

**Setting Up and Starting
AViiON™ 5000 Series Systems**

Setting Up and Starting AViiON™ 5000 Series Systems

014-001806-03

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Setting Up and Starting AViiON™ 5000 Series Systems

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Preface

This manual is written for the person or persons responsible for installing and starting the AViiON™ 5000 series office computer. It contains step-by-step procedures for setting up and starting your AViiON system hardware for the first time, and similar procedures for starting and running AViiON System Diagnostics. This manual also lists technical specifications and pin assignments for I/O connectors.

How This Manual Is Organized

The first three chapters contain general information that describes how to unpack the computer and connect various system components to the computer unit.

- Chapter 1 Describes the basic AViiON 5000 series system and its hardware components, site requirements, how to unpack your system and verify the equipment, and the cables required for setting up.
- Chapter 2 Describes how to connect those system components available on all systems (the system console, a parallel printer, and one optional asynchronous device such as a modem) to the computer unit. Also describes how to terminate and/or connect a SCSI bus to the computer, and includes SCSI device identification and configuration guidelines.
- Chapter 3 Describes how to connect optional devices such as LANs, terminals, printers, modems, and cluster boxes to the computer unit. Also describes controller configurations, port locations, cables, and cable/port connectors.

Chapters 4 and 5 contain step-by-step instructions for powering up the system for the first time, solving some common problems you may encounter during any powerup, and running an optional hardware acceptance test under AViiON System Diagnostics.

- Chapter 4 Contains step-by-step procedures for powering up your system the first time. Describes power-up messages, and solutions to common power-up problems.
- Chapter 5 Describes how to boot AViiON System Diagnostics from cartridge tape or hard disk, and provides step-by-step instructions for running an acceptance test on your system hardware. Also describes diagnostic tools and utilities.

Preface

The appendixes to this manual contain material to which you can refer as needed.

Appendix A Includes technical specifications of your hardware.

Appendix B Contains pin assignments for I/O connectors.

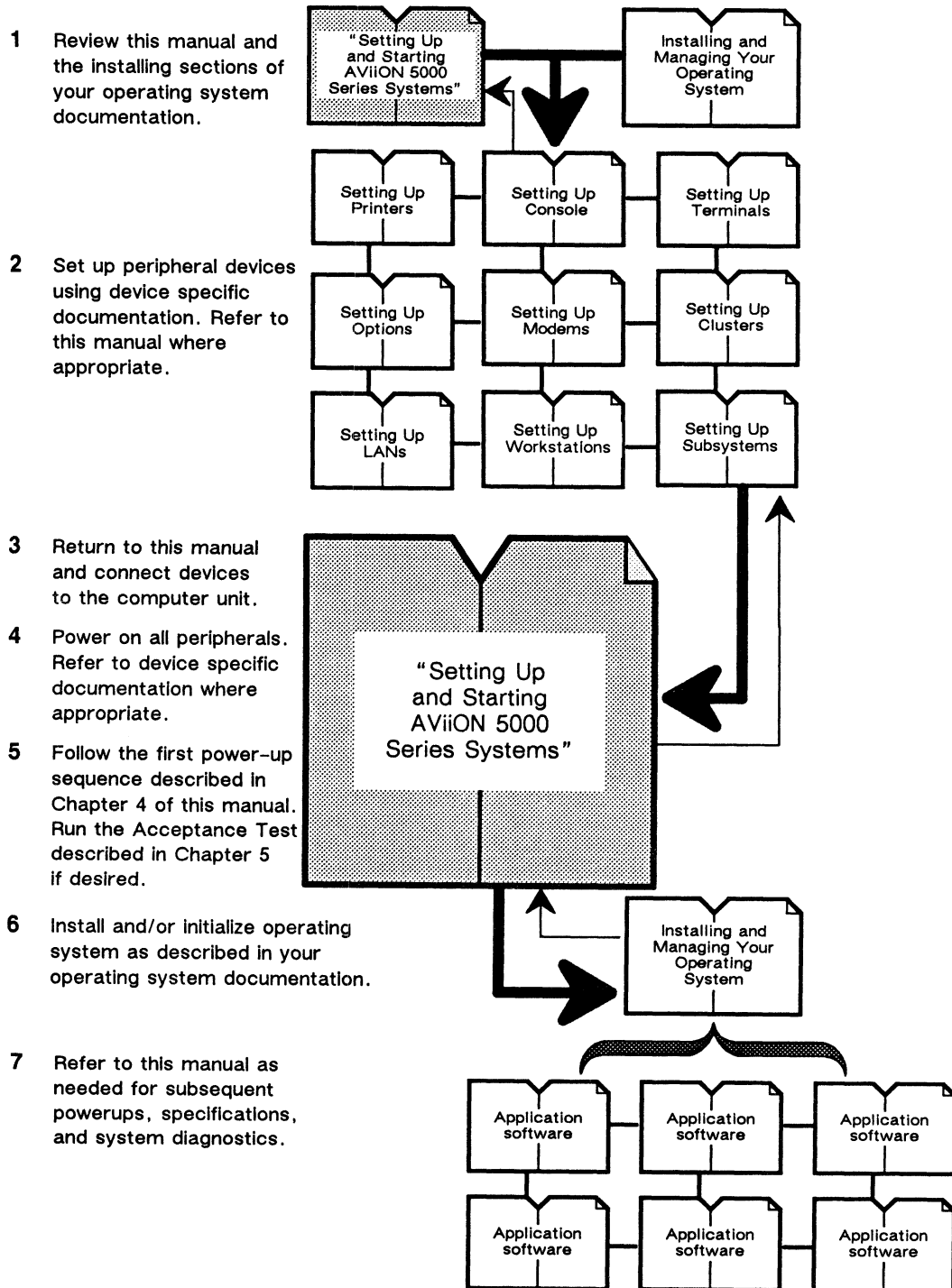
Once your computer system is set up and started, you should refer to your operating system documentation for detailed information on installing, managing, and using your operating system software. You can then refer to this manual as needed; for example, you should refer to Chapter 4 if you encounter problems during subsequent powerups, Chapter 5 if you want to use AViiON System Diagnostics, or Appendix A for technical specifications.

Reading Path and Sequence of Procedures

To set up your office system, we recommend that you use this manual to follow the sequence of installation and startup procedures outlined below:

1. Review this manual and the installing sections of your operating system documentation. Within this manual, note particularly SCSI information, configuration rules, and appropriate controller information. Make certain you have the equipment you ordered, and the correct cables and connectors to install your equipment.
2. Set up all peripheral devices and local area networks, using the device-specific documentation supplied with each component.
3. Return to this manual to connect devices to your basic system; then use the material in Chapter 3 to connect your remaining system options.
4. Follow the first power-up sequence described in Chapter 4; refer to the last section of that chapter if you encounter power-up problems.
5. If you need to check or specify configuration parameters for your system console, modem port device, or parallel printer, refer to *Using the AViiON™ System Control Monitor (SCM)*.
5. If you want added assurance that your system hardware is functioning properly, enter the System Control Monitor, boot AViiON System Diagnostics, and run a system Acceptance Test as described in Chapter 5.
6. Refer to the appendixes as needed.

The reading chart on the following page illustrates the intended use of this manual.



Reading Path and Sequence of Procedures

The remainder of this Preface contains important information on related manuals, text conventions used in this manual, and contacting Data General.

Related Documents

A comprehensive list of documentation available from Data General and related to AViiON 5000 series systems follows the Index at the back of this manual. Some of the first power-up steps described in this manual refer you to the following:

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

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

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

Describes how to install, run, and manage the DG/UX operating system. If your system includes DG/UX, you will need this manual to completely install and initialize your operating system immediately following your first powerup.

Reader, Please Note

In this book, we distinguish between the words *terminal* and *system console* as follows:

Terminal	An interactive device with a keyboard for input and a screen or printer for output. A terminal with a screen is called a <i>display terminal</i> ; a terminal with a printer is called a <i>hard-copy terminal</i> .
System console	The terminal that will display diagnostic messages and from which you will bring up your operating system. The system console communicates directly with the computer's system board.

This manual refers to small computer system interface (SCSI) printed-circuit boards within the computer unit as *SCSI controllers*. Some documentation, especially for your system software, may refer to the same boards as *SCSI adapters*.

The term *New Line* in this manual refers to the New Line key on some Data General keyboards. The keyboard for your system console may label the equivalent key Return, CR (Carriage Return), Enter, or with a standard symbol like the following:



Additionally, this manual uses certain symbols in special ways:

Symbol	Means
↵	Press the New Line, Carriage Return (CR), or Enter key on your terminal's keyboard.
SCM>	The default System Control Monitor prompt on single processor systems.
Jp#n/SCM>	The default System Control Monitor prompt on multiple processor systems, where n is the number of the attached job processor.

Finally, in examples we use

This typeface to show your entry.

This typeface to show system queries and responses.

Contacting Data General

Data General wants to assist you in any way it can to help you use its products. Please feel free to contact the company as outlined below.

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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.

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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.

End of Preface

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Chapter 1

AViiON™ Office Computer System Hardware and Options

This chapter describes the basic AViiON™ 5000 series office computer system and its requirements for an appropriate installation site. Most systems consist of the computer unit, a system console, user terminals, modems, and printers. Your AViiON system might also include LAN-based devices such as workstations, cluster controllers for asynchronous user devices, and add-on mass storage units.

Figure 1-1 shows the AViiON 5000 computer unit and typical device options.

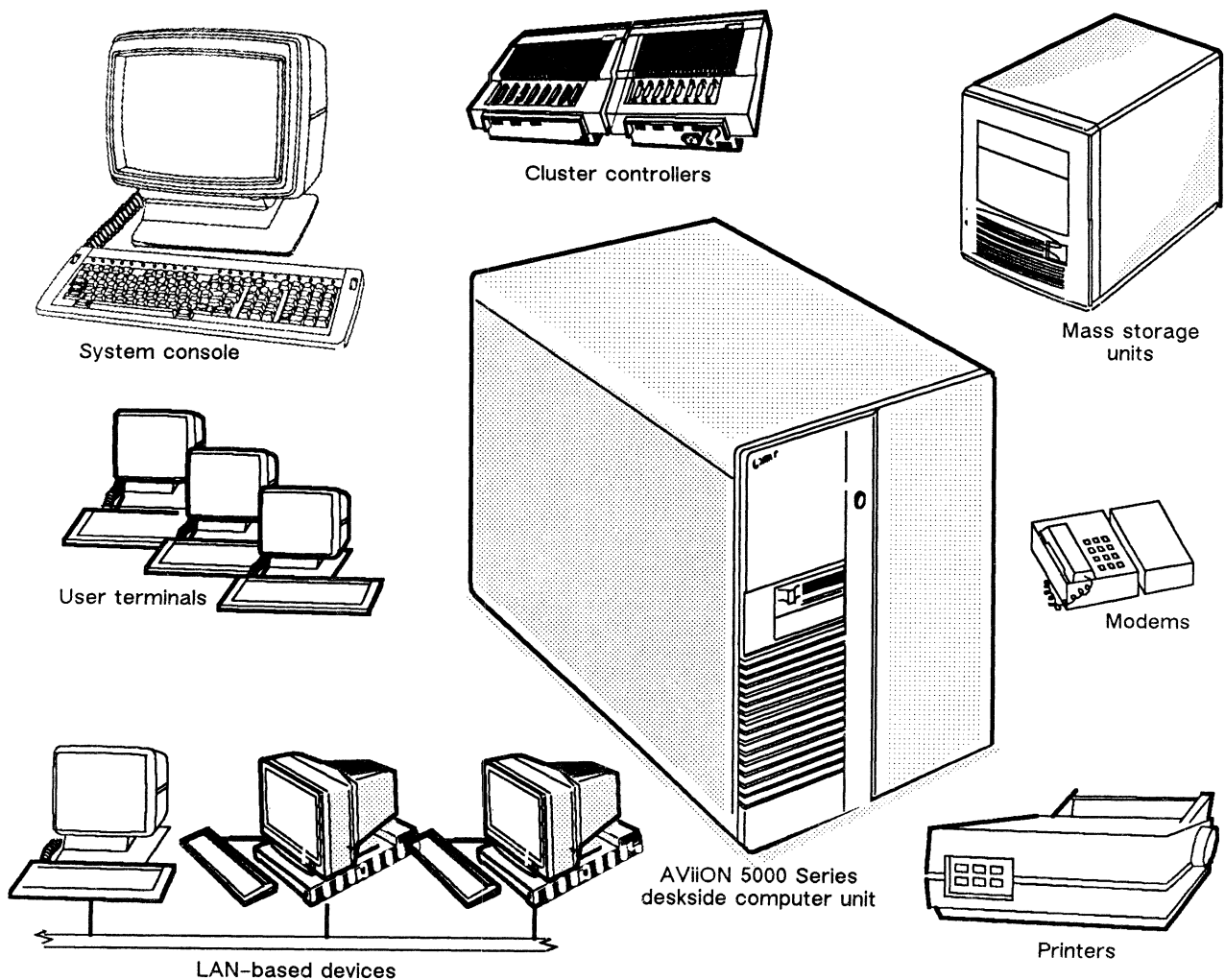


Figure 1-1 AViiON 5000 Series System Components

Basic System and Options

The AViiON 5000 series computer is a multiuser or server system supporting a variety of configurations. The basic desktside computer unit shown in Figure 1-2 includes the system board, power supply, a VME bus, one SCSI bus controller with an external SCSI bus connector, a SCSI cartridge tape drive, one ESDI controller, and an ESDI hard disk.

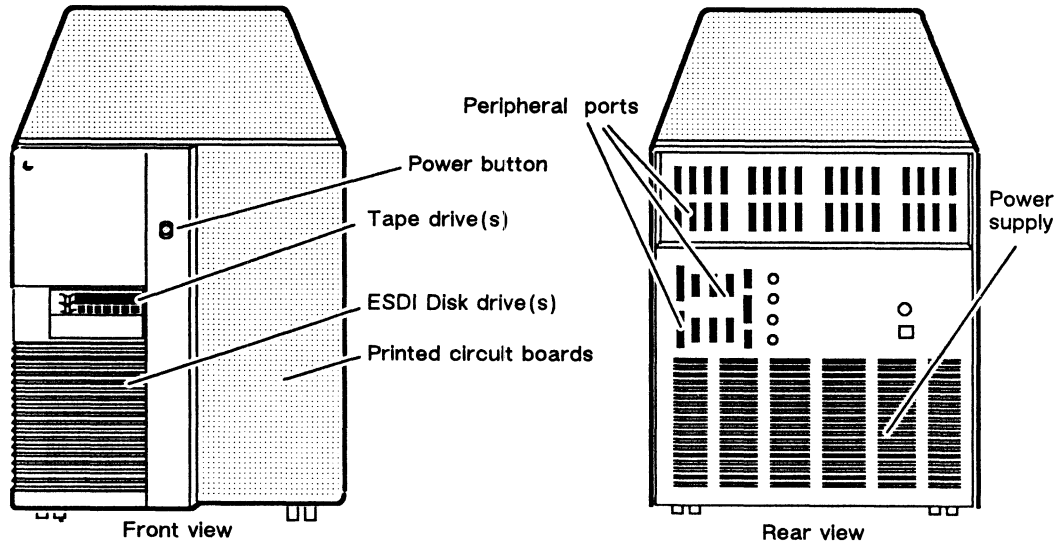


Figure 1-2 AViiON 5000 Series Computer Unit

Each AViiON 5000 series system includes the following standard components enclosed within the computer unit:

Standard Components

- System processor board
 - Single or dual processor
 - 16 or 8 Mbytes memory (dual – 16 only)
 - Support for three peripheral ports including:
 - 1 line for system console
 - 1 parallel printer port
 - 1 asynchronous option (modem) port
- One small computer system interface (SCSI) controller with external bus expansion port
- 150-Mbyte (QIC-150) SCSI cartridge tape drive
- One enhanced small device interface (ESDI) controller
- 322- or 648-Mbyte ESDI Winchester disk drive
- 760-watt Power supply
- 10-slot backpanel printed circuit board with VME bus (one slot dedicated to system processor board)

Your computer system may also include a combination of the following:

Internal Options (Maximum)

- Second internal 150-Mbyte (QIC-150) SCSI cartridge tape drive
- Second and third ESDI Winchester disks
- Four 16-, 32-, or 48-Mbyte memory expansion boards
Total of 208 Mbytes maximum
- One additional SCSI bus controller
Supports up to seven external SCSI disk and tape devices
- Four VSC/4 synchronous controllers
- Two VAC/16 asynchronous controllers
- Four VDA/128 asynchronous host adapters
- Two VLC Ethernet Local Area Network controllers

External Options (Maximum)

- Model 10565 Peripheral Housing Unit (PHU) mass storage subsystems
 - Three half-height (1.75-inch) 5.25-inch SCSI devices per PHU:
 - QIC-150 cartridge tape
 - One full-height (3.25-inch) 5.25-inch SCSI device per PHU:
 - 662-Mbyte SCSI Winchester disk
 - 322-Mbyte SCSI Winchester disk
 - 2-Gbyte archival cartridge tape drive
 - Combination of one full-height and one half-height device per PHU
- Four Model 6586/6587 reel-to-reel tape drives per SCSI controller
- Four synchronous devices per VSC/4 controller;
Four synchronous devices per system
- 16 asynchronous devices per VAC/16 controller
- 128 asynchronous devices per VDA/128 host adapter; 512 maximum per system
Controlled by maximum of 16 VDC/8P or maximum of eight VDC/16
downloadable cluster controller boxes per VDA/128

Reviewing Your Installation Site

Before you unpack and set up your AViiON system, check your site against the environmental and electrical requirements given below. For detailed computer specifications, see Appendix A, "Technical Specifications." For peripheral device specifications, see the documentation shipped with the peripheral device.

Environmental Requirements

Temperature: 50–100 degrees F; 10–38 degrees C

Relative humidity: 20–80 percent, noncondensing

Altitude: 0–8000 feet (0–2438 meters)

Minimum clearance front and back: 18 inches

Keep the computer and all peripheral devices out of direct sunlight.

Your computer, while running, emits 1,875 Btus of heat per hour.

Voltage Level

All systems use single-phase ac power within the frequency range 47–63 hertz.

Your system has one of the following voltage options:

120 volts, 12 amperes

220 volts, 10 amperes

100 volts, 12 amperes

Power Consumption

Your computer unit, including blowers, consumes a maximum of 760 watts of power.

This power consumption does not include peripheral devices such as modems, terminals, and printers; they consume extra power. See the device-specific documentation for peripheral device specifications.

Unpacking and Inspecting Your AViiON Computer System

Once you have reviewed your site, you are ready to take the computer out of its shipping carton, check the packing list to verify the carton's contents, and inspect the cables and cable connectors to ensure that you can set up your system properly.

This section describes how to unpack and inspect your AViiON computer system and the cables that connect your system components together. The last section provides tables that specify appropriate cables and connectors you will need.

Tools and Equipment

To unpack and inspect your system, you will need the following tools and equipment:

- Pen or pencil
- Knife or similar tool to cut any shipping tape
- Bolt wrench (inside shipping carton)
- Packing slip (on shipping carton)
- Your order form for the components you received

Unpacking Your AViiON Computer System

Follow these steps to unpack your computer system.

1. Examine the shock indicator label located on the side of the shipping carton. If it indicates that the carton has been mishandled, *do not open the carton*. Instead, follow the instructions that accompany the label on the outside of the carton. If the shock indicator indicates that the carton has not been mishandled, proceed to step 2.
2. Remove the packing slip from the outside of the shipping carton. Compare the list of contents with your order form; if the packing list does not match the components you ordered, contact Data General immediately by calling 1-800-DG-HELPS. If the packing slip matches the components you ordered, proceed to step 3.

NOTE: Keep your packing slip as a configuration sheet for future reference. You might need this information for reference later if you contact Data General about your AViiON system. You will also use this packing slip again to take an inventory of your equipment (step 5).

3. Open the shipping carton and remove your computer as pictured on the outside of the carton. (A wrench to remove the bolts that secure your computer to the shipping pallet is shipped in the carton.) Once you unpack and dismount your computer unit, open the other shipping cartons and *carefully* remove any other system components that arrived with your order. To avoid damaging the contents of your boxes, use a sharp knife or similar tool to make *shallow* cuts through any shipping tape.

Inspecting Your AViiON Computer System

Follow these steps to inspect and inventory your computer system.

1. Inspect your computer and any components for damage. If your unit or any components appear damaged, contact Data General immediately by calling 1-800-DG-HELPS.
2. Inventory your equipment.

Compare the items you received with the items listed on the packing slip. Make sure that you have all of the cables listed on the packing slip (the cables may be in a separate box.) Also, make sure that the model and part numbers on the packing slip match those on your equipment. If any items appear incorrect or missing, contact Data General.

- a. If your order includes a DASHER® terminal, check the labels on the back of the terminal and on the bottom of the keyboard for suffixes after the model numbers. These suffixes should match those for the equipment you ordered. The letter following the keyboard's model number specifies the international font of your keyboard as shown below:

Suffix	Font
A	U.S. English
B	U.K. English
C	French
D	German
E	Japanese/Katakana
G	Spanish
I	Italian
N	Swedish/Finnish

- b. Make sure that the power characteristics match those of your ac power source. Since most sites in the United States and Canada have 120 volts ac power, the voltage on your AViiON 5000 system power supply is usually 120 volts ac. If the ac power voltage at your site is between 220 and 240 volts ac, or 90 and 110 volts ac, your order and the model specified on your packing slip should conform to the correct power specifications. A suffix of -1 after your system model number indicates that your system voltage is 100 volts ac. Suffixes -5, -6 ...-0 indicate 220/240 volts ac. If you are not sure about the correct ac power voltage at your site, consult with a licensed electrician or contact Data General.

CAUTION: Any attempt to power up the AViiON computer system with an incorrect voltage setting can seriously damage the computer.

Identifying Cables

Compare the cables you received with the equipment in your system configuration, and with the part and model numbers in the Tables 1-1 through 1-3.

NOTE: Do not attempt to connect any part of your system with the incorrect cable, even if the cables appear similar.

**Table 1-1 AViiON 5000 Series Systems
Direct-Connection Cables**

Device	Part No.	Length (ft)	Model No.	
System console and modem port terminal	005-34255	10	15339E010	
	005-34992	15	15339E 015	
	005-34993	25	15339E025	
Modem port modem	005-32917	6	15290E006	
	005-32918	15	15290E015	
	005-32919	25	15290E025	
Asynchronous terminals	005-34256	10	15340E010	
	005-34990	15	15340E015	
	005-34991	25	15340E025	
Asynchronous modems	005-36256	10	To be supplied	
	005-36257	15	To be supplied	
	005-36258	25	To be supplied	
Synchronous devices (modems)	005-32917	6	15290E006	
	005-32918	15	15290E015	
	005-32919	25	15290E025	
(D25 connectors for all synchronous and asynchronous device cables)				
Parallel Printer	Centronics	005-35573	15	15345E015
	Centronics	005-35574	25	15345E025
	Data Products	005-35575	15	15346E015
	Data Products	005-35576	25	15346E025
(CHAMP 36 pin connector)				

(continued)

**Table 1-1 AViiON 5000 Series Systems
Direct-Connection Cables**

Device	Cable Part No.	Cable Length (ft)	Cable Model No.
Cluster controller network	005-34246	25	15338E025
	005-34247	50	15338E050
	005-34248	100	15338E100
	(RG-62 coax with BNC connectors)		
SCSI external bus	005-33003	1.3	15325E001
	005-33004	5	15325E005
	005-33005	10	15325E010
	(CHAMP 50 pin connectors)		
LAN	Teflon	005-33791	16.4 (5m) 1326
	Teflon	005-33787	65.6 (20m) 1326A
	PVC	005-33766	16.4 (5m) 15274E005
	PVC	005-31694	65.6 (20m) 15274E020
(D15 connector)			

(concluded)

Table 1-2 Cluster Controller Power Cords (VDC/8P and VDC/16)

Voltage	Part No.	ac Frequency	Power Suffix
100	NA	50/60	-1
120	NA	60	none
(North American standard)			
240	109-813	50	-5
	109-809	50	-6
220	109-812	50	-7
	109-811	50	-8
	109-815	50	-9
	109-810	50	-0

NOTE: Each cluster controller package includes a 100/120 volt power cord, shipped with the controller box. If your site requires 220 or 240 volts ac, make sure you received the correct number and type of additional power cords; do not attempt to use the 100/120 volt ac cords.

Table 1-3 AViiON 5000 Series Power Cords

Voltage	Part No.	ac Frequency	Power Suffix
100	109-821	50/60	-1
120 (North American standard)	109-821	60	none
240	109-886	50	-5
	109-885	50	-6
220	109-884	50	-7
	109-883	50	-8
	109-849	50	-9
	109-848	50	-0

End of Chapter

Chapter 2

Setting Up the Basic System

This chapter describes how to connect a system console, a parallel printer, a SCSI bus cable or bus terminator, and a single modem or other optional asynchronous device to the rear panel of your computer. Refer to the individual manuals that accompanied each device to set up these peripherals; then follow the procedures in this chapter to connect the devices to your system. *After* connecting all of your basic devices to the computer unit, you can attach the correct ac power cord as described in “Connecting the AC Power Cord,” later in this chapter.

NOTE: If your system includes any external SCSI peripheral devices, such as peripheral housing units or tape drives, read the section in this chapter on SCSI configuration rules and device identification numbers *before* you set up your external SCSI peripheral device(s).

Figure 2-1 shows examples of AViiON basic system devices.

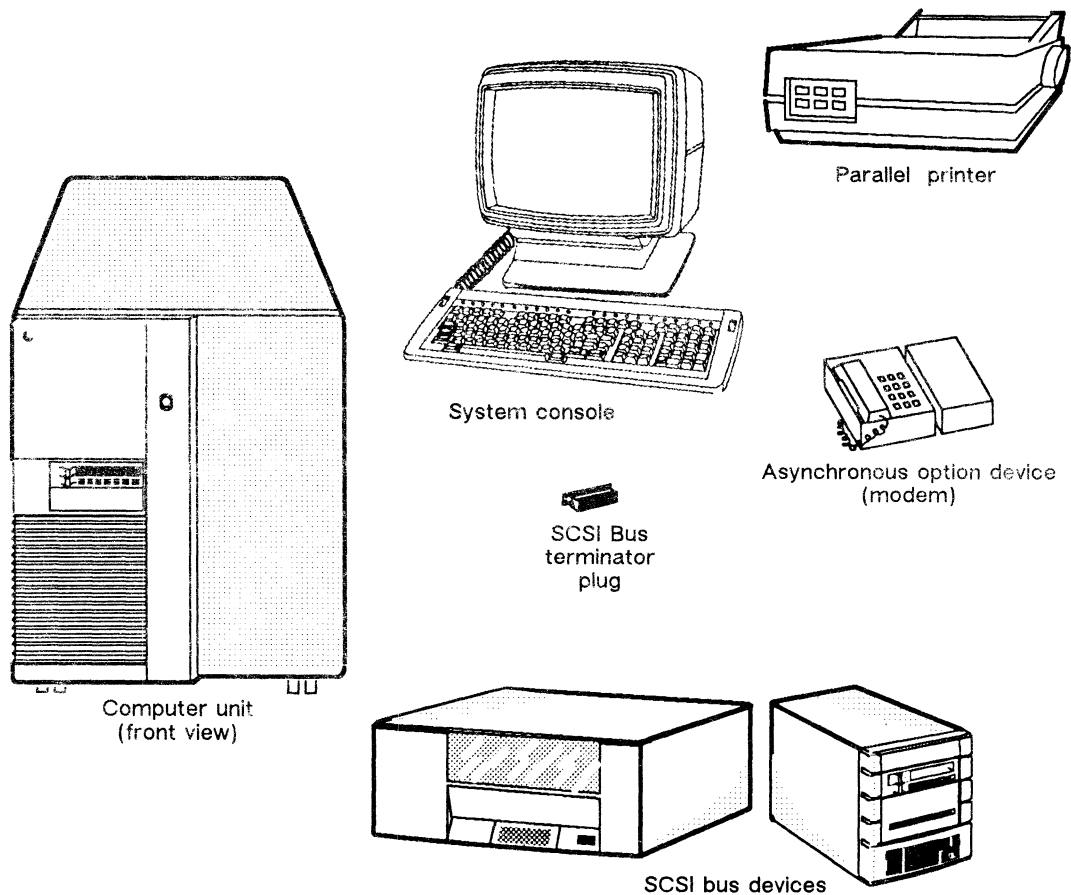


Figure 2-1 AViiON 5000 Basic System Devices

Tools and Equipment

To set up and connect the various components of your system, you will need the following tools and equipment as a minimum set. Some optional devices may require additional equipment as indicated in the installation manuals for each device.

- All manuals describing how to set up and configure peripheral devices; in some cases this includes multiple manuals for a single device
- Small flat-head screwdriver
- Needle-nose pliers
- Phillips-head screw driver

NOTE: The term *bulkhead* refers to the top rear area of your computer housing (the area labeled for asynchronous ports 1–32); the term *rear panel* refers to the lower back portion of your computer housing. Do not confuse either term with the system *backpanel* (sometimes called the *backplane*), which is enclosed within the computer housing. The backpanel is accessible by qualified Data General field personnel only.

Figure 2-2 shows the computer unit bulkhead and all rear panel connectors.

Note: Your computer will not support the combination of options indicated in this figure. (See Chapter 3 for configuration guidelines.)

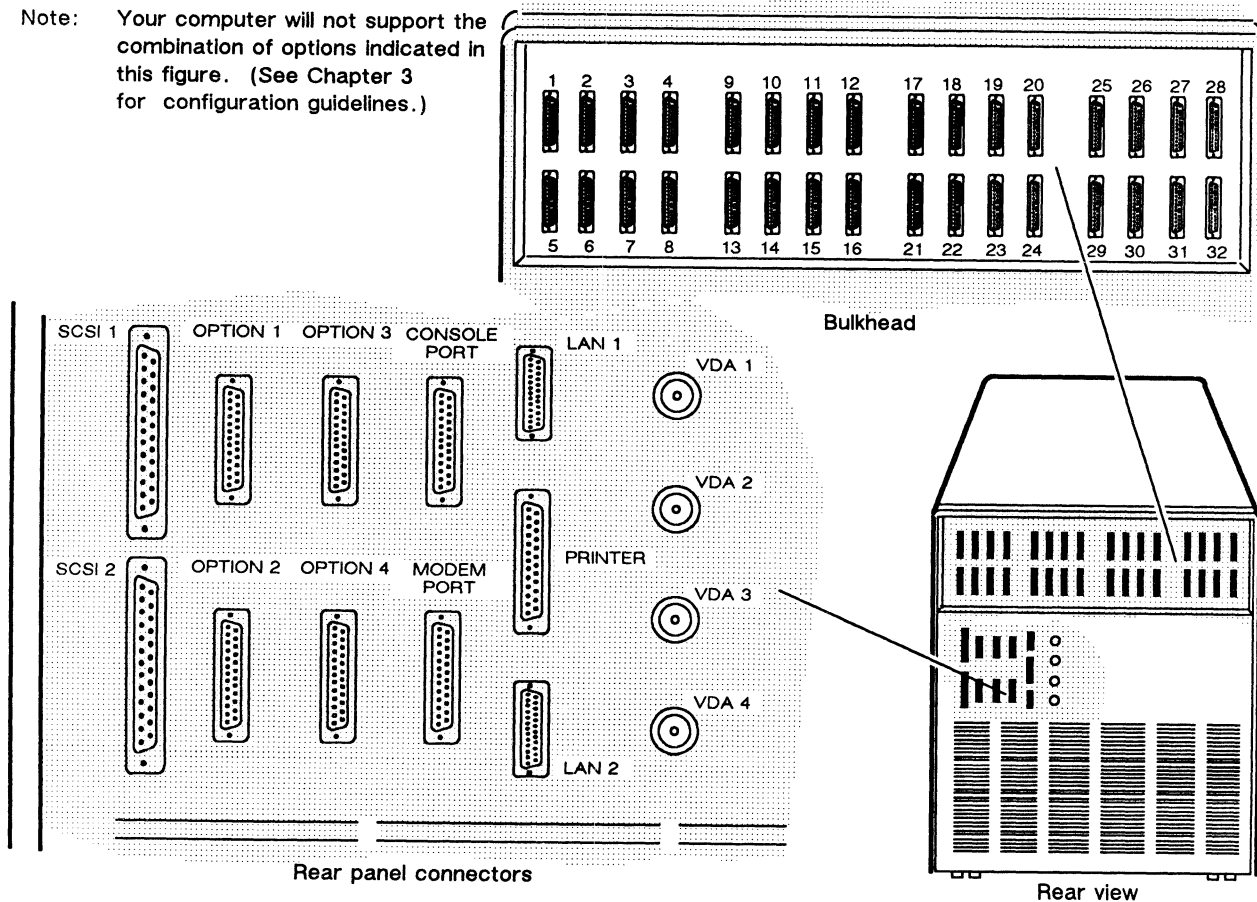


Figure 2-2 AViiON 5000 Bulkhead and Rear Panel

Connecting the System Console

You can use several types of asynchronous devices for a system console; most systems employ a standard display terminal. Your system console must include keyboard I/O and have an RS-232-C interface.

Figure 2-3 shows the location of the system console connector on the rear panel of your computer.

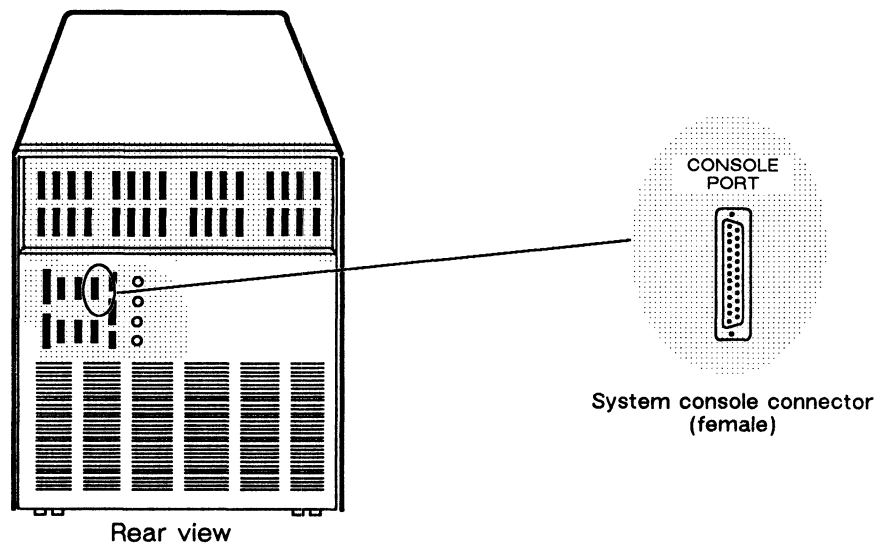


Figure 2-3 AViiON 5000 System Console Port

The default characteristics for an AViiON system console line are as follows:

- 9600 baud rate
- 8 data bits, no parity
- ANSI character code set
- Enabled flow control
- U.S. English console language (keyboard set)

To power up your system for the first time, your system console should conform to the default baud and data bit characteristics listed above (it will also work correctly if set to mark, rather than even, parity). Refer to the device-specific documentation for your console device to verify and, if necessary, change the device parameters. You can change the console characteristics settings expected by your computer *after* your first power up as described in *Using the AViiON™ System Control Monitor (SCM)*.

If the device-specific documentation for your system console suggests that you test the device with the power on, make sure to turn off power to the console before you connect it to your computer. Make sure the keyboard is connected to the console.

Setting Up the Basic System

The system console connects to the rear panel of your computer with one of the following cables. *Make certain you use the correct cable to connect your system console.*

Cable Part Number	Cable Length (ft)
005-34255	10
005-34992	15
005-34993	25

NOTE: Although both ends of your system console cable may look identical, the internal structure of the cable requires that you attach the connector marked P1 to your computer unit, and the connector marked P2 to your console.

Figure 2-4 shows how to align the connector pins and D-shaped bevels before gently pushing the cable connector marked P1 onto the rear panel connector. Align the two captive connector screws with the stand-off mounts as shown, and then tighten the screws securely.

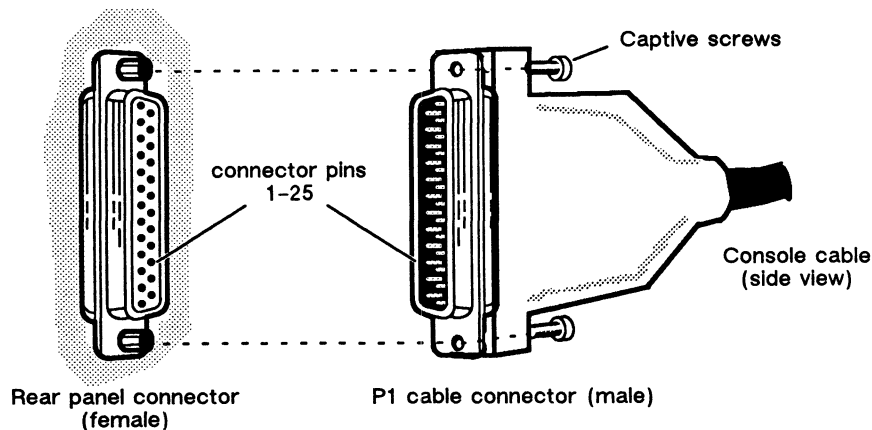


Figure 2-4 Plugging Together the System Console Connectors

Connect the remote (P2) end of the cable to your console (refer to the device-specific documentation for your console, if necessary). Then, continue with the next section that applies to your system. Most systems include a parallel printer, which you would attach as described in the next section, "Connecting a Parallel Printer." However you configure your system, you must connect or terminate the SCSI bus as described in the section "Terminating and Connecting the SCSI Bus."

Connecting a Parallel Printer

Set any characteristics unique to your printer (such as vertical format unit [VFU] or tab memory) before connecting the printer to your computer. The system is initially set to support a Centronics printer interface with a negative strobe; *Using the AviiON™ System Control Monitor (SCM)* describes how you can change that printer port setting during or after the first powerup to support a Data Products printer interface that uses a positive strobe.

Figure 2-5 shows the location of the parallel printer connector on the rear panel of your computer.

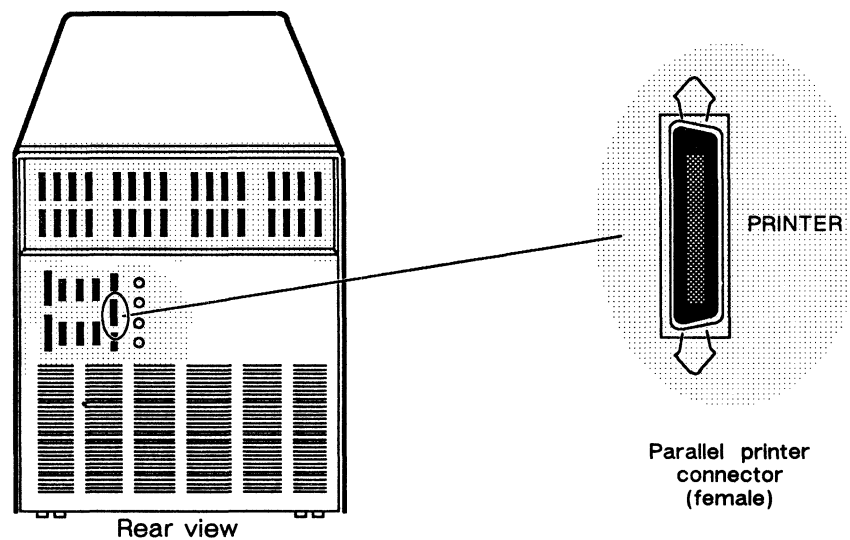


Figure 2-5 AViiON 5000 Parallel Printer Port

A parallel printer connects to the rear panel of your computer with one of the following cables. If your printer requires an adapter, connect the adapter connector/cable before you attach the cable to your computer.

Printer Interface	Cable Part Number	Cable Length (ft)
Centronics	005-35573	15
Centronics	005-35574	25
Data Products	005-35575	15
Data Products	005-35576	25

Figure 2-6 shows how to align the connector pins and the D-shaped connector bevels before gently inserting the cable connector into the rear panel connector.

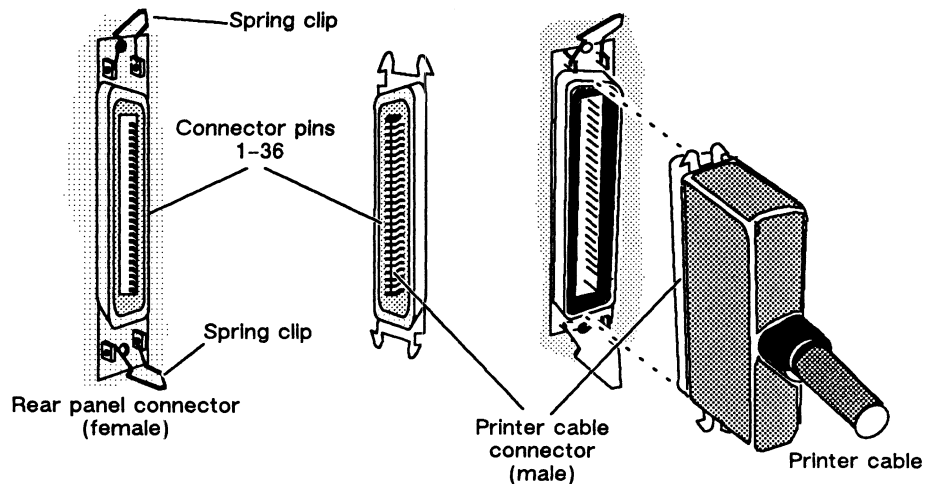


Figure 2-6 Plugging Together Printer Connectors

Push the spring clips attached to the rear panel connector straight up or down into the brackets on the cable connector as shown in Figure 2-7. Your vertical pressure will push the clips into place; do not squeeze or pull the clips out of shape.

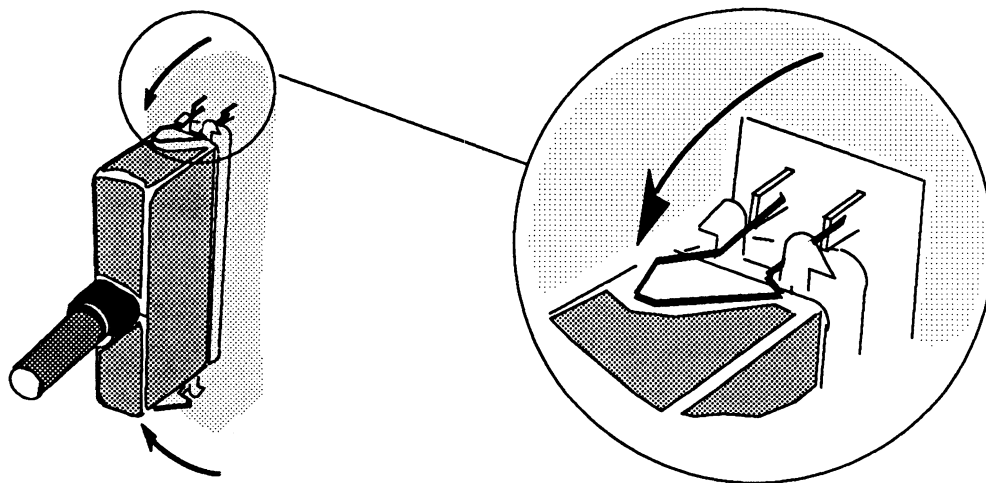


Figure 2-7 Securing the Printer Connector

If you haven't already connected the remote end of the cable to your printer, do so now (refer to the device-specific documentation for your printer, if necessary). Then, continue with the next section, "Connecting a Device to the Modem Port." If you do not plan to connect a device to the "modem" port, skip the next section and continue with "Terminating and Connecting the SCSI Bus."

Connecting a Device to the Modem Port

The port marked “MODEM PORT” on the rear panel of your computer (sometimes referred to as “option port B”) supports any asynchronous device with an RS-232-C interface.

Figure 2-8 shows the location of the modem port connector on the rear panel of your computer.

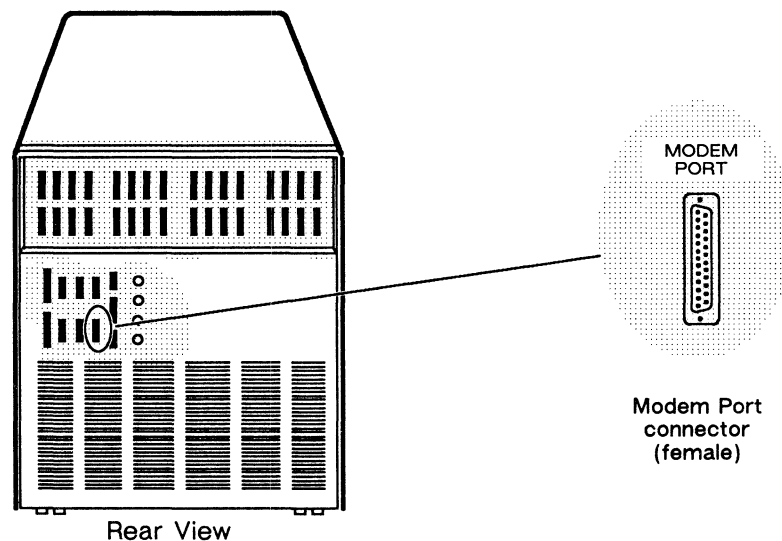


Figure 2-8 AViiON 5000 Modem Port

Make sure you have set the device parameters as specified in the documentation that accompanied the device. If the modem port device does not conform to the default characteristics expected by the computer, it will not affect your first powerup. You can change the baud rate and character size settings to conform to your device later, as described in *Using the AviiON™ System Control Monitor (SCM)*. The default I/O characteristics for this port are as follows:

- 1200 baud rate
- 7 data bits, even parity

Connect a device to the modem port with one of the following cables. *Make certain you use the correct cable* to connect your modem or terminal to the modem port.

	Cable Part Number	Cable Length (ft)
Terminal	005-34255	10
	005-34992	15
	005-34993	25
Modem	005-32917	6
	005-32918	15
	005-32919	25

Figure 2-9 shows how to align the connector pins and the D-shaped bevels before gently pushing the cable connector onto the rear panel connector. Align the two captive connector screws as shown, and then tighten them securely.

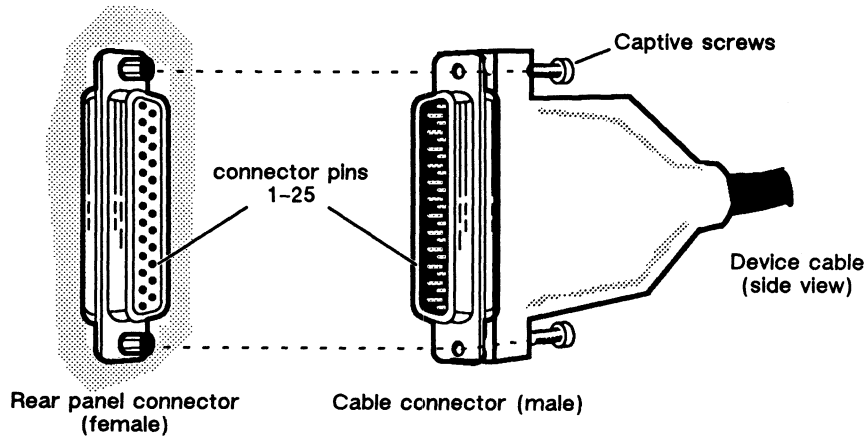


Figure 2-9 *Plugging Together Modem Port Connectors*

If you haven't already connected the remote end of your cable to your optional device, do so now (refer to the device-specific documentation for your option, if necessary). Then, continue with the next section, "Terminating and Connecting the SCSI Bus."

Installing and Terminating a SCSI Bus

Your computer unit includes at least one small computer systems interface (SCSI) bus controller that supports your internal cartridge tape drive(s). This controller is factory-specified as controller 0 and the bus it supports extends to the external connector labelled "SCSI 1" on your computer's rear panel. An optional second SCSI bus controller is factory-specified as controller 1 and supports a bus extending from the connector marked "SCSI 2" on the rear panel. Each SCSI bus in your system can support a total of seven SCSI-based tape and/or disk devices housed internally, independently, or within a mass-storage subsystem.

NOTE: Some documentation, especially for your system software, may refer to the AViiON 5000 SCSI controller boards as SCSI *adapters*.

An enhanced small device interface (ESDI) controller supports any disk drive(s) housed within the AViiON 5000 computer unit. The ESDI controller and drive(s) are completely factory-installed and configured.

Figure 2-10 shows the location of the SCSI connectors on the rear panel of your computer. (If your system does not include a second SCSI controller, the rear panel slot marked "SCSI 2" will not contain a connector.)

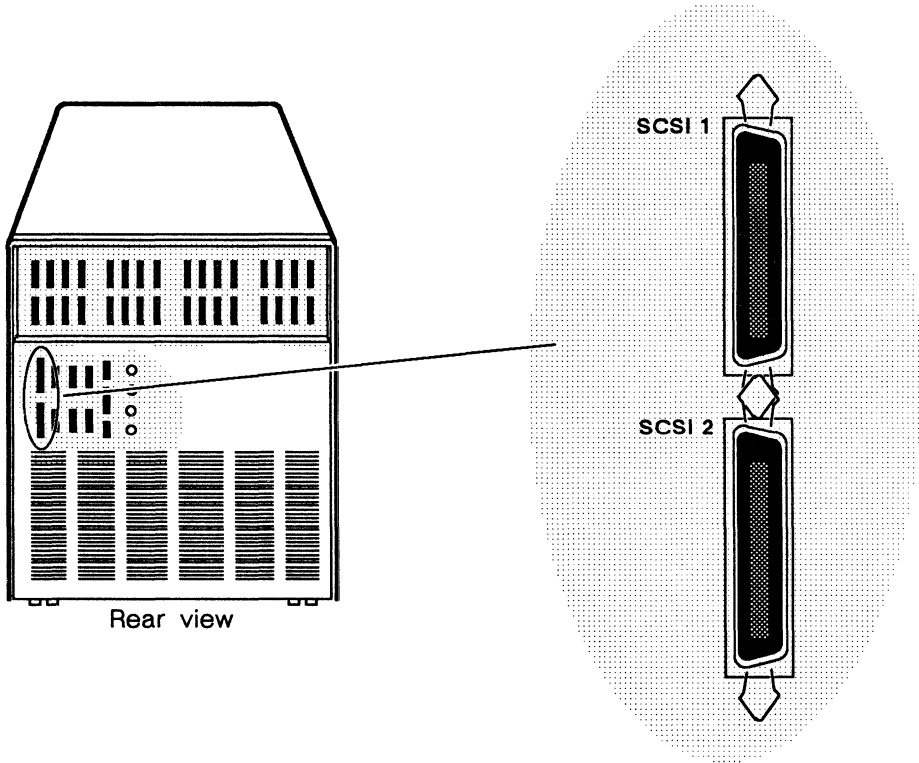


Figure 2-10 AViiON 5000 External SCSI Bus Ports

If your system includes external SCSI devices such as stand-alone tape drives or Peripheral Housing Units, skip the next section and proceed with "Planning an External SCSI Bus."

Terminating the Internal SCSI Bus

If your system does not include any external SCSI devices, you must terminate the bus that links SCSI controller 0, your internal tape drive(s), and the SCSI 1 rear panel connector. Your tape drives will not operate correctly until the SCSI bus is properly terminated.

To terminate the internal SCSI bus, follow these steps.

1. Locate the CHAMP terminator plug, Data General number 005033334, and the SCSI 1 rear panel connector shown in Figure 2-11.

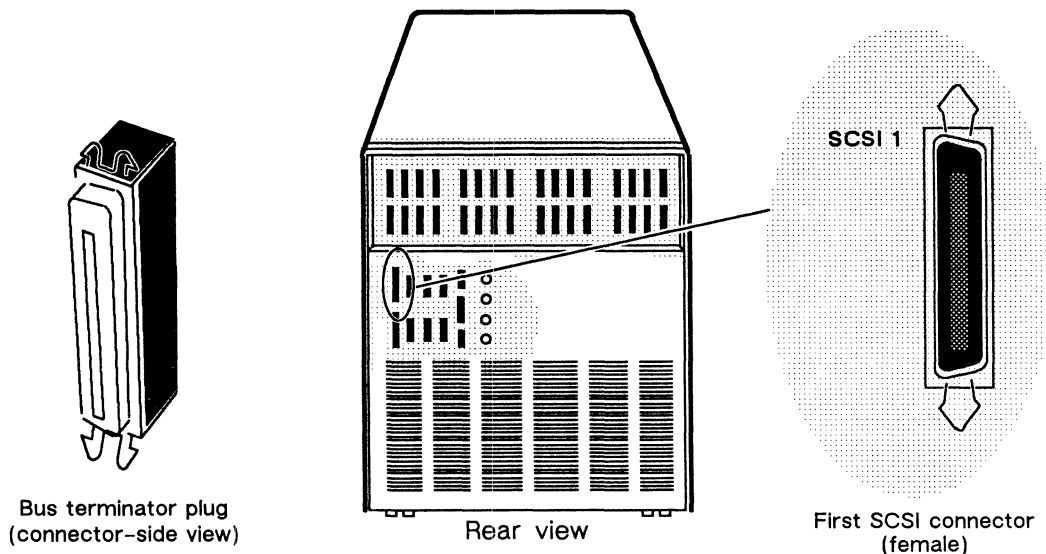


Figure 2-11 SCSI 1 Port and Terminator Plug

2. Align the connector pin numbers and the D-shaped connector bevels before gently inserting the the plug in the SCSI 1 connector, as shown in Figure 2-12.

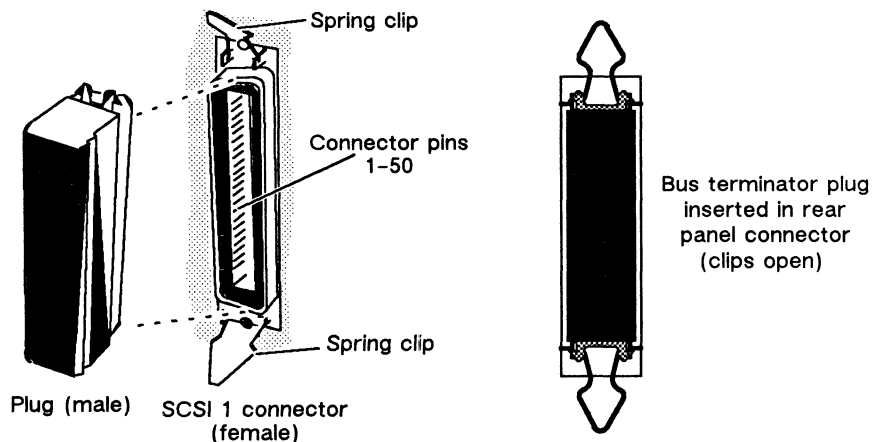


Figure 2-12 Plugging Together SCSI Terminator Connectors

3. Push the spring clips attached to the SCSI 1 connector straight down or straight up into the brackets on the terminator plug, as shown in Figure 2-13. Your vertical pressure will push the clips into place; do not squeeze or pull the clips out of shape.

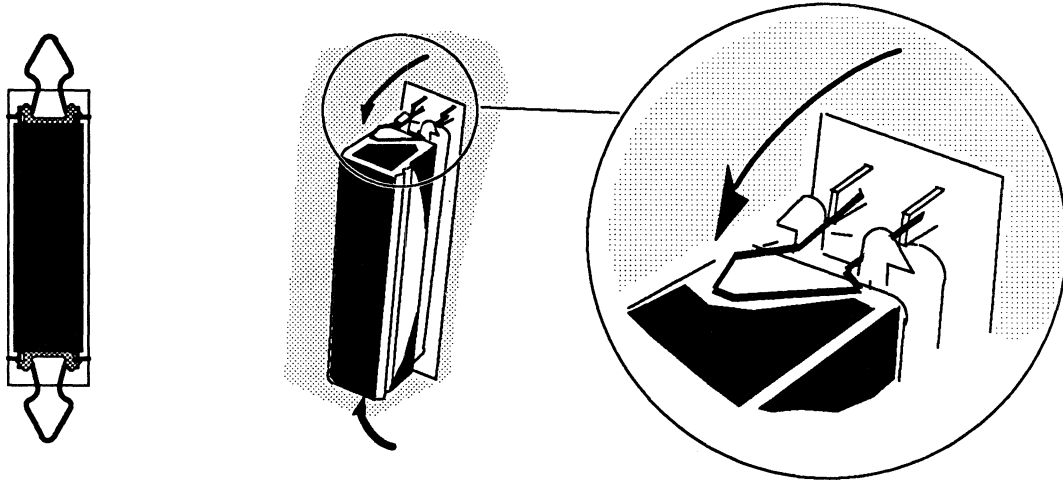


Figure 2-13 Securing a SCSI Bus Terminator

NOTE: To remove a terminator, simply reverse the process illustrated above; pull the clips vertically and gently pull the terminator out of the rear panel connector.

After you terminate your internal SCSI bus, skip the next section and continue with the last section in this chapter, "Connecting the AC Power Cord."

Planning an External SCSI Bus

If your system includes any external SCSI devices (such as stand-alone tape drives or Peripheral Housing Units), you should carefully plan your entire SCSI bus configuration *before* you begin setting up the devices. As you set up your SCSI devices, make sure that your system adheres to the following SCSI bus cable and SCSI device identification rules.

SCSI Bus Cable Rules

SCSI bus cabling begins inside the computer unit at the SCSI controller, and links the devices on the SCSI bus in a daisy-chain as shown in Figure 2-14. The maximum length of combined internal and external SCSI bus cable cannot exceed 19.6 feet per SCSI controller.

- Your system's first connector (SCSI 1) supports an external SCSI bus with a cable maximum of 9.1 feet; 10.5 feet of the 19.6-foot SCSI cable maximum resides within the AViiON 5000 computer unit.
- An optional bus connector (SCSI 2) supports an external SCSI bus with a cable maximum of 17.1 feet; only 2.5 feet of the 19.6-foot SCSI cable maximum resides within the AViiON 5000 computer unit.
- Some peripheral SCSI devices consume internal cable, further reducing the maximum length of your cable configuration. For example, the Model 10565 Peripheral Housing Unit uses 2.5 feet of internal SCSI cable.

Figure 2-14 illustrates the SCSI bus cable requirements.

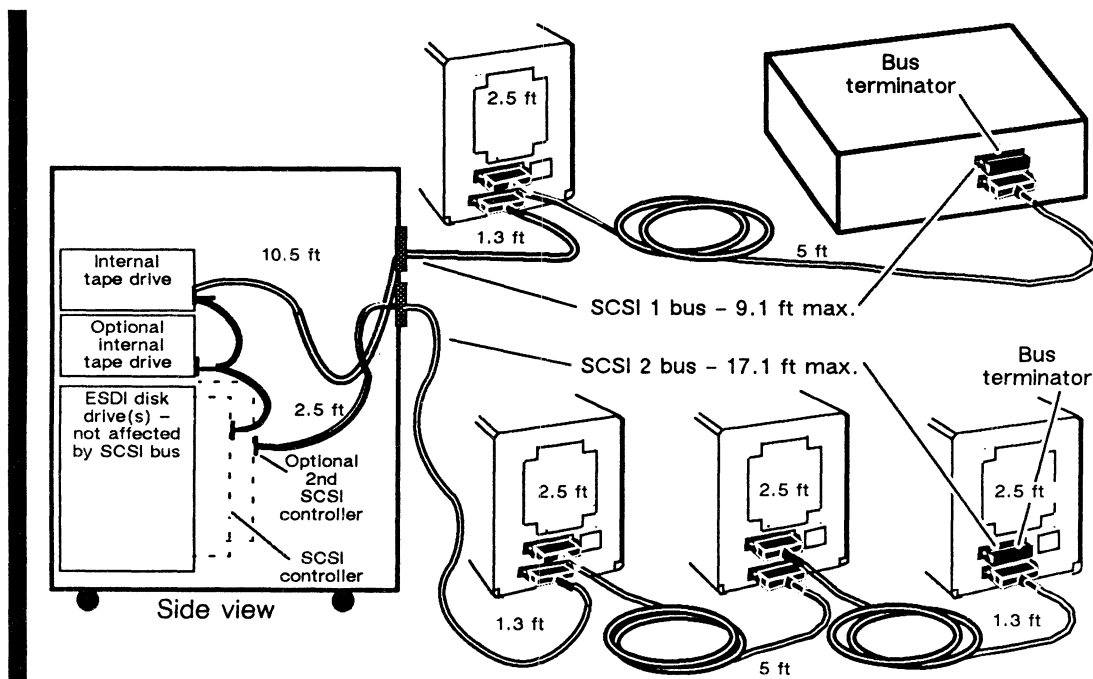


Figure 2-14 Daisy Chain and SCSI Bus Cable Lengths

SCSI Device Identification Rules

Each SCSI controller in your computer unit can support a total of seven SCSI devices, *including* internal devices such as your internal tape drive(s). For example, since your computer includes one tape drive, you can connect six additional devices to the first (controller 0, SCSI 1) bus; if your computer unit includes an optional second tape drive, you can connect only five external devices to the SCSI 1 bus. Since it does not support internal drives, your second (controller 1, SCSI 2) bus can support seven external SCSI devices. When a single mass-storage subsystem contains multiple drives, each individual drive applies to the seven device maximum.

Each individual drive on a SCSI bus must have a unique SCSI identification number (also referred to as a *device ID*, or *DID*) with a value from 0 through 6. The device IDs for your internal devices are preset before you receive your computer unit; you must set the IDs for external devices by positioning drive-select jumpers on the individual device(s). Table 2-1 shows the recommended DIDs you should apply to external SCSI devices as you set up your mass-storage subsystem(s) and/or stand-alone device(s).

Table 2-1 Recommended SCSI Device Identifications

SCSI 1 Bus		SCSI 2 Bus	
Device	SCSI ID No.	Device	SCSI ID No.
1st SCSI disk	0	1st SCSI disk	0
2nd SCSI disk	1	2nd SCSI disk	1
3rd SCSI disk	2	3rd SCSI disk	2
4th SCSI disk	3	4th SCSI disk	3
1st SCSI tape drive	4*	1st SCSI tape drive	4
2nd SCSI tape drive	5**	2nd SCSI tape drive	5
3rd SCSI tape drive	6	3rd SCSI tape drive	6

* Preset at factory

** Preset if internal

NOTE: ID assignments do not need to reflect the physical positioning of devices along the SCSI bus; a drive at the physical end of the bus can have a higher or lower device identification number than another drive closer to the computer unit.

The DG/UX operating system kernel allows the configuration of any SCSI device at any unique and valid SCSI ID. However, other software such as device drivers may limit the use of certain IDs to specific types of devices. Check the device-specific documentation for your unit, and the documentation for any customized software you plan to run on your system, for any further SCSI restrictions.

Installing an External SCSI Bus and SCSI Devices

Before you begin physically installing your SCSI bus and SCSI devices, plan your cabling scheme(s) and assign SCSI ID numbers to each device according to the rules described in the preceding two sections of this chapter. Make certain to assign ID numbers compatible with any application software requirements planned for your system. Figure 2-15 shows a sample AViiON 5000 series SCSI layout that adheres to SCSI bus cable and device identification rules.

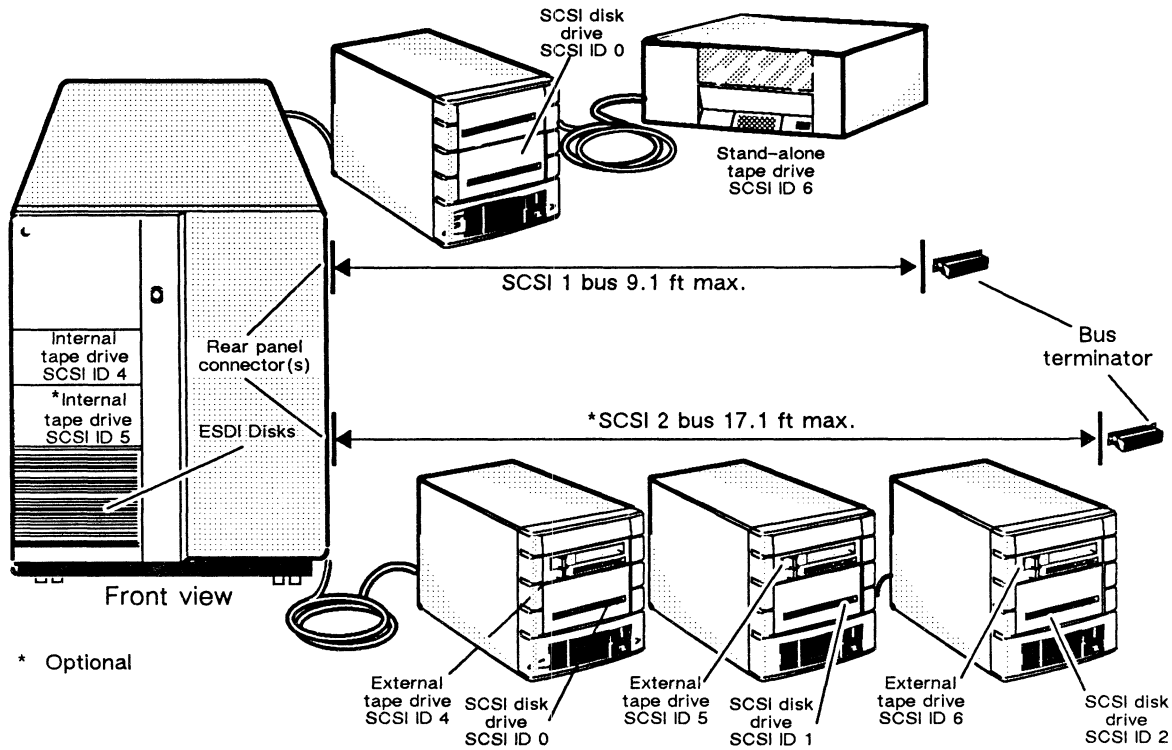


Figure 2-15 SCSI Cable Rules and Sample Device IDs

You will also need the device-specific documentation for each SCSI-based device you plan to install on your system. For example, if your system includes add-on cartridge tape or disk drives preinstalled in a Model 10565 mass storage subsystem, you should locate the manuals for each drive and the manual that describes how to set up the peripheral housing unit.

The next sections of this chapter describe the following steps to physically install a SCSI bus on your system:

- Installing SCSI ID jumpers on each external SCSI tape and/or disk drive
- Connecting the SCSI bus cable in a daisy-chain to the subsystems and stand-alone devices
- Terminating the SCSI bus
- Connecting the SCSI bus to your computer unit

Installing SCSI ID Jumpers

The following steps outline how to assign device identifications to your SCSI-based devices.

1. Refer to your drive documentation for any stand-alone tape and/or disk drives on your SCSI bus for instructions, and then set the SCSI ID jumpers according to your SCSI bus plan.
2. Refer to the unit manual for any peripheral housing units (such as the Model 10565 Mass Storage Subsystem) for instructions, and then remove any drive whose device ID conflicts with your SCSI bus plan.

NOTE: Each SCSI drive located in a mass storage subsystem must have its own unique ID number.

Refer to the device-specific documentation for each drive in the housing unit for instructions, and then set the SCSI ID jumpers according to your SCSI bus plan.

Replace each drive according to the peripheral housing unit manual.

3. Attach a label that identifies the SCSI ID numbers assigned to the drive(s) to the outside of each drive or subsystem. For peripheral housing units, indicate each drive's location in the unit.

NOTE: Step 3 is important for those who will operate and maintain your system. Your AViiON system software refers to SCSI drives by identification number and SCSI controller number (0 for the SCSI 1 bus, 1 for SCSI bus 2).

Connecting the SCSI Bus to SCSI devices

Before you begin connecting your SCSI devices together, locate all of your SCSI bus external cables. Refer to your device-specific documentation for the part and model numbers of the cables you need. Based on the length of the cable(s) you ordered, your SCSI bus connects to the computer unit with one of the following:

Cable Part Number	Cable Length (ft)
005-33003	1.3
005-33004	5
005-33005	10

When you arrange your SCSI drives along the bus, make certain to avoid strain on any part of the SCSI cable. (See the bus cabling schemes in Figures 2-14 and 2-15.)

Refer to your device-specific documentation for instructions, and then install each device along the bus.

Terminating the SCSI Bus

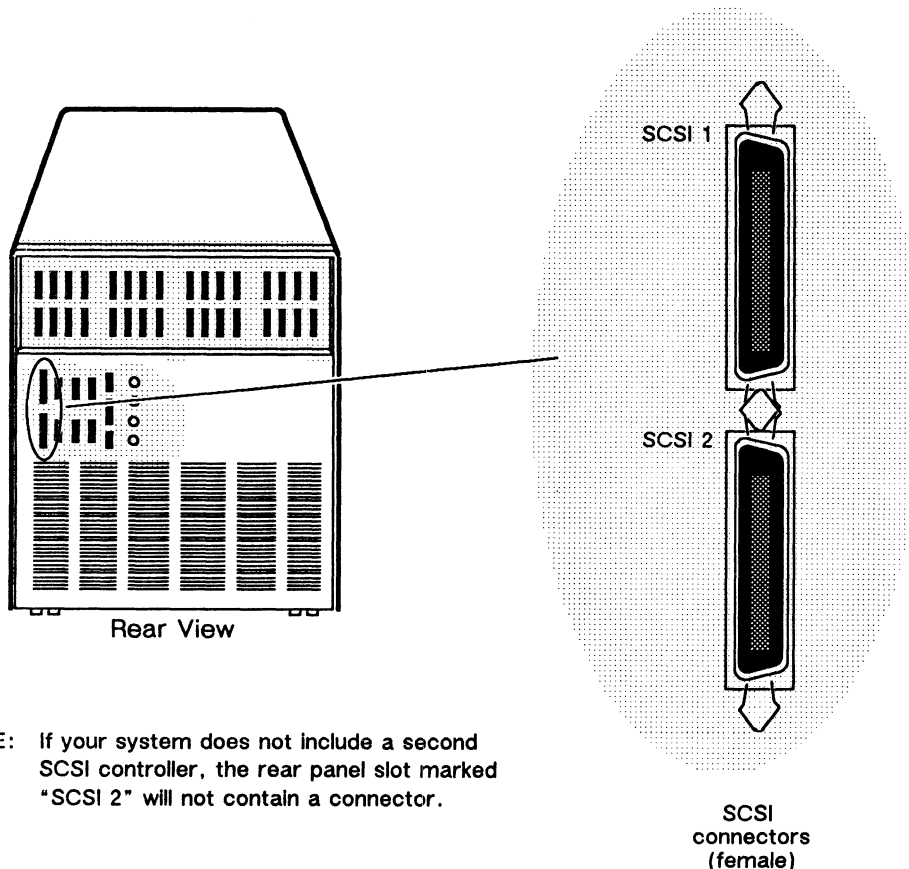
You must terminate the SCSI bus at the last device or peripheral housing unit on each SCSI bus (SCSI 1 or SCSI 2). Depending on the physical placement and type of SCSI peripherals included in your system, you terminate your bus with one of the following:

- A terminating plug (Data General part number 005033334) that you install on the unused bulkhead connector on the outside of the unit. On such housings (for example, the Model 10565 Mass Storage Subsystem), *do not terminate any of the SCSI devices within the unit*. See Figures 2-14 and 2-15.
- A terminating resistor pack that you install on an individual drive's printed circuit board. Note that devices terminated in this manner must also connect at the physical *end* of any daisy-chain configuration.

To locate the SCSI bus terminators and connectors for each SCSI drive and drive housing in your system, refer to the device-specific manual for that drive or unit.

Connecting the SCSI Bus to the Computer Unit Rear Panel

Figure 2-16 shows the location of the SCSI connectors on the rear panel of your computer.



NOTE: If your system does not include a second SCSI controller, the rear panel slot marked "SCSI 2" will not contain a connector.

Figure 2-16 AViiON 5000 External SCSI Connectors

To connect your SCSI bus to the rear panel of your computer unit, use the following cables:

Cable Part Number	Cable Length (ft)
005-33003	1.3
005-33004	5
005-33005	10

Align the connector pin numbers and the D-shaped connector bevels before gently inserting the cable connector in the rear panel connector as shown in Figure 2-17.

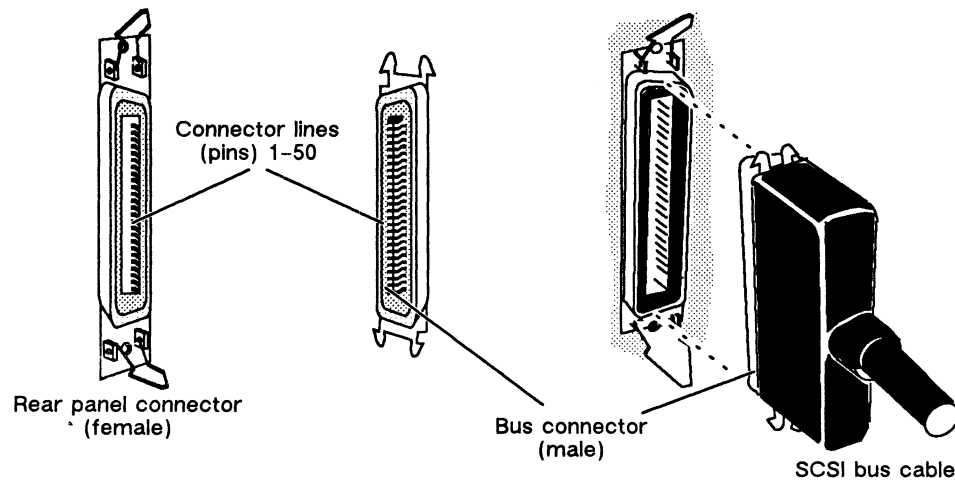


Figure 2-17 Plugging Together SCSI Bus Connectors

Push the spring clips attached to the rear panel connector straight down or straight up into the brackets on the cable connector as shown in Figure 2-18. Your vertical pressure will push the clips into place; do not squeeze or pull the clips out of shape.

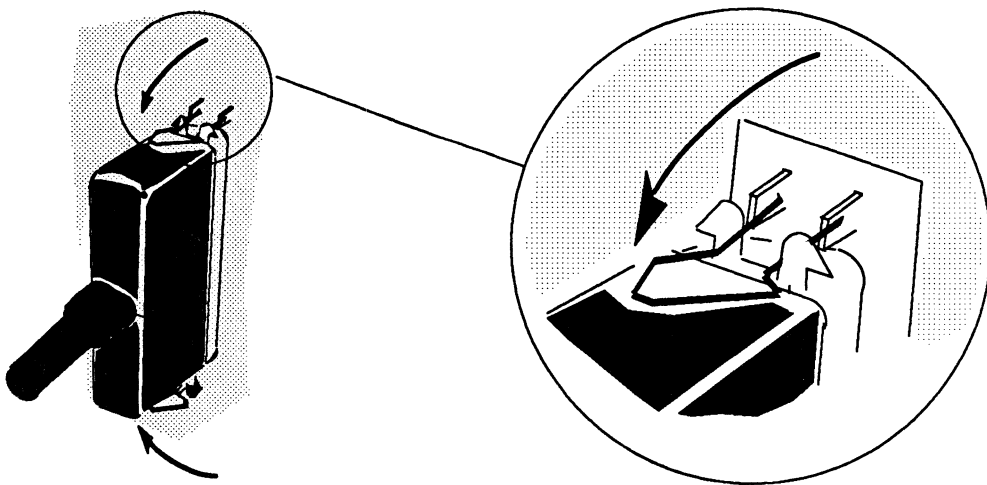


Figure 2-18 Securing a SCSI Cable Connection

If you haven't already connected the remote end of the cable to your first SCSI external device, do so now (refer to the device-specific documentation, if necessary). Then, continue with the next section, "Connecting The AC Power Cord."

Connecting the AC Power Cord

You should attach the ac power cord last, after all your optional and peripheral devices are connected to the bulkhead and rear panel of your computer. The power cord connects to a three-prong receptacle at the right side of the rear panel.

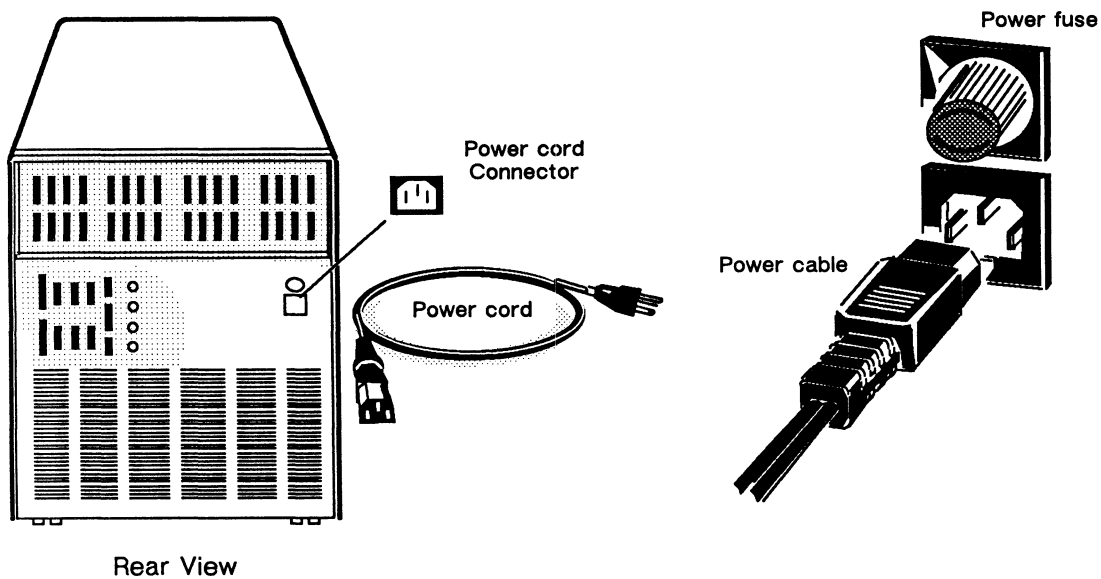


Figure 2-19 AViiON 5000 Power Receptacle and Cord

To connect your computer to an ac power outlet, make sure to use the correct power cord:

Power Cord	Part No.	Power Suffix (appended to model No.)
100 V 50/60 ac frequency	109-821	-1
120 V 60 ac frequency (North American standard)	109-821	none
240 V 50 ac frequency	109-886	-5
	109-885	-6
220 V 50 ac frequency	109-884	-7
	109-883	-8
	109-849	-9
	109-848	-0

Your Next Step

If you followed the procedures outlined in this chapter, you have set up and connected your basic system and any optional devices that reside on an external SCSI peripheral bus. You should now set up any remaining terminals, modems, printers, or other devices planned for your system according to the device-specific documentation for each device. You should also complete setting up any local area networks (LANs) that will connect to your computer. When all of your remaining devices and LANs are set up, return to this manual and continue with Chapter 3, "Connecting Optional Devices."

End of Chapter

Chapter 3

Connecting Optional Devices

This chapter describes how to connect peripheral devices that are not part of your basic system to your computer unit. It also describes the cables and connectors you need to attach these peripherals to the unit's rear panel and bulkhead. One section in this chapter describes how to set up and connect a VDA/128 communications cluster. You should review the configuration guidelines, and read the sections on each optional device your system will include, *before* you begin setting up the remainder of your system. Set up your peripherals according to the device-specific manuals for each device, and then follow the procedures in this chapter to connect them to your system. *After* connecting all of your optional devices to the computer unit, attach the correct ac power cord as described in the last section of this chapter.

Configuration Guidelines for Optional Device Controllers

The optional controller and/or adapter boards you purchased with your AViiON system communicate with the system over a standard VME bus. The VME bus can support a maximum of 10 boards *including* the system board, SCSI controller board(s), and a maximum of 4 memory expansion boards. All boards on the VME bus are factory-installed, preconfigured, and contained within the computer unit. The devices they support connect to your computer unit through ports on the rear panel and/or bulkhead. Besides the SCSI controller(s) described in Chapter 2, your computer can support the following types of optional device controllers and adapters:

- Ethernet LAN controllers, also called VLCs
- Synchronous device controllers (VSC/4s)
- Asynchronous device controllers (VAC/16s)
- Asynchronous host adapters (VDA/128); each VDA/128 supports a system of VDC/8P and/or VDC/16 downloadable cluster controllers

Table 3-1 lists the maximum configurations of these options supported by AViiON 5000 Series systems.

Table 3-1 Configuration Maximums for Optional Controllers

Option	Type	Options per System	Controllers per Adapter	Devices per Option	Devices per System
VLC controller	Ethernet	2*		NA	NA
VSC/4 controller	sync	4		4	4**
VAC/16 controller‡	async	2		16	32
VDA/128 host adapter‡		4		128	512
Cluster boxes:					
VDC/8P controller	async	64	16	9‡‡	
VDC/16 controller	async	32	8	16	

* Although your computer can support more than two LAN controllers, the rear panel includes ports for only two.

** Regardless of the number of VSC/4 controllers in your system, your computer can support only four synchronous devices.

‡ Your computer supports any combination of asynchronous controllers and host adapters that totals four or less.

‡‡ The VDC/8P includes eight asynchronous ports and a parallel printer port. The host adapter maximum remains 128 devices whether or not you employ the printer port.

Tools and Equipment

To set up and connect various peripheral components of your system, you will need the following tools and equipment as a minimum set. Some devices may require additional equipment as indicated in the installation manuals for each device.

- All manuals describing how to set up and configure peripheral devices; in some cases this includes multiple manuals for a single device.
- Small flat-head screwdriver
- Needle-nose pliers
- Phillips-head screw driver

Connecting an Ethernet LAN

An Ethernet local area network (LAN) can incorporate several devices that communicate over a common system of cable and transceivers. This section describes how to connect the drop cable between your computer and the first transceiver on a LAN.

NOTE: For information on setting up the cables and transceivers on your Ethernet LAN, refer to *Ethernet/IEEE 802.3 Local Area Network Installation Guide* (014-000793)

Figure 3-1 shows the location of the two DB15 local area network connectors on the rear panel of your computer.

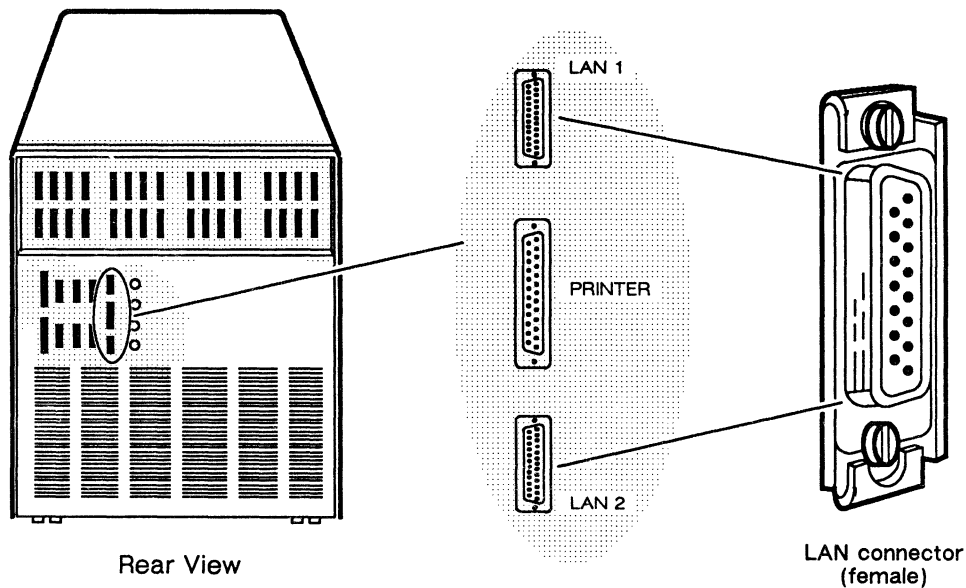


Figure 3-1 AViON 5000 LAN Connectors

As shown in Figure 3-2, LAN cable connectors include slide clip mounts rather than the captive screws found on your asynchronous and synchronous device connectors. The female connector on the rear panel of your computer includes a slide clip.

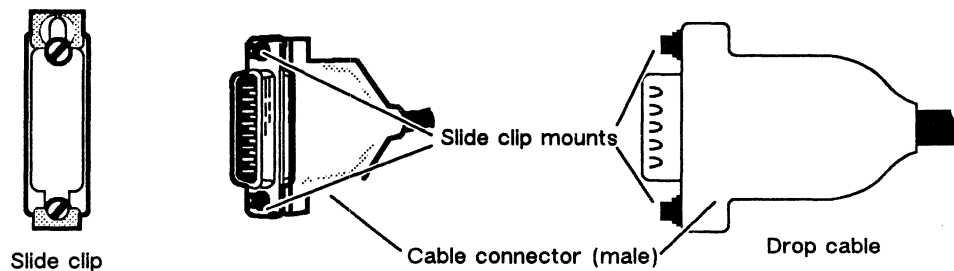


Figure 3-2 LAN Connector Slide Clip and Slide Clip Mounts

Use the following drop cables to connect your LAN transceiver to the computer.

Cable Type	Cable Part Number	Cable Length (m)
Teflon	005-33791	5 (16.4 ft)
	005-33787	20 (65.6 ft)
PVC	005-33766	5 (16.4 ft)
	005-31694	20 (65.6 ft)

To connect your LAN drop cable to a standard slide clip, follow these directions.

1. Align the larger mount slot on the clip with the screw behind it as shown in Figure 3-3. This position allows the cable connector to fit completely over the rear panel connector before you secure the connection.

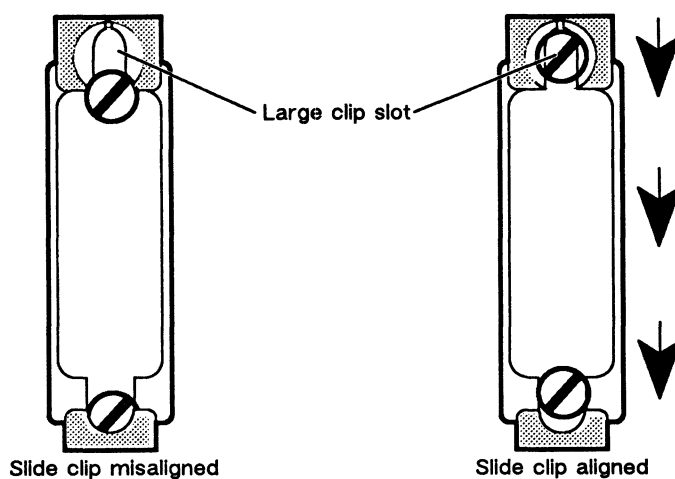


Figure 3-3 Aligning a LAN Connector Slide Clip Before Connection

2. Align the connector pins, clip mounts, and D-shaped bevels as shown in Figure 3-4 before gently pushing the cable connector completely over the rear panel connector. Make certain the slide clip has not hindered a secure connection.

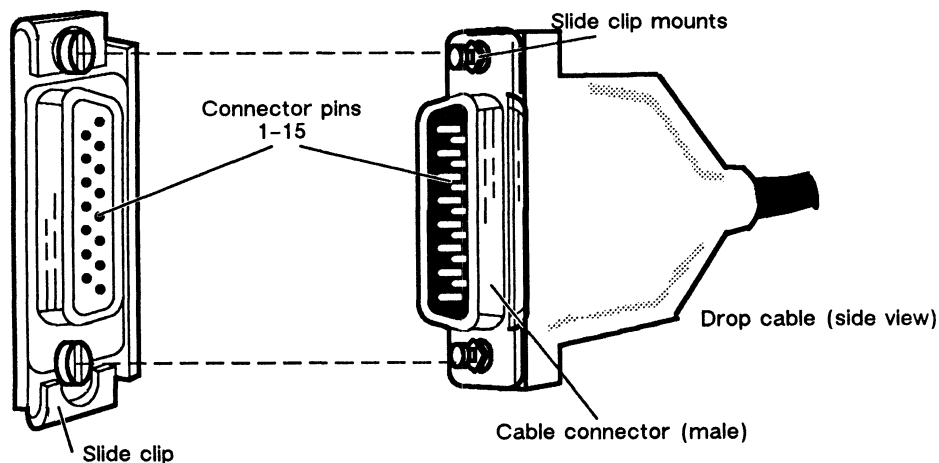


Figure 3-4 Aligning Slide Clip Mounts With a LAN Connector

3. Push the edge of the slide clip into position so the small mount slot surrounds its cable connector mount. Figure 3-5 illustrates how to secure a slide clip connection.

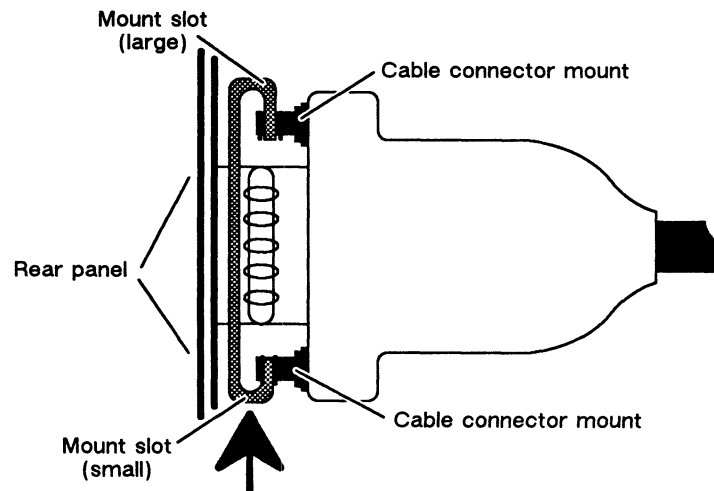


Figure 3-5 Connecting a LAN Drop Cable to a Rear Panel Connector

If you haven't already connected the remote end of the cable to your transceiver, do so now (refer to the device-specific documentation for your transceiver, if necessary). Then, continue with the next section that applies to your system. For example, if your system includes no synchronous devices, skip the next section and continue with the appropriate section(s) on VAC/16 or VDA/128 asynchronous connections.

If you have completed connecting all of your system's optional devices, connect the power cord to your computer as described in the last section in this chapter, "Connecting the AC Power Cord." Then, continue with Chapter 4, "Powering Up the First Time."

Connecting Synchronous Devices to a VSC/4 Controller

A single VSC/4 controller in your system can support four lines, with ports on the rear panel of your computer. (Your system can include a maximum of four VSC/4 controllers, but no more than four lines). Each full-duplex line can support an RS-232-C synchronous modem or other device. Figure 3-6 shows the location of the device connectors attached to an optional synchronous controller board or boards.

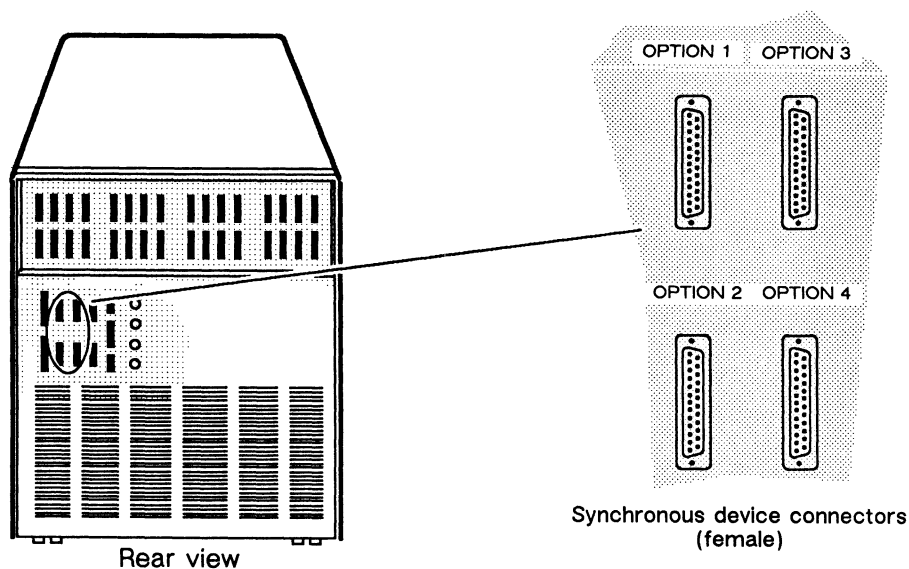


Figure 3-6 VSC/4 Device Connectors

You specify the characteristics of synchronous devices through your operating system software. Most operating systems refer to peripherals such as terminals, printers, and modems as *tty* (for teletypewriter) devices. After your first powerup, you should refer to the device-specific documentation and your operating system documentation for information on setting characteristics such as baud rate and parity to conform to your device requirements. DG/UX system users can also refer to the on-line Help files and/or *Man Pages* (for manual) entries for *gettydefs*, *termio*, and *sysadm installtty* for additional information.

Synchronous devices connect to the rear panel of your computer through cables with male DB25 connectors. To connect synchronous devices to the rear panel of your computer unit, use one of the following cables:

Cable Part Number	Cable Length (ft)
005-32917	6
005-32918	15
005-32919	25

NOTE: Make certain you use the correct cables to connect your synchronous devices. Although the RS-232-C interface supports many devices, your device requires the correct cable in order to work properly.

Align the connector pins and D-shaped bevels before gently pushing the cable connector onto the rear panel connector. Align the two captive connector screws as shown in Figure 3-7, and then tighten them securely.

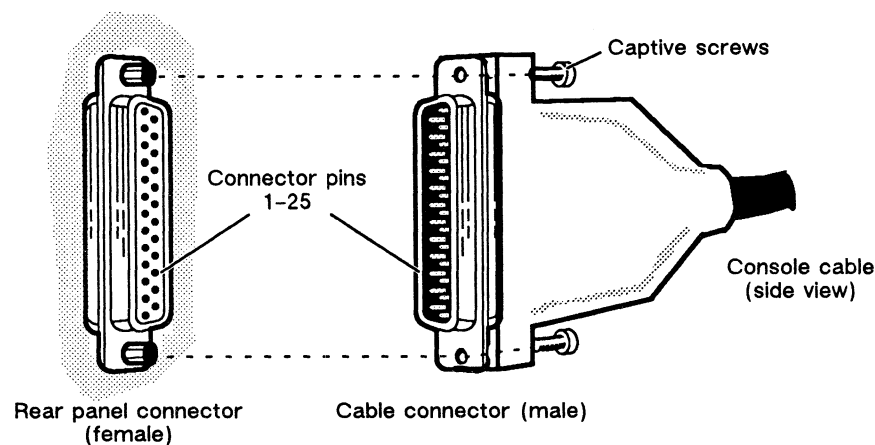


Figure 3-7 Plugging Together Synchronous Device Connectors

If you haven't already connected the remote end of the cable to your synchronous device, do so now (refer to the device-specific documentation for your option, if necessary). Then, continue with the next section that applies to your system's asynchronous connections.

If you have completed connecting all of your system's optional devices, connect the power cord to your computer as described in the last section in this chapter, "Connecting the AC Power Cord." Then, continue with Chapter 4, "Powering Up the First Time."

Connecting Asynchronous Devices to a VAC/16 Asynchronous Controller

Each VAC/16 controller in your system supports 16 lines, with ports on your computer bulkhead. Each full-duplex line can support an RS-232-C asynchronous terminal, modem, serial printer, or other device. Figure 3-8 shows the location of the device connectors attached to an optional VAC/16 board or boards. The first controller supports bulkhead ports 1-16, and a second controller supports ports 17-32.

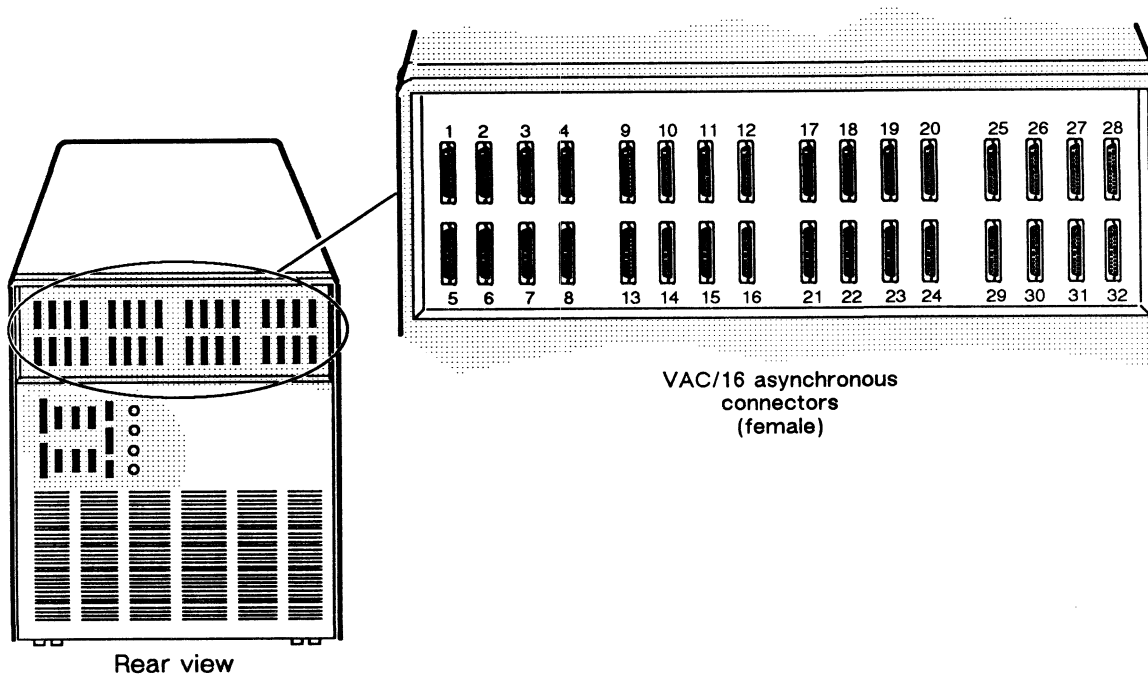


Figure 3-8 VAC/16 Device Connectors

You specify the characteristics of devices attached to a VAC/16 controller through your operating system software. Most operating systems refer to peripherals such as terminals, printers, and modems as *tty* (for teletypewriter) devices. After your first powerup, you should refer to the device-specific documentation and your operating system documentation for information on setting characteristics such as baud rate and parity to conform to your device requirements. DG/UX system users can also refer to the on-line Help files and/or *Man Pages* (for manual pages) entries for *gettydefs*, *termio*, and *sysadm installtty* for additional information.

Asynchronous devices attach to the bulkhead with male DB25 cable connectors. To connect an asynchronous device to your computer unit, use one of the following cables:

	Cable Part Number	Cable Length (ft)
Terminals	005-34256	10
	005-34990	15
	005-34991	25
Modems	005-36256	10
	005-36257	15
	005-36258	25

For convenience while working with multiple cables in a close area, you should connect cables planned for the bottom row of asynchronous option ports (5-8, 13-16, 21-24, and 29-32) first. You should also plan your connecting sequence to work from one side of the bulkhead to the other to avoid constricting work space and crossing the cables unnecessarily.

Align the connector pins and D-shaped bevels before gently pushing the cable connector over the rear panel connector. Align the two captive connector screws as shown in Figure 3-9, and then tighten them securely.

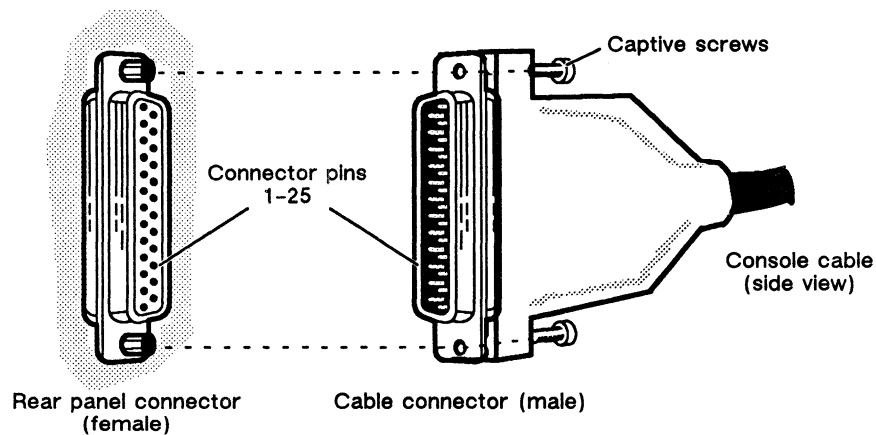


Figure 3-9 Plugging Together VAC/16 Device Connectors

If you haven't already connected the remote ends of the cables to your asynchronous devices, do so now (refer to the device-specific documentation for your option, if necessary). If your system includes a VDA/128 adapter and its corresponding communications clusters, continue with the next section.

If you have completed connecting all of your system's optional devices, connect the power cord to your computer as described in the last section in this chapter, "Connecting the AC Power Cord." Then, continue with Chapter 4, "Powering Up the First Time."

Connecting a VDA/128 Asynchronous Communications Cluster

This section describes how to connect a linked chain of downloadable cluster controllers to a VDA/128 adapter in your computer. It also describes how to connect asynchronous peripheral devices to a cluster controller box.

This manual does not describe how to set up or configure a cluster controller system. Refer to the *HPS Downloadable Cluster Controller Installation Guide* for setup and configuration instructions.

NOTE: If your system uses the DG/UX operating system, you can use *only* the node addresses between 01 and 10 hexadecimal (1 through 16 decimal) when setting up your cluster controller system.

A VDC/8P cluster controller (or *cluster box*, or *node*) includes eight serial ports and one Centronics-compatible parallel printer port. VDC/16 controllers include 16 RS-232-C serial ports. You use RG-62 coaxial cable to link up to 16 cluster boxes to a single VDA/128 (eight 16-port cluster boxes or sixteen 8-port boxes with a total of no more than 128 devices). Each connection along the chain uses a BNC "T" fitting to allow the removal of a single controller without disrupting communications along the cable. Figure 3-10 shows the basic elements of a VDA/128 communications cluster .

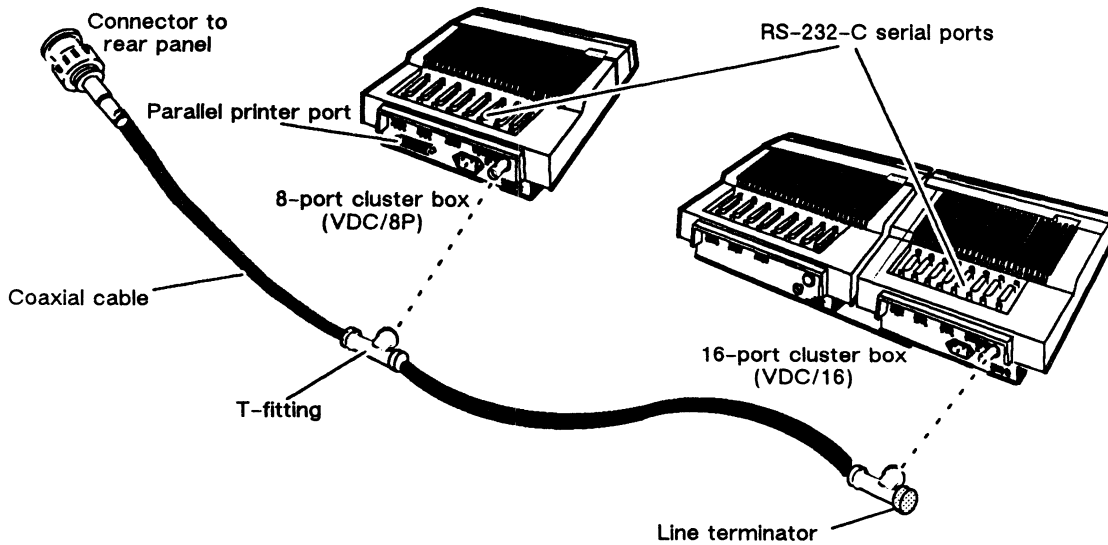


Figure 3-10 Communications Cluster Elements

To connect a daisy chain of cluster controllers to your computer unit, use one of the cables listed below. These cables include a BNC host connector.

Cable Part Number	Cable Length (ft)
005-34246	25
005-34247	50
005-34248	100

Connecting a Cluster Controller Cable to the Computer Rear Panel

Each adapter in your system connects to a corresponding port on the rear panel. To attach a controller cluster to a VDA/128 adapter, you need a BNC host connector, which connects to your computer at one of the ports marked "VDA." Figure 3-11 shows the correct host connector and the location of the VDA ports on your computer's rear panel.

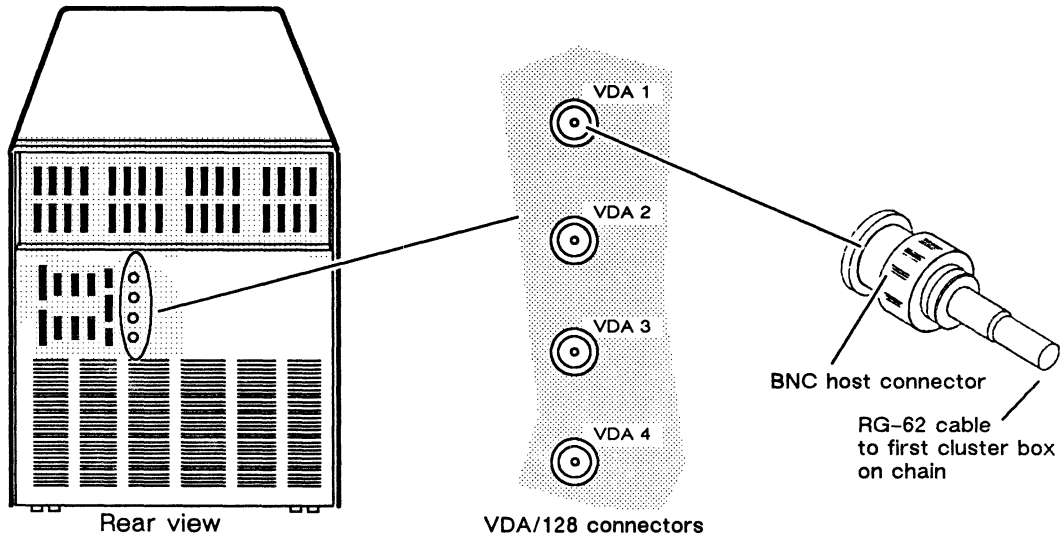


Figure 3-11 VDA/128 Connector Location

NOTE: You must connect the cluster line cable to your computer with a host connector rather than a T-fitting.

To connect a host connector to the receptacle on your computer's rear panel, simply push the host connector firmly onto the rear panel receptacle, making sure that the pins on the receiving fitting slide completely into the slots on the host connector. (See Figure 3-12.) Then turn the knurled ring on the connector clockwise until the pins on the receiving connector snap into place.

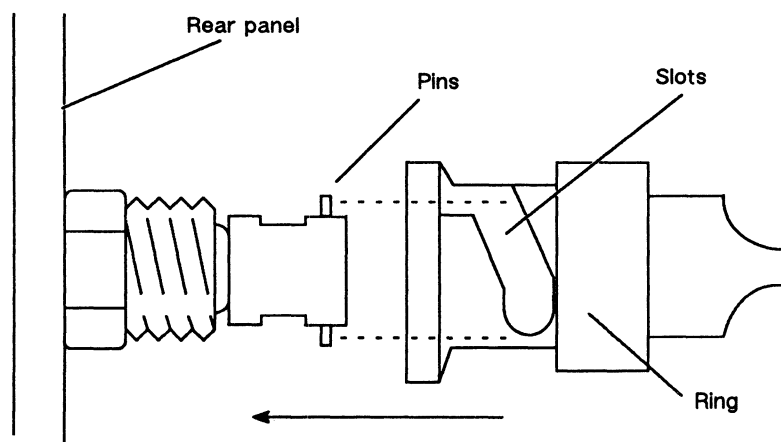


Figure 3-12 Attaching a BNC Host Connector to a Rear Panel Receptacle

Connecting Asynchronous Devices to a Cluster Box

Each terminal or modem line on a cluster controller box can support any RS-232-C asynchronous device. Figure 3-13 shows the location of the asynchronous device connectors on the controller.

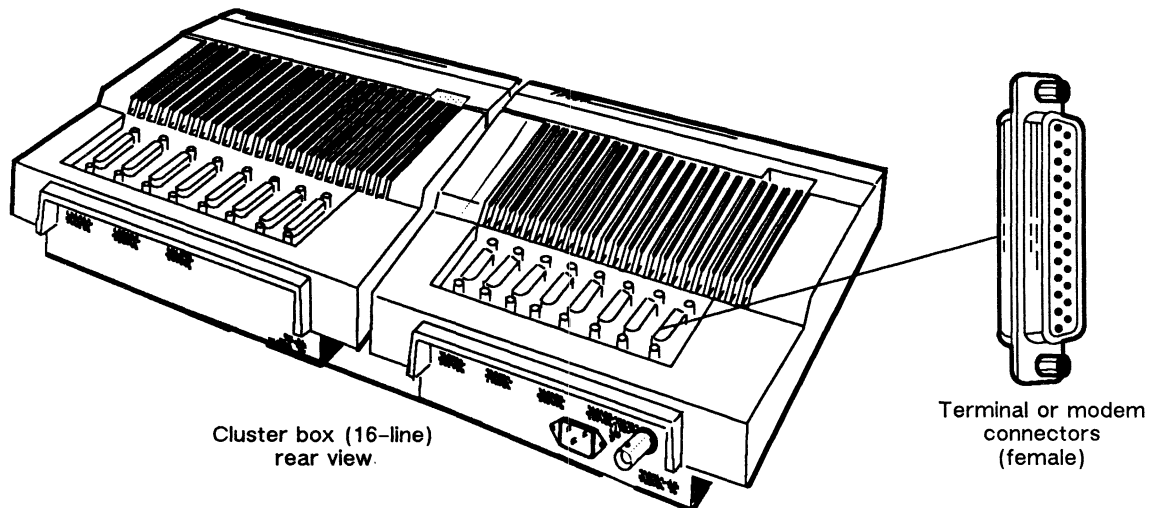


Figure 3-13 Cluster Box Device Connectors

You specify the characteristics of devices attached to a cluster controller through your operating system software. Most operating systems refer to peripherals such as terminals, printers, and modems as *tty* (for teletypewriter) devices. After your first powerup, you should refer to the device-specific documentation and your operating system documentation for information on setting characteristics such as baud rate and parity to conform to your device requirements. DG/UX system users can also refer to the on-line Help files and/or *Man Pages* (for manual pages) entries for *gettydefs*, *termio*, and *sysadm installtty* for additional information.

To connect an asynchronous device to the cluster box, use one of the following cables:

	Cable Part Number	Cable Length (ft)
Terminals	005-34256	10
	005-34990	15
	005-34991	25
Modems	005-36256	10
	005-36257	15
	005-36258	25

You should plan your connecting sequence to work from one side of the box to the other to avoid constricting work space and crossing the cables unnecessarily.

Align the connector pins and D-shaped bevels before gently pushing the cable connector onto the cluster box connector. Align the two captive connector screws as shown in Figure 3-14, and then tighten them securely.

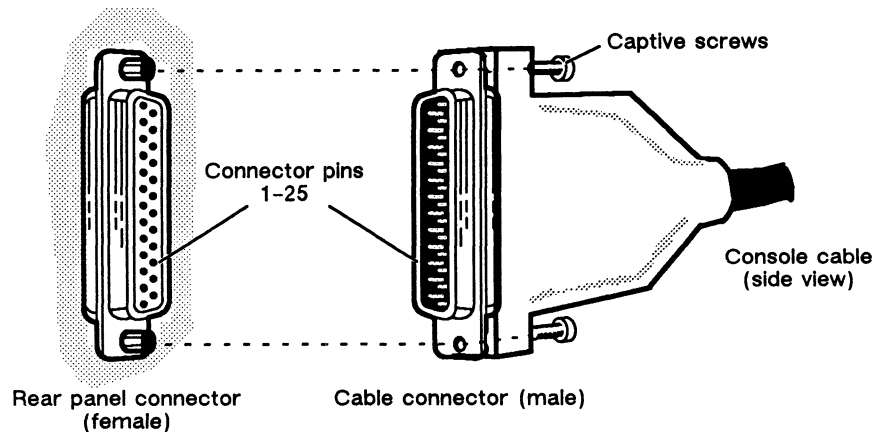


Figure 3-14 Plugging Together Cluster Box Device Connectors

If you haven't already connected the remote ends of the cables to your asynchronous devices, do so now (refer to the device-specific documentation for your option, if necessary). If your cluster controller system includes any parallel printers, continue with the next section.

If you have completed connecting all of your system's optional devices, connect the power cord to your computer as described in the last section in this chapter, "Connecting the AC Power Cord." Then, continue with Chapter 4, "Powering Up the First Time."

Connecting a Parallel Printer to a Cluster Box

Each VDC/8P cluster controller on your system can support a Centronics-compatible parallel printer. Figure 3-15 shows the location of the parallel printer port on each controller.

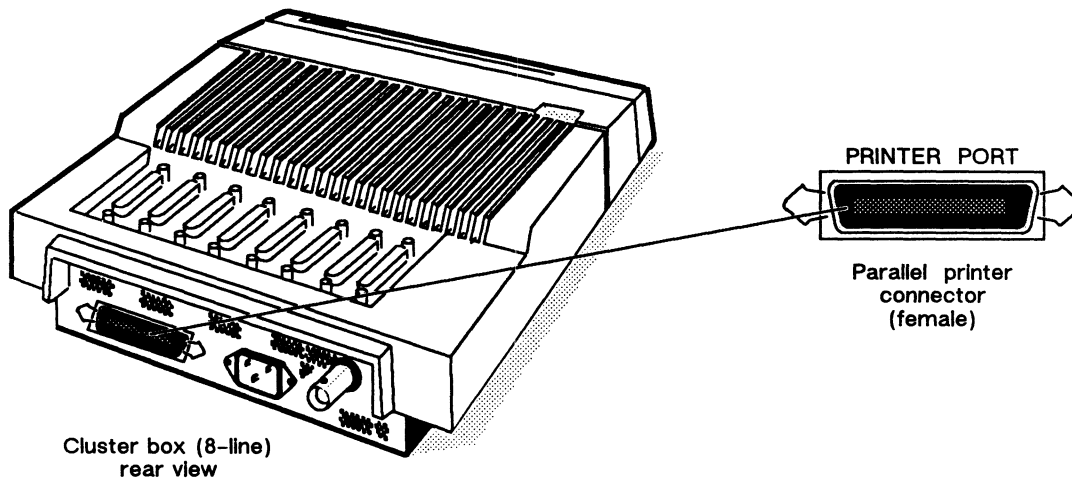


Figure 3-15 VDC/8P Parallel Printer Port

Specify any characteristics unique to each printer, such as vertical form unit (VFU) or tab memory, before connecting the printer to a cluster box. You specify other characteristics of printers attached to a cluster controller through your operating system software. Most operating systems refer to peripherals such as terminals, printers, and modems as *tty* (for teletypewriter) devices. After your first powerup, you should refer to the device-specific documentation and your operating system documentation for information on setting printer characteristics to conform to your device requirements. DG/UX system users can also refer to the on-line Help files and/or *Man Pages* (for manual pages) entries for *gettydefs*, *termio*, and *sysadm installtty* for additional information.

A parallel printer connects to the cluster box with one of the following cables. If your printer requires an adapter, connect the adapter connector/cable before you attach the cable to your cluster box.

Printer Interface	Cable Part Number	Cable Length (ft)
Centronics	005-35573	15
Centronics	005-35574	25
Data Products	005-35575	15
Data Products	005-35576	25

Figure 3-16 shows how to align the connector pins and the D-shaped connector bevels before gently inserting the cable connector into the VDC/8P connector.

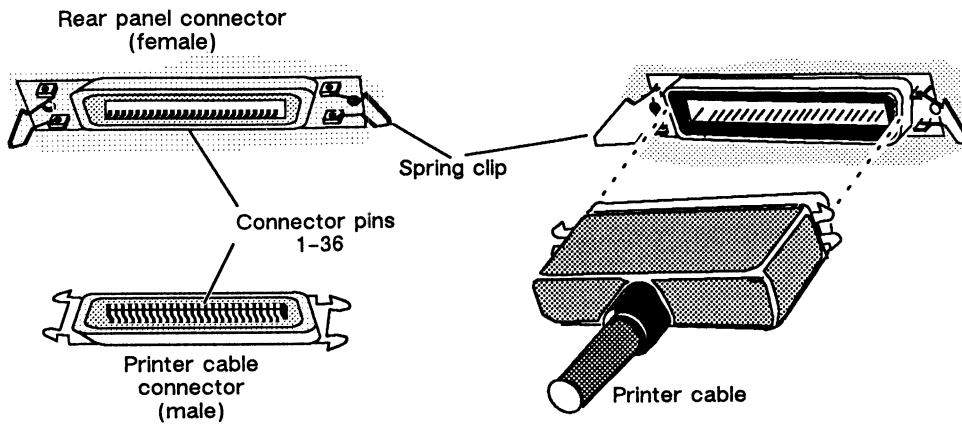


Figure 3-16 Plugging Together VDC/8P Printer Connectors

Push the spring clips attached to the top and bottom of the rear panel connector sideways into the brackets on the cable connector as shown in Figure 3-17. Your horizontal pressure will push the clips into place; do not squeeze or pull the clips out of shape.

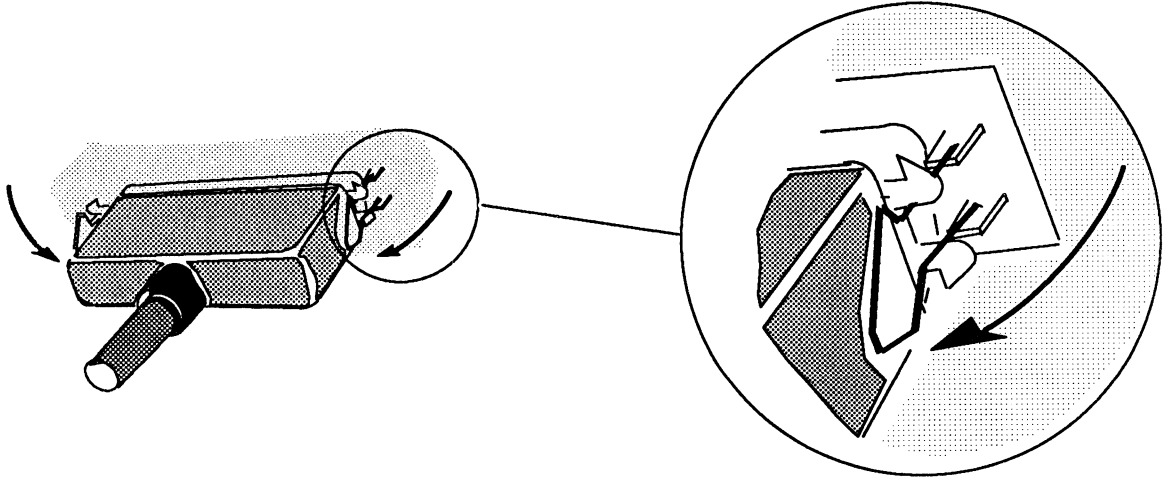


Figure 3-17 Securing the VDC/8P Printer Connector

If you haven't already connected the remote end of the cable(s) to each printer in your system, do so now (refer to the device-specific documentation for each printer, if necessary). Then, continue with the next section, "Connecting the AC Power Cord."

Connecting the AC Power Cord

After all your optional and peripheral devices are connected to the bulkhead and rear panel of your computer, you should attach the ac power cord. The power cord connects to a three-prong receptacle at the right side of the rear panel as shown in Figure 3-18.

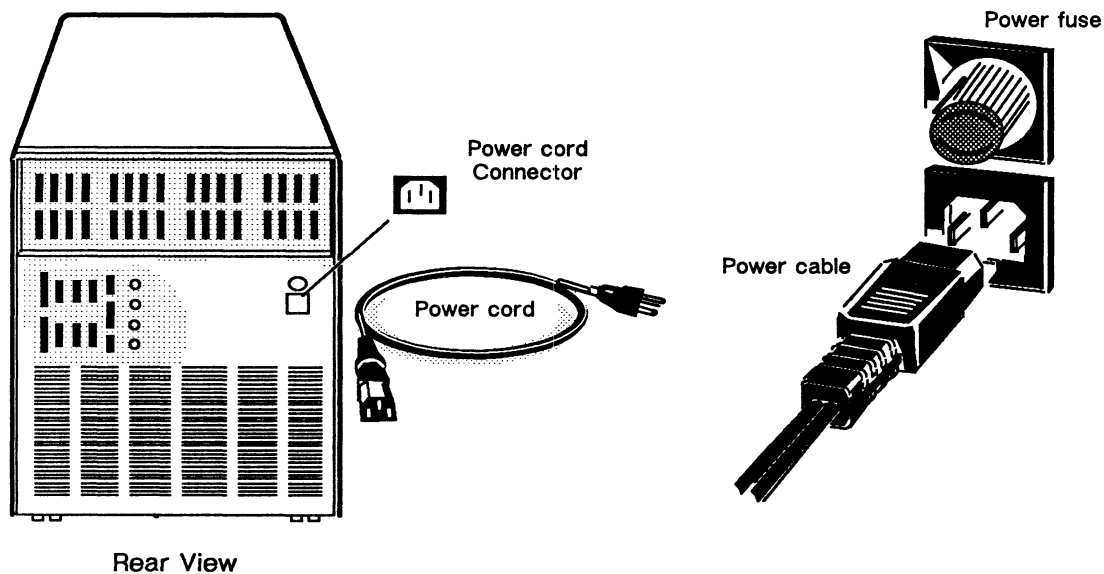


Figure 3-18 AViiON 5000 Power Receptacle and Cord

To connect your computer to an ac power outlet, make sure to use the correct power cord:

Power Cord	Part No.	Power Suffix (appended to model No.)
100 V 50/60 ac frequency	109-821	-1
120 V 60 ac frequency (North American standard)	109-821	none
240 V 50 ac frequency	109-886	-5
	109-885	-6
220 V 50 ac frequency	109-884	-7
	109-883	-8
	109-849	-9
	109-848	-0

When you finish connecting the ac power cord to your computer unit, continue with the next chapter, "Powering Up the First Time."

End of Chapter

Chapter 4

Powering Up the First Time

This chapter contains instructions on powering up your computer for the first time. The following chapter includes instructions on running the AViiON System Diagnostics Acceptance Test, which you may want to include in your first powerup to exercise and check your system hardware. If you encounter any problems during your initial powerup, refer to the last section in this chapter, “Solving Power-Up Problems.”

Computers that include preloaded DG/UX™ on disk will automatically boot the DG/UX Starter System (kernel) after passing power-up tests. If your system does not include preloaded DG/UX, refer to your operating system documentation and *Using the AViiON™ System Control Monitor (SCM)* for information on installing and booting your operating system.

Running the Acceptance Test as described in Chapter 5 adds less than 30 minutes to your first powerup, but is neither required nor in most cases necessary. Extending the first powerup to verify your system hardware configuration provides an added measure of insurance against future problems.

After your system powers up, you should set any system configuration parameters that do not conform to the equipment you connected to the system console, parallel printer, or modem option ports. *Using the AViiON™ System Control Monitor (SCM)* describes how to change system parameters to support your console, printer, or modem port devices.

The following steps outline the extended sequence of procedures described in the next two chapters. These steps assume that you have completed all the necessary hardware connections described in Chapters 2 and 3.

First powerup

1. Supply ac power to peripheral and network devices first. When peripherals are powered on and on line, turn on ac power to the computer unit.
2. Monitor power-up diagnostics and, if present, DG/UX autoboot messages.
3. Refer to “Solving Power-Up Problems” if necessary.
4. Refer to *Using the AViiON™ System Control Monitor (SCM)* to specify any nondefault system configurations.
5. Refer to operating system documentation to complete installing operating system and/or initializing system, *or* extend first powerup to include step 6.

Extended powerup

6. Run the AViiON System Diagnostics Acceptance Test.
7. Refer to operating system documentation to complete installing operating system and/or initializing system.

Figure 4-1 illustrates the extended first power-up sequence.

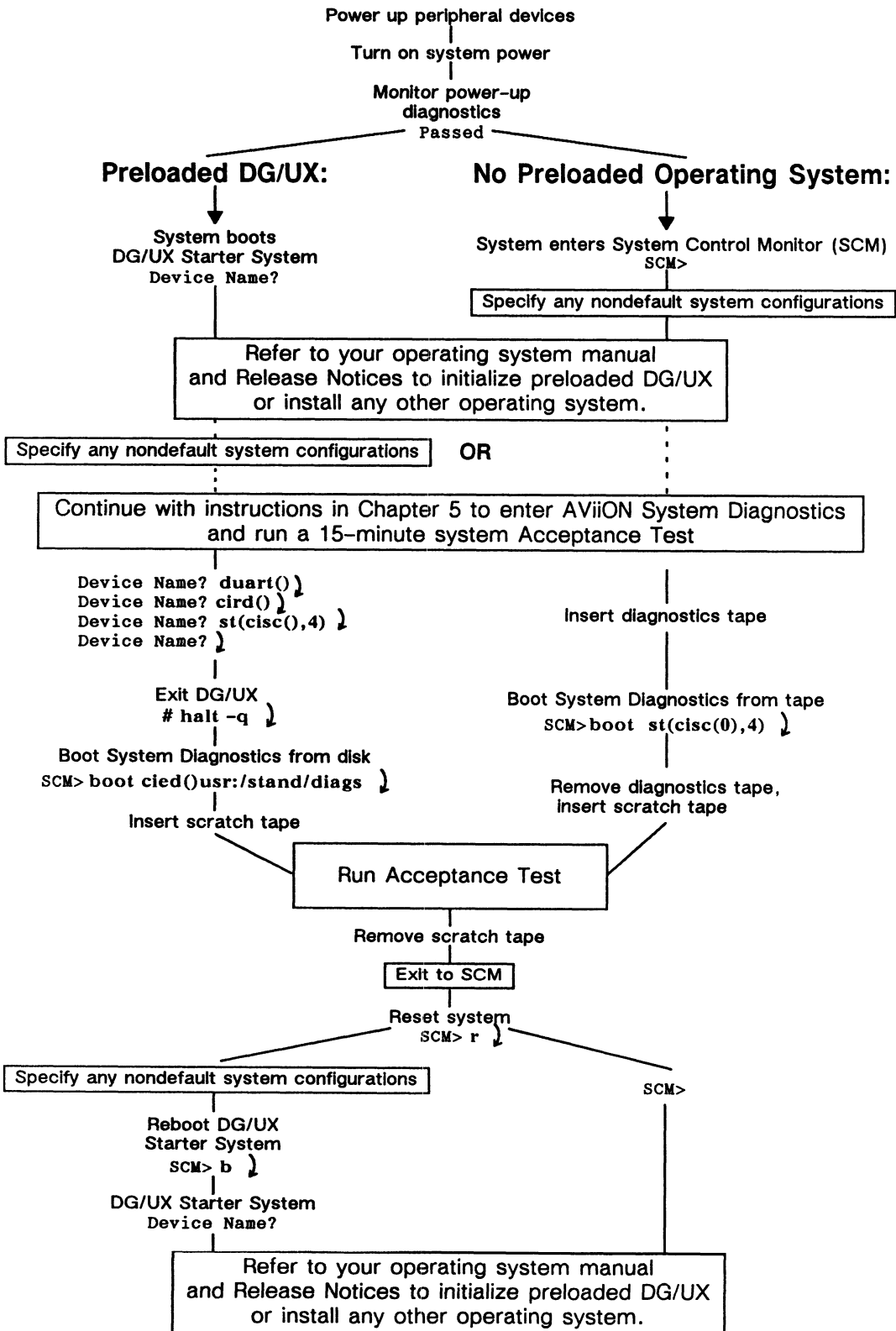


Figure 4-1 First Time Power-Up Sequence

Powering Up

The following sequence of events describes how to start up your AViiON system for the first time.

1. Turn on ac power to the system console and all cluster boxes, terminals, printers, plotters, and external drives that connect to your system. Make sure that the peripheral devices are *on line*.

Normally, when you turn on a terminal or printer, it runs an automatic self-test and finishes by coming on line. In general, this is indicated when the On Line light or Data light is steadily on (when the computer power is turned on) or blinking (when the computer is turned off). On DG/UX systems, the On Line light on terminals other than the system console will continue blinking until you initialize your asynchronous controllers and/or a multiuser environment. For specific information, see the documentation that came with your device.

2. Turn on the computer unit by pressing the power button on the front panel as shown in Figure 4-2. Make sure the power button on the computer lights up and stays pushed in.

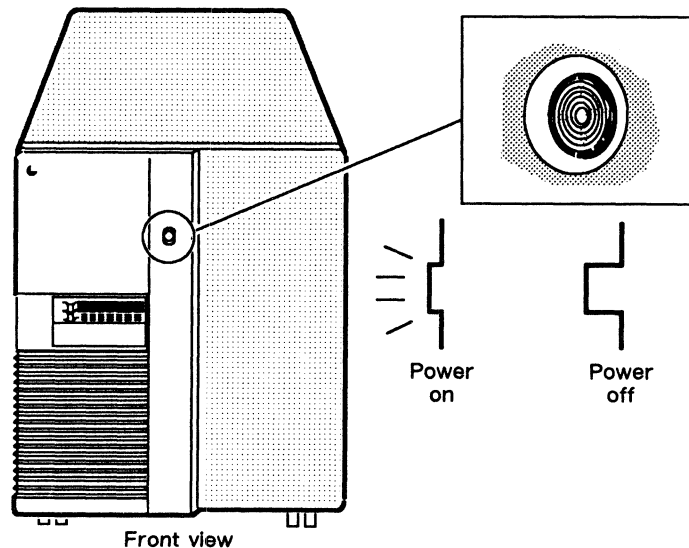


Figure 4-2 Turning on Computer Power

Most display terminals begin displaying the power-up test messages after a 5 to 15 second delay. If your terminal does not behave in this manner, refer to the device-specific documentation and the last section in this chapter, "Solving Power-Up Problems."

3. The system begins to display test messages like the following:

```

Data General AViiON - 5000/8000
Firmware Revision 00.00
Initializing [16 Megabytes]
Testing...
0123456789ABCDEFGHIJKLMNQRSTUWXYZ
Passed
  
```

Each character in the alphanumeric sequence 0123...ABC...Z indicates a power-up test that has passed.

4. Compare the test messages with your configuration sheet to make sure that the screen display is correct. If the model number or memory size displayed is incorrect, contact Data General immediately.

If the test messages are either incomplete or end with an error message, refer to the last section in this chapter, "Solving Power-Up Problems."

Once the system displays the message Passed, the power-up tests are complete.

NOTE: What you and your system do next depends on whether or not you purchased the DG/UX operating system preloaded on your system.

Continue with step 5 if your system does not include preloaded DG/UX.

If your system includes the preloaded DG/UX operating system, skip the next two steps and continue with step 7.

5. After it passes the power-up tests, all AViiON 5000 systems attempt to find a bootable file on one of the disks in the default autoboot path provided with your computer. If no operating system was preloaded in the default autoboot path, your system then enters the System Control Monitor (SCM) program. Boot messages and the SCM prompt will display on your screen as shown below.

```
Data General AViiON - 5000/6000
Firmware Revision 00.00
Initializing [16 Megabytes]
Testing...
  0123456789ABCDEFGHIJKLMN0PQRSTUVWXYZ
Passed

Booting cied(0,0)
Unable to load boot file cied(FFFFEF00,0,0)
Booting sd(cisc(),0)
Unable to load boot file sd(cisc())

SCM>
```

If your screen display appears correct and similar to the preceding example, continue with step 6. If you encounter a problem, refer to the section "Solving Power-Up Problems," later in this chapter.

NOTE: The SCM prompt for dual-processor computer systems precedes the letters SCM with Jp#n, where n identifies the attached job processor. For example, your prompt might read Jp#0/SCM>. The examples in this chapter use SCM> to indicate either prompt.

6. If any equipment attached to your basic system (“CONSOLE,” “MODEM,” or “PRINTER” ports on your computer’s rear panel) does not presently conform to the default configuration parameters listed in Chapter 2, you should specify new configuration parameters for those devices now. (For example, your parallel printer might use a Data Products interface rather than the default Centronics printer interface, or your “MODEM” port could connect a 9600 baud device rather than the default 1200). Skip the remainder of this chapter and refer to Chapter 2, “Using SCM Menus,” in *Using the AViiON™ System Control Monitor (SCM)* to specify the correct parameters for your equipment.

Once your system console, parallel printer, and modem port device all conform to the original default configuration parameters listed in Chapter 2, you can run a diagnostics Acceptance Test.

- If you do not want to run an Acceptance Test as part of your first powerup, continue with the next section, “Your Next Step.”
 - If you prefer to extend your first powerup and run a diagnostic Acceptance Test now, skip the remainder of this chapter and go to Chapter 5, “Starting and Running AViiON System Diagnostics.”
7. If your system includes preloaded DG/UX, it begins booting the DG/UX Starter System immediately after passing power-up tests, as shown in the following screen display example.

```

Data General AViiON - 5000/6000
Firmware Revision 00.00
Initializing [16 Megabytes]
Testing...
  0123456789ABCDEFGHIJKLMN0PQRSTUVWXYZY
Passed

Booting cied(0,0)root:dgux.starter

DG/UX Bootstrap Release 4.10

BCS Compliant File Header: 0555.
=====
Relocating relocater.

DG/UX System Release 4.10
Using [16 Megabytes] of physical memory
Found 1 processor(s)
Processor 0 running

                DG/UX Starter System
Enter the names of the devices you will use in Common Device
Specification Format, with one name per line. Enter just newline
when done.
Examples: sd(insc(),0) st(insc(),4) cird() st(cisc(),4)

Include duart() for servers and kbd() and grfx() for workstations.

Device Name?

```

Make sure the operating system recognizes the correct amount of memory for your system, and that it found the correct number of processors for your dual- or single-processor computer. If either of these values is incorrect, contact Data General immediately.

If your screen display appears correct and similar to the preceding example, continue with the next step. If the DG/UX Starter System does not boot, or you encounter some other problem, refer to the last section in this chapter, "Solving Power-Up Problems."

8. When your system displays the Device name? prompt, you should carefully consider which of the following options you want to perform next.
 - If any equipment attached to your basic system ("CONSOLE," "MODEM," or "PRINTER" ports on your computer's rear panel) does not presently conform to the default configuration parameters listed in Chapter 2, you should specify new configuration parameters for those devices now. (For example, your parallel printer might use a Data Products interface rather than the default Centronics printer interface, or your "MODEM" port could connect a 9600 baud device rather than the default 1200). Continue with step 9.
 - If you want to extend your first powerup and run a diagnostic Acceptance Test now, continue with step 9.
 - If you do not want to run an Acceptance Test or change configuration parameters, skip the following steps and then continue with the next section, "Your Next Step."

9. Before you can change configuration parameters or run an Acceptance Test, you must continue with the DG/UX Starter System, then exit from DG/UX to the System Control Monitor. The following instructions describe the minimum steps required to enter the System Control Monitor from the Starter System; Chapter 2 of *Installing and Managing the DG/UX™ System* contains a detailed description of the Starter System and the DG/UX boot process.
 - a. At the Device name? prompt(s), enter the names of the minimum devices required to initialize your system. When you finish entering devices, press New Line without an entry, as shown below.

```
Device Name? duart() ↵
Device Name? cird() ↵
Device Name? st(cisc(),4) ↵
Device Name? ↵
```

NOTE: You *must* enter the **duart()** response to enable your keyboard. If you enter single-user DG/UX with the keyboard disabled, you will need to power down your system; then power it up and begin again.

- b. After you press New Line without an entry, the system will initialize DG/UX in single-user mode, as shown in the following example screen display.

```
DG/UX System Release 4.10
Using [16 Megabytes] of physical memory
Found 1 processor(s)
Processor 0 running
```

```

                DG/UX Starter System
Enter the names of the devices you will use in Common Device
Specification Format, with one name per line. Enter just newline
when done.
Examples: sd(insc(),0) st(insc(),4) cird() st(cisc(),4)

Include duart() for servers and kbd() and grfx() for workstations.

Device Name?  duart()
Device Name?  cird()
Device Name?  st(cisc(),4)
Device Name?

**root: No check necessary for root.

INIT: Cannot open /etc/TIMEZONE. Environment not initialized.
INIT: /etc/inittab file created from prototype file
INIT: Checking and mounting /usr...
INIT: /usr is now mounted

INIT: SINGLE USER MODE
#
```

- c. Enter the System Control Monitor (SCM) by shutting down DG/UX and performing a quick system halt, as shown below.

```
# shutdown -g0 -y ↵
# halt -q ↵
```

When your system enters the System Control Monitor program, the current settings for various caches appear on your screen. Your screen display then looks similar to the following:

```
INIT: SINGLE USER MODE

# shutdown -x
# halt -q

      PSR      XPC      NPC      FPC      DCSH      DMMU      ICSH      IMMU
900003F6 00040472 00040476 0004047A Y        Y        Y        Y
SCM>
```

- d. To specify new system configuration parameters, skip the remainder of this chapter and refer to Chapter 2, "Using SCM Menus," in *Using the AViiON™ System Control Monitor (SCM)*.

To run a diagnostic Acceptance Test, skip the remainder of this chapter and go to Chapter 5, "Starting and Running AViiON System Diagnostics."

Your Next Step

You have finished powering up for the first time.

If your system includes preloaded DG/UX, you should now refer to *Installing and Managing the DG/UX™ System* for detailed instructions on what to do next. Chapter 2 in that manual provides an overview, examples of file systems, and instructions for the installation process; systems running preloaded DG/UX have already completed parts of the installation.

If your system does *not* include preloaded DG/UX, you should refer to your operating system manual(s) for instructions on what to do next. In most cases, you will need to *software* format your system disk, and then install your operating system on the formatted disk. Consider the following before you begin either process.

- The default automatic boot path probes your unit 0 ESDI hard disk (the bottom drive in your computer unit) for a bootable file each time you power up; if it finds no such file, it attempts to boot from SCSI disk drive 0 in an add-on mass storage subsystem. If your operating system does not reside on either hard disk, you must boot it manually each time you power up, or alter your system configuration to use an automatic boot path other than the default provided with your system. Refer to *Using the AViiON™ System Control Monitor (SCM)* for instructions on changing the system boot path, and for detailed information on booting from nondefault media.
- Your system does not require a reserved space on the system disk for AViiON System Diagnostics.
- The disks you received with your system are *hardware* formatted at the factory; you will not need to hardware format disks provided by Data General. For Data General to maintain systems with disks and disk controllers supplied by other vendors, a minimum list of format restrictions includes the following:

Data General's hardware formatter must be allowed to obtain disk controller parameters, a vendor defect list, and disk chronology information.

Block 0, track 0 must contain Data General disk geometry information; *do not* write to or alter the contents of block 0 on your disk.

Solving Power-Up Problems

When you turn on your computer unit, power-up diagnostic programs automatically test your computer to make sure that it can perform certain basic operations. This chapter tells you what you should do in case your computer fails a power-up diagnostic test.

When your system passes the power-up diagnostic tests, it displays the message **Passed** before it displays the SCM prompt or begins booting an installed operating system. If your computer fails a power-up diagnostic test, either the system console screen remains blank, an error message on the screen indicates a failure, or the system *hangs* (does not continue testing) at some point in the initial powerup.

If your system console screen remains blank for more than 2 minutes, try to resolve the problem yourself by following the steps in the “Blank Screen on the System Console” section below. If your system hangs or displays an error message, try to resolve the problem by following the steps in the “Error Messages on the Screen” section. If your system fails to boot preloaded DG/UX or does not reset correctly, refer to the “SCM Boot and Reset Errors” section.

NOTE: If you do not have a specific problem, but want to run a thorough system check using the AViiON System Diagnostics, refer to Chapter 5, “Starting and Running AViiON System Diagnostics.”

Blank Screen on the System Console

Follow the steps in this section if your system console screen remains blank for more than 2 minutes after powerup.

1. Make sure the power button light is on, and listen for the whirring noise of the fans inside the unit. If the light is off or you do not hear the fan, make sure the computer unit is getting power by testing the power cord and power source.
2. Make sure the terminal you are watching is the system console.
3. Make sure the system console is turned on.

Make sure the system console’s power cord is plugged tightly into an ac power outlet, and that the ac outlet is supplying power.

4. Make sure the screen intensity on your system console is adjusted brightly enough so you can see messages on the screen. (Try temporarily adjusting the screen intensity to the maximum setting.)
5. Make sure the keyboard’s On Line light is on. If it is not on, hold down the Cmd key and press the On Line key. If the light comes on, go to step 7.
6. If the keyboard’s On Line light is still off, do the following:
Make sure the cable that connects the keyboard to the terminal is plugged securely into the terminal. If it is secure, and the On Line light is still off, go to step 8.

7. If the On Line light is on and your screen is still blank, do the following:

Take the terminal off line by holding down the Cmd key and pressing the On Line key. (The On Line key acts as a toggle switch between on and off Line.) With the terminal off line, use the keyboard to type something. If the characters appear on your console screen, put the terminal back on line by holding down the Cmd key and pressing the On Line key.

8. If you still do not receive the power-up messages on your system console screen, make sure the cables that connect your station components together are undamaged and their connectors are secured tightly so that they make a good connection.
9. If the display is still blank, your system console may have a problem. Replace the system console with another terminal.

If your terminal has switches for setting the baud rate, parity, data length, and so forth, make sure they are set correctly as listed in Chapter 2. Refer to the device-specific documentation for the terminal if necessary.
10. If the cables are connected properly and the switch settings for the terminals are correct, turn your system power off, and then try powering up your system again.
11. If your screen is still blank, contact Data General. Within the United States and Canada, you can contact the Data General Service Center by calling 1-800-DG-HELPS for toll-free telephone support.

Error Messages on the Screen

Follow the steps in this section if the power-up diagnostic tests display an error message, or the terminal hangs and does not display a complete message.

1. Write down the error code or, if no error code appears, write down the last letter or number displayed. Note which series of tests produced the fault.
2. If the error is indicated by a meaningless display on your system console screen, examine the device cables, interfaces, and line settings at the back of your terminal and computer unit, and then change any that do not comply with the part numbers and settings listed in Chapter 2. *Make certain you have connected the correct ends of the system console cable to the console and your computer unit, and that your system console parity setting is correct.* If necessary, refer also to the device-specific documentation for your terminal to reset the settings.
3. Turn off the computer unit's power.
4. Turn on power to the computer unit again.
5. If your system powers up far enough to run an Acceptance Test as described in Chapter 5, "Starting and Running AViiON System Diagnostics," do so now. Contact Data General to report any error messages you receive.

NOTE: If your system recovers from the error condition after restarting, you should still consider the original problem a warning to run AViiON System Diagnostics as soon as possible.

6. If the error reoccurs, record the screen display and contact Data General. Within the United States and Canada, you can contact the Data General Service Center by calling 1-800-DG-HELPS for toll-free telephone support.

SCM Boot and Reset Errors

If your system fails to boot preloaded DG/UX, and instead displays the SCM> prompt, follow these steps.

1. Use the RESET command to reset the system by typing `r`, and then pressing New Line, as follows:

```
SCM> r ↵
```
2. When the SCM> prompt reappears, enter the BOOT command manually, as follows:

```
SCM> b ↵
```
3. If preloaded DG/UX again fails to boot, *power cycle* your computer unit by turning system power off, waiting a few minutes, and then turning power on again.
4. If the error reoccurs, record the screen display and contact Data General. Within the United States and Canada, you can contact the Data General Service Center by calling 1-800-DG-HELPS for toll-free telephone support.

If your computer fails to display an N in each of the last four columns (the data and instruction cache enabled/disabled setting) in the screen display after executing the SCM RESET command, repeat the command as follows:

```
SCM> r ↵
```

If your system does not reset to the expected values a second time, *power cycle* your computer unit by turning system power off, waiting a few minutes, and then turning power on again. This will reset registers and caches.

Contact Data General if your system does not reset to the proper values. Within the United States and Canada, you can contact the Data General Service Center by calling 1-800-DG-HELPS for toll-free telephone support.

End of Chapter

Chapter 5

Starting and Running AViiON System Diagnostics

AViiON System Diagnostics is a complete set of diagnostics for Data General's AViiON product line. It includes a diagnostic Acceptance Test, and various other utilities to help you test and maintain your system hardware. You received this diagnostics package on a separate cartridge tape from your operating system.

Since your system automatically runs power-up diagnostics each time you turn on your computer, you normally run AViiON System Diagnostics only when you encounter a problem. You might also want to run these diagnostics whenever you add or replace any hardware components on your system, and/or extend your first powerup to verify your system hardware configuration.

This chapter describes how to load the diagnostics operating system from disk or tape, run the Acceptance Test, and run specific floppy disk, tape, LAN, and line test utilities. The final section describes how to reboot your operating system from the SCM.

NOTE: If you intend to run an Acceptance Test, either to diagnose a problem or as part of an extended first powerup, the entire procedure should take less than 30 minutes; the system will return to the System Control Monitor (SCM) prompt when you finish.

All of the procedures in this chapter, outlined below, assume your system has successfully passed its power-up tests.

1. Enter the System Control Monitor (SCM) program.
2. Boot diagnostics.
3. Select and run the test or tool of your choice.
4. Exit diagnostics and re-enter the SCM.
5. Reset your system.
6. Reboot a disk resident operating system, or refer to operating system documentation to install and initialize your system.

The next section describes how to enter the SCM program, from which you can start and run AViiON System Diagnostics. If your system is currently running the SCM (for example, if this is your first powerup) you can skip the next section and continue with "Booting AViiON System Diagnostics."

Entering the SCM

Since AViiON System Diagnostics cannot run simultaneously with another operating system (such as the DG/UX system), you must boot the system diagnostics from the System Control Monitor (SCM). The SCM program allows you to load and start AViiON System Diagnostics directly from the system hardware, and then relinquishes control of the computer until you exit from the diagnostics system. (For a detailed description of the System Control Monitor, see *Using the AViiON™ System Control Monitor (SCM)*.)

You enter the SCM either at system powerup, or by terminating all other programs running on your system. If no bootable file (such as an operating system bootstrap program) resides in your system's automatic boot path, the system enters the SCM immediately after passing power-up tests. The command interpreter prompt `SCM>` displayed on your screen indicates that the SCM is running. (In systems with multiple processors, the SCM prompt includes the running processor number, as in `Jp#1/SCM>`.)

If your system includes a bootable file located in the automatic boot path, your system does not enter the SCM at powerup. Instead, it automatically boots the operating system or file. In this case, you must enter the SCM by halting the booted program. For example, if your system is currently running DG/UX software in single-user mode you can perform a quick system halt as follows:

```
# halt -q }
```

NOTE: You can always enter the SCM by suspending or terminating whatever other software your system is currently running. Refer to the appropriate program-specific documentation to halt your system if it is not running DG/UX software.

When your computer enters the System Control Monitor program, the current settings for various caches appear on your screen. Your screen display then looks similar to the following:

```
# halt -q

PSR      XPC      NPC      FPC      DCSH    DMMU    ICSH    IMMU
900003F6 00040472 00040476 0004047A Y       Y       Y       Y
SCM>
```

The next section, "Booting AViiON System Diagnostics," describes how to boot the diagnostics system from either a system disk or cartridge tape. Both procedures begin with your system displaying the appropriate prompt and running the SCM.

Booting AViiON System Diagnostics

If your system includes the preloaded DG/UX operating system, or you have installed AViiON System Diagnostics on disk, you can boot and run AViiON System Diagnostics directly from the appropriate disk. The next section describes how to boot these installed diagnostics from disk.

If your system does not include the preloaded DG/UX software or AViiON System Diagnostics installed on disk, you must boot the diagnostics from tape. You can skip the next section on booting from disk, and continue with "Booting System Diagnostics from Cartridge Tape."

Booting System Diagnostics from Disk

Follow these steps to start disk-resident AViiON System Diagnostics.

1. To boot diagnostics, enter the BOOT command followed by the location and filename of the diagnostic system as it resides on your system disk. Press New Line after the command line. For example, if your system includes preloaded DG/UX you enter the following:

```
SCM> boot cied(usr:/stand/diags )
```

NOTE: *Using the AViiON™ System Control Monitor (SCM)* contains detailed information on specifying SCM boot devices.

The system then loads the AViiON System Diagnostics into memory. After loading the correct file, your system displays the following prompt:

Press New Line to continue.

2. Press New Line. In a short time, your system displays the following screen:

```

Licensed Material - Property of DGC
Data General Proprietary Diagnostics

This diagnostic material contains information which is
proprietary and confidential to Data General Corporation (DGC) and
is the exclusive property of DGC. Unless there is a license agree-
ment executed by DGC under which DGC has identified this diagnostic
material and expressly licensed you, this diagnostic material is
provided to you in trust under the "Data and Proprietary Rights"
clause of your agreement with DGC only for use by or on behalf of
DGC (including its subsidiary companies) during the warranty period
and under any contract maintenance period. This diagnostic material,
in whole or in part, is not to be reproduced by any means nor made
available to any third party. You agree to return this diagnostic
material to DGC at the end of the above identified period(s) or
destroy this diagnostic material and, upon request, notify DGC in
writing of such destruction.
```

```

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publication or public disclosure.
```

Press New Line to continue.

Skip the next section on booting diagnostics from tape, and continue with the section on “Running System Diagnostics.”

Booting System Diagnostics from Cartridge Tape

To load and start the AViON System Diagnostics you received on cartridge tape, you must first properly insert the tape into your tape drive. Once the tape is correctly situated, you can load its contents into memory and start the diagnostics.

Inserting a Cartridge Tape

To insert the AViON System Diagnostics cartridge tape in your cartridge tape drive, follow these steps.

1. Make sure the write-protect indicator on the cartridge tape labeled “AViON System Diagnostics” is set to “SAFE,” and then insert the tape into the tape drive, as shown in Figure 5-1.

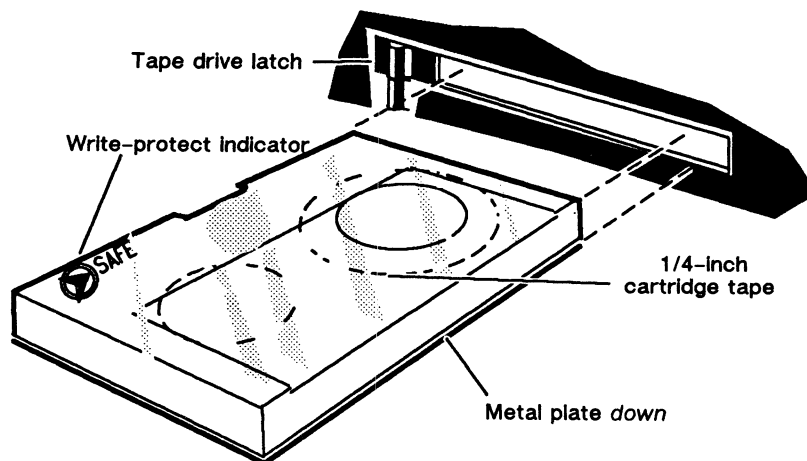


Figure 5-1 Inserting the AViON System Diagnostics Cartridge Tape

2. Push the tape cartridge entirely into the drive until the cartridge settles, and then slide the drive latch to the right to secure the cartridge tape in the drive. See Figure 5-2.

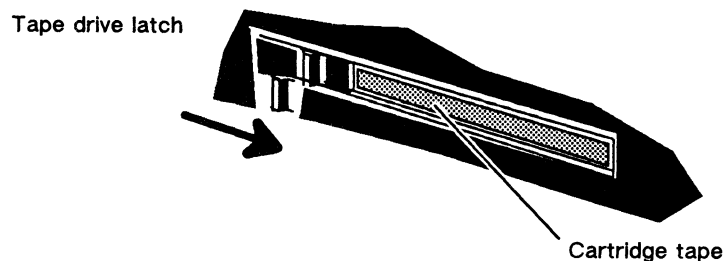


Figure 5-2 Securing the Cartridge Tape Latch

Booting the System Diagnostics Tape

To load AViiON System Diagnostics from tape into memory, continue with these steps.

3. Enter the BOOT command with the correct device identification for your tape drive at the SCM prompt, and then press New Line. For example, to boot from a tape drive defined as SCSI device 4 and managed by your unit 0 (first) SCSI controller, you would enter the following:

```
SCM> boot st(cisc(0),4) ↵
```

NOTE: *Using the AViiON™ System Control Monitor (SCM)* contains detailed information on specifying SCM boot devices. Most AViiON systems pre-set the first cartridge tape identification on any SCSI controller to unit 4.

The system then loads the AViiON System Diagnostics into memory. After loading the tape contents, the system displays the following prompt:

Press New Line to continue.

4. Press New Line. In a short time, your system displays the following screen:

```

                Licensed Material - Property of DGC
                Data General Proprietary Diagnostics

This diagnostic material contains information which is
proprietary and confidential to Data General Corporation (DGC) and
is the exclusive property of DGC. Unless there is a license agree-
ment executed by DGC under which DGC has identified this diagnostic
material and expressly licensed you, this diagnostic material is
provided to you in trust under the "Data and Proprietary Rights"
clause of your agreement with DGC only for use by or on behalf of
DGC (including its subsidiary companies) during the warranty period
and under any contract maintenance period. This diagnostic material,
in whole or in part, is not to be reproduced by any means nor made
available to any third party. You agree to return this diagnostic
material to DGC at the end of the above identified period(s) or
destroy this diagnostic material and, upon request, notify DGC in
writing of such destruction.

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publication or public disclosure.

Press New Line to proceed.
```

Continue with the next section, "Running System Diagnostics."

Running System Diagnostics

Follow this sequence of events to run AViiON System Diagnostics after your system console screen displays the Licensed Material Proprietary Notice.

1. Press New Line when you are ready to clear the screen. The AViiON System Diagnostics begins initialization by sizing the VME bus for device controllers; this process produces a screen display similar to the following:

```
Data General AViiON System Diagnostics
Revision xx.xx mm/dd/yy hh:mm:ss

Initializing operating system for System Diagnostics

Sizing Controllers on VME Bus:

Checking for VME ESDI/SMD Boards at addresses:
    fffff00 (hex)      Found
    fffff100 (hex)     Not found
    fffffb00 (hex)     Not found
    fffffd00 (hex)     Not found

Checking for VME SCSI Boards at addresses:
    fffff300 (hex)     Found
    fffff500 (hex)     Not found

Checking for VME LAN Boards at addresses:
    ffff4000 (hex)     Found
    ffff5000 (hex)     Not found

Checking for Synchronous I/O Boards at addresses:
    55b00000 (hex)     Found
    55b10000 (hex)     Not found

Checking for Asynchronous I/O Boards at addresses:
    80000000 (hex)     Found
    80020000 (hex)     Not found
    80040000 (hex)     Not found
    80060000 (hex)     Not found
    80080000 (hex)     Not found

Press New Line to proceed
```

Compare the controller sizing messages with your configuration sheet or original packing invoice to make sure that the screen display includes all the VME boards in your system. For example, your system may not include a LAN controller (or it may support two or more), and it may include various combinations of asynchronous controllers and host adapters. If a VME board is missing, it may be jumpered or installed incorrectly, or may be faulty. Stop here and contact Data General by phoning 1-800-DG-HELPS.

If the sizing messages correctly reflect the VME boards in your system, press New Line to continue the initialization.

2. Initialization messages appear on your screen. Your display appears similar to the following once the system diagnostics initializes each system component:

```

16384 Kbytes system memory
15109 Kbytes memory available for test
PROM revision xx.xx
Dual CPU System (Motorola 88100 CPU Rev x)
2 Instruction Caches (Motorola 88200 CMMU Rev x)
2 Data Caches (Motorola 88200 CMMU Rev x)
Initializing Virtual Console
Initializing Real Time Clock
Initializing VME Async I/O Board 0
Initializing VME SCSI 0
Initializing VME ESDI/SMD 0
Initializing Parallel Printer
Initializing Duart
Initializing VME LAN
Initializing VME Sync I/O Board 0

```

Compare the initialization messages with your configuration sheet or original packing invoice to make sure that the screen display includes all the components of your system correctly. For example, a dual-processor system would initialize two CPUs and four CMMUs. If any part of the screen display is incorrect, stop here and contact Data General by phoning 1-800-DG-HELPS.

3. Once the system completes initialization, it prompts you with cache questions. Type Y (yes) and press New Line, or simply press New Line to accept the default [Y] response for each question, as follows:

```
Run with instruction caches on (Y/N) [Y]? ↵
```

```
Run with data caches on (Y/N) [Y]? ↵
```

4. Verify the current time when the system displays the following prompt:

```
Current time is 14:45 Thursday, May 25, 1989. Is this correct (Y/N) [Y]?
```

5. If the time is correctly set, press New Line. If you need to correct the time, type N and press New Line. Enter the correct date (mm/dd/yy), and then the correct time (hh:mm). Use a 24-hour clock for time entries. For example, if the time is 1:00 p.m., enter 13:00, and then press New Line to continue.

Next, the diagnostic system checks your system for connected peripherals and lists them. Your screen should look similar to the following example:

```
Run with instruction caches on (Y/N) [Y]?
Run with data caches on (Y/N) [Y]?

Current time is xx:xx Tuesday, May 4, 1990. Is this correct (Y/N) [Y]?

Sizing Peripherals....

VME SCSI Board 0:
  Unit 0: Microp 1370 Ao5 Disk Drive found
  Unit 1: Microp 1370 Ao5 Disk Drive found
  Unit 3: TEAC 5.25 Floppy (LUN 2) Disk Drive found
  Unit 4: Archive Viper 150 21247-045 Tape Drive found

VME ESDI/SMD Board 0:
  Unit (Drive Number) 0: 322MB ESDI Disk found
  Unit (Drive Number) 1: 322MB ESDI Disk found
  Unit (Drive Number) 2: 322MB ESDI Disk found

VME Async Board 0:

  VME Host Adapter
  Model              = HPS-6945
  Firmware P/N      = 90-070052-3-02A

  Sizing Cluster Controller Network
  -----
  Net ID = 01 (hex): HPS-7080-020 (Ready)
  Net ID = 08 (hex): HPS-7088-020 (Ready)
  Net ID = 13 (hex): HPS-7082-020 (Ready)

VME Async Board 1:

  16-line VME Async Board
  Model              = HPS-6236
  Firmware P/N      = 90-070408-8-01A

Press New Line to proceed
```

If you do not have a record of configuration information (such as device, controller, or cluster controller network identifications), use the sizing display to record the configuration information now for future reference.

6. When you are certain that the peripheral list matches your system configuration, press New Line to continue.

If a configured device does not appear, contact Data General for help and explain the problem.

If the message `Drive not ready` appears after a listed device, make certain the unit is on line. Refer to the device-specific documentation to bring the drive on line. If the message remains on your screen, contact Data General.

If the message `Unsupported drive` appears, the system will not test the device.

7. If the list of peripherals sized by System Diagnostics matches your system, press New Line to continue running diagnostics.

After you press New Line, the screen displays the AViiON System Diagnostics Main Menu, as follows:

```
AViiON System Diagnostics
Revision: xx.xx
```

```
Data General Corporation
Proprietary Use Only
```

Main Menu

1. Run acceptance test
2. View Tools Menu
3. Display help screen
4. Exit to SCM

```
Enter choice: 1
```

The AViiON System Diagnostics Main Menu lets you choose the diagnostic test or utility you want to run. You select the option you want by entering the option number and pressing New Line. The system then prompts you with a menu corresponding to the option you chose.

NOTE: If you choose the wrong option or change your mind, you can leave any AViiON System Diagnostics menu by pressing the Esc key on your keyboard.

8. Continue with the following section that describes the test or utility you want to run:

If you want to perform an extended first powerup, or locate a hardware problem, go to the next section, "Running the Acceptance Test."

If you want to format a floppy disk, adjust cartridge tape tension, test LAN connections with a Time Domain Reflectometry test, or test an asynchronous terminal line, go to the section "Using the AViiON System Diagnostics Tools."

Running the Acceptance Test

Option 1, “Acceptance Test” on the AViiON System Diagnostics Main Menu sizes your system and lists the components to test. Next, it runs nondestructive tests on all listed components for a total of 15 minutes.

The Acceptance Test also includes a *destructive* test of the tape drive(s) included in your system. This test requires a high-density scratch (nonessential) tape in each drive. If you booted the diagnostics from tape, you will need to remove the AViiON System Diagnostics tape and replace it with a scratch tape for testing.

To run the Acceptance Test, follow these steps:

1. Press New Line at the AViiON System Diagnostics Main Menu to select the default, option 1, “Acceptance Test.”

```
AViiON System Diagnostics  
Revision: xx.xx
```

```
Data General Corporation  
Proprietary Use Only
```

```
      Main Menu
```

- ```
1. Run acceptance test
2. View Tools Menu
3. Display help screen
4. Exit to SCM
```

```
Enter choice: 1)
```

The system displays a current inventory list similar to the example on the next page:

The Acceptance Test verifies that the following system components are functioning:

Memory  
Multiple CPU  
Integrated DUART Channel B  
Clock  
VME LAN Board 0  
Parallel Printer  
VME ESDI Board 0 322MB ESDI Disk (Unit: 0)  
VME ESDI Board 0 322MB ESDI Disk (Unit: 1)  
VME ESDI Board 0 322MB ESDI Disk (Unit: 2)  
VME SCSI Board 0 Microp 1370 disk drive (unit: 0)  
VME SCSI Board 0 Microp 1370 disk drive (unit: 1)  
VME SCSI Board 0 Microp 1370 disk drive (unit: 2)  
VME SCSI Board 0 ARCHIVE VIPER 150 tape (unit: 4)  
VME Async Host Adaptor  
16-line VME Async Board 1  
VME Sync Board 0

This test runs for 15 minutes

Press New Line to Start Acceptance Test - Press Q to Quit.

2. Press New Line to start the test. The diagnostic system displays the following warning message:

CAUTION: Tape Tests destroy all data on the tape.

Please insert write-enabled scratch tapes for all tape units to be tested. Press New Line when ready to proceed

If you booted diagnostics from tape, remove the AViiON System Diagnostics tape from the drive *before you press New Line*. Slide the tape drive latch to the left to release the tape, and then gently pull the cartridge from the drive.

3. If you want to test the tape units listed on your screen, you must insert a high density cartridge tape with contents you do not need into each drive you want tested, as shown in Figures 5-3 and 5-4.
  - a. Set the write-protect indicator on the high density scratch tape(s) to enable (rather than prevent) writing to the tape. On most tapes, you turn an indicating arrow away from the word "SAFE" etched on the cartridge. (See Figure 5-3.)

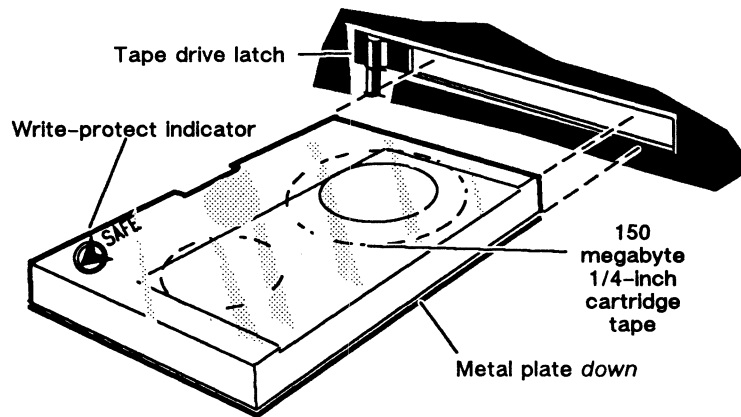


Figure 5-3 Inserting a Scratch Cartridge Tape

- b. Push the tape cartridge(s) entirely into the drive until the cartridge settles, and then slide the drive latch to the right to secure the cartridge tape in the drive. (See Figure 5-4.)

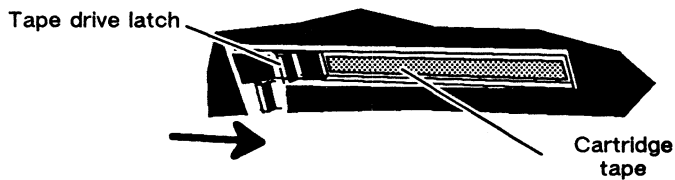


Figure 5-4 Securing the Tape Drive Latch

4. Press New Line to begin the Acceptance Test. The system displays the General Status Report screen, as follows:



```

 General Status Report

Revision: xx.xx Total Errors: 0000
Elapsed Time: 00:00:00 Current Time: 09:56:13

TEST SUBSYSTEM PASS SOFT HARD KBYTES KBYTES
ID DESCRIPTION COUNT ERRORS ERRORS READ WRITTEN

48 Memory 0 0 0 0 0
47 Multiple CPU 0 0 0 0 0
46 Integrated DUART 0 0 0 0 0
45 Clock 0 0 0 0 0
44 VME LAN Board 0 0 0 0 0 0
43 VME ESDI Board 0 0 0 0 0 0
42 VME SCSI Board 0 0 0 0 0 0
41 16-line VME Async Board 0 0 0 0 0
42 VME Sync Board 0 0 0 0 0 0

S to Update General Status Report Ctrl-D to Stop All Tests

```

The diagnostic system assigns a test number to each individual test. Once testing begins, the status report records the number of test passes completed for each test, any soft and hard errors detected during testing, and Kbytes read and written during tests that perform read and write operations.

The General Status Report screen automatically displays updated information every minute. You can press the "s" key to view current statistics at any time. (The statistics update immediately; you do not need to press New Line as you would to execute most commands.)

```

 General Status Report

Revision: xx.xx Total Errors: 0000
Elapsed Time: 00:01:01 Current Time: 09:57:14

TEST SUBSYSTEM PASS SOFT HARD KBYTES KBYTES
ID DESCRIPTION COUNT ERRORS ERRORS READ WRITTEN

48 Memory 16662 0 0 4073 4073
47 Multiple CPU 2398 0 0 0 0
46 Integrated DUART 56 0 0 13 13
45 Clock 0 0 0 0 0
44 VME LAN Board 0 1265 0 0 24 24
43 VME ESDI Board 0 240 0 0 5172 0
42 VME SCSI Board 0 233 0 0 2226 3008
41 16-line VME Async Board 3 0 0 0 0
42 VME Sync Board 0 1 0 0 32 32

S to Update General Status Report Ctrl-D to Stop All Tests

```

The test will run for 15 minutes. To stop the testing and return to the Main Menu, press Ctrl-D at any time. This interrupts and invalidates any testing already completed. You must run the Acceptance Test for the full 15 minutes in order to properly test the system.

If the Acceptance Test encounters a serious fault, all testing halts and you see either an error message or the SCM (System Control Monitor) prompt on your screen. If either of these things happen, write down any text displayed on your screen and call Data General.

- At the end of the Acceptance Test, you see a final status report like the following:

```

 General Status Report
Revision: xx.xx Total Errors: 0000
Elapsed Time: 00:01:01 Current Time: 10:11:34

TEST SUBSYSTEM PASS SOFT HARD KBYTES KBYTES
ID DESCRIPTION COUNT ERRORS ERRORS READ WRITTEN
* Memory 24383 0 0 59465 59465
* Multiple CPU 34136 0 0 0 0
* Integrated DUART 788 0 0 167 167
* Clock 2 0 0 0 0
* VME LAN Board 0 17827 0 0 339 339
* VME ESDI Board 0 3507 0 0 77185 0
* VME SCSI Board 0 3472 0 0 32234 43428
* 16-line VME Async Board 51 0 0 0 0
* VME Sync Board 0 73 0 0 324 324

Press New Line to return to the Main Menu

```

If the value for “Total Errors” (top right of General Status Report screen) is 0000, your system has passed the Acceptance Test. Continue with step 6.

If there are any errors reported in the “HARD ERRORS” column, there is a problem with the tested component that you should investigate before continuing with normal power-up procedures or software installation. If you see a large number in the “SOFT ERRORS” column, you may also want to investigate further.

To further diagnose the problem, refer to the device-specific documentation for the appropriate component, and the next section in this chapter, “Using AViiON System Diagnostics Tools”. If you remain unsure of the problem or how to solve it, contact Data General.

- Remove your scratch tapes from the tape drive(s). Release the tape by sliding the tape drive latch to the left, and then gently pulling the cartridge from the drive.
- Press New Line to return to the AViiON System Diagnostics Main Menu.  
If you intend to run one of the system diagnostics tools now, skip the remainder of this section and continue with “Using AViiON System Diagnostics Tools.” If you do not intend to use any of the diagnostics tools, continue with step 8 and re-enter the System Control Monitor Program.
- To re-enter the System Control Monitor Program, type 4 and press New Line to select option 4, “Exit to SCM” from the AViiON System Diagnostics Main Menu.

```
AViON System Diagnostics
Revision: xx.xx
```

```
Data General Corporation
Proprietary Use Only
```

```
Main Menu
```

1. Run acceptance test
2. View Tools Menu
3. Display help screen
4. Exit to SCM

```
Enter choice: [1] 4 ↵
```

Your system will display the SCM prompt.

```
SCM>
```

9. Type `r` and press New Line to *reset* your system. The `RESET` command returns your system to the running parameters necessary to boot your operating system.

```
SCM> r ↵
```

The reset cache and other values will display on your screen, followed by the SCM prompt. The following example shows Xs where hexadecimal numbers appear.

```
SCM> r
```

```
PSR XPC NPC FPC DCSH DMMU ICSH IMMU
XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX N N N N
SCM>
```

**NOTE:** If your display shows a Y rather than N in any of the last four columns (indicating that the data and instruction caches are still enabled), repeat the `RESET` command. If a second reset does not return the correct values, *power cycle* your computer unit by turning system power off, waiting a few minutes, and then turning power on again. This will reset registers and caches.

If you have installed your operating system on disk, you can now reboot your operating system as described in the section, "Rebooting a Disk-Resident Operating System."

If you have not yet installed your operating system on disk, you should skip to the last section in this chapter, "Your Next Step."

## Using the AViiON System Diagnostics Tools

The AViiON System Diagnostics tools allow you to format floppy disks, adjust the tension on your cartridge tapes, test the cables and connections on an Ethernet LAN, and test the asynchronous lines to your user terminals. This section describes how to enter and exit the AViiON System Diagnostics Tools Menu, and provides step-by-step procedures for using the diagnostic tools.

You enter the Tools Menu from the AViiON System Diagnostics Main Menu. From the Tools Menu, you select the option you want by entering the option number and pressing New Line. The system then prompts you with messages and instructions corresponding to the option you chose.

**NOTE:** If you choose the wrong option or change your mind, you can leave any AViiON System Diagnostics menu by pressing the Esc key on your keyboard.

To enter the Tools Menu, do the following:

1. While in the System Diagnostics Main Menu, type **2** and press New Line to select option 2, "Tools Menu."

```
AViiON System Diagnostics
Revision: xx.xx
```

```
Data General Corporation
Proprietary Use Only
```

**Main Menu**

1. Run acceptance test
2. View Tools Menu
3. Display help screen
4. Exit to SCM

```
Enter choice: [1] 2)
```

The system displays the Tools Menu, as shown on the next page.

```
Tools Menu

1. Format Floppy Disk
2. Run tape adjustment utility
3. Test network connection (TDR)
4. View Terminal Test Menu
5. Display help screen
6. Return to Main Menu

Enter choice [6]:
```

2. Select the function that you want to perform by entering the option number for the function and pressing New Line. The system prompts you with a menu corresponding to the option you chose.

The following sections describe how to use the diagnostic tools listed on the Tools Menu.

If you select option 5, "Display help screen" you can view a brief description of each test on the Tools Menu. If you select the last option, the system returns to the System Diagnostics Main Menu.

Continue with steps 3 and 4 after you finish running the diagnostics option(s) you selected.

3. To re-enter the System Control Monitor Program, type 4 at the System Diagnostics Main Menu and press New Line to select option 4, "Exit to SCM" from the AViiON System Diagnostics Main Menu.

```
AViiON System Diagnostics
Revision: xx.xx

Data General Corporation
Proprietary Use Only

Main Menu

1. Run acceptance test
2. View Tools Menu
3. Display help screen
4. Exit to SCM

Enter choice: [1] 4 ↵
```

Your system will display the SCM prompt.

4. Type `r` and press New Line to *reset* your system. The RESET command returns your system to the running parameters necessary to boot your operating system.

```
SCM> r ↵
```

The reset cache and other values will display on your screen, followed by the SCM prompt. The following example shows Xs where hexadecimal numbers appear.

```
SCM> r

PSR XPC NPC FPC DCSH DMMU ICSH IMMU
XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX N N N N
SCM>
```

**NOTE:** If your display shows a Y rather than N in any of the last four columns (indicating that the data and instruction caches are still enabled), repeat the RESET command. If your system does not reset to the expected values a second time, *power cycle* your computer unit by turning system power off, waiting a few minutes, and then turning power on again. This will reset registers and caches.

Contact Data General if your system does not reset to the proper values. Within the United States and Canada, you can contact the Data General Service Center by calling 1-800-DG-HELPS for toll-free telephone support.

If you have installed your operating system on disk, you can now reboot your operating system as described later in this chapter in the “Rebooting a Disk-Resident Operating System” section.

If you have not yet installed your operating system on disk, you should skip to the last section in this chapter, “Your Next Step.”

The following sections describe how to use the diagnostic tools listed on the Tools Menu.

## Formatting Floppy Disks

If your system includes an external diskette drive, you should hardware format a new floppy disk (diskette) before you use it. You can also format any used diskettes whose integrity you suspect. Since formatting destroys all data on the diskette, *use a separate medium to save any data you do not want to lose* before you hardware format. To format a floppy disk, follow the steps below.

1. Insert the diskette into its drive.
2. Select option 1 from the Tools Menu.

```

 Tools Menu

1. Format Floppy Disk
2. Run tape adjustment utility
3. Test network connection (TDR)
4. View Terminal Test Menu
5. Display help screen
6. Return to Main Menu

Enter choice [6]:1)

```

Your system displays a list of any diskette drives it finds and prompts you to select or delete each drive for formatting.

2. To hardware format a floppy disk, type **s** after the appropriate drive listing, as shown below for drive unit 3.

To indicate no formatting on a diskette in any drive, type **d** after the drive listing, as shown below for drive unit 5.

To accept the default response, shown in brackets on the screen, press New Line when the cursor is positioned at that entry, as shown below for unit 6.

```

Target Selection:

Enter S to Select, D to Delete, New Line to retain current value

VME SCSI Board 0

TEAC 5.25 floppy (LUN 2) (Unit 3) [Deleted]: s
TEAC 5.25 floppy (LUN 2) (Unit 5) [Selected]: d
TEAC 5.25 floppy (LUN 2) (Unit 6) [Deleted]:)

Press New Line to Start - Press Q to Exit

```

3. Press New Line to start the formatting utility on floppy disks in the selected drives. The utility then displays the following message:

```
Initializing for Format Selection under Disk Media Maintenance
Radix for all input/output (DECIMAL, HEX) [DECIMAL]
```

4. Press New Line to select the default radix (base 10 or base 16), or enter your desired format and then press New Line. The utility responds as follows:

```
Input session for TEAC 5.25 Floppy (LUN 2)
```

After approximately 30 seconds, the diskette format utility continues with a display similar to the following:

```
Current disk geometry information for Unit 3...
Cylinders per disk = 40
Heads per cylinder = 2
Data sectors per track = 9
Spares per track = 0
Head skew = 0
Cylinder skew = 0
Interleave factor = 0
User area starting sector =1, ending sector = 718

Press New Line to proceed
```

5. Press New Line to accept the geometry information.
6. When you accept the floppy disk information on your screen, the utility then asks that you specify the type of diskette in the drive, as follows:

```
Available densities for the 5.25 inch drive:

HIGH - 1.2 Megabytes
LOW - 360 Kilobytes
MEDIUM - 720 Kilobytes

Density for formatting (HIGH, LOW, MEDIUM) [LOW]
```

7. Press New Line to select the default diskette density, or enter the correct floppy disk type and then press New Line. The utility then *twice* asks you to verify your desire to format before continuing further, as shown in the following screen display.



Available densities for the 5.25 inch drive:

HIGH - 1.2 Megabytes  
 LOW - 360 Kilobytes  
 MEDIUM - 720 Kilobytes

Density for formatting (HIGH, LOW, MEDIUM) [LOW] medium ↵

Do you still want to format this disk (NO, YES) [NO] y ↵

Disk Media Maintenance functions selected:

Format selected for TEAC 5.25 Floppy (LUN 2) (Unit 3)  
 on VME SCSI Board 0

Do you want to cancel all selected functions (NO, YES) [YES] n ↵

8. If you answer n, or no to the "...cancel all selected functions..." query, the utility begins formatting your diskette. When finished, it displays a Status Report on your screen, as shown below.

```

 Status Report
Revision: xx.xx Elapsed Time: xx.xx.xx
Controller Unit Operation Current Current Defects
 Pass Track Found
VME SCSI 3 FORMAT 0 Complete 0

```

Press New Line to proceed

Each diskette takes less than 2 minutes to hardware format. When the last selected drive finishes formatting its floppy disk, the utility provides a summary report, as shown below.

#### Media Maintenance Summary

VME SCSI 0, unit 3: TEAC 5.25 Floppy (LUN 2)

Operation: Format  
 Operation completed successfully

Do you want to print Media Maintenance Summary (NO, YES) [NO]

Press New Line to return to previous menu

9. Press New Line to return to the Tools Menu. From the Tools Menu, you can either format additional diskettes, run other diagnostic tools, or return to the System Diagnostics Main Menu. From the Main Menu, you can re-enter the SCM and then boot your operating system.

If you choose to format more floppy disks, simply repeat steps 1–8 in this section.

If you want to run other diagnostic tools, skip the remaining steps in this section, and continue with the appropriate following section(s).

10. Select option 6, “Return to Main Menu” to return to the System Diagnostics Main Menu.
11. Type 4 and press New Line to select option 4, “Exit to SCM” from the AViiON System Diagnostics Main Menu.

**NOTE:** You should reset your system before booting your operating system; refer to step 4 in the preceding section, “Using the AViiON System Diagnostics Tools” for instructions.

## Running the Tape Adjustment Utility

It is a good idea to establish proper tension before writing to a new cartridge tape and to restore proper tension before writing to a previously used cartridge tape. To adjust a cartridge tape's tension, follow the steps below.

1. Insert the cartridge tape into its drive.
2. Select option 2 from the Tools Menu.

```

 Tools Menu

1. Format Floppy Disk
2. Run tape adjustment utility
3. Test network connection (TDR)
4. View Terminal Test Menu
5. Display help screen
6. Return to Main Menu

Enter choice [6]: 2)

```

Your system displays a list of any tape drives it finds and prompts you to select or delete each drive for tape adjustment.

2. To establish proper tension on a tape, type **s** after the appropriate drive listing, as shown below for drive unit 4.

To indicate no tension adjustment on a tape in any drive, type **d** after the drive listing, as shown below for drive unit 5.

To accept the default response, shown in brackets on the screen, press New Line when the cursor is positioned at that entry, as shown below for unit 6.

```

Target Selection:

Enter S to Select, D to Delete, New Line to retain current value

VME SCSI Board 0

ARCHIVE Viper 150 Tape (Unit 4) [Deleted]: s
ARCHIVE Viper 150 Tape (Unit 5) [Selected]: d
ARCHIVE Viper 150 Tape (Unit 6) [Deleted]:)

Press New Line to Start - Press Q to Exit

```

3. Press New Line to start the tape adjustment utility on tapes in the selected drives.

The utility takes about 5 minutes to restore proper tape tension to each cartridge tape in the selected drive(s). You see the following prompt when the utility begins on the first selected drive.

```
Tape Adjustment in Progress - Please Wait
```

When it finishes adjusting tension on a tape, the utility displays a message similar to the following:

```
VME SCSI Board 0:
 Adjustment of ARCHIVE Viper 150 Tape (Unit 4) Completed
```

After adjusting tension on the tape in the last selected tape drive, the utility prompts you to return to the Tools Menu:

```
Press New Line to return to Tools Menu
```

4. Press New Line. From the Tools Menu, you can either adjust tension on additional cartridge tapes, run other diagnostic tools, or return to the System Diagnostics Main Menu. From the Main Menu, you can re-enter the SCM and then boot your operating system.

If you choose to adjust the tension on more tapes, simply repeat steps 1–3 in this section.

If you want to run other diagnostic tools, skip the remaining steps in this section, and continue with the appropriate following section(s).

5. Type 6 and press New Line to select option 6, “Return to Main Menu” from the Tools Menu. You return to the System Diagnostics Main Menu.
6. Type 4 and press New Line to select option 4, “Exit to SCM” from the AViiON System Diagnostics Main Menu.

**NOTE:** You should reset your system before booting your operating system; refer to step 4 in the previous section, “Using the AViiON System Diagnostics Tools” for instructions.

## Testing LAN Network Connections

You can test the network connections for faults or shorts. Follow the steps below to run a TDR (Time Domain Reflectometry) test on your network hardware:

1. While in the Tools Menu, type 3 and press New Line to select option 3, "Test network connection (TDR)."

```

Tools Menu

1. Format Floppy Disk
2. Run tape adjustment utility
3. Test network connection (TDR)
4. View Terminal Test Menu
5. Display help screen
6. Return to Main Menu

Enter choice [6]: 3 ↵

```

Your system displays a list of any LAN controllers it finds and prompts you to select or delete each LAN to test connections.

2. To test the cable connections for the first Ethernet LAN, type *s* after the appropriate board listing, as shown below for VME LAN Board 0.

To indicate no testing for cable faults on a LAN system, type *d* after the board listing, as shown below for VME LAN Board 1.

To accept the default response, shown in brackets on the screen, press New Line when the cursor is positioned at that entry.

```

Target Selection:

Enter S to Select, D to Delete, New Line to retain current value

VME LAN Board 0 [Deleted]: s
VME LAN Board 1 [Selected]: d

Press New Line to Start - Press Q to Exit

```

3. Press **New Line** to start the utility. The system displays the following:

Number of Passes to Run TDR test (1-256) [1]:

4. Select a number from 1 through 256 indicating how many times you want to run the test on your system. The amount of time required for each pass depends on your network; you should probably select a low number the first time you run this test on a LAN. For example, to run the test twice type **2** and press **New Line**.

5. The system displays a message after each pass of the test. The message appears as follows if the test finds no hardware faults in your LAN connection:

TDR Pass Number: 001                      TDR Test Passed with NO ERROR

If the test finds a fault, the system reports the approximate distance (in meters) from the transceiver to the problem. You see two distances reported. You use the first value to locate a faulty LAN connection with “thick” cabling; use the second value if you have “thin” cabling. (Refer to your LAN installation documentation if you need to determine which type of coaxial cable your system uses). At the end of testing, the system prompts you as follows:

Press **New Line** to return to the previous menu.

6. Press **New Line** to re-enter the Tools Menu. From the Tools Menu, you can either check connections on another LAN with a Time Domain Reflectometry test, run other diagnostic tools, or return to the System Diagnostics Main Menu. From the Main Menu, you can re-enter the SCM, and then boot your operating system.

If you want to test the hardware connections on another LAN, repeat steps 1-5 in this section.

If you want to run other diagnostic tools, skip the remaining steps in this section, and continue with the appropriate following section(s).

7. Type **6** and press **New Line** to select option 6, “Return to Main Menu” to return to the System Diagnostics Main Menu.
8. Type **4** and press **New Line** to select option 4, “Exit to SCM” from the AViiON System Diagnostics Main Menu.

**NOTE:** You should reset your system before booting your operating system; refer to step 4 in the previous section, “Using the AViiON System Diagnostics Tools” for instructions.

## Using the Terminal Test Menu

If you suspect a problem with one or more of the asynchronous lines between your terminals and computer unit, you can run the Terminal Test tool from your system console to check that the lines are transmitting data properly. The Terminal Test diagnostic tool allows you to simultaneously test a maximum of 40 terminal lines provided by VDA/128 host adapters or VAC/16 asynchronous controllers. To test asynchronous terminal lines, follow the steps below.

**NOTE:** For the Terminal Test to work properly, the terminal(s) whose lines you want to test must be set in ANSI mode, 9600 baud, and 1 stop bit. Refer to the Terminal Test Menu help screen for the proper parity and data bit settings for your system.

1. While in the Tools Menu, type 4 and press New Line to select option 4, "View Terminal Test Menu."

```

Tools Menu

1. Format Floppy Disk
2. Run tape adjustment utility
3. Test network connection (TDR)
4. View Terminal Test Menu
5. Display help screen
6. Return to Main Menu

Enter choice [6]: 4 ↵

```

Your system displays the Terminal Test Menu, shown below.

```

Terminal Test Menu

1. Start scrolling characters set test
2. Start lines of characters test
3. Start keyboard echo test
4. Start port ID message test
5. Auto port identification
6. Terminate a test
7. Show executing tests
8. Display help screen
9. Return to Tools Menu

Enter choice [9]:

```

2. Select the test you want to run by typing the option number and pressing New Line. The system prompts you with messages corresponding to the option you choose.

You can run simultaneous tests on more than one terminal, but not on individual terminals; starting a new test to a terminal line automatically terminates any test currently running on that line.

**NOTE:** If you start a test on more than 40 terminals, or start simultaneous tests so that more than 40 tests are running, the Terminal Test tool displays an error message:

```
Out of process ID's, Press New Line to Proceed
```

Press New line, and then select option 6, "Terminate a test," to terminate some of the current tests so that the utility can continue testing.

Before executing options 1-5, the Terminal Test tool runs a self-test on any board that has not been previously tested during the current Terminal Test session. After completing the self-test(s), the test program returns to the Terminal Test Menu, from which you can continue. We suggest you begin each session by running option 4, "Start port ID message test," on all boards to complete the self-tests before continuing with other options. We describe option 4 later in this section.

If you select option 8, "Display help screen," you can view a brief description of each test on the Terminal Test Menu.

When you finish any test, press New Line to return to the Terminal Test Menu; you can then run additional tests on your asynchronous terminal lines or exit to the Tools Menu.

Continue with steps 3, 4, and 5 after you finish running the diagnostics option(s) you selected.

3. From the Terminal Test Menu, type **9** and press New Line to select option 9, "Return to Tools Menu." From the Tools Menu, you can either run other diagnostic tools, or return to the System Diagnostics Main Menu. From the Main Menu, you can re-enter the SCM, and then boot your operating system.

If you want to run other diagnostic tools, refer to the appropriate following section(s) in this chapter.

4. From the Tools Menu, type **6** and press New Line to select option 6, "Return to Main Menu" to return to the System Diagnostics Main Menu.
5. Type **4** and press New Line to select option 4, "Exit to SCM" from the AViiON System Diagnostics Main Menu.

**NOTE:** You should reset your system before booting your operating system; refer to step 4 in the previous section, "Using the AViiON System Diagnostics Tools" for instructions.

The following sections describe how to identify terminal lines and use Terminal Test Menu options 1 through 7.



## Identifying Ports

Each time you select, terminate, or view currently executing terminal tests, the system prompts you for both the board number of the controller that manages the terminal lines you are testing and the unique *port number* for each terminal line. If you are testing lines supplied by a host adapter, you must also provide the network *cluster address* of the host adapter.

After selecting any option except 5 or 7 from the Terminal Test Menu, you are prompted for the number of the board you want to test, as follows:

Board number (0,1,[ALL])?

Then, if you selected a host adapter board, you are prompted for the cluster controller's network address, as follows:

Cluster address (xx, yy, zz, [ALL])?

followed by the port number(s):

Port number (1-16, [ALL])?

You can determine board, cluster, and port number responses as follows:

- Port numbers for VDA/128 lines correspond to the node address of the target cluster controller plus the channel (port) number for the individual line. Cluster addresses are specified in hexadecimal on the cluster box; port numbers are specified 0-15 on the box.
- The port number of VAC/16 lines corresponds to the channel number on the computer bulkhead, offset by one; for example, channel 000 corresponds to port number 1 on the bulkhead, 001 to port 2, and 015 to port 16.
- You can also use options 4 or 5 on the Terminal Test Menu to determine the board number, cluster address, and port number of any connected terminal, as described in the following sections.

### Start Port Id Message Test (Option 4)

While in the Terminal Test Menu, type 4 and press New Line at your system console to select option 4, "Start port ID message test."

The port identification test listens to every port on the boards you specify and prints the appropriate board information, host adapter cluster address, and port number on the corresponding *remote terminal*. In the following example system console display, all boards are selected for the port ID message test.

```

Board number (0, 1, [ALL])? ↵
 Running selftest on VME Host Adapter Board 0
 (approximately 30 seconds), please wait.....
 Running selftest on 16-line Async Board 1
 (approximately 30 seconds), please wait.....

Press New Line to Proceed

```

When you press New Line, the system console returns to the Terminal Test Menu.

A port identification display similar to the following appears on each selected remote terminal :

```
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
VME Host Adaptor 0, cluster address 13, port:7
```

The test will continue until you run another test to that terminal line, or terminate the test using option 6 from the Terminal Test Menu. You perform either function from your system console.

### Auto Port Identification (Option 5)

While in the Terminal Test Menu, type **5** and press New Line to select option 5, "Auto port identification."

The automatic port identification test receives and interprets identification messages from a specified terminal or terminals. The message identifies the controller and port number to which the terminal is connected. If the terminal is connected via a cluster controller, the cluster controller address will also be displayed.

Use this test if you suspect trouble with particular terminal lines. The test identifies the proper board, channel address, and port number of particular terminal(s) to use when running other tests on that line, and is itself a test of the terminal line's ability to transmit data from the remote terminal to the computer unit. Use the keyboard echo test (option 3) to test the validity of keyboard input.

Since this option terminates all current processes, you see the following message immediately if there are other terminal utilities running:

```
Terminating currently executing tests, please wait.
```

Then, the utility displays the following message:

```
Strike any key on a remote terminal, and the port will be
identified, or press ESC on this system console to terminate the
test....
```

When you press a key at any connected terminal, the board number, cluster address (only if host adaptor), and port number display on the system console, as follows:

```
VME Host adapter 0, Cluster address: 34, port: 12
or
16-line Async Controller 1, port: 8
```

## Testing Terminal Lines

Options 1, 2, and 3 send or receive data to or from selected remoted terminals, and display an expected pattern. If your remote terminal display does not appear as described in this section, check that its operating parameters conform to those listed at the beginning of "Using the Terminal Test Menu." If mode, baud, parity and data bit settings are correct, and your terminal display appears incorrect, contact Data General. Within the United States and Canada, you can contact the Data General Service Center by calling 1-800-DG-HELPS for toll-free telephone support.

### Start scrolling characters set test (Option 1)

The scrolling characters set test verifies output to selected ports.

While in the Terminal Test Menu, type **1** and press New Line to select option 1, "Start scrolling characters set test." Your system console display asks for the board number(s) and port number(s) you want to test. When you specify the board(s) and port(s), the system console displays **Press New Line to Proceed** while a complete set of ASCII characters, scrolling right to left, appears on the screen of each selected remote terminal.

The test will continue until you run another test to that terminal line, or terminate the test using option 6 from the Terminal Test Menu. You perform either function from your system console.

### Start lines of characters test (Option 2)

The lines of characters test verifies line output to selected ports.

While in the Terminal Test Menu, type **2** and press New Line to select option 2, "Start lines of character test." Your system console display asks for the board number(s) and port number(s) you want to test. When you specify the appropriate board(s) and port(s), the system console displays **Press New Line to Proceed** while a full line of each character in the ASCII character set, scrolling top to bottom, appears on the screen of each selected remote terminal.

The test will continue until you run another test to that terminal line, or terminate the test using option 6 from the Terminal Test Menu. You perform either function from your system console.

### Start keyboard echo test (Option 3)

The keyboard echo test verifies line input from selected ports to a controller or adaptor board.

While in the Terminal Test Menu, type **3** and press New Line to select option 3, "Start keyboard echo test." Your system console display asks for the board number(s) and port number(s) you want to test. When you specify the appropriate board(s) and port(s), the system console displays **Press New Line to Proceed** while the test awaits keyboard input on the targeted line(s).

When you press a key on a specified keyboard, the echo test displays a complete line of that character on the specified terminal screen and on the system console screen.

The test will continue until you run another test to that terminal line, or terminate the test using option 6 from the Terminal Test Menu. You perform either function from your system console.

## Managing the Terminal Test Tool

Use option 6 to stop a test or tests from completing. If you do not know which test is currently executing on a particular port or group of ports, use option 7, "Show executing tests" to determine on which ports you want to terminate testing.

### Terminating Tests (Option 6)

While in the Terminal Test Menu, type 6 and press New Line to select option 6, "Terminate a test." Your system console display will ask for the board number(s) and port number(s) on which you want to terminate testing. When you specify the appropriate board(s) and port(s), the Terminal Test tool ends whatever test is currently running on the specified terminal(s). You can then press New Line to continue.

### Displaying Executing Tests (Option 7)

You can test several ports using different terminal tests simultaneously. The "Show executing tests" option displays a status screen that shows the test currently running on each port.

While in the Terminal Test Menu, type 7 and press New Line to select option 7, "Show executing tests."

Your system console screen displays a listing of the boards and ports that the utility has identified on your system. This listing specifies the terminal test currently running on each port, as in the following example:

```

S - scrolling character set test; L - lines of characters test;
I - port ID message test; E - keyboard echo test; . - none

 Host adapter 0

[CC] PORT Currently Executing Tests.....

[01] 00-08 I I I I I I I I
.
[08] 00-07
" " 08-15
[34] 00-07
" " 08-15

 16-line Async Controller 1

 PORT Currently Executing Tests.....

00-08 S S S S S S S S
09-16

 Press New Line to Proceed

```

## Rebooting a Disk-Resident Operating System

To reboot an operating system that resides on disk from the System Control Monitor (SCM), perform the single step described below:

1. At the SCM prompt, enter the BOOT command followed by the location and filename of the operating system bootstrap file as it resides on your system disk. Press New Line after the command line. If your system operating system resides on the automatic boot path, you simply enter the following:

```
SCM> b ↵
```

**NOTE:** *Using the AViiON™ System Control Monitor (SCM)* contains detailed information on specifying SCM boot devices.

Your operating system boots in whatever mode is indicated in your system initialization file. The following example shows a typical screen display for a system rebooting preloaded DG/UX in single user mode as part of an extended first powerup.

```
SCM>b

Booting cied(0,0)root:dg/ux.starter

DG/UX Bootstrap Release 4.10

BCS Compliant File Header: 0555.
=====
Relocating relocater.

DG/UX System Release 4.10
Using 16 Megabytes of physical memory
Found 1 processor(s)
Processor 0 running

 DG/UX Starter System
Enter the names of the devices you will use in Common Device Speci-
fication Format, with one name per line. Enter just newline
when done.
Examples: sd(insc(),0) st(insc(),4) cird() st(cisc(),4)

Include quart() for servers and kbd() and grfx() for workstations.

Device Name?
```

Continue with "Your Next Step."

## Your Next Step

Your system is currently running either your operating system or the System Control Monitor (SCM) program. You can continue with whatever tasks your system was performing before you entered AViiON System Diagnostics. If you just ran an Acceptance Test as part of an extended first power-up sequence, you should now begin installing your operating system.

If you need to install the DG/UX operating system, you should now refer to your Release Notices and *Installing and Managing the DG/UX™ System* for detailed instructions on what to do next. Chapter 2 in that manual provides an overview, examples of file systems, and instructions for the installation process; you might also need to review your TCP/IP and/or NFS® documentation if your system runs that software.

If your system will use an operating system other than the DG/UX system, you should refer to your operating system manual(s) for instructions on what to do next. In most cases, you will need to *software* format your system disk, and then install your operating system on the formatted disk. Consider the following before you begin either process.

- If your operating system does not reside on a hard disk specified in the default automatic boot path, you must either change the autoboot path or load and boot your operating system manually each time you power up. Refer to *Using the AViiON™ System Control Monitor (SCM)* for instructions on changing the system boot path to support your system, and for detailed information on booting from nondefault media.
- Your system does not require a reserved space on the system disk for AViiON System Diagnostics.
- The disks you received with your system are *hardware* formatted at the factory; you will not need to hardware format disks provided by Data General. For Data General to maintain systems with disks and disk controllers supplied by other vendors, a minimum list of format restrictions includes the following:

Data General's hardware formatter must be allowed to obtain disk controller parameters, a vendor defect list, and disk chronology information.

Block 0, track 0 must contain Data General disk geometry information; *do not* write to or alter the contents of block 0 on your disk.

End of Chapter

# Appendix A

## Technical Specifications

### System Board

Single or dual Central Processing Unit (CPU)

Motorola 88100 32-bit RISC processor

Motorola 88200 Central Memory Management Unit (CMMU)

Two per CPU

8 or 16 Mbytes memory

ERCC with single-bit error correction and double-bit error detection

Three peripheral ports

One parallel printer port; Centronics or Data Products compatible

One asynchronous system console port

One asynchronous optional device port (modem)

### Memory Expansion

Maximum of four 16-, 32-, or 48- Mbyte memory expansion boards

208 Mbytes maximum

### VME Bus

Supports 10 backpanel slots, of which 6 also support memory bus

Electrically compliant with Motorola VME specification, Revision C.1

Sustained block mode VME bus transfer rate: 30 Mbytes/s

Sustained nonblock mode VME bus transfer rate: 20 Mbytes/s

### Internal Mass Storage

ESDI controller

Maximum of one

2.5-Mbyte/s data transfer rate

ESDI 322-Mbyte 5.25-inch Winchester disk

Maximum of three

937.5-Kbytes/s data transfer rate

18-ms average seek

ESDI 648-Mbyte 5.25-inch Winchester disk

Maximum of three

1.25-Mbytes/s data transfer rate

16.5-ms average seek

SCSI controller

Single-ended SCSI interface

Asynchronous operation mode support (2 Mbytes/s)

Synchronous operation mode support (4 Mbytes/s)

Supports seven devices maximum (two internal) on SCSI bus

Internal SCSI QIC 150-Mbyte cartridge tape

Maximum of two

Read/write QIC 120 Mbytes; read-only QIC 40 and 60 Mbytes

135-Kbytes/s sustained data transfer rate

## Optional External Mass Storage

One additional SCSI controller

Supports maximum of seven devices on external SCSI bus

Model 10565 Mass Storage Subsystem (Peripheral Housing Unit, PHU)

Cable length restrictions determine maximum subsystems per system

Maximum of three half-height, one half-height and one full-height, or one full-height device per PHU

SCSI 322-Mbyte 5.25-inch Winchester disk

Maximum of one per PHU

937.5-Kbytes/s data transfer rate

18-ms average seek

SCSI 662-Mbyte 5.25-inch Winchester disk

Maximum of one per PHU

1.5-Mbytes/s data transfer rate

16.5-ms average seek

SCSI 150-Mbyte QIC cartridge tape

Maximum of three per PHU

Read/write QIC 120 Mbytes; read-only QIC 40 and 60 Mbytes

135-Kbyte/s sustained data transfer rate

SCSI 2-Gbyte archival cartridge tape

Maximum of four per system; three per PHU

246-Kbyte/s sustained data transfer rate

150 IPS

Single-ended SCSI interface

Model 6586/6587 reel-to-reel tape

1600 bpi PE format reel-to-reel tape drive

Auto-thread, auto-load

25/100 IPS selectable

160-Kbytes/s PE transfer rate (instantaneous)

6- to 10.5-inch diameter reels



## Communications

### VME Asynchronous Controller (VAC/16)

Maximum of two

Sixteen full-duplex RS232-C lines per controller

Signals supported: CTS, DCD, DSR, DTR, RTS, RXD, TXD, GROUND

38.4-Kb/s maximum transfer rate

### VME Distributed Asynchronous Host Adapter (VDA/128)

Maximum of four

Each supports up to 128 asynchronous lines via RG62 coaxial cable connected to VDC/16 and VDC/8P downloadable cluster controllers

2.5-Mb/s transfer rate to controllers

### VME Distributed Cluster Controllers (VDC/16, VDC/8P)

#### VDC/16

Maximum of eight VDC/16 per VDA/128 adapter

Connected externally via RG62 coaxial cable

Sixteen full-duplex RS232-C asynchronous lines per controller

Maximum transfer rate 19.2-Kb/s per line

Signals supported on each line:

CTS, DCD, DSR, DTR, RTS, RXD, TXD, GROUND

#### VDC/8P

Maximum of sixteen VDC/8P per VDA/128 adapter

Connected externally via RG62 coaxial cable

Eight full-duplex asynchronous RS232-C lines per controller

Maximum transfer rate 19.2-Kb/s per line

One Centronics parallel printer port

Signals supported on each asynchronous line:

CTS, DCD, DSR, DTR, RTS, RXD, TXD, GROUND

Maximum of four VDA/128s and/or VAC/16s, any combination, per system

### VME Synchronous Controller (VSC/4)

Maximum of four controllers per system

Maximum of four synchronous lines per system (1, 2, 3, or 4 controllers)

Four full-duplex synchronous RS232-C lines per VSC/4

1.6-Mb/s transfer rate per line

Signals supported on each synchronous line:

CTS, DCD, DSR, DTR, RTS, RXD, TXD, TX Clock, RCV Clock, RI, SI, SC

### VME LAN Controller (VLC)

Maximum three per system (ports for only two)

10-Mb/s transfer rate

Supports thick and thin Ethernet coaxial cable

## Technical Specifications

### Power Supply

760 W

Single-phase ac

Frequency range 47 Hz through 63 Hz.

|              |                                        |      |
|--------------|----------------------------------------|------|
| 100 V ac     | +/-10% (90 V ac through 110 V ac)      | 12 A |
| 120 V ac     | +10%, -15% (102 V ac through 132 V ac) | 12 A |
| 220/240 V ac | +10%, -15% (187 V ac through 264 V ac) | 10 A |

### Environment

Temperature:

|           |                                               |
|-----------|-----------------------------------------------|
| Operating | 50 through 100 deg F; 10 through 38 deg C     |
| Storage   | -40 through +149 deg F; -10 through +65 deg C |

Relative humidity:

|           |                       |
|-----------|-----------------------|
| Operating | 20-80%, noncondensing |
| Storage   | 10-90%, noncondensing |

Altitude:

|           |                      |
|-----------|----------------------|
| Operating | 0-8000 ft; 0-2438 m  |
| Storage   | 0-25000 ft; 0-7620 m |

Minimum clearance:

|       |                  |
|-------|------------------|
| Front | 18 in.; 45.72 cm |
| Back  | 18 in.; 45.72 cm |

End of Appendix

# Appendix B

## I/O Connector Pin Assignments

This appendix lists pin assignments for each I/O connector. All of the AViiON connectors use industry-standard interfaces.

### AViiON 5000 I/O Connectors

This appendix describes pin assignments for the following connectors:

- System console connector (RS-232-C 25 pin)
- Modem port connector (RS-232-C 25 pin)
- Asynchronous connectors (RS-232-C, 25 pin)
- Synchronous connectors (RS-232-C, 25 pin)
- Parallel (printer) connector (CHAMP 36-pin)
- SCSI connectors (CHAMP 50-pin)
- Ethernet LAN connectors (15-pin)

The parallel printer, system console, and modem port connector signals are controlled by the system board. Each SCSI bus connector communicates with a separate SCSI controller/adaptor; each LAN connector also requires a separate controller (VLC). One or more VSC/4 controllers manages synchronous connector signals.

Asynchronous connector signals are controlled by optional VAC/16 controllers, or by VDC/8P and/or VDC/16 controllers in conjunction with a VDA/128 host adapter. A 10-slot backpanel printed circuit board with VME bus distributes I/O between the system board, expansion memory board(s) and all adapters/controllers.

Table B-1 lists the connectors, size, and Data General part numbers for device cables that connect directly to AViiON 5000 series systems.

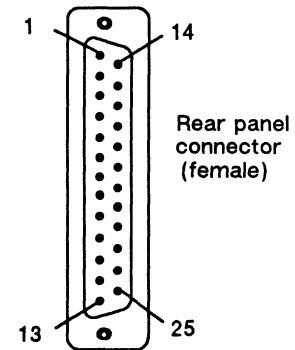
**Table B-1 Connectors and Device Cables**

| <b>Subsystem</b>                           | <b>Connector Type</b> | <b>Cable Type/ Size</b> | <b>Part Number</b> |
|--------------------------------------------|-----------------------|-------------------------|--------------------|
| System console and terminal at modem port  | RS-232 D25            | 10 ft                   | 005-34255          |
|                                            |                       | 15 ft                   | 005-34992          |
|                                            |                       | 25 ft                   | 005-34993          |
| Modem at modem port                        | RS-232 D25            | 6                       | 005-32917          |
|                                            |                       | 15                      | 005-32918          |
|                                            |                       | 25                      | 005-32919          |
| Asynchronous terminals                     | RS-232 D25            | 10 ft                   | 005-34256          |
|                                            |                       | 15 ft                   | 005-34990          |
|                                            |                       | 25 ft                   | 005-34991          |
| Asynchronous modems                        | RS-232 D25            | 10 ft                   | 005-36256          |
|                                            |                       | 15 ft                   | 005-36257          |
|                                            |                       | 25 ft                   | 005-36258          |
| Synchronous devices (modems)               | RS-232 D25            | 6                       | 005-32917          |
|                                            |                       | 15                      | 005-32918          |
|                                            |                       | 25                      | 005-32919          |
| LAN interface                              | D15                   | 5 m Teflon              | 005-33791          |
|                                            |                       | 20 m Teflon             | 005-33787          |
|                                            |                       | 5 m PVC                 | 005-33766          |
|                                            |                       | 20 m PVC                | 005-31694          |
| Parallel printer (printer port and VDC/8P) | CHAMP 36 pin          | 15 ft Centronics        | 005-35573          |
|                                            |                       | 25 ft Centronics        | 005-35574          |
|                                            |                       | 15 ft Data Products     | 005-35575          |
|                                            |                       | 25 ft Data Products     | 005-35576          |
| SCSI port                                  | CHAMP 50 pin          | 1.3 ft                  | 005-33003          |
|                                            |                       | 5 ft                    | 005-33004          |
|                                            |                       | 10 ft                   | 005-33005          |
| VDA port                                   | BNC                   | 25 ft RG-62 Coaxial     | 005-34246          |
|                                            |                       | 50 ft RG-62 Coaxial     | 005-34247          |
|                                            |                       | 100 ft RG-62 Coaxial    | 005-34248          |

## System Console Port Connector

The system console connects to the console port through an RS-232-C, 25-pin female DB25 connector located on the computer's rear panel. Figure B-1 shows the signals and pin numbers for this connector.

| Pin | Signal                      |
|-----|-----------------------------|
| 1   | Chassis Ground (CG)         |
| 2   | Transmit Data (TxD) >       |
| 3   | Receive Data (RCD) <        |
| 4   | Request to Send (RTS) >     |
| 5   | Clear to Send (CTS) <       |
| 6   | Data Set Ready (DSR) <      |
| 7   | Signal Ground (SG)          |
| 8   | Data Carrier Detect (DCD) < |
| 20  | Data Terminal Ready (DTR) > |



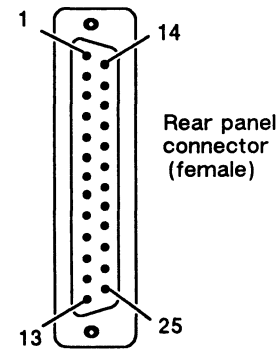
< indicates received by controller  
> indicates transmitted from controller

*Figure B-1 System Console Connector Signals*

## Modem Port Connector

Modems and other asynchronous serial devices can connect to the modem port through an RS-232-C, 25-pin female DB25 connector. This connector is located on the computer's rear panel. Figure B-2 shows the signals and pin numbers for the modem port connector.

| Pin | Signal                      |
|-----|-----------------------------|
| 1   | Chassis Ground (CG)         |
| 2   | Transmit Data (TxD) >       |
| 3   | Receive Data (RCD) <        |
| 4   | Request to Send (RTS) >     |
| 5   | Clear to Send (CTS) <       |
| 6   | Data Set Ready (DSR) <      |
| 7   | Signal Ground (SG)          |
| 8   | Data Carrier Detect (DCD) < |
| 20  | Data Terminal Ready (DTR) > |
| 22  | Ring Indicator (RI) <       |
| 23  | Speed Indicator (CI) <      |



< indicates received by controller  
> indicates transmitted from controller

*Figure B-2 Modem Port Connector Signals*

## Asynchronous Serial Port Connectors

Serial devices connect to the serial ports through RS-232-C, 25-pin female DB25 connectors. Asynchronous connectors are located either on an optional cluster box or on the computer's bulkhead, labeled 1 through 32. Figure B-3 shows the signals and pin numbers for these asynchronous connectors.

| Pin | Signal                      |
|-----|-----------------------------|
| 1   | Chassis Ground (CG)         |
| 2   | Transmit Data (TxD) <       |
| 3   | Receive Data (RCD) >        |
| 4   | Request to Send (RTS) <     |
| 5   | Clear to Send (CTS) >       |
| 6   | Data Set Ready (DSR) >      |
| 7   | Signal Ground (SG)          |
| 8   | Data Carrier Detect (DCD) > |
| 20  | Data Terminal Ready (DTR) < |

< indicates received by controller

> indicates transmitted from controller

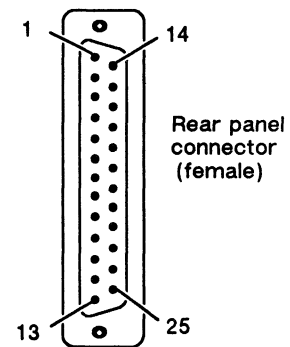


Figure B-3 Asynchronous Serial Connector Signals

## Synchronous Serial Port Connectors

Synchronous serial devices (usually modems) connect to the serial ports through RS-232-C, 25-pin female DB25 connectors. Synchronous connectors are labeled "OPTION" 1 through 4 on the rear panel. Figure B-4 shows the signals and pin numbers for synchronous connectors.

| Pin | Signal                               |
|-----|--------------------------------------|
| 1   | Chassis Ground (CG)                  |
| 2   | Transmit Data (TxD) >                |
| 3   | Receive Data (RCD) <                 |
| 4   | Request to Send (RTS) >              |
| 5   | Clear to Send (CTS) <                |
| 6   | Data Set Ready (DSR) <               |
| 7   | Signal Ground (SG)                   |
| 8   | Data Carrier Detect (DCD) <          |
| 15  | Transmit Signal Timing (TX Clock) <  |
| 17  | Receiver Signal Timing (RCV Clock) < |
| 20  | Data Terminal Ready (DTR) >          |
| 22  | Ring Indicator (RI) <                |
| 23  | Speed Indicator (CI) <               |
| 24  | Transmit Signal Timing (SC) >        |

< indicates received by controller  
> indicates transmitted from controller

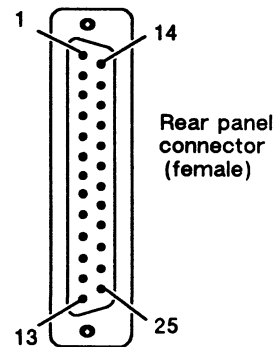


Figure B-4 Synchronous Serial Connector Signals



## Parallel Port Connector

Parallel printers connects to the system through 36-pin connectors located on the back of the computer unit and on the back of VDC/8P controller boxes. Figure B-5 shows the signals and pin numbers for parallel printer connectors.

| Pin | Signal      | Pin | Signal   |
|-----|-------------|-----|----------|
| 1   | Data Strobe | 19  | Ground   |
| 2   | Data 1      | 20  | Ground   |
| 3   | Data 2      | 21  | Ground   |
| 4   | Data 3      | 22  | Ground   |
| 5   | Data 4      | 23  | Ground   |
| 6   | Data 5      | 24  | Ground   |
| 7   | Data 6      | 25  | Ground   |
| 8   | Data 7      | 26  | Ground   |
| 9   | Data 8      | 27  | Ground   |
| 10  | Acknowledge | 28  | Ground   |
| 11  | Not Used    | 29  | Not Used |
| 12  | Not Used    | 30  | Not Used |
| 13  | Select      | 31  | Reset    |
| 14  | Sg (Ground) | 32  | Ready    |
| 15  | Not Used    | 33  | Not Used |
| 16  | Not Used    | 34  | Not Used |
| 17  | Not Used    | 35  | Not Used |
| 18  | Not Used    | 36  | Demand   |

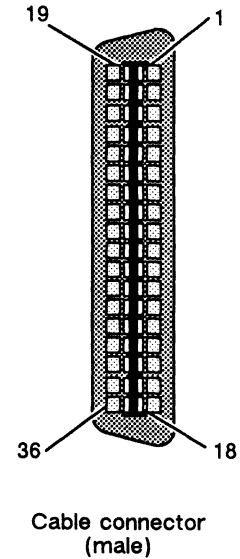


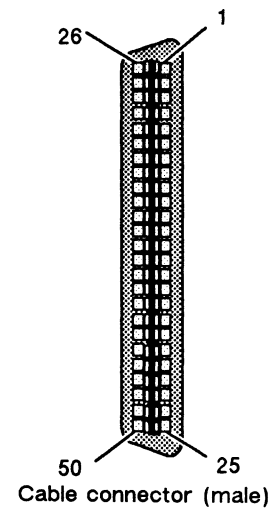
Figure B-5 Parallel Printer Connector Signals

## SCSI Bus Connector

The SCSI bus 50-pin CHAMP connectors are located on the rear panel of the computer unit. Figure B-6 shows the signals and pin numbers for these connectors.

■ NOTE: AViiON 6000 series systems use a *single-ended* SCSI interface.

| Pin | Signal            | Pin | Signal       |
|-----|-------------------|-----|--------------|
| 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 |
| 38  | Termination Power |     |              |



NOTE: Pins 1 through 24 are connected to ground.  
Pin 25 is left open.

Figure B-6 SCSI Bus Connector Signals

## LAN Interface Connector

The LAN interface provides a 15-pin D connector for an AUI cable. The AUI cable connects the computer 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. Figure B-7 shows the signals and pin numbers for these connectors.

| Pin           | Signal      | Circuit Name                      |
|---------------|-------------|-----------------------------------|
| 1             | Ground      | CI-S (Control In circuit shield)  |
| 2             | Collision + | CI-A (Control In circuit A)       |
| 3             | Transmit +  | DO-A (Data Out circuit A)         |
| 4             | Ground      | DI-S (Data In circuit shield)     |
| 5             | Receive +   | DI-A (Data In circuit A)          |
| 6             | Ground      | VC (Voltage common)               |
| 7             | No Connect  | CO-A (Control Out circuit A)      |
| 8             | Ground      | CO-S (Control Out circuit shield) |
| 9             | Collision - | CI-B (Control In circuit B)       |
| 10            | Transmit -  | DO-B (Data Out circuit B)         |
| 11            | Ground      | DO-S (Data Out circuit shield)    |
| 12            | Receive -   | DI-B (Data In circuit B)          |
| 13            | +12 Volts   | VP (Voltage plus)                 |
| 14            | Ground      | VS (Voltage shield)               |
| 15            | No Connect  | CO-B (Control Out circuit B)      |
| Connect shell | Ground      | PG (Protective Ground)            |

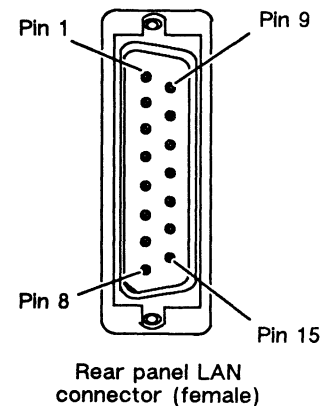


Figure B-7 LAN Interface Connector Signals

End of Appendix



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# Documentation Set

## Hardware Manuals

### *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.

### *Setting Up and Starting AViiON™ 5000 Series Systems (014-001806)*

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

### *AViiON™ 5000 and 6000 Series Systems: Programming System Control and I/O Registers (014-001805)*

Describes the system board architecture, including the CPU, memory, registers, I/O, address decode and bus arbitration. Discusses how to program the system board registers for addressing, interrupts, I/O, and system board control and status.

### *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.

### *HPS Downloadable Cluster Controller Installation Guide (014-001814)*

Describes how to install the HPS Downloadable Cluster Controller hardware in an AViiON system environment.

## Software Manuals

### *Finding Your Way Around the DG/UX™ Documentation (069-701013)*

Contains a task index that guides users to the appropriate DG/UX™ manual and chapter. Describes the manuals in the DG/UX documentation set and explains how to use manual (man) pages.

### *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. Aimed at system administrators who are familiar with the UNIX® operating system.

### *Managing NFS® and Its Facilities on the DG/UX™ System (093-701049)*

Shows how to install, manage, and use the DG/UX ONC™/NFS product. This manual contains information on the Network File System (NFS), the Yellow Pages (YP), Remote Procedure Calls (RPC), and External Data Representation (XDR).

## Documentation Set

### *User's Reference for the DG/UX™ System (093-701054)*

Contains an alphabetical listing of manual (man) pages for commands relating to system administration or operation.

### *Installing and Managing DG TCP/IP (DG/UX™) (093-701051)*

Explains how to prepare for the installation of the Data General's TCP/IP (DG/UX) package on AViiON computer systems. This manual contains information on tailoring the software for your site, managing the system, and troubleshooting system problems.

### *Writing a Device Driver for the DG/UX™ System (093-701053)*

Describes how to write your own device driver for a DG/UX system running on an AViiON computer. Under the AViiON architecture, drivers must be written to address either a specific device or an adapter that manages secondary bus access to specific devices. This manual address both types of driver.

### *Porting Applications to the DG/UX™ System (069-701059)*

Describes how to port UNIX application programs to the DG/UX system.

### *Using the DG/UX™ System (069-701035)*

Describes the DG/UX system and its major features, including **mailx**, the C shell, the Bourne shell, and the filing system.

### *Using the DG/UX™ Editors (069-701036)*

Describes the text editors **vi** and **ed**, the batch editor **sed**, and the command line editor **editread**.

### *Using DG/UX™ System Programming Tools (093-701048)*

Discusses programming support tools (**awk**, **nawk**, **lex**, **yacc**, **ld**, **lint**, and **as**), interprocess communications, archiving, the C language, SCCS, and COFF.

### *System Manager's Reference for the DG/UX™ System (093-701050)*

Contains an alphabetical listing of manual (man) pages for commands relating to system administration or operation.

### *Programmer's Reference for the DG/UX™ System (093-701055 and 093-701056)*

Alphabetical listing of manual (man) pages for programming commands on the DG/UX system. This two-volume set includes information on system calls, file formats, subroutines, and libraries.

### *Programming with DG TCP/IP (DG/UX™) (093-701024)*

Describes how to program with the TCP and IP protocols and UDP interfaces.

### *DG TCP/IP User's Manual (DG/UX™) (093-701023)*

Introduces Data General's TCP/IP (DG/UX) family of protocols and describes how to use the package.

*Using DG/UX™ SNA/3270 (069-701030)*

Explains how to use the DG/UX SNA/3270 te3278 terminal emulator and the pe3287 printer emulator.

*Managing DG/UX™ SNA/3270 (069-701044)*

Explains how to manage the DG/UX SNA/3270 terminal and printer emulation software, the SNA controller emulator, and the SDLC software.

*DG/UX™ SNA/3270 API Programmer's Reference (093-701045)*

Shows how to incorporate API function calls into C language programs to replicate the functions of a 3278 terminal.

*Using DG/UX™ SNA/RJE (069-701031)*

Explains how to use the DG/UX SNA/RJE workstation emulation to send batch jobs to an IBM host.

*Managing DG/UX™ SNA/RJE (069-701046)*

Explains how to manage DG/UX emulation software, the SNA controller emulator, and the SDLC software.

**Peripheral Manual***Installing and Operating the Model 10565 Mass-Storage Subsystem (014-001810)*

Describes how to unpack, test, install, and power up the subsystem. 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 subsystem.

**Third-Party Manuals***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).

*The VMEbus Specification*

Defines the mechanical and electrical specifications, protocols, and terminology of the Versa Modula Europa bus (VMEbus). This interface is used to interconnect data processing, data storage, and peripheral control devices in a closely-coupled hardware configuration.

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*Learning the UNIX® Operating System* (069-701042)

Helps beginners learn UNIX fundamentals through a step-by-step tutorial.

*C: A Reference Manual* (069-100226)

Describes lexical structure, the preprocessor, declarations, types, expressions, statements, functions, programs, and the run-time libraries.

*Green Hills Software User's Manual C-88000* (069-100230)

Describes the differences in C when run on an 88000 system.

*Green Hills Software User's Manual Fortran-88000* (069-100231)

Describes the differences in FORTRAN when run on an 88000 system.

*Green Hills Software User's Manual Pascal-88000* (069-100232)

Describes the differences in Pascal when run on an 88000 system.

*STREAMS Primer for the DG/UX™ System* (069-701033)

Defines STREAMS, a set of tools for developing DG/UX system communications services, explains how to build a stream, and discusses user-level and kernel-level functions.

*STREAMS Programmer's Guide for the DG/UX™ System* (069-701034)

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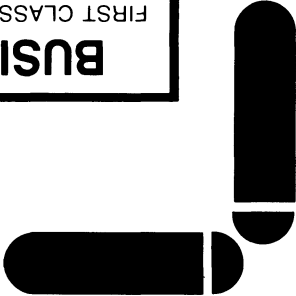


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