Data General
Data General Corporation, Westboro, Massachusetts 01580

Customer Documentation

Installing and Operating AViiON® 8500 Series Computers

014–002247–01

AViiON®
PRODUCT LINE

Installing and Operating AViiON® 8500 Series Computers

014–002247–01

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Notice

Installing and Operating AViiON® 8500 Series Computers
014–002247–01

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A vertical bar in the margin of a page indicates substantive technical change from the previous revision. (Note that we renumbered the appendices in this revision. Material that was originally in Appendix A is now covered in a different manual.)

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference in which case the user will be required to correct the interference at his own expense. Testing was done with shielded cables. Therefore, in order to comply with the FCC regulations, you must use shielded cables with your installation.

WARNING

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe (A) prescrites dans la norme sur le matériel brouilleur : "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）
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協議会（ＶＣＣＩ）基準に適合しております。従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。取扱説明書に従って正しい取り扱いをして下さい。

About this manual

This manual describes how to set up and operate AViiON® 8500 series computer hardware. Although it addresses readers with some computer hardware experience, you do not need detailed knowledge of AViiON or RISC–based computer technology to use this manual.

For information on installing, configuring, and operating CLARiiON storage systems, the DG/UX™ operating system, VMEbus devices, AV/Alert℠, and other system options, you should refer to the product–specific manuals listed later in this preface. This manual does not cover these products, but instead complements the detailed documentation you received with them.

WARNING: Unqualified personnel attempting to remove, install, or service internal components or options in AViiON® 8500 series systems risk both personal injury and damage to the system. Data General Corporation supports the maintenance and expansion of these systems by qualified Data General personnel only. Service by other than Data General personnel may void product warranties. For more information regarding Data General warranties, refer to your Data General sales and field engineering contracts.

Organization

This manual contains four chapters and two appendixes. The following gives an overview of what you will find in each:

Chapter 1 Describes how to select an appropriate site for your installation, and how to unpack the computer unit. Provides step-by-step instructions for connecting components to the AViiON 8500 input/output controller(s). Shows power cord installation and guidelines for cable routing after installation.

Chapter 2 Explains how to correctly power the computer system up and down and describes routine firmware powerup testing. Describes a proper system reset and appropriate use of RESET and ABORT switches.

Chapter 3 Provides an overview of AViiON 8500 hardware configuration options for high availability, and describes their implementation. Also provides suggestions for resolving minor powerup problems such as blank screen display or unreadable test messages.

Chapter 4 Describes System Control Monitor (SCM) commands available to all users. Describes menus you can use to view or change configuration parameters for devices connected to the first Input/Output Controller (IOC 0) board. Also describes how to change the system automatic boot paths, automatic reboot parameters, and table of dual–initiated SCSI buses.

Appendix A Lists some technical specifications and configuration guidelines for your hardware.

Appendix B Lists external cables and specific I/O pin assignments.

Related Data General Manuals

For a complete description of AViiON and DG/UX documentation available from Data General and related documentation available from sources other than Data General Corporation, refer to your *Guide to AViiON® and DG/UX™ System Documentation* (069–701085). Within this manual, we refer to the following documentation:

- *Achieving High Availability on AViiON® Systems* (093–701133). For system managers interested in or responsible for larger systems that employ failover and other high availability elements. Provides an overview of Data General Corporation's HA solutions, describes hardware and software elements, and offers example scenarios of setting up and operating highly available AViiON systems.
- *Configuring and Managing a CLARiiON® Disk-Array Storage System — DG/UX™ Environment* (014–002323). Explains how to configure and manage a Series 2000 or Series 1000 disk-array storage system with AViiON® computers and the DG/UX™ operating system. Describes how to plan, configure, and manage the storage system; complements the storage-system installing and maintaining manual and the DG/UX operating system manuals.
- *Installing, Operating, and Maintaining the CLARiiON™ Tape–Array Storage System – DG/UX™, AOS/VS II, or AOS/VS Environment* (014–002181). Describes hardware, firmware, and software required to configure and run the subsystem. Explains how to make the physical tapes accessible to the operating system..
- *Installing the DG/UX™ System* (093–701087). Describes how to install the DG/UX system on AViiON computers.
- *Managing the DG/UX™ System* (093–701088). Discusses the concepts and tasks related to DG/UX system management, and provides general administration orientation. Explains how to use the **sysadm** facility.
- *Managing Mass Storage Devices and DG/UX™ File Systems* (093–701136). Explains how to manage disk and tape drives. Also explains DG/UX file systems, virtual disks, mirrors, and caching.
- *Setting Up and Installing VMEbus Options in AViiON® Systems* (014–001867). Describes how to add VMEbus–related hardware to an AViiON system. Supplements the AViiON model–specific installing or operating manual that lists supported VME options.

- *Setting Up SCSI Bus Configurations in the AViiON® Environment* (014–002372). Describes how to plan and configure a Small Computer System Interface (SCSI) bus for an AViiON® system environment. Includes default and recommended SCSI identification numbers, operating parameters for individual drives, terminating rules, and cabling restrictions.
- *Using AViiON® Diagnostics and the AV/Alert^{sm} Support System* (014–002183). For system managers and responsible operators. Explains how to install and implement the AV/Alert remote and machine–initiated assistance system. Also explains how to use stand–alone AViiON System Diagnostics.

Reader, please note:

Throughout this manual we use the following format conventions:

command *required* [*optional*] ...

Where	Means
command	You must enter the command (or its accepted abbreviation) as shown.
required	You must enter some argument (such as a filename). Sometimes, we use { *required1* / *required2* } which means you must enter one of the arguments. Do not type the braces; they only set off the choices.
[*optional*]	You have the option of entering this argument. Do not type the brackets; they only identify the argument as an option.
...	You may repeat the preceding entry.

Additionally, we use certain symbols in command lines.

Symbol	Means
↵	Press the New Line, Carriage Return (CR), or Enter key on your terminal keyboard.
<CTRL–D>	Hold the Control key down and press the D key on your terminal keyboard.
#	The UNIX® shell superuser prompt.

Finally, in examples we use:

This typeface to show your entry.
This typeface to show system queries and responses.
`This typeface to show terminal display.`

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

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Appendix A – Specifications

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1 Setting up your AViiON 8500 series system

Data General designed the AViiON® 8500 series computer system for simple installation and operation in a typical office environment. The computer unit fits under most desks and tables; a basic installation includes a system console (terminal and keyboard) and modem for Data General Corporation's remote customer support program, AV/Alert[SM].

This chapter describes how to unpack and install your computer unit hardware. It contains instructions on

- picking a proper site
- removing the computer from its packing crate
- verifying cables
- connecting basic system components to the computer unit

Where necessary, these instructions refer you to other documentation to complete device–specific tasks not directly related to your AViiON 8500 computer. When you complete the instructions in this chapter, you can continue to the next chapter, "Starting and stopping your computer system," for your first powerup.

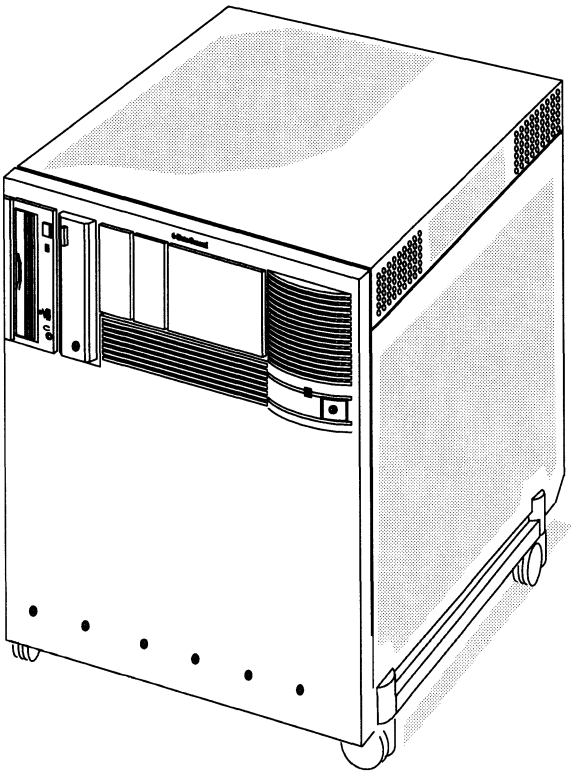


Figure 1–1 The AViiON 8500 series computer

Getting started

Before setting up your system, you need to prepare a site, unpack and inspect your equipment, and gather materials required for installation.

Selecting a site

Select the final location for setting up and operating your computer system before you begin unpacking. Try to complete as much of the installation as possible at this final location. It should meet the environmental specifications listed in Appendix A of this manual, and the following requirements:

- Access to enough ac electrical outlets for all your system components: terminals, modems, subsystems, printers, and others.

  IMPORTANT: For optimal operation, systems that include CLARiiON storage systems should connect their AViiON and CLARiiON components to *separate* 15–amp (or greater) ac power circuits. Make certain your outlets connect to multiple circuits.

- A telephone connection and line reserved for the exclusive use of the AV/Alert modem and remote service program.
- A desk or cleared work surface to position the system console, modem, and any external peripherals such as subsystems and printers at a comfortable height for use.
- Sufficient lighting.
- A cleared floor area where the computer unit is not likely to be moved or jarred.

Unpacking system components

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.

1. Remove and set aside the packing slips 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.

2. If you haven't already done so, remove the computer unit from its packing carton. Refer to the illustrations on the carton and in the setup guide you found on top of the accessory box as you follow these steps:

   a. Remove the packing corners and the accessory box from the carton. Place the accessory box in a convenient place; it contains more hardware and diagnostics documentation, standard system cables, a cable labeling kit, cable dressing straps and, for U.S. shipments, your AV/Alert modem kit.

   b. Lift the outer carton up and away from the computer unit. **Take care to provide enough clearance for the wooden descending ramp to drop safely to the floor.** Release the descending ramp from the computer unit, and lower it gently to the floor.

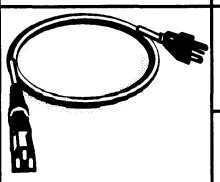
   c. Remove any hardware (for example, wing nuts and carriage bolts) that secures the stabilizing foam under the ramp side of the computer unit to the pallet. Grip the foam by the notched handle, and pull it out from under the computer unit. Gently pull the unit toward the ramp and onto its casters.

   d. Carefully roll the computer unit down the descending ramp onto the floor. Remove the pallet and packing material from your installation site, and proceed to unpack the remainder of your shipment. Remember to keep the CPU accessory box near your computer unit; you will need its contents to complete your installation.

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 slips 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 certain you have the appropriate power cord for your site, as listed in Table 1–1.

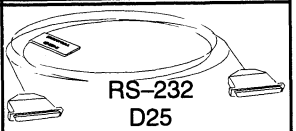
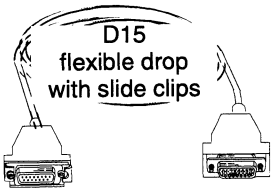
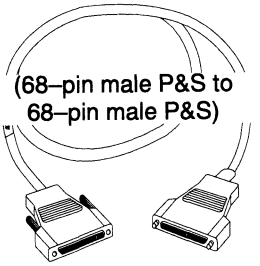
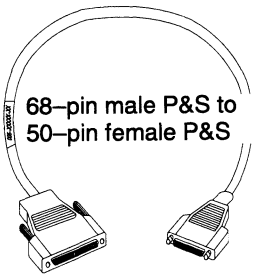
Table 1–1 AViiON 8500 AC power cords

Country	Part Number	Cord	Country	Part Number
US, Canada	109–719		Europe, except the following:	109–884
United Kingdom	109–886		Italy	109–883
Australia	109–885		Denmark	109–849
			Switzerland	109–848

5. Make sure that you have all of the device cables listed on your packing slips; the cables may be together in one box or packaged separately with their specific devices.

   Use Table 1–2 to verify that you have the necessary cables for standard system components.

Table 1–2 Device cables and corresponding connector ports

Peripheral device/ AViiON 8500 system port	Cable/ Connector type
System console at OP CON port (all asynchronous terminals)	 RS–232 D25
AV/Alert modem at SERVICE port (all asynchronous modems)	 RS–232 D25
Ethernet transceiver at LAN port	 D15 flexible drop with slide clips
Wide, fast SCSI device at SCSI-2 ports (single–ended or differential)	 (68–pin male P&S to 68–pin male P&S)
Narrow SCSI devices at SCSI–2 ports: Adapter cable from wide SCSI-2 ports to narrow device cable (single–ended or differential)	 68–pin male P&S to 50–pin female P&S

Note that your configuration may include additional peripherals and cabling; Table 1–2 shows only the cables for a basic configuration.

Refer to Table B–1 in Appendix B for additional information about your system cables and connectors; it lists the connector type, size, and part number for all Data General device cables that connect directly to AViiON 8500 systems.

Gathering documentation and media

The accessory box includes manuals on AV/Alert support, system diagnostics, and system hardware options.

IMPORTANT: If you already have an installed terminal with keyboard to use as a system console, the accessory box contains everything you initially need to set up your computer. Note, however, that you will need your external peripheral and operating system documentation to plan and complete a full hardware and software installation.

Before you start up your system for the first time, locate the manual *Installing the DG/UX™ System*. Your software Release Notices itemize the documentation and media necessary to complete the installation of software packages.

Refer to *Using AViiON® Diagnostics and the AV/Alert℠ Support System* for information on setting up AV/Alert or using diagnostics to verify your hardware configuration as an optional part of the installation.

The *Guide to AViiON® and DG/UX™ System Documentation* lists and describes all the documentation available for your computer system.

Your next step

The remainder of this chapter describes how to connect standard devices to your AViiON 8500 series computer.

Before you continue, we recommend that you set up external devices such as printers or VMEbus devices for use before connecting them to your computer unit, as described in the documentation that shipped with the peripheral.

Connecting system components

This section describes how to connect the following standard devices to an input/output controller (IOC) at the computer rear panel:

- system console
- AV/Alert service modem
- Uninterruptible Power Supply (UPS)
- external SCSI bus cable(s)
- Ethernet LAN cable(s)

First, set up external devices as described in the documentation that shipped with the device; then, follow the procedures in this chapter to connect the device to your system.

IMPORTANT: If your system includes VMEbus options, refer to *Setting Up and Installing VMEbus Options in AViiON® Systems* for instructions on connecting those devices to your AViiON 8500 computer unit.

After connecting all of your devices, attach the ac power cord as described in the last section of this chapter.

You attach devices using connectors on the input/output controller (IOC) boards installed in the computer's rear panel backplane. Every AViiON 8500 has an IOC in the backplane slot marked 8. If your system includes two IOC boards, the second uses slots 6 and 7. Figure 1–2 shows the AViiON 8500 rear panel with two IOCs.

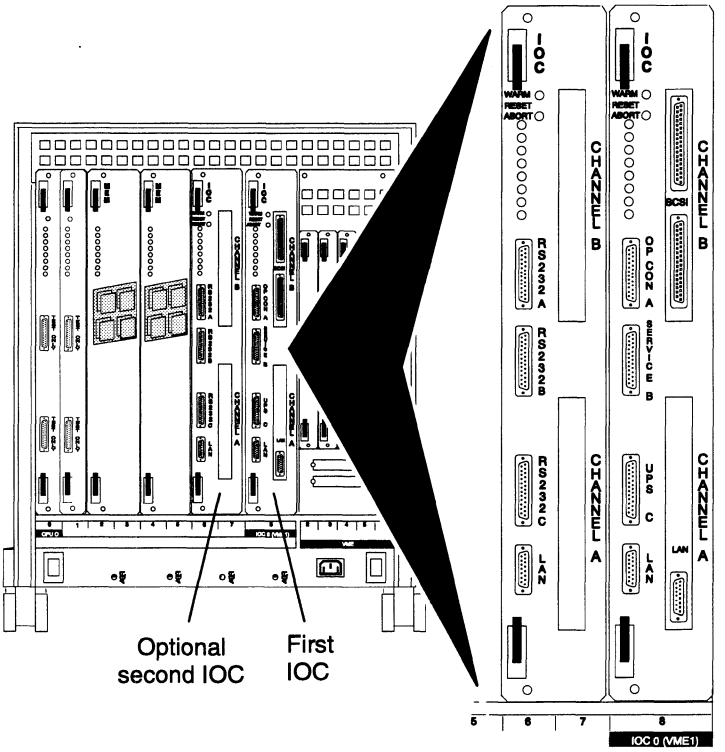


Figure 1–2 AViiON 8500 series input/output controller (IOC) boards

Connecting the system console

The *system console* is the keyboard and display device that receives powerup diagnostic test messages and from which you bring up your operating system. You can use several types of asynchronous devices for a system console; most systems use a standard display terminal. Your system console must include a keyboard and have an RS–232–C interface.

IMPORTANT: Any asynchronous terminal with an ANSI–standard character set and an RS–232–C interface can be the system console. However, for full functionality in a UNIX® environment, the terminal must support the display of the ASCII BS (backspace) character by moving the cursor left one column. To support a UNIX–based screen editor, your terminal must further conform to ANSI standard X3.64 (1977). Those terminals that conform to the standard include Data General terminals with ANSI mode, and any terminal that emulates a VT100 or VT220 terminal.

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

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

To power up your computer system for the first time, your system console should conform to these default baud and data bit characteristics. See the device–specific documentation for your console device to verify and, if necessary, change the device parameters. You can change the console characteristics settings expected by your computer *after* your first powerup as described in Chapter 4.

▶ **Locate the system console cable.**

The system console connects to the computer IOC(s) with one of the following cables. Make certain you use the correct cable to connect your system console.

Cable Part Number	Cable Length (ft)
005–34256	10
005–34990	15
005–34991	25

▶ **Locate the AViiON 8500 system console port.**

Figure 1–3 shows the location of the system console connector on AViiON 8500 series IOC boards. *Always connect the console to the port marked* OP CON *on the IOC board in slot 8 (IOC 0).*

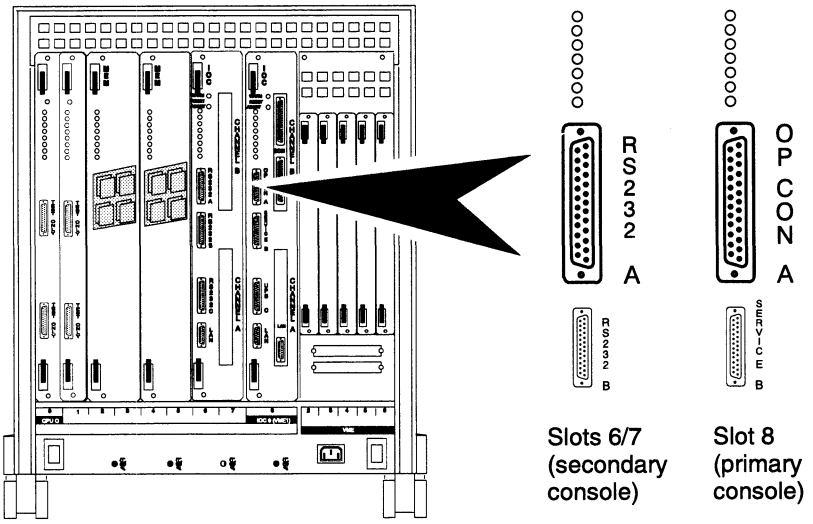


Figure 1–3 System console (OP CON, RS232 A) ports

Some systems configured for higher availability use a second input port on the console terminal to connect the same system console to an optional second IOC. You make this connection to the IOC1 port marked OP CON (or RS232 A) in slots 6 and 7, also shown in Figure 1–3.

By default, your system recognizes the OP CON port on IOC 0 whenever present and configured; the system holds the secondary port on IOC 1 in reserve in case the primary console channel fails. (Refer to Chapter 3 for a discussion of high–availability configuration.)

▶ **Attach the system console cable to the IOC connector.**

CAUTION: Make certain that power to the console is OFF before you connect it to your computer. Make sure the keyboard is connected to the console.

Figure 1–4 shows how to align the connector pins and D–shaped bevels before gently pushing the cable or adapter connector onto the IOC connector.

Align the two captive connector screws with the stand–off mounts as shown, and then tighten the screws securely with a thin–blade screwdriver.

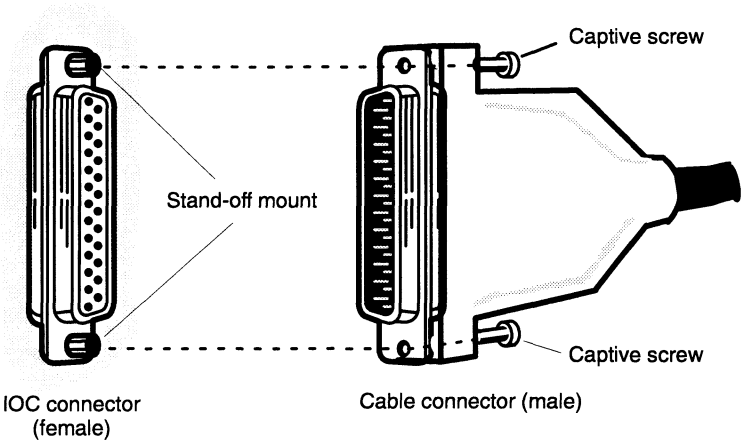


Figure 1–4 Plugging together the system console connectors

▶ **Attach the system console device.**

Connect the remote end(s) of the cable(s) to your console as shown in Figure 1–5. Refer to the device–specific documentation for your console.

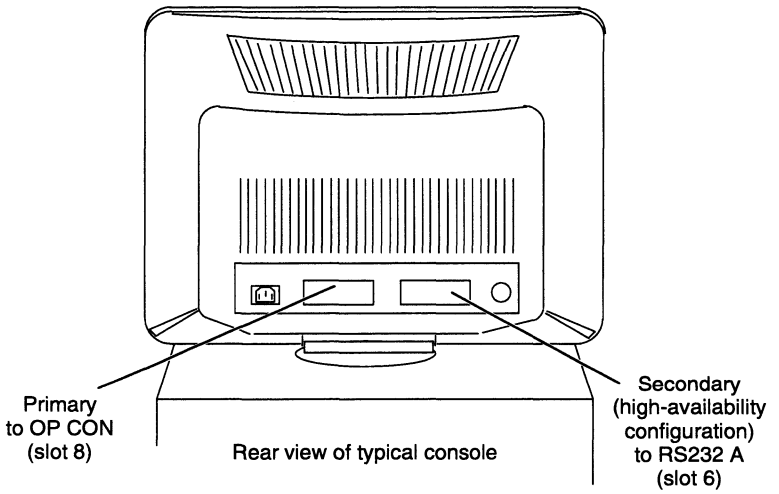


Figure 1–5 System console connections

IMPORTANT: The secondary input connector on some terminals may require a female-to-female connector adapter and, in some cases, a 9-to-25 pin adapter cable. We supply these components (DGC part numbers 005–32921 and 005–39476, respectively) to systems with more than one IOC board. If necessary for your system console terminal, connect the adapters between the terminal and your asynchronous terminal cable as shown in Figure 1–6.

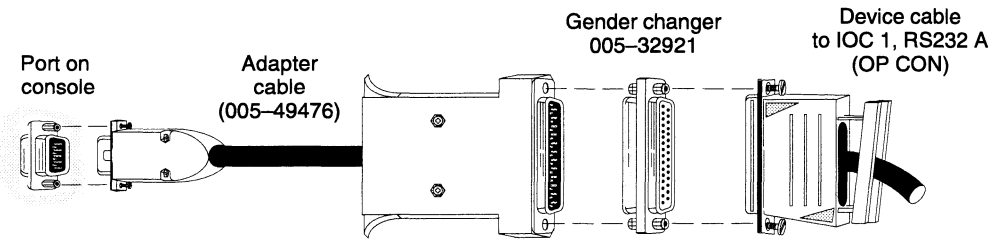


Figure 1–6 Adapting a secondary terminal input port to AViiON 8500 asynchronous terminal cables

Continue with the next section that applies to your system.

Connecting the AV/Alert modem

The port marked SERVICE on IOC board 0 is reserved for Data General's remote troubleshooting and diagnostic system, AV/Alert. This port specifically supports the AV/Alert modem we provide to systems intended for installations in North America.

Set up your modem and set the device parameters as specified in the documentation that accompanied the modem. If the modem does not conform to the default characteristics expected by the computer, it will not affect your first powerup. You can change the baud rate and character size settings to conform to your device as described in Chapter 4.

The default I/O characteristics for this port are:

- 2400 baud rate
- 8 data bits, no parity

IMPORTANT: You complete your installation by enabling AV/Alert *after your first powerup* as described in the manual *Using AViiON® Diagnostics and the AV/Alert℠ Support System.*

▶ **Locate the AV/Alert modem cable.**

Connect your AV/Alert modem with one of the following cables. *Make certain you use the correct cable* to connect your modem to the SERVICE port.

Cable Part Number	Cable Length
005–36256	10 ft
005–36257	15 ft
005–36258	25 ft

▶ **Locate the AViiON 8500 AV/Alert port.**

Figure 1–7 shows the AV/Alert (SERVICE) connector, located on the IOC 0 board.

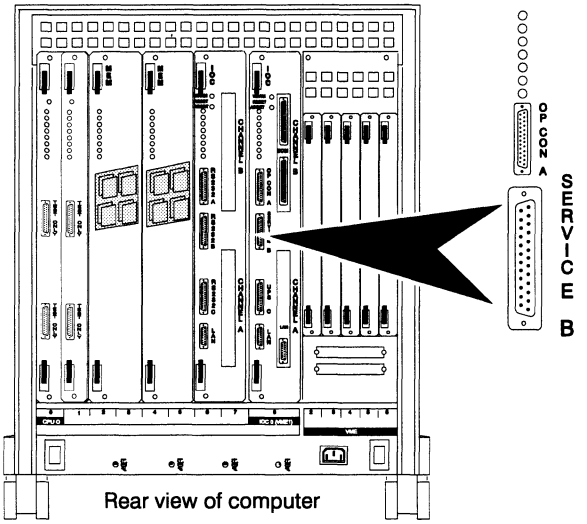


Figure 1–7 AV/Alert (SERVICE) port

▶ **Attach the cable to the IOC connector.**

CAUTION: Make certain that power to the modem is OFF before you connect it to your computer.

Figure 1–8 shows how to align the connector pins and the D–shaped bevels before gently pushing the cable connector onto the IOC 0 SERVICE connector. Align the two captive connector screws as shown, and then tighten them securely.

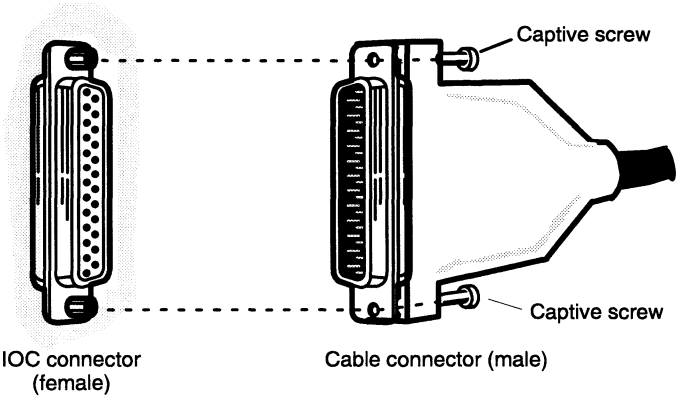


Figure 1–8 Plugging together service port connectors

▶ **Attach the cable to the modem.**

If you haven't already connected the remote end of your cable to your modem, do so now (see the device–specific documentation for your modem, if necessary). Then, continue with the next section that applies to your system.

Connecting an Uninterruptible Power Supply (UPS)

The port marked UPS on the IOC 0 board is reserved for an Uninterruptible Power Supply. A UPS allows your system to bring itself down gracefully, or even continue operating, in the event of an unanticipated power failure.

Set up your UPS and set the device parameters as specified in the documentation that accompanied the power supply. Note that you can further define the operating characteristics of the UPS port after you have installed your operating system; refer to *Managing the DG/UX™ System* for details.

▶ **Locate the UPS cable.**

Connect your uninterruptible power supply with one of the special cables that accompanied the unit. *Make certain you use the correct cable* to connect the supply to the UPS port.

▶ **Locate the AViiON 8500 UPS port.**

Figure 1–9 shows the location of the UPS connector on the IOC 0 board.

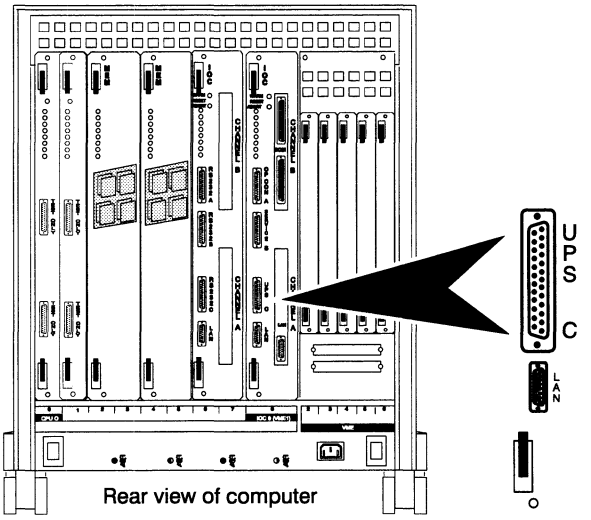


Figure 1–9 UPS port

▶ **Attach the UPS cable to the IOC connector.**

CAUTION: *Make certain that power to the UPS is OFF before you connect it to your computer.*

Figure 1–10 shows how to align the connector pins and the D–shaped bevels before gently pushing the cable connector onto the IOC UPS connector. Align the two captive connector screws as shown, and then tighten them securely.

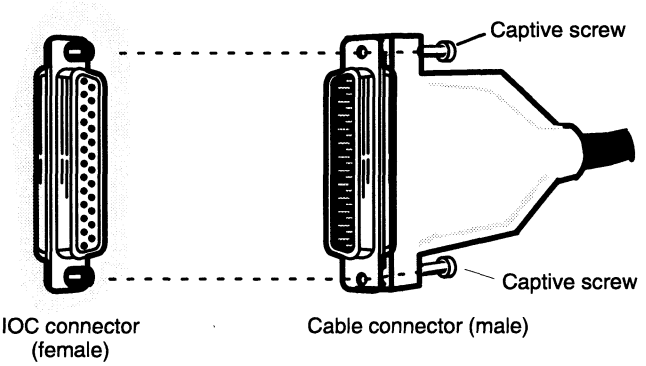


Figure 1–10 Plugging together UPS port connectors

▶ **Attach the cable to the UPS device.**

If you haven't already connected the remote end of your cable to your backup power supply, do so now (see the device–specific documentation for your UPS, if necessary). Then, continue with the next section that applies to your system.

Connecting an Ethernet local area network

An Ethernet local area network (LAN) can incorporate several devices that communicate over a common system of cables and transceivers. This section describes how to connect a LAN by cable to your computer.

▶ **Install the LAN transceiver.**

If you haven't already installed your LAN, do so now.

Connect a LAN cable (DGC part number 007–6253) to the transceiver for your computer (see the device–specific documentation for your transceiver, if necessary).

IMPORTANT: For information on installing LAN cables and transceivers, see your Ethernet/IEEE 802.3 installation guide(s).

▶ **Locate the AViiON 8500 Ethernet port(s).**

Each IOC board in your system includes at least one Ethernet/IEEE 802.3 Local Area Network (LAN) controller. Your AViiON 8500 may also include optional Model 7436 LAN controller boards in the slots for IOC daughter boards, marked CHANNEL A and CHANNEL B.

Figure 1–11 shows the location of the DB15 local area network connectors on an example IOC board.

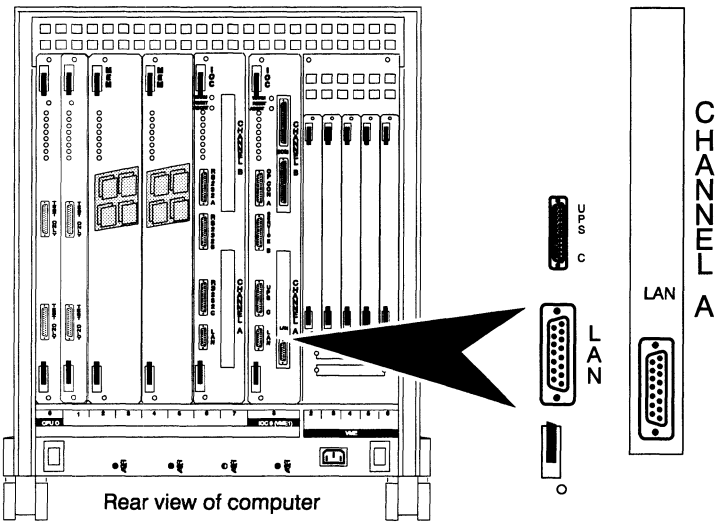


Figure 1–11 AViiON 8500 series LAN ports (sample configuration)

▶ Attach the LAN cable to the IOC connector.

The LAN connectors use slide clips and pins rather than the captive screws found on most other connectors.

To connect your LAN transceiver cables (DGC part number 007–6253) to your computer, complete the following steps. You might need a flat–blade screwdriver or comparable tool.

1. Align the holes in the transceiver cable with the pins in the IOC LAN connector, as shown in Figure 1–12.
2. As shown in Figure 1–12(A) and (B), line up the slide clip on the IOC connector so that the slide clip mounts on the cable can pass through; then push the cable firmly into the connector.
3. Once the cable and clip mounts are secured to the connector, slide the clip (using a screwdriver or comparable tool, if necessary) to lock the cable in place as shown in Figure 1–12(C).

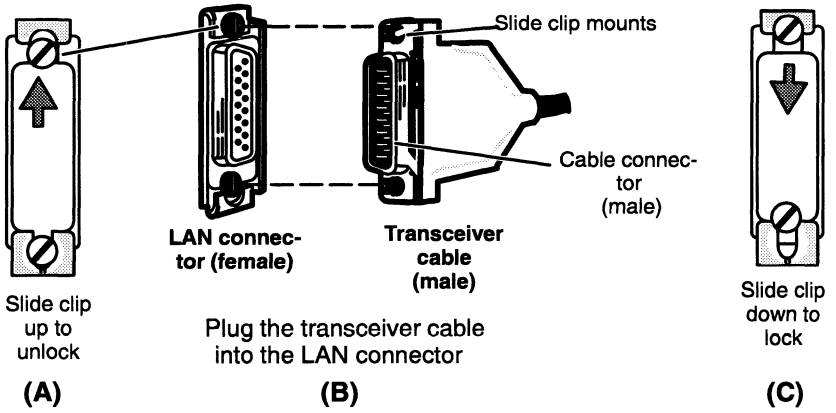


Figure 1–12 Attaching and securing LAN transceiver cables

Continue with the next section that applies to your system.

Connecting external SCSI devices

This section describes how to connect a SCSI bus that is already set up and configured for your *external* SCSI devices (such as CLARiiON storage systems, peripheral housing units, CSS subsystems, or stand-alone drives).

Refer to Chapter 3 for information about AViiON 8500 series high–availability features for SCSI bus devices.

IMPORTANT: For background and guidelines on setting up and configuring an external SCSI bus, refer to the manual *Setting Up SCSI Bus Configurations in the AViiON® Environment*.

When connecting external SCSI devices to your AViiON 8500 system, be sure to complete the following steps.

1. Make certain each SCSI–2 bus you are connecting conforms to the guidelines for SCSI configurations described in the manual *Setting Up SCSI Bus Configurations in the AViiON® Environment* and in your device–specific documentation.
2. Power all devices on your SCSI bus *OFF* before you connect the bus to your computer.

   CAUTION: Connecting powered–on devices to your computer may trip the SCSI fuse on the IOC board.

▶ **Locate the AViiON 8500 SCSI port.**

To support external SCSI devices, your AViiON 8500 must include one or more optional Model 7435 SCSI adapter boards. Your optional SCSI adapter boards are installed in an IOC daughter board slot marked CHANNEL A and/or CHANNEL B.

Each Model 7435 SCSI adapter board provides your system with two independent buses that support SCSI–2 and SCSI–1 devices and use a single–ended or differential interface.

Locate the appropriate connector(s) for single–ended or differential bus interface on your IOC board. Each SCSI connector is labeled SE or DIFF. *Do not attempt to use single–ended devices or terminators on a differential bus, or vice–versa.* If you are unsure of which interface your external devices require, contact Data General as described in the Preface.

WARNING: Data General supports altering Model 7435 differential and single–ended interfaces by qualified personnel *only*. If you need to change a bus from one interface to another, contact Data General as described in the Preface.

Figure 1–13 shows the location of the external SCSI bus connectors on an example AViiON 8500 series IOC board.

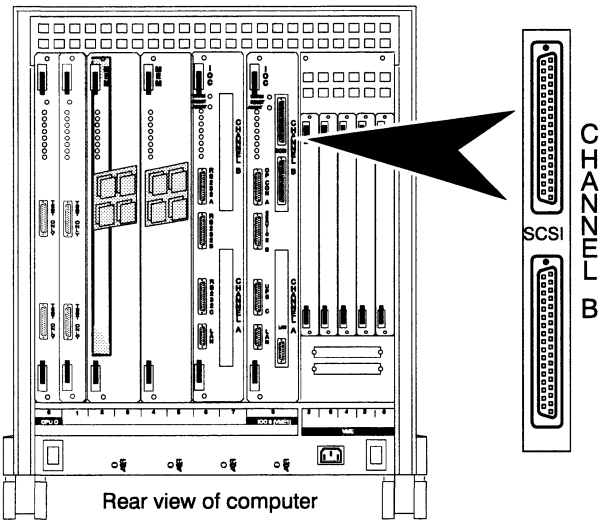


Figure 1–13 External SCSI bus connectors (sample configuration)

Figure 1–14 shows the locations of all possible SCSI connectors and lists the controller numbers assigned by default to each location. The maximum configuration consists of two IOC boards with two SCSI daughter boards, as seen in Figure 1–14.

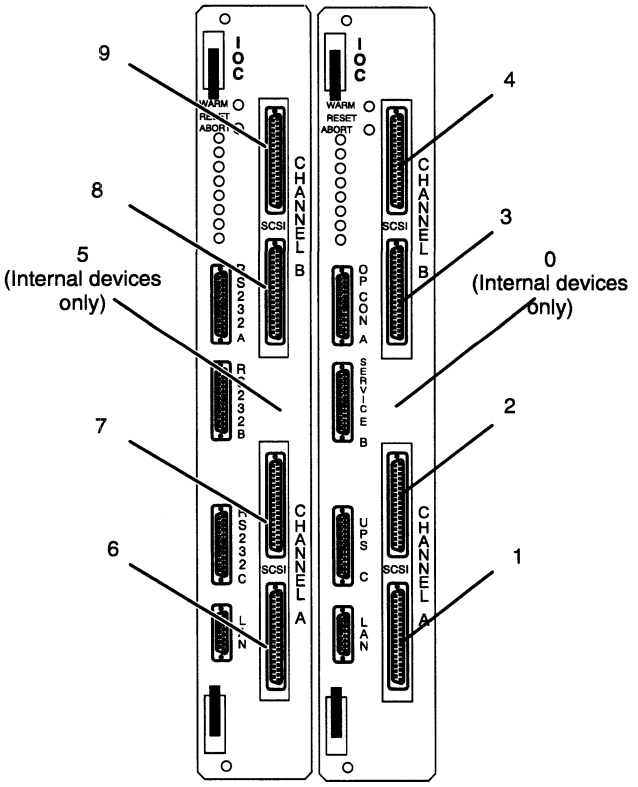


Figure 1–14 All possible SCSI ports and assigned controller numbers

Note that each IOC board in your system includes one on–board Small Computer System Interface–2 (SCSI–2) controller/adapter dedicated to *internal* (within the computer unit chassis) devices. On–board controllers 0 and 5 have no visible external connectors.

▶ **Locate the correct SCSI cable(s).**

Model 7435 SCSI boards use 68–pin connectors. In most cases, you will need a 68– to 50–pin adapter cable connected to the IOC (host), plus a second cable that connects directly to your first external device.

CAUTION: *Use only the provided adapter cable, DGC part number 005–39975, to convert 50–pin (narrow bus) connections to your 68–pin (wide bus) AViiON 8500 connectors. Do not use 005–39975 to adapt daisy–chained SCSI devices (as a mid–bus adapter). The cable is specifically designed for connection to a host CPU only.*

The special adapter cable is currently required to connect all devices supported by Data General except the CLARiiON™ Tape–Array Storage System; the tape–array storage system also offers wide (68–pin) connectors.

IMPORTANT: AViiON 8500 adapter and device cables support both differential and single–ended SCSI–2 interfaces.

If your installation requires the 68– to 50–pin adapter cable (005–39975), align the D–shaped bevel of each SCSI connector with the 68–pin end of the adapter cable. Then, connect the 50–pin end of your adapter cable to the corresponding end of one of the following device cables:

Cable Part Number	Cable Size
005–39718	5 ft
005–39719	10 ft
005–39720	20 ft
005–39721	40 ft

If your first external SCSI device on a given bus supports wide, 68–pin connectors, use one of the following 68–pin to 68–pin cables; you do not need an adapter cable.

Cable Part Number	Cable Size
005–40003	10 ft
005–40004	20 ft
005–40005	40 ft

▶ **Attach the SCSI bus cable to the IOC connector.**

Gently push the connectors together, then secure the captive thumbscrews on the cable connectors to the IOC SCSI connector.

When using the 68– to 50–pin adapter cable, the connection should resemble Figure 1–15.

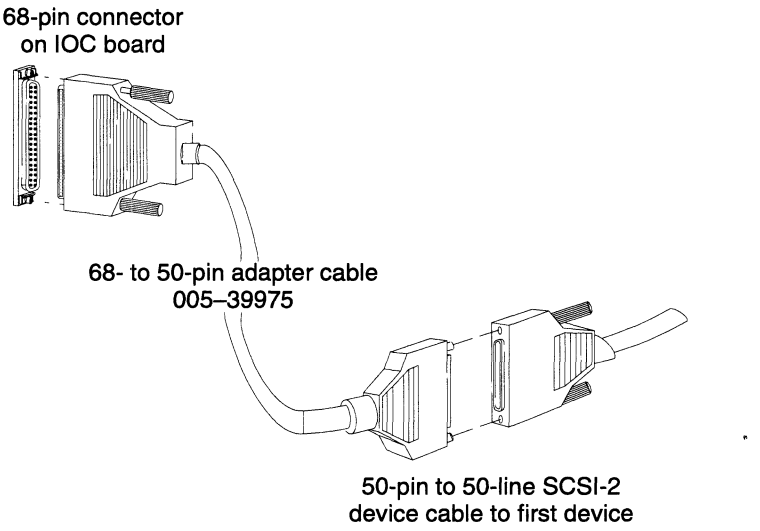


Figure 1–15 Adapting AViiON 8500 SCSI connectors to 50–pin (narrow) SCSI device cables

▶ **Attach external SCSI devices.**

If you haven't already connected the remote end of your cable to the first device on the installed bus, do so now (see the device–specific documentation for your subsystem, storage system, or drive if necessary).

Make certain you have connected only differential devices to IOC connectors marked DIFF, and single–ended devices to IOC connectors marked SE.

▶ **Terminate the SCSI bus.**

Verify that each SCSI bus in your system is terminated at the remote end of the bus with the appropriate terminator from the following list:

Terminator Part Number	SCSI Bus Type
005–33334	Single–ended
005–33011	Differential
111–03454	Wide differential

IMPORTANT: You do not need to terminate any unused SCSI connectors on the AViiON 8500 IOC board(s).

Repeat these steps for each SCSI bus in your system. Then, continue with the next section that applies to your configuration.

Connecting VMEbus options

Refer to *Setting UP and Installing VMEbus Options in AViiON® Systems* for information on connecting external devices to your system's VMEbus option boards.

When assigning slot priority within the AViiON 8500 series VMEbus card cage, available slots begin with slot number 2. A daughter card attached to the IOC in system slot 8 contains VMEbus arbitration logic and occupies VME slot 1.

CAUTION: *Slot 2 in the 8500 series VMEbus card cage supports only those VMEbus controller / adapter boards qualified and supplied by Data General Corporation because it utilizes user–defined signals to supply power to the VMEbus backplane.*

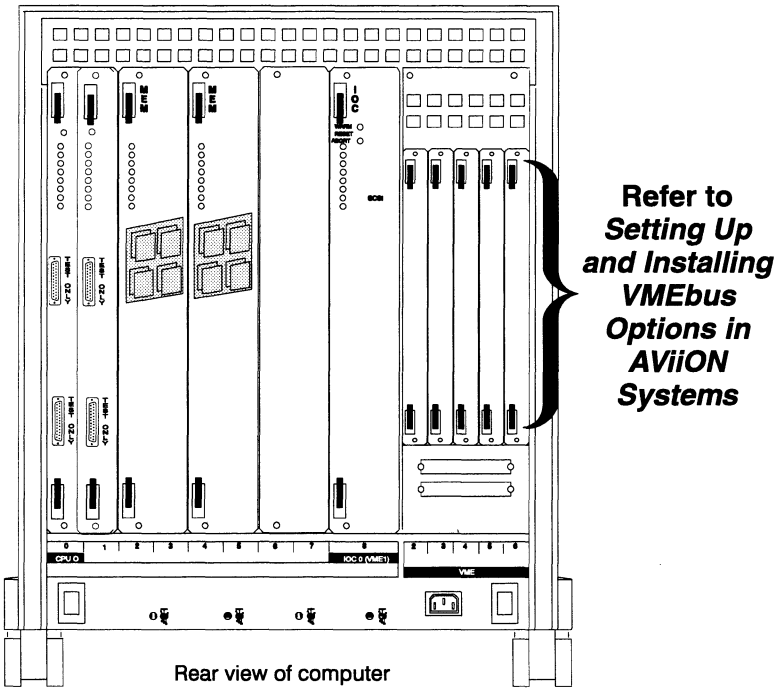


Figure 1–16 AViiON 8500 VMEbus card cage

After you set up and connect your VMEbus options to the controllers in your AViiON 8500 VME card cage, continue with the next section in this chapter.

Connecting the ac power cord

After all your optional and peripheral devices are connected to the computer, attach the ac power cord. The power cord connects to a three–prong receptacle at the right side of the rear panel as shown in Figure 1–17.

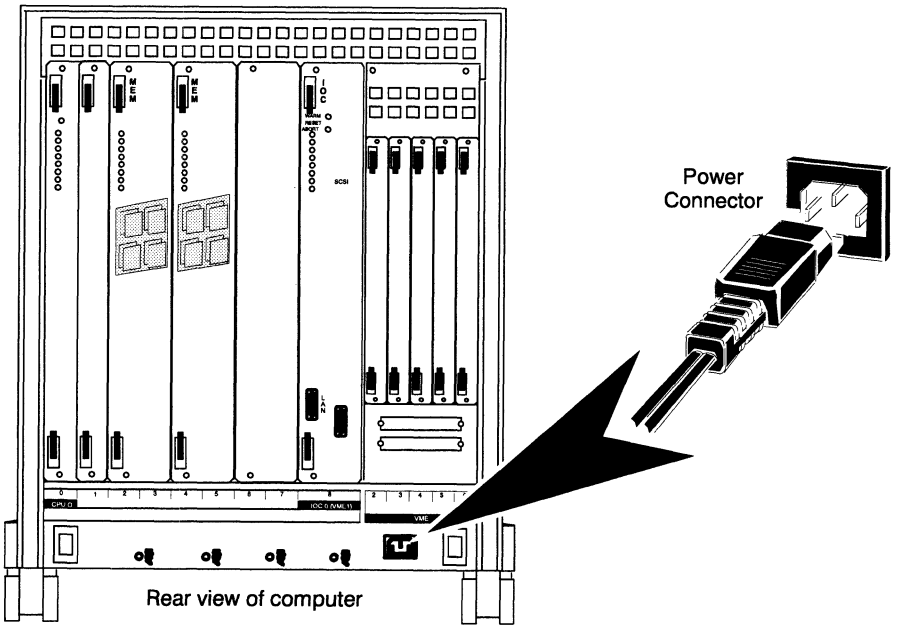


Figure 1–17 AC power receptacle and cord

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

Site Voltage/Frequency	Part No.	Power Suffix	Usage
100 Vac 50/60 Hz	109–719	–1	U.S., Canada
120 Vac 60 Hz	109–719	none	North America standard
240 Vac 50 Hz	109–886	–5	United Kingdom[1]
240 Vac 50 Hz	109–885	–6	Australia
220 Vac 50 Hz	109–884	–7	Europe[2]
220 Vac 50 Hz	109–883	–8	Italy
220 Vac 50 Hz	109–849	–9	Denmark
220 Vac 50 Hz	109–848	–0	Switzerland

[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.

IMPORTANT: The 8500 series computer unit power supply automatically selects between 100/120 and 220/240 V ac.

When you finish connecting the ac power cord to your computer, you can complete your installation as described in the next section, or continue with the next chapter, "Starting and stopping your computer system."

Completing your installation

When you have finished connecting devices to your IOC and VMEbus boards, you should organize your cables and record their destinations for future use. We recommend that you postpone performing this step until after your initial installation, when you are sure of your configuration and the entire system is stable.

The accessory box that shipped with your computer unit includes a cabling label and map kit, and a number of cable straps that you can attach to your computer. Follow the instructions that accompanied each kit to neatly dress your cables to prevent them from entanglement, and to specify the various cables, their purpose, and the devices to which they attach.

Figure 1–18 shows the back of a sample AViiON 8500 computer unit after routing the cables through attached straps.

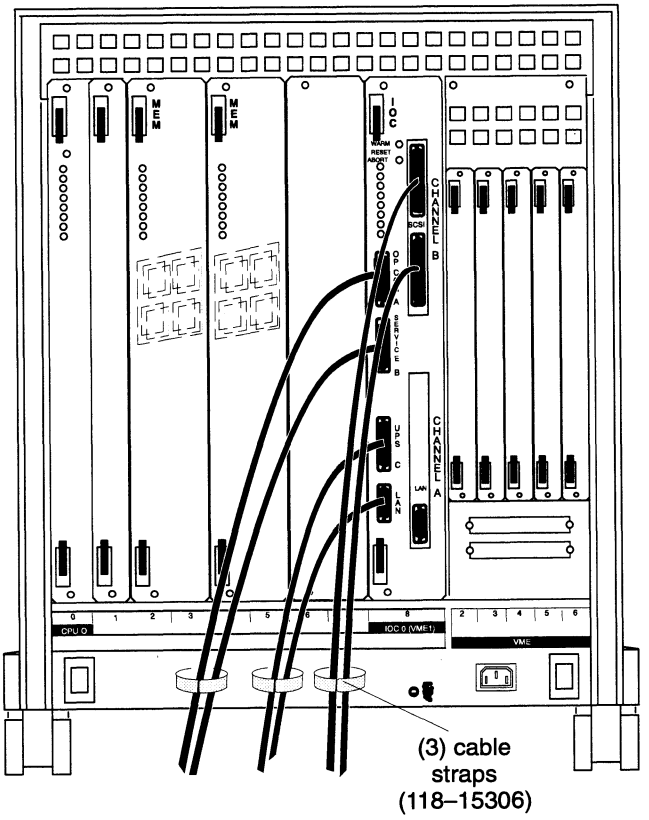


Figure 1–18 Routing cables with cable straps

End of Chapter

2 Starting and stopping your computer system

The first section of this chapter contains instructions on powering up your computer, and describes a normal powerup sequence. The last section of this chapter explains how to power down, reset, and restart an AViiON® 8500 computer system.

IMPORTANT: This chapter does *not* provide detailed instructions for installing or booting the DG/UX™ operating system. For information about installing your operating system, refer to *Installing the DG/UX™ System.* For detailed information on booting your operating system, refer to *Managing the DG/UX™ System.* You should also consult any Release Notices that accompany your system.

Refer to Chapter 4 for a detailed description of the system **boot** command syntax and parameters.

Starting the computer system

Each time you supply power to your AViiON 8500 system, you should follow a prescribed sequence to ensure that all the system components recognize each other and are working together correctly. The first part of this section describes the sequence of procedures we recommend whenever you start your system from a powered–off state.

If you encounter any problems during powerup, refer to Chapter 3.

Powering up your system hardware

The following sequence of procedures and events describes how to *cold start* (cold boot) a completely powered down system. Always make certain that you turn on ac power to the computer unit and its peripherals (system consoles, CLARiiON storage systems, CSS subsystems, terminals, printers, and VMEbus options) in the order prescribed below.

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

IMPORTANT: Most terminals or printers react to powering on by running automatic self–tests, and finish by coming on line. In general, the on–line state is indicated when the On–Line light or Data light is steadily on (when the computer power is turned on) or blinking (when the computer is turned off). On some systems, the On–Line light on terminals other than the system console will continue blinking until you initialize your asynchronous controllers and/or a multiuser environment. For specific information, see the documentation that came with your device.

2. Turn on power to all subsystems and storage systems (for example, CSS or CLARiiON units) by pressing each power switch.

3. Turn on the computer unit by pressing the power switch on the front panel. Make sure the power switch on the computer lights up and returns to its position flush with the front panel. Figure 2–1 shows the location of the power switch.

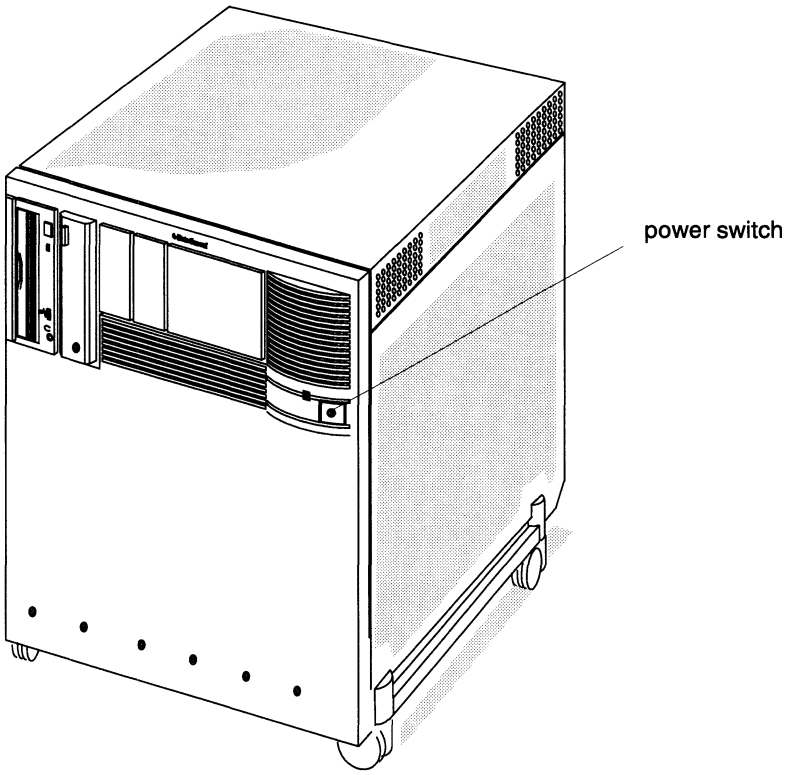


Figure 2–1 Powering on the AViiON 8500 computer

Each time you supply power to your AViiON 8500 system, a series of diagnostic tests in the computer firmware verifies a number of basic hardware functions.

The system begins by displaying test messages like the following:

```
   Sizing system
CPU board in slot 0
MM board in slot 2
IOC board in slot 8
Found SIMM A (32M) in slot 2
Found SIMM B (32M) in slot 2
Found SIMM C (32M) in slot 2
Found SIMM D (32M) in slot 2

Initializing Caches.............................
Initializing memory starting at 0x0; ending at 0x7FFFFFC

Sizing for expansion devices on IOC0...
Found on-board SCSI
Found on-board LAN
Found VME
Found expansion 0 LAN
Found expansion 1 SCSI A
Found expansion 1 SCSI B

Sizing for expansion devices on IOC1...
Found on-board LAN
Found expansion 0 LAN
Found expansion 1 SCSI A
Found expansion 1 SCSI B
Testing memory access

Copyright Data General Corporation 1993
AViiON 8500/9500 Series Computer
Multi processor
Firmware Revision 0X.X
IOC0 Integrated LAN: Ethernet address is XX:YY:ZA:BB:CC:DD
IOC1 Integrated LAN: Ethernet address is XX:YY:ZA:BB:CC:DD
Initializing 128 Megabytes [128]
Testing...
   0123abcde
```

`IOC0` on your display refers to the Input/Output Controller in slot 8; IOC1 refers to a second IOC in slots 6 and 7. "`Expansion 0`" on your IOC sizing display specifies the option slot labeled CHANNEL A on your IOC board. "`Expansion 1`" refers to the CHANNEL B option slot. SCSI connectors are also specified from the bottom up; `SCSI A` describes the lower bus connector in an SCSI option board, `SCSI B` the top bus.

4. Record your Ethernet address(es) on a configuration worksheet or cable labeling map for future use.

5. Compare how many megabytes of memory your test messages indicate are initialized with the memory size on your invoices or configuration sheets. If the memory size displayed is incorrect, contact Data General immediately. Refer to Chapter 4 for an explanation of AViiON 8500 memory deconfiguration.

Each uppercase character in the alphanumeric sequence on your display represents a series of powerup tests; subsequent lowercase characters indicate individual tests within a series. As your computer passes a test sequence, the powerup diagnostic program erases the lowercase characters from your display before beginning the next test series. When testing completes, your screen display shows the entire alphanumeric sequence 0123...ABC...Z in uppercase.

If the test messages are either incomplete or end with an error message, refer to Chapter 3.

```
Copyright Data General Corporation 1993
AViiON 8500/9500 Series Computer
Multi processor
Firmware Revision 0X.X
IOC0 Integrated LAN: Ethernet address is XX:YY:ZA:BB:CC:DD
Initializing 128 Megabytes [128]
Testing...
   0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
Passed
```

Once the system displays the message `Passed`, the powerup tests are complete. Passing these firmware tests usually indicates that your system hardware is functioning well enough to run an operating system.

Your next step

Continue with step 6, 7, or 8 in the next section, depending on your system display.

After passing the powerup tests, AViiON 8500 systems probe the devices in three autoboot paths for a bootable file. (We discuss the autoboot paths in Chapter 4.) In most installed systems, the first autoboot path specifies a bootstrap file or files that will start your operating system kernel, usually file 0 on your system disk. Preloaded systems that do not have an installed and customized DG/UX system kernel (for example, systems that are powering up for the first time) attempt by default to boot the DG/UX installer program; first from a CD–ROM drive, then tape, and finally a system disk.

IMPORTANT: If you do not wish to begin the system software installation and bring up DG/UX at this powerup, you must execute the <Ctrl–C> sequence from your system console keyboard before the autoboot sequence completes. (Do not enter Ctrl–C until *after* your system passes powerup diagnostics and displays the message `Passed.`) Exiting the autoboot before it executes will bring your system to the System Control Monitor (SCM) prompt as described in step 8.

6. If you have not modified the default autoboot paths in a preloaded system, the system will automatically enter the DG/UX installer program as shown in the next sample screen display.

   Refer now to *Installing the DG/UX™ System* for instructions on installing system packages, planning a network, and building a custom kernel.

```
Booting sd(ncsc(),0)root:/dgux.installer -i
DG/UX System Release 5.4R2.10, Bootstrap
Loading image.....................................
DG/UX System Release 5.4R2.10, Version Installer
Using 128 Megabytes of physical memory
Found 2 processor(s)
Configuring devices.................

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

7. If this is not your first powerup and your system finds your customized DG/UX kernel bootstrap file, it continues to load the kernel and execute the operating system. Refer now to Chapter 2 in *Managing the DG/UX™ System* for a description of the remainder of the software startup process, and what you should do as your system boots DG/UX.

8. If your system finds no bootable file in the autoboot path, it enters the System Control Monitor (SCM) program. Boot messages and the SCM prompt appear on your screen, as shown in the next sample screen display.

```
Testing...
0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
Passed
Booting sd(ncsc(),3)
Unable to load boot file sd(ncsc(),3)

Booting st(ncsc(),4)
*** Check SCSI cabling, and check that tape is in drive.***
Unable to load boot file st(ncsc(),4)

Booting sd(ncsc(),0)
Unable to load boot file sd(ncsc(),0)

Jp#0/SCM>
```

   From the SCM prompt, you have a variety of options for what to do next. They include the following:

   - Perform a warm hardware reset, and/or attempt a warm boot of your operating system. The last two sections of this chapter describe resetting and restarting your system from the SCM.
   - Use AViiON System Diagnostics to further test your system hardware. Refer to *Using AViiON® Diagnostics and the AV/Alert^{sm} Support System.*

- Install or update an operating system. Refer to *Installing the DG/UX™ System* and/or the Release Notices that accompanied your software.
- Boot a stand–alone program. Refer to Chapter 4 for an explanation of the SCM **boot** command.
- Verify whether your autoboot paths accurately reflect the current location of your operating system, or change the autoboot paths. Refer to Chapter 4 for instructions on modifying your autoboot paths. You might also need the information in any Release Notices that accompanied your system, and in your operating system documentation.
- View or change the Small Computer System Interface (SCSI) identifications assigned to systems that share the use of a single SCSI bus between two SCSI initiators. Refer to Chapter 4 for instructions on viewing or setting up dual–initiator SCSI IDs. Refer to your CLARiiON and/or DG/UX documentation for a detailed explanation of dual–initiated configurations.
- Change any system configuration parameters that do not conform to the equipment connected to your system console or service ports. Refer to Chapter 4 for further instructions.

Shutting down your computer system

Each time you turn off the computer system, you must complete a 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 way we recommend that you shut down your computer system. If your AViiON 8500 computer system provides resources for other computers, you probably won't shut it down very often. For some uses however, you may shut down and restart your system as often as daily. Once you become familiar with powerdown, reset, and restart procedures, you won't need to refer to this section to shut down or reset your computer system.

The last two parts of this section describe how you can reset your system hardware without turning off system power, and how to warm restart (warm boot) the operating system software without completely powering down and restarting your entire 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 power down 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 for the root user to *immediately* shut down the operating system is as follows:

   # cd / ↵

   # shutdown -g0 -y ↵

   # halt -q ↵

2. Once you see the SCM prompt,

   ```
   Jp#0/SCM>
   ```

   you can safely turn off power to the computer unit.

IMPORTANT: You may want to reset your computer and/or restart your operating system from the System Control Monitor rather than complete the system shutdown as described in the remainder of this section. The last two subsections in this chapter, "Resetting your system" and "Restarting your system," contain instructions for *warm resetting* and *warm starting* AViiON 8500 series systems.

3. Press the computer unit's power switch. Figure 2–2 shows the location of the AViiON 8500 power switch.

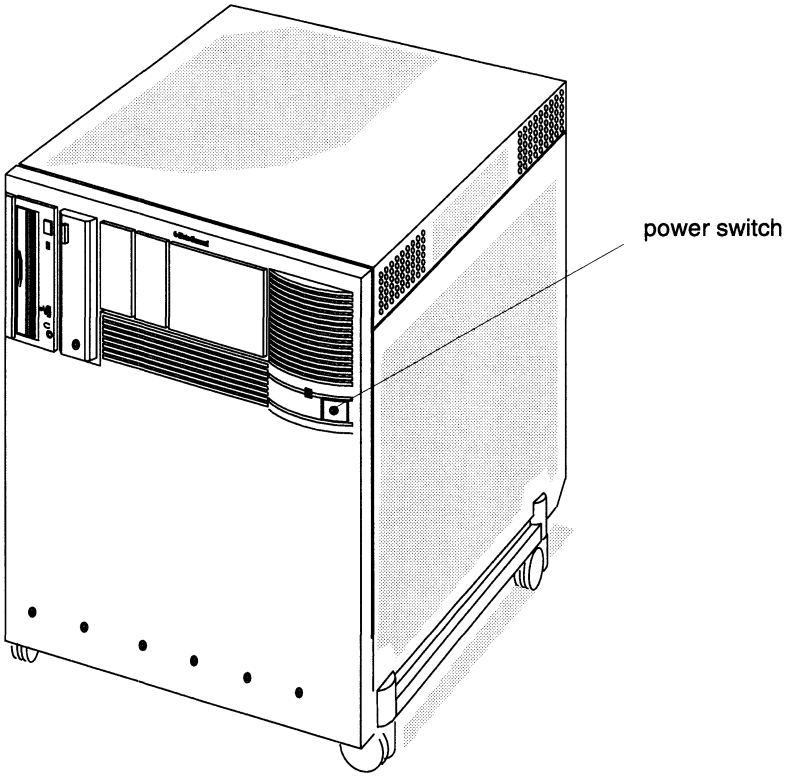


Figure 2–2 Powering down the AViiON 8500

4. Turn off power to all subsystems (CSS2 or CLARiiON) connected to the computer chassis by pressing the subsystem power switch(es).
5. If your system includes any other external storage device connected to your computer unit, turn off power to the external unit.
6. If you have printers, VMEbus options, or other devices connected to your computer system, turn off power. Make sure you turn off power to each device.
7. Turn off power to the system console.

CAUTION: Wait at least a minute before attempting to restart your computer system. Listen for the computer unit fans; do not turn power back on until you hear that the fans have stopped spinning.

Resetting the computer system

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 powerup testing and its automatic boot sequence, as described in the "Powering up your system hardware" 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) command interpreter prompt, but does not proceed through powerup tests or automatically boot your operating system.

IMPORTANT: Pressing the ABORT switch on an IOC board 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 can perform a warm reset by using the SCM RESET command while at the SCM prompt, as follows:

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

CAUTION: We recommend that you do ***not*** *use the* WARM RESET *switch on an IOC board to reset your system. Improper use of this switch may cause unwarranted system deconfiguration and degradation in some situations.*

Never use the SYSTEM RESET *switch on the CPU board. For a complete system reset, power cycle your system by turning off system power, waiting 1–2 minutes, then turning system power back on.*

Never press a warm reset switch during powerup testing. If you want to interrupt a powerup sequence, wait until you see the message `Passed`*, then attempt a <CTRL–C> sequence from your system console keyboard. 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.*

Restarting your system

Each time you turn power on, your system goes through powerup testing and its automatic boot sequence, as described earlier in this chapter under the section "Powering up your system hardware." It is not necessary to power down completely in order to restart your operating system.

If you shut down your operating system to the System Control Monitor, you can restart your operating system by entering the **boot** command at the SCM prompt, as follows:

`Jp#0/SCM>` **b** ↵ (or, `Jp#0/SCM>` **boot** ↵)

When you use the **boot** command without an argument, the computer system uses its default boot paths and boots the same file it uses at every powerup. Refer to Chapter 4 for detailed information about the SCM **boot** command, default boot paths, the automatic boot sequence, and boot syntax.

End of Chapter

3 Solving powerup problems and using AViiON 8500 series high–availability features

When you turn on your computer unit, powerup diagnostic programs test your computer to make sure that it can perform certain basic operations. This chapter outlines what the diagnostics do if they discover a problem, and steps you can take to overcome some of the problems that can prevent a successful powerup.

The first major section of this chapter describes simple checks you should make in case your computer appears to fail a powerup diagnostic test. The second major section describes *high-availability* features built into AViiON 8500 computers to minimize the impact of hardware problems.

Solving powerup problems

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

IMPORTANT: If your system's SCM autoboot feature is enabled and powerup diagnostics identify a serious problem with an AViiON 8500 component, they will attempt to *deconfigure* that hardware (remove it from the system's list of components present) and prepare to start your system without it. Unless you intervene to stop the automatic boot process, your system will continue to operate in a *degraded* mode until you replace or repair the failed component. This high–availability feature prevents a single faulty component from causing your entire system to fail powerup. If you encounter a deconfiguration message during powerup, you should contact Data General immediately. We discuss AViiON 8500 high–availability features later in this chapter.

If your system has a valid and implemented AV/Alert contract, it will send a machine–initiated incident packet (*MI call*) to a Data General support center detailing any powerup failure. AV/Alert will also notify Data General each time your system boots DG/UX to init level 3. For more information on how you can use AV/Alert features, refer to *Using AViiON® Diagnostics and the AV/Alert^{sm} Support System*.

If your system console screen remains blank for more than 2 minutes, try to resolve the problem yourself by following the steps in the "Blank screen on the system console" section below. If your system hangs or displays an error message, try to resolve the problem by following the steps in the "Error messages on the screen" section later in this chapter. If your system appears to pass its hardware tests but halts processing within the DG/UX operating system, exit the system as described in the section "Exiting a DG/UX hang."

Blank screen on the system console

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

1. Make certain that the power switch is lit, and listen for the whirring noise of the fans inside the unit. Also examine the exposed LEDs at the rear of the computer. If you do not see the lights or hear the fans, make sure the computer unit is getting power by testing the power cord connection and the power source.
2. Make sure the terminal you are watching is the system console.
3. Make sure the system console's power cord is plugged tightly into an ac power outlet, and that the ac outlet is supplying power.
4. Make sure the system console is turned on.
5. Make sure the screen intensity on your system console is adjusted brightly enough so you can see messages on the screen. (Try temporarily adjusting the screen intensity to the maximum setting.)
6. If your keyboard has an On Line light, On Line key, and Cmd key, make sure the light is on. If not, hold down the Cmd key and press the On Line key. If the light comes on, go to step b.
    a. If the keyboard's On Line light is still off, make sure the cable that connects the keyboard to the terminal is plugged securely into the terminal. If it is secure, and the On Line light is still off, go to step 7.
    b. If the On Line light is on and your screen is still blank, do the following:

       Take the terminal off line by holding down the Cmd key and pressing the On Line key. With the terminal off line, use the keyboard to type something. If the characters appear on your console screen, put the terminal back on line by holding down the Cmd key and pressing the On Line key.
7. If you still do not receive the powerup messages on your system console screen, make sure the cables that connect your components together are undamaged and their connectors are secured tightly so that they make a good connection.

8. If the display is still blank, your system console may have a problem. Replace the system console with another terminal.
9. If your terminal has switches for setting the baud rate, parity, data length, and so forth, make sure they are set to the default settings expected by the System Control Monitor. In most cases, the default characteristics for an AViiON system console line are as follows:
   - 9600 baud rate
   - 8 data bits, no parity
   - ANSI character code set
   - Enabled flow control
   - U.S. English console language (keyboard set)

   Refer to the device–specific documentation for the terminal if necessary.
10. If the cables are connected properly and the switch settings for the terminals are correct, turn your system power off, and then try powering up your system again.

CAUTION: Do not attempt to reset your system by pressing the SYSTEM RESET, WARM RESET, *or* ABORT *switches. Power cycle your computer from the power switch only.*

11. If your screen is still blank, contact Data General. Within the United States and Canada, you can contact the Data General Service Center by calling 1–800–DG–HELPS for toll–free telephone support.

Error messages on the screen

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

1. Write down the error code or, if no error code appears, write down the last letter or number displayed. Note which series of tests produced the fault.
2. If the error is indicated by a meaningless display on your system console screen, examine the device cables, interfaces, and line settings at the back of your terminal and computer unit. *Make certain that your system console parity setting is correct* as listed in step 9 in the preceding section of this chapter. If necessary, also refer to the device–specific documentation for your terminal to reset the settings.
3. Turn off the computer unit's power.

CAUTION: Do not attempt to reset your system by pressing the SYSTEM RESET, WARM RESET, *or* ABORT *switches. Power cycle your computer from the power switch only.*

4. Wait at least 1 minute, then turn on power to the computer unit again.
5. If the error reoccurs, record the screen display and contact Data General. Within the United States and Canada, you can contact the Data General Service Center by calling 1–800–DG–HELPS for toll–free telephone support.

Exiting a DG/UX hang

To halt the DG/UX system when it is hung (seems frozen and you cannot continue operation), hold down the Ctrl key and type three sets of right and left bracket keystrokes in sequence, as follows:

] [ ] [ ] [(be sure to hold down the Ctrl key while doing this)

This *hot key* sequence generates an operating system panic that should halt current processing. The system will respond by asking if you want to take a system dump for later analysis. In most cases you type **n** and press the New Line key to proceed to the System Control Monitor (SCM). (Refer to *Managing the DG/UX™ System* for a description of the dump procedure; refer to Chapter 4 in this manual for a description of the SCM.)

```
Do you want to take a system dump? n↵
```

IMPORTANT: If your system has a valid and implemented AV/Alert contract, it will send a machine–initiated incident packet (*MI call*) to a Data General support center detailing the operating system panic. We describe AV/Alert features in *Using AViiON® Diagnostics and the AV/Alert^{sm} Support System*.

If your system does *not* have the SCM auto–reboot feature enabled, it immediately displays the SCM prompt.

Your system is set by default to attempt an automatic reboot of your operating system in the event of failure or panic. (We describe how you can disable this feature in Chapter 4.) With the SCM auto–reboot feature enabled, your system follows an operating system panic with the following query:

```
Do you wish to continue with autoboot? [y] y↵
```

Type **n** and press the New Line key if you wish to display the SCM prompt. If you continue with the autoboot, your system will attempt to reboot the operating system.

AViiON 8500 high–availability features

This section describes some of the features that we built into AViiON 8500 computers to minimize the impact of hardware problems. With some interruption and possible system degradation, your AViiON 8500 can continue processing despite Central Processing Unit (CPU), memory, fan, power supply, and input/output failures; we refer to this capability as *high availability.*

The inherent high–availability features of AViiON 8500 computers work in conjunction with those in DG/UX, AV/Alert, CLARiiON, Uninterruptible Power Supply (UPS), and other system components. This manual covers only the high availability of hardware and firmware components integral to the computer unit, as follows:

- Automatic reboot and boot-on-error
- Central processor unit deconfiguration
- Cooling unit (fan tray) compensation
- Power supply failover
- Memory deconfiguration
- Input/Output Controller deconfiguration and failover

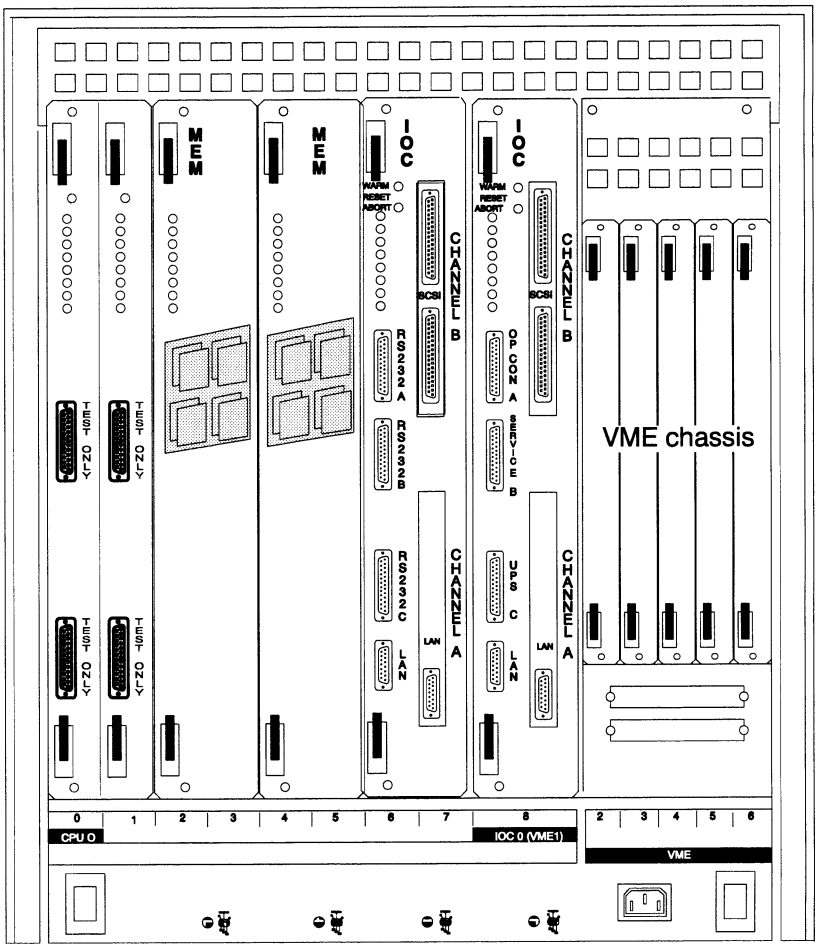
IMPORTANT: Note that this manual uses the term *failover* to describe the transfer of responsibility, function, and features from one component to another within the same computer unit; other publications might define failover as the transfer of disk modules and applications from one *machine* to another.

For detailed information on other facets of high–availability configuration and implementation, refer to the related Data General manuals listed in the Preface, and to Technical Briefs available through your Data General representative.

Many of the features described in this chapter depend on your configuration: that is, the type, number, and arrangement of system hardware and software components.

Figure 3–1 shows an AViiON 8500 computer unit configured for maximum high availability, with dual memory and dual Input/Output controllers.

CAUTION: Please note that most of the high-availability elements described in this chapter require personnel qualified by Data General to set them up properly. When you require assistance, contact Data General as described in the Preface to this manual.



Rear view of computer unit within chassis

Figure 3–1 High–availability configuration with dual CPU, memory, and I/O controllers

Automatic reboot and Boot-on-error

This section describes high-availability features based in AViiON firmware that enable continued performance in the event of a hardware failure. All AViiON 8500 systems (regardless of hardware configuration) ship with the Auto–reboot and Boot-on-error features enabled in firmware by default.

In addition to Automatic reboot and Boot-on-error, your system supports machine–initiated callout for remote assistance from Data General support centers. In most scenarios, AV/Alert calls for help whenever the operating system or a powerup diagnostic test fails.

Automatic reboot after an operating system failure

Whenever the operating system panics and shuts down the system software, system firmware initiates a cold reset. During a cold reset, the system goes through powerup testing and the automatic boot sequence described in the "Powering up your system hardware" section of Chapter 2.

Boot on error after a cold reset

The Boot-on-error feature enables your system to *deconfigure* (deactivate and remove from system use) failed components after a cold reset, and then continue powerup.

With Boot on error enabled in the SCM, the system attempts to boot the operating system and continue processing in a *degraded* (down-sized configuration) mode.

IMPORTANT: If your system includes more than one IOC board, the boot-on-error feature further enables component failover from the first board to the second, as described later in this chapter

If your system fails a powerup test with Boot on error *disabled*, the diagnostic firmware will identify the suspect component and halt powerup at the SCM prompt; it will not attempt to boot from the automatic boot sequence.

You can use SCM menus to disable and re-enable the boot-on-error feature and alter or set boot paths as described in the "Changing the default system boot paths" section of Chapter 4.

The remainder of the chapter describes what happens in the event of specific component failures.

Central Processor Unit deconfiguration

AViiON 8500 computer systems include one or two system (CPU) board(s). Each CPU board contains either two or four Motorola 88110 central processing units, also called *job processors*, or JPs. An AViiON 8500 system can include 2, 4, 6, or 8 processors.

After the failure of one or more CPU, an automatic or operator–initiated cold reset causes powerup diagnostics to deconfigure the system board(s) that contains the failed unit(s). Systems with AV/Alert enabled send a message packet to a remote service center.

After deconfiguring a system board, powerup firmware displays a warning message that the system is degraded and asks whether powerup should continue. The system does not require a response; it attempts to boot the operating system. DG/UX boot messages inform the operator of the number of processors found.

If powerup firmware fails to boot the operating system, it attempts to reach the System Control Monitor program to allow remote assistance and/or on–site diagnostics execution.

If every CPU in your system appears to fail, the AViiON 8500 attempts to continue powerup using a suspect CPU. This might initiate an MI call to a remote service center or enable you to run system diagnostics from the SCM.

Cooling unit (fan tray) compensation

When a fan fails, the remaining units in an AViiON 8500 fan tray increase speed to compensate by providing more cooling per unit. *This high–availability feature requires no operator intervention.* Your operating system, or powerup diagnostics, sends a warning message to the system console; systems with AV/Alert enabled send a message packet to a remote service center.

If your system determines that more than one fan has failed, it will shut down the computer unit after sending the appropriate warning messages to the system console and AV/Alert service center.

Memory deconfiguration

After the failure of one or more memory modules (SIMMs), an automatic or operator–initiated cold reset causes powerup diagnostics to deconfigure the failed module(s). The system displays a deconfiguration message, warns the operator that the system is degraded, and asks whether powerup should continue. Systems with AV/Alert enabled send a message packet to a remote service center.

The system does not require a response to continue the autoboot. Powerup messages further inform the operator of the number of SIMMs found; DG/UX boot messages display the total amount of memory in use.

If a memory controller board fails, powerup firmware will deconfigure the entire board and attempt to continue – using the SIMMS on the remaining memory controller, if present.

IMPORTANT: For the most highly available memory, you should distribute memory SIMMs evenly across two memory controller boards. This configuration might create a slight performance impediment, but ensures reasonable memory configuration in case one entire controller fails.

If your system includes only one memory controller board, and that controller fails, your AViiON 8500 system will continue processing to the System Control Monitor (SCM). A system without memory cannot boot the DG/UX operating system.

Input/Output controller deconfiguration

This section describes high–availability features of AViiON 8500 Input/Output Controller (IOC) boards.

LAN and SCSI controller deconfiguration

Each IOC includes a Small Computer System Interface (SCSI) controller for internal disk and tape devices and an Ethernet controller for LAN connection; an IOC can also support additional LAN and SCSI options.

If an Ethernet LAN or SCSI controller on an IOC board fails, an automatic or operator–initiated cold reset starts powerup diagnostics that identify and deconfigure the failed controller.

The system displays a deconfiguration message, warns the operator that the system is degraded, and asks whether powerup should continue. Powerup messages further inform the operator of the number and type of IOC components found. Systems with AV/Alert enabled send a message packet to a remote service center.

IOC board deconfiguration

System firmware will deconfigure the entire IOC if it detects a failure of either DUART (dual universal asynchronous receiver–transmitter) controlling an IOC board's asynchronous ports, or the failure of the internal SCSI bus controller.

Note that systems with a single IOC can continue limited processing; a reserve system board DUART will continue communication with your system console through the IOC OP CON connector.

Input/Output controller failover

This section describes the hardware failover that occurs automatically in configurations with more than one input/output controller board whenever the system deconfigures an entire IOC.

IOC board failover

IOC failure in systems configured with two IOC boards initiates one of the following scenarios, depending on which IOC failed and the specific configuration of each board. Note that in either case, the system loses whatever unique functions were assigned to IOC1.

- If the failed board is the second (IOC1) controller board, powerup firmware will simply deconfigure that board and its dependent controllers. As in other deconfiguration scenarios, the system will display console messages and send AV/Alert packet(s) to its support center.
- If IOC0 fails, an automatic or operator–initiated power cycle (cold boot) causes powerup diagnostics to deconfigure the controller board. As in other deconfiguration scenarios, the system will display console messages and send AV/Alert packet(s) to its support center. Unlike other deconfiguration scenarios, deconfiguring IOC0 automatically implies failover to any second IOC, as described below.

During powerup, firmware assigns the base address for IOC0 to the first *active* IOC board in your system, regardless of its physical slot position. After deconfiguration of a failed IOC0, the board formerly assigned the address of IOC1 assumes the controller identity and function of IOC0 wherever the two boards shared configuration. Minimally, this includes the asynchronous ports, internal SCSI controller, and first LAN controller in your system. The remaining sections of this chapter describe the failover of AViiON 8500 IOC components.

Asynchronous port (DUART) failover

IOC boards connected to the AViiON 8500 system backplane contain an internal DUART with external ports for an asynchronous console, UPS, and AV/Alert modem.

We strongly recommend that you leave the DUARTs on a second IOC idle, to act as failover reserves.

The first (OP CON, RS232-A) asynchronous port on an IOC is reserved for connection to the system console. If the terminal you are using for a system console supports dual–porting, you can configure your system for console high availability by connecting two OP CON connectors to the same terminal. IOC failover then enables your system console from the backup OP CON port. (Note that your system always holds the RS232–A, "OP CON," port on a second IOC in reserve: you cannot use that port for any purpose other than as a potential system console.)

IMPORTANT: Switching a dual-ported terminal from one connection to another requires operator intervention at the system console; usually a "hot key" sequence such as <Ctrl–Alt> switches the active host connection.

If the asynchronous devices connected to your IOC0 do not support dual–porting (for example, an AV/Alert modem with only one asynchronous connector), you can still use the ports on your second IOC. Before powerup firmware sizes your re–configured system, simply disconnect the cables from the failed IOC ports and connect them to the corresponding ports on the active IOC.

SCSI and LAN failover

After deconfiguration of a failed IOC0, system firmware assigns the base address for IOC0 to the first *active* IOC. SCSI and LAN controllers formerly assigned IOC1 addresses assume the controller identity and function of their IOC0 counterparts wherever the two boards shared configuration.

IOC1 controllers can act as reserves for counterparts on IOC0; as with dual–ported asynchronous connectors, you can dual–initialize SCSI buses and connect more than one LAN controller to the same network. (Refer to your operating system and LAN documentation for information on setting up this sort of redundancy.)

In most configurations, however, a system administrator or operator will need to intervene to disconnect the cables from the failed IOC ports and connect them to the corresponding ports on the active IOC.

Table 3–1 lists the memory–mapped I/O address associated with each standard controller in an AViiON® 8500 system. The system recognizes and specifies standard LAN and SCSI controllers/adapters by their device mnemonic and their I/O address. Memory addresses correspond to specific physical locations for each board in your system. These addresses are determined from the base addresses that firmware assigns to each active IOC board.

IMPORTANT: If a device or application depends on a specific Ethernet address, you must provide the new address associated with the appropriate controller on the active IOC. Failover of Ethernet LAN controller specification and memory address does *not* apply to device–specific Ethernet addresses.

Table 3–1 Input/Output controller addresses

Controller – IOC 0[1]	Address	Controller – IOC 1	Address
Integrated bus ncsc(0) – IOC 0 (internal devices only)	FFFA0000	Integrated bus ncsc(5) – IOC 1 (held in reset for failover)	FF7A0000
Optional bus ncsc(4) – IOC 0 (CHANNEL B, upper connector)	FFFA5000	Optional bus ncsc(9) – IOC 1 (CHANNEL B, upper connector)	FF7A5000
Optional bus ncsc(3) – IOC 0 (CHANNEL B, lower connector)	FFFA3000	Optional bus ncsc(8) – IOC 1 (CHANNEL B, lower connector)	FF7A3000
Optional bus ncsc(2) – IOC 0 (CHANNEL A, upper connector)	FFFA4000	Optional bus ncsc(7) – IOC 1 (CHANNEL A, upper connector)	FF7A4000
Optional bus ncsc(1) – IOC 0 (CHANNEL A, lower connector)	FFFA2000	Optional bus ncsc(6) – IOC 1 (CHANNEL A, lower connector)	FF7A2000
Integrated LAN dgen(0) – IOC 0 Slot 8	FFFA0100	Integrated LAN dgen(3) – IOC 1 Slot 6	FF7A0100
Optional LAN dgen(1) – IOC 0 Slot 8, CHANNEL A	FFFA2100	Optional LAN dgen(4) – IOC 1 Slot 7, CHANNEL A	FF7A2100
Optional LAN dgen(2) – IOC 0 Slot 8, CHANNEL B	FFFA3100	Optional LAN dgen(5) – IOC 1 Slot 7, CHANNEL B	FF7A3100

[1] If your system has deconfigured and failed over the IOC board in slot 8, the system will assign the logical addresses for IOC 0 to the corresponding physical connectors on slots 6 and 7 (IOC 1 becomes IOC 0).

For example, a SCSI controller at address FF7A5000 (ncsc(9)), becomes, after failover, ncsc(4) at address FFFA5000.
LAN controller dgen(3) assumes the memory address and controller number of dgen(0). Note that the system assumes a higher priority for devices on IOC0; we strongly recommend that you plan your system configuration accordingly.

IMPORTANT: The internal mass–storage controllers ncsc(0) and ncsc(5) in a dual–IOC system are always terminated at each other. After failover, the integrated SCSI controller on IOC1 (held in reset for just this purpose) takes over the system disk and media responsibilities commonly associated with SCSI controller 0. This allows even a severely degraded system to boot and operate internal storage without operator intervention.

Figures 3–2 and 3–3 illustrate the results of IOC0 deconfiguration and failover to the second IOC.

Figure 3–2 illustrates SCSI controller deconfiguration and failover to the second IOC.

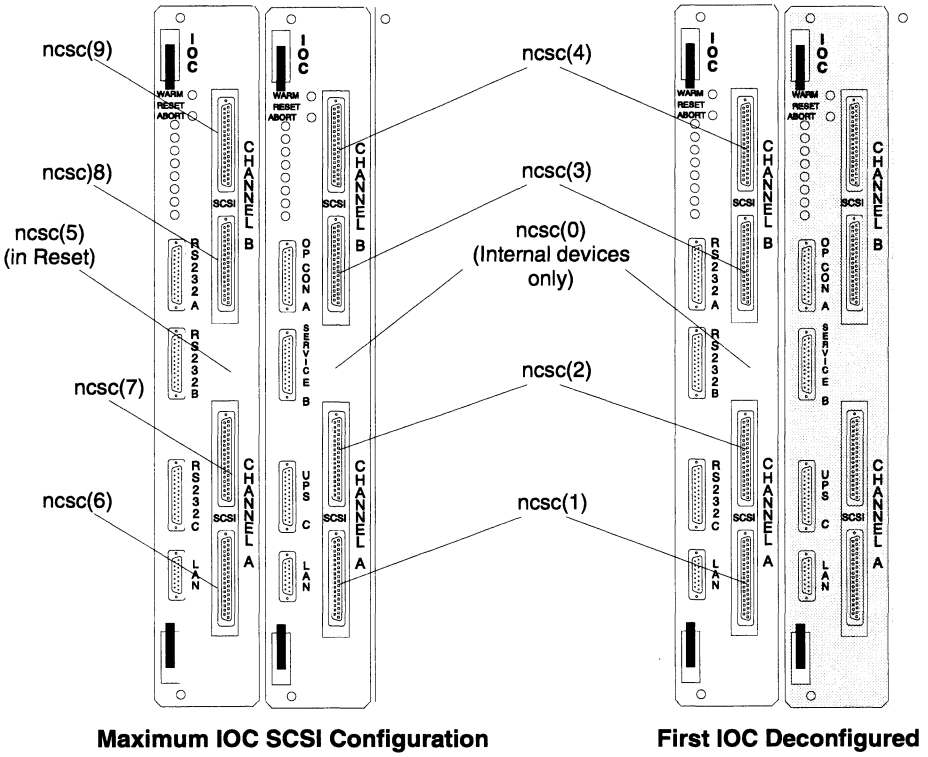


Figure 3–2 SCSI controller configuration before and after IOC failover

Figures 3–3 illustrates LAN controller deconfiguration and failover to the second IOC.

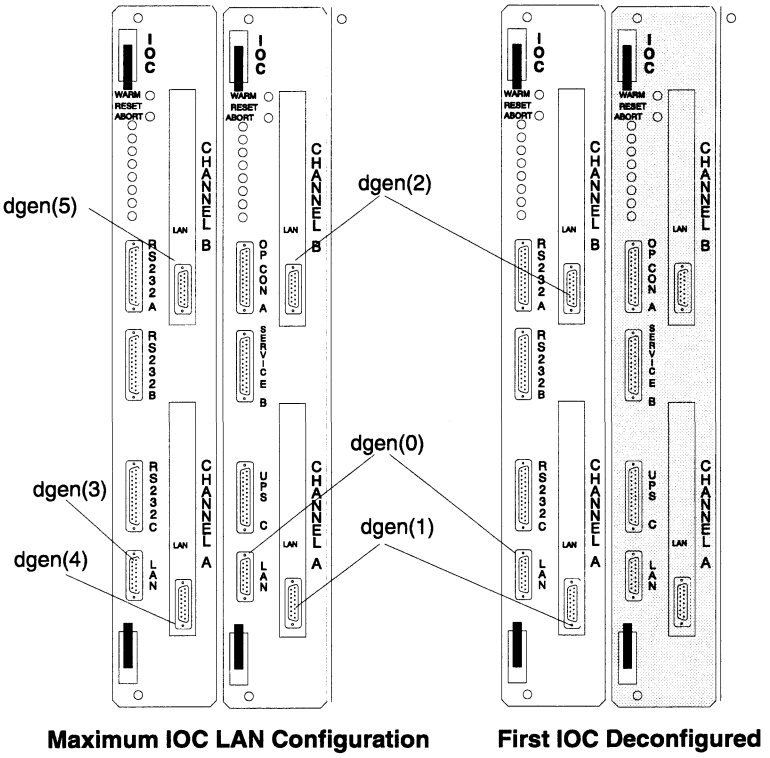


Figure 3–3 LAN controller configuration before and after IOC failover

End of Chapter

4 Using SCM commands and menus

The System Control Monitor (SCM) manages and tests your computer at powerup and maintains control until the operating system or other system software takes over. Whenever your system software halts, the SCM resumes control. The SCM consists of microprograms stored in programmable read–only memory (PROM); these PROM–based programs are part of your computer hardware (often called *microcode* or *firmware*).

The SCM provides a command interpreter and several interactive menus. You can use SCM commands and menu items to view or change system configuration parameters, control program flow, and boot system software.

This chapter explains how to use the SCM menus to set or change your system configuration parameters. It also describes basic SCM commands you can use for system operation.

Getting to the SCM

You can tell you are in the SCM when you see its command interpreter prompt. You'll only see the SCM prompt when your operating system is completely shut down and the *job processors* (or CPUs, Central Processing Units) are halted. Your default SCM prompt indicates the currently attached job processor, as follows:

`Jp#[N]/SCM>` (Where [N] is 0–7, depending on your configuration.)

You can use the SCM to load, start, modify, control, or halt programs, but the SCM never runs at the same time as system software. During normal operation, you access the SCM only when system software encounters a problem it cannot handle while running.

Your computer displays the SCM command interpreter prompt under the following circumstances:

- **The automatic boot sequence fails or is interrupted**

  The SCM controls powerup testing and then brings up your system software through an automatic boot sequence. You enter the SCM if the system cannot overcome a diagnostic test failure or if the automatic boot sequence does not complete successfully.

  You can access the SCM intentionally by executing the SCM interrupt sequence **<Ctrl–C>** before your operating system software boots at powerup. After powerup testing completes, execute the sequence repeatedly until you see the SCM prompt.

CAUTION: Never use the SCM **<Ctrl–C>** *sequence during powerup testing. If you want to interrupt the automatic boot sequence, wait until you see the message* `Passed` *after the diagnostic test messages on your screen.*

- **A user command halts the operating system**

  You can use UNIX operating system commands to shut down the system, stop all processors, and display the SCM prompt. If you are running the DG/UX system, always try the following command sequence to shut down the operating system properly:

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

IMPORTANT: This command brings down your operating system to single user mode immediately. You can modify the **shutdown** command to provide a period of time for users to log out. Refer to your DG/UX documentation for information.

Then, halt the operating system to display the SCM prompt, as follows:

```
# halt -q↵
Jp#0/SCM>
```

If you don't have the DG/UX system, refer to your operating system documentation for information about properly shutting down before halting the system.

CAUTION: Always try to shut down your operating system properly before attempting to halt the system. Halting your system while the operating system or other software is running may result in lost or corrupted data.

- **The operating system halts after encountering an unsupported program breakpoint or interrupt**

  Your system software handles all exceptions (program breakpoints and interrupts); it halts if it encounters an exception it does not expect or cannot handle.

- **A user keyboard command break sequence halts the operating system**

  Most system software lets you use a keyboard break sequence to halt current processing and display the SCM prompt. Which keys you press depend on both your keyboard type and the support of your operating system or stand–alone program. For information about the proper keyboard sequence to halt your system and enter the SCM, refer to the documentation that came with your operating system or other system software.

CAUTION: Always try to shut down your operating system properly before attempting to halt the system. Halting your system while the operating system or other software is running may result in lost or corrupted data.

To halt the DG/UX system when it is hung (seems frozen and you cannot continue operation), hold down the Ctrl key and type three sets of right and left bracket keystrokes in sequence, as follows:

] [ ] [ ] [(be sure to hold down the Ctrl key while doing this)

This sequence generates an operating system panic that should halt current processing. The system will respond by asking if you want to take a system dump for later analysis; type **n** and press the New Line key to proceed to the System Control Monitor.

```
Do you want to take a system dump? n↵
```

IMPORTANT: If your system has a valid and implemented AV/Alert contract, it will send a machine–initiated incident packet (*MI call*) to a Data General support center detailing the operating system panic. We describe AV/Alert features in *Using AViiON® Diagnostics and the AV/Alert^{sm} Support System*.

If the SCM auto–reboot feature is not enabled, your system immediately displays the SCM prompt.

However, your system is set by default to attempt an automatic reboot of your operating system in the event of failure or panic. We describe how you can disable this feature later in this chapter in the "Enabling or disabling auto–reboot" section; we describe these features in more detail in Chapter 3.

With the SCM auto–reboot feature enabled, your system follows an operating system panic with the following query:

```
Do you wish to continue with autoboot? [y] n↵
```

To display the SCM prompt, type **n** and press the New Line key. If you continue with the autoboot, your system will attempt to reboot the operating system.

Using SCM commands

This section describes SCM command interpreter conventions, explains how to execute commands, lists SCM commands with their functions, and provides reference pages for the commands you are most likely to use.

An SCM command line consists of one valid command and, in many cases, one or more arguments (required or optional) that you enter at the SCM prompt. Follow these guidelines when using SCM commands:

- Type no more than 80 characters in one command line.
- You do not have to type the entire command name; the SCM accepts the first letter of a command as its minimal mnemonic. Exceptions are DATE, GMT, RSI, and TIME commands, which require the full command name.
- SCM commands and arguments are *not* case–sensitive (with the exception of device specification arguments to the **boot** command, which *must* be lowercase).

If you use a command incorrectly, the SCM displays a brief error message and returns the prompt so you can try again.

The SCM supports several keyboard control characters. Table 4–1 describes keyboard control sequences you can use to edit command lines, to interrupt and exit from several SCM commands, and to restore default settings for configuration parameters.

Table 4–1 SCM line editing features and keyboard control sequences

Keyboard Entry	Function
↵	Completes the current input line, begins execution of command input, and returns the SCM prompt.
<Ctrl–A>	Recalls and displays the last command string you entered at the SCM prompt.
<Ctrl–C> [1]	Interrupts execution of an SCM command and returns the SCM prompt. This is a polled interrupt; some procedures complete before they break. If you do not have an auto–repeat keyboard, execute the **<Ctrl–C>** sequence repeatedly until you see the SCM prompt.
<Ctrl–I> [2]	Resets system NVRAM to factory default settings for boot paths, dual–initiator SCSI id entries, and VME A24 configuration. Restores port parameters to: 9600 baud, 8 data bits, no parity, ANSI character set, enabled flow control, U.S. English keyboard language. SCSI tape drives: block transfer mode.
<Ctrl–Q>	Resumes SCM output display that was suspended with the **<Ctrl–S>** sequence.
<Ctrl–S>	Suspends SCM output display until you resume it with the **<Ctrl–Q>** sequence.
<Ctrl–U>	Erases the current line of text, from the left of the cursor to the SCM prompt.

[1] Functions only as an interrupt to SCM functions.

[2] You can execute this sequence only while in the SCM.

Summary of commands

This section describes those SCM commands commonly used for system operation. Table 4–2 lists these commands and intended functions. Use the **help** command to view all commands available to you on your system; use the **format** command to view the main system configuration menu.

Table 4–2 Summary of system operation SCM commands and command functions

Command	Description	Function
boot	Starts system from bootstrap device	System operation
date	Displays or sets system date	System operation, AV/Alert
format	Displays View or Change Configuration menu	System operation, debugging, program control
gmt	Displays or sets system offset from Greenwich Mean Time	System operation, AV/Alert
help	Lists valid SCM commands	System operation, debugging, program control
prompt	Changes text of SCM prompt	System operation
reset	Initializes system to powerup state	System operation
rsi [1]	Displays AV/Alert Remote Service Interface (REMOTE Menu)	System operation, AV/Alert
start	Starts processing from a designated address	Program control, error detection, and system recovery
time	Displays or sets system time	System operation, AV/Alert

[1] Requires valid contract. See *Using AViiON® Diagnostics and the AV/Alert℠ Diagnostic Support System.*

Setting the system date and time

You can use the SCM **date**, **time**, and **gmt** commands to reset your system clock between Daylight Savings and Standard Time, or to reflect time zone changes in shipped systems.

CAUTION: *In most cases, you should not use the System Control Monitor to set system time or date parameters. We recommend that you set your system's date and time at the operating system level as described in Managing the DG/UX™ System or the man pages for the* ***date*** *command.*

IMPORTANT: Setting the system date or time from the SCM alters the values in a battery backup system clock. Unless you have entered the correct offset from Greenwich Mean Time, your operating system and applications may read the values incorrectly or as Coordinated Universal Time (UTC).

Using the date command

With no argument, the **date** command reports the current system date and corresponding day of week, in English (`Mon`=Monday; `Tue`=Tuesday; `Wed`=Wednesday; `Thu`=Thursday; `Fri`=Friday; `Sat`=Saturday; `Sun`=Sunday.) With a date argument (month/day/year), the command resets the system date.

CAUTION: Setting date backwards may disable AV/Alert functions; contact your remote service center before reversing system date. Refer to your system software documentation for information about possible results to applications of resetting the system date.

Command format **date** *[mm/dd/yy]*

Arguments

mm/dd/yy

mm is a one– or two–digit decimal representation for the current month, based on the standard 12–month calendar;
dd is a one– or two–digit decimal representation for the current day, based on the standard 30- or 31-day numerical calendar format;
yy is a two– or four–digit decimal representation for the current year. The first two digits are assumed to be 19 unless specified.

- All three date argument fields (month, day, year) are required
- You must separate these fields with a space, comma (,), or slash character (/).

Related commands

time, gmt	View or set system clock time setting and offset from Greenwich Mean Time

Related messages

```
Argument(s) Required
```

Examples

1. Display the current system date and day of the week.

```
Jp#0/SCM>date↵
Fri 11/13/93
```

2. Change the system date.

```
Jp#0/SCM>date 11 16 93 ↵
Mon 11/16/93
```

Using the time command

With no argument, the **time** command reports the current date and time that your system firmware uses. Values reflect any GMT offset in effect. With a time argument (hour:minutes:second), the **time** command resets the system clock.

CAUTION: Setting time backwards more than 1 hour may disable AV/Alert functions; contact your remote service center before reversing system time. Refer to your system software documentation for information about possible results to software applications of resetting the system clock.

Command format **time** *[hh mm ss]*

Arguments

hh:mm:ss

hh is a one– or two–digit decimal representation for the current hour, based on the standard 24–hour day clock;
mm is a one– or two–digit decimal representation for the current minute, based on the standard 60–minute hour;
ss is a one– or two– decimal representation for the current second, based on the standard 60–second minute.

- All three time argument fields (hour, minute, second) are required
- You must separate these fields with a space, colon (:), or comma (,).

Related commands

date, gmt	Display or set system clock date, or offset from GMT.

Related messages

```
Argument(s) Required
```

Examples

1. Display the current system time at approximately 3:00 p.m.

```
Jp#0/SCM>time↵
Fri 11/13/94
15:00:35
```

2. Change the system time to exactly 3:00 a.m.

```
Jp#0/SCM>time 3:00:00 ↵
Mon 11/16/94
3:00:02
```

Using the gmt command

With no argument, reports the current offset from Greenwich Mean Time (GMT) in the system clock. The GMT offset is the time, in minutes, your site is from the GMT time zone; this standard time zone is also referred to as *Coordinated Universal Time* (UTC) or simply Universal time. With a time argument (between plus 840 minutes and minus 840 minutes), resets the system offset from GMT.

CAUTION: Setting time or dates backwards may disable AV/Alert functions; contact your remote service center before reversing system time. Refer to your system or network software documentation for information about possible results of resetting the offset from GMT to software applications.

Command format **gmt** [+ – *mmm*]

Arguments

+ – *mmm* *mmm* is a one– to three–digit decimal representation of the number of minutes your time zone differs (is *offset)* from GMT. You must specify – (minus) or + (plus) to indicate whether your time zone is behind or ahead of GMT.

Related commands

date, time Display or set system clock date and time

Related messages

```
Argument(s) Required
```

Examples

1. Display the current offset from GMT; your site is in New York City.

```
Jp#0/SCM>gmt↵
Local timezone is -300 minutes from GMT
```

2. Change the current system offset from GMT for a site in Melbourne.

```
Jp#0/SCM>gmt +600 ↵
Local timezone changed to 600 minutes from GMT
```

Booting your system

This section describes the **boot** command and how you specify bootable devices at the SCM prompt. An explanation of the default system boot paths and how to change them with the SCM format menus follows later in this chapter.

The **boot** command starts the system from a specified device. The command first resets system hardware; it then loads a bootstrap program from the device you specify in an optional argument *device*. Valid boot device arguments vary according to your peripheral configuration. After the first–stage boot completes, the SCM passes the second optional argument, *file*, to the booted program for further processing.

Typically, the booted program is the operating system second–stage bootstrap. With disk and tape boots, you can use the second stage, or *file*, argument to specify a particular program or program parameter (such as UNIX run level) to bring up and properly initialize your operating system.

In a LAN boot, the optional arguments specify the physical LAN connection and the server system's Internet address. When you omit the second argument in a LAN boot, the SCM probes the LAN for any server that recognizes your computer's Ethernet address and then boots the default boot file. (Note that this boot method requires that your server's network administrator set up your host as a boot client. Refer to *Managing the DG/UX™ System* for details.)

When you use the **boot** command with *neither* optional argument, the SCM attempts to boot from a default boot path. Refer to the section "Changing the default system boot paths," later in this chapter, for information about using the Change Boot Parameters menu to set or change these default boot paths.

Command format

boot [*device*] [*file*]

Arguments

device
file

The optional boot device specification *device* and the optional file specification *file* represent the first– and second–stage boot process; together, they constitute a full boot path. A full boot path contains a maximum of 80 characters.

Related commands

format	Displays View or Change System Configuration menu, where you change the default system boot path.

Related messages

```
Booting from ...

Unable to load boot file ...
```

IMPORTANT: The following sections contain detailed descriptions of the first–and second–stage boot arguments you can use with DG/UX systems. If you do not use the DG/UX system, refer to your operating system documentation for information about device naming conventions.

First–stage (device) argument

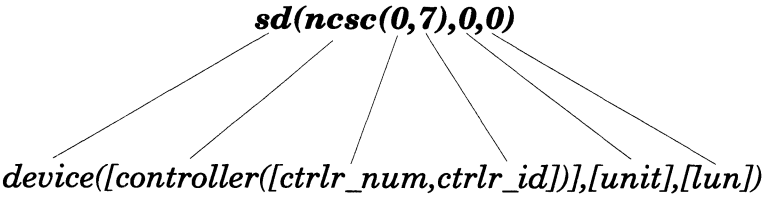
The device specification (first–stage boot) consists of a mnemonic that identifies the type of device and names the device driver, plus optional parameters that provide additional information to specify fully that device.

IMPORTANT: To view the boot paths for the devices on your system, you can use option 5, "View System Configuration" on the View or Change System Configuration menu.

Boot device syntax includes the device mnemonic (*device*), followed by open and close parentheses. Mnemonics are always in lowercase type. The minimum specification is ***device()***. The optional parameters are included inside the parentheses, separated by commas or spaces, according to the following syntax:

device([controller([ctrlr_num,ctrlr_id])],[unit],[lun])

For example, the first–stage boot argument **sd(ncsc(0,7)0,0)** specifies all the parameters in a complete device specification, as shown below:



When a parameter value is numeric, it uses zero–based logical numbering; when you use 0 you are specifying the *first* value for that parameter. Device drivers interpret most missing parameters as 0, so you can usually omit a number–based parameter to specify its *first* value. Device drivers interpret a missing controller ID parameter as 7; you do not need to specify this parameter unless the specified SCSI bus is shared by more than one host (dual–initiated).

IMPORTANT: Even when all device parameters are defaults and are therefore omitted, you *must* include both the open and close parentheses after the device mnemonic.

Table 4–3 lists the mnemonic names for your computer's bootable devices, and defines the optional parameters for each device. For a detailed explanation of how to boot from devices on dual–initiated SCSI buses, refer to *Managing the DG/UX™ System.* If appropriate for your system, refer also to your CLARiiON documentation.

Table 4–3 Mnemonics and parameters for bootable devices

Mnemonic	Device Type	Parameters			
		controller number	controller id	unit	lun
ncsc	SCSI–2 controller/adapter	I/O address	7 or 6 (dual-initiated only)	N/A	N/A
sd	SCSI disk (includes CD-ROM)	ncsc(0–4, 6–9)	ncsc([0–9],[6,7])	SCSI ID[1]	0
st	SCSI tape	ncsc(0–4, 6–9)	ncsc([0–9],[6,7])	SCSI ID[1]	0
dgen	Integrated Ethernet LAN	0–5	N/A	N/A	N/A

[1]An integer, determined by configuration jumpers. Refer to Table 4–4 for values.

IMPORTANT: Model 7429 VLCi Ethernet and Model 7416 VTRC token ring LAN controllers and model 7430 VSA SCSI adapters are *not* valid boot devices.

First parameter: specifying the controller

To name a peripheral device, you must name the controller that manages it. The first parameter, *controller(ctrlr_num,ctrlr_id),* specifies the device driver, the controller number, and the controller's Small Computer System Interface (SCSI) identification. (The controller ID is necessary only in dual–initiator configurations.) Together they specify the device controller's memory–mapped I/O address. You can also specify standard SCSI controllers/adapters by their device mnemonic **ncsc** and their I/O address; Table 4–4 lists the memory–mapped I/O address associated with each **ncsc** standard controller in an AViiON® 8500 system. Note that the memory addresses correspond to specific physical locations for each board in your system.

Table 4–4 SCSI controller parameter values

ncsc SCSI–2 Bus – IOC 0	Address	ncsc SCSI–2 Bus – IOC 1	Address
Integrated ncsc bus 0 – IOC 0 (internal devices only)	FFFA0000	Integrated ncsc bus 5 – IOC 1 (not used)	FF7A0000
Optional ncsc bus 4 – IOC 0 (CHANNEL B, upper connector)	FFFA5000	Optional ncsc bus 9 – IOC 1 (CHANNEL B, upper connector)	FF7A5000
Optional ncsc bus 3 – IOC 0 (CHANNEL B, lower connector)	FFFA3000	Optional ncsc bus 8 – IOC 1 (CHANNEL B, lower connector)	FF7A3000
Optional ncsc bus 2 – IOC 0 (CHANNEL A, upper connector)	FFFA4000	Optional ncsc bus 7 – IOC 1 (CHANNEL A, upper connector)	FF7A4000
Optional ncsc bus 1 – IOC 0 (CHANNEL A, lower connector)	FFFA2000	Optional ncsc bus 6 – IOC 1 (CHANNEL A, lower connector)	FF7A2000

IMPORTANT: If your system has deconfigured and failed over the IOC board in slot 8, the system will assign the logical addresses for IOC 0 to the corresponding physical connectors on slots 6 and 7 (IOC 1 becomes IOC 0). Refer to Chapter 3 for a discussion of AViiON 8500 high–availability options.

The simplest device specification combines the device mnemonic with the controller parameter specification. For example, **sd(ncsc())** specifies the first SCSI disk unit on the first SCSI adapter. In both cases, the disk hardware is jumpered according to its default factory configuration.

When you boot over a LAN, the bootstrap device is your computer's LAN controller. Therefore, the minimum LAN boot path is simply your LAN controller's device driver name: for example, **dgen()**. If you have more than one of the same type LAN controller, you specify the controller number inside the parentheses. For example, the specification for an optional second integrated Ethernet controller in channel A is **dgen(1)**.

To specify a controller *explicitly*, use its I/O address as the first parameter. or example, rather than **sd(ncsc(0))** the specification is **sd(fffA0000)**. You need to use this method only if you have nonstandard devices configured with your system; refer to "Specifying nonstandard boot devices," later in this chapter.

Second parameter: specifying a device unit

The second parameter (*unit*) specifies the identification number of the device on the previously specified controller. Different controller types have different unit parameters. As shown in Table 4–3, the *unit* parameter for your SCSI devices is the SCSI ID number assigned to each device. Logical numbering for the *unit* parameter begins at 0 and is determined by configuration jumpers. By omitting the second parameter, you specify the first unit for that device type (that is, SCSI ID 0).

Table 4–5 defines factory–default SCSI ID numbering for AViiON 8500 systems. Note that SCSI ID 7 is reserved for the SCSI bus host adapter.

Table 4–5 Default SCSI device ID and LUN numbers

Device	SCSI ID
First disk	0
Second disk	1
Third disk	2
Fourth disk, first CD–ROM drive	3
First bootable (QIC) cartridge tape drive	4
Second bootable cartridge tape or First non–bootable (DAT, 8mm) tape drive	5
Third tape or second non–boot tape drive	6

Third parameter: specifying a logical unit

The third parameter specifies a drive's logical unit number (LUN). You rarely use the third parameter (*lun#*); it supplies additional information when the second parameter (*unit*) does not uniquely identify the bootstrap device.

If you have more than one drive managed by the same SCSI adapter board, the drives have the same SCSI ID number. The LUN differentiates drives managed by the same SCSI adapter. Two drives managed by the same adapter will have the same SCSI ID, but different LUNs.

Second–stage (file) argument

Typically, the first–stage boot brings up the operating system second–stage bootstrap, which uses any text it finds after the device specification in the boot path to bring up and properly initialize your operating system. You can use this second stage, or *file path*, argument to specify any executable file or program parameter (such as run level).

To specify a file path, append its specification just after the device specification (do not type a space after the right parenthesis), as described in the following subsections.

Using the file argument to boot from disk or CD–ROM

When booting from disk or CD–ROM, include the name of the executable image (*file*), preceded by the directory path to that file (*dir...*) and the name of the logical disk (*ld*) which contains the file.

Include a colon after the logical disk name (:) and separate each directory partition with a slash, according the following format:

[ld:][/dir...]file

You can omit the boot device specification and use the file path argument alone when booting from the default boot device (the first boot path stored in the Change Boot Parameters menu). The logical disk name and directory path are also optional; the file path starts from the root (root:) by default. The following is sufficient to boot the executable image file in the root directory of the first default boot device:

```
Jp#0/SCM> b file↵
```

Using the file argument to boot from tape

When booting from cartridge tape, you can specify the tape file number as the file path argument. For example, to boot file 1 (the second file) on a cartridge tape in the drive at SCSI ID 4, the full boot path is **st(ncsc(),4)2**.

Using the file argument to boot over a LAN

When booting as a client to a local area network server, you can specify the Internet address of the operating system server. Use the following format to specify a LAN boot path argument:

LAN–controller()[Server–Internet–address:]

For example, the following boot path specifies the server at Internet address 128.111.2.3 on the first Ethernet LAN:

dgen()128.111.2.3:

If you don't know your operating system server's Internet address, you can omit the second–stage argument and use only the LAN controller specification; your client gets the Internet address of the server and other information necessary to boot over the network.

An operating system server keeps information about each configured client in a boot parameters file. During the second–stage boot, the server sends the client its boot parameters. Refer to your operating system and network administration documentation for information about these boot parameters and for details about the LAN boot process.

Nonstandard devices

AViiON device drivers use a particular memory address (or addresses) to access each device controller. The device specification you use when booting a device includes this memory location, either explicitly or via device tables. Since the devices supplied by Data General are preconfigured to default memory–mapped I/O addresses, you do not explicitly name their addresses. In this chapter, we call these devices at default addresses *standard* boot devices. The "Arguments" section of this command description explains the syntax for booting standard devices.

If you configure devices that are *not* listed in Table 4–3, or if you do not use the DG/UX operating system's device drivers, standard device specifications apply only for the first–stage boot and may not apply at all. This section describes an extended format for specifying boot devices.

There are several reasons for using the extended, nonstandard device format for boot device specifications. You may need to configure a device controller at a different I/O address than the current Data General convention, or you may have more devices configured than can be named by the current defaults. You may want to change device configurations to accommodate your operating system or to configure additional devices not supplied by Data General.

Without the default parameter values used for standard devices, a boot path specification is even more complex. The extended format for an SCM boot path includes information you do not need when specifying standard boot devices. (Your operating system may store device information in this extended format, however.)

When you use nonstandard boot devices, you need to set configuration jumpers on the device and include its I/O address as the first parameter (*param1*) in device specifications.

The following is the format for an expanded or nonstandard disk or tape boot path argument:

dev[@vector]([param1],[param2],[param3])

Where	Means
dev()	The name of the device driver that supports the device.
[@vector]	The interrupt vector number, or device code.
[param1]	The memory–mapped I/O address of the controller.
[param2] and *[param3]*	Additional parameters, defined by the device driver, to identify fully the device.

For example: **sd@70(ffffe000,1)usr:/ops/program** specifies an executable image called **program** in directory **ops** located on the logical disk **usr**, the second physical disk connected to a SCSI adapter at the nonstandard base address FFFFE000; its device code (interrupt vector) is 70_{16}. This example assumes that the device driver **sd** is present, and that it defines each parameter as described.

The following is the format for an expanded or nonstandard LAN boot path argument:

dev[@vector]([param1],[param2],[param3])

Where	Means
dev()	The name of the device driver that supports the LAN controller.
[@vector]	The interrupt vector number, or device code.
[param1]	The memory–mapped I/O address of the controller. (VME A16 address).
[param2]	Additional parameter, defined by the device driver, to further identify the device. (VME A32 address).
[param3]	Additional parameter, defined by the device driver, to fully identify the device. (Alternate Ethernet address).

For example, the default specification for the first integrated Ethernet controller (jumpered according to its factory configuration) is dgen(). To specify a *different* Ethernet LAN controller (for example, a VMEbus Ethernet LAN) at a nonstandard address, the device specification includes the device code (interrupt vector) and both the VME A16 and A32 address, as follows: **dgen@14(ffff4d000,e1400000)**.

Examples

1. Boot the default system boot path.

   ```
   Jp#0/SCM> b ↵
   ```

2. Boot from file 0 on the first tape drive (SCSI ID 4).

   ```
   Jp#0/SCM> b st(ncsc(),4) ↵
   ```

   (Default third parameter and second stage boot: specifies **st(ncsc(),4,0)0**)

3. Boot from the third file on the tape in the second tape drive (SCSI ID 5).

   ```
   Jp#0/SCM> b st(ncsc(),5)2 ↵
   ```

4. Boot your DG/UX operating system kernel to run level 3.

   Jp#0/SCM> **b sd(ncsc(),0)root:/dgux -3** ↵

5. Boot AViiON Diagnostics (the program file **diags** located in the directory called **stand** on the logical disk **usr**) from the default system disk.

   Jp#0/SCM> **b sd(ncsc(),0)usr:/stand/diags** ↵

6. Boot any executable file called **bootfile** in the root directory on the second SCSI disk (SCSI ID 1).

   Jp#0/SCM> **b sd(ncsc(),1)root:/bootfile** ↵

7. Boot from the host at Internet address 128.111.5.6 on a VLC Ethernet LAN.

   Jp#0/SCM> **b dgen()128.111.5.6:** ↵

Displaying available SCM commands

Execute the **help** command to display an alphabetical list of the minimal mnemonic for valid SCM commands, the arguments each command accepts, and a brief command description.

Command format **help**

Arguments

None

Related messages

None

Examples

Determine valid SCM commands, their associated arguments, and what you can do with each one.

Jp#0/SCM> **h** ↵

```
                *** SCM Commands - Rev xx.xx ***

B     [dev([cntrl],[unit],[file#])]  -Boot a device
DATE  [date]                         -View/Change System date
F                                    -View/Change System Configuration
GMT   [±GMT]                         -View/Change GMT offset
H                                    -Display help message
P     [new prompt]                   -Change prompt
TIME  [time]                         -View/Change System time
R                                    -Reset system
RSI                                  -Display AV/Alert remote menu
S     address [trace count]          -Start processor
```

Changing the SCM prompt

The **prompt** command changes the default SCM prompt prefix to any specified ASCII string. This can be useful if you want to identify your system console display when you have multiple computers. The active job processor (cpu) number precedes the text string. The right bracket symbol (>) appears after the text prefix; if you change the prompt text to a null text string, your prompt is simply the right bracket symbol preceded by the active processor number.

Command format

prompt [*new–prompt*]

Arguments

new–prompt Text string of ASCII characters to replace the prompt. The ASCII string can have as many as 1510 characters. There are no character or symbol restrictions.

Related messages

```
Argument(s) out of range
```

Examples

Display the current SCM prompt; then change it to System1.

```
Jp#0/SCM> p ↵
Jp#0/SCM>

Jp#0/SCM> p System1 ↵
Jp#0/System1>
```

Reinitializing (resetting) your system

The **reset** command initializes system hardware elements (excluding memory) to their original powerup state.

Unlike a *cold reset* (power applied to the system), a *warm reset* (initiated by software or the RESET command) does not initialize memory or run powerup diagnostics.

CAUTION: Do not enter **r** *at the SCM prompt accidentally. You cannot use* **<Ctrl–C>** *or an SCM command to recover.*

Command format **reset**

Arguments

None

Related commands

boot	Issues a reset command, boots a device.

Related messages

`System Reset`

Examples

Reset the system.

```
Jp#0/SCM> r ↵

.....
 PSR       XPC       NPC       FPC
 A00003F2  FFC0264A  FFC0264E  FFC02652
```

Displaying your Remote Service (AV/Alert support) Interface

If your system has a valid hardware service contract and the AV/Alert service enabled, you can view the AV/Alert Remote Support menu using the Remote Service Interface (**rsi**) command. In systems with AV/Alert disabled, the command displays only the `Dynamic Password` option; you must install a proprietary, dynamic password to enable AV/Alert. Refer to *Using AViiON® Diagnostics and the AV/Alert[sm] Diagnostic Support System* for information about enabling AV/Alert or using the AV/Alert support menu.

Command format

rsi

Examples

The following examples demonstrate the immediate results of executing the **rsi** command.

1. In a system with a valid hardware service contract, display the AV/Alert service menu.

   `Jp#0/SCM>` **rsi**↵

```
          REMOTE MENU

1         Remote Access Password  []
2         Remote Enable/Disable  [Enabled]
3         Remote Phone Numbers
4         Remote Dialout
5         Pause MI  [Enabled]
6         Dynamic Password
7         Status
8         Reset Modem
9         View System ID
10        Return to previous screen

Enter choice ->
```

2. In a system in which AV/Alert is disabled, use the **rsi** command.

   `Jp#0/SCM>` **rsi**↵

```
          REMOTE MENU

1         Dynamic Password
2         Return to previous screen

Enter choice ->
```

Starting your system from a memory address

The **start** command begins a job processor (executing a program) at the main memory address specified. The operating system or user program resumes system control unless you use the *trace–count* argument.

This command is commonly used to collect a dump from a system that just reset after a "hard DG/UX hang." Use the command `SCM>`**s 1000** for this purpose.

Command format

start *address* [*trace–count*]

Arguments

address Memory location at which the processor starts executing.

trace–count The system displays the address, data, and mnemonic (in that order) after executing the hexadecimal number of instructions you specify with this argument. Then the system halts and the monitor displays status information.

Related commands

boot	Boots a device.

Related messages

None

Examples

Start processor executing at address 1000

```
Jp#0/SCM> s 1000 ↵
```

Entering the SCM configuration menu system

The **format** command displays the View or Change System Configuration menu. You access all SCM menus to set configuration parameters from the View or Change System Configuration menu.

Command format **format**

Arguments

None

Related commands

None

Related messages

None

Examples

Display the View or Change System Configuration menu.

```
Jp#0/SCM> f↵
```

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->
```

Using SCM menus

You reach all SCM menus from the View or Change System Configuration menu. From this primary menu you can display or modify several system configuration parameters.

Summary of menus and menu conventions

To display the View or Change System Configuration menu, use the **format** command. Enter the following command line at the SCM prompt:

```
Jp#0/SCM> f↵
```

The system will display the following menu.

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->
```

Two of the View or Change System Configuration menu options provide submenus from which you can choose specific configuration parameters, as shown in Figure 4–1. The other options provide direct access to the parameter listed.

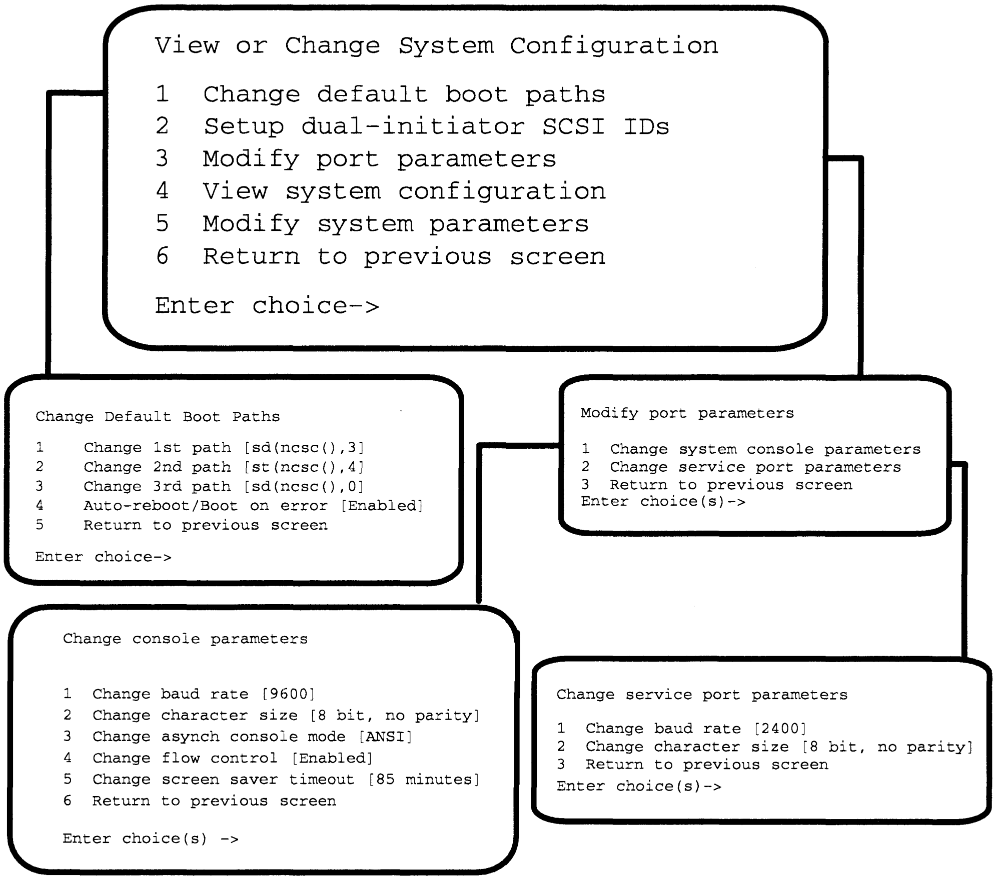


Figure 4–1 System Control Monitor (SCM) menus

Most changes you make while using SCM menus become effective immediately; some might require you to power up or reset the computer. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 2.

You can exit from any menu by selecting the last item on the menu. You return to the previous menu, *except* when you leave the View or Change System Configuration menu; when you exit from the View or Change System Configuration menu you return to the SCM prompt.

You can select multiple items to view or change at the `Enter choice(s)->` prompt on each menu. The SCM executes the items in sequence before returning to the menu screen. Use a space or a comma to separate item numbers.

Changing the default system boot paths

Whenever you start your system, the SCM begins an automatic boot sequence after powerup testing completes. The SCM uses the default system boot paths to find the automatic boot device. It uses these same default system boot paths whenever you use the **boot** command without an argument. The first default system boot path is usually your operating system.

If you do not set valid default system boot paths (or if you leave the boot paths empty), the default boot paths are not initialized. When you power on the computer without an initialized boot path, the SCM uses a hardwired sequence to attempt a boot from an internal SCSI tape drive. If it cannot boot from the tape drive (your system may not even include an internal tape), it enters the System Control Monitor.

IMPORTANT: The default system boot paths were initialized at the factory to boot the DG/UX installer system from a CD–ROM device, a tape drive, or the first SCSI hard disk.

To view the boot paths for the devices on your system, you can use FORMAT menu option 5, "View System Configuration," as described later in this chapter.

Specifying boot devices

This section briefly describes the device specifications for booting your computer from disk or tape or across a LAN. You use this information as a *boot path* argument to the SCM **boot** command or as an entry for your system's *default* boot path in the View or Change System Configuration menu.

Because the boot process is very flexible, it can sometimes be complex. Therefore, this section provides a quick reference that emphasizes default (standard) configurations. It reviews information detailed in the preceding section of this chapter, "Using the boot command." You may need to review that section if you have any nonstandard devices configured with your computer.

About the bootstrap process

To identify any peripheral device to the system you must provide a *device specification*, a software descriptor that uniquely identifies that device. An SCM *boot path* is a device specification for a bootable hardware device and, optionally, a second software descriptor that identifies an executable image on the booted media called the *file path*. The SCM passes the file path to the booted program after loading the first stage bootstrap from the boot device.

The boot device specification and the optional file path represent a first– and second–stage boot process; together, they constitute a full boot path. Figure 4–2 shows their combined formats. A full boot path contains a maximum of 80 characters.

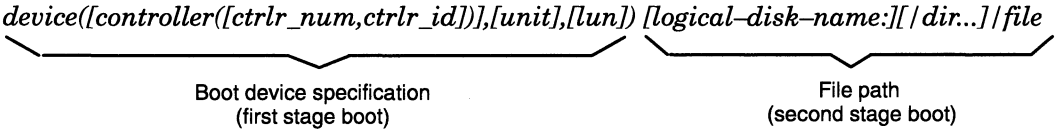


Figure 4–2 Full boot path format

IMPORTANT: The syntax for booting over a LAN is slightly different; see the section "Booting over a local area network."

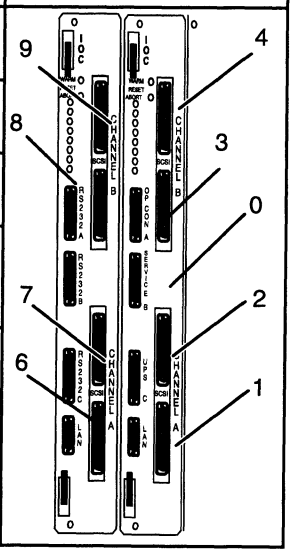
The following sections define the first– and second–stage boot paths for disk, CD–ROM, tape, and LAN boot devices.

Booting from disk, CD–ROM, or tape

This section defines the first–stage boot path for internal or external disk and tape devices in systems using single–initiated Small Computer System Interface (SCSI) buses. Note that your system identifies CD–ROM as a disk device.

Table 4–6 lists the first–stage boot paths (device specifications) you use to boot from drives on your internal and external SCSI buses. Use this specification syntax to boot from devices on all buses in your system, substituting the appropriate controller number 0–4, 6–9 (the *ctrlr_num* parameter shown in Figure 4–2) for the x specified in Table 4–6. Note that controller numbers are associated with their physical location within your system. The system will assume a default *ctrlr_num,ctrlr_id* of 0,7 if you do not enter a value in this field; you *must* include the open and closed parenthesis () in any boot path specification.

Table 4–6 Boot specifications for disk and tape drives

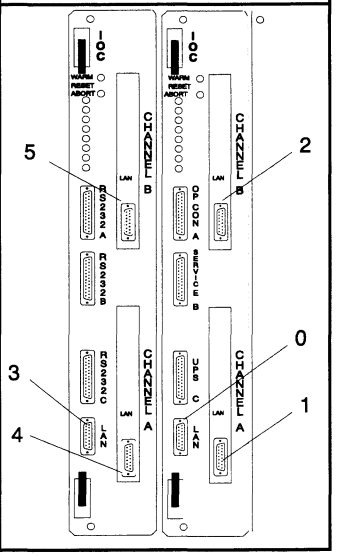
Device	Specification (syntax)	Controller Numbers (internal =0)
First disk drive	**sd(ncsc(x),0)**	
Second disk drive	**sd(ncsc(x),1)**	
Third disk drive	**sd(ncsc(x),2)**	
Fourth disk drive or first CD–ROM	**sd(ncsc(x),3)**	
First tape drive	**st(ncsc(x),4)**	
Second tape drive	**st(ncsc(x),5)**	
Third tape drive	**st(ncsc(x),6)**	

IMPORTANT: The specifications in Table 4–6 assume that drive jumpers are set according to their factory configuration. The default single–initiator SCSI controller ID of 7 and the default lun of 0 are not included in the specification. For a detailed explanation of how to boot from devices on shared unit IDs and/or dual–initiated SCSI buses, refer to *Managing the DG/UX™ System.* If appropriate for your system, refer also to your CLARiiON® storage system documentation.

Booting over a local area network

This section describes boot paths for LAN devices. Table 4–7 lists the specifications for LAN controllers you may have in your system configuration.

Table 4–7 Boot specifications for LAN devices

Controller (Location)	Specification	Controller Numbers
IOC 0 integrated Ethernet LAN (slot 8)	**dgen(0)**	
IOC 0 expansion LAN CHANNEL A (slot 8)	**dgen(1)**	
IOC 0 expansion LAN CHANNEL B (slot 8)	**dgen(2)**	
IOC 1 integrated Ethernet LAN (slot 6)	**dgen(3)**	
IOC 1 expansion LAN CHANNEL A (slot 7)	**dgen(4)**	
IOC 1 expansion LAN CHANNEL B (slot 7)	**dgen(5)**	

When you boot over a LAN, the boot device is your computer's LAN controller. In the second–stage bootstrap argument, specify the Internet address of the server. For example, the following boot path specifies the server at Internet address 128.111.2.3 on the first Ethernet LAN:

dgen(0)128.111.2.3:

Specifying a second–stage boot file

Typically, the first–stage boot brings up the operating system second–stage bootstrap, which uses any text it finds after the device specification in the boot path to bring up and properly initialize your operating system. You can use this second stage, or *file path*, argument to specify any executable file or program parameter (such as run level).

For example, the file path **usr:/stand/diags** refers to the AViiON System Diagnostics program file, called **diags**, located in the directory **stand** on the logical disk **usr**. To boot **diags** from the disk at SCSI ID 0, use the following boot path:

sd(ncsc(),0)usr:/stand/diags

You can also specify a tape file number using the file path argument. For example, if **diags** is the third file on a tape defined as SCSI ID 4, the full boot path is **st(ncsc(),4)2.**

Using the Change Default Boot Paths menu

To view, initialize, or change the default boot device(s), follow these steps:

1. While in the View or Change System Configuration menu, type **1** and press New Line to select item 1, "Change default system boot paths."

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->1 ↵
```

2. The system displays the Change Default Boot Paths Menu. The display includes current system boot paths inside square brackets, as follows:

```
        Change Default Boot Paths

1  Change 1st path [sd(ncsc(),3]
2  Change 2nd path [st(ncsc(),4]
3  Change 3rd path [sd(ncsc(),0]
4  Auto-reboot/Boot on error [Enabled]
5  Return to previous screen

Enter choice-> ↵
```

IMPORTANT: The boot path is *not initialized* when the brackets are empty.

To keep the existing boot paths, simply press New Line at the prompt, or select item 5, "Return to previous screen."

To set or change a boot path, type the appropriate number and press New Line at the `Enter choice->` prompt.

The system displays the following prompt.

```
Enter new path ->
```

3. Type a valid boot path (*device specification*) and press New Line. Refer to Table 4–6 and Table 4–7 for valid entries.

CAUTION: If you don't enter anything at the prompt, and press New Line, the SCM empties the path.

For example, to boot the DG/UX operating system from the first SCSI disk — boot path **sd(ncsc(),0)** and file path **root:/dgux** — type the following for the first default boot path:

```
Enter new path -> sd(ncsc(),0)root:/dgux ↵
```

The SCM will now automatically attempt to boot DG/UX from this device at every powerup.

4. After you specify a new default boot path, the SCM immediately returns to the change default boot paths menu, and displays your new entry in brackets, as shown below.

```
        Change Default Boot Paths

1  Change 1st path [sd(ncsc(),0)root:/dgux]
2  Change 2nd path [st(ncsc(),4]
3  Change 3rd path [sd(ncsc(),0]
4  Auto-reboot/Boot on error [Enabled]
5  Return to previous screen

Enter choice-> ↵
```

Enabling or disabling auto-reboot

If your operating system comes down unexpectedly (without an operator bringing it down in the controlled fashion described in Chapter 2), AViiON® 8500 systems are set by default to automatically attempt to reboot the operating system from the default boot paths. During powerup, systems set to the factory default also attempt to boot despite powerup errors by deconfiguring faulty components and bringing the system up in a degraded mode. (Refer to Chapter 3 for a more thorough discussion of AViiON 8500 autoboot and deconfiguration features.)

You can disable or enable your system's automatic boot features from the Change Default Boot Paths menu. With auto–reboot/boot on error disabled, a system panic, operating system failure, or powerup diagnostic failure brings your system to the SCM prompt, where it awaits your input.

To change your auto–reboot/boot on error setting, follow these steps:

1. While in the View or Change System Configuration menu, type **1** and press New Line to select item 1, "Change default system boot paths."

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->1 ↵
```

2. The system displays the Change Default Boot Paths menu. The display shows the current auto–reboot setting inside square brackets, as follows:

```
        Change Default Boot Paths

1  Change 1st path [sd(ncsc(),3]
2  Change 2nd path [st(ncsc(),4]
3  Change 3rd path [sd(ncsc(),0]
4  Auto-reboot/Boot on error [Enabled]
5  Return to previous screen

Enter choice->4 ↵
```

3. To keep the existing auto–reboot setting, simply press New Line at the prompt, or select item 5, "Return to previous screen."

4. To reverse the current setting, type **4** and press New Line to select item 4, "Auto–reboot/Boot on error."

   If auto–reboot is currently enabled, selecting the menu item will disable it immediately. If auto–reboot is disabled, you will immediately enable the feature.

5. After you select your auto–reboot setting, the SCM immediately returns to the change default boot paths menu, and displays your new setting in brackets.

```
        Change Default Boot Paths

1  Change 1st path [sd(ncsc(),3]
2  Change 2nd path [st(ncsc(),4]
3  Change 3rd path [sd(ncsc(),0]
4  Auto-reboot/Boot on error [Disabled]
5  Return to previous screen

Enter choice-> ↵
```

   Select item 4 again if you wish to toggle auto–reboot to its previous setting.

Setting SCSI bus operating parameters

The Small Computer System Interface controller(s) in your system control peripheral device buses conform to the SCSI–2 specification. You can use the SCM menus described in this section to do the following:

- View or change the data transfer speed of the internal (integrated to the system board) bus
- Define the controller ID and number for dual–initiated systems

Viewing or changing the identification list for dual–initiator SCSI controllers

In order to use a *dual–initiator* configuration (in which two host computers share a single SCSI bus), your system software needs a way to determine the SCSI identification of each host controller/adapter. The DG/UX system and AViiON System Diagnostics refer to a firmware database to determine your configuration and avoid conflict on the SCSI bus. SCM configuration item 2, "Setup dual–initiator SCSI IDs," allows you to view and make entries to your host computer firmware's list of SCSI host controller identifications.

IMPORTANT: We strongly recommend that the person who sets up your dual–initiator configuration enter the device names of each of your system's SCSI buses in this menu.

For detailed explanations of dual–initiated systems, see your CLARiiON and DG/UX documentation; if your system does not use a dual–initiator (multihost) SCSI configuration, you will not need to use this option.

Using the Setup Dual–Initiator SCSI ID menu

To view, list, delete, or enter the device names of SCSI buses on your host, follow these steps:

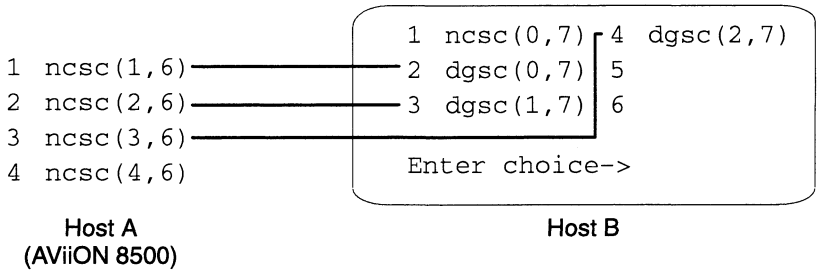
1. While in the View or Change System Configuration menu, type **2** and press New Line to select item 2, "Setup dual–initiator SCSI Ids."

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->2
```

The system displays a list of valid SCSI controller specifications. **0 and 5 will always be 7 and cannot be dual-inited** If you or another system administrator has not manually entered any specifications, the list contains no entries. If someone has previously entered controller identifications, the list appears similar to the following example, in which the system operator has entered the host computer's specifications for four dual–initiated buses:

```
1  ncsc(1,6)              11
2  ncsc(2,6)              12
3  ncsc(3,6)              13
4  ncsc(4,6)              14
5                         15
6                         16
7                         17
8                         18
9                         19
10                        20

Enter choice->
```

Note that in the example above, the operator has assigned the device (controller) ID of 6 to the four optional SCSI controllers in the system. Corresponding entries in the second host's SCSI ID table can use any valid controller type and number, but require alternate device identifications. (For convenience and consistency, we recommend that one host in a dual–initiated configuration use device id 7 for its adaptor on every shared bus, and that its counterpart use device id 6.) The following example compares ID lists in a dual–initiated system configuration with an AViiON 8500 and another AViiON host computer. The lines between list entries indicate physically shared buses.



2. Type the number of the specification field you want to alter, and press New Line. The system then asks you to enter the SCSI controller identification:

```
Type controller specification ->
```

3. Enter the controller specification and press New Line, as shown in the next example. If you want to delete a specification from the table, simply press New Line without entering a new SCSI ID.

```
1  ncsc(1,6)                11
2  ncsc(2,6)                12
3  ncsc(3,6)                13
4  ncsc(4,6)                14
5                           15
6                           16
7                           17
8                           18
9                           19
10                          20

Enter choice->5↵

Type controller specification ->ncsc(6,6)↵

Enter choice->
```

4. Repeat steps 2 and 3 as necessary until you have specified all of your system's shared SCSI buses.

5. Verify the menu entries displayed on your screen by comparing them to any system configuration worksheets you might have received with your SCSI devices. Press New Line at the `Enter choice ->` prompt to return to the View or Change System Configuration menu.

Modifying system console port parameters

Items on the Modify Port Parameters menu allow you to set the operating parameters for a device connected to the system console (OP CON) port or to view the default values for these parameters. The following subsections describe how to view or change console parameters.

The *system console* refers to the keyboard and display device that receive powerup diagnostic test messages and from which you bring up your operating system.

IMPORTANT: If you connect a terminal for use as a system console, make sure that the characteristic settings on the terminal correspond to the parameter settings for the system console port. Power down the computer if you are connecting a new terminal or changing the terminal characteristics.

Changes you make through the SCM Modify Port Parameters menu option do not affect the port devices until you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 2.

1. To display the Modify Port Parameters menu, type **3** and press New Line while in the View or Change System Configuration menu.

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->3 ↵
```

The system displays the Modify Port Parameters menu, as follows:

```
Modify port parameters

1     Change system console parameters
2     Change service port parameters
3     Return to previous screen
Enter choice(s)->1 ↵
```

2. Select option 1, "Change system console parameters," to display the Change Console Parameters Menu.

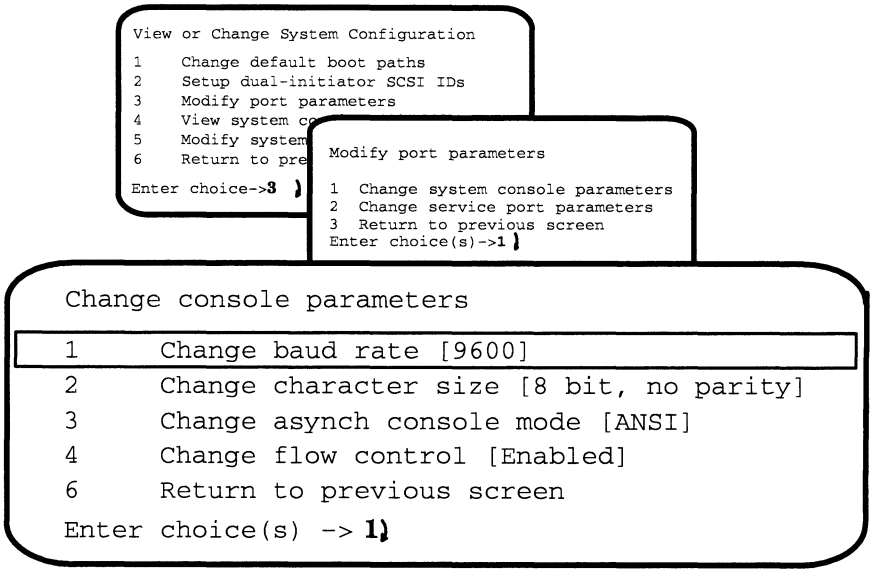
```
Change console parameters

1     Change baud rate [9600]
2     Change character size [8 bit, no parity]
3     Change asynch console mode [ANSI]
4     Change flow control [Enabled]
6     Return to previous screen
Enter choice(s) ->
```

The next sections in this chapter describe how to change the system console port's baud rate, character size, mode, XON/XOFF flow control setting, and screensaver time–out.

Changing the system console baud rate

The current system console baud rate is displayed as part of the "Change baud rate" selection of the Change Console Parameters menu. To change the baud rate, follow these steps:

3. Type **1** and press New Line to select item 1, "Change baud rate."



The system displays the Change Baud Rate menu.

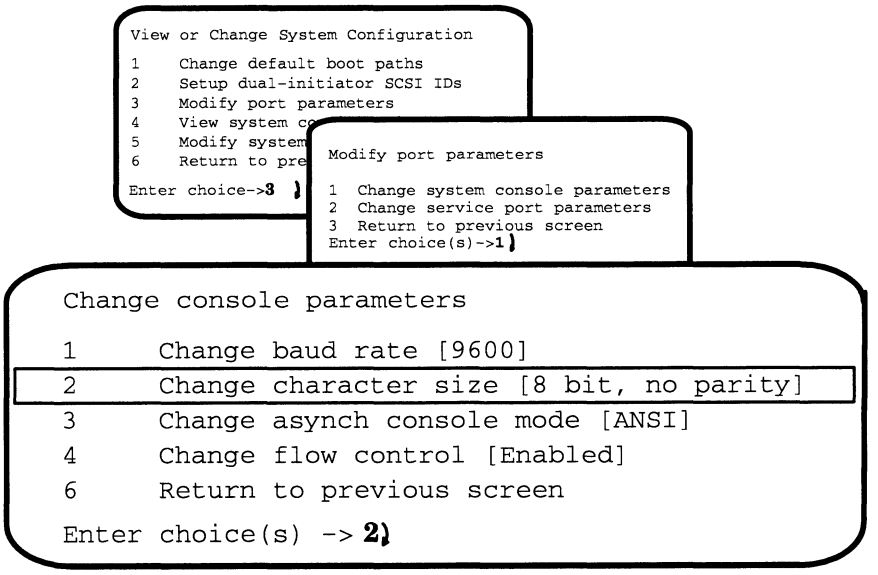
```
Change baud rate

1       300
2       600
3       1200
4       2400
5       4800
6       9600
7       19200
8       Return to previous screen
Current baud rate [9600]

Enter choice(s)->
```

4. Type the item number of the baud rate you want and press New Line.

   The new baud rate will take effect after you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 2.

Changing the system console character length

The current system console character length is displayed as part of the "Change character size" selection of the Change Console Parameters menu.



1. To change the character length, type **2** and press New Line.

CAUTION: The DG/UX operating system requires that your system console be set to 8 data bits, no parity.

The system displays the Change Character Size menu.

```
Change character size

1      8 bit, no parity
2      7 bit, even parity
3      7 bit, odd parity
4      7 bit, mark parity
5      7 bit, no parity
6      Return to previous screen

Current character size is [8 bit, no parity]

Enter choice(s)->
```

2. Type the item number of the character size you want and press New Line.

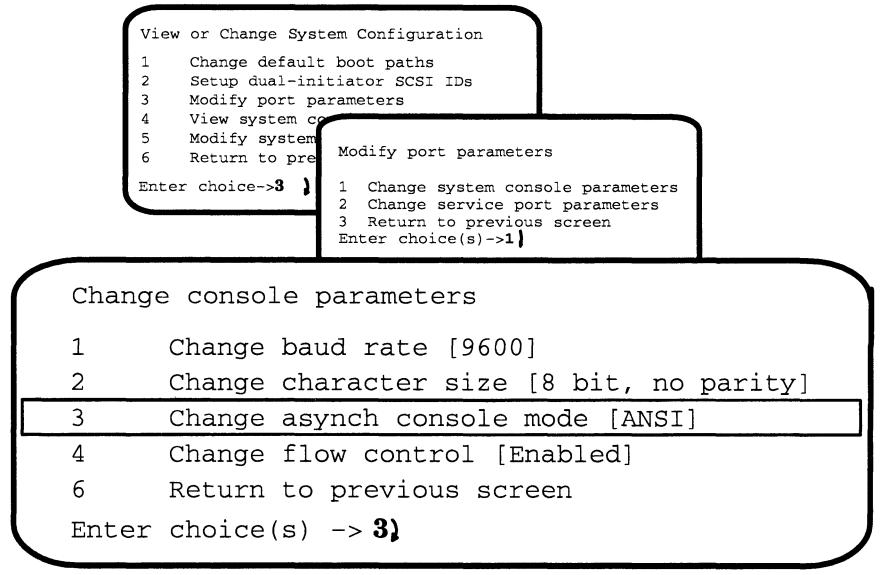
   The new setting will take effect after you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 2.

Changing the system console mode

The current system console mode is displayed as part of the "Change asynch console mode" selection of the Change Console Parameters menu.

1. While in the View or Change System Configuration menu, type **3** and press New Line to select item 3, "Modify port parameters."
2. Select item 1, "Change system console parameters."

   The system displays the current value in brackets next to item 3 on the Change Console Parameters menu.



3. Select item 3, "Change asynch console mode" to change the default character code setting for the system console port.

   See the documentation that came with the terminal for information about supported character modes.

CAUTION: The console character code set must be ANSI if you use the DG/UX operating system.

If the character set is currently ANSI, you will change the specification to DG mode. If the character set is currently DG mode, you will change it to ANSI. You return to the Change Console Parameters menu without further screen display. Select item 3 again to toggle it to its previous setting.

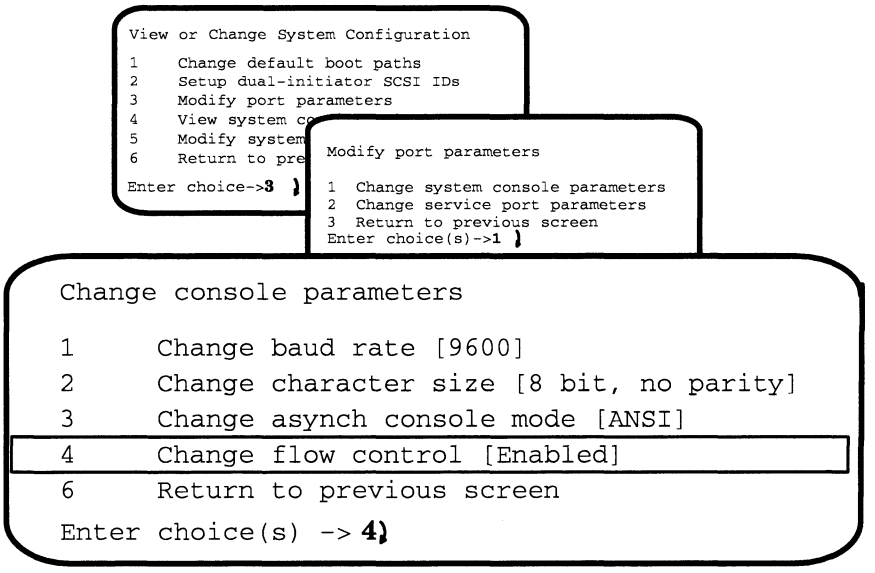
The new console mode will take effect after you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 2.

Enabling or disabling system console flow control

With flow control (XON/XOFF protocol) enabled, you can use the **<Ctrl–S>** sequence to suspend screen output and **<Ctrl–Q>** to resume screen display while in the SCM. Flow control is enabled within the SCM by default.

1. While in the View or Change System Configuration menu, type **3** and press New Line to select item 3, "Modify port parameters."
2. Select item 1, "Change console parameters".
3. Select item 4, "Change flow control" to enable or disable the default flow control setting (while in the SCM).

   The system displays the current value in brackets.



If flow control is currently enabled, selecting item 4 will disable it; if flow control is currently disabled, the selection will enable it.

IMPORTANT: Your selection at this menu does not affect flow control for your operating system or stand–alone programs.

The new console characteristic will take effect after you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 2.

Changing service (AV/Alert) port parameters

Use the Change Service Port Parameters menu to specify the proper configuration for the service (modem) port, which is located on the computer rear panel. Make sure that the device and the port have the same settings.

IMPORTANT: The SCM will not specify parameters for the UPS asynchronous port, or RS232 ports A, B, and C on an optional second IOC board. Set these parameters through your operating system as open user dev/tty terminal nodes. (Refer to *Managing the DG/UX™ System*.)

1. While in the View or Change System Configuration menu, type **3** and press New Line to select item 3, "Modify port parameters."

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->3 ↵
```

The system displays the Modify Port Parameters menu, as follows:

```
Modify port parameters

1     Change system console parameters
2     Change service port parameters
3     Return to previous screen
Enter choice(s)->2 ↵
```

2. Select option 2, "Change service port parameters."

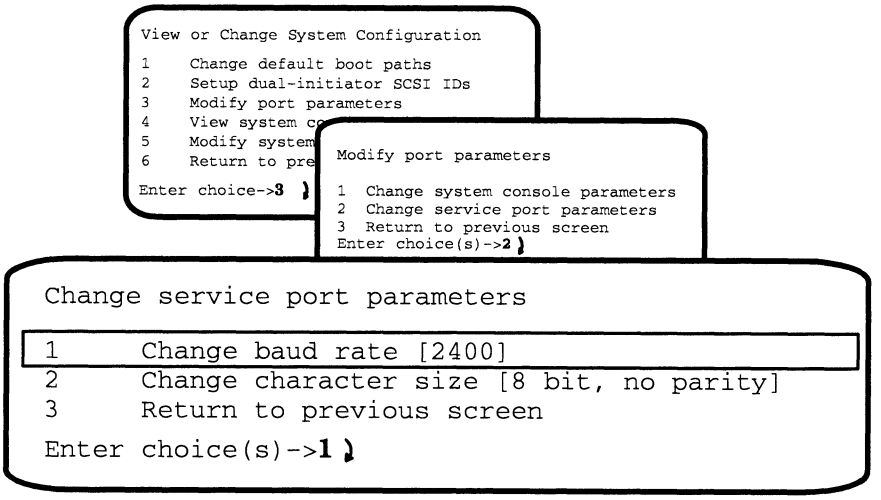
The system displays the Change service port Parameters menu (with current default values in brackets), as follows:

```
Change service port parameters

1  Change baud rate [2400]
2  Change character size [8 bit, no parity]
3  Return to previous screen

Enter choice(s)->
```

3. Select the item you want to change (baud rate or character length) by entering the item number and pressing New Line. Proceed with the appropriate section that follows.

Changing the service port baud rate

The system displays the current baud rate in brackets. See the documentation that came with your modem for information on the modem's baud rate(s).



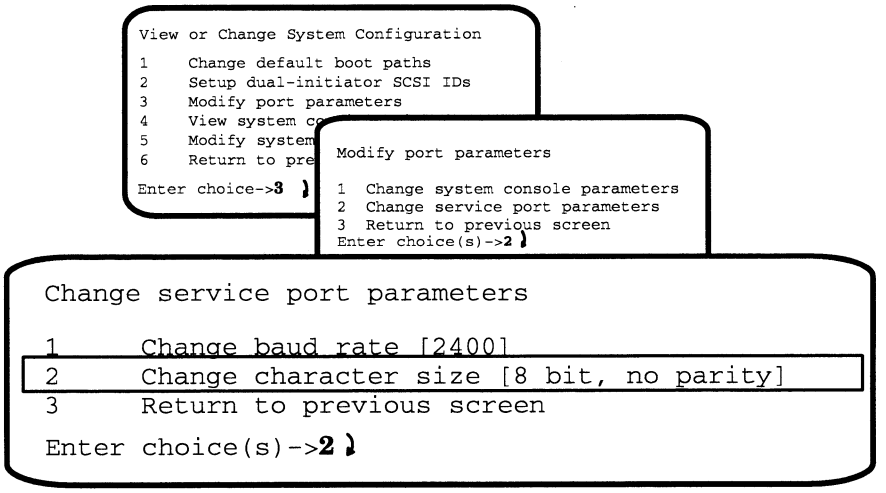
To change the baud rate, type the item number of the baud rate you want, and press New Line.

```
Change baud rate

1      300
2      600
3      1200
4      2400
5      4800
6      9600
7      19200
8      Return to previous screen
Current baud rate [9600]

Enter choice(s)->
```

The new baud rate will take effect after you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 2.

Changing the service port character size

Use item 2, "Change character size" to change the character size for the service port. The default value is 8 data bits, no parity. See the documentation that came with your device for information about setting the correct character length and parity.



To change the character size, type the item number of the character size you want, and press New Line.

```
Change character size

1     8 bit, no parity
2     7 bit, even parity
3     7 bit, odd parity
4     7 bit, mark parity
5     7 bit, no parity
6     Return to previous screen

Current character size is [8 bit, no parity]

Enter choice(s)->
```

The new character size will take effect after you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 2.

Displaying the system configuration

While in the View or Change System Configuration menu, type **4** and press New Line to view the system configuration.

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->4
```

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->4 ↵
```

The system displays the same information you see in the powerup initialization messages. The display contains information similar to the following:

```
Memory size is 128 Mbytes
Top of memory = 1FFFFFC hex
Top of memory for use = 1FBFFFC hex
Memory module 0 contains 32 Mbytes
Memory module 1 contains 32 Mbytes
Memory module 2 contains 32 Mbytes
Memory module 3 contains 32 Mbytes

Integrated SCSI:
       Size SCSI bus? [y]n    y ↵
       Enter host SCSI ID [7]    ↵
       ID0: FUJITSU disk drive    Boot specification sd(ncsc(0),0)
       ID4: TANDBERG tape drive   Boot specification st(ncsc(0),4)

IOCO Integrated LAN: Ethernet address is 08:00:1B:20:00:66
                     BOOT SPECIFICATION dgen(0)

Press any key to continue.
```

To identify devices on a SCSI bus, answer **y** (for yes) and press New Line at the sizing prompt, as shown in the example above. The system then consults the dual–initiator SCSI ID table (discussed earlier in this chapter under "Viewing or changing the identification list for dual–initiator SCSI controllers") for the host SCSI ID. If it does not find a controller ID in the firmware database, the system assumes the default value of 7. The system console then displays detailed device and boot path information for each SCSI device it finds at that controller address.

Changing the VME A24 configuration

It is very unlikely that you will ever need to complete the steps in this section. The Change VME A24 Configuration menu lets you alter the way default system address mapping allows access to VME A24 space. *You do not need to reconfigure A24 space if you purchased VME controllers from Data General.*

CAUTION: Do not make changes in the VME A24 configuration menu unless you have one or more A24–type controllers ***and*** *you are familiar with VME programming and configuration concepts.*

Logic within the system board controls access to portions of system address space. Address decoders, in conjunction with programmable address maps, regulate accesses to and from the system board. The VMEbus Address Decoder (VAD) enables access from a VME controller to system memory. VAD mapping determines how the 16 megabytes of A24 address space is accessed. At powerup, system firmware loads and verifies the VAD to default values. The Change VME A24 Configuration menu allows you to change this default A24 space mapping.

An A24 board that directs data transfers between itself and other VMEbus boards contains a *MASTER module*. If the same board contains memory accessible from the VMEbus, it also contains a *SLAVE module*. When a VME A24 Location Module is in SLAVE mode, it detects Data Transfer Bus (DTB) cycles initiated by a MASTER and can transfer data between itself and the MASTER. When A24 is in MASTER mode, it initiates DTB cycles in order to transfer data between itself and a SLAVE module. Since A24 space is partitioned into four 4–megabyte pages, you can specify which pages of A24 address space function in SLAVE mode and which are in MASTER mode using this menu.

The combination, type, and use of VME A24 controllers in your system determines how you should configure A24 address space.

See *The VMEbus Specification,* from Motorola Corporation, for more information about DTB master and slave functionality.

To change the VME A24 configuration, select the appropriate menu option while in the View or Change System Configuration menu.

```
View or Change System Configuration

1  Change default boot paths
2  Setup dual-initiator SCSI IDs
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice->5 ↵
```

The system displays a menu similar to the following:

```
Change VME A24 configuration

1 VME A24 Page 0  [(DTB Slave Mode (VME-to-MBUS)]
2 VME A24 Page 1  [(DTB Master Mode (MBUS-to-VME)]
3 VME A24 Page 2  [(DTB Slave Mode (VME-to-MBUS)]
4 VME A24 Page 3  [(DTB Master Mode (MBUS-to-VME)]
5 Return to previous screen

Enter choice(s)->
```

The system displays the current value in brackets next to the item for each page of VME A24 space. The screen above shows the default configuration. If an A24 page is currently configured in SLAVE mode, you will change the default to MASTER mode by selecting the corresponding item number; if the page is currently in MASTER mode, you will change it to SLAVE.

Type the item numbers of pages you want to toggle, and press New Line.

End of Chapter

A Specifications

This appendix lists basic specifications and configuration guidelines for AViiON 8500 series computer systems. Most systems consist of the computer unit, mass–storage devices, a system console, user terminals, modems, and printers. Your system might also include CLARiiON storage systems and LAN–based devices such as workstations.

Environment

Temperature:	
Operating	10 through 38 °C; 50 through 100 °F
Storage	–40 through +65 °C;–40 through +149 °F
Relative humidity:	
Operating	20–80%, noncondensing
Storage	10–90%, noncondensing
Altitude:	
Operating	0–2438 m; 0–8000 ft
Storage	0–7620 m; 0–25000 ft
Minimum clearance:	
Front	45.72 cm; 18 in
Back	45.72 cm; 18 in
sides	5.08 cm; 2 in

Standard components

The computer unit comes in a deskside package 69 cm (26.9 inches) high, 45 cm (17.6 inches) wide, and 63.5 cm (24.7 inches) deep. At maximum configuration, the basic system weighs 75 kg (165 lbs).

The computer unit includes the power supply, cooling fans, VME backplane with VME system control board, and a 9–slot system backplane printed–circuit board.

A standard system backplane configuration contains:

- one system processor board
- one memory board
- one input/output controller (IOC) board

See the "Optional components" section for maximum configurations.

Power supply

120–240 Vac

1020 W maximum total output power, including the following maximums per output:

+5 V dc	— 140 A	
+12 V dc	— 20 A	
–12 V dc	— 4 A	
+2 V dc	— 12 A	
+12 V fan	— 5 A	(used internally by system fans)

Single–phase ac

Frequency range 47 Hz through 63 Hz.

Input range 90–276 V ac: wide range, auto–select

Current rating (draw):

12 A maximum @ 100 volts
12 A maximum @ 120 volts
7 A maximum @ 200 volts

100 Vac

Configurations are limited to draw 850 W maximum total from power supply outputs.

AViiON 8500 system processor board

Each AViiON 8500 system processor board contains:

- two 45-Mhz Motorola 88110 Central Processing Units (CPUs)
- one 256-Kbyte Motorola 88410 Secondary Cache Controller

AViiON 8500 Plus system processor board

The system processor boards for 2-, 4-, or 6-processor AViiON 8500 Plus configurations contain:

- two 50-MHz Motorola 88110 Central Processing Units (CPUs) with 16-Kbyte on–chip cache
- one 1-Mbyte Motorola 88410 Secondary Cache Controller

Processor boards for 8-processor AViiON 8500 Plus systems contain:

- four 50-MHz Motorola 88110 Central Processing Units (CPUs) with 16-Kbyte on–chip cache
- two 1-Mbyte Motorola 88410 Secondary Cache Controller

System memory board

The AViiON 8500 system memory controller board supports:

- 32- or 128-Mbyte memory modules
- Maximum of 16 memory modules (2-Gbytes total)
- ECC with single–bit error correction and double–bit detection

Integrated input/output controller (IOC)

The AViiON 8500 system backplane contains one or two IOC boards. Standard devices connect to the first IOC, in the slot marked 8 (IOC board 0). If your system includes two IOC boards, IOC board 1 fills slots 6 and 7.

Each IOC contains slots for two optional daughter boards, plus external connectors for the following standard components:

- IEEE 10-Base-5 Ethernet LAN controller
- Three serial ports:
  RS–232–C line for system console
  RS–232–C line for AV/Alert service (modem)
  RS–232–C line for Uninterrupted Power Supply (UPS)
- One single–ended SCSI–2 controller (for internal devices)

Internal SCSI devices

Each IOC board in your system includes an on–board SCSI–2 controller/adapter dedicated to *internal* (within the computer unit chassis) devices. These on–board controllers (SCSI ID 0 and 5) have no visible external connectors. External mass storage options require additional SCSI–2 adaptors, and are described later in this appendix.

The internal SCSI configuration includes as many as 4 or 7 singled-ended, half-height devices, depending on your chassis type.

Standard with every system are the following 5.25-inch SCSI-2 devices:

- 600–Mbyte read–only memory compact disk (CD–ROM)
- multicapacity 1/4–inch cartridge (QIC) tape

You may also have the following 3.5-inch SCSI-2 devices:

- 2-Gbyte 4-mm Digital Audio Tape (DAT)
- .5-Gbyte Winchester hard disk

VMEbus

Each AViiON 8500 series system includes a 6–slot backplane printed–circuit board with VME bus, electrically compliant with Motorola VME specification, Revision C.1.

A daughter card attached to the IOC board in system slot 8 contains VMEbus arbitration logic; it occupies VME slot 1. The remaining 5 slots in the VME backplane are available for VMEbus optional controllers.

CAUTION: VME slot 2 restricted to DGC–supplied boards only.

Optional components

Your computer unit may include a combination of the following optional printed–circuit boards.

IMPORTANT: For detailed configuration information, contact your Data General representative. Board maximums depend on the system configuration; software restrictions might also apply.

System processor expansion

AViiON 8500 systems include on or two processor boards; each contains the following:

- two 45-MHz Motorola 88110 Central Processing Units (CPUs)
- one 256-Kbyte Motorola 88410 Secondary Cache Controller

AViiON Plus systems (in 2-, 4-, or 6-processor configurations) include one to three processor boards; each contains the following:

- two 50-Mhz Motorola 88110 Central Processing Units (CPUs) with 16-Kbyte on–chip cache
- one 1-Mbyte Motorola 88410 Secondary Cache Controller

An 8-processor AViiON 8500 Plus configuration includes two processor boards, each board contains:

- four 50-Mhz Motorola 88110 Central Processing Units (CPUs) with 16-Kbyte on–chip cache
- two 1-Mbyte Motorola 88410 Secondary Cache Controllers

Memory expansion

One optional memory controller board supporting a maximum of eight 32– or 128–Mbyte memory SIMMs

2 Gbytes maximum per system.

Input/Output expansion

An expansion IOC (IOC board 1) fills slots 6 and 7. The second IOC board provides the following additional external connectors:

- one integrated IEEE 10-Base-5 Ethernet LAN controller
- three serial ports with modem support:
  RS–232–C line for system console
  RS–232–C line for AV/Alert service (modem)
  RS–232–C line for Uninterrupted Power Supply (UPS)
- one single–ended SCSI–2 controller (reserved for high–availability failover)

Like IOC board 0, the expansion IOC contains slots for two optional daughter boards. Each IOC supports maximum of 2 daughter options:

Communications: Model 7436 integrated Ethernet LAN

Mass Storage: Model 7435 or 7435–CI SCSI–2 adapter board(s) (Supports 2 independent buses per board. Each bus is selectable for single–ended or differential SCSI–2 interface. *Single–ended interface supports "slow" (5 MHz) devices only.*)

External mass storage options

Your system requires optional SCSI–2 adaptors for external mass storage. Model 7435 and 7435–CI SCSI Host Adapters install directly to IOC boards; Model 7430 VSA adapters use the system VMEbus. Each type provides two SCSI–2 buses, selectable for single–ended or differential interface.

We list currently available external mass-storage devices below.

CLARiiON disk–array storage system
Requires differential SCSI–2 bus

CLARiiON tape–array storage system
Requires differential SCSI–2 bus

Combined Storage Subsystem 2 (CSS2/DC)
Single–ended or differential SCSI interface

Peripheral Housing Unit (PHU) subsystem

Model 6691 stand–alone 1/4-inch cartridge (QIC) tape
Requires single–ended SCSI bus

For up-to-date or detailed information about supported mass–storage options, contact your Data General representative.

VMEbus options

This section contains information about currently available VMEbus devices. For up-to-date or detailed information, contact your Data General representative.

VDA/255A asynchronous host adapters

Support devices via RG62 coaxial cable connected to maximum of 16 VDC/16P, VDC/16, and VDC/8P downloadable cluster controllers per host adapter:

- VDC/16P
  16 full–duplex RS–232–C asynchronous lines *or*
  8 full–duplex asynchronous RS–232–C lines and
  1 Centronics parallel printer port
- VDC/16
  16 full–duplex RS–232–C asynchronous lines
- VDC/8P
  8 full–duplex asynchronous RS–232–C lines
  1 Centronics parallel printer port

VFC fiber–distributed data interface (FDDI) LAN controllers

Single or dual attachment. ANSI X3T9.5 compliant.

VSA SCSI-2 controller/adapters

Supports 2 independent buses per board, each bus selectable for single–ended or differential SCSI–2 interface.
(Single–ended interface supports "slow" (5 MHz) devices only.)

VLCi Ethernet LAN controllers

IEEE 802.3 Ethernet LAN

VSC/3i synchronous device controllers

3 channels per board, each channel independently selectable for RS-232, RS-449/RS-530/X.21, or V.35 electrical interface

VTC terminal controllers

Each supports up to 255 user terminals
IEEE 802.3 Ethernet LAN interconnect

VTRC token–ring LAN controllers

IEEE 802.5 Ethernet LAN

End of Appendix

B Device cables and I/O connector pin assignments

This appendix describes pin assignments for the following standard integrated I/O connectors available on AViiON 8500 systems:

- Asynchronous RS–232–C, 25–pin connectors for OP CON (system console) SERVICE (AV/Alert modem), and UPS (Uninterruptible Power Supply) port connectors
- ncsc SCSI connectors (pin and socket, 68–pin)
- Ethernet LAN connectors (15–pin)

IMPORTANT: For cable and pin assignment information about the VMEbus options available on your system, refer to *Setting Up and Installing VMEbus Options in AViiON® Systems*.

All of the AViiON connectors use industry–standard interfaces.

Signals for the asynchronous RS-232 connectors and one LAN connector are controlled by the Input/Output Controlle (IOC) board.

Optional Model 7436 Ethernet LAN controllers use the same interface as the IOC–controlled LAN connector.

Each external SCSI-2 bus connector extends a separate independent SCSI bus from a Model 7435 adapter board.

AViiON 8500 I/O cables

Table B–1 lists the connectors, size, and Data General part numbers for device cables that attach directly to AViiON 8500 system connectors.

Table B–1 Connectors and device cables

Device/Port	Connector Type	Cable Type/Size	DGC Part/Model Number
System console at OP CON port (all asynchronous terminals)	RS–232 D25 with captive screws	10 ft	005–34256/15340E010
		15 ft	005–34990/15340E015
		25 ft	005–34991/15340E025
AV/Alert modem at SERVICE port (all asynchronous modems)	RS–232 D25 with captive screws	10 ft	005–36256/15369E010
		15 ft	005–36257/15369E015
		25 ft	005–36258/15369E025
Ethernet LAN	D15 with slide clips	10 ft flexible drop	007–6253/4028A
ncsc SCSI-2 ports to narrow device (single–ended or differential)	Wide, fast SCSI–2 68–pin P&S with thumb screws	2.5 ft wide to narrow (adapter to 50–pin P&S)	005–39975
	from adapter cable to device (single–ended or differential) 50–pin P&S to 50–pin CHAMP	5 ft	005–39718/15396E005
		10 ft	005–39719/15396E010
		20 ft	005–39720/15396E020
		40 ft	005–39721/15396E040
ncsc SCSI-2 ports to wide, fast device (single–ended or differential)	68–pin P&S to 68–pin P&S with thumb screws	10 ft	005–40003/15418E010
		20 ft	005–40004/15418E020
		40 ft	005–40005/15418E040

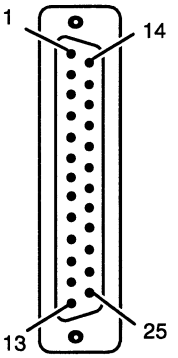
Refer to *Setting Up and Installing VMEbus Options in AViiON® Systems* to verify the cables for any VMEbus options you installing.

IOC board asynchronous port connectors

Your system console, AV/Alert modem, and Unterruptible Power Supply (UPS) and other asynchronous serial devices connect to the Input /Output Controller(s) (IOC) through RS–232–C, 25–pin female DB25 connectors. These Data Communications Equipment (DCE) connectors are located in slot 8 and, optionally, slot 6 at the rear of the computer unit. Table B–2 shows the signals and pin numbers for these connectors.

Table B–2 IOC asynchronous connector signals

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



< indicates received by controller

> indicates transmitted from controller

* Proper terminal operation while running the DG/UX operating system requires the DCD signal pulled up (enabled) by the presence of an IOC board jumper. By default, DCD is *not* enabled to the SERVICE or RS232 B connectors.

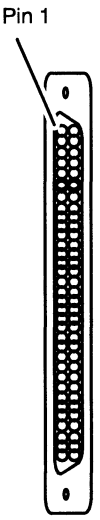
** not used by OP CON or RS232 A connectors

SCSI bus connectors

The SCSI bus 68–pin P&S connectors are located on the rear of the Input/Output Controller in the locations marked CHANNEL A and/or CHANNEL B. Table B–3 lists the signals and pin numbers for these connectors.

Table B–3 SCSI–2 connector signals

Single–Ended Interface					Differential Interface			
Pin	Signal	Pin	Signal		Pin	Signal	Pin	Signal
1	Ground	35	Ground		1	Ground	35	Ground
2	Ground	36	–Data Bus 8		2	+Data Bus 8	36	–Data Bus 8
3	Ground	37	–Data Bus 9		3	+Data Bus 9	37	–Data Bus 9
4	Ground	38	–Data Bus 10		4	+Data Bus 10	38	–Data Bus 10
5	Ground	39	–Data Bus 11		5	+Data Bus 11	39	–Data Bus 11
6	Ground	40	–Data Bus 12		6	+Data Bus 12	40	–Data Bus 12
7	Ground	41	–Data Bus 13		7	+Data Bus 13	41	–Data Bus 13
8	Ground	42	–Data Bus 14		8	+Data Bus 14	42	–Data Bus 14
9	Ground	43	–Data Bus 15		9	+Data Bus 15	43	–Data Bus 15
10	Ground	44	–Data Bus P1		10	+Data Bus P1	44	–Data Bus P1
11	Ground	45	–AcknowledgeB		11	+AcknowledgeB	45	–AcknowledgeB
12	Ground	46	Ground		12	Ground	46	DIFFSENS
13	Ground	47	–RequestB		13	+RequestB	47	–RequestB
14	Ground	48	–Data Bus 16		14	+Data Bus 16	48	–Data Bus 16
15	Ground	49	–Data Bus 17		15	+Data Bus 17	49	–Data Bus 17
16	Ground	50	–Data Bus 18		16	+Data Bus 18	50	–Data Bus 18
17	Termination PowerB	51	Termination PowerB		17	Termination PowerB	51	Termination PowerB
18	Termination PowerB	52	Termination PowerB		18	Termination PowerB	52	Termination PowerB
19	Ground	53	–Data Bus 19		19	+Data Bus 19	53	–Data Bus 19
20	Ground	54	–Data Bus 20		20	+Data Bus 20	54	–Data Bus 20
21	Ground	55	–Data Bus 21		21	+Data Bus 21	55	–Data Bus 21
22	Ground	56	–Data Bus 22		22	–Data Bus 22	56	–Data Bus 22
23	Ground	57	–Data Bus 23		23	+Data Bus 23	57	–Data Bus 23
24	Ground	58	–Data Bus P2		24	+Data Bus P2	58	–Data Bus P2
25	Ground	59	–Data Bus 24		25	+Data Bus 24	59	–Data Bus 24
26	Ground	60	–Data Bus 25		26	+Data Bus 25	60	–Data Bus 25
27	Ground	61	–Data Bus 26		27	+Data Bus 26	61	–Data Bus 26
28	Ground	62	–Data Bus 27		28	+Data Bus 27	62	–Data Bus 27
29	Ground	63	–Data Bus 28		29	+Data Bus 28	63	–Data Bus 28
30	Ground	64	–Data Bus 29		30	+Data Bus 29	64	–Data Bus 29
31	Ground	65	–Data Bus 30		31	+Data Bus 30	65	–Data Bus 30
32	Ground	66	–Data Bus 31		32	+Data Bus 31	66	–Data Bus 31
33	Ground	67	–Data Bus P3		33	+Data Bus P3	67	–Data Bus P3
34	Ground	68	Ground		34	Ground	68	Ground



– indicates active low, + indicates active high

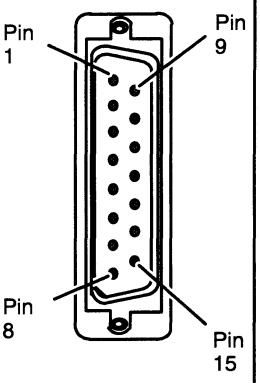
Ethernet LAN interface connectors

The LAN interfaces provide a 15–pin D connector for an AUI cable. The AUI cable connects the computer to an external Medium Attachment Unit (MAU). The MAU contains the Ethernet transceiver and the Medium Dependent Interface (MDI) for connection to the physical network.

Table B–4 shows the signals and pin numbers for these connectors.

Table B–4 LAN interface connector signals

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



End of Appendix

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