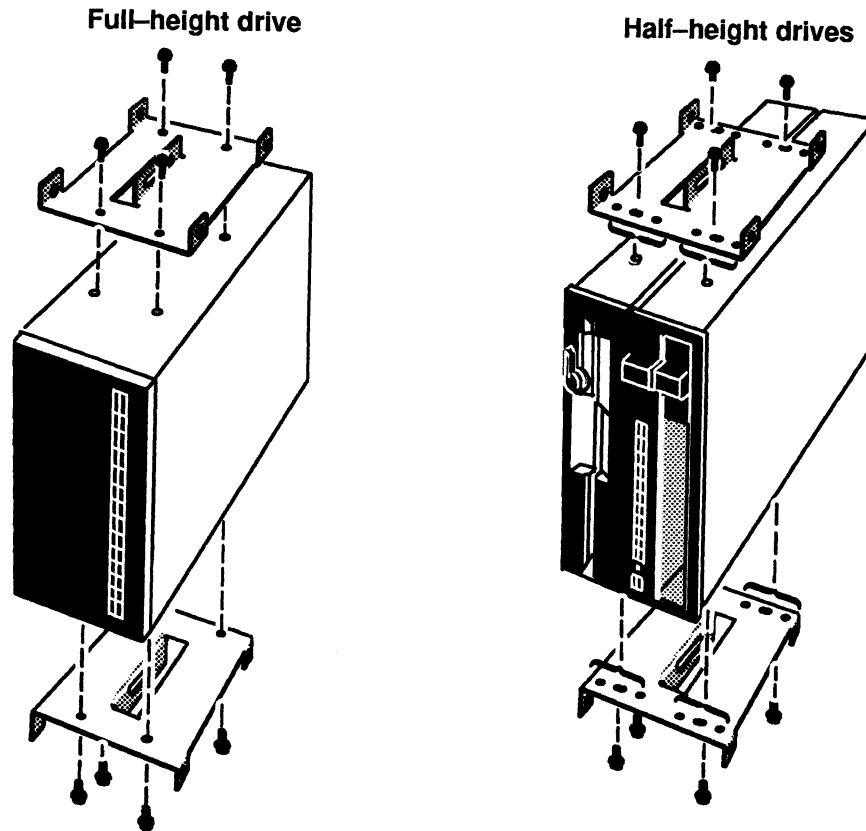


Figure 2-10 Attaching Brackets to Drives

Now go to the next section, “Installing a Drive Assembly” to complete the installation of the drive.

Installing a Drive Assembly

To complete the installation of the drive, follow the steps below. You will need a medium (#2) Phillips screwdriver, and in some cases, a small flat-blade screwdriver. If you are installing a removable media drive, start with Step 1; otherwise start with Step 2.

1. If you are installing a removable media drive, look at the computer unit's front panel. If a bezel covers the front of the slot where you are installing the drive, you must remove the bezel as described below. Figure 2-11 shows a bezel covering the right position of the front slot.

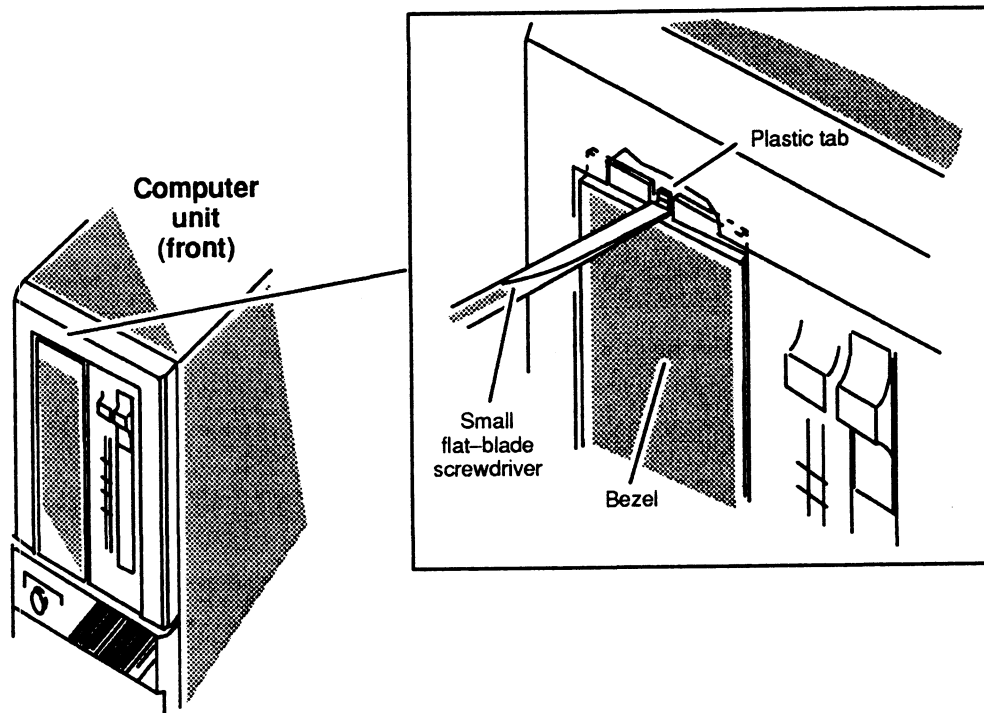


Figure 2-11 Removing or Replacing a Bezel

While supporting the bezel, insert the tip of a flat-blade screwdriver about an 1/8-inch into the recessed slot and gently twist the screwdriver to release the plastic tab on the top of the bezel from the front panel. The bezel will pop out.

2. Position the drive in the slot so that its back (connector end) faces toward the center of the computer unit. If you are installing a drive assembly in a front slot, slide the drive into the front panel opening.
3. Align the holes on the drive assembly's brackets with the holes in the computer unit frame, and attach the drive assembly to the computer unit with the eight screws and washers as shown in Figure 2-12.

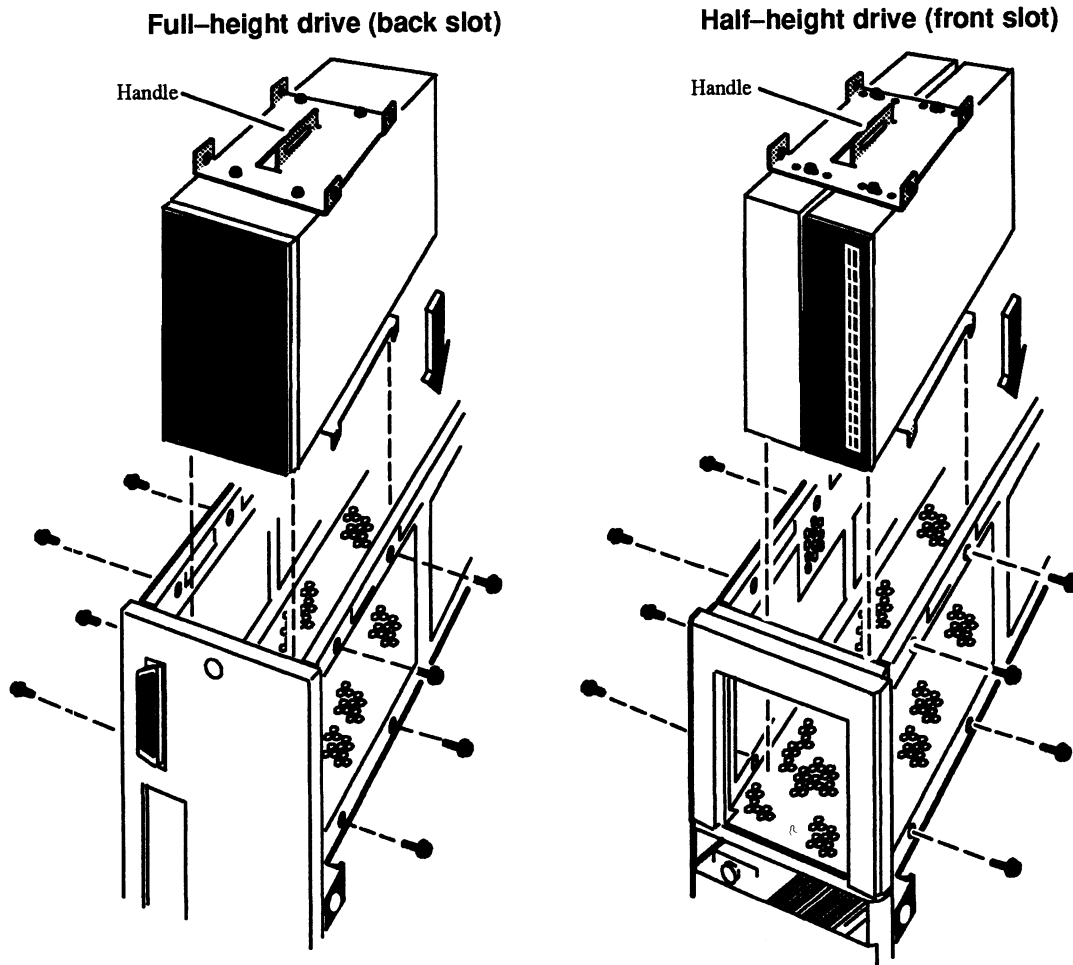


Figure 2-12 Installing a Drive Assembly in the Computer Unit

4. Plug the power cable and SCSI bus cable firmly into the power and SCSI bus connectors on each drive in the drive assembly. For information on the connector locations, refer to the manual for installing the drive.

NOTE: You can plug the cable in one way only: the connector on the power cable has beveled edges to match the power connector on the drive; the connector on the SCSI cable is keyed.

If you are installing a diskette drive, plug the power adapter cable into the diskette drive you are installing as shown in Figure 2-13.

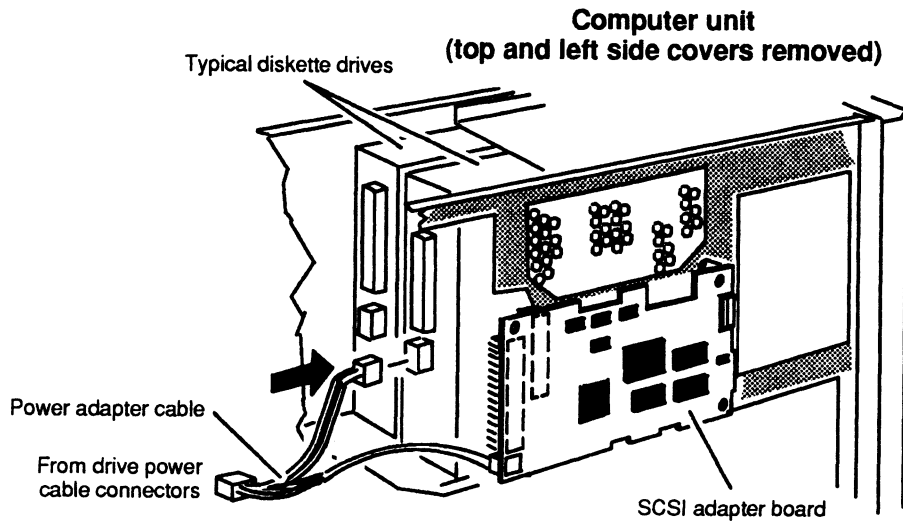


Figure 2-13 Plugging the Power Adapter Cable into a Diskette Drive

Next, plug the I/O bus cable into the diskette drive you are installing as shown in Figure 2-14. Be sure to plug in the cable so that the red line is on the bottom.

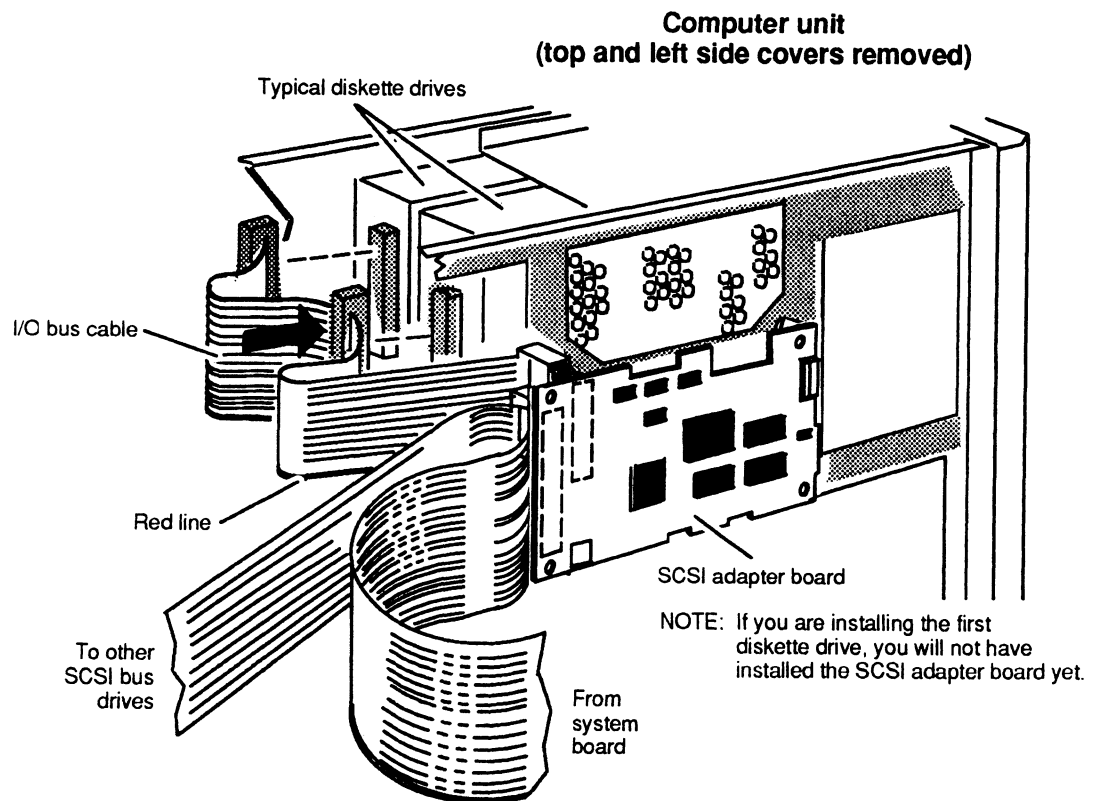


Figure 2-14 Plugging the I/O Bus Cable into a Diskette Drive

If you installed the *first* diskette, go to the “Removing and Installing the SCSI Adapter Board” section of this chapter to install the SCSI adapter board. If you are installing a drive other than the first diskette drive, you have now completed the procedure for installing a drive. If you are finished adding options or replacing CRUs, you should remove the ESD wrist strap, reinstall the top and side covers, and plug in the computer unit’s power cord as described in the “Closing the Computer Unit” section of Chapter 1.

After you have closed the computer unit, you should power up any peripheral housing units and other peripherals, and then the computer according to the instructions in the operating manuals for the computer system and the the operating system software. Then test your computer system by running the AViiON System Diagnostics as described in the *Using AViiON™ System Diagnostics* manual.

Adding or Replacing the SCSI Adapter Board

The diskette drive requires a SCSI adapter board. One SCSI adapter board supports two diskette drives.

NOTE: If you are adding a second diskette drive, it must have the same capacity as the first diskette drive.

If you are adding the SCSI adapter board, go to the section, “Installing the SCSI Adapter Board.” If you are replacing the SCSI adapter board, continue to the next section, “Removing the SCSI Adapter Board.”

Removing the SCSI Adapter Board

Before you can remove the SCSI adapter board, you should remove the computer unit’s top and side covers and attach the ESD wrist strap as described in the “Opening the Computer Unit” section of Chapter 1.

CAUTION: *Unless you are properly grounded, you can discharge static electricity and damage components in the system.*

To remove the SCSI adapter board from the computer unit, follow the steps below.

1. Unplug the SCSI bus and I/O bus cables from the SCSI adapter board as shown in Figure 2-15.

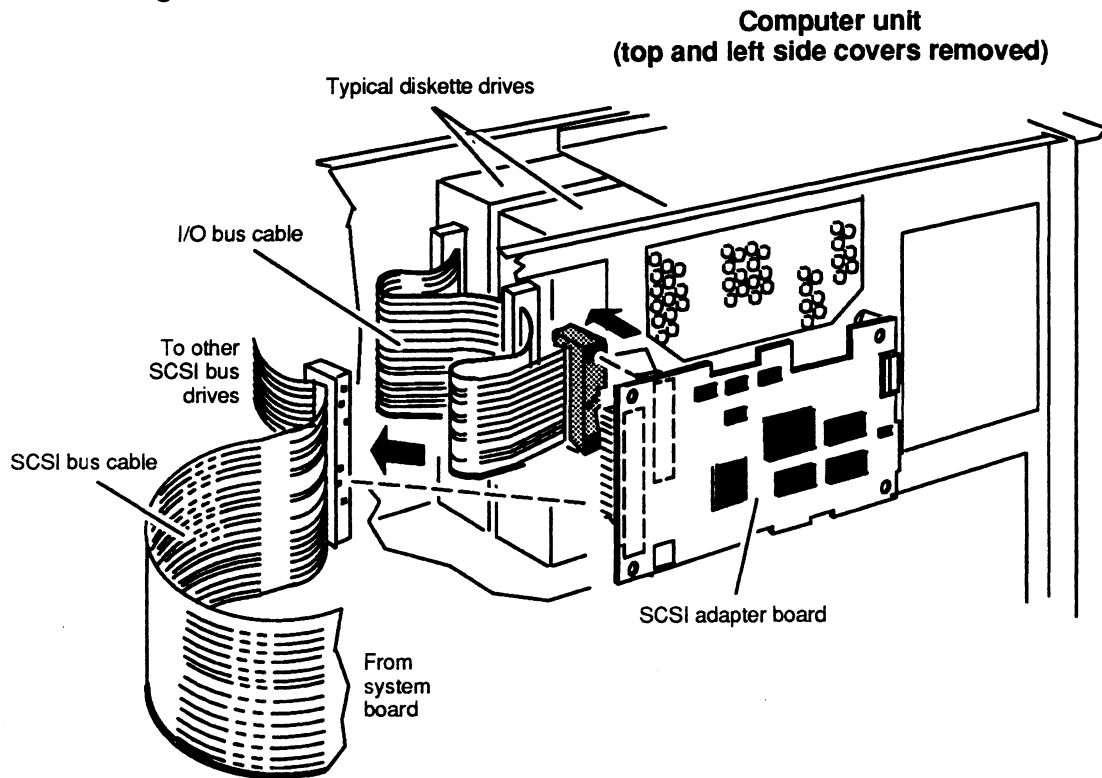


Figure 2-15 Unplugging the SCSI Bus and I/O Bus Cables from the SCSI Adapter Board

2. Unplug the power adapter cable from the SCSI adapter board as shown in Figure 2-16.

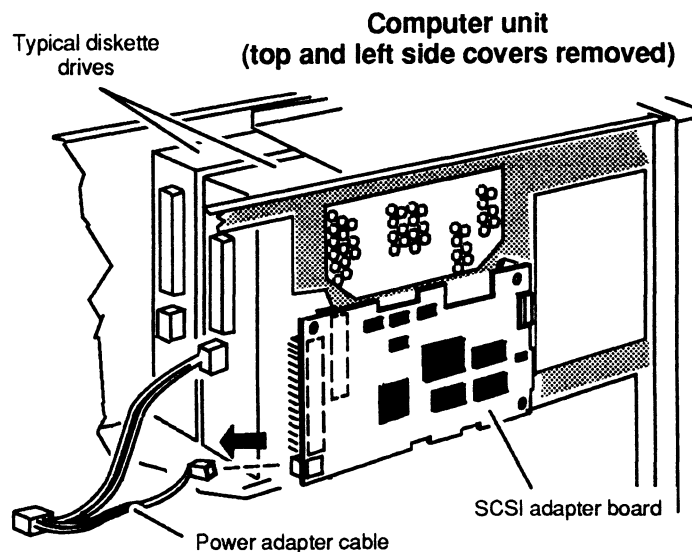


Figure 2-16 Unplugging the Power Adapter Cable from the SCSI Adapter Board

3. Remove the two screws securing the SCSI adapter board to the front of the left side of the computer unit as shown in Figure 2-17.

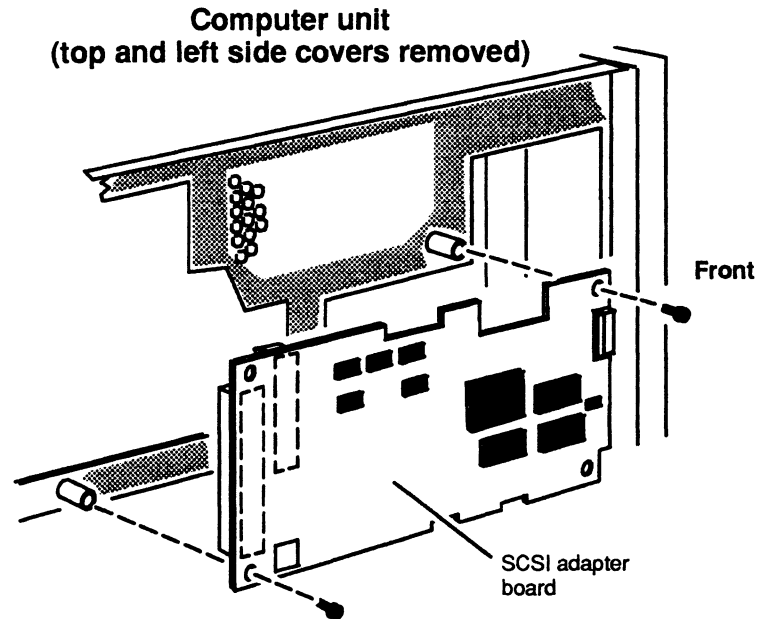


Figure 2-17 Removing or Installing the Screws that Attach the SCSI Adapter Board to the Computer Unit

If you removed a failed SCSI adapter board, insert it in an antistatic bag and return it to Data General. For more information, refer to the “Returning Customer Replaceable Units (CRUs)” section of the Preface.

Installing the SCSI Adapter Board

Before you can install a new SCSI adapter board, you should remove the computer unit’s top and side covers and attach the ESD wrist strap as described in the “Opening the Computer Unit” section of Chapter 1. You also need to prepare the SCSI adapter board as described in the manual *Installing the Models 6562 and 6563 Series Diskette Drives*.

CAUTION: *Unless you are properly grounded, you can discharge static electricity and damage components in the system.*

To install the SCSI adapter board in the computer unit, follow the steps below.

1. Attach the SCSI adapter board to the computer unit with the two screws as shown in Figure 2-17.

2. Plug the power adapter cable into the SCSI adapter board as shown in Figure 2-18.

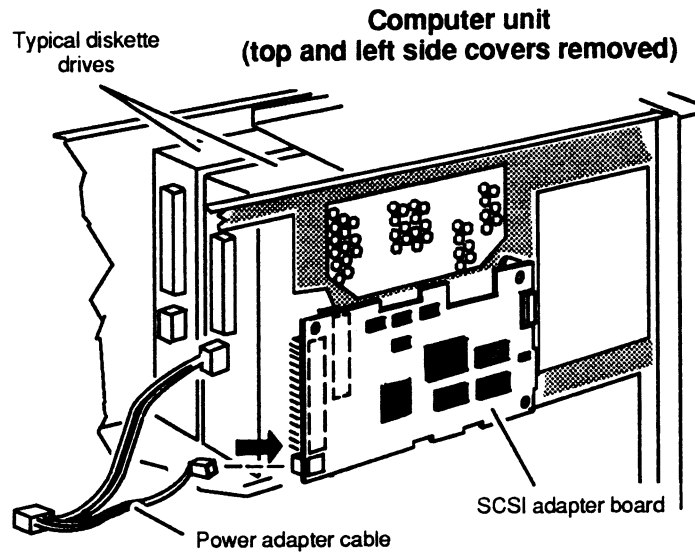


Figure 2-18 Plugging the Power Adapter Cable into the SCSI Adapter Board

3. Plug the the SCSI bus and the I/O bus cables into the SCSI adapter board as shown in Figure 2-19. Be sure to in plug each cable so that the red line is on the bottom.

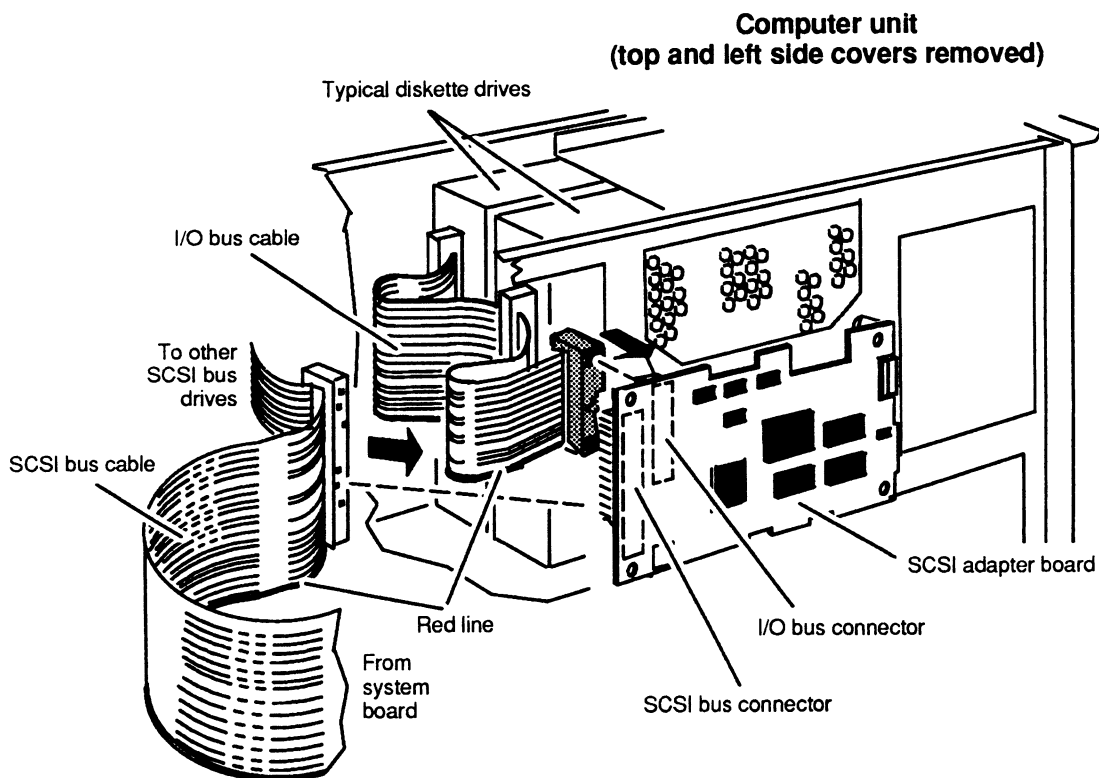


Figure 2-19 Plugging the SCSI Bus and I/O Bus Cables into the SCSI Adapter Board

You have now completed the procedure for installing the SCSI adapter board. If you are finished adding options or replacing CRUs, you should remove the ESD wrist strap, reinstall the top and side covers, and plug in the computer unit's power cord as described in the "Closing the Computer Unit" section of Chapter 1.

After you have closed the computer unit, you should power up any peripheral housing units and other peripherals, and then the computer according to the instructions in the operating manuals for the computer system and the the operating system software. Then test your computer system by running the AViiON System Diagnostics as described in the *Using AViiON™ System Diagnostics* manual.

Replacing the Terminator Plug

The computer uses a SCSI bus terminator plug that is already installed in the external SCSI connector on the rear panel. If you have an AViiON 4000 series computer with any peripheral housing units, the terminator plug is installed in either the top or bottom SCSI bus connector on the *last* peripheral housing on the SCSI bus.

To replace the terminator plug, follow the steps below.

1. If the computer and peripheral housing unit(s) are running, power them down. Refer to the operating manuals for the computer and the operating system software for the proper power-down procedure.
2. Release the spring clips on each side of the terminator plug as shown in Figure 2-20, and unplug the terminator plug from the SCSI bus connector.

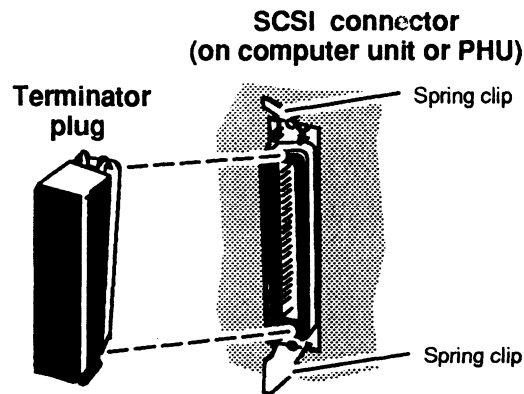


Figure 2-20 Unplugging and Plugging in the SCSI Bus Terminator Plug

3. Plug the new terminator plug into the same connector, and push the two spring clips down onto the new terminator plug to hold it in place.

End of Chapter

Chapter 3

Adding or Replacing Memory Modules

This chapter gives the rules for installing memory modules and tells how to add a new memory module or replace a failed memory module. You will need to remove memory modules to replace a failed memory module, to replace a failed system board, or to replace the PROM component.

An AViiON 3000 series computer system supports two to four 4-megabyte memory modules. An AViiON 4000 series computer system supports two to eight 4-megabyte memory modules. Each memory module mounts in a connector on the system board as shown in Figure 3-1.

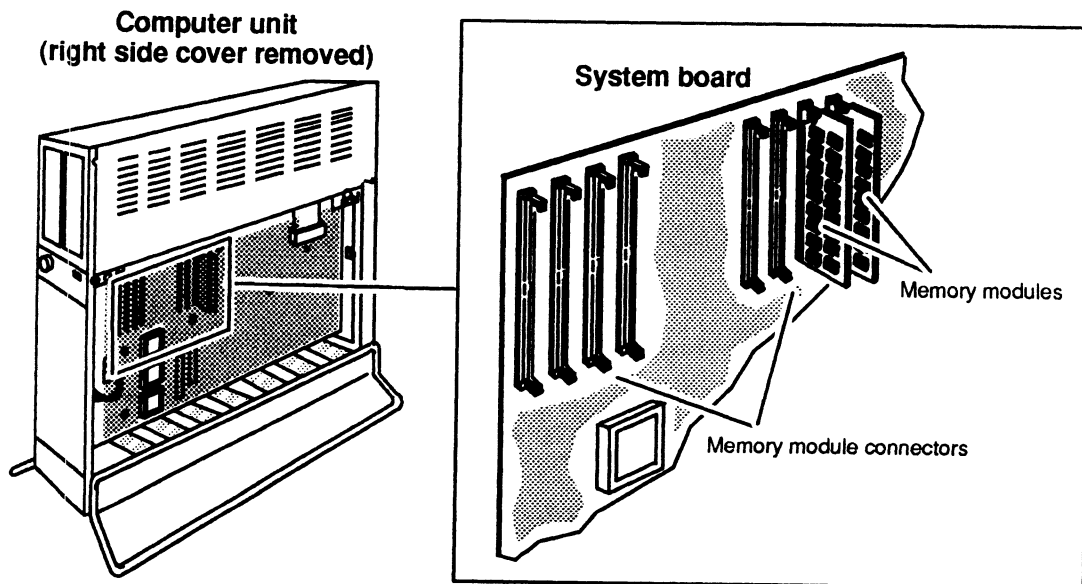


Figure 3-1 Location of Memory Modules and Connectors on the System Board

Rules for Installing Memory Modules

When you install memory modules, you must follow the rules below.

- You must install memory modules in *consecutive* memory module connectors, starting with the rightmost connector (connector number 1) and working towards the left. (Never leave a connector empty between memory modules.)
- If you are replacing a memory module, you must temporarily remove *all* the memory module(s) installed to the left of the one you are replacing, starting with the leftmost memory module and working toward the right. For example, if memory modules occupy connectors 1 through 6 and you are replacing the module in connector 3, then you must first remove the memory module in connector 6, then the memory module in connector 5, and then the memory module in connector 4, and finally the memory module in connector 3.

Figure 3–2 shows how the memory module connectors are numbered.

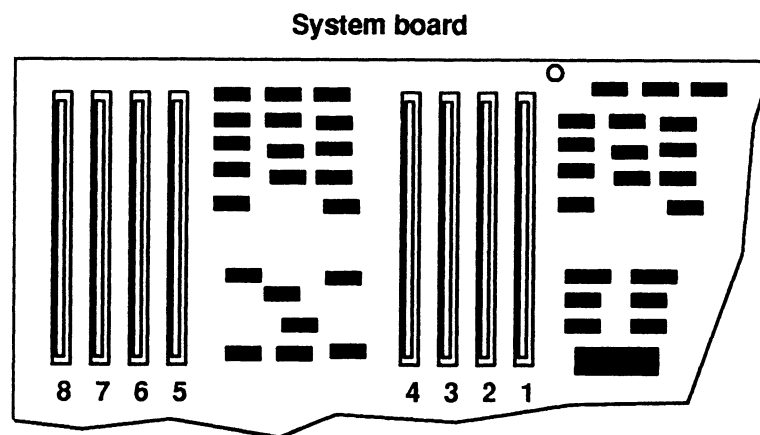


Figure 3–2 Numbering Scheme for Memory Module Connectors on the System Board

If you need to remove a memory module, go to the section “Removing Memory Modules.” If you are adding a memory module in an empty connector, go to the section “Installing Memory Modules.”

Removing Memory Modules

Before you can remove any memory modules, you must remove the computer unit's right side cover and attach the ESD wrist strap as described in the "Opening the Computer Unit" section of Chapter 1.

CAUTION: *Unless you are properly grounded, you can discharge static electricity and damage components in the system.*

To remove a memory module, follow the steps below.

NOTE: You must temporarily remove all memory module(s) installed to the left of the one you are replacing, starting with the leftmost memory module and working toward the right.

1. Using your finger, gently push the locking tab on the *bottom* of the connector *down* as shown in Figure 3-3. Then gently push the locking tab on the *top* of the connector *up* as shown in Figure 3-3. The memory module will spring up slightly, indicating that the module is released.

CAUTION: *When you push on the locking tabs, push gently, using only enough force to release the memory module. If you push too hard, you could break the locking tabs, making it difficult for you to reinstall a memory module securely in the connector.*

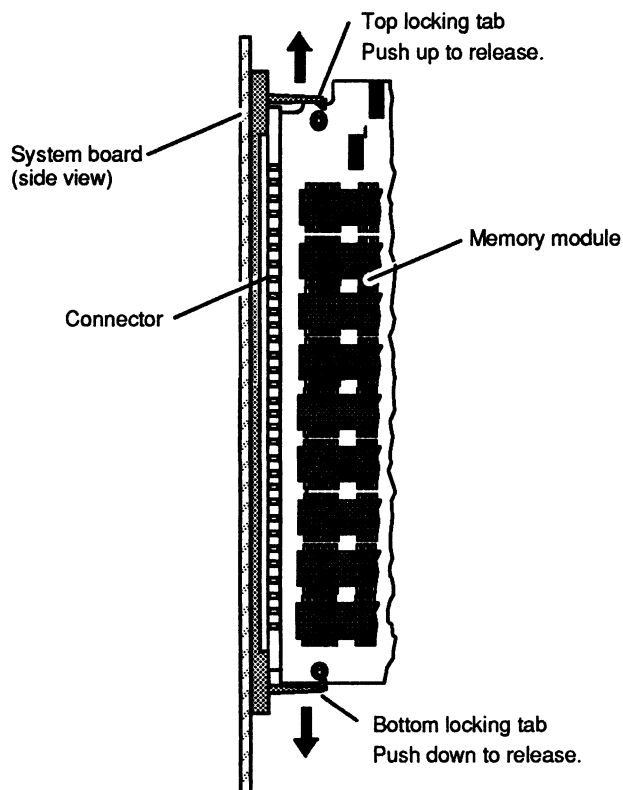


Figure 3-3 Releasing the Memory Module Locking Tabs

2. With the locking tabs released, raise the memory module to about a 20° angle as shown in Figure 3-4, and *gently* pull the module from its connector.

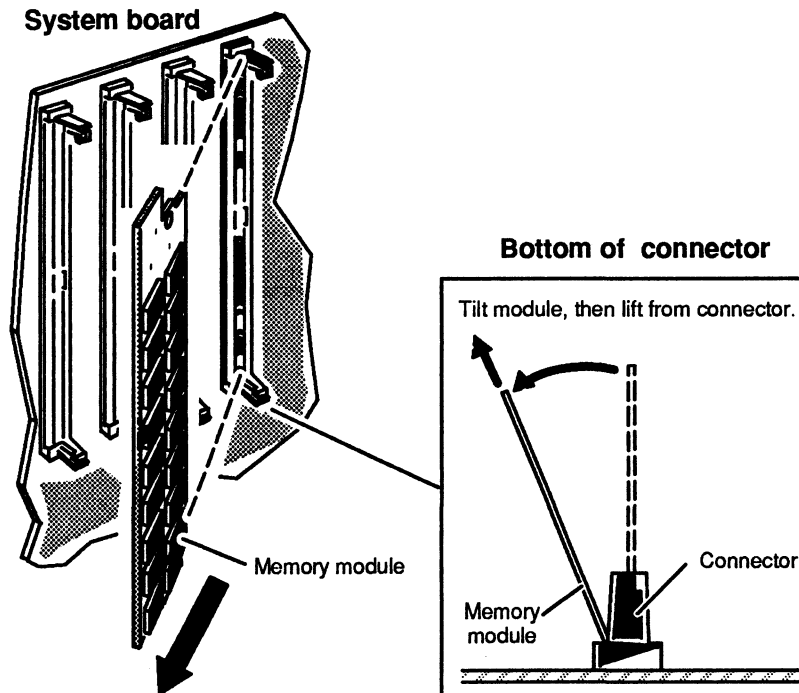


Figure 3-4 Removing a Memory Module

CAUTION: If you need to set the memory module down, put it back inside the antistatic shipping bag.

If you removed a failed memory module, insert it in an antistatic bag and return it to Data General. For more information, refer to the "Returning Customer Replaceable Units (CRUs)" section of the Preface. If you temporarily removed a memory module, insert it in an antistatic bag until you are ready to reinstall it. If you removed all memory modules to replace the PROM component or the system board, go to Chapter 5, "Replacing the PROM Component," or Chapter 6, "Replacing the System Board." Otherwise, continue to the next section, "Installing Memory Modules," to install a new memory module.

Installing Memory Modules

Before you can install any memory modules, you must remove the computer unit's right side cover and attach the ESD wrist strap as described in the "Opening the Computer Unit" section of Chapter 1. When installing memory modules you must begin by installing the rightmost memory module first (the module that will occupy the lowest numbered connector). Figure 3-2, earlier in this chapter, shows the numbering scheme for the memory module connectors. If any memory modules are installed to the left of the memory modules you are installing, you must remove them temporarily if you have not done so already.

To install a memory module, follow the steps below.

1. Carefully remove the memory module from its package. Save the antistatic shipping bag and packing materials to use if you have to return the memory module.

CAUTION: If you need to set the memory module down, put it back inside the antistatic shipping bag.

2. Position the memory module in the connector at approximately a 20° angle as shown in Figure 3-5, and *gently* push the top of the module right towards the perpendicular. You will hear a click as each connector tab locks the module into place.

CAUTION: Never force the memory module into the connector or against the locking tabs.

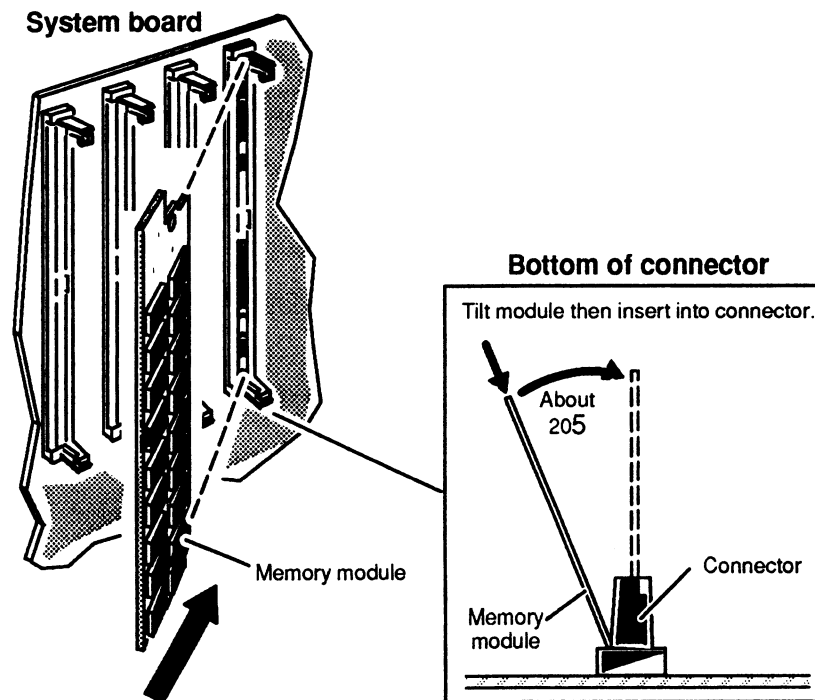


Figure 3-5 Installing the Memory Module in the Connector

Repeat steps 1 and 2 to install or reinstall any remaining memory module(s).

You have now completed the procedure for installing memory modules. If you are finished adding options or replacing CRUs, you should remove the ESD wrist strap, reinstall the top and side covers, and plug in the computer unit's power cord as described in the "Closing the Computer Unit" section of Chapter 1.

After you have closed the computer unit, you should power up any peripheral housing units and other peripherals, and then the computer according to the instructions in the operating manuals for the computer system and the operating system software. Then test your computer system by running the AViiON System Diagnostics as described in the *Using AViiON™ System Diagnostics* manual.

End of Chapter

Chapter 4

Adding or Replacing the Second CPU Board

This chapter tells how to add the second CPU board to an AViiON 4000 or 4100 series computer unit and to replace a failed second CPU board in an AViiON 4000 series computer unit. If your computer system has the second CPU board, you will need to remove it to replace a failed system board.

The second CPU board plugs into an interboard connector on the system board. Figure 4-1 shows the location of second CPU board on the system board.

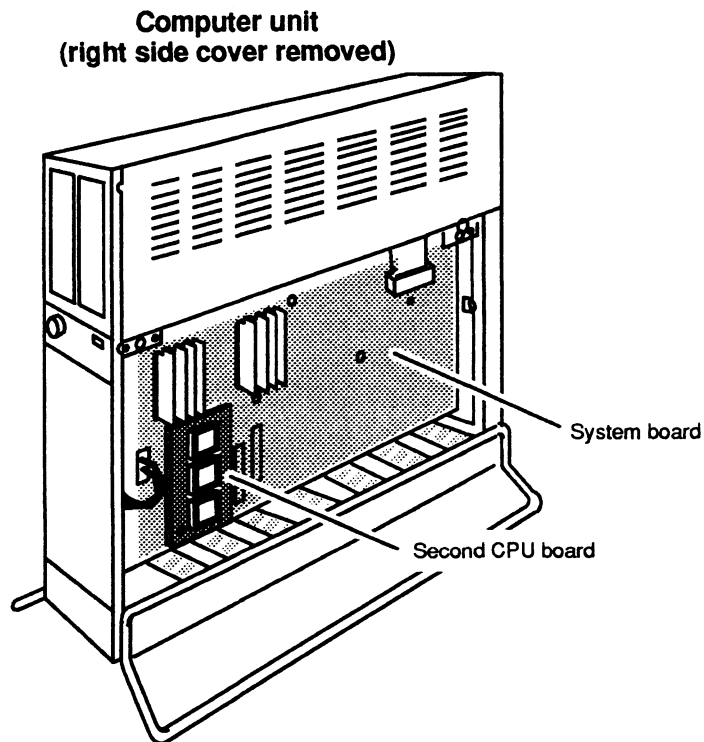


Figure 4-1 Location of the Second CPU Board on the AViiON 4000 Series System Board

Removing the Second CPU Board

You will need to remove the second CPU board to replace it or a failed system board. Before you can remove the second CPU board, you must remove the computer unit's right side cover and attach the ESD wrist strap as described in the "Opening the Computer Unit" section of Chapter 1.

CAUTION: *Unless you are properly grounded, you can discharge static electricity and damage components in the system.*

To remove the second CPU board, follow the steps below. You will need a medium Phillips screwdriver.

1. Remove the two screws, shown in Figure 4–2, that secure the second CPU board to the system board.

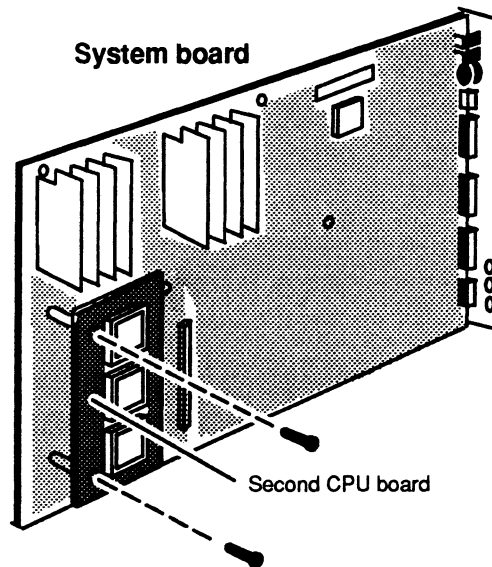


Figure 4–2 Removing the Screws Securing the Second CPU Board to the System Board

2. Separate the interboard connector on the back of the second CPU board from the interboard connector on the system board as shown in Figure 4–3.

CAUTION: *Grasp the board at its edges to avoid damaging any components on the board.*

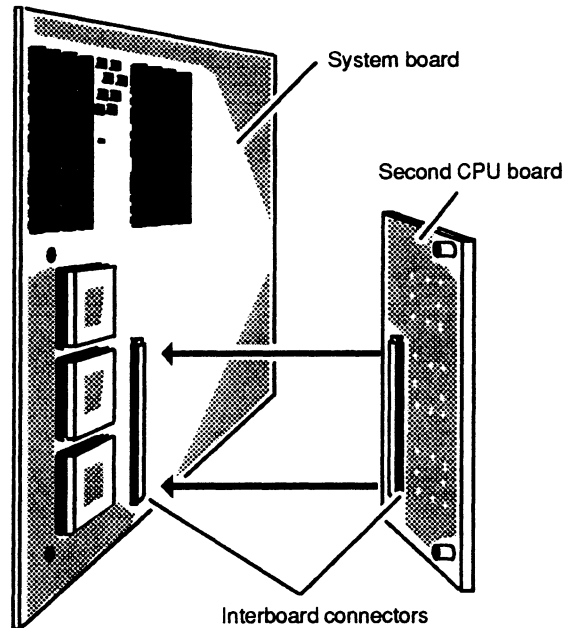


Figure 4-3 Separating the Interboard Connectors

3. Lift the second CPU board away from the system board, and set it aside.

If you are replacing the second CPU board, insert it in an antistatic bag and return it to Data General. For more information, refer to the “Returning Customer Replaceable Units (CRUs)” section of the Preface.

If you removed the second CPU board temporarily to replace the system board, put the second CPU board inside an antistatic bag until you are ready to reinstall it, and go to Chapter 6, “Replacing the System Board.” Otherwise, continue to the next section, “Installing the Second CPU Board,” to install the new second CPU board.

Installing the Second CPU Board

Before you can install a second CPU board, you must remove the computer unit’s right side cover and attach the ESD wrist strap as described in the “Opening the Computer Unit” section of Chapter 1.

CAUTION: *Unless you are properly grounded, you can discharge static electricity and damage components in the system.*

To install the second CPU board, follow the steps below. If you are installing a new board, start with Step 1. If you are reinstalling a board you removed temporarily, start with Step 2.

1. Carefully remove the option board from its package. Save the antistatic shipping bag and packing materials to use if you have to return the option board.

CAUTION: *If you need to set the board down, put it back inside the antistatic shipping bag.*

2. Align the interboard connector on the second CPU board with the interboard connector on the system board, as shown in Figure 4-4, and press them together. If you cannot press the connectors together, make sure that the connectors are aligned correctly, and then try pressing them together again.

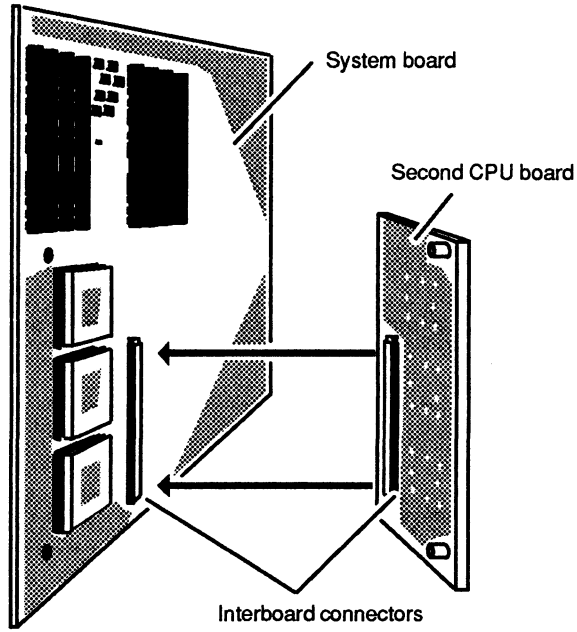


Figure 4-4 Joining the Interboard Connectors

3. Secure the second CPU board to the system board with the two screws as shown in Figure 4-5.

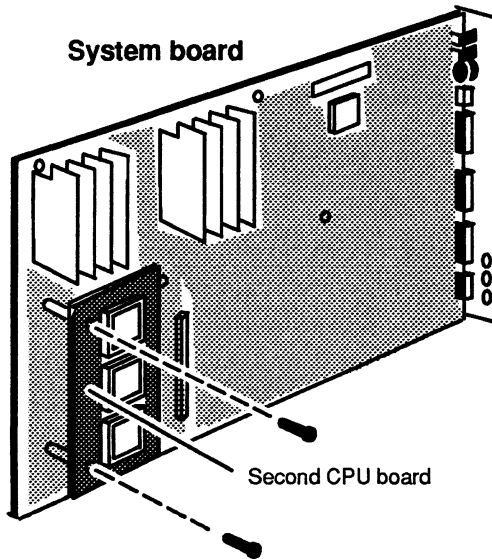


Figure 4-5 Securing the Second CPU Board to the System Board

You have now completed the procedure for installing the second CPU board. If you are finished adding options or replacing CRUs, you should remove the ESD wrist strap, reinstall the top and side covers, and plug in the computer unit's power cord as described in the "Closing the Computer Unit" section of Chapter 1.

After you have closed the computer unit, you should power up any peripheral housing units and other peripherals, and then the computer according to the instructions in the operating manuals for the computer system and the operating system software. Then test your computer system by running the AViiON System Diagnostics as described in the *Using AViiON™ System Diagnostics* manual.

End of Chapter

Chapter 5

Replacing the System Board

This chapter describes how to replace a failed system board. Figure 5–1 shows the location of the system board and the memory modules and second CPU board (AViiON 4000 series only) that mount on the system board.

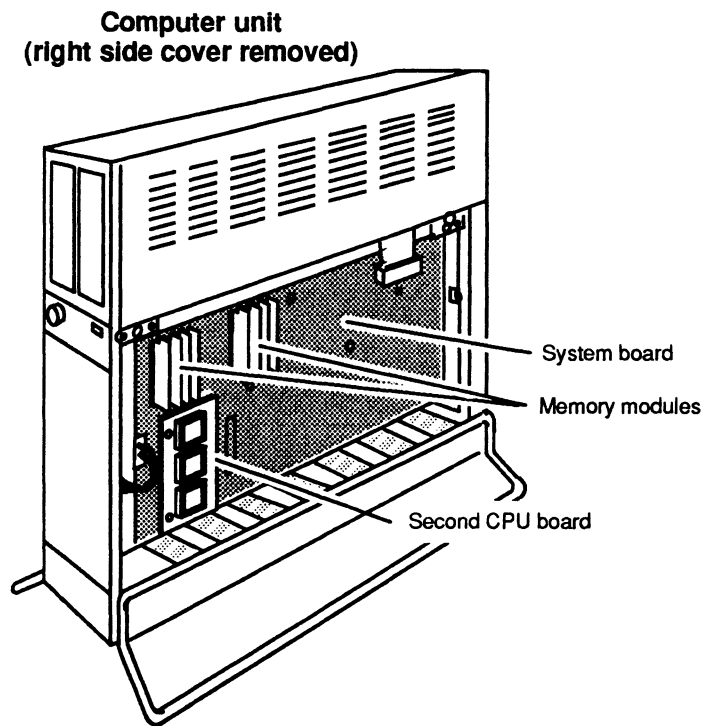


Figure 5–1 Location of the System Board, Memory Modules, and Second CPU Board

Removing the System Board

Before you can remove the system board, you need to remove the computer unit's right side cover and attach the ESD wrist strap as described in the "Opening the Computer Unit" section of Chapter 1.

To remove the system board, follow the steps below. You will need a small (#1) and a medium (#2) Phillips screwdriver.

1. Remove all the memory modules as described in the "Removing Memory Modules" section of Chapter 3, and remove the second CPU board, if present, as described in the "Removing the Second CPU Board" section of Chapter 4.
2. Using the small Phillips screwdriver, remove the five screws, shown in Figure 5-2, that secure the system board bracket to the back of the computer unit.

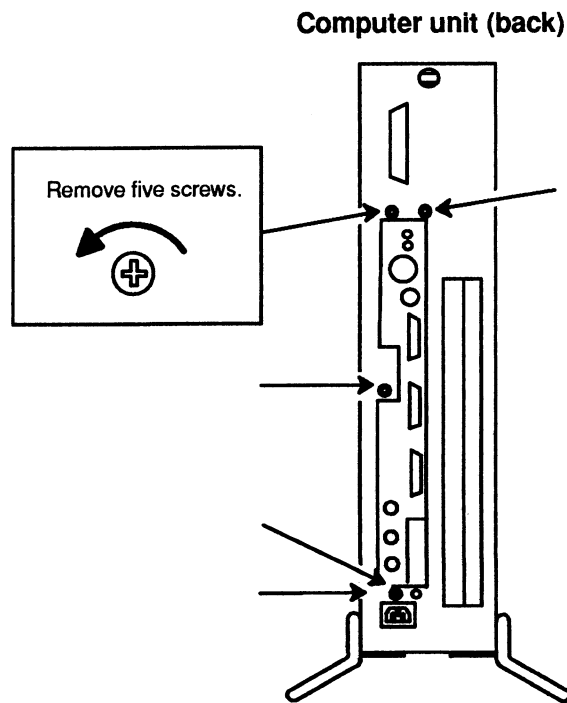


Figure 5-2 Removing the Screws that Secure the System Board Bracket to the Back of the Computer Unit

3. Unplug the speaker and SCSI bus cables from the system board as shown in Figure 5-3.

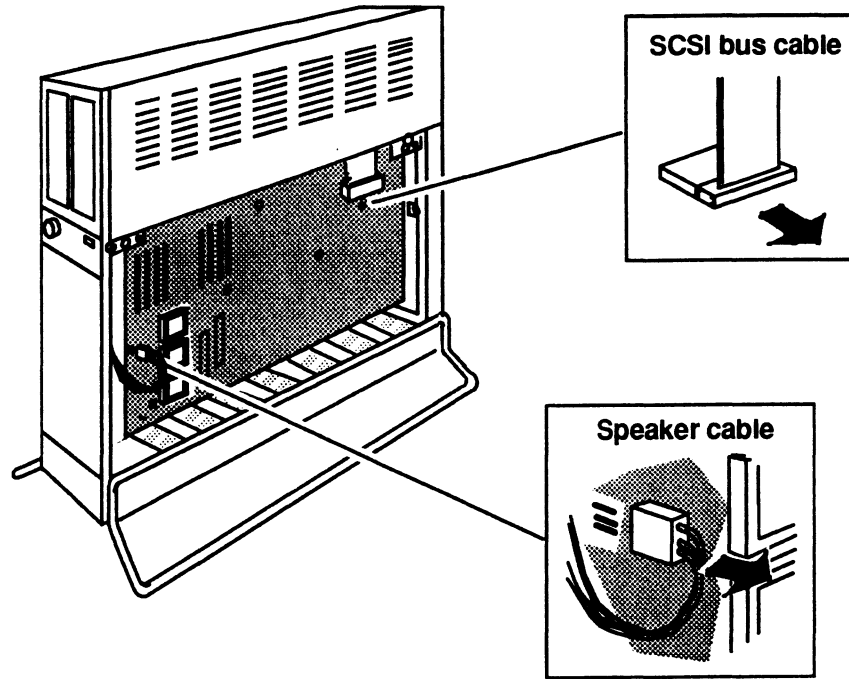


Figure 5-3 Unplugging the Speaker and the SCSI Bus Cables from the System Board

4. Using the medium Phillips screwdriver, remove the eight screws, shown in Figure 5-4, that secure the system board to the computer unit.

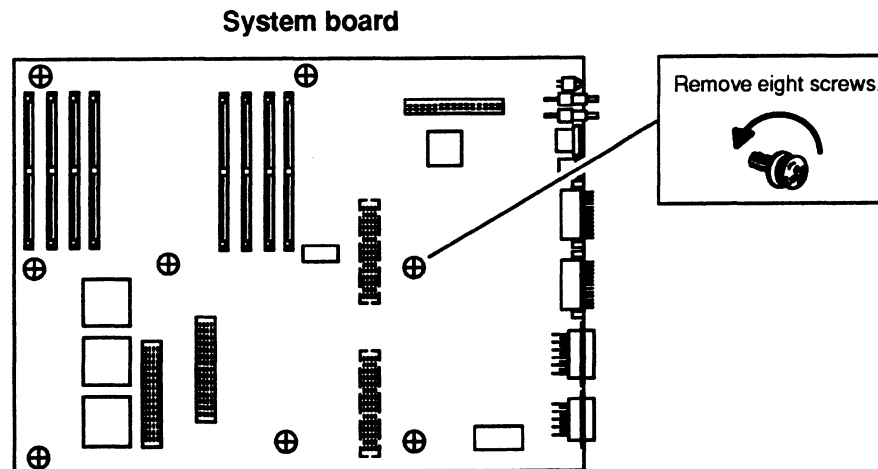


Figure 5-4 Removing the Screws Securing the System Board to the Computer Unit

5. Push the two ejector levers to the right as shown in Figure 5-5 to disconnect the system board from the VME connectors behind it.

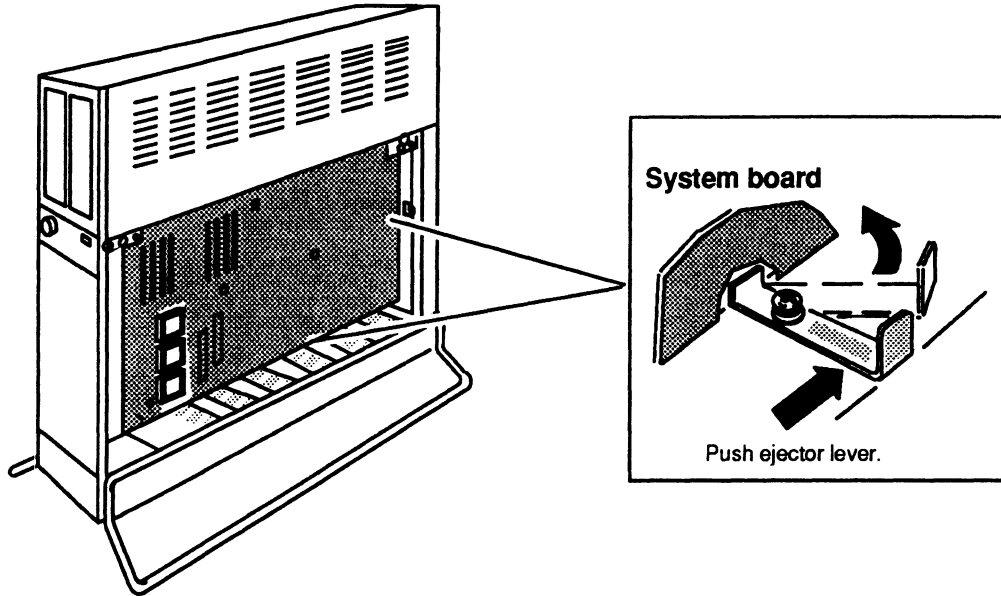


Figure 5-5 Disconnecting the Connectors from the System Board

6. Remove the system board by pulling its bracket away from the computer unit; then lifting the board out of the computer unit as shown in Figure 5-6.

CAUTION: Grasp the system board by its edges to avoid damaging any components.

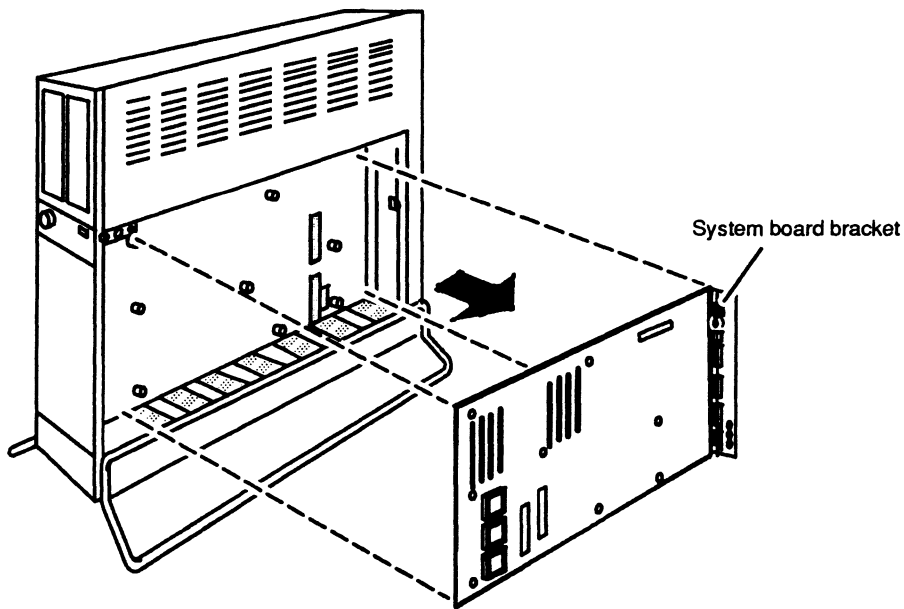


Figure 5-6 Removing the System Board

7. Using a flat-blade screwdriver, *gently* pry up one end and then the other end of the PROM component as shown in Figure 5-7 until it is loose enough to remove by hand.

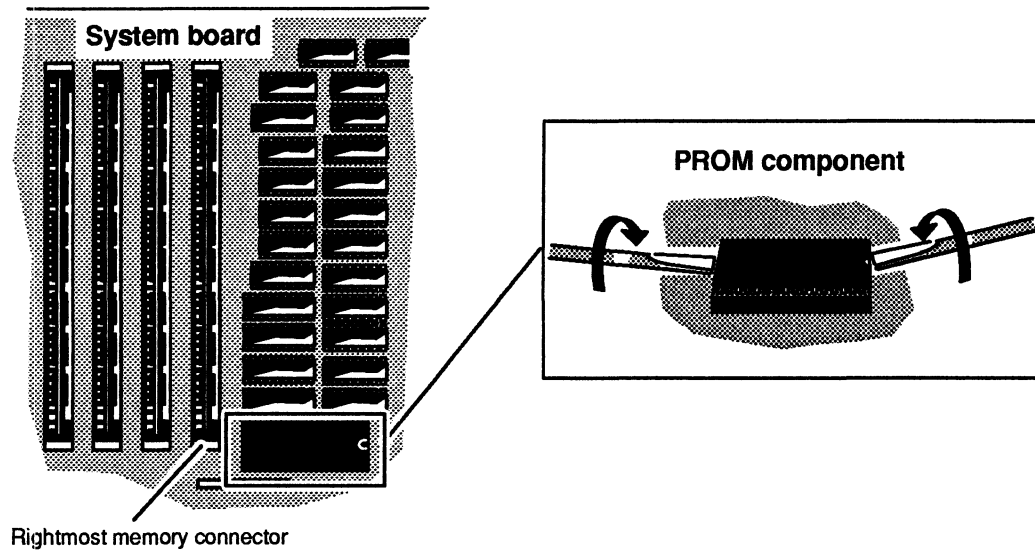


Figure 5-7 Removing the PROM Component

8. Lift the PROM component out of its socket, put it in an antistatic bag, and set it aside for later installation on the replacement system board.

CAUTION: To be able to access applications software, you must install this original PROM on the replacement system board.

9. Insert the failed system board in an antistatic bag.

To install the replacement system board, go to the next section “Installing the System Board.”

Installing the System Board

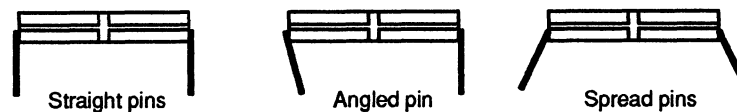
Before you can install the new system board, you need to remove the computer unit's right side cover and attach the ESD wrist strap as described in the "Opening the Computer Unit" section of Chapter 1. If the *replacement* system board has a PROM installed as shown in Figure 5-7, you need to remove the PROM component from the replacement system board following Steps 7 and 8 in the previous section "Removing the System Board."

To install the system board, follow the steps below. You will need a small (#1) and a medium (#2) Phillips screwdriver.

1. Look at the pins on the *original* PROM component (the PROM component you removed from the *failed* system board) to see if they are straight as shown in Figure 5-8. If they are spread too far apart or angled incorrectly as shown in Figure 5-8, you must straighten the pins as follows.

Lay the PROM component down on one side on a table, and carefully roll the component to bend the pins into line as shown in Figure 5-8. Once the pins are in line on one side, repeat this procedure with the other side of the component.

PROM component pin positions



Straightening PROM component pins

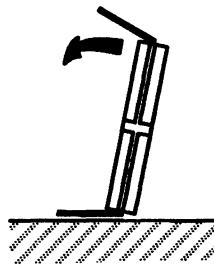


Figure 5-8 Straightening the Pins on the PROM Component

2. Matching the notch on the PROM component with the notch on the socket, on the replacement system board, align the pins of the PROM component with the holes in the socket as shown in Figure 5-9, and insert the PROM component into the socket.

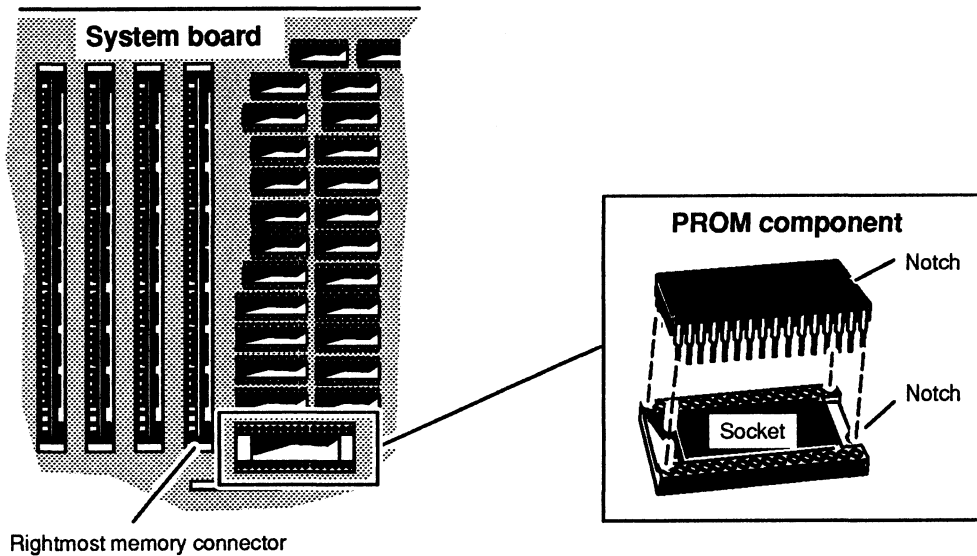


Figure 5-9 Installing the PROM Component

3. Gently push on one side and then the other side of the PROM component to seat it in the socket.
4. Insert the system board in computer unit, aligning the VME two connectors on the back panel, shown in Figure 5-10, with the two connectors on the back of the system board.

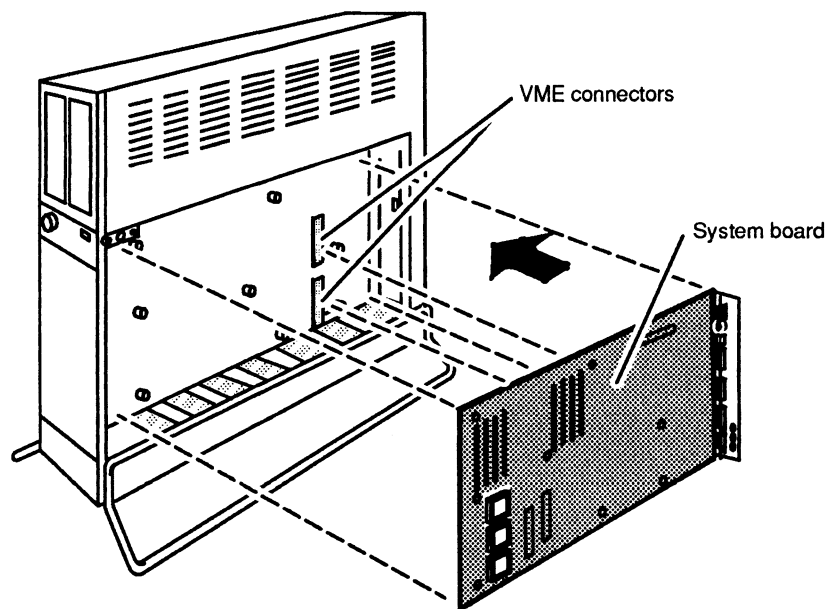


Figure 5-10 Inserting the System Board into the Computer Unit

5. Press the system board firmly on each side of the VME connector pins shown in Figure 5-11. Press on one side of the top pins and then on the other side of the top pins, and continue to work your way down the connectors pressing on one side of the pins and then the other. Since the pins are surrounded by components, you will have to press on the components.
6. Using the medium Phillips screwdriver, secure the system board to the computer unit with the eight screws and washers shown in Figure 5-11.

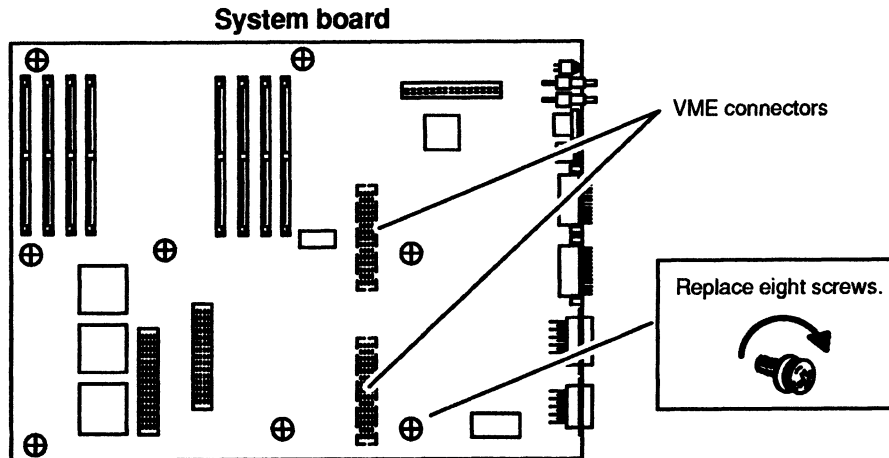


Figure 5-11 Securing the System Board Bracket to the Computer Unit

7. Using the small Phillips screwdriver, secure the system board bracket to the back of the computer unit with the five screws shown in Figure 5-12.

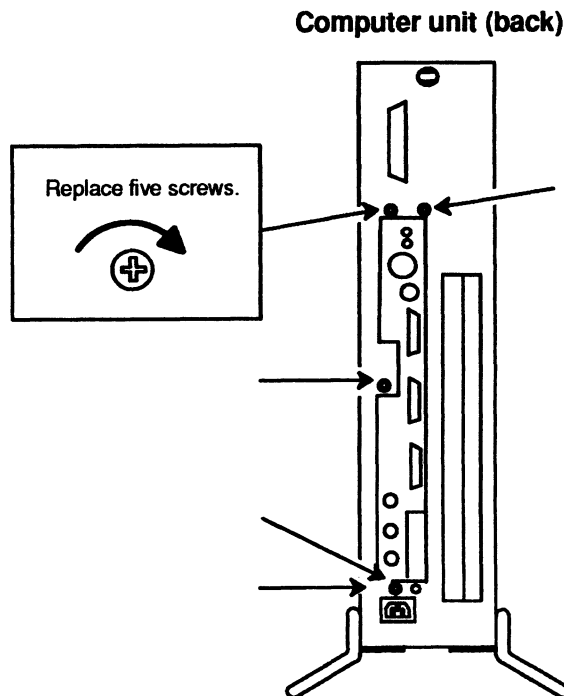


Figure 5-12 Installing the Screws that Secure the System Board Bracket to the Back of the Computer Unit

8. Reinstall the memory modules and the second CPU board, if present, that you removed from the failed system board as described in the "Installing Memory Modules" section of Chapter 3 and the "Installing the Second CPU Board" section of Chapter 4.
9. Plug the SCSI bus and the speaker cables into the system board as shown in Figure 5-13.

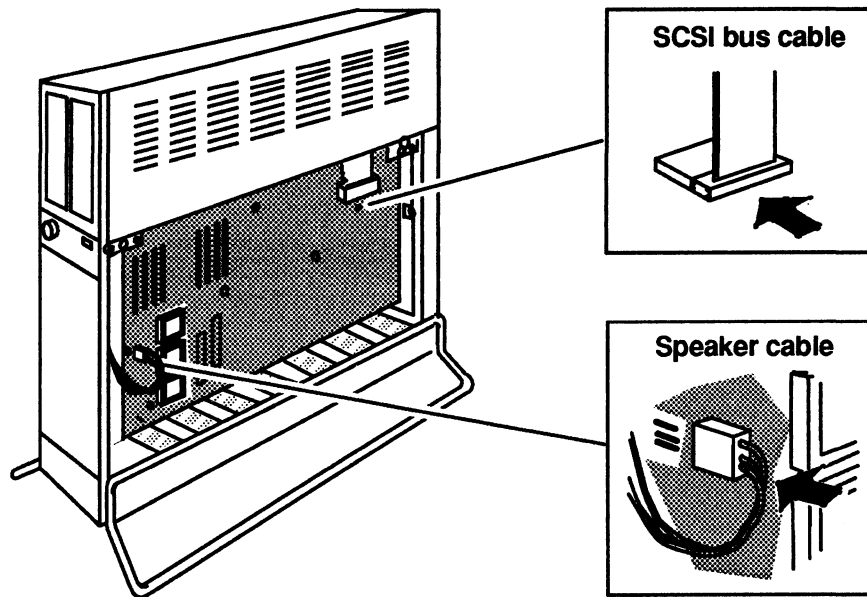


Figure 5-13 Plugging the Speaker and the SCSI Bus Cables into the System Board

If you removed the PROM from the *replacement* system board, you should insert this PROM on the *failed* system board as described in Steps 1 through 3 of this section.

Insert the failed system board in an antistatic bag, and return it to Data General. For more information, refer to the "Returning Customer Replaceable Units (CRUs)" section of the Preface.

You have now completed the procedure for replacing the system board. If you are not adding any other options or replacing any other CRUs, you should remove the ESD wrist strap, reinstall the computer unit cover(s), and plug in the computer unit's power cord as described in the "Closing the Computer Unit" section of Chapter 1.

After closing the computer unit, you should power up any peripheral housing units and other peripherals, and then the computer unit according to the instructions in the operating manuals for the computer system and the operating system software. Next, you should test your computer system by running the AViiON System Diagnostics as described in the *Using AViiON™ System Diagnostics* manual.

End of Chapter

Chapter 6

Replacing the Power Supply, Fuse, or Fan Assembly

This chapter tells how to replace a failed power supply, a blown tape/disk fuse, and a failed fan assembly. Figure 6-1 shows the location of the power supply, tape/disk fuse, and fan assembly.

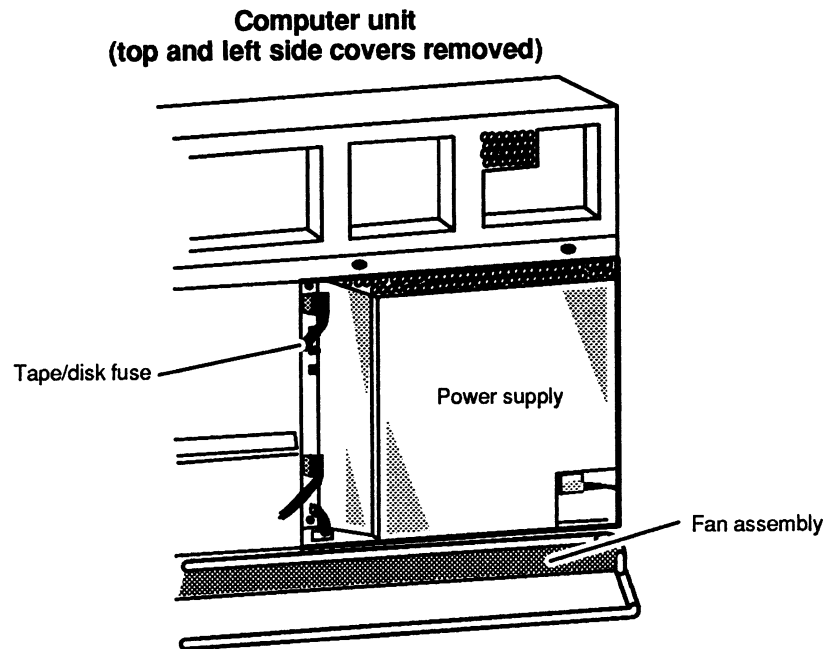


Figure 6-1 Location of Power Supply, Tape/Disk Fuse, and Fan Assembly

Replacing the Power Supply

This section tells how to remove a failed power supply and install a new power supply.

WARNING: The inside of power supply contains high voltage that can be present even after the supply is disconnected from the ac power source. Never remove the cover of the power supply, or attempt to service the power supply.

Removing the Power Supply

Before you can remove the power supply, you need to power down any peripherals and the computer unit, and remove the computer unit's top and left side covers as described in the "Opening the Computer Unit" section of Chapter 1.

1. Unplug the ac power and fan assembly power cables from the power supply as shown in Figure 6-2.

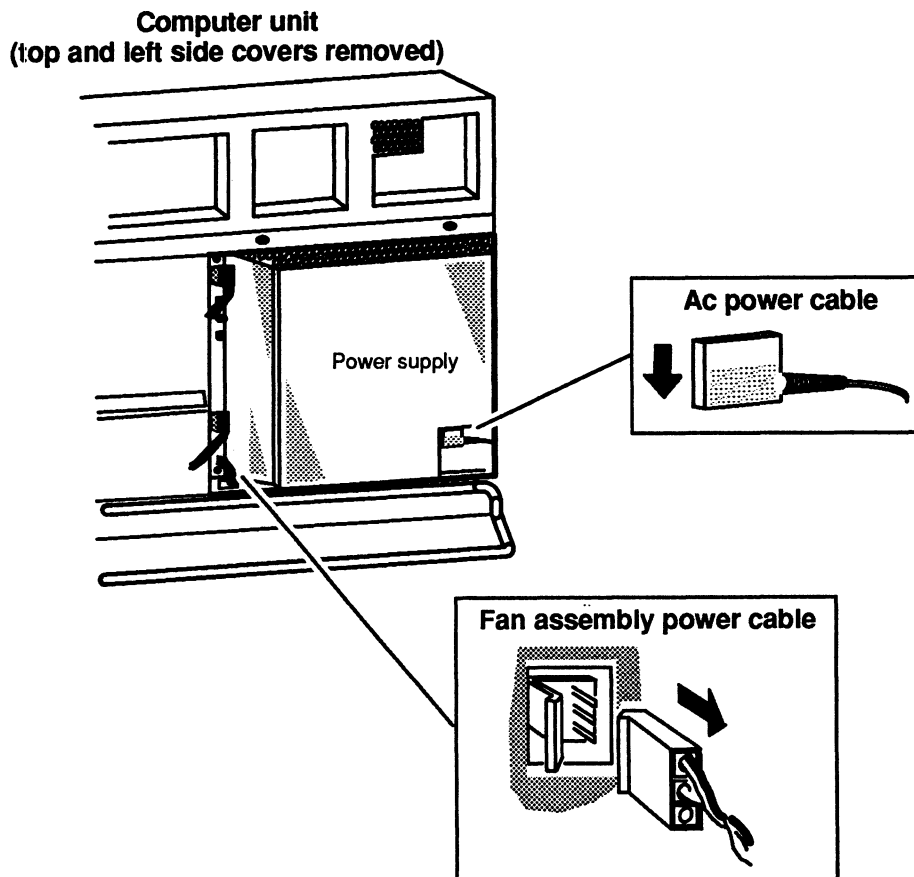


Figure 6-2 Unplugging the Ac Power and Fan Assembly Power Cables from the Power Supply

2. Unplug the tape/disk power and logic power cables from the power supply as shown in Figure 6-3.

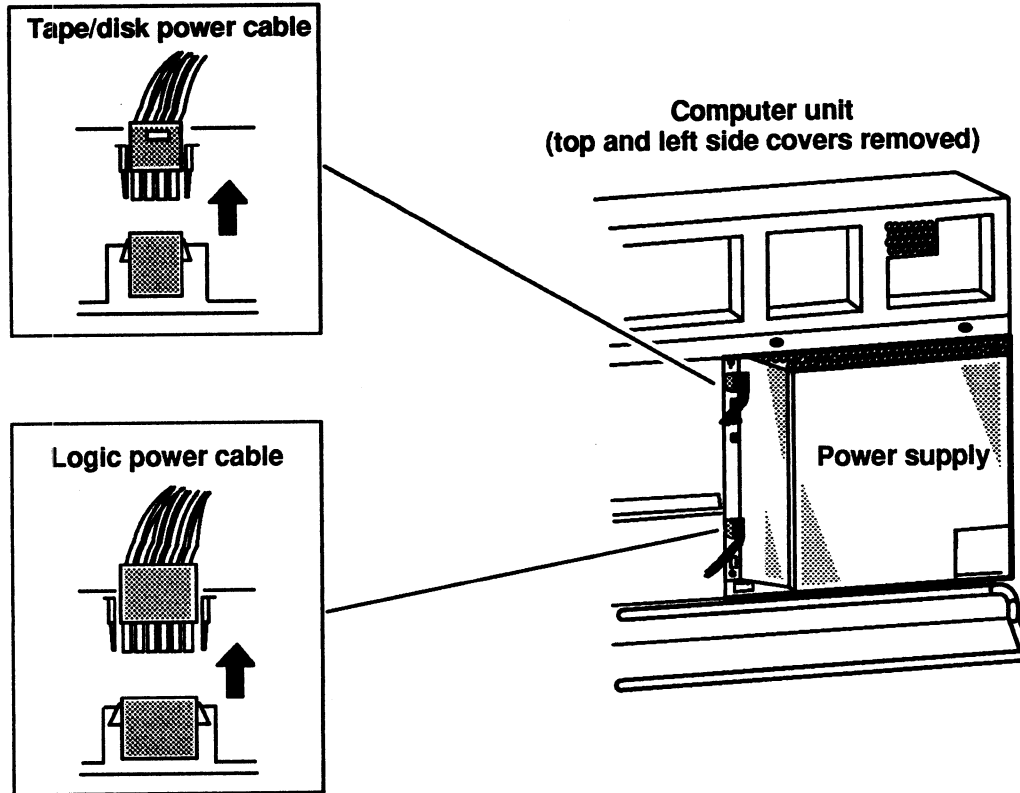


Figure 6-3 Unplugging the Tape/Disk Power and Logic Power Cables from the Power Supply

3. Release power supply from the computer unit by gently pulling out the power supply latches shown in Figure 6-4.

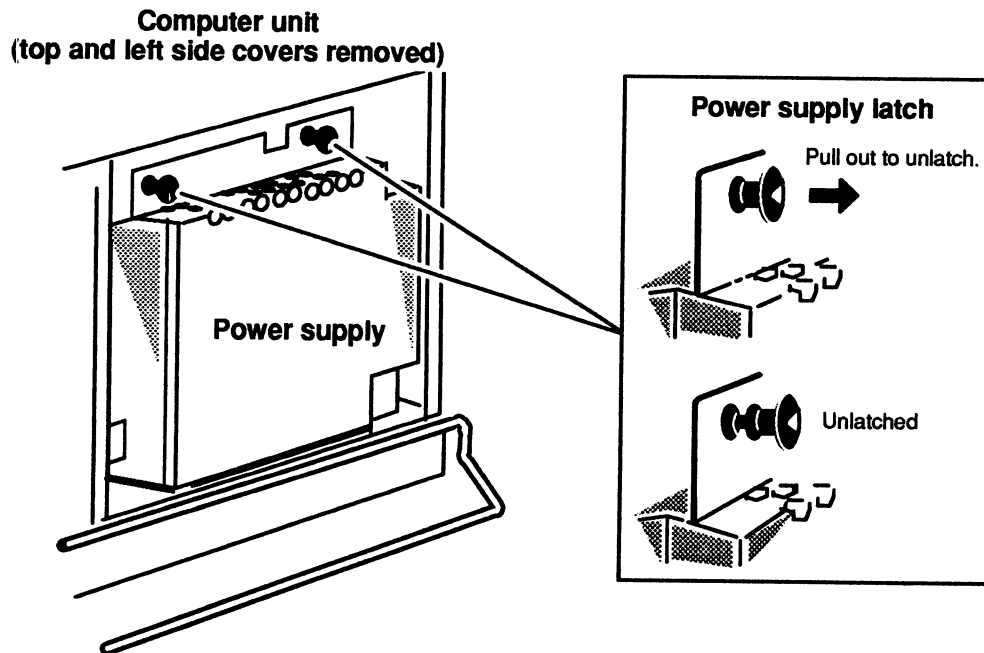


Figure 6-4 Releasing the Power Supply from the Computer Unit

4. Lift the power supply up and then out of the computer unit as shown in Figure 6-5.

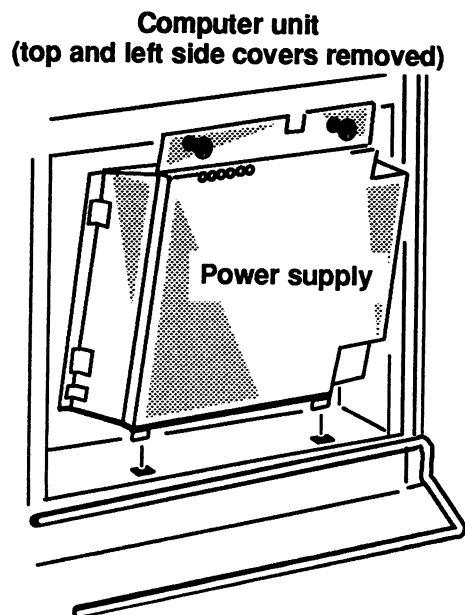


Figure 6-5 Removing the Power Supply

Return the failed power supply to Data General. Refer to the “Returning Customer Replaceable Units (CRUs)” section of the Preface for more information. To install the new power supply, continue to the next section, “Installing the Power Supply.”

Installing the Power Supply

Before you can install a new power supply, you need to remove the computer unit’s top and left side covers as described in the “Opening the Computer Unit” section of Chapter 1.

To install a power supply, follow the steps below.

1. Carefully remove the power supply from its package. Save the packing materials to use if you have to return the power supply.
2. Set the voltage selection switch on the power supply to the ac power voltage for your site as shown in Figure 6–6. If your installation site has 100 or 120 V ac power, set the voltage selection switch to 115 V; if it has 220 or 240 V ac power, set the switch to 230 V.

Most sites in the United States and Canada have 120 V ac power. If you are not sure about the correct ac power voltage at your site, consult a licensed electrician.

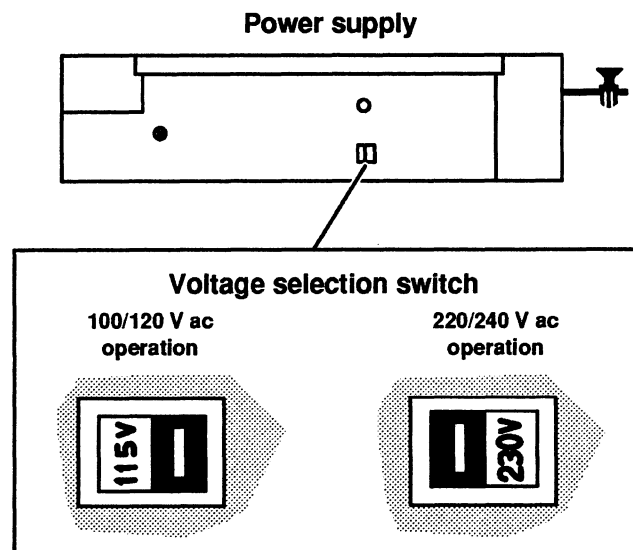


Figure 6–6 Setting the Voltage Selection Switch

CAUTION: Powering up the computer unit with the voltage switch set incorrectly can damage the computer.

3. Insert the two tabs on the bottom of the power supply into the slots at the base of the computer unit as shown in Figure 6-7.

**Computer unit
(top and left side covers removed)**

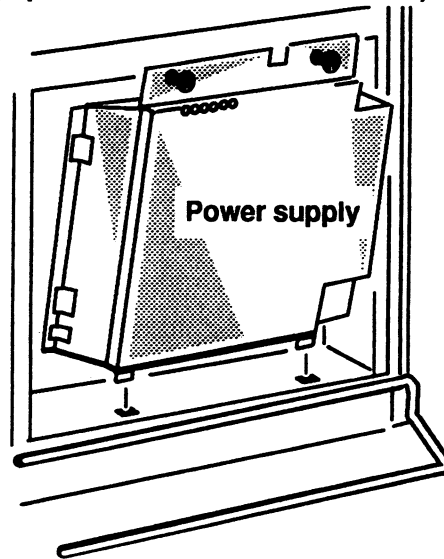


Figure 6-7 Inserting the Power Supply to the Computer Unit

4. Secure the power supply to the computer unit by pushing in the two power supply latches shown in Figure 6-8.

**Computer unit
(top and left side covers removed)**

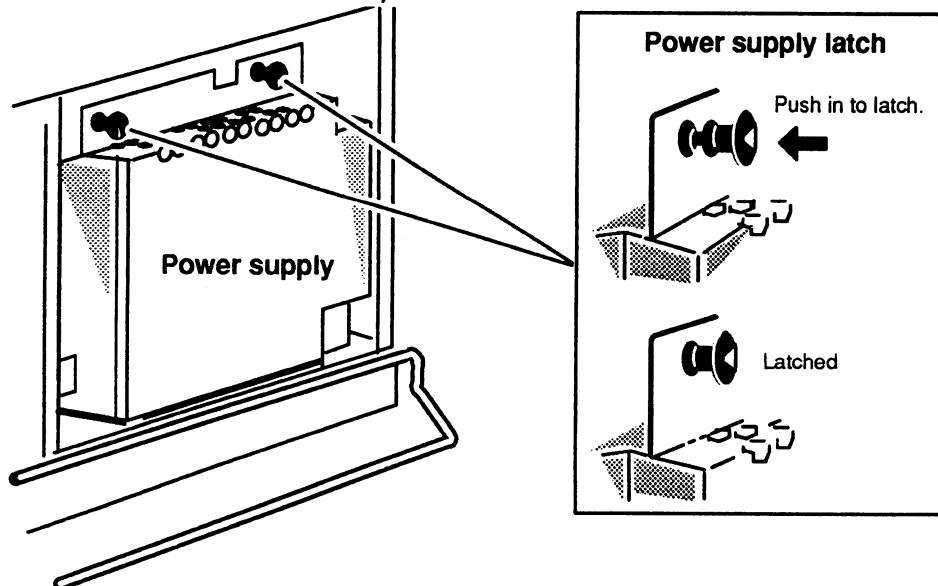


Figure 6-8 Securing the Power Supply to the Computer Unit

5. Plug the tape/disk power and logic power cables into the power supply as shown in Figure 6-9.

NOTE: You can insert the tape/disk and logic power cables one way only because their connectors have beveled edges to match the receptacles on the power supply.

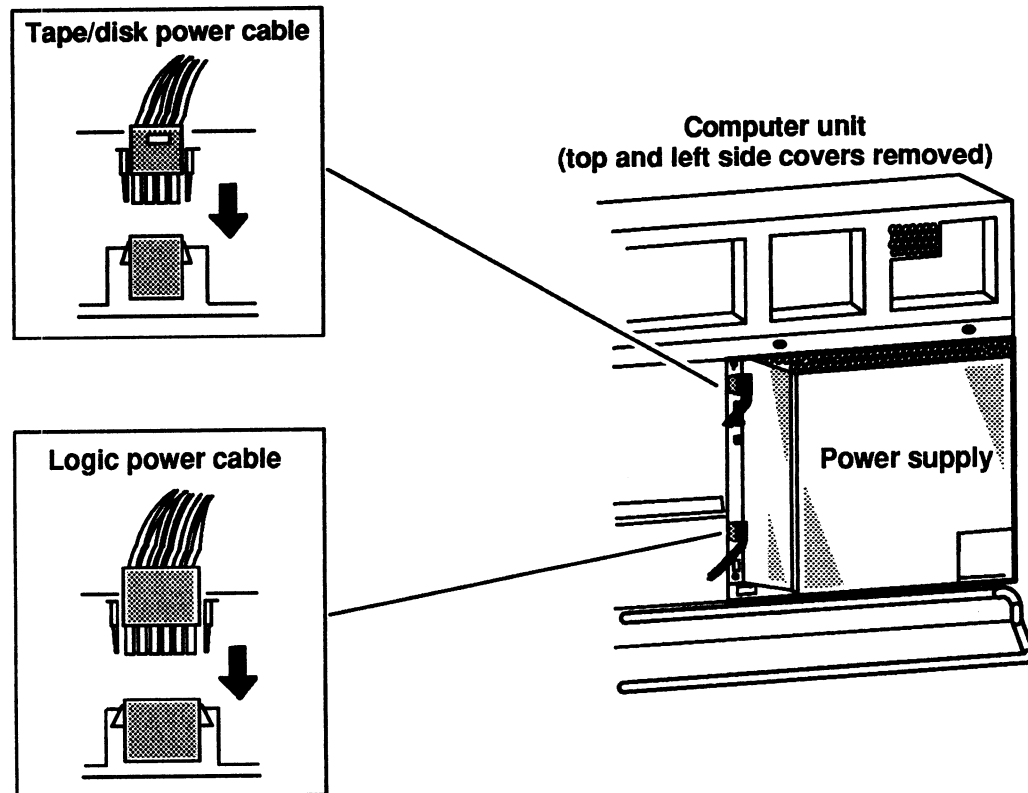


Figure 6-9 Plugging the Tape/Disk Power and Logic Power Cables into the Power Supply

6. Plug the fan assembly power and the ac power cables to the power supply as shown in Figure 6–10.

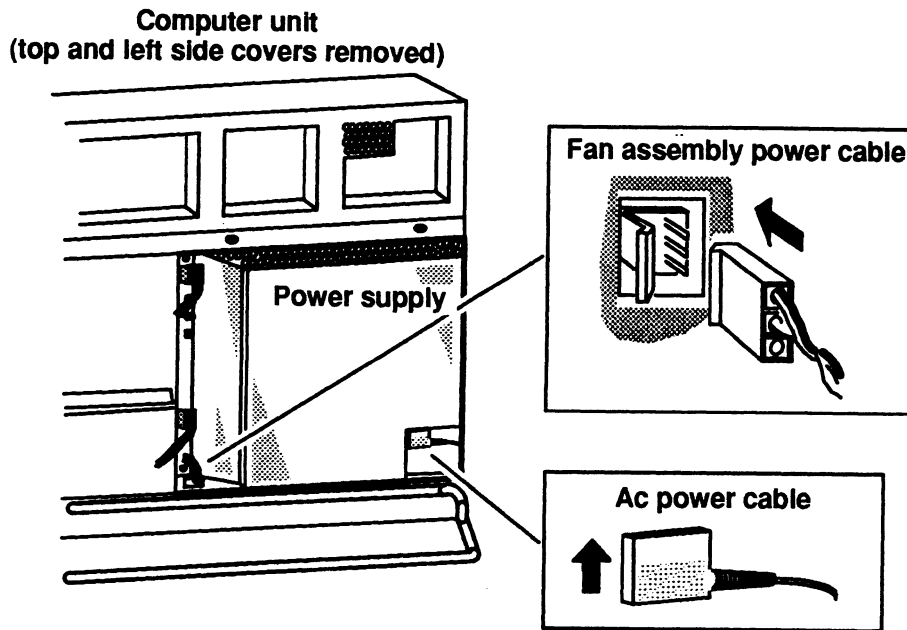


Figure 6–10 *Plugging the Fan Assembly Power and the Ac Power Cables into the Power Supply*

You have now completed the procedure for replacing the power supply. If you are finished adding options or replacing CRUs, you should reinstall the computer unit covers, and plug in the computer unit's power cord as described in the "Closing the Computer Unit" section of Chapter 1.

After closing the computer unit, you should power up any peripheral housing units and other peripherals, and then the computer unit according to the instructions in the operating manuals for the computer system and the operating system software. Next, you should test your computer system by running the AViiON System Diagnostics as described in the *Using AViiON™ System Diagnostics* manual.

Replacing the Tape/Disk Fuse

This section tells how to replace a blown tape/disk fuse.

Before you can replace the tape/disk fuse in the power supply, you need to power down any peripherals and the computer unit and remove the computer unit's left side cover as described in the "Opening the Computer Unit" section of Chapter 1.

WARNING: Always unplug the power cord from the ac power outlet and from the receptacle on the back of the computer unit before removing any cover from the housing.

To replace the tape/disk fuse, follow the steps below. You will need a medium (#2) flat-blade screwdriver.

1. Using a small flat-blade screwdriver, gently lift the fuse, shown in Figure 6-11, until you can pull it out of the holder with your fingers. Remove the fuse from the holder.
2. Press a new 250 V, 12 A fuse into the holder until it is firmly seated.

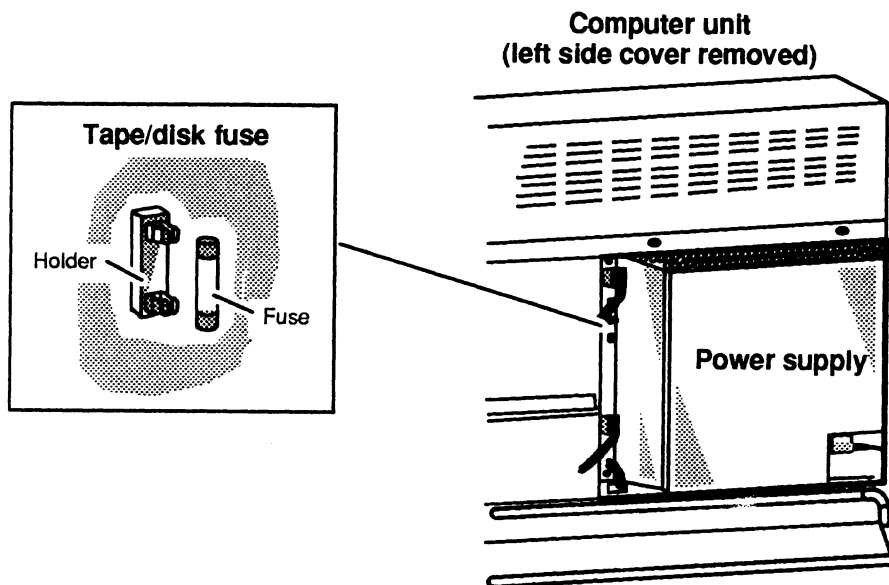


Figure 6-11 Replacing the Tape/Disk Fuse

You have now completed the procedure for replacing the tape/disk fuse. If you are finished adding options or replacing CRUs, you should reinstall the computer unit covers, and plug in the computer unit's power cord as described in the "Closing the Computer Unit" section of Chapter 1.

After closing the computer unit, you should power up any peripheral housing units and other peripherals, and then the computer unit according to the instructions in the operating manuals for the computer system and the operating system software. Next, you should test your computer system by running the AViiON System Diagnostics as described in the *Using AViiON™ System Diagnostics* manual.

Replacing the Fan Assembly

This section tells how to remove a failed fan assembly and install a new fan assembly.

Removing the Fan Assembly

Before you can remove a failed fan assembly, you need to power down any peripherals and the computer unit and remove the computer unit's left side cover as described in the "Opening the Computer Unit" section of Chapter 1.

WARNING: Always unplug the power cord from the ac power outlet and from the receptacle on the back of the computer unit before removing any cover from the housing.

To remove a fan assembly, follow the steps below. You will need a medium (#2) Phillips screwdriver.

1. Unplug the fan assembly power cable from the power supply, and push it down through the hole in the computer unit as shown in Figure 6-12.

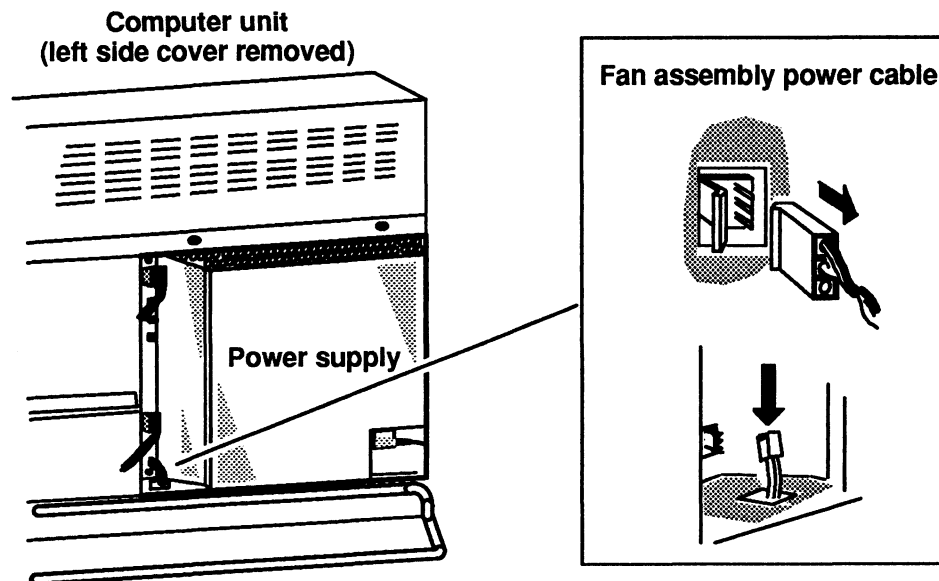


Figure 6-12 Unplugging the Fan Assembly Power Cable from the Power Supply

2. Support the bottom of the back of the fan assembly. Using a medium Phillips screwdriver, remove the two screws and washers that secure the fan assembly to the back of the computer unit as shown in Figure 6-13.

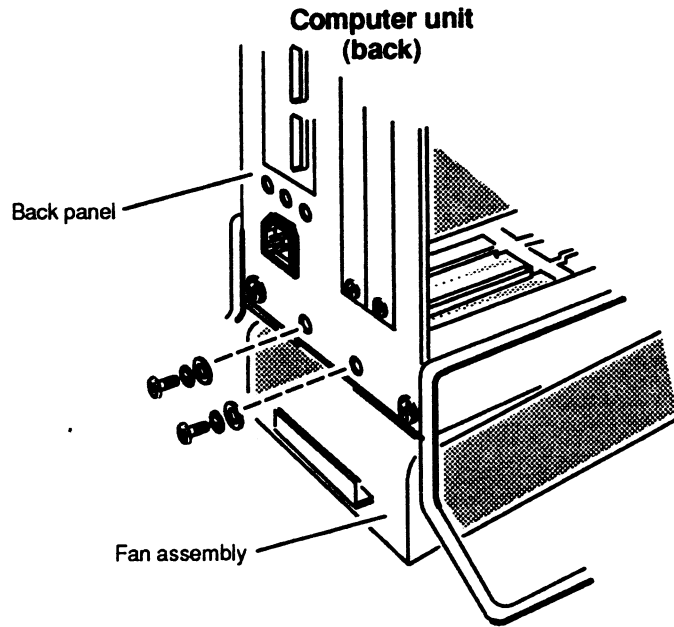


Figure 6-13 Releasing the Fan Assembly from the Back of the Computer Unit

3. Support the bottom of the fan assembly, and pull it out and down to disengage it from the computer unit as shown in Figure 6-14.

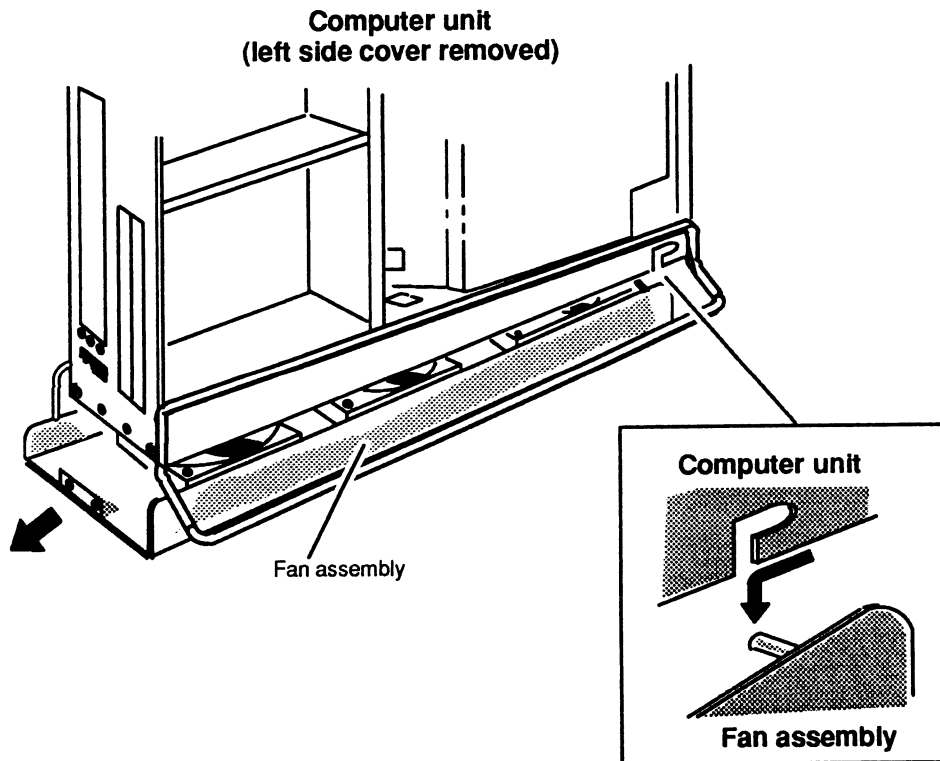


Figure 6-14 Removing the Fan Assembly from the Computer Unit

- Slide the fan assembly out from under the computer unit.

Return the failed fan assembly to Data General. Refer to the “Returning Customer Replaceable Units (CRUs)” section of the Preface for more information.

To install a new fan assembly, go to the next section, “Installing the Fan Assembly.”

Installing the Fan Assembly

Before you can install a new fan assembly, you need to power down any peripherals and the computer unit, and remove the computer unit’s left side cover as described in the “Opening the Computer Unit” section of Chapter 1.

WARNING: Always unplug the power cord from the ac power outlet and from the receptacle on the back of the computer unit before removing any cover from the housing.

To install a fan assembly, follow the steps below. You will need a medium (#2) Phillips screwdriver.

- Slide the fan assembly directly under the computer unit as shown in Figure 6–15.
- Pull the fan assembly power cable up through the hole in the computer unit as shown in Figure 6–15.

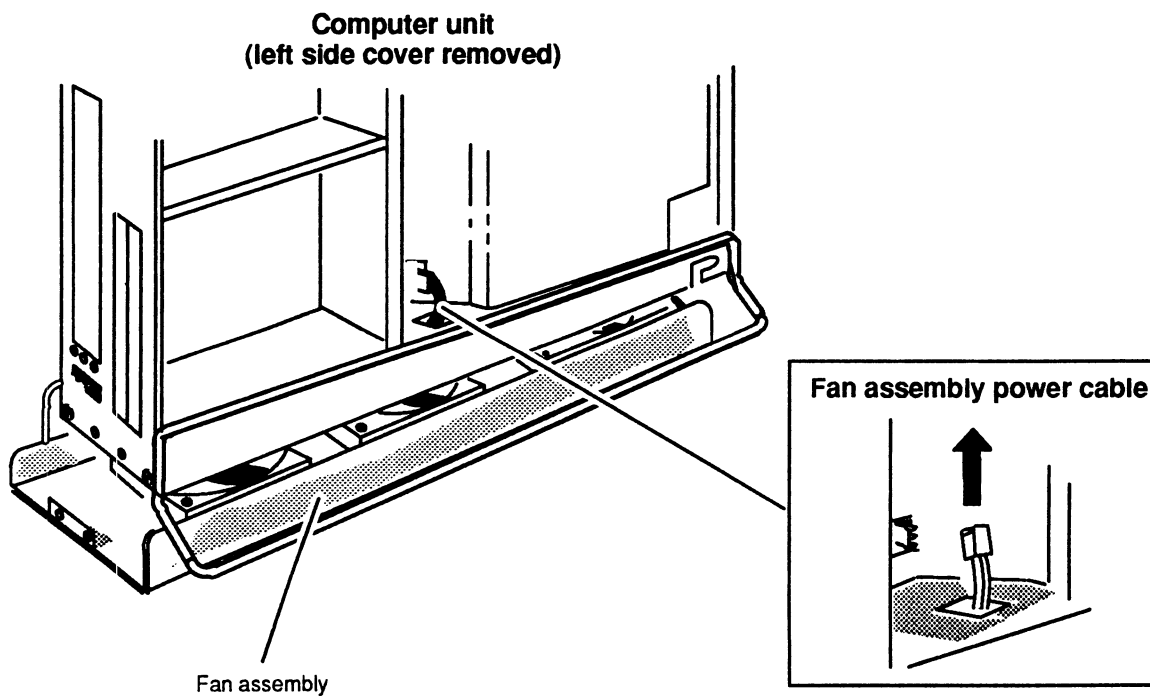


Figure 6–15 Positioning the Fan Assembly Under the Computer Unit

3. Insert the two pins on the fan assembly into the two slots on the bottom front of the computer unit as shown in Figure 6-16, and push the fan assembly forward to secure it to the computer unit.

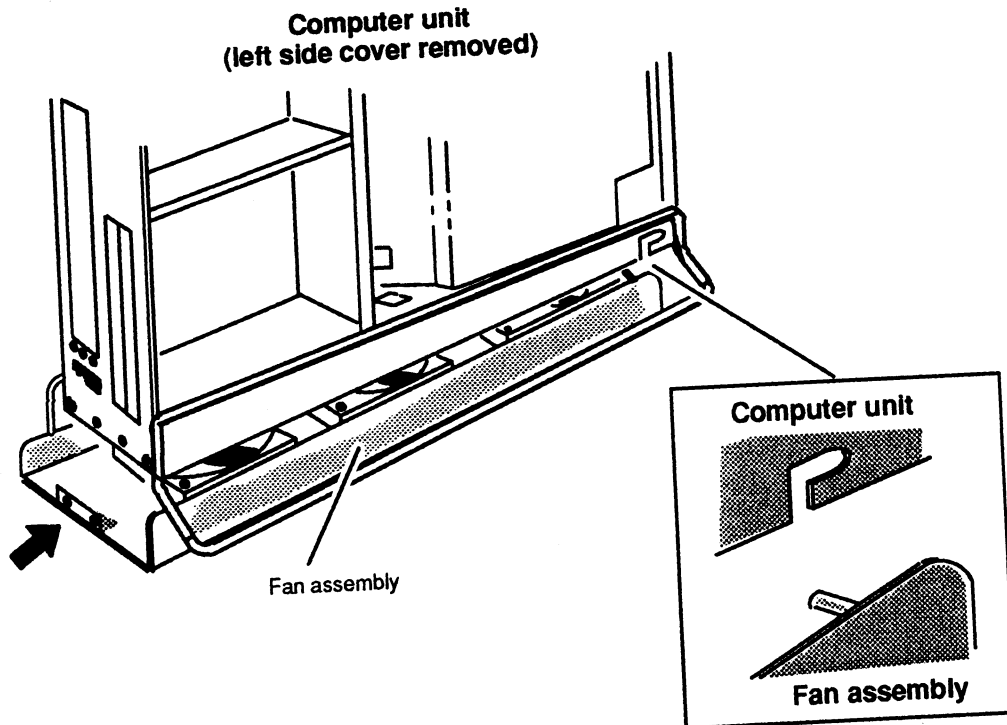


Figure 6-16 Installing the Fan Assembly in the Computer Unit

4. Plug the fan assembly power cable into the power supply as shown in Figure 6-17.

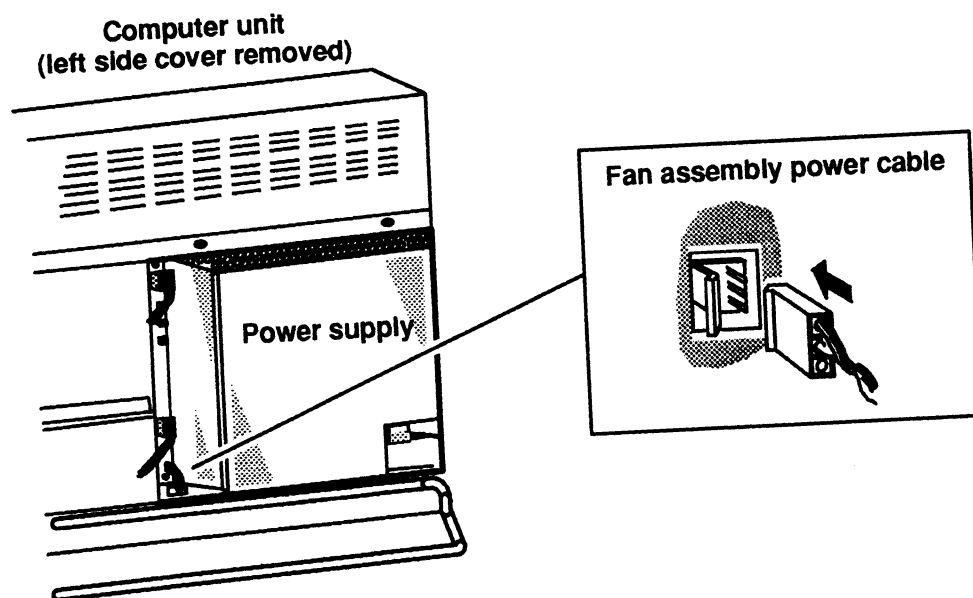


Figure 6-17 Plugging the Fan Assembly Power Cable into the Power Supply

5. Support the bottom of the back of the fan assembly. Using a medium Phillips screwdriver, secure the fan assembly to the back of the computer unit with the two screws and washers shown in Figure 6–18.

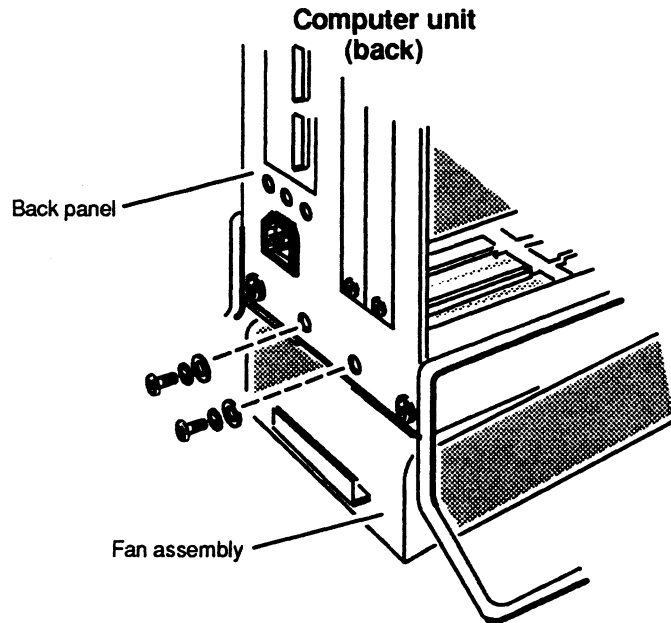


Figure 6–18 Securing the Fan Assembly from the Back of the Computer Unit

You have now completed the procedure for replacing the fan assembly. If you are finished adding options or replacing CRUs, you should reinstall the computer unit cover(s), and plug in the computer unit's power cord as described in the "Closing the Computer Unit" section of Chapter 1.

After closing the computer unit, you should power up any peripheral housing units and other peripherals, and then the computer unit according to the instructions in the operating manuals for the computer system and the operating system software. Next, you should test your computer system by running the AViiON System Diagnostics as described in the *Using AViiON™ System Diagnostics* manual.

End of Chapter

Appendix A

Customer Replaceable Units (CRUs)

The AViiON 3000 and 4000 series computers contain customer replaceable units (CRUs). CRUs are subassemblies that are easily removed and installed by a person responsible for operating or maintaining the computer. Table A-1 lists the CRUs that you can order from Data General for AViiON 3000 and 4000 series computers.

Table A-1 AViiON 3000 and 4000 Series Customer Replaceable Units (CRUs)

CRU	Part Number	CRU	Part Number
CD ROM drives		Power cord (computer unit)	
600-Mbyte	118-004898	100/120 V ac	109-000996
Disk drives		240 V ac (Australia)	109-000812
179-Mbyte	005-030139	240 V ac (Austria)	109-000809
332-Mbyte	005-037108	240 V ac (Denmark)	109-000815
662-Mbyte	005-030138	240 V ac (Italy)	109-000811
Diskette drives		240 V ac (Switzerland)	109-000810
1.2-Mbyte	118-003096	240 V ac (U.K.)	109-000813
1.44-Mbyte	118-004574	Power supply assembly	005-036553
Fan module	005-035751	Second CPU board ¹	
LAN cable (IEEE 802.3)		16 MHz	005-034267
16.4 ft (5 m)		20 MHz	005-035713
Teflon	005-033791	System board	
PVCJ	005-033766	16 MHz	005-034266
65.6 ft (20 m)		20 MHz ¹	005-035712
Teflon	005-033787	Tap drive	
LAN cable (Ethernet)		150-Mbyte	005-033382
65.6 ft (20 m)		Terminal or serial printer cable (EIA RS-232-C)	
Teflon	005-033742	5 ft (1.5 m)	005-013325
Memory module	005-033889	15 ft (4.6 m)	005-033703
Modem cable		25 ft (7.6 m)	005-033788
25 ft (7.6 m)	005-033775	50 ft (15.2m)	005-033776
Parallel printer cable (Centronics)			
5 ft (1.5 m)	005-023915		
15 ft (9.1 m)	005-033762		

¹ For AViiON 4000 series computers only.

End of Appendix

Appendix B

I/O Connectors

If you use optional I/O devices, you may need to know how the I/O port pins are assigned. This appendix lists the I/O connections and signals available on the computer unit.

Table B-1 lists the connectors on the computer unit.

Table B-1 Connectors on the Computer Unit

Connectors	Cable Type
Serial (RS-232-C)	25-pin
Serial (RS-232-C)	25-pin
Parallel printer	25-pin
SCSI ¹	50-pin
LAN	15-pin

¹ On AViiON 4000 series only.

Serial Port Connectors

A serial device connects to the serial (RS-232-C) port through one of two 25-pin, male D-connectors located on the back of the computer unit. Table B-2 lists the signals for the serial connectors, and Figure B-1 shows the pin numbers for the serial connectors.

Table B-2 Serial Connector Signals

Pin	Signal	Direction
1	Chassis Ground	Not applicable
2	RS-232-C Transmit Data	Out
3	RS-232-C Receive Data	In
4	Request to Send	Out
5	Clear to Send	In
6	Data Set Ready	In
7	Signal Ground	Both
8	Data Carrier Detect	In
9	Not used	
10	Not used	
11	Not used	
12	Not used	
13	Not used	
20	Data Terminal Ready	Out
22	Ring Indicator	In

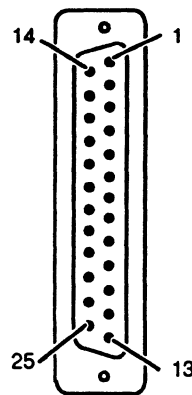


Figure B-1 Serial Connectors (25-Pin) on the Back of the Computer Unit

Parallel Printer Connector

A parallel printer connects to the computer through a female 25-pin connector located on the back of the computer unit. Table B-3 lists the signals for the connector, and Figure B-2 shows the pin numbers.

Table B-3 Parallel Printer Connector Signals

Pin	Signal	Function
1	Parallel port data strobe (PP_DATASTROB)	This strobe pulse reads data from the printer. Timing and polarity for this signal depend type of interface software configured for the parallel port. For more information, refer to the manual <i>AViiON™ 300 and 400 Series Stations: Programming System Control and I/O Registers</i> in conjunction with the <i>Technical Notice for AViiON™ 3000 and 4000 Series Systems: Programming System Control and I/O Registers</i> .
2	PP_D1	Parallel port data bit. PP_D1 is the least-significant bit.
3	PP_D2	Parallel port data bit.
4	PP_D3	Parallel port data bit.
5	PP_D4	Parallel port data bit.
6	PP_D5	Parallel port data bit.
7	PP_D6	Parallel port data bit.
8	PP_D7	Parallel port data bit.
9	PP_D8	Parallel port data bit.
10	Parallel port (PP_DEMAND)	Indicates that the printer demands another character.
11	PP_BUSY	Tells the system that the printer is busy and cannot accept another character.
12	PP_PE	Indicates that the printer is out of paper.
13	PP_SELECT	Selects the printer using this signal.
14	Unused	
15	PP_FAULT	Indicates a printer error.
16	PP_ONLINE	Indicates that the printer is on line.
17-25	Unused	

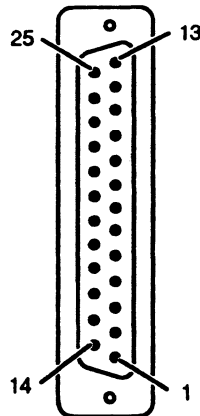


Figure B-2 Parallel Printer Connector (25-Pin) on the Back of the Computer Unit

SCSI Bus Connector (AViiON 4000 series only)

The SCSI bus connector is located on the back of the AViiON 4000 series computer unit. The SCSI bus for the AViiON 4000 series computer currently uses single-ended drivers. Table B-4 lists the signals for the single-ended SCSI connector, and Figure B-3 shows the pin numbers for the connector.

Table B-4 SCSI Bus Single-Ended Connector Signals

Pin	Signal	Pin	Signal
1-25	Unused	38	Termination Power
26	Data Bus 0	39	Ground
27	Data Bus 1	40	Ground
28	Data Bus 2	41	Attention
29	Data Bus 3	42	Ground
30	Data Bus 4	43	Busy
31	Data Bus 5	44	Acknowledge
32	Data Bus 6	45	Reset
33	Data Bus 7	46	Message
34	Data Bus P	47	Select
35	Ground	48	Control/Data
36	Ground	49	Request
37	Ground	50	Input/Output

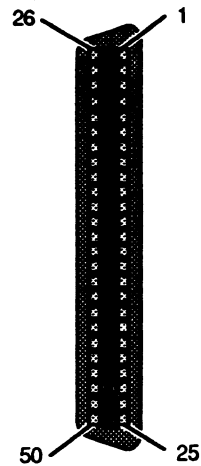


Figure B-3 SCSI Connector (50-Pin) on the Back of the Computer Unit

LAN Connector

The LAN interface provides a D15 connector for an attachment unit interface (AUI) cable. The AUI cable connects the computer system to an external medium attachment unit (MAU). The MAU contains the Ethernet transceiver and the medium-dependent interface (MDI) for connection to the physical network. The MAU provides electrical isolation between the AUI cable and the physical network. You can attach the LAN interface via the AUI cable to any one of the following types of external 10 MHz MAUs: 10BASE5 (Ethernet), 10BASE2 (Cheapernet or Thin Ethernet), 10BROAD36 (Ethernet over CATV), 10BASET (proposed Ethernet over twisted pair), or any other 10-MHz AUI compatible MAU or MAU-like device that does not require the Control Out signal specified in the AUI definition.

Table B-5 lists the signals for the LAN connector, and Figure B-4 shows the pin numbers for the connector.

Table B-5 LAN Interface Connector Signals

Pin	Signal	Circuit Name
1	Ground	CI-S (Control In Shield)
2	Collision +	CI-A (Control In A)
3	Transmit +	DO-A (Data Out A)
4	Ground	DI-S (Data In Shield)
5	Receive +	DI-A (Data In A)
6	Ground	Vc (Voltage Common)
7	No Connect	CO-A (Control Out A)
8	Ground	CO-S (Control Out Shield)
9	Collision -	CI-B (Control In B)
10	Transmit -	DO-B (Data Out B)
11	Ground	DO-S (Data Out Shield)
12	Receive -	DI-B (Data In B)
13	+12 V	VP (Voltage Plus)
14	Ground	VS (Voltage Shield)
15	No Connect	CO-B (Control Out B)
	Connect shell	Ground PG (Protective Ground)

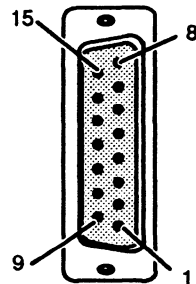


Figure B-4 LAN Connector (15-Pin) on the Back of the Computer Unit

End of Appendix

Appendix C

Current Requirements

Table C-1 lists the nominal current required (in amperes) by each board and drive. For the current requirements of VME controllers, refer to *Setting Up and Installing VMEbus Options in AViiON™ Systems*.

Table C-1 Current Requirements for Boards and Drives

Board Name	Current (Amperes)		
	+5 V dc	+12 V dc	-12 V dc
System Board	14.4	7	1
Second CPU Board	0.90	NA	NA
Memory Modules			
4-Mbytes	0.24	NA	NA
I/O Boards			
SCSI adapter	0.07	NA	NA
Internal Mass-Storage Drives			
150-Mbyte cartridge tape drive	0.7	1.5	NA
332-Mbyte disk drive	1.0	1.6	NA
662-Mbyte disk drive	2.0	4.0	NA
179-Mbyte disk drive	1.1	1.4	NA
2-Gbyte tape drive	2.7	0.65	NA
1.44-Mbyte diskette drive	0.51	1.0	NA
1.2-Mbyte diskette drive	1.2	NA	NA
600-Mbyte CD ROM drive	0.9	1.6	NA

NA = not applicable

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Documentation Set

This section lists those documents currently available for AViiON 3000 and 4000 series systems. The documents specifically referred to in the text of this manual are also listed in the “Related Manuals” section of the Preface.

Hardware Manuals

AViiON™ 300 and 400 Series Stations: Programming System Control and I/O Registers (014–001800) used in conjunction with *Technical Notice for AViiON™ 3000 and 4000 Series Computers: Programming System Control and I/O Registers* (014–001878)

Describes the system board architecture and explains how to program the system control logic, serial and parallel ports, LAN interface, and SCSI port.

Ethernet / IEEE 802.3 Local Area Network Installation Guide (014–000793)

Explains how to install both the coaxial cable plant of an Ethernet local area network (LAN) and the transceivers that connect the network to a node communication controller.

Expanding and Maintaining AViiON™ 3000 and 4000 Series Computers (014–001874)

Explains how to add or replace components (drives, memory modules, system board assembly, CPU board, power supply, fan assembly, and PROM).

MC88100 User's Manual, Reduced Instruction Set Computer (RISC) (014–001809)

Describes the Motorola 88100 Central Processing Unit (CPU), including the registers, addressing modes, internal and bus timing, and assembly–language instruction set.

MC88200 User's Manual, Cache / Memory Management Unit (CMMU) (014–001808)

Describes the Motorola 88200 Cache/Memory Management Unit (CMMU), including the CMMU registers, the cache and cache coherency, memory management and user/supervisor space, the Processor bus (Pbus), and the Memory bus (Mbus).

Using AViiON™ System Diagnostics (014–001863)

Describes how to use menu–based utilities to verify system hardware, test terminal or graphics display, test the functionality of a graphics keyboard and mouse, locate faults in LAN connections, and maintain cartridge tape and diskette media on AViiON hardware models.

Using the AViiON™ System Control Monitor (SCM) (014–001802)

Describes how technical users can use the commands and menus of the firmware monitor program to bring up software, control their system environment, and debug programs on AViiON hardware models.

Manuals for VME Hardware

HPS Application Installation Manual (069–000348)

Contains information about transferring software to VAC/16 asynchronous multiplexors and VDA/128 host adapters.

HPS Cluster Controller Download Package User Manual (069–000361)

Contains information about transferring code from the host computer to HPS cluster controllers that are managed by a VDA/128 host adapter.

HPS Diagnostic Application User Manual (069–000349)

Contains information about the interface provided by the Diagnostic Application software for the host system.

HPS Downloadable Cluster Controller Technical Manual (014–001813)

Contains information about installing, programming, and operating the HPS Downloadable Cluster Controller hardware.

HPS Downloadable Cluster Controller Installation Guide (014–001814)

Describes how to install the HPS Downloadable Cluster Controller hardware.

HPS Terminal Control Software, Version 03A User's Manual (069–000347)

Contains information about the interface provided by the Terminal Controller software for the host system. This interface allows access to the asynchronous communication channels of the VAC/16 multiplexor and the VDA/128 host adapter board with its cluster controllers.

HPS VMEbus Host Adapters Technical Manual (014–001815)

Contains information about installing, programming, and operating the HPS VMEbus Host Adapter (VDA/128) hardware.

HPS VMEbus Multiplexor (HPS–6236/6237) Technical Manual (014–001817)

Contains information about installing and operating the HPS VMEbus Multiplexor hardware (VAC/16).

Setting Up and Installing VMEbus Options in AViiON™ Systems (014–001867)

Describes how to jumper VME controllers to operate in an AViiON environment. Explains how to install and remove the controller boards in the system's VME card cage, and how to jumper the VME printed circuit backplane when necessary. Also supplies instructions for connecting external devices to the controller boards.

V/Ethernet 3207 Hawk Local Area Network Controller for Ethernet User's Guide (014–001818)

Contains information about programming and installing the V/Ethernet 3207 Hawk Local Area Network Controller (VLC).

VMEbus Data Communications Processor (DCP-8820) Technical Manual
(014-001816)

Contains information about installing the VMEbus Data Communications Processor (VSC/3).

Storage Peripheral Manuals

Installing and Operating the Model 10565 Peripheral Housing Unit (014-001810)

Describes how to unpack, inspect, install, and power up the unit. Explains how to replace the power supply, line cord, fan, and provides general instructions for replacing a drive. Lists physical, electrical, and environmental specifications of the peripheral housing unit.

Installing the Model 6586/6587 Magnetic Tape Streamer Unit (014-001692)

Describes how to unpack, inspect, install, and power up the unit. Explains how to install and remove reel-to-reel tapes.

Installing and Operating Your Model 6538/6539 Half-Height Winchester Disk Drive (014-001722)

Describes how to unpack, install, power up, and maintain the 179-megabyte half-height Winchester disk drive.

Installing the Model 6491 Fixed Disk Drive (014-001460)

Describes how to unpack, install, power up, and maintain the 322-megabyte full-height Winchester disk drive.

Installing Your Model 6660 Series Fixed Disk Drive (014-001940)

Describes how to unpack, install, power up, and maintain the 332-megabyte half-height Winchester disk drive.

Installing Your Model 6554/6555 Series Disk Drive (014-001702)

Describes how to unpack, install, power up, and maintain the 662-megabyte full-height Winchester Drive.

Installing and Operating Your Model 6552 Series CD-ROM Drive (014-001721)

Describes how to unpack, install, power up, and maintain the 600-megabyte half-height CD-ROM drive.

Installing and Operating Your 150-Megabyte 1/4-inch Cartridge Tape (014-001699)

Describes how to unpack, install, power up, and maintain the 150-megabyte QIC (quarter-inch cartridge) half-height tape drive.

Installing and Operating Your Model 6590 Series Cartridge Tape Drive (014-001701)

Describes how to unpack, install, power up, and maintain the 2.2-gigabyte standalone cartridge tape drive.

Installing the Model 6562/6563-Series Diskette Drive (014-001921)

Describes how to unpack, install, power up, and maintain the 1.44-megabyte, 5.25-inch and 1.2-megabyte, 3.5-inch half-height diskette drives (with SCSI adapter board).

Software Manuals

Installing and Managing the DG/UX™ System (093-701052)

Shows how to install and manage the DG/UX operating system on AViiON hosts that will run as stand-alone, server, or client systems. Intended for system administrators who are familiar with the UNIX operating system.

Other Organizations' Documents

The following documents are available from other organizations.

The VMEbus Specification (Motorola document number HB212)

Describes Motorola's Versa Modula Europa bus (VMEbus), and how to program using the VMEbus. This document is available from Motorola Corp.

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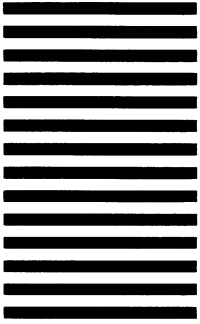
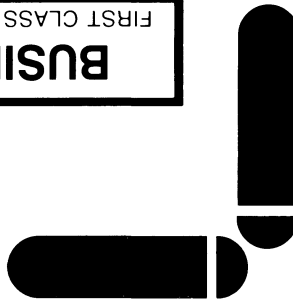
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