

Related Documents

You received a comprehensive documentation package with your AViiON 410, 412, 4100, or 4300 computer system. Only those documents specifically mentioned within the text of this manual appear below. The manuals in this section are a small subset of manuals available for your computer system. Refer to the document *Guide to AViiON® and DG/UX™ Systems Documentation* (069–701085) or to the document *Read This First* (069–000519) for a complete list of related documentation.

Hardware Manuals

Using AViiON® System Diagnostics (014–001863)

Describes how to use menu-based utilities to verify system hardware and test the graphics monitor, keyboard, and mouse or asynchronous terminal. Also describes how to check for faults in LAN connections, and maintain cartridge tape and diskette media.

AViiON® Series Systems Automatic Reporting and Remote Assistance User's Guide (015–000356)

Available with a Remote Assistance contract only. Provides details about remote and machine initiated calling features. Explains how to set up your system and how to make a remote connection, and describes user menus.

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

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

DG/UX Manual

Installing the DG/UX™ System (093–701087)

Shows how to install the DG/UX operating system on AViiON computers. Instructions address first-time installations on new hardware, installations on existing systems, and upgrades to a newer release of the software.

Local Area Network Manual

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 communication controller.

Peripheral Manuals

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


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

Installing CSS2 and CSS2/DC Storage Subsystem Components (014-002032)

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


Reader, Please Note

We use the following conventions in this manual:

Within text, “press New Line” means that you should press the New Line key on the Data General DASHER® keyboard. If you are using a keyboard compatible with the industry-standard IBM PC AT® keyboard, the equivalent key is usually marked Enter, Return, or with a symbol such as .

The term *system console* refers to the keyboard and display device that receives powerup diagnostic test messages and from which you bring up your operating system. The system console communicates directly with the AViON computer's system board. A workstation's system console consists of the graphics monitor and keyboard. A computer's system console consists of an asynchronous terminal.

Within text, we use the following symbols:

Symbol	Means
	Press the New Line, Carriage Return (CR), Return, or Enter key on your system console keyboard.
SCM>	The default System Control Monitor (SCM) prompt.
#	The default DG/UX Superuser shell prompt.

In examples we use

This typeface to show your keyboard 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.

Manuals

If you require additional manuals, please use the enclosed TIPS order form (United States only) or contact your local Data General sales representative.

Telephone Assistance

If you are unable to solve a problem using any manual you received with your system, free telephone assistance is available with your hardware warranty and with most Data General software service options. If you are within the United States or Canada, contact the Data General Customer Support Center (CSC) by calling 1-800-DG-HELPS. Lines are open from 8:00 a.m. to 5:00 p.m., your time, Monday through Friday. The center will put you in touch with a member of Data General's telephone assistance staff who can answer your questions.

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

Joining Our Users Group

Please consider joining the largest independent organization of Data General users, the North American Data General Users Group (NADGUG). In addition to making valuable contacts, members receive *FOCUS* monthly magazine, a conference discount, access to the Software Library and Electronic Bulletin Board, an annual Member Directory, Regional and Special Interest Groups, and much more. For more information about membership in the North American Data General Users Group, call 1-800-253-3902 or 1-508-443-3330.

End of Preface



Contents

Chapter 1 – Getting Started

AViiON 410, 412, 4100, and 4300 Series Computers	1-1
Basic System and Options	1-2
Internal Options	1-3
External Options	1-4
About the System Console (AViiON 4100 and 4300 Series)	1-7
About the Graphics Monitor (AViiON 410 and 412 Series)	1-8
About the Keyboard and Mouse (AViiON 410 and 412 Series)	1-8
About VME Options	1-9
About Mass–Storage Drives	1-10
Before You Start	1-11
Selecting a Site	1-11
Unpacking and Inspecting Your Equipment	1-11
Gathering Documentation and Media	1-18

Chapter 2 – Setting Up Your Computer System

Connecting the System Console to AViiON 4100 Series	2-1
Connecting the System Console to AViiON 4300 Series	2-3
Connecting the Graphics Monitor to AViiON 410 and 412 Series	2-6
Connecting the Keyboard to AViiON 410 and 412 Series	2-9
Connecting the Mouse to AViiON 410 and 412 Series	2-10
Connecting a Cluster Controller Cable to a VDA Adapter (AViiON 4300 Series)	2-11
Connecting a Local Area Network Cable	2-12
Connecting Asynchronous Devices	2-14
Connecting Asynchronous Devices to AViiON 410, 412, or 4100 Series Systems	2-14
Connecting Asynchronous Devices to AViiON 4300 Series Systems	2-17
Connecting a Parallel Printer	2-19
Terminating an Internal SCSI Bus	2-20
Connecting the Computer Unit Power Cord	2-22

Chapter 3 – Starting and Stopping Your Computer System

Starting the Computer System	3-1
Powering Up	3-1
Your Next Step	3-6
Shutting Down Your Computer System	3-7
Powering Down	3-7
Resetting the Computer System	3-8
Restarting Your System	3-9

Chapter 4 – Setting Up and Installing a SCSI Bus

Planning a SCSI Bus Configuration	4-2
Identifying SCSI Drives	4-3
SCSI Bus Cabling Rules	4-5
Configuring Drive Operating Parameters	4-6
Terminating the External SCSI Bus	4-6
Installing a SCSI Bus and SCSI Drives	4-9
Installing Configuration Jumpers	4-10
Connecting the SCSI Bus to SCSI drives	4-11
Connecting the External SCSI Bus to the Computer Unit Rear Panel	4-11

Chapter 5 – Expanding and Maintaining Your Computer System

Maintaining Your System	5-1
If a Computer System Problem Occurs	5-2
Reviewing System Specifications	5-2
Verifying Support for Your Configuration	5-3
Calculating Power Requirements	5-3
Avoiding Electrostatic Discharge (ESD) Damage	5-7
Emergency Procedures (Without an ESD Kit)	5-7
Installing Board Jumpers and Setting Switches	5-8
Installing Jumpers	5-8
Setting Switches	5-9
Opening the Computer Unit	5-10
Removing the Side Covers	5-10
Removing the Top Cover	5-12
Closing the Computer Unit	5-13
Installing the Top Cover	5-13
Installing the Side Covers	5-14

Chapter 6 – Adding or Replacing Internal Mass–Storage Drives

Supported Mass–Storage Drives	6-1
Mass–Storage Drive Locations	6-2
Removing a Drive Assembly	6-3
Removing Brackets from a Drive	6-6
Configuring New or Replacement Drives	6-7
Installing a Drive Assembly	6-9
Attaching Brackets to a Drive	6-9
Completing the Drive Assembly Installation	6-10
Adding or Replacing the SCSI Adapter Board	6-14
Removing the SCSI Adapter Board	6-14
Installing the SCSI Adapter Board	6-16
Replacing the Terminator Plug	6-17

Chapter 7 – Adding or Replacing Memory Modules

Rules for Installing Memory Modules in AViiON 4300 Series Systems	7-3
Rules for Installing Memory Modules in AViiON 410, 412, and 4100 Series Systems	7-4
Removing Memory Modules	7-7
Installing Memory Modules	7-9

Chapter 8 – Adding or Replacing CPU and Graphics Boards

Adding or Replacing a CPU Option Board	8-2
Removing a CPU Option Board	8-2
Installing a CPU Option Board	8-4
Adding or Replacing a Graphics or Z–buffer Board (AViiON 410 and 412 Series)	8-6
Removing the Graphics or Z–Buffer Board	8-6
Installing the Graphics or Z–Buffer Board	8-9

Chapter 9 – Replacing the System Board

Removing the System Board	9-1
Installing the System Board	9-5

Chapter 10 – Replacing the Fan Assembly

Removing the Fan Assembly	10-1
Installing the Fan Assembly	10-3

Chapter 11 – Replacing the Power Supply and Fuses

Removing the Power Supply	11-1
Installing the Power Supply	11-3
Replacing the Tape/Disk Fuse	11-6

Appendix A – Solving Powerup Problems

Blank Monitor Screen at Powerup (AViiON 410 and 412 Series)	A-5
Blank Terminal Screen at Powerup (AViiON 4100, and 4300 Series)	A-6
Unclear Monitor Display (AViiON 410 and 412 Series)	A-7
Testing With an Asynchronous Terminal	A-8
Unclear Terminal Display	A-9
Error Codes and Messages	A-9
Screen Display	A-10
LED Signals	A-11
Speaker Signals	A-11

Appendix B – Using the System Control Monitor

Using the SCM Configuration Menus	B-1
Summary of Menus and Menu Conventions	B-2
Changing the Default Boot Path	B-4
Changing Console Parameters	B-9
Changing Modem Port Parameters	B-16
Changing the Mouse Baud Rate	B-18
Viewing the Memory Configuration	B-19
Getting to the SCM	B-19
Using SCM Commands	B-22
Summary of Commands	B-24

Appendix C – Technical Specifications

Physical and Environmental Specifications	C-1
System Board and System Bus Options	C-2
VMEbus Backplane and Options	C-3
Mass Storage Options	C-5
Power Subsystem Specifications	C-6
Peripherals Specifications (AViiON 410 and 412 Series)	C-8
Display Monitor	C-8
Keyboard	C-9
Mouse	C-9
Integrated I/O Connections and Signals	C-11
Asynchronous Serial Port Connectors (AViiON 4300)	C-11
Asynchronous Serial Port Connectors (AViiON 410, 412, and 4100 Series)	C-12
Parallel Port Connector	C-13
SCSI Bus Connector	C-14
LAN Connector	C-15
Keyboard Connector (AViiON 410 and 412 Series)	C-16
Mouse Connector (AViiON 410 and 412 Series)	C-17

**Appendix D – Starting Your Computer System
(any preloaded DG/UX system with a release
prior to 5.4)**

Starting the Computer System	D-1
Powering Up	D-1

Tables

Table

1-1	Voltage Suffixes	1-15
1-2	Cable/Cord Inventory Worksheet	1-17
1-3	Language Suffixes for Keyboard Part Numbers	1-18
4-1	Default SCSI Device ID Numbers	4-3
6-1	AViON 410, 412, 4100, and 4300 Series Internal Mass-Storage Drives .	6-2
6-2	SCSI Device Identification Numbers	6-8
7-1	Valid Memory Configurations for AViON 4300 Systems	7-4
7-2	Valid Memory Configurations for AViON 410, 412, and 4100 Series Systems	7-6
A-1	Reading Path for Power-Up Testing Hangs	A-1
A-2	Quick Reference for Powerup Problems (Graphics Console)	A-3
A-3	Quick Reference for Powerup Problems (Nongraphics Console)	A-4
A-4	Beep Codes	A-11
B-1	Boot Specifications for Disk and Tape Drives	B-6
B-2	Specifications for LAN Devices	B-7
B-3	Alternate Keyboard Codes	B-16
B-4	SCM Line Editing Features and Keyboard Control Sequences	B-23
B-5	Summary of SCM Commands and Command Functions	B-24
B-6	Mnemonics and Parameters for Bootable Devices	B-27
B-7	Controller (cntrl) Parameter Values	B-28
B-8	Default SCSI Device ID and LUN Numbers	B-29
C-1	Internal Component Current Requirements for AViON 410, 412, 4100, and 4300 Series Systems	C-7

Figures

Figure

1-2	AViiON 410 and 412 Series Rear Panel and Connectors	1-5
1-3	AViiON 4100 Series Rear Panel and Connectors	1-6
1-4	AViiON 4300 Series Rear Panel and Connectors	1-7
1-5	Color Graphics Monitor and Controls	1-8
1-1	Removing the Shipping Cover	1-12
1-2	Removing the Shipping Tray and Packing	1-13
1-3	Removing the Computer from the Packing Tray	1-14
1-6	Voltage Setting Label	1-15
1-7	Installation Checklist	1-19
2-1	Connecting the System Console to an AViiON 4100 Series System	2-2
2-2	Connecting the System Console to an AViiON 4300 System	2-4
2-3	Placing the Graphics Monitor	2-6
2-4	Connecting the Color Monitor Power Cord	2-7
2-5	Plugging the Cables and Power Cord into the Monitor and Computer Unit	2-8
2-6	Connecting the Keyboard	2-9
2-7	Connecting the Mouse	2-10
2-8	VDA//255 Connector	2-11
2-9	Attaching a BNC Host Connector to a VDA/255 Receptacle	2-12
2-10	Connecting the LAN Transceiver Cable to the Computer Unit	2-13
2-11	Attaching and Securing the LAN Transceiver Cable	2-14
2-12	Connecting Devices to the Computer Unit Serial Ports (AViiON 410, 412, and 4100 Series)	2-15
2-13	Connecting Devices to the Computer Unit Serial Ports (AViiON 4300)	2-18
2-14	Connecting a Parallel Printer to the Computer Unit	2-19
2-15	AViiON 410, 412, 4100, and 4300 Series SCSI Bus Connector	2-20
2-16	Installing the SCSI Bus Terminator Plug	2-21
2-17	Securing a SCSI Bus Terminator	2-21
2-18	Connecting the Computer Unit Power Cord	2-23
3-1	Monitor Power Switch	3-2
3-2	Peripheral Housing Unit (PHU) and Combined Storage Subsystem Deskside Chassis (CSS2/DC) Power Switch	3-2
3-3	Computer Unit Power Switch and LED Power-On Indicator	3-3
3-4	Computer Unit Reset and Power Switches	3-8
4-1	AViiON 410, 412, 41000, and 4300 Series SCSI Bus Connector	4-2
4-2	Sample SCSI Device Identification Configuration	4-4
4-3	Typical Daisy Chain and SCSI Bus Cable Lengths	4-5
4-4	SCSI Bus Configuration Worksheet	4-7
4-5	Sample Configuration Worksheet	4-8

Figure

4-6	SCSI Cable Rules and Sample Device IDs	4-9
4-7	AViiON 41000 and 4300 Series External SCSI Connectors	4-12
4-8	Removing the SCSI Bus Terminator Plug	4-13
4-9	Plugging Together SCSI Bus Connectors	4-13
4-10	Securing a SCSI Cable Connection	4-14
5-1	Sample Current and Power Calculation Form for AViiON 410, 412, 4100, and 4300 Series Systems	5-5
5-2	Current and Power Calculation Form	5-6
5-3	Removing or Installing Jumper Plugs	5-9
5-4	DIP Switches on Printed Circuit Boards	5-10
5-5	Loosening the Side Cover Fasteners	5-11
5-6	Removing the Side Covers	5-11
5-7	Attaching the ESD Wrist Strap and Clip	5-12
5-8	Removing the Top Cover	5-13
5-9	Installing the Top Cover	5-14
5-10	Inserting the Cover Tabs into the Computer Unit Slots	5-15
5-11	Installing the Side Covers	5-15
5-12	Tightening the Side Cover Fasteners	5-16
5-13	Connecting the Computer Unit's Power Cord	5-17
6-1	Internal Drive Slots	6-2
6-2	SCSI Bus Ribbon Cable and Drive Power Connectors	6-4
6-3	Unplugging the I/O Bus Cable from a Diskette Drive	6-4
6-4	Unplugging the Power Adapter Cable from a Diskette Drive	6-5
6-5	Removing a Drive Assembly from the Computer Unit	6-5
6-6	Removing Brackets from Drives	6-6
6-7	Example of Recommended SCSI ID Settings	6-8
6-8	Bracket Mounting Holes for Drives	6-9
6-9	Attaching Brackets to Drives	6-10
6-10	Removing or Replacing a Filler Panel	6-11
6-11	Installing a Drive Assembly in the Computer Unit	6-12
6-12	Plugging the Power Adapter Cable into a Diskette Drive	6-13
6-13	Plugging the I/O Bus Cable into a Diskette Drive	6-13
6-14	Unplugging the SCSI Bus and I/O Bus Cables from the SCSI Adapter Board	6-14
6-15	Unplugging the Power Adapter Cable from the SCSI Adapter Board ...	6-15
6-16	Removing or Installing the Screws that Attach the SCSI Adapter Board to the Computer Unit	6-15
6-17	Plugging the Power Adapter Cable into the SCSI Adapter Board	6-16
6-18	Plugging the SCSI Bus and I/O Bus Cables into the SCSI Adapter Board	6-17
6-19	Unplugging and Plugging in the SCSI Bus Terminator Plug	6-18
7-1	AViiON 4300 Series ECC Memory Modules	7-1
7-2	AViiON 410, 412, and 4100 Series Byte-Parity Memory Modules	7-2
7-3	Location of Memory Modules and Connectors	7-2
7-4	Numbering Scheme for Memory Module Connectors	7-3
7-5	Releasing the Memory Module Locking Tabs	7-8
7-6	Removing a Memory Module	7-9

Figure

7-7	Installing the Memory Module in the Connector	7-10
8-1	AViiON 410, 412, 4100, and 4300 Series System Board and CPU and Graphics Option Boards	8-1
8-2	AViiON 410, 412, 4100, and 4300 Series CPU Option Board	8-2
8-3	Removing the CPU Option Board Screws	8-3
8-4	Separating the Interboard Connectors	8-3
8-5	Joining the Interboard Connectors	8-4
8-6	Securing CPU Option Board to the System Board	8-5
8-7	Location of the Graphics and Z-Buffer Boards on the AViiON 410 and 412 Series System Board	8-6
8-8	Releasing the BNC Connectors from the Computer Bulkhead	8-7
8-9	Removing the Board-Retaining Screws	8-8
8-10	Separating the Interboard Connectors	8-9
8-11	Removing the BNC Connector Filler Plugs	8-10
8-12	Joining the Interboard Connectors	8-11
8-13	Replacing the Board-Retaining Screws	8-12
8-14	Securing BNC Connectors to the Computer Bulkhead	8-13
9-1	AViiON 410, 412, 4100, and 4300 Series System Board and Mounted Components	9-1
9-2	Releasing the System Board Bracket from the Back of the Computer Unit	9-2
9-3	Unplugging Cables from the System Board	9-3
9-4	Unscrewing the System Board from the Computer Unit	9-3
9-5	Releasing the System Board from the VME Backplane	9-4
9-6	Removing the System Board	9-4
9-7	Removing the PROM Component	9-5
9-8	Straightening the Pins on the PROM Component	9-6
9-9	Installing the PROM Component	9-6
9-10	AViiON 4300 Series System Board	9-7
9-11	Inserting the System Board into the Computer Unit	9-8
9-12	Securing the System Board to the Computer Unit	9-8
9-13	Securing the System Board Bracket to the Back of the Computer Unit ..	9-9
9-14	Plugging Cables into the System Board	9-9
10-1	Unplugging the Fan Assembly Power Cable from the Power Supply	10-1
10-2	Releasing the Fan Assembly from the Back of the Computer Unit	10-2
10-3	Removing the Fan Assembly from the Computer Unit	10-2
10-4	Positioning the Fan Assembly Under the Computer Unit	10-3
10-5	Installing the Fan Assembly in the Computer Unit	10-4
10-6	Securing the Fan Assembly to the Back of the Computer Unit	10-4
10-7	Plugging the Fan Assembly Power Cable into the Power Supply	10-5
11-1	Unplugging the Ac Power and Fan Assembly Power Cables	11-1
11-2	Unplugging the Tape/Disk Power and Logic Power Cables	11-2
11-3	Releasing the Power Supply from the Computer Unit	11-2
11-4	Removing the Power Supply	11-3
11-5	Setting the Voltage Selection Switch	11-4
11-6	Inserting the Power Supply into the Computer Unit	11-4

Figure

11-7	Securing the Power Supply to the Computer Unit	11-5
11-8	Connecting the Tape/Disk Power and Logic Power Cables	11-5
11-9	Connecting the Fan Assembly Power and the ac Power Cables	11-6
11-10	Replacing the Tape/Disk Fuse	11-7
A-1	Monitor Brightness and Degauss Switch	A-7
B-1	SCM Menus	B-3
B-2	Full Boot Path Format	B-5
C-1	Asynchronous Serial Port (RS232 A-C) Connector Signals for AViiON 4300 Systems	C-11
C-2	Asynchronous Cable Signal Routing	C-12
C-3	Asynchronous Serial Port (RS232 A-C) Connector Signals for AViiON 410, 412, and 4100 Series	C-12
C-4	Printer Connector (25-Pin)	C-13
C-5	SCSI Connector (50-Pin)	C-14
C-6	LAN Connector (15-Pin)	C-15
C-7	Keyboard Connector and Cable Pin Numbering	C-16
C-8	Mouse DIN Connector and Cable Pin Numbering	C-17
D-1	Monitor Power Switch	D-2
D-2	Peripheral Housing Unit (PHU) and Combined Storage Subsystem Deskside Chassis (CSS2/DC) Power Switch	D-2
D-3	Computer Unit Power Switch and LED Power-On Indicator,	D-3

Chapter 1

Getting Started

This chapter provides an overview of the basic AViiON® 410, 412, 4100 and 4300 series computer systems and their hardware options. It also describes what you should do before you begin to set up your system: how to select a site; unpack and inventory your equipment; and gather appropriate documentation.

AViiON® 410, 412, 4100, and 4300 Series Computers

AViiON 410, 412, 4100, and 4300 series systems support a variety of configurations. AViiON 4100, and 4300 series computers function primarily as server systems; AViiON 410 and 412 computers add graphics options to the same basic system to work as graphics computer systems. Figure 1-1 illustrates the deskside computer unit that the three models hold in common, with the color graphics monitor, IBM PC AT®-style keyboard, and a mouse device that distinguish an AViiON 410 and 412 series computer systems.

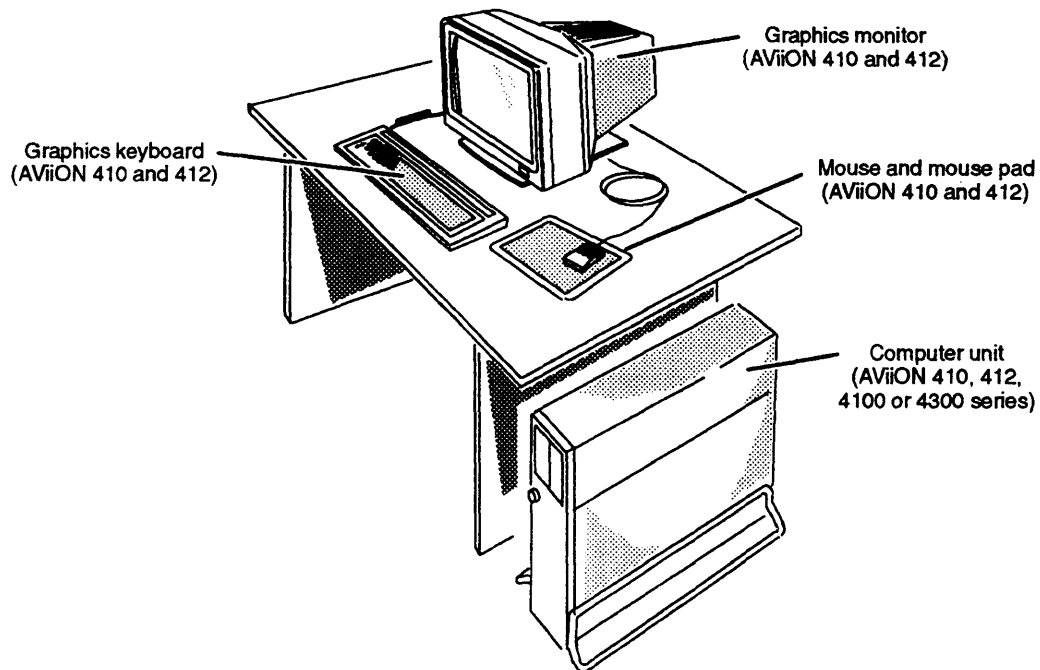


Figure 1-1 AViiON 410 and 412 Series Computer

Basic System and Options

All AViiON 410, 412, 4100 and 4300 series computer units include the following:

- One system processor (system) board containing
 - Minimum 8 megabytes, byte–parity memory (AViiON 410, 412, or 4100 series, except 4300).
 - Minimum 8 megabytes, ECC memory (AViiON 4300 series).
 - Two asynchronous RS–232–C ports for a modem or data terminal devices.
 - One parallel printer port, compatible with a Centronics LPT1 interface.
 - One integrated AMD Ethernet local area network (LAN) interface.
compatible with thin or thick Ethernet networks (transceiver not included).
 - One integrated NCR small computer system interface (SCSI) controller for internal (maximum of four) and external (bus maximum of seven) SCSI mass–storage drives (external support for AViiON 410, 412, 4100 and 4300 series).
 - One integrated VDA/255 (AViiON 4300).
 - One 16.67 or 20 megahertz Motorola 88000 processor, or one 25 megahertz Motorola 88100 processor.
 - Two Motorola 88200 Cache/Memory Management Units (CMMUs).
- One 2–slot backpanel printed circuit board with VMEbus (supplies VMEbus to a maximum of two options).
- A 326–watt power supply.

AViiON 410 and 412 series systems further include the following:

- One 8–bit or one 24–bit color graphics controller (internal).
- IBM PC AT®–style keyboard.
- Mouse.
- Color graphics display monitor.

NOTE: AViiON 4100 and 4300 series systems require an asynchronous terminal to serve as a system console.

Internal Options

In addition to the basic components listed in the previous section, your system might include some of the following options housed within the computer unit:

System Bus Options

- One additional CPU option board.
- 4-Mbyte or 16-Mbyte, byte-parity single in-line memory modules (AViON 410, 412, and 4100 series, except 4300).
 - AViON 410, 412, and 4100: 128-Mbytes maximum.
- 4-Mbyte or 16-Mbyte ECC single in-line memory modules (AViON 4300 series).
 - Maximum of three additional pairs (four pairs total per system) – 128-Mbytes system maximum.
- One integrated NCR SCSI controller supporting a maximum of seven external SCSI mass-storage drives.
- One integrated AMD Ethernet LAN controller .
- One 24-bit, Z-buffer board for enhanced graphics performance (AViON 410 and 412 series).

Mass-Storage Drives

Maximum of four (total) of the following:

- Removable media drives (maximum of two):
 - 1/4-inch cartridge (QIC) SCSI cartridge tape drives.
 - 1.2-Mbyte and 1.44-Mbyte diskette drives.
 - 600-Mbyte CD ROM.
 - Digital audio tape (DAT) drive.
- Winchester hard disk drives (maximum of three half-height or one full-height):
 - 1.4-Gbyte (full-height).
 - 1-Gbyte (full-height).
 - 662-Mbyte (full-height).
 - 1.65-Gbyte (full-height).
 - 332-Mbyte (full-height).
 - 520-Mbyte (full-height).

VMEbus Option Boards

Maximum of two (total) of the following:

- One or two VSC/3 VME Synchronous Controllers.
- One or two VAC/16 VME Asynchronous Controllers.
- One or two VLC VME Ethernet LAN Controllers.
- One or two VTRC VME Token Ring LAN Controllers.
- One VDA/255 VME Distributed Asynchronous host adapter.
- • One or two VTC VME Terminal Controllers.

External Options

AViiON 410, 412, 4100, and 4300 series systems also support the following external devices connected to the rear panel of the desktside computer unit.

- Model 10565 Peripheral Housing Unit (PHU) mass-storage subsystems:
 - Three half-height (1.75-inch) 5.25-inch SCSI drives per PHU
 - One full-height (3.25-inch) 5.25-inch SCSI drive per PHU
 - Combination of one full-height and one half-height drive per PHU.
- CSS2/DC mass-storage subsystems:
 - Seven half-height, five full-height, or combination of seven drives.
 - 5.25-inch SCSI drives per CSS2/DC.
- Model 6586/6587, Model 6588/6589 reel-to-reel SCSI tape drives.
- 3 synchronous devices per VSC/3 controller.
- 16 asynchronous devices per VAC/16 controller.
- 255 asynchronous devices per VDA/255 adapter.
 - Controlled by VDC/8P or VDC/16 downloadable cluster controller boxes.
- • 255 asynchronous devices per VTC controller.

Refer to the following sections of this chapter and Appendix C for more detailed information about base and optional system components. Figure 1-2 illustrates the rear panel and connectors to I/O ports for AViiON 410 and 412 series systems. Figure 1-3 illustrates the rear panel and connectors to I/O ports for AViiON 4100 series systems. Figure 1-4 illustrates the rear panel and connectors to I/O ports for AViiON 4300 series systems. Refer to Chapter 2 for information about installing devices in any of the connectors.

NOTE: For information about connecting devices to VMEbus options, refer to *Setting Up and Installing VMEbus Options in AViiON® Systems*.

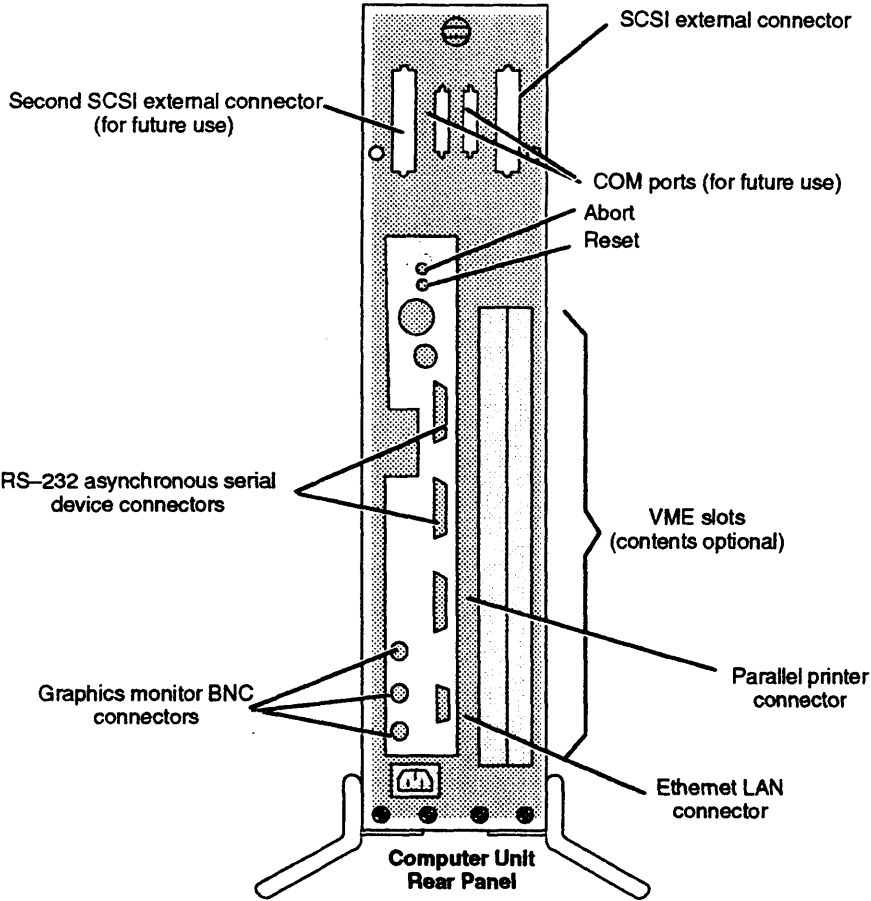


Figure 1-2 AViON 410 and 412 Series Rear Panel and Connectors

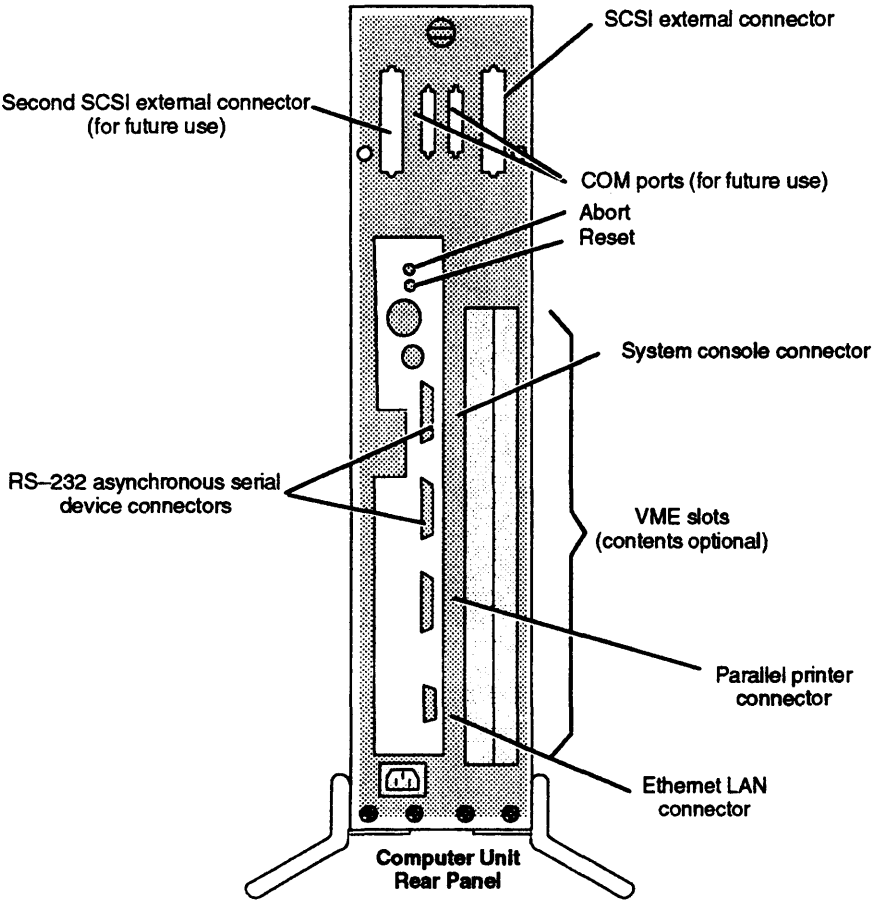


Figure 1-3 AViiON 4100 Series Rear Panel and Connectors

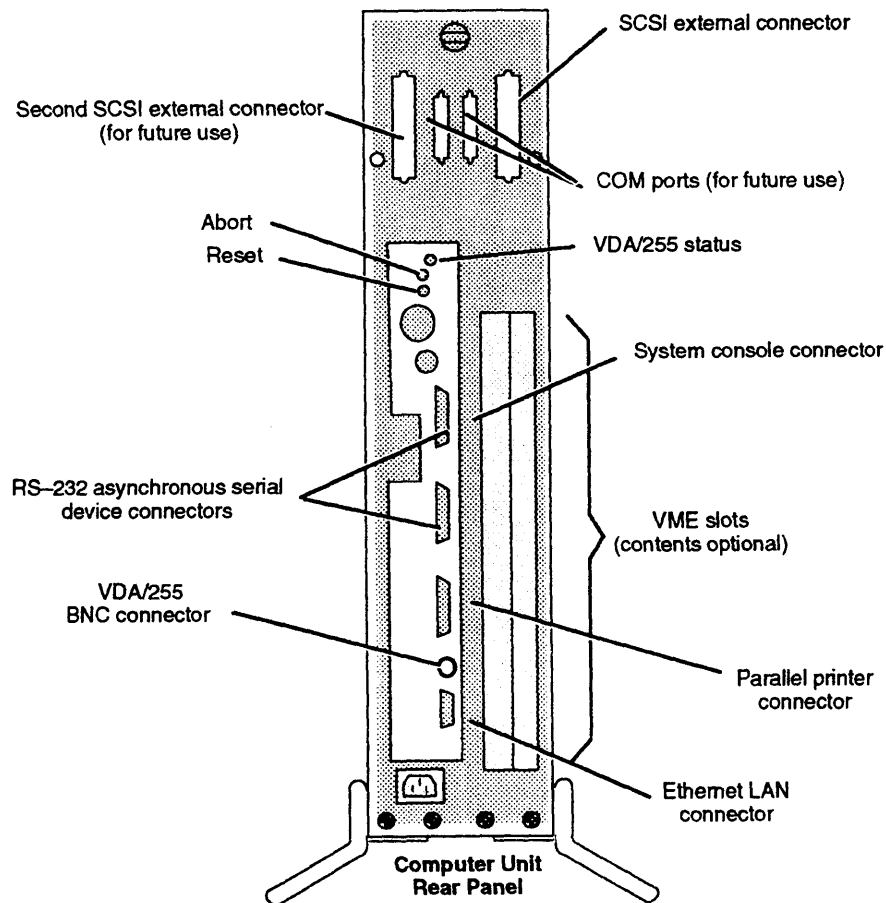


Figure 1-4 AViiON 4300 Series Rear Panel and Connectors

About the System Console (AViiON 4100 and 4300 Series)

The term *system console* refers to a terminal with keyboard that receives powerup diagnostic test messages and from which you bring up your operating system.

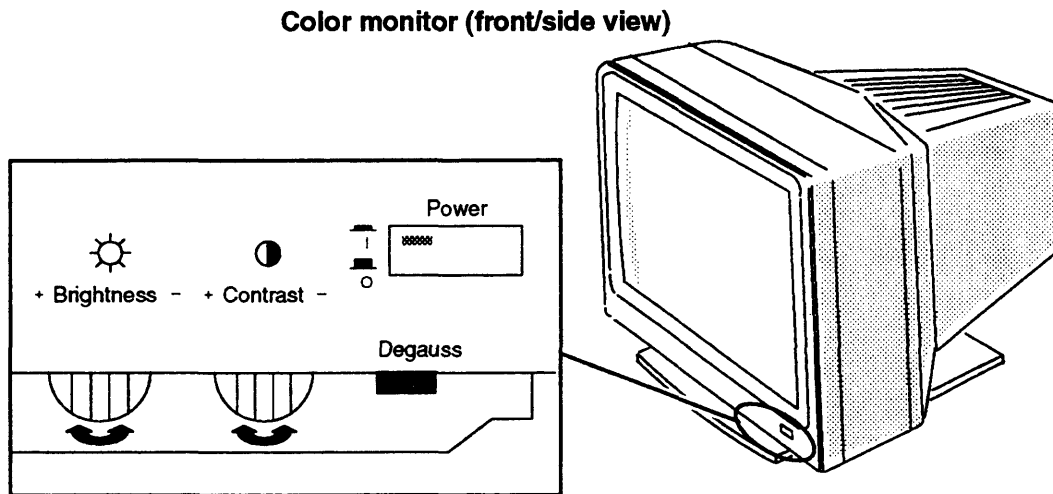
Any asynchronous terminal and keyboard with an ASCII character set and an RS-232-C interface can serve as the system console for AViiON 4100 and 4300 series computers. However, you need a terminal that conforms to ANSI standard X3.64 (1977) to support a UNIX screen editor. Those terminals that conform to the standard include Data General terminals with ANSI mode, and any terminal that emulates a VT100 or VT220 terminal.

Refer to Chapter 2 for information about connecting the system console to an AViiON 4100 or 4300 series rear panel connector.

About the Graphics Monitor (AViiON 410 and 412 Series)

An AViiON 410 or 412 series computer system package includes a color graphics monitor, Model G6487. Figure 1-5 illustrates its dials and switches. Refer to Chapter 2 for information about connecting your graphics monitor to the computer unit.

A "C" suffix in your series number (AViiON 410C, for example) indicates that the computer system contains a color graphics controller and uses the 19-inch color monitor illustrated in Figure 1-5.



NOTE: Rotate Brightness and Contrast controls left and right to activate. Press Power and Degauss switches in to activate. The Power switch LED illuminates when monitor power is on.

Figure 1-5 Color Graphics Monitor and Controls

Over time, the monitor screen becomes magnetized and your screen display may appear distorted; pressing the Degauss switch demagnetizes the monitor screen and clears any associated distortion.

If you did not order Data General's Model G6487 graphics monitor, you can use another color graphics monitor with the correct video parameters. Refer to

■ Appendix C for required hardware specifications for the monitor.

About the Keyboard and Mouse (AViiON 410 and 412 Series)

Your computer system graphics packages includes (in addition to the graphics monitor) a keyboard and a three-button optical mouse with pad. Both have optional extension cables for connection to the computer unit. The U.S. English keyboard is compatible with the IBM PC AT-101; some international versions contain 102 keys. The Japanese keyboard is PC AX-compatible. Refer to Chapter 2 for information about

■ connecting the keyboard and mouse to the desktop computer unit, and to Appendix C for their technical specifications.

About VME Options

The VME bus backplane printed-circuit board and card cage in an AViON 410, 412, 4100 or 4300 series computer unit can support one or more of the following communications options:

- **VAC/16** — VME Asynchronous Controller that provides as many as 16 ports for asynchronous devices such as user terminals.
- **VSC/3** — VME Synchronous Controller that provides as many as three synchronous communications ports.
- **VDA/255** — VME Distributed Asynchronous host adapter that supports as many as 255 asynchronous user devices via a network of cluster controllers.

NOTE: Not an option for AViON 4300 computer systems.

- **VTC** — VME Terminal Controller that supports as many as 255 asynchronous user devices over a standard Ethernet/IEEE 802.3 LAN.
- **VLC** — VME LAN Controller with a connector for a second Ethernet LAN transceiver. Supplements the Ethernet connection managed by the integrated LAN controller(s) on the system board and optional I/O expansion board.
- **VTRC** — VME Token Ring LAN Controller that enables a system to communicate with other computers over an IEEE 802.5 token ring local area network.

About Mass-Storage Drives

The Small Computer System Interface (SCSI) is an ANSI-defined standard for computer and peripheral interconnection. The SCSI bus connector(s) on the computer unit allow you to connect SCSI-based mass-storage drives to your computer system. Each SCSI controller in your system can support as many as seven SCSI drives, including standalone drives or drives residing in mass-storage housing units.

Refer to Chapter 4 for information about connecting mass-storage drives using the external SCSI bus connectors on the computer unit rear panel.

Each PHU or CSS2/DC in your system contains a combination of the following 5.25-inch, full-height (3.25-inch) SCSI-based drives:

- 662-megabyte, 1-gigabyte, or 1.4-gigabyte Winchester disk drive (Full-Height)
- 332- or 520-megabyte Winchester disk drive (Full-Height; – both drives include adapter brackets to convert from 3.5- to 5.25-inch width)
- 590-megabyte erasable optical disk drive (Full-Height)
- 2-gigabyte cartridge tape backup (Full-Height)
- 150-megabyte quarter-inch cartridge (QIC) tape drive (Half-Height)
- Multicapacity (320/525-megabyte) QIC tape drive (Half-Height)
- 3.5- or 5.25-inch diskette drive (Half-Height)
- 600-megabyte CD-ROM disk drive (Half-Height)

Refer to the manual that came with the drive and to the manual that came with the mass-storage housing unit for information about adding a drive. These manuals also contain specific information such as environmental specifications, and operating and maintaining procedures.

The following sections describe what you need to do before setting up your new computer system. We suggest that you complete the Installation Checklist (Figure 1-11, at the end of this chapter) before proceeding with any of these installation procedures.

Before You Start

Before setting up your system, you need to prepare a site, unpack and inspect your equipment, confirm that the computer unit voltage is correct for your site, and gather required documentation and materials.

Selecting a Site

Your first step is to select the final location for setting up and operating your computer system. Try to complete as much of the installation as possible at this final location. Select an area with the following physical requirements:

- Access to at least one ac outlet, plus one outlet for each external peripheral (such as storage units and printers). AViON 410 and 412 series systems also require an outlet for the graphics monitor.
- A desk or cleared work surface to position the external peripherals at a comfortable height for use.

For the AViON 410 and 412 series computer, a desk or cleared work surface to hold the computer unit, graphics monitor, keyboard, mouse with pad, and external peripherals at a comfortable height for use.

- Floor area for the deskside computer unit where it is not likely to be jarred.
- Appropriate natural or electrical lighting.

Make certain that your site is compatible with the physical, environmental, and electrical requirements listed in Appendix C. If you have peripheral devices, examine the documentation that you received with each device for electrical and environmental requirements.

Unpacking and Inspecting Your Equipment

Follow the steps in this section to unpack and inspect your new computer system. Although it may seem simpler to unpack items as you install them, it is important to verify that your equipment arrived as ordered and undamaged before you start.

1. Remove and set aside the packing slip from the outside of each shipping carton; open the cartons one by one and remove the equipment. As you do so, inspect the equipment carefully for visible damage.

CAUTION: *Handle your computer equipment carefully; do not drop or jar it. Lift by grasping firm surfaces only.*

2. Refer to Figures 1–6 through 1–9 to unpack the computer unit.

NOTE: The computer unit can weigh over 70 pounds. Unpacking the unit involves a vertical lift of approximately six inches, and requires control of the entire unit while it balances at angles approaching forty degrees. While the instructions in Figures 1–6 through 1–9 should enable you to unpack the unit alone, you might want the help of another person.

enable you to unpack the unit alone, you might want the help of another person.

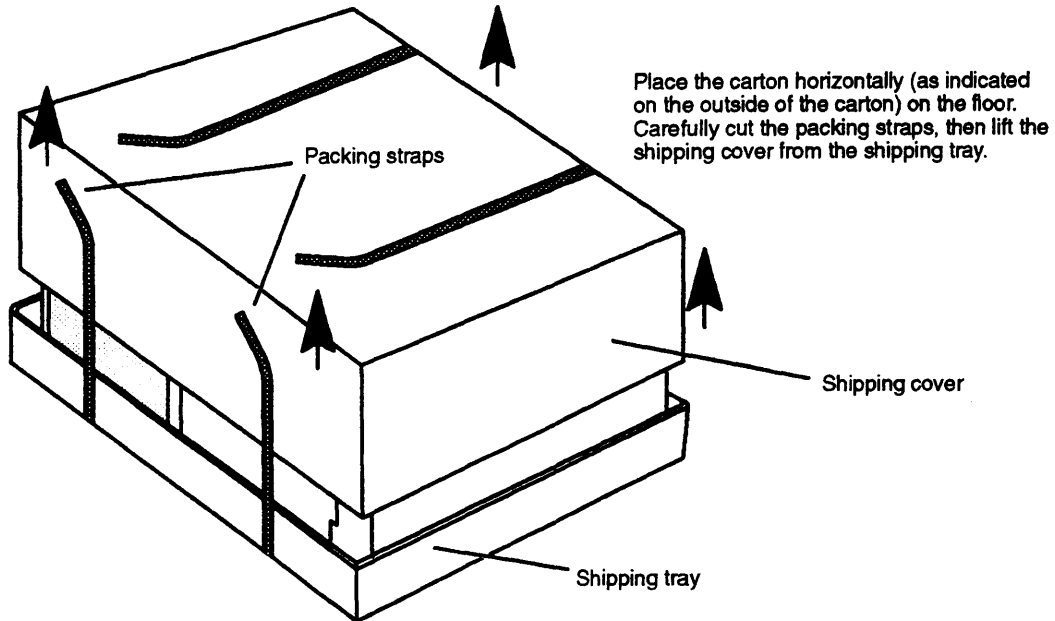


Figure 1-6 Removing the Shipping Cover

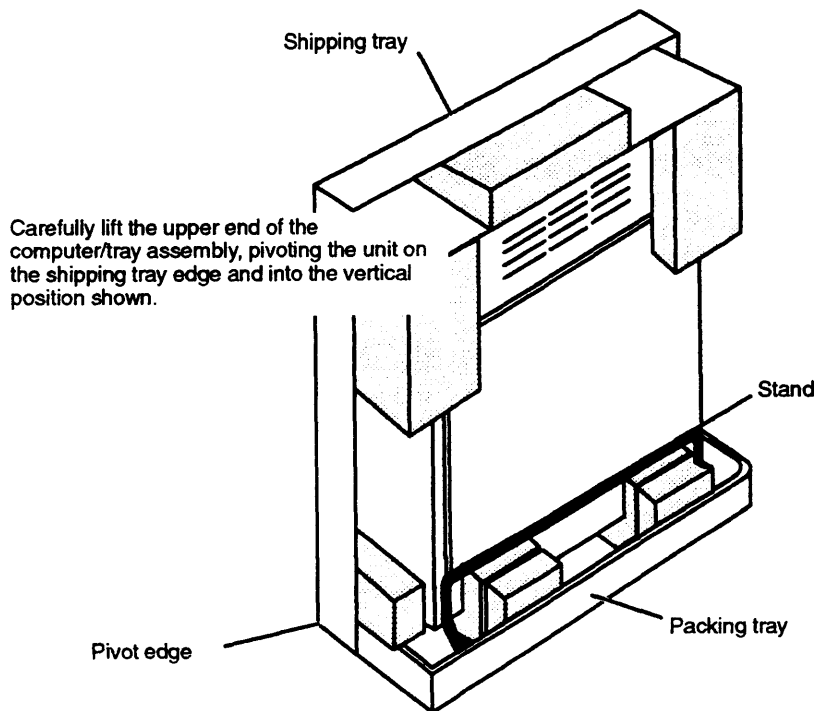


Figure 1-7 Positioning the Computer Unit Upright

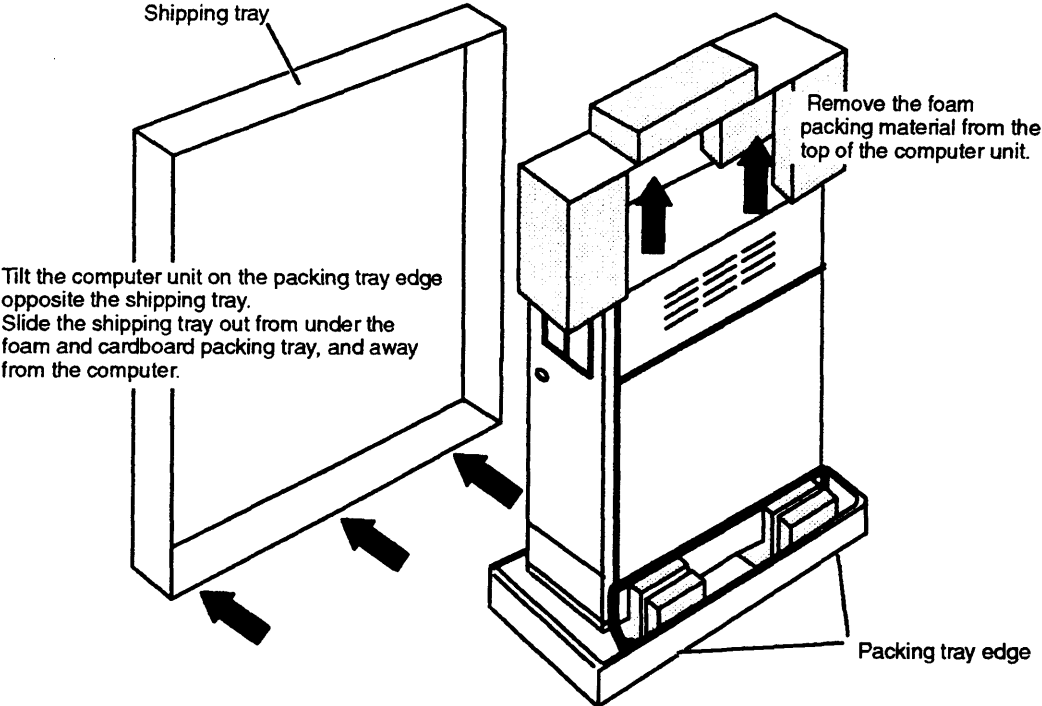
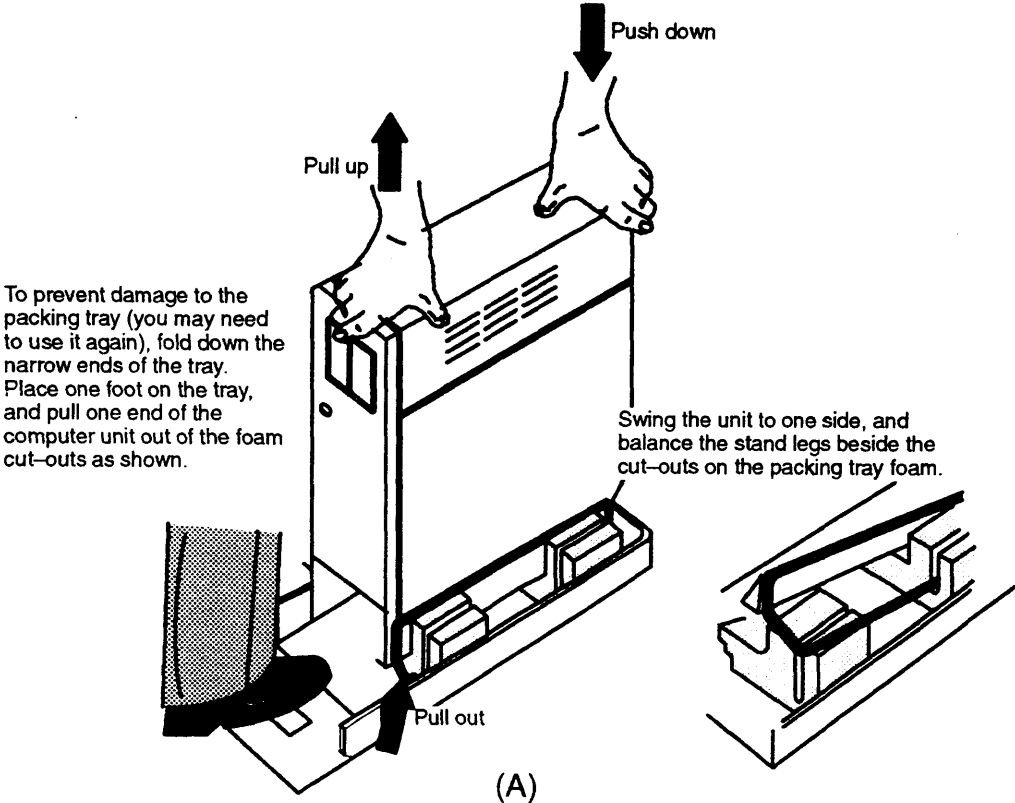
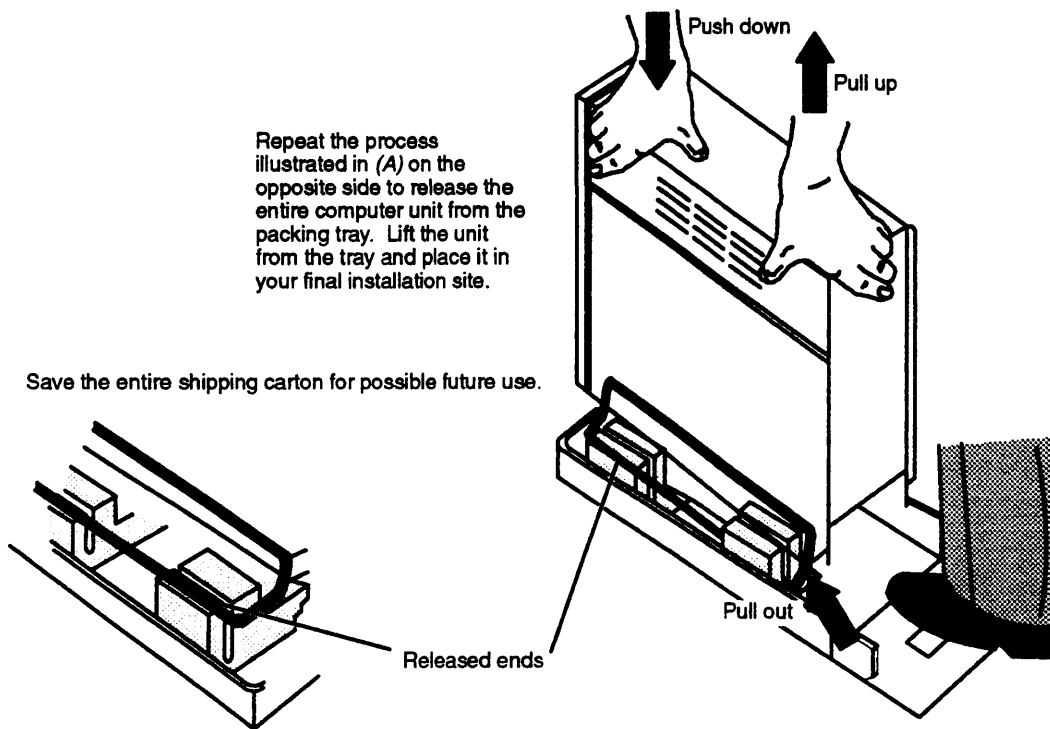


Figure 1-8 Removing the Shipping Tray and Packing Material





(B)

Figure 1-9 Removing the Computer from the Packing Tray

3. Compare the items you received with the items listed on the packing slips. Make sure that the model and/or part numbers on the packing slip match those on your equipment. Open every carton. If you think you received the wrong equipment, contact Data General as described in the Preface.
4. Make sure that you received equipment with the proper voltage and frequency for your site.

You can determine the voltage rating for your power cords (and monitor, for AViiON 410 and 412 series computer systems) by examining their model number suffixes. Table 1-1 lists voltage suffixes (by country) for your computer unit power cord and for the model G6487 graphics monitor power cord. Verify that the voltage for both is appropriate for your site.

Table 1-1 Voltage Suffixes

Country	Voltage	Model Number Suffix
U.S./Canada	120	None
U.S./Canada	100	-1
United Kingdom ¹	240	-5
Australia	240	-6
Europe ²	220	-7
Italy	220	-8
Denmark	220	-9
Switzerland	220	-0

¹ Used in Bangladesh, Bermuda, Hong Kong, Nigeria, Pakistan, Singapore, Sri Lanka, and the United Arab Republics.

² Excluding Switzerland, Italy, the United Kingdom, and Denmark.

Verify that the voltage setting for your computer unit power supply is correct for your site. The label shown in Figure 1-10 specifies whether the power supply is set for 100-120 or 200-240 volt operation.

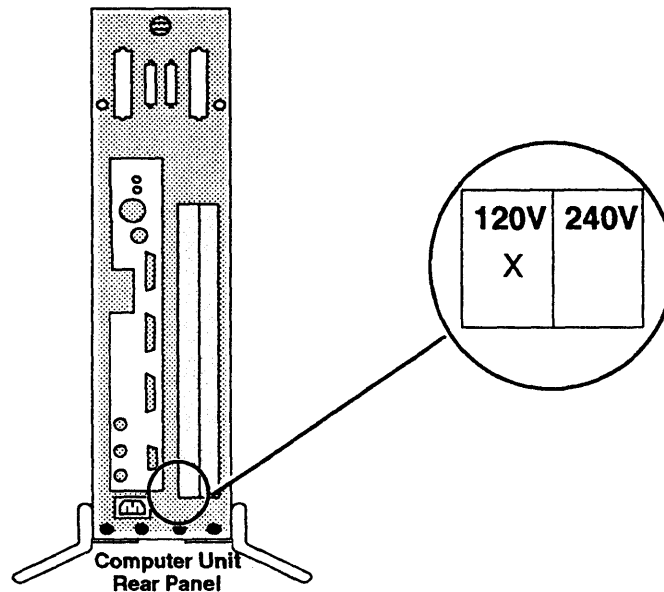


Figure 1-10 Voltage Setting Label

5. Make sure that you have all of the cables listed on your packing slip; the cables may be together in one box or packaged separately with the device. Use Table 1–2 to record the cables you received for integrated system components. (With the exception of the asynchronous adapter cables, you receive only those cables listed in Table 1–2 that were ordered with your computer system.) Refer to *Setting Up and Installing VMEbus Options in AViiON® Systems* to verify the cables for any VMEbus options you received.

Table 1-2 Cable/Cord Inventory Worksheet

<input checked="" type="checkbox"/>	Cable or Cord Type	Part Number	Model Number
	Mouse and Keyboard (AViON 400 series only)		
<input type="checkbox"/>	5-ft (1.52 m) mouse extension cable	005-008468	15357E005
<input type="checkbox"/>	6-ft (1.83 m) keyboard extension cable	005-008469	15358E006
	Graphics Monitor (AViON 400 series only)		
<input type="checkbox"/>	Color monitor triple-BNC cable	005-034408	N/A
<input type="checkbox"/>	120-V monitor power cord		109-001253
<input type="checkbox"/>	240-V monitor power cord		109-001544
	Ethernet LAN		
<input type="checkbox"/>	16.4-ft (5 m) IEEE 802.3 plenum	005-033791	1326
<input type="checkbox"/>	65.6-ft (20 m) IEEE 802.3 plenum	005-033787	1326A
<input type="checkbox"/>	16.4-ft (5 m) IEEE 802.3 PVC	005-033766	15274E005
<input type="checkbox"/>	65.6-ft (20 m) IEEE 802.3 PVC	005-031694	15274E020
	External SCSI Mass-Storage		
<input type="checkbox"/>	1.3-ft cable	005-037722	15378E001
<input type="checkbox"/>	3-ft cable	005-037725	15378E003
<input type="checkbox"/>	5-ft (1.52 m) cable	005-037723	15378E005
<input type="checkbox"/>	10-ft (3.05 m) cable	005-037722	15378E010
<input type="checkbox"/>	15-ft (4.6 m) cable	005-036625	15378E015
<input type="checkbox"/>	Asynchronous 9- to 25-pin Adapter Cables	005-038420	N/A
	Synchronous Devices		
<input type="checkbox"/>	6-ft (m) EIA RS-232 cable	005-032917	15290E006
<input type="checkbox"/>	15-ft (4.6 m) EIA RS-232 cable	005-032918	15290E015
<input type="checkbox"/>	25-ft (7.6 m) EIA RS-232 cable	005-032919	15290E025
	Asynchronous Terminals		
<input type="checkbox"/>	10-ft (3.05 m) EIA RS-232 cable	005-034256	15340E010
<input type="checkbox"/>	15-ft (4.6 m) EIA RS-232 cable	005-034990	15340E015
<input type="checkbox"/>	25-ft (7.6 m) EIA RS-232 cable	005-034991	15340E025
	Asynchronous Modems		
<input type="checkbox"/>	10-ft (3.05 m) EIA RS-232 cable	005-036256	15369E010
<input type="checkbox"/>	15-ft (4.6 m) EIA RS-232 cable	005-036257	15369E015
<input type="checkbox"/>	25-ft (7.6 m) EIA RS-232 cable	005-036258	15369E025
	Parallel Printer		
<input type="checkbox"/>	5-ft (1.5 m) Centronics cable	005-023915	10235
<input type="checkbox"/>	30-ft (9.1 m) Centronics cable	005-033762	15293E030

If you think you received incomplete or incorrect cabling, contact Data General as described in the Preface.

If you are setting up an AViiON 410 and 412 series computer system, examine the model number and suffix (the letter following the model number) on the label at the bottom of the keyboard (G6488-x, where x is the the suffix for your keyboard language) to make sure you received the appropriate keyboard.

Table 1-3 lists the language suffixes for available keyboards.

Table 1-3 Language Suffixes for Keyboard Part Numbers

Suffix	Keyboard	Suffix	Keyboard
A	U.S. English	I	Italian
B	U.K. English	M	French/Canadian
C	French	N	Swedish/Finnish
D	German	O	Norwegian
G	Spanish	S	Katakana(AX) ¹
H	Danish	Y	Swiss

¹ Japan's AT-compatible keyboard. Supports Katakana and Kanji.

If you think you received the wrong keyboard, contact Data General as described in the Preface.

Gathering Documentation and Media

The *Guide to AViiON® and DG/UX™ System Documentation* contains a list and description of all the documentation available for your computer system. The *Installation Roadmap* outlines the path we recommend that you follow through the hardware installation documentation. The Installation Checklist on the following page summarizes the hardware and software installation manuals you may need to set up the computer system and begin software installation.

If you ordered a DG/UX™ operating system package, the files you need to install your operating system are already on disk, along with AViiON System Diagnostics. Keep the cartridge tapes you received as backup copies of your system software.

Whether or not you ordered the DG/UX operating system, you received AViiON System Diagnostics software on a cartridge tape. You can use these diagnostics to verify your hardware configuration as an optional part of the installation, or use them to test your hardware at a later time. Refer to *Using AViiON® System Diagnostics* for information about using the 15-minute hardware acceptance test and the other diagnostic utilities provided.

Figure 1-11 itemizes what you need to set up and start your computer system for the first time. Your software Release Notices itemize the documentation and media necessary to complete the installation of software packages.

<input checked="" type="checkbox"/>	Check When Completed:
<input type="checkbox"/>	Make sure your installation site satisfies the electrical and environmental requirements listed in Appendix C.
<input type="checkbox"/>	Inspect equipment received for damage.
<input type="checkbox"/>	Compare packing slips with equipment received and equipment ordered.
<input type="checkbox"/>	Determine the ac line current for your site: <ul style="list-style-type: none"> <input type="checkbox"/> 100/120 volts <input type="checkbox"/> 220/240 volts
<input type="checkbox"/>	Ensure that all of your equipment and cable model numbers reflect the proper site voltage for your site.
<input checked="" type="checkbox"/>	Make Sure You Have These:
<input type="checkbox"/>	Small flat-blade screwdriver (non-magnetic).
<input type="checkbox"/>	Operating system installation documentation. Use <i>Installing the DG/UX™ System</i> to install a basic DG/UX configuration. Most DG/UX installations will also need <i>Customizing the DG/UX™ System</i> .
<input type="checkbox"/>	Software Release Notices, plus cartridge tapes if you did not order preloaded software.
	You May Need These:
<input type="checkbox"/>	<i>Installing and Operating the Model 10565 Peripheral Housing Unit, Installing and Maintaining the CSS2/DC, or Installing the Model 6586/6587 Magnetic Tape Steamer Unit</i> for information about using any of these peripheral options.
<input type="checkbox"/>	<i>Ethernet/IEEE 802.3 Local Area Network Installation Guide</i> for information about installing your integrated LAN(s).
<input type="checkbox"/>	<i>DG/Token Ring Local Area Network Installation Guide</i> for information about installing token-ring network hardware.
<input type="checkbox"/>	<i>Using AViiON® System Diagnostics</i> for information about using the hardware acceptance test or other diagnostic utilities before installing your operating system.
<input type="checkbox"/>	<i>Setting Up and Installing VMEbus Options in AViiON® Systems</i> for information on connecting devices to the VMEbus.
<input type="checkbox"/>	<i>AViiON® Series Systems Automatic Reporting and Remote Assistance User's Guide</i> if your maintenance contract includes this option.

Figure 1-11 Installation Checklist

End of Chapter



Chapter 2

Setting Up Your Computer System

This chapter describes how to connect the computer system console (an asynchronous terminal or a graphics monitor with keyboard and mouse), SCSI bus terminator, and computer unit power cord. It also describes how to connect system options such as a local-area network (LAN) transceiver, a parallel printer, and asynchronous devices (serial printers, scanners, plotters, or modems).

NOTE: If your system includes VMEbus distributed controllers, you will need the manual *Setting Up and Installing VMEbus Options in AViiON® Systems* to complete your installation.

Proceed with this chapter to begin your system installation. In many cases, it will describe all the hardware installation procedures you need to set up and install your entire system. If your system includes external SCSI-based mass-storage devices, you will need the information in Chapter 4, "Setting Up and Installing a SCSI Bus." For an overview of the computer system hardware components, refer to Chapter 1.

CAUTION: Do not apply power to the computer unit while setting it up. Refer to Chapter 3 for powerup instructions.

Connecting the System Console to AViiON 4100 Series

Your system console is the keyboard and display device that receives powerup diagnostic test messages from the computer and from which you bring up your operating system. This section describes how to connect an asynchronous terminal to the computer unit rear panel to use as a system console.

An asynchronous terminal with an ANSI-standard character set and an RS-232-C interface serves as the system console for AViiON 4100 series computers. However, for full functionality in a UNIX® environment, the terminal has to support the display of the ASCII BS (backspace) character by moving the cursor left one column. Furthermore, you need a terminal that conforms to ANSI standard X3.64 (1977) to support a UNIX-based screen editor. Those terminals that conform to the standard include Data General terminals with ANSI mode, and any terminal that emulates a VT100 or VT220 terminal.

To connect an asynchronous terminal to the system console port of an AViiON 4100 series system use one of the following cables:

Device	Cable part number	length (ft.)
System console	005-013325	5
	005-033703	15
	005-033788	25
	005-033776	50

To connect a terminal to the system console connector on the computer unit, complete the following steps.

NOTE: You will need a small flat-head screwdriver to complete these steps.

As you perform the first two steps refer to Figure 2-1.

1. Align the pins of the cable to the holes in the connector labeled "RS232 A" on the computer unit rear panel.

NOTE: Do not use serial Port B for the system console.

2. Secure the cable to the connector by tightening the two cable screws with a small flat-head screwdriver.

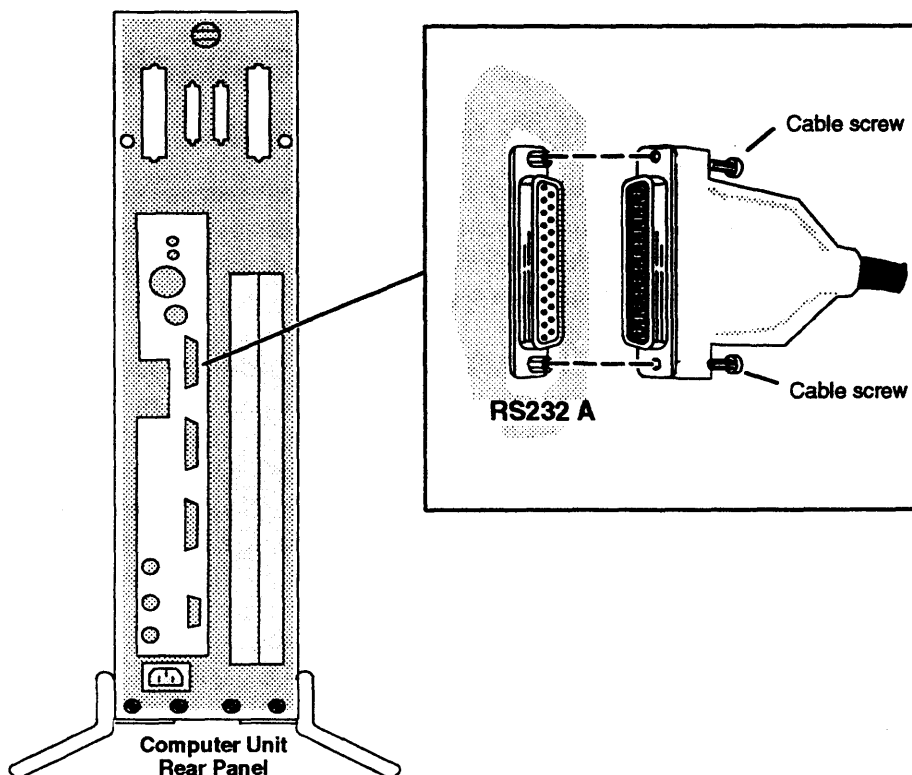


Figure 2-1 Connecting the System Console to an AViiON 4100 Series System

3. Secure the other end of the terminal cable to the RS232 C connector on the back of the terminal. Often, the terminal connector is labeled HOST.
4. Initially, both your firmware and the DG/UX operating system require that your system console have the following characteristics:

9600 baud
 8 data bits
 No parity
 ANSI character set
 Enabled flow control

Set the terminal to select these characteristics. For information on terminal switches, see the manual that came with the terminal.

If you have an operating system that supports different terminal characteristics, refer to Chapter 5 for information about changing the console port parameters after your first powerup.

NOTE: SCM menus refer to port RS232 A as the “console port” and to port RS232 B as the “modem port.”

Connecting the System Console to AViiON 4300 Series

Your system console is the keyboard and display device that receives power-up diagnostic test messages from the computer and from which you bring up your operating system. This section describes how to connect an asynchronous terminal to the computer unit rear panel to use as a system console.

Any asynchronous terminal with an ANSI-standard character set and an RS-232-C interface can serve as the system console for AViiON 4300 series computers. However, for full functionality in a UNIX® environment, the terminal has to support the display of the ASCII BS (backspace) character by moving the cursor left one column. Furthermore, you need a terminal that conforms to ANSI standard X3.64 (1977) to support a UNIX-based screen editor. Those terminals that conform to the standard include Data General terminals with ANSI mode, and any terminal that emulates a VT100 or VT220 terminal.

To connect an asynchronous terminal to the system console port of an AViiON 4300, use the 9 pin-to-25 pin asynchronous adapter cable (female to female), part number 005-38420, and one of the following cables:

Device	Cable part number	Cable model number	length (ft.)
System console	005-34256	15340E010	10
	005-34990	15340E015	15
	005-34991	15340E025	25

To connect a terminal to the system console connector on the computer unit, complete the following steps.

NOTE: You will need a small flat-head screwdriver to complete these steps.

As you perform the first two steps refer to Figure 2-2.

1. Align the holes in the 9-pin end of the asynchronous adapter cable to the pins in the connector labeled "RS232 A" on the computer unit rear panel.

NOTE: Do not use serial ports B for the system console.

2. Secure the cable to the connector by tightening the two cable screws with a small flat-head screwdriver.

Secure the other (25-pin) end of the adapter cable into one end of the terminal cable.

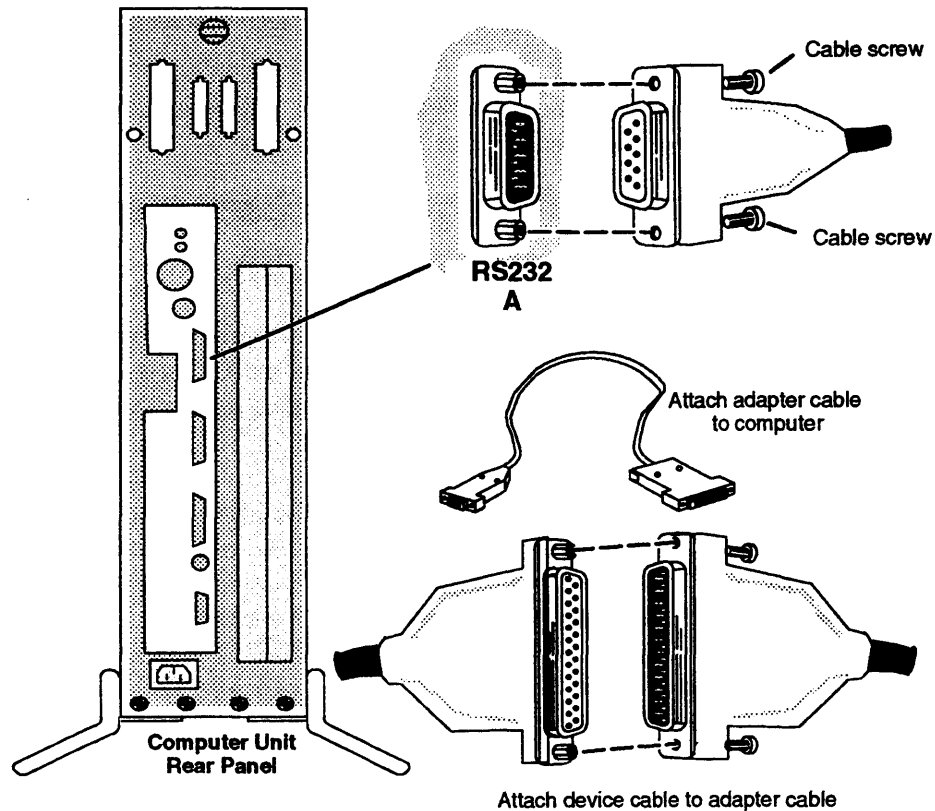


Figure 2-2 Connecting the System Console to an AViiON 4300 System

3. Secure the other end of the terminal cable to the RS-232-C connector on the back of the terminal. Often, the terminal connector is labeled HOST.

4. Initially, both your firmware and the DG/UX operating system require that your system console have the following characteristics:

- 9600 baud
- 8 data bits
- No parity
- ANSI character set
- Enabled flow control

Set the terminal to select these characteristics. For information on terminal switches, see the manual that came with the terminal.

If you have an operating system that supports different terminal characteristics, refer to Appendix B for information about changing the console port parameters after your first powerup. ■

NOTE: SCM menus refer to port RS232 A as the “console port” and to port RS232 B as the “modem port.”

Connecting the Graphics Monitor (AViiON 410 and 412 Series)

This section describes how to connect a color graphics monitor to your AViiON 410 and 412 series computer unit.

AViiON 410 and 412 series systems use the following cables to connect a monitor to the computer unit and to an ac power outlet:

Device	Cable part number	Cable model number
Color monitor (triple BNC)	005-034408	NA
120 volt power cord		109-001253
240 volt power cord		109-001544

1. Place the monitor on top of the work surface. Make sure that the power switches for both the computer unit and the monitor are off, as shown in Figure 2-3.

CAUTION: The monitor is heavy (approximately 60 pounds); be careful when moving it.

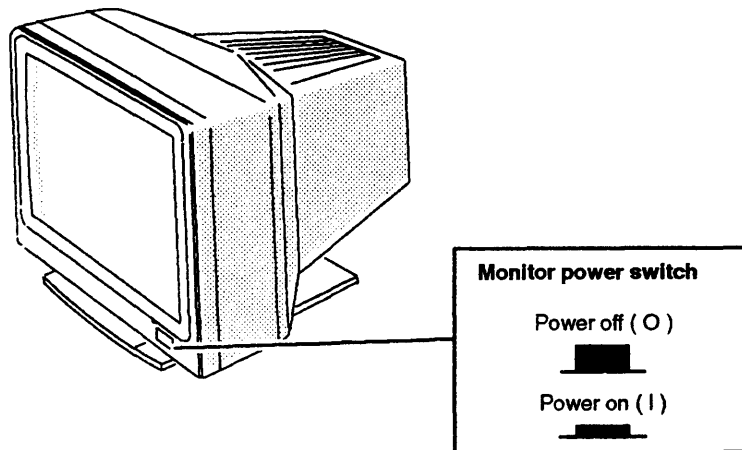


Figure 2-3 Placing the Graphics Monitor

2. Plug the female end of the monitor power cord into the ac connector at the back of the monitor. Plug the male end of the monitor power cord into an ac outlet. Figure 2-4 illustrates how to connect the monitor cord.

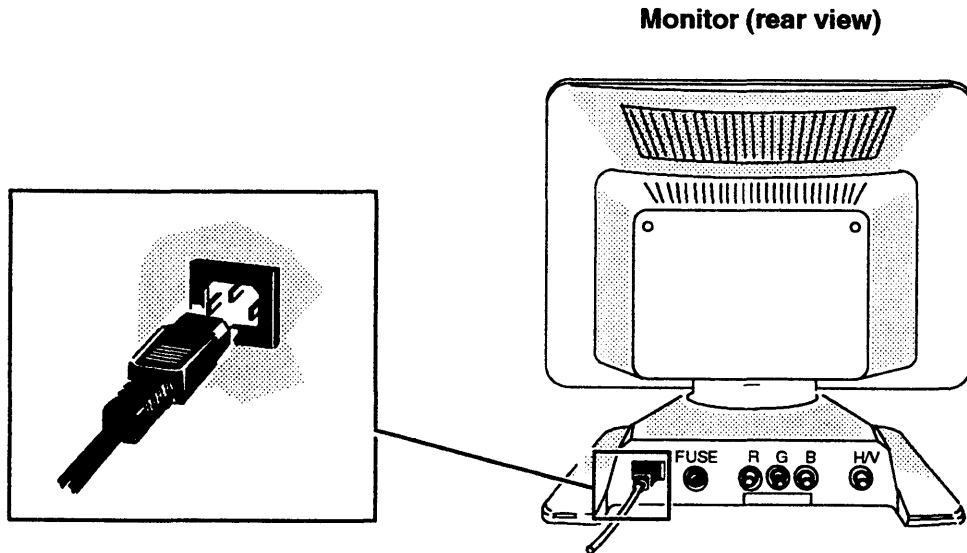


Figure 2-4 Connecting the Color Monitor Power Cord

3. Plug one end of the monitor BNC cable into the connectors on the back of the monitor. The cable is coded with red, green, and blue color strips near the connector ends. Connect the red cable to the R monitor connector, the green cable to the G/MONO connector, and the blue cable to the B connector, as shown in Figure 2-5. Turn the ends of the cables clockwise to lock them in place.

NOTE: If you are cabling the computer unit for gray-scale operation, plug only the *green* BNC cable into the G/MONO connector.

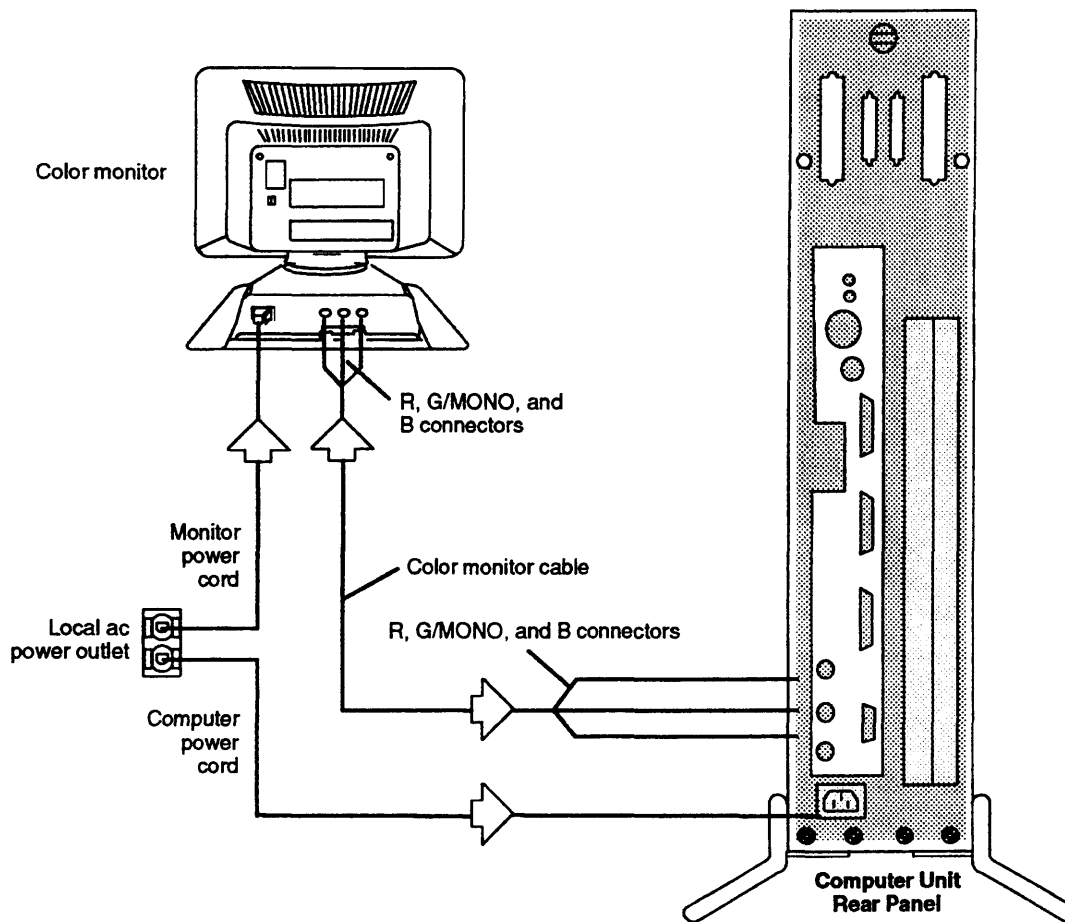


Figure 2-5 Plugging the Cables and Power Cord into the Monitor and Computer Unit

4. Plug the other end of the monitor cable into the connectors on the back of the computer unit. The color monitor cable has color-coded ends which plug into the appropriate R, G/MONO, and B connectors on the back of the computer unit, as shown in Figure 2-5. Turn the ends of the cables clockwise to lock them in place.

NOTE: If you are cabling the computer unit for gray-scale operation, plug only the *green* BNC cable into the G/MONO connector.

Connecting the Keyboard (AViON 410 and 412 Series)

Follow these steps to connect the keyboard to the computer unit. Reverse the order of these instructions to remove a faulty keyboard in order to replace it.

CAUTION: Do not remove or replace your keyboard while the computer power is on.

AViON 400 series systems use the following extension cable to connect the keyboard cable to the computer unit:

Cable	part number	model number	length (ft.)
Keyboard (extension)	005-08469	1538E006	6

1. Position the computer unit so that you have access to the rear panel connectors.
2. Place the keyboard on the work surface.
3. Plug the female end of the keyboard extension cable into the end of the keyboard cable; then, plug the other end of the extended keyboard cable into the keyboard connector on the rear panel of the computer unit, as shown in Figure 2-6.

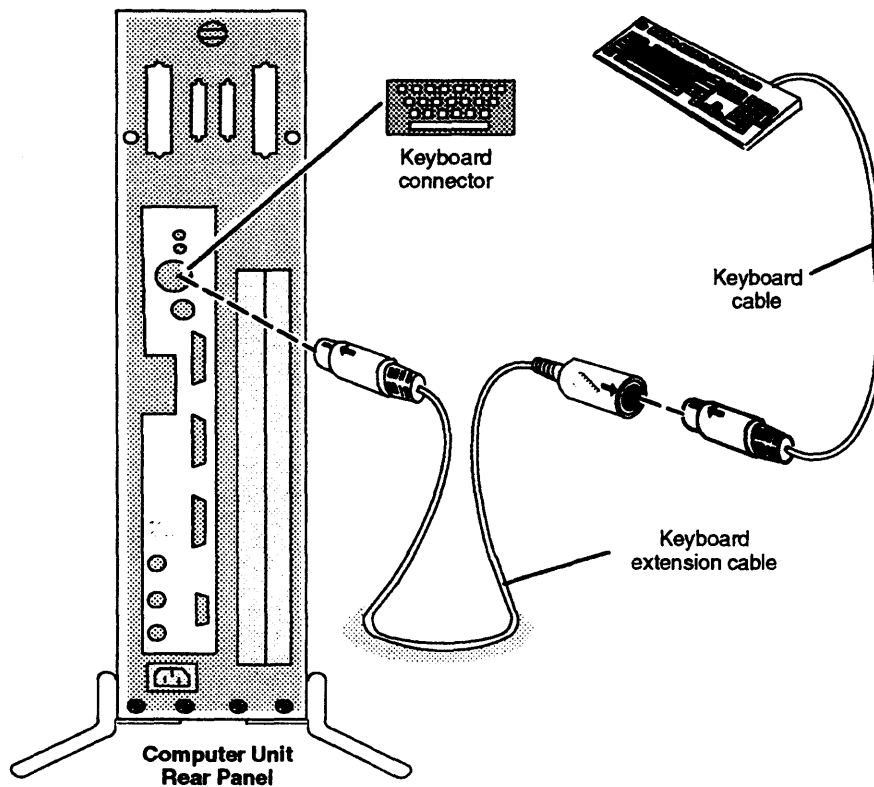


Figure 2-6 Connecting the Keyboard

Connecting the Mouse (AViiON 410 and 412 Series)

Follow these steps to connect the mouse device to the computer unit. Reverse the order of these instructions to remove a faulty mouse in order to replace it.

CAUTION: *Do not remove or replace your mouse while computer power is on.*

AViiON 410 and 412 series systems use the following extension cable to connect the mouse cable to the computer unit:

Cable	part number	model number	length (ft.)
Mouse (extension)	005-08468	1537E005	5

1. Position the computer unit so that you have access to the rear panel connectors.
2. Place the mouse and pad on the work surface with the shiny side facing up. Position the mouse pad so that its longer side aligns with the edge of the work surface and place the mouse on the mouse pad.

NOTE: For right-handed use, position the mouse pad just to the right of the keyboard; place it to the left for left-handed use.

3. Plug the female end of the mouse extension cable into the end of the mouse cable; then, plug the other end of the extended mouse cable into the mouse connector on the rear panel of the computer unit, as shown in Figure 2-7.

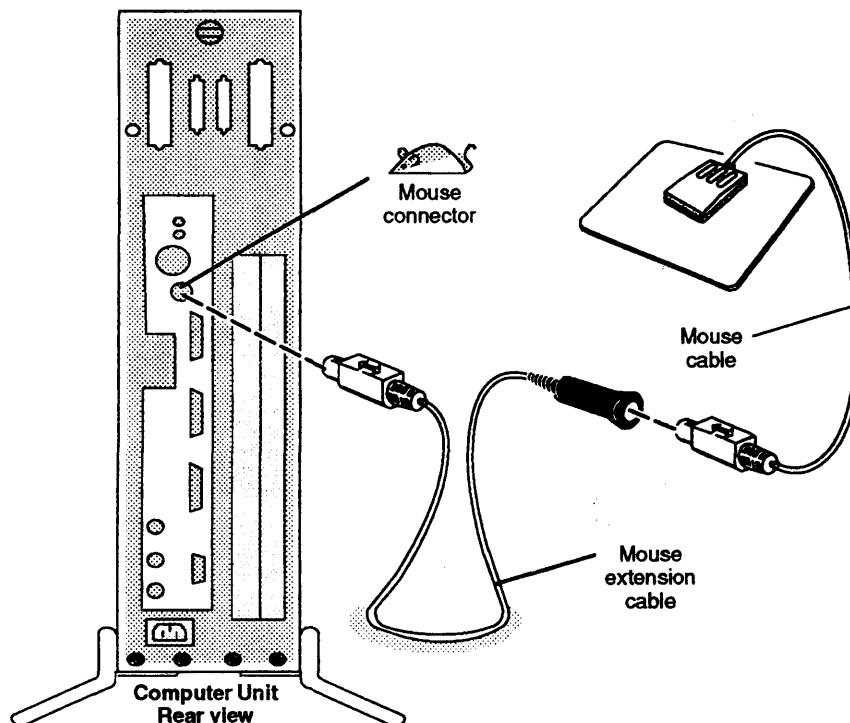


Figure 2-7 Connecting the Mouse

NOTE: The mouse is initially set at 1200 baud. Refer to Appendix B for information about changing the mouse baud rate setting.

Connecting a Cluster Controller Cable to a VDA Adapter (AViON 4300 Series)

To attach a controller cluster to a VDA/255 adapter, you need a BNC host connector, which connects to the BNC connector on your AViON 4300 computer system. Figure 2-8 shows the host connector and the location of the VDA port.

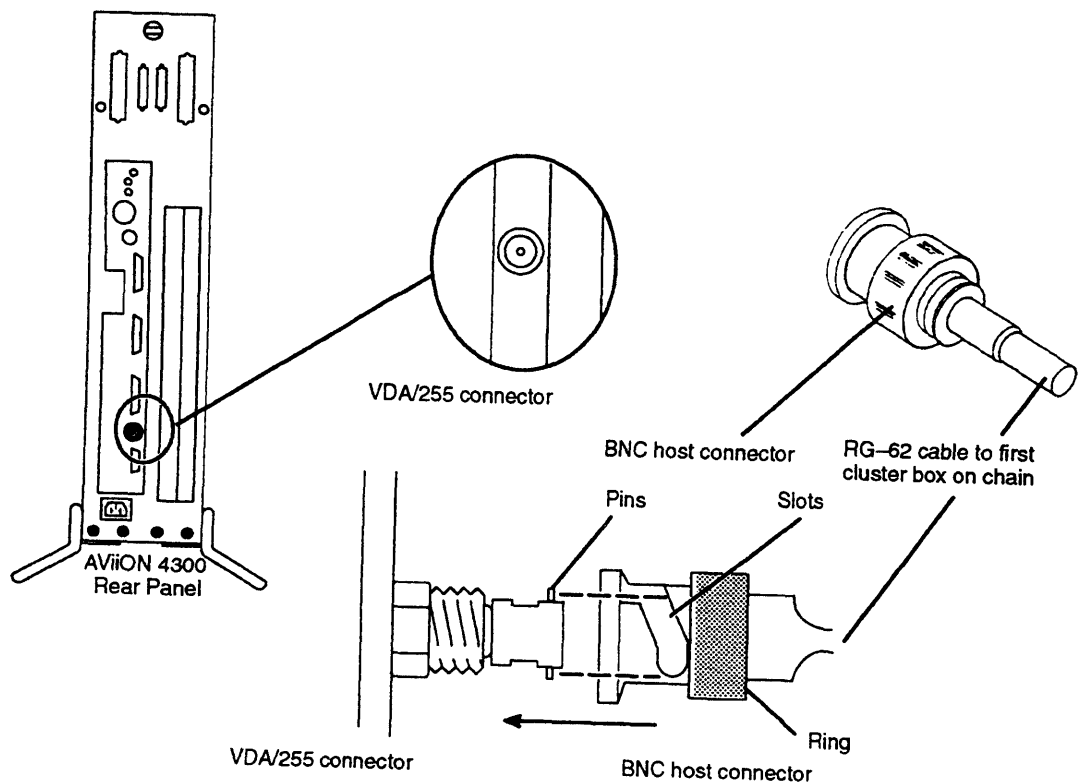


Figure 2-8 VDA/255 Connector

NOTE: You must connect the cluster line cable to your computer with a host connector rather than a T-fitting. T-fittings connect the cluster boxes to the cable chain. For information on how to install the cluster boxes, refer to the *Setting Up and Installing VMEbus Options in AViON® Systems* manual.

To connect a host connector to the receptacle on the adapter board, simply push the host connector firmly onto the receptacle, making sure that the pins on the receiving fitting slide completely into the slots on the host connector. See Figure 2-9. Then turn the knurled ring on the connector clockwise until the pins on the receiving connector snap into place.

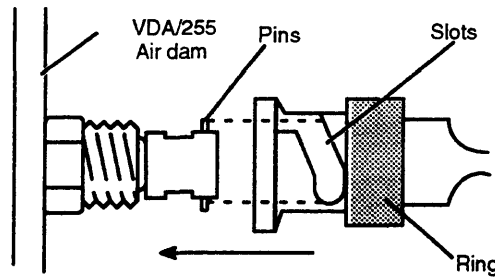


Figure 2-9 Attaching a BNC Host Connector to a VDA/255 Receptacle

Connecting a Local Area Network Cable

If your computer system will be part of a local area network (LAN), you must connect the LAN transceiver cable to the computer unit LAN connector. The steps in this section assume that the LAN drop cable is already installed and the male end of the cable is within reach of your computer unit. Refer to the manual *Ethernet/IEEE 802.3 Local Area Network Installation Guide* (listed in the Preface) for detailed information about installing your Ethernet network.

NOTE: Your AViiON 410, 412, 4100 or 4300 series system may include optional VLC, VTC, or VTRC controllers installed in the rear panel VME card cage. Refer to *Setting Up and Installing VMEbus Options in AViiON® Systems* for information about installing VMEbus options.

AViiON 410, 412, 4100, or 4300 series systems use the following cables to connect an Ethernet LAN to the rear panel connector(s):

Cable type	Cable part number	Cable model number	length (ft.)
Teflon ® (plenum)	005-33791	1326	16.4
	005-33787	1326A	65.6
PVC	005-33766	15274E005	16.4
	005-31694	15274E020	65.6

To connect a LAN transceiver cable to the computer unit LAN connector, complete the following steps. You will need a flat-blade screwdriver or comparable tool to complete these steps. Reverse the order of these steps to remove a faulty LAN cable in order to replace it.

NOTE: An optional screw converter kit (part number 005-37438) enables you to remove the sliding lock assembly described in these steps and use screw mounts to secure your LAN cable. If you received this option, refer to the instructions that came with the screw converter kit.

3. Align the holes in the transceiver cable with the pins in the computer unit LAN connector, shown in Figure 2-10.

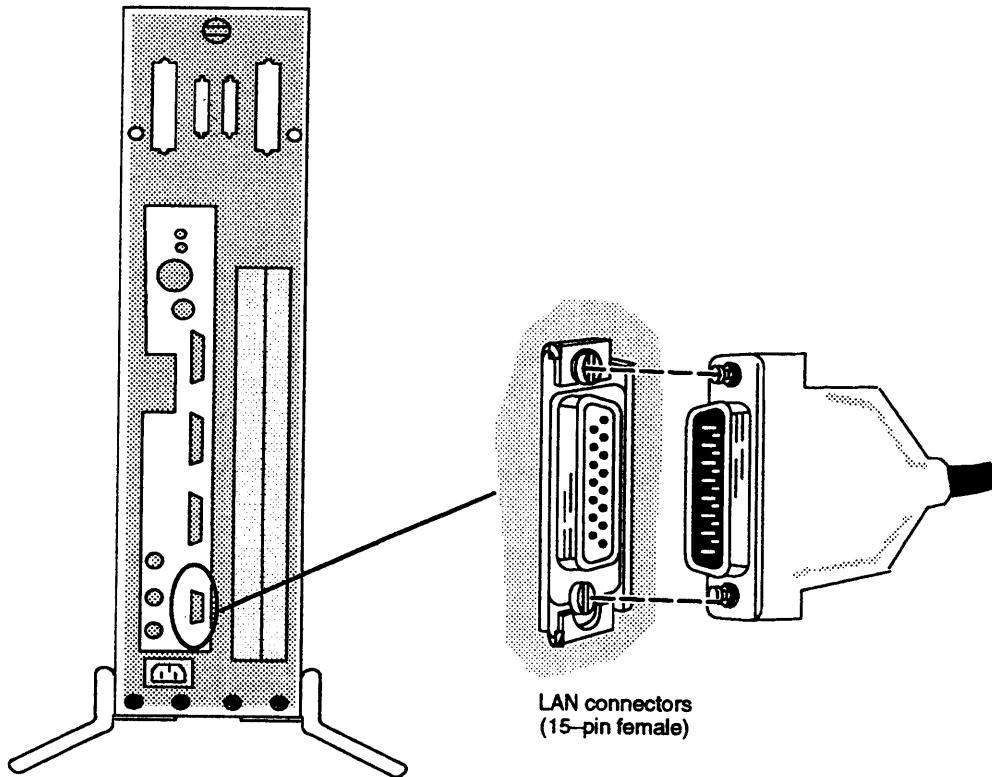


Figure 2-10 Connecting the LAN Transceiver Cable to the Computer Unit

4. As shown in Figure 2-11(a) and 2-11(b), line up the slide clip on the computer unit connector so that the slide clip mounts on the cable can pass through; then push the cable firmly into the connector.

5. Once the cable and clip mounts are secured to the connector, slide the clip using your screwdriver or a comparable tool to lock the cable in place, as shown in Figure 2-11(c).

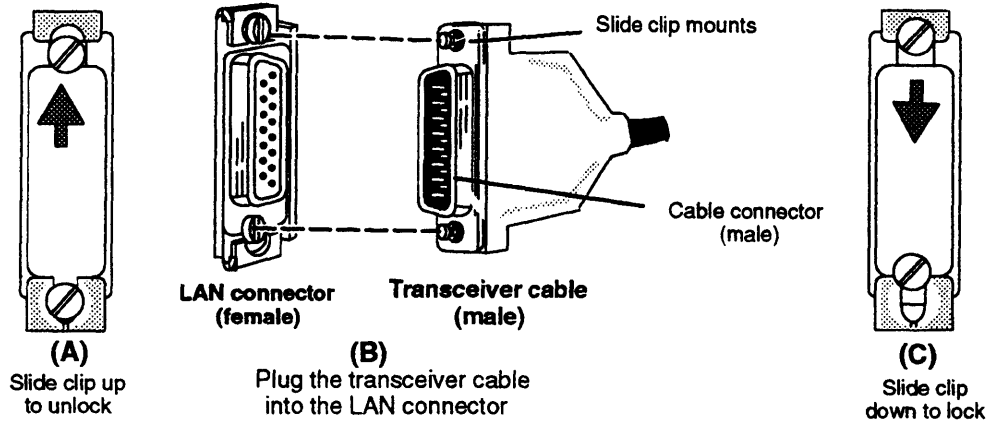


Figure 2-11 Attaching and Securing the LAN Transceiver Cable

Connecting Asynchronous Devices

This section describes how to connect an asynchronous device such as a display terminal, modem, scanner, plotter, or printer to any of the three serial port connectors on the computer unit rear panel.

Connecting Asynchronous Devices to AViiON 410, 412, or 4100 Series Systems

AViiON 410, 412, or 4100 series systems use the following cables to connect asynchronous serial devices to the rear panel connectors:

Device	Cable part number	length (ft.)
Terminal,	005-013325	5
modem, or	005-033703	15
system console	005-033788	25
	005-033776	50

Complete the following steps to connect an asynchronous device to your computer system. Reverse these steps to remove or replace an asynchronous device. You will need a nonmagnetic, small flat-blade screwdriver or similar tool to complete these steps. Refer to Figure 2-12 as you perform the first three steps.

1. Align the pins of the cable to one of the two connectors on the two male connectors on the back of the computer unit. The connectors are labeled RS232 A and RS232 B. Use the A port for the first device you connect.

NOTE: If an asynchronous terminal will serve as a workstation system console instead of a graphics monitor and keyboard, you must connect the terminal to Port A and disconnect the keyboard from its computer unit connector.

Devices requiring Data Carrier Detect (DCD) signal transmission further require installation of a DCD enabling jumper on the system board. On systems running the DG/UX] operating system, such devices include all terminals. DCD to the system console serial port connector marked RS232 A is factory-enabled; to operate another terminal connected to Port B, you must install an enabling jumper as shown in Figure 9-10.

2. Secure the cable to the connector by tightening the two cable screws with a small flat-head screwdriver.

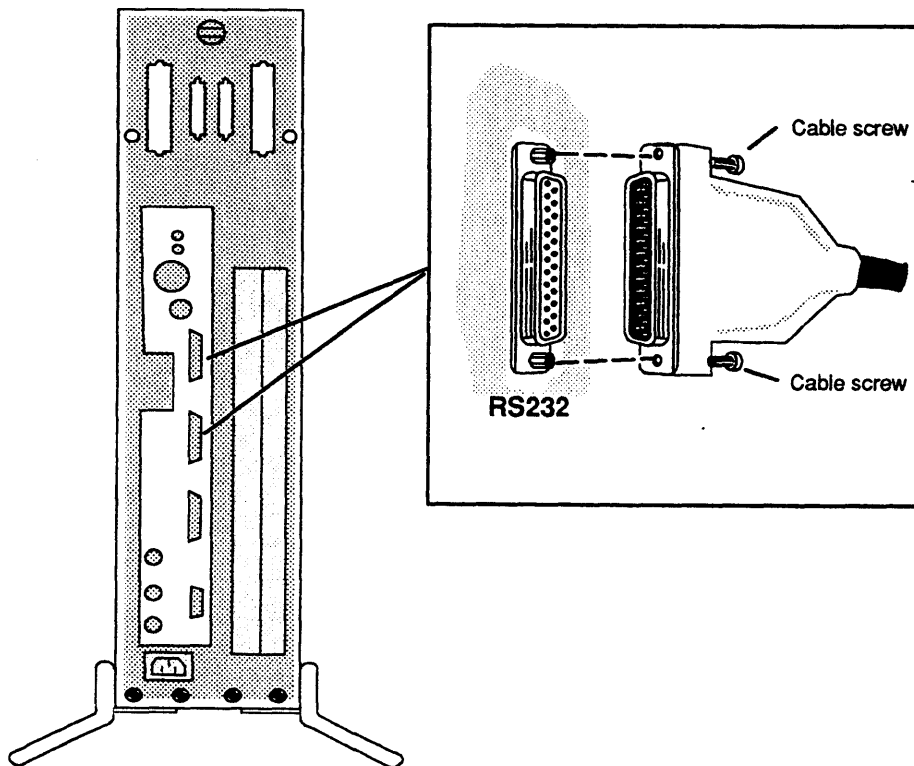


Figure 2-12 Connecting Devices to the Computer Unit Serial Ports (AViiON 410, 412, and 4100 Series)

3. Connect the device cable to the RS232 C connector on the back of the terminal, modem, or printer and secure the cable connection.
4. Set the switches or configuration menu on the terminal, modem, or printer to select the appropriate characteristics. Initially, both your firmware and the DG/UX operating system require that the device connected to port "RS232 A" have the following characteristics:

9600 baud 8 data bits
No parity ANSI character set
Enabled flow control

NOTE: These default settings are applied to both asynchronous ports prior to shipment.

Set the switches or configuration menu to select these characteristics. For information on device switches or configuration menus, see the manual that came with the device.

If you need to change these default characteristics, refer to Appendix B for information about changing the configuration parameters after your first powerup. SCM menus refer to serial Port A as the "console port" and to Port B as the "modem port."

Connecting Asynchronous Devices to AViiON 4300 Series Systems

AViiON 4300 use the following cables to connect asynchronous serial devices to the rear panel connectors:

part number 00538420 9- to 25-pin (female-female) asynchronous adapter cable

and one of the following:

Device	Cable part number	Cable model number	length (ft.)
Terminal or system console	005-34256	15340E010	10
	005-34990	15340E015	15
	005-34991	15340E025	25
Modem	005-36256	15369E010	10
	005-36257	15369E015	15
	005-36258	15369E025	25

Complete the following steps to connect an asynchronous device to your computer system. Reverse these steps to remove or replace an asynchronous device. You will need a nonmagnetic, small flat-blade screwdriver or similar tool to complete these steps. Refer to Figure 2-13 as you perform the first three steps.

1. Plug the 9-pin female end of the asynchronous adapter cable into one of the two male connectors on the back of the computer unit. The connectors are labeled RS232 A and RS232 B. Use the A port for the first device you connect.

NOTE: If an asynchronous terminal will serve as a workstation system console instead of a graphics monitor, you must connect the terminal to the Port A and disconnect the graphics keyboard from its computer unit connector.

2. Secure the adapter cable to the connector by aligning and then tightening the two screws on the cable.

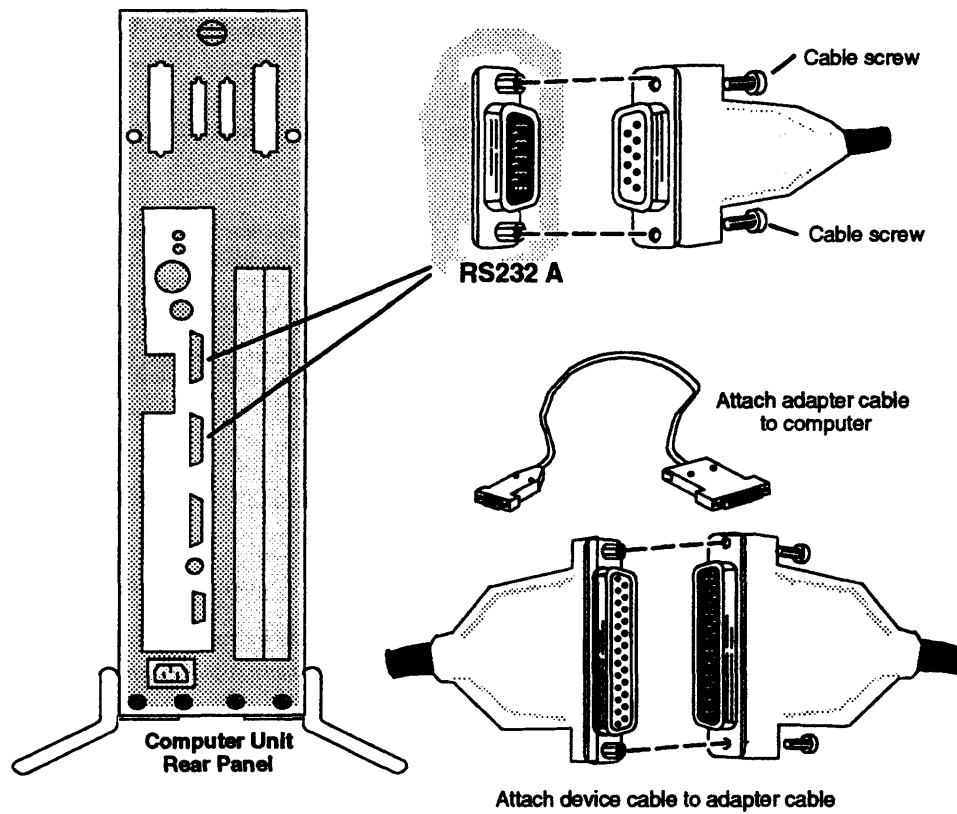


Figure 2-13 Connecting Devices to the Computer Unit Serial Ports (AViiON 4300)

3. Connect the device cable to the RS232 C connector on the back of the terminal, modem, or printer and secure the cable connection.
4. Set the switches or configuration menu on the terminal, modem, or printer to select the appropriate characteristics. Initially, both your firmware and the DG/UX operating system require that the devices connected to port "RS232 A" have the following characteristics:

9600 baud 8 data bits
 No parity ANSI character set
 Enabled flow control

NOTE: These default settings are applied to both asynchronous ports A and B prior to shipment.

Set the switches or configuration menu to select these characteristics. For information on device switches, see the manual that came with the device.

If you need to change these default characteristics, refer to Appendix B for information about changing the configuration parameters after your first powerup. SCM menus refer to serial Port A as the "console port" and to Port B as the "modem port."

Connecting a Parallel Printer

This section describes how to connect a parallel printer with a Centronics LPT1 interface. Reverse the order of these steps to remove or replace your parallel printer cable.

AViON 410, 412, 4100, and 4300 series systems use the following 25-pin CHAMP cables to connect a parallel printer to the rear panel connector:

Device	Cable part number	Cable model number	length (ft.)
Parallel printer	005-023915	10235	5
(Centronics LPT1 interface)	005-033762	15293E030	30

1. Plug the 25-pin end of the printer cable into the parallel printer connector on the back of the computer unit as shown in Figure 2-14. Attach the printer cable to the connector by tightening the two screws on the printer cable.

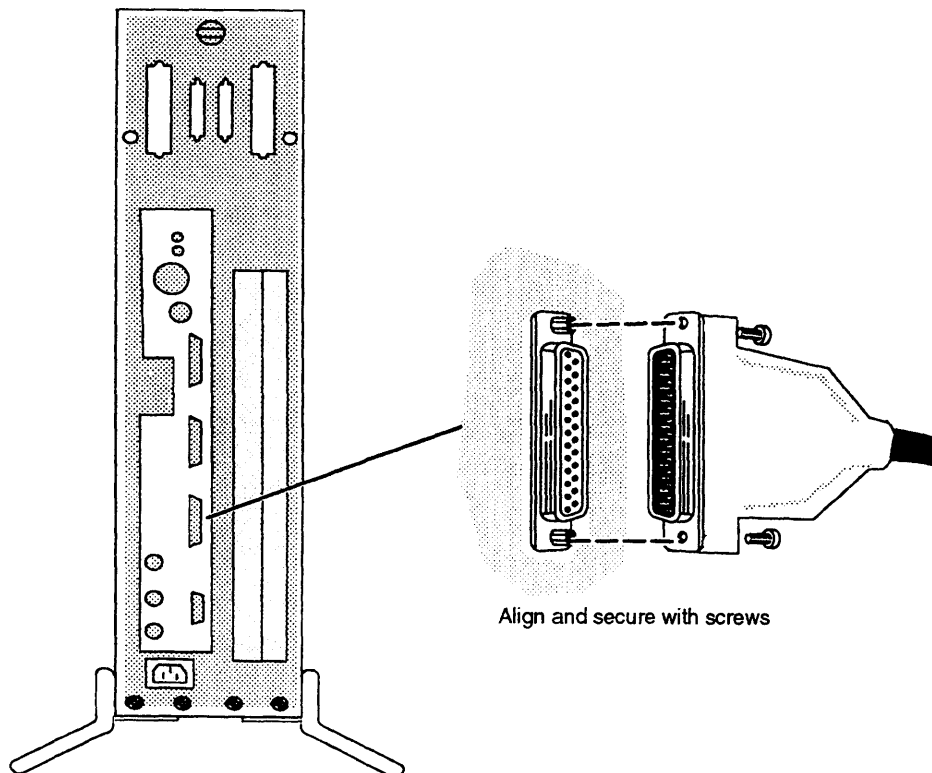


Figure 2-14 Connecting a Parallel Printer to the Computer Unit

2. Plug the other (36-position CHAMP) end of the printer cable into the connector on the parallel printer. See the documentation that came with the printer for further instructions.

NOTE: To further set up your printer to operate under the DG/UX operating system, refer to *Customizing the DG/UX™ System*.

Terminating an Internal SCSI Bus

If your system does not include any *external* mass-storage subsystems or drives, you must terminate the bus that links the Small Computer System Interface (SCSI) controller, your internal SCSI drives, and the SCSI A rear panel connector. Your tape and disk drives will not operate correctly until the SCSI A bus is properly terminated.

NOTE: In most cases, your computer unit is shipped with the SCSI bus terminator(s) already installed. If a large black plug occupies the rear panel connector(s) labeled SCSI, and you have no external SCSI devices, you can skip this section and continue with the next section, "Connecting the Computer Unit Power Cord."

If your system *includes* external SCSI drives (any disk, tape, diskette, CD-ROM, or optical disk drive housed outside the computer unit), skip this section and refer to Chapter 4, "Setting Up and Installing a SCSI Bus." When you finish setting up and installing your external SCSI bus, return to the last section in this chapter, "Connecting the Computer Unit Power Cord."

To terminate an internal SCSI bus, follow these steps.

5. Locate the CHAMP terminator plug, Data General number 005-033334, and the SCSI rear panel connector shown in Figure 2-15.

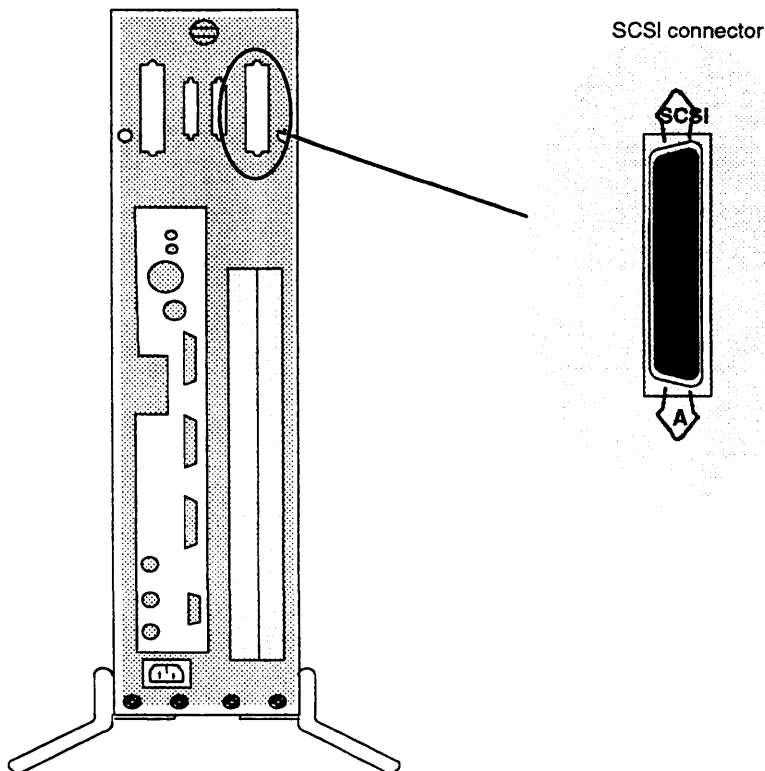


Figure 2-15 AViiON 410, 412, 4100, and 4300 Series SCSI Bus Connector

- Align the connector pin numbers and the D-shaped connector bevels before gently inserting the plug in the SCSI connector, as shown in Figure 2-16.

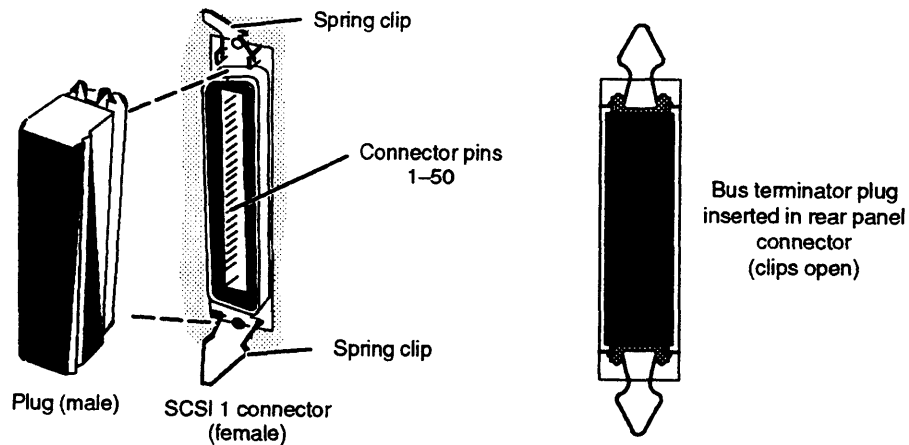


Figure 2-16 Installing the SCSI Bus Terminator Plug

- 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 2-17. Your vertical pressure will push the clips into place; do not squeeze or pull the clips out of shape.

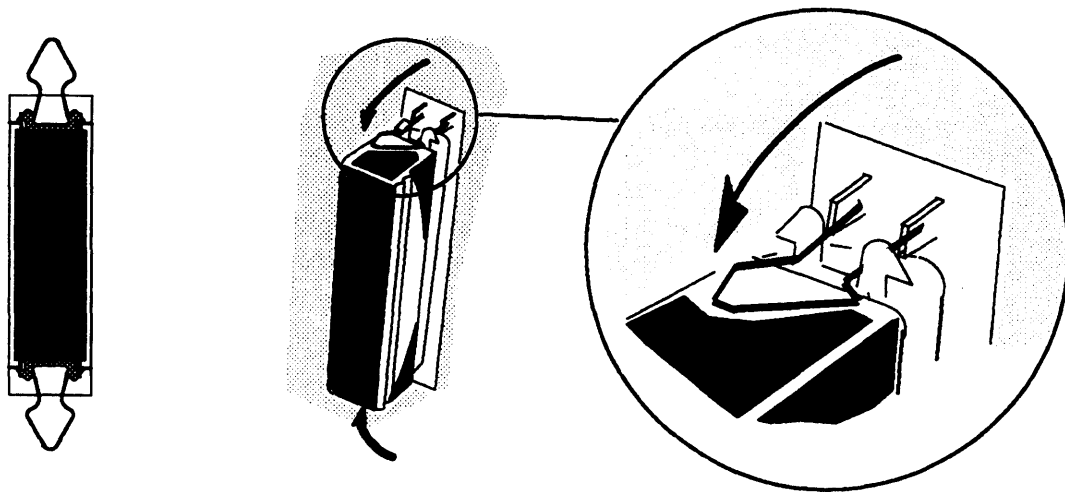


Figure 2-17 Securing a SCSI Bus Terminator

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.

Connecting the Computer Unit Power Cord

After you have assembled your computer system, including any devices connected to VME-based option boards, use these steps to connect the computer unit power cord to an ac outlet and complete your set-up procedures. Reverse the order of these steps to disconnect the computer unit power cord.

CAUTION: *Make sure that the computer unit power switch is off before connecting the power cord.*

1. Locate the computer unit power cord. The correct power cord part number ensures that you are using a proper cord for your site's voltage. AViiON 410, 412, 4100, and 4300 series computers use the following power cords:

Cord	part number	model number	Country
120 volt	109-996		US
100 volt	109-996	-1	US/Canada
240 volt	109-813	-5	UK ¹
240 volt	109-809	-6	Australia
220 volt	109-812	-7	Europe ²
220 volt	109-811	-8	Italy
220 volt	109-815	-9	Denmark
220 volt	109-810	-0	Switzerland

¹ Used in Bangladesh, Bermuda, Hong Kong, Nigeria, Pakistan, Singapore, Sri Lanka, and the United Arab Republics.

² Excluding Italy, Switzerland, the United Kingdom, and Denmark.

2. The computer unit is shipped with a yellow and black warning label covering the rear panel ac connector. Examine the computer unit's device rating label to be sure your computer unit's voltage is properly set for your site. If the label indicates proper voltage, remove the warning label and plug the female end of the computer unit power cord into the ac connector as shown in Figure 2-18.

WARNING: **Do not attempt to connect or power up your machine if it is not compatible with your ac power source. If the warning label does not indicate the proper voltage selection for your site, contact Data General before continuing.**

3. Plug the male end of the computer unit power cord into an ac outlet.

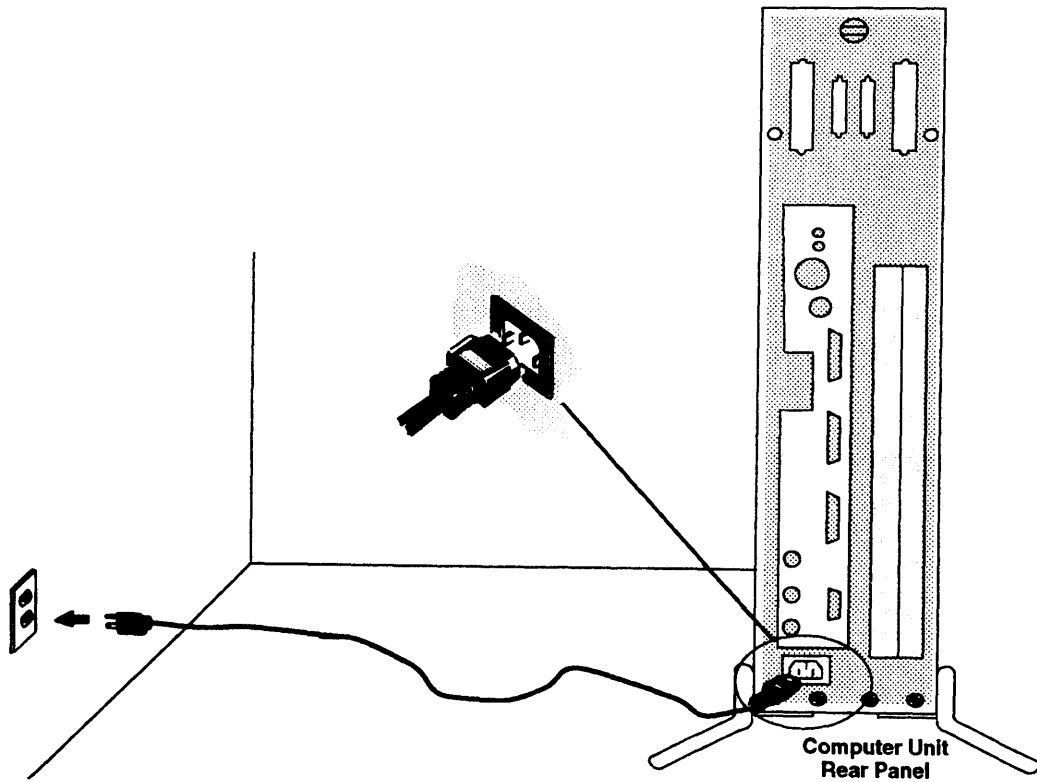


Figure 2-18 Connecting the Computer Unit Power Cord

Now that you have set up the computer system hardware, continue with the steps in Chapter 3 to ensure that the computer system starts properly, to become familiar with power-up procedures, and to verify that the computer system hardware passes all power-up diagnostic tests. When you complete the procedures described in Chapter 3, you can install your operating system and application software.

End of Chapter

Chapter 3

Starting and Stopping Your Computer System

The first section of this chapter describes a normal powerup sequence. After you install your computer system hardware (for the first time, as described in Chapter 2, or after hardware maintenance, as described in Chapter 5), follow the steps in the “Powering Up” section of this chapter to start the computer and boot your operating system. The last section of this chapter explains how to properly power down, reset and restart the computer system.

Starting the Computer System

Each time you apply ac power to your computer system, a series of diagnostic tests in the firmware verify that the hardware is functioning well enough to run your operating system and its applications. Appendix A, “Solving Powerup Problems,” describes what you can do if your computer system fails to successfully complete power-up diagnostic tests. The following sections describe how to power up your system, and describe what you should do the first time you start up your AViON 410, 412, 4100, or 4300 series computer.

Once you install and customize your operating system, the sequence of events and displays you see after powerup testing will change; refer to your operating system documentation for information on booting software.

CAUTION: *Verify that the computer unit, monitor, peripherals, and all power cords have appropriate ac power voltage for your site as described in Chapter 2, before turning on power to your computer system.*

Powering Up

This section describes how to power up your computer system. It is important that you turn power on to the computer unit and peripherals in the proper sequence, and that your computer system complete the powerup testing properly.

1. Turn on power to the system console. For graphics workstations, turn on power to the display monitor, as shown in Figure 3-1.

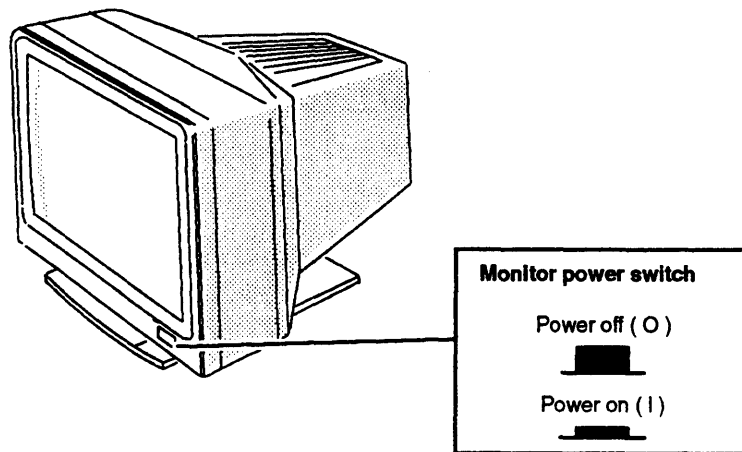


Figure 3-1 Monitor Power Switch

2. If you have a Peripheral Housing Unit (PHU), a combined storage subsystem (CSS2/DC), or another external peripheral unit connected to your computer system, turn on power to that device. Figure 3-2 shows how to turn on power to a PHU or CSS/DC.

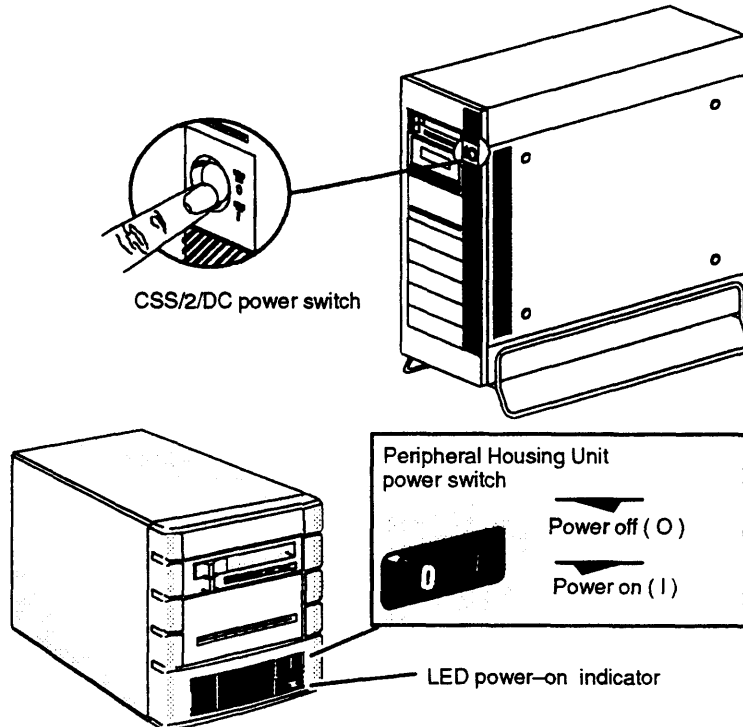


Figure 3-2 Peripheral Housing Unit (PHU) and Combined Storage Subsystem Deskside Chassis (CSS2/DC) Power Switch

3. If you have a printer or other devices connected to your computer system, including those connected to VME-based controllers, turn on power and make sure that each is *on line*. For specific information, see the documentation that came with the devices.
4. Turn on power to the computer unit by pressing the computer unit's power switch as shown in Figure 3-3.

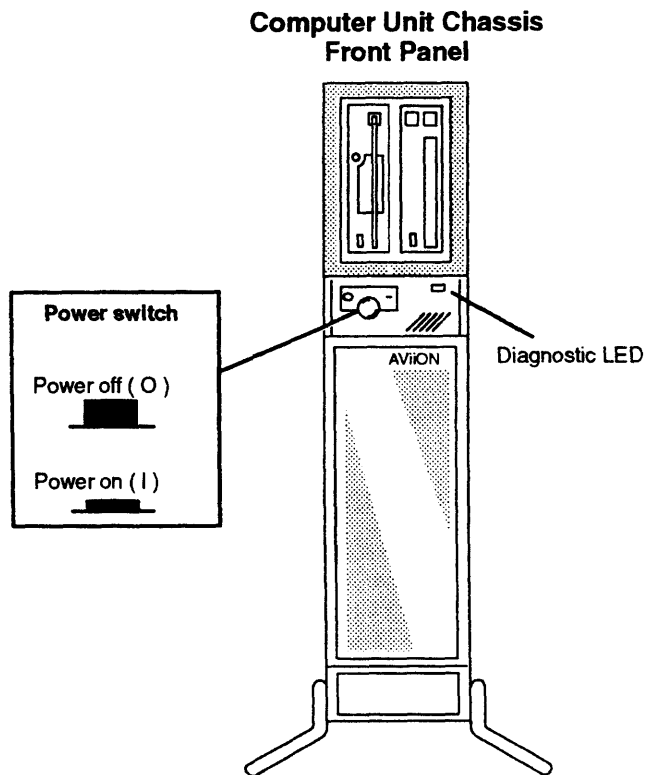
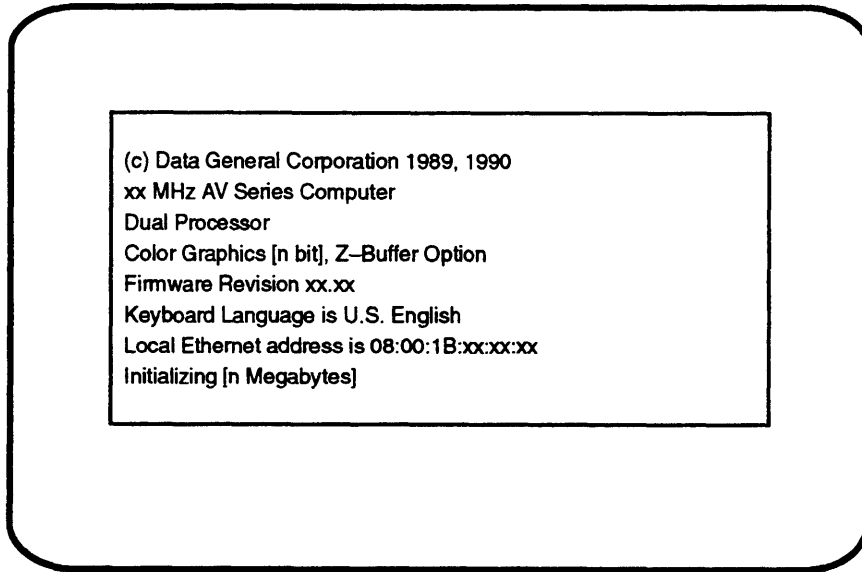


Figure 3-3 Computer Unit Power Switch and LED Power-On Indicator

5. Watch the system console (or graphics display monitor on an AViiON 410 or 412 series system) carefully. You will hear beep tones from the computer unit speaker. After approximately 10 seconds, the screen displays a power-up window in the center of the screen with a black cursor in its top left corner, followed by initialization messages after another several seconds. Continue with the next step when you see text messages in the powerup window. If the console does not behave in this manner, refer to Appendix A, "Solving Powerup Problems."

Your AViiON 410 or 412 series system should display initialization text similar to the following example:



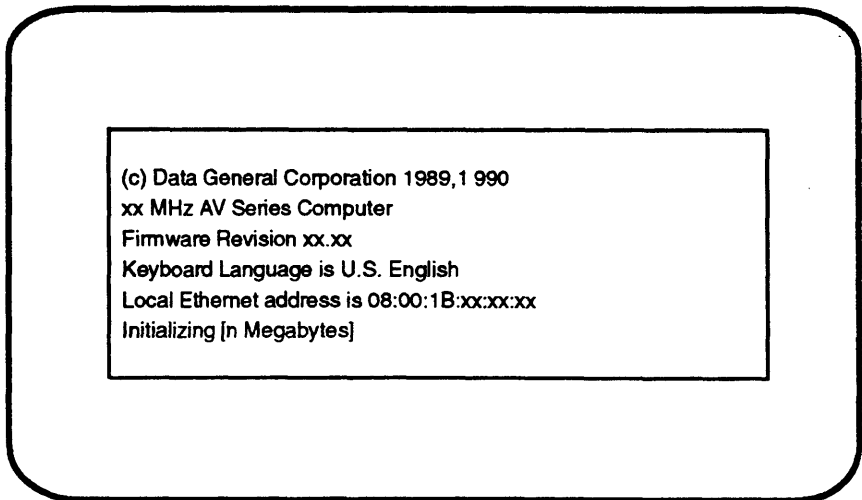
Where

xx MHz
Dual Processor
Single Processor
n bit
Z-Buffer Option
n Megabytes

Indicates

Computer system clock speed, in megahertz
Second CPU installed
Second CPU option not installed
Type of graphics board installed
Enhanced graphics board installed
Amount of memory installed

Your AViiON 4100 or 4300 series system should display initialization text similar to the following example:



Where

xx MHz
n Megabytes

Indicates

Computer system clock speed, in megahertz
Amount of memory installed

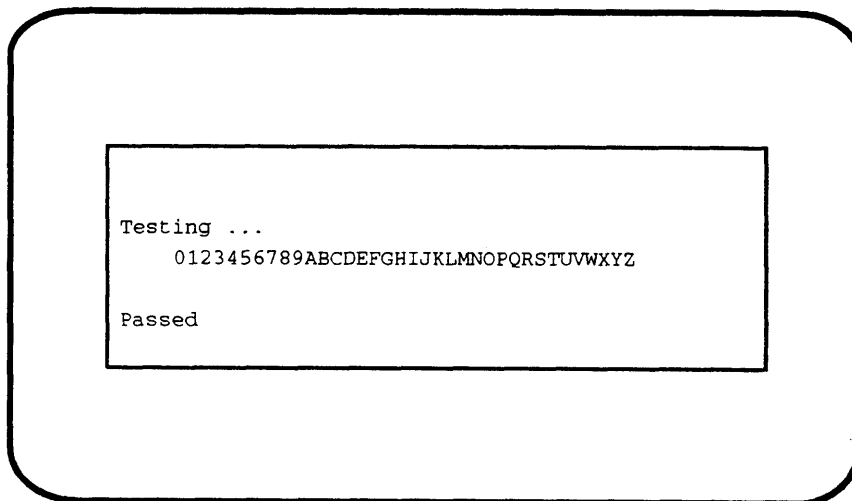
If your display does not appear as described, turn power off to the computer unit, to the graphics or nongraphics console, and to all connected peripherals; wait approximately one minute, and then repeat steps 1 through 4. If the trouble persists, refer to Appendix A, "Solving Powerup Problems."

- 6. Examine the initialization information in your powerup display carefully. Once you have verified that the information is correct, continue with the next step.

NOTE: Write down the computer system Ethernet address for future use. If any of the initialization messages report inaccurate information, or if your system does not find components that you ordered, contact Data General immediately.

- 7. After the computer system hardware is initialized, powerup tests begin. As testing progresses, each character in the alphanumeric sequence 0123...ABC...Z appears on the screen, indicating that the hardware has passed.

Make sure that powerup tests complete. Once the system displays the message Passed, continue to the next step. Your console screen appears as follows:



If the test messages are incomplete or include an error message, refer to Appendix A, "Solving Powerup Problems."

NOTE: If you installed add-on memory modules, the testing may halt when the "2" is displayed. Simply press the space bar to continue the self test.

- 8. After power-up testing is completed, your computer system tries to automatically boot the operating system. If your systems has a preloaded disk, your screen displays the name of the disk and file that your computer system is attempting to boot, as follows:

```
Loading image. . . . .
DG/UX System Release 5.4, Version Installer
```

If your system does not have a preloaded disk, the SCM> prompt will be displayed on your system console screen.

What happens next depends on whether or not you ordered a preloaded DG/UX operating system package.

Your Next Step

If you ordered the DG/UX operating system preloaded on disk, the system automatically boots the DG/UX installer kernel.

If you did *not* order DG/UX preloaded on disk or if you intend to run a different operating system, see the appropriate operating system installation manuals now. Refer to the following instructions depending on whether or not you ordered DG/UX preloaded on your system.

Preloaded DG/UX Systems

Once your firmware has successfully booted the DG/UX bootstrap, the hardware powerup is complete and the booted operating system takes over. The DG/UX bootstrap program displays initialization and sizing messages, and then enters the DG/UX installer kernel. Your screen display stops for your input and asks:

```
Do you want to configure any nonstandard devices? [no]
```

You will reach this point each time you power up, until you build a DG/UX kernel, as described in the manual *Customizing the DG/UX™ System*.

NOTE: If you ordered a preloaded DG/UX operating system package, but the installer kernel fails to boot automatically, first refer to Appendix A, “Solving Powerup Problems,” to verify that the trouble is not caused by the way you set up your hardware. Then try to boot DG/UX manually by typing the following command line at the SCM prompt:

```
SCM> b sd(insc(),0)root:/dgux.installer -i
```

If the DG/UX installer kernel fails to boot again, contact Data General as described in the Preface.

Systems Without Preloaded DG/UX

If you did *not* order preloaded DG/UX with your computer unit or if you intend to run a different operating system, the automatic boot process will fail.

When the automatic boot sequence fails to boot the DG/UX installer kernel, you’ll see this message from the System Control Monitor (SCM):

```
Unable to load bootfile sd(insc(),0)root:/dgux...
```

You have *not* failed the firmware powerup; your system has simply failed to boot the DG/UX installer kernel from disk. Proceed now to your operating system documentation for installation instructions.

For information about the SCM configuration menus, refer to Appendix B. You can use these menus to change asynchronous port B, display console, mouse, or keyboard

configuration parameters. Once your operating system is installed, you can use an SCM menu to change the default boot path to that of your configured operating system; it will then come up automatically in subsequent powerups.

To run a diagnostics acceptance test, refer to the instructions in the manual *Using AViiON® System Diagnostics*. When you finish running diagnostics, proceed to your operating system documentation for installation instructions.

Shutting Down Your Computer System

Each time you turn off the computer system, you must complete a software sequence of shutdown procedures to ensure that data is not lost and that you leave the hardware in the proper state. It is important to bring down your software and turn power off to your computer and peripherals in the correct order.

This section describes the various ways you can shut down your computer system. If your AViiON computer system provides resources for other computers, you probably won't shut it down very often. If you use your computer system as a stand-alone system or as a client to a server system, however, you are likely to start it at the beginning of each work day and shut it down at the close of the day. Once you become familiar with powerdown, reset, and restart procedures, you won't need to follow the steps in this section to shut down or reset your computer system.

Powering Down

Follow these steps when shutting down the computer system entirely; for instance, when the computer system won't be used for a long period, or when you plan any kind of hardware maintenance tasks. You may also want to powerdown if your computer system is experiencing intermittent errors; often the process of restoring hardware components to the powerup state resolves temporary problems, or identifies problems that are not temporary.

CAUTION: *Never turn off power to your computer system before properly shutting down your operating system software. Resetting or cycling power to your computer while the operating system is running may result in lost data.*

1. Shut down your applications and operating system software according to the procedures in your operating system documentation. For a DG/UX system, the sequence to *immediately* shut down the operating system is as follows:

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

2. Once you see the SCM prompt displayed on the system console, turn off power. Make sure you turn off power to each device.
3. Turn off power to the computer unit by pressing the computer unit's power switch

4. If you have a Peripheral Housing Unit (PHU), Combined Storage Subsystem Deskside Chassis (CSS/DC) or another external storage device connected to your computer system, turn off power to the external unit.
5. Turn off power to the monitor or system console.
6. Wait at least a minute before attempting to restart your computer system. Listen for the computer unit fan; do not turn power back on until you hear that the fan has stopped spinning.

Resetting the Computer System

As long as your computer system has completed powerup testing, you can reset the hardware at any time by pressing the reset switch on the computer unit rear panel. Figure 3-4 shows the location of the computer unit power and reset switches.

CAUTION: *Never press the reset switch during powerup testing. If you want to interrupt a powerup sequence, wait until you see the message Passed. Also, remember that resetting or cycling power to your computer while your operating system is running may result in lost data. Always try to shut down your operating system before resetting your computer system.*

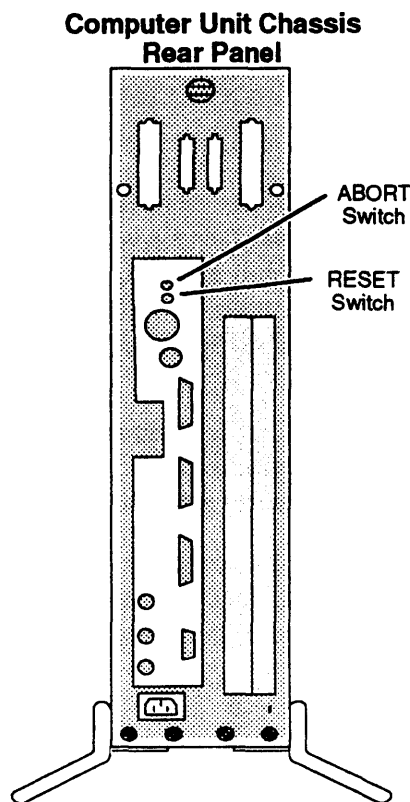


Figure 3-4 Computer Unit Reset and Power Switches

NOTE: Pressing the Reset/Abort switch down (to ABORT) sends an interrupt to the CPU without resetting the system. The effect of this interrupt depends on what operating system or stand-alone software is running at the time of the interrupt; refer to your software documentation to determine the abort switch's use on your system. If, for example, your system includes the DG/UX kernel debugging software, pressing the abort switch brings you to the kernel debugger prompt, described in the manual *Using the DG/UX™ Kernel Debugger*.

You may want to reset the computer system if it seems to be experiencing intermittent errors; often the process of restoring hardware components to the powerup state resolves temporary problems.

Resetting the hardware without cycling power is called a *warm reset*; turning power off, and then on again is a *cold reset*. With a cold reset, your system goes through power-up testing and its automatic boot sequence, as described in the “Powering Up” section at the beginning of this chapter. With a warm reset, your computer system restores system board components to their powerup state and displays the System Control Monitor (SCM) prompt, but does not proceed through power-up tests or automatically boot your operating system.

You can perform a warm reset while at the SCM prompt without pressing the reset switch by using the SCM RESET command, as follows:

```
SCM> r ) (or, SCM> reset ) )
```

Restarting Your System

Each time you turn power on, your system goes through power-up testing and its automatic boot sequence, as described in the “Powering Up” section at the beginning of this chapter. It is not necessary to power down completely in order to restart your operating system, however.

If you shut down your operating system to the SCM prompt or press the reset switch (as described in the previous sections), you can restart your operating system by entering the BOOT command at the SCM prompt, as follows:

```
SCM> b ) (or, SCM> boot ) )
```

When you use the BOOT command without an argument, the computer system uses its default boot path and boots the same file it uses at every powerup. If there is no default boot path, it looks for a bootable file on the first SCSI disk and then tries to boot over the LAN if it cannot boot from disk. Refer to Appendix B for additional information about the SCM BOOT command, the default boot path, and the automatic boot sequence.

End of Chapter



Chapter 4

Setting Up and Installing a SCSI Bus

This chapter describes how to plan and configure a Small Computer System Interface (SCSI) bus for AViiON 410, 412, 4100, and 4300 series systems. It includes default and recommended SCSI identification numbers, operating parameters for the individual mass-storage drives on the bus, terminating rules, cabling restrictions that apply to your system, and worksheets to help you prepare your SCSI configuration. This chapter also provides instructions for connecting SCSI drives and subsystems to your computer unit.

NOTE: Factory-set SCSI IDs for the internal drives in your system are listed on a label attached to your computer unit's rear panel, above the SCSI connector(s). In most cases, the IDs for factory-installed subsystem drives are listed on a label attached to your PHU or CSS2/DC. Table 4-1 lists the default identification settings and DG/UX device names for AViiON 410, 412, 4100, and 4300 series SCSI drives; components purchased together as a system are factory-preconfigured to these defaults.

If your system includes *external* drives or subsystems (housed outside the computer unit), you will need the information in the "Connecting an External SCSI Bus to the Computer Unit Rear Panel" section of this chapter to connect those drives to your computer unit. To ensure that your system components work together, you should also fill out the worksheets and make certain that your SCSI bus adheres to the device identification and cable rules described in this chapter. *Before* adding any new internal or external SCSI drives to your system, you should read this chapter to plan your SCSI bus configuration.

NOTE: If your system does *not* include any external SCSI mass-storage subsystems or stand-alone SCSI drives (such as reel-to-reel tape drives), you probably do not need the information in this chapter unless you plan to add more drives. However, you do need to terminate the SCSI bus at the computer unit, as described in Chapter 2.

Planning a SCSI Bus Configuration

You should carefully plan your entire SCSI bus configuration *before* you begin setting up the drives. As you set up your SCSI drives, make sure that your system adheres to the following SCSI device identification, bus cable, and bus termination rules. Use the worksheets in Figure 4-4 along with the information in the following sections to plan and/or verify your configuration.

Your computer unit includes one single-ended SCSI bus controller that supports your internal disk, tape, diskette, and CD-ROM drives. This controller is factory-specified as Controller 0 and the bus it supports extends to the external connector labeled SCSI A on your computer's rear panel. The SCSI bus in your system can support a total of seven drives housed internally, independently, or within a mass-storage subsystem.

Figure 4-1 shows the location of the SCSI connector on the rear panel of your computer.

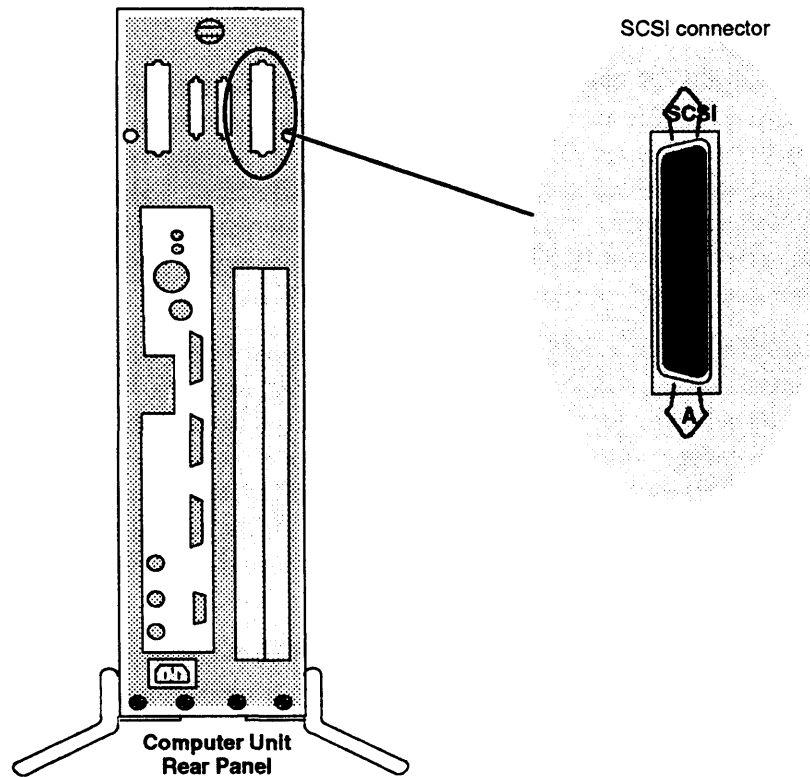


Figure 4-1 AViiON 410, 412, 4100, and 4300 Series SCSI Bus Connector

Identifying SCSI Drives

The SCSI controller in your computer unit can support a total of seven SCSI drives, *including* internal drives. For example, if your computer includes one tape drive and one SCSI disk on the bus, you can connect five additional drives to that (controller 0, SCSI A) bus. If your computer unit includes three internal drives, you can connect only four external drives to the SCSI A bus; the maximum of four internal drives reduces the maximum number of external drives the bus could support to three. When a single mass-storage subsystem contains multiple drives, each individual drive applies to the seven-drive maximum.

Each individual drive on a SCSI bus must have a unique SCSI identification number (also referred to as a *SCSI ID*, *device ID*, or *DID*) with a value from 0 through 6. When you receive preinstalled drives mounted either inside the computer unit or mounted inside a mass-storage housing unit, the SCSI ID numbers are already set. If you add or replace drives anywhere on the SCSI bus, you must set the IDs by positioning drive-select jumpers on the individual drive(s).

Table 4-1 lists the default (factory-installed) SCSI device ID numbers for hard disk, diskette, and tape drives. The “DG/UX Device Name” column lists the mnemonic name that the DG/UX operating system and the computer system firmware use to identify a drive on the first (controller 0) bus in your system; the mnemonic name includes the SCSI ID of the drive.

Table 4-1 Default SCSI Device ID Numbers

Drives	ID Number	DG/UX Device Name
Disk¹		
First	0	sd(insc())
Second	1	sd(insc(),1)
Third	2	sd(insc(),2)
Fourth	3	sd(insc(),3)
Diskette		
First (Diskette LUN 0) ²	1, 2, or 3; determined as next sequential disk (x)	sd(insc(),x)0
Second (Diskette LUN 1)		sd(insc(),x)1
Cartridge Tape³		
First	4	st(insc(),4)
Second	5	st(insc(),5)
Third	6	st(insc(),6)

¹ Includes diskette, optical disk, and CD-ROM drives.

² The SCSI ID of a diskette drive is set on a SCSI adapter board, not on the drive. If you have more than one diskette drive managed by the same SCSI adapter board, the drives have the same SCSI ID number. The LUN (Logical Unit Number) differentiates drives managed by the same SCSI adapter.

³ Includes digital audio tape drives.

Refer to your DG/UX documentation or Appendix C for more information about drive specifications. ■

NOTE: ID assignments do not need to reflect the physical positioning of drives 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 SCSI controller in the computer unit.

The DG/UX operating system allows the configuration of any SCSI drive at any unique and valid SCSI device ID number. However, other software such as device drivers could limit the use of certain device ID numbers to specific types of drives. Check the drive manual(s), and the documentation for any customized software you plan to run on your system, for further SCSI ID restrictions.

The automatic boot sequence for your computer system looks for a disk at device ID 0 on the first SCSI controller. Therefore, you should assign SCSI device ID 0, Controller 0, to the system (root) disk. Unless you manually change the automatic boot path, this disk will boot automatically when you power up the computer system. You also use the SCSI ID of a drive when booting it directly (using the **SCM BOOT** command) or to change the automatic boot path, as described in Appendix B.

Figure 4-2 shows an example of a valid SCSI ID configuration that follows the pattern of recommended ID assignments.

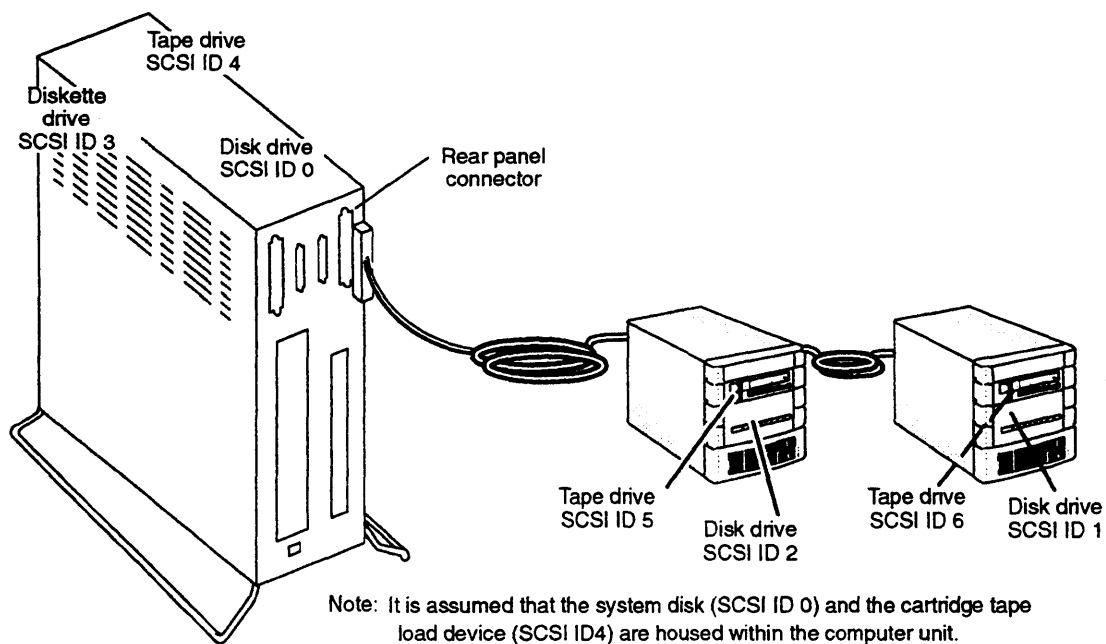


Figure 4-2 Sample SCSI Device Identification Configuration

Labels on the back of your computer unit and subsystem display the the device IDs assigned to your mass-storage drives. Before you connect the SCSI bus cable to your computer unit, make certain each drive on the bus has a *unique* SCSI ID; if you notice a conflict, you will need to reassign SCSI identifications by changing jumpers on the drive(s).

Examine the configuration labels on the back of your drives or subsystems, and enter the SCSI IDs for each drive on the worksheet in Figure 4-4. Verify that each drive on a bus has a unique device ID of 0 to 6. If your device ID configuration appears valid, make certain the SCSI bus you plan to install meets the cabling restrictions described in the next section, "SCSI Bus Cabling Rules."

SCSI Bus Cabling Rules

The cabling for a SCSI bus begins inside the computer unit at the SCSI controller and connects the mass-storage drives on the bus in a cabled daisy chain. The maximum length of combined internal and external SCSI bus cabling cannot exceed 19.6 feet.

When you calculate the length of your SCSI bus cabling, consider the following:

- Your system's connector (SCSI A) supports an external SCSI bus with a cable maximum of 14.85 feet. Of the 19.6-foot cable maximum, 4.75 feet resides within the AViON 410, 412, 4100 or 4300 series computer unit.
- Some peripheral SCSI drives consume internal cable, further reducing the maximum length of your cable configuration. For example:

The Model 10565 PHU uses 2.75 feet of internal SCSI cable.

The CSS2/DC uses 4.83 feet of internal SCSI cable.

The G6587 reel tape drive uses 0.5 feet of internal SCSI cable.

The G6589-A and G6589-TA reel tape drives each use 0.34 feet of internal SCSI cable.

Figure 4-3 illustrates the SCSI bus cable requirements.

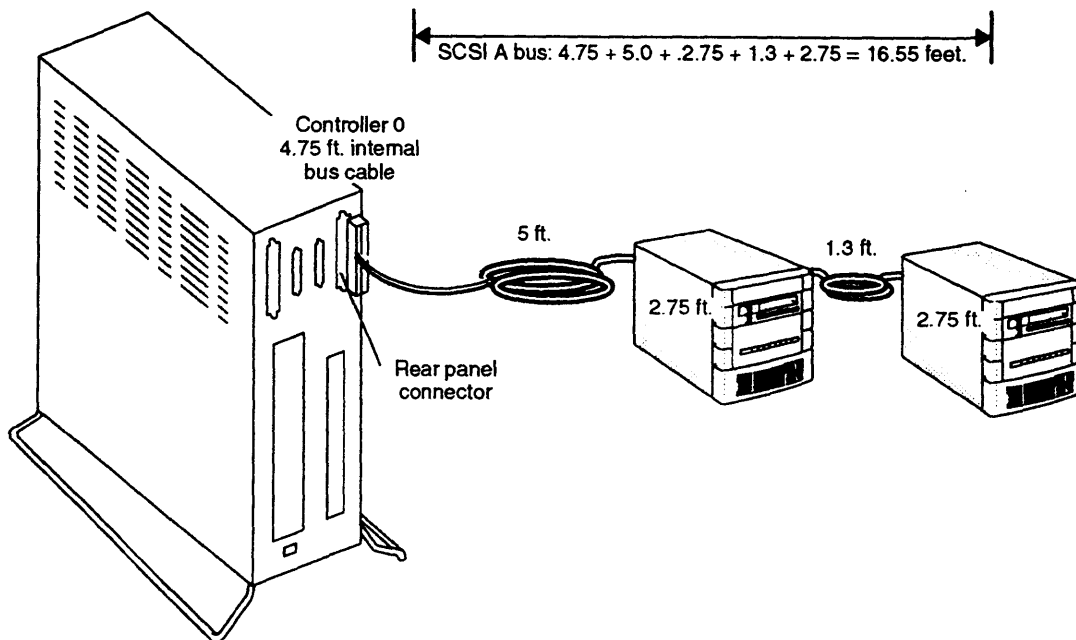


Figure 4-3 Typical Daisy Chain and SCSI Bus Cable Lengths

Configuring Drive Operating Parameters

The SCSI drives you received with your system are preconfigured to comply with the operating parameters of the controller and the other drives on the SCSI bus. Before you install an internal or external drive on your SCSI bus, you need to set its operating parameters as described in this section. Configure all new or replacement drives as follows:

- Set all disk drives for sequential drive motor start. The drive will then delay starting up its spindle motor a number of seconds (a multiple of the SCSI ID number) when you power up your system.
- Set all drives so that the SCSI bus (host system) provides terminator power rather than the drives themselves. Some drives specify this option as “SCSI pin 26 ON,” or “power from interface cable pin 26.”
- Set any drive that offers these options to *enable* parity checking and arbitration.
- Make sure the bus termination is correct on the new drive:

In an AViON 410, 412, 4100, or 4300 series computer or mass-storage subsystem, *all* drives and SCSI adapter boards for drives must have their SCSI bus terminator resistors *removed*.

Most stand-alone drives employ an external terminator plug to terminate the SCSI bus; if your drive does *not* have an external terminator, and will be physically positioned as the last drive on the SCSI bus, you must install bus termination resistors. Refer to the next section, “Terminating the External SCSI Bus.”

NOTE: For information about setting the SCSI jumpers/switches and removing the terminator resistors, refer to the list of drive installation manuals in the *Guide to AViON® and DG/UX™ System Documentation*.

Terminating the External SCSI Bus

You must terminate the SCSI bus at the last drive or mass storage subsystem on the SCSI bus. 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 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 drives within the unit*.
- 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 manual for the drive or mass storage subsystem.

Internal Drives				
Slot	Drive Type	SCSI ID	Cable Length	
Front	<input type="checkbox"/> half-height left		} 4.75 feet	
	<input type="checkbox"/> half-height right			
	<input type="checkbox"/> full-height			
Back	<input type="checkbox"/> half-height left			
	<input type="checkbox"/> half-height right			
	<input type="checkbox"/> full-height			
<input type="checkbox"/> SCSI Adapter Board				
External Mass-Storage Drives (external connector port A)				
Device	Drive Type	SCSI ID		
Total Cable Length (19.6 feet maximum)			_____	

Figure 4-4 SCSI Bus Configuration Worksheet

Internal Drives			
Slot	Drive Type	SCSI ID	Cable Length
Front <input checked="" type="checkbox"/> half-height left <input checked="" type="checkbox"/> half-height right <input type="checkbox"/> full-height	3.5" diskette	(LUN 0)	} 4.75 feet
	525-Mbyte QIC tape	4	
Back <input type="checkbox"/> half-height left <input type="checkbox"/> half-height right <input checked="" type="checkbox"/> full-height			
	662-Mbyte disk	0	
<input type="checkbox"/> SCSI Adapter Board	for diskette	3	
External Mass-Storage Drives (external connection port A)			
Device	Drive Type	SCSI ID	Cable Length
PHU	1-Gbyte disk	1	} 2.75'
	525-Mbyte QIC tape	5	
			} 5' cable .5'
	Reel tape 6587	6	
Total Cable Length (19.6 feet maximum)			18 feet

Figure 4-5 Sample Configuration Worksheet