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Customer Documentation

Operating AViiON® 9500 Series Computers

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AViiON®
PRODUCT LINE

Operating AViiON® 9500 Series Computers

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Notice

Operating AViiON® 9500 Series Computers
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A vertical bar in the margin of a page indicates substantive technical change from the previous revision. (Note that Chapter 3 was substantially reorganized for this revision.)

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.

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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 operate AViiON® 9500 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 the DG/UX™ operating system, CLARiiON® storage systems, VMEbus controllers and devices, the AV/Alert℠ diagnostic support system, and other system options, you should refer to the product–specific manuals listed later in this preface and in the *Guide to AViiON® and DG/UX™ System Documentation*. 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® 9500 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 unauthorized 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 three chapters and one appendix. The following list gives an overview of what you will find in each:

Chapter 1 Explains how to correctly power the computer system up and down and describes routine firmware powerup testing. Describes a proper system reset.

Chapter 2 Provides an overview of AViiON 9500 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 3 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. Describes System Control Monitor (SCM) commands available to all users.

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

Related Data General Manuals

The *Guide to AViiON® and DG/UX™ System Documentation* (069–701085) lists and describes AViiON and DG/UX documentation available from Data General and related documentation available from sources other than Data General Corporation.

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 use 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). Your primary DG/UX reference. Discusses the concepts and tasks related to DG/UX system management, and provides general administration orientation. Explains how to use the **sysadm** facility. Includes instructions for managing disk resources, user profiles, file systems, printers, tapes drives, and other system features.
- *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.
- *Using AViiON® Diagnostics and the AV/Alert^{sm} Diagnostic Support System* (014–002183). 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.

Readers, Please Note

Data General manuals use certain symbols and styles of type to indicate different meanings. You should familiarize yourself with these conventions before reading the manual.

This manual presumes the following meanings for the terms "command line," "format line," and "syntax line."

- A *command line* is an example of a command string that you should type verbatim; it is preceded by a system prompt and is followed by a delimiter such as the curved arrow symbol for the New Line key.
- A *format line* shows how to structure a command; it shows the variables that must be supplied and the available options.
- A *syntax line* is a fragment of program code that shows how to use a particular routine; some syntax lines contain variables.

The Data General symbol and typeface conventions used in this manual are defined in the following list.

Convention	Meaning
boldface	In command lines and format lines: Indicates text (including punctuation) that you type verbatim from your keyboard. All commands, pathnames, and names of files, directories, and manual pages also use this typeface.
`Typewriter`	Represents a system response on your screen. Syntax lines also use this font.
italic	In format lines: Represents variables for which you supply values; for example, the names of your directories and files, your username and password, and possible arguments to commands.
[ ]	In format lines: These brackets surround an optional argument. Don't type the brackets; they only set off what is optional. The brackets are in regular type and should not be confused with the boldface brackets shown below.
[ ]	In format lines: Indicates literal brackets that you should type. These brackets are in boldface type and should not be confused with the regular type brackets shown above.
...	In format lines and syntax lines: Means you can repeat the preceding argument as many times as desired.

Convention	Meaning
$ and %	In command lines and other examples: Represent the system command prompt symbols used for the Bourne and C shells, respectively. Note that your system might use different symbols for the command prompts.
↵	In command lines and other examples: Represents the New Line key, which is the name of the key used to generate a new line. (Note that on some keyboards this key might be called Enter or Return instead of New Line.) Throughout this manual, a space precedes the New Line symbol; this space is used only to improve readability—you can ignore it.
< >	In command lines and other examples: Angle brackets distinguish a command sequence or a keystroke (such as <**Ctrl-D**>, <**Esc**>, and <**3dw**>) from surrounding text. Note that you do not type these angle brackets are in regular type and you do not type them.

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, telephone support is available with your hardware warranty and with Support Plus and Hotline Software Support service contracts. 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

NADGUG, the North American Data General Users Group, is a unique network of Data General users who wish to discover more about working computer environments and how to use them. As a professional, user–run organization, NADGUG enables members to make contacts with colleagues, share expertise and perspectives, and influence the companies that provide products and services. The Users Group is your connection to expert users of Data General products, including AViiON® open systems, CLARiiON® advanced storage solutions, PCs, and ECLIPSE® MV/Family systems. Getting just one solution from a fellow member can more than pay for the cost of belonging to NADGUG. To join or for more information, call 1–800–253–3902, extension 1222, or 508–443–3330, extension 1222.

End of Preface

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1 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® 9500 computer system.

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

Refer to Chapter 3 for a detailed description of the system BOOT command, syntax, and parameters.

Starting the computer system

Each time you supply power to your AViiON 9500 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 2.

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 (for example, CSS, CLARiiON, or external VME 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 1–1 shows the location of the power switch.

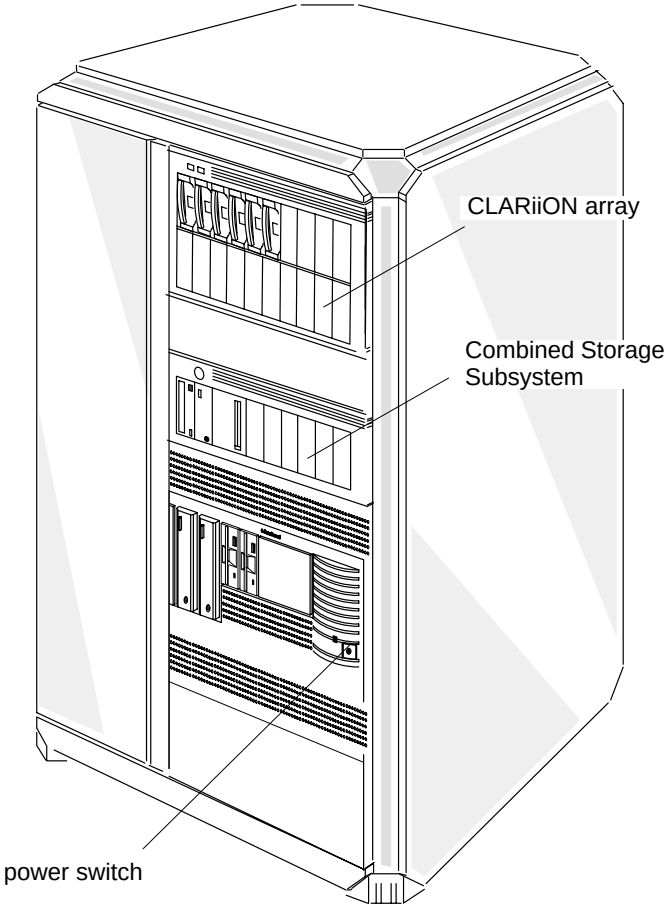


Figure 1–1 Powering on an AViiON 9500

Each time you supply power to your AViiON 9500 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 10
IOC board in slot 8
PM board in slot 31
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.............................
Initing 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, 1994
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
```

4. If you haven't already done so during previous powerups, 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 initialized memory size does not agree with your actual configuration, contact Data General immediately. Refer to Chapter 2 for an explanation of AViiON 9500 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 2.

```
Copyright Data General Corporation 1993, 1994
AViiON 8500/9500 Series Computer
Multi processor
Firmware Revision 0X.X
IOC0 Integrated LAN: Ethernet address is XX:YY:ZA:BB:CC:DD
Found 128 Megabytes of memory [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

After passing the powerup tests, AViiON 9500 systems probe the devices in your autoboot paths for a bootable file. (We discuss the autoboot paths in Chapter 3.) 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. Systems that do not have an installed and customized system kernel (for example, systems that are powering up for the first time) attempt by default to boot an installer program. The boot sequence tries first to boot from a CD–ROM drive, then tape, and finally a system disk.

IMPORTANT: If you do not wish to bring up an installed operating system 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 process before it executes will bring your system to the System Control Monitor (SCM) prompt as described in step 7.

Continue with step 6 if your system includes an installed operating system with consistent autoboot paths and a customized kernel. Continue with step 7 if this is your first powerup.

6. If your system finds a customized DG/UX kernel bootstrap file, it continues to load the kernel and execute the operating system as shown in the following sample screen display.

```
Booting sd(ncsc(),0)root:/dgux –3
DG/UX System Release 5.4R3.10, Bootstrap
Loading image.........................................
DG/UX System Release 5.4R3.10, Version generic
Using 128 Megabytes of physical memory
Found 2 processor(s)
Configuring devices..................
```

Refer to *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.

7. If you interrupt autoboot or 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 Diagnostics to further test your system hardware. Refer to *Using AViiON® Diagnostics and the AV/Alert℠ Diagnostic 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 3 for an explanation of the SCM boot command.

- Verify that your autoboot paths accurately reflect the current location of your operating system, or change the autoboot paths. Refer to Chapter 3 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 3 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 3 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 9500 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 the computer system” and “Restarting your system,” contain instructions for *warm resetting* and *warm starting* AViiON 9500 series systems.

3. Press the computer unit’s power switch, shown in Figure 1–2.

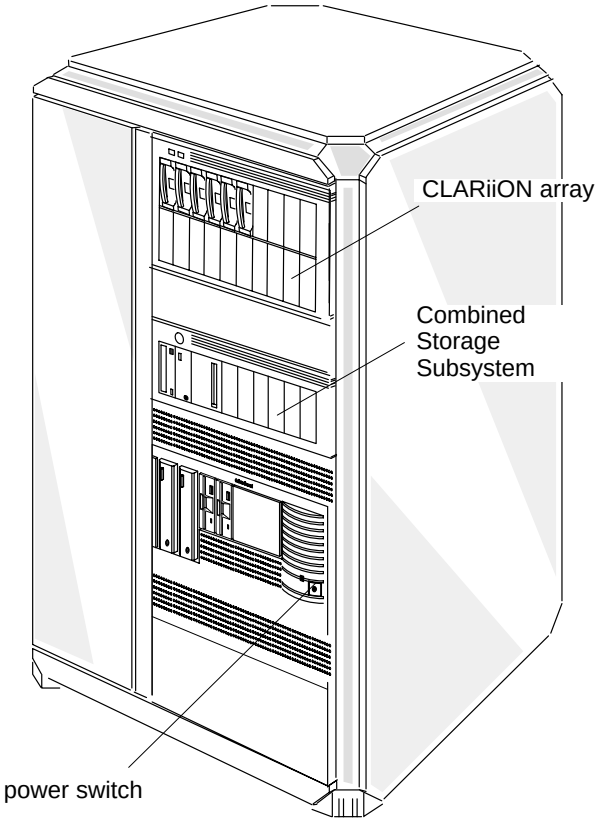


Figure 1–2 Powering off an AViiON 9500

4. Turn off power to all subsystems (CSS, VME, 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 initiates 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.

You can perform a warm reset by using the SCM **reset** command while at the SCM prompt, as follows:

`Jp#0/SCM>` **r** ↵ (or, `SCM>` **reset** ↵)

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 3 for additional information about the default boot paths, the automatic boot sequence, the SCM **boot** command, and boot syntax.

End of Chapter

2 Solving powerup problems and using AViiON 9500 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 9500 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 9500 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 9500 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} Diagnostic 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 it should dump the contents of memory 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 3 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℠ Diagnostic 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 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] 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 9500 high–availability features

This section describes some of the features that we built into AViiON 9500 computers to minimize the impact of hardware problems. With some interruption and possible system degradation, your AViiON 9500 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 9500 computers work in conjunction with those in DG/UX, AV/Alert, CLARiiON and Uninterruptible Power Supply (UPS) systems, and other system components. This manual covers 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

For detailed information on other facets of high–availability configuration and implementation, refer to the related Data General manuals described 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. Most of these elements require personnel qualified by Data General to set them up properly; when you require assistance, please contact Data General as described in the Preface to this manual.

WARNING: Unqualified personnel attempting to remove, install, or service internal components or options in AViiON 9500 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 unauthorized personnel may void product warranties. For more information regarding Data General warranties, refer to your Data General sales and field engineering contracts.

By default, all AViiON 9500 systems share the following keys to continued performance in the event of a hardware failure:

- **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 its automatic boot sequence as described in the "Powering up your system hardware" section of Chapter 1.
- **Boot on error** after a cold reset to *deconfigure* (deactivate and remove from system use) failed components and then continue powerup. With boot-on-error enabled, the system attempts to boot the operating system and continue processing in a *degraded* (downsized configuration) mode. 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 disable and re-enable this feature, and alter or set boot paths, as described in the "Changing the default system boot paths" section of Chapter 3.

  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. (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 differently; for example, as the transfer of disk modules and applications from one machine to another.)

In addition to these hardware features, your system supports AV/Alert 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.

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

Central processor unit (CPU) deconfiguration

AViiON 9500 systems include up to four system boards. Each system board contains two Motorola 88110 central processing units, also called *job processors*, or JPs.

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 one or more diagnostic tests, the AViiON 9500 will attempt to continue powerup using a suspect CPU. This process can initiate an MI call to a remote service center, and might enable you to run system diagnostics from the SCM.

If your system's only or last working system board fails, the AViiON 9500 will halt processing entirely.

Cooling unit (fan tray) compensation

Upon fan failure, the remaining units in an AViiON 9500 fan tray increase speed to compensate for the failed fan 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 entire computer unit after sending the appropriate warning messages to the system console and AV/Alert service center.

Power supply failover

If one of the AViiON 9500 unit's power supplies fails, the remaining supply will compensate for the failure and power the entire system. *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.

Memory deconfiguration

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

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 remaining memory controller, if present. For optimal memory high availability, 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 9500 system will continue processing at the System Control Monitor (SCM). Note that a system without memory cannot boot the DG/UX operating system.

Input/Output Controller deconfiguration and failover

Input/Output Controller (IOC) boards connected to the AViiON 9500 system backplane contain asynchronous console, UPS, and modem ports, a local area network controller and port, and a Small Computer System Interface (SCSI) controller for internal disk and tape devices. IOC boards can also support additional LAN and SCSI options. The first IOC in an AViiON 9500 system supports an internal or external VME bus; a second IOC, with the required repeater printed-circuit board options, can support a second external VME chassis. This section describes high–availability features of AViiON 9500 Input/Output Controllers.

LAN and optional SCSI controller deconfiguration and failover

If an Ethernet LAN or SCSI controller on an Input/Output Controller board fails, your AViiON 9500 system reacts as described in preceding sections for other system components; a cold reset starts powerup diagnostics that identify and deconfigure the failed controller. Systems with AV/Alert enabled send a message packet to a remote service center. 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.

IMPORTANT: Properly configured and customized systems allow backup IOC and VME-based LAN and SCSI controllers to assume some responsibilities from deconfigured counterparts. See *Achieving High–Availability in AViiON® Systems* for information on setting up multi–path LAN and SCSI configurations to support software failover between controllers.

IOC board deconfiguration and failover

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.

The remainder of this chapter 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 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, the diagnostics initiated by cold reset will 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 9500 IOC components.

Asynchronous port (DUART) failover

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.

IMPORTANT: Note that switching a terminal from one connection to another requires operator intervention at the system console. On most terminals, 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.

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

SCSI and LAN failover

The system recognizes and specifies standard LAN and SCSI controllers/adapters by their device mnemonic and their I/O address. Table 2–1 lists the memory–mapped I/O address associated with each standard controller in an AViiON® 9500 system. 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.

Table 2–1 Input/output controller addresses

Controller – IOC0[1]	Address	Controller – IOC1	Address
Integrated bus ncsc(0) – IOC0 (internal devices only)	FFFA0000	Integrated bus ncsc(5) – IOC1 (held in reset for failover)	FF7A0000
Optional bus ncsc(4) – IOC0	FFFA5000	Optional bus ncsc(9) – IOC1	FF7A5000
Optional bus ncsc(3) – IOC0	FFFA3000	Optional bus ncsc(8) – IOC1	FF7A3000
Optional bus ncsc(2) – IOC0	FFFA4000	Optional bus ncsc(7) – IOC1	FF7A4000
Optional bus ncsc(1) – IOC0	FFFA2000	Optional bus ncsc(6) – IOC1	FF7A2000
Integrated LAN dgen(0) – IOC0	FFFA0100	Integrated LAN dgen(3) – IOC1	FF7A0100
Optional LAN dgen(1) – IOC0	FFFA2100	Optional LAN dgen(4) – IOC1	FF7A2100
Optional LAN dgen(2) – IOC0	FFFA3100	Optional LAN dgen(5) – IOC1	FF7A3100

[1] If your system has deconfigured and failed over the rightmost IOC board in your system, the system will assign the logical addresses for IOC 0 to the corresponding physical connectors on the next IOC to the left (IOC1 becomes IOC0).

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.

For example, a SCSI controller at address FF7A5000 (ncsc(9)), becomes, after this hardware 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.

Failover of Ethernet LAN controller specification and memory address does *not* apply to device–specific Ethernet addresses. 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.

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.) Configurations without reserved failover ports require an operator's intervention to disconnect the cables from the failed IOC ports and connect them to the corresponding ports on the active IOC.

Figures 2–1 and 2–2 illustrate the results of IOC0 deconfiguration and failover to the second IOC.

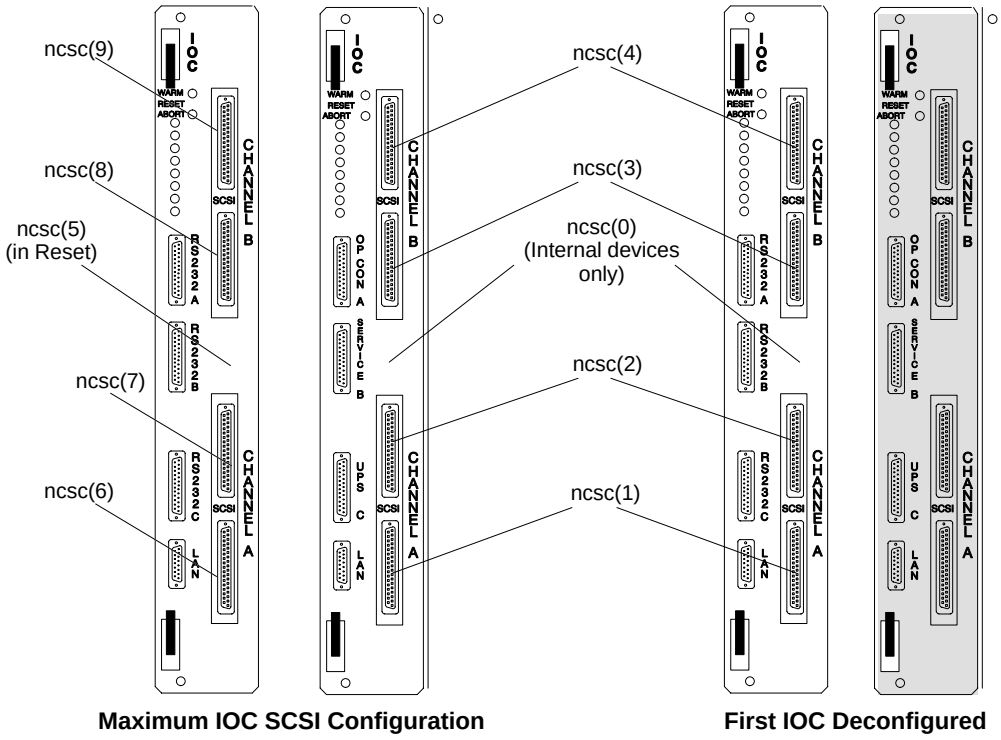


Figure 2–1 SCSI controller configuration before and after IOC failover

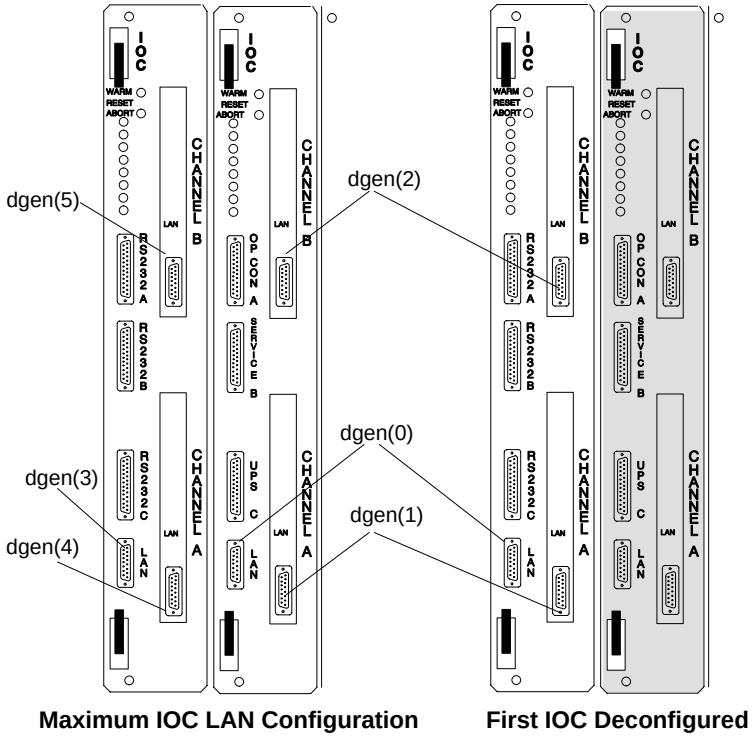


Figure 2–2 LAN controller configuration before and after IOC failover

End of Chapter

3 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 0–15, 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 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 later in this chapter in the "Enabling or disabling auto–reboot" section; we describe these features in more detail in chapter 2.) 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↵
```

Type **n** and press the New Line key to display the SCM prompt. 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 3–1 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 3–1 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 3–2 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 3–2 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^{sm} 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 using 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 04/11/94
```

2. Change the system date.

```
Jp#0/SCM>date 04 14 94 ↵
Mon 04/11/94
```

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 using 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 04/11/94
15:00:35
```

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

```
Jp#0/SCM>time 3:00:00 ↵
Mon 04/11/94
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 + (plus) or – (minus) to indicate whether your time zone is ahead of or behind 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

The first part of 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

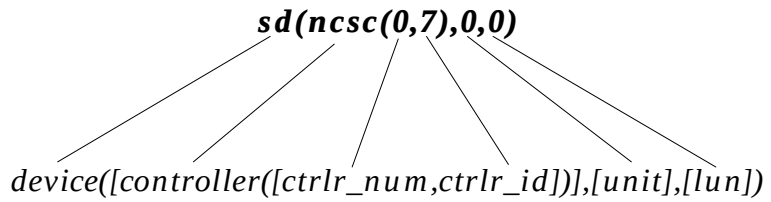
The device specification (first–stage boot) consists of a mnemonic that identifies the type of device and names the device driver, plus optional parameters that provide additional information to specify fully that device.

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

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 3–3 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 3–3 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 3–4 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 3–4 lists the memory–mapped I/O address associated with each **ncsc** standard controller in an AViiON® 9500 system. Note that the memory addresses correspond to specific physical locations for each board in your system.

Table 3–4 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	FFFA5000	Optional ncsc bus 9 – IOC 1	FF7A5000
Optional ncsc bus 3 – IOC 0	FFFA3000	Optional ncsc bus 8 – IOC 1	FF7A3000
Optional ncsc bus 2 – IOC 0	FFFA4000	Optional ncsc bus 7 – IOC 1	FF7A4000
Optional ncsc bus 1 – IOC 0	FFFA2000	Optional ncsc bus 6 – IOC 1	FF7A2000

IMPORTANT: If your system has deconfigured and failed over the rightmost IOC board in your system, the system will assign the logical addresses for IOC 0 to the corresponding physical connectors on the next IOC to the left (IOC 1 becomes IOC 0). Refer to Chapter 2 for a discussion of AViiON 9500 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.

To specify a controller *explicitly*, use its I/O address as the first parameter. For example, rather than **sd(ncsc(0))** the specification is **sd(fffA0000)**. You should 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.

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 is **dgen(1)**.

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 3–3, 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 3–5 defines factory–default SCSI ID numbering for AViiON 9500 systems. Note that SCSI ID 7 is reserved for the SCSI bus host adapter.

Table 3–5 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.

Booting 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 3–3, 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.

```
SCM110>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.

We describe when and how you might use the **reset** command in Chapter 1, "Starting and stopping your computer system."

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, then 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^{sm} service enabled, you can view the AV/Alert Remote Service Support menu by executing 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} 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 currently 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  Set SCSI bus operating parameters
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  Set SCSI bus operating parameters
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 3–1. The other options provide direct access to the parameter listed.

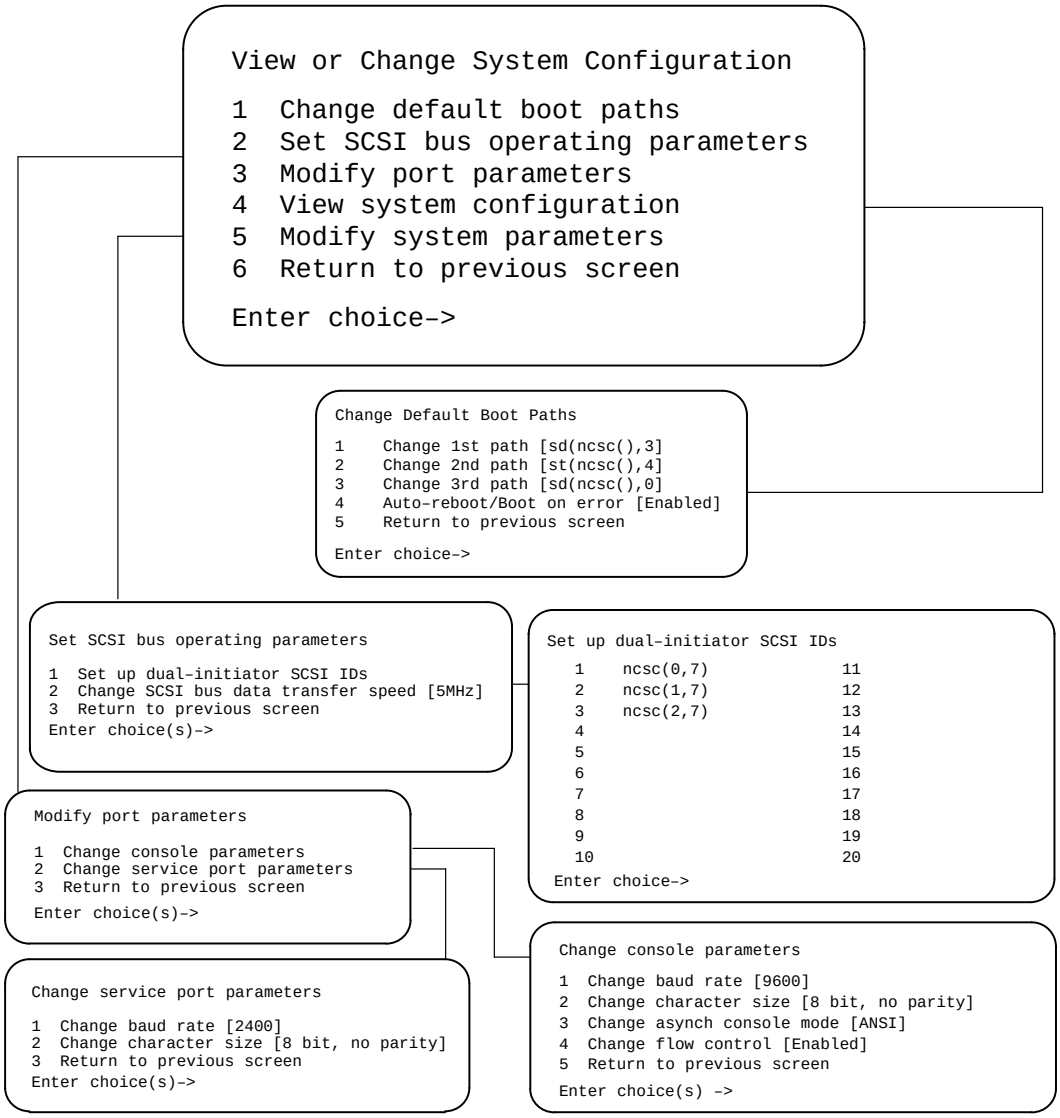


Figure 3–1 System Control Monitor (SCM) menus

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 power cycling the system as described in Chapter 1,“Starting and Stopping Your Computer System.”.

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 main 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 4, "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 3–2 their combined formats. A full boot path contains a maximum of 80 characters.

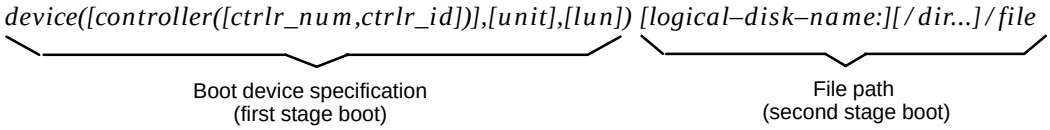


Figure 3–2 Full boot path format

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.

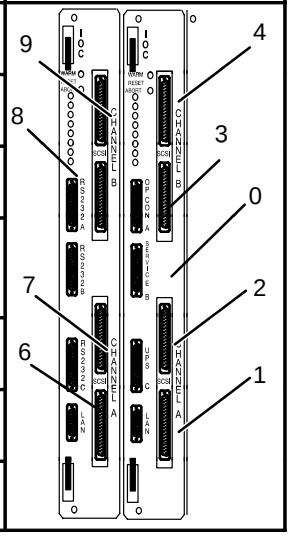
Booting from Disk, CD–ROM, or Tape

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 3–6 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 3–2) for the x specified in Table 3–6.

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 3–6 Boot specifications for disk and tape drives

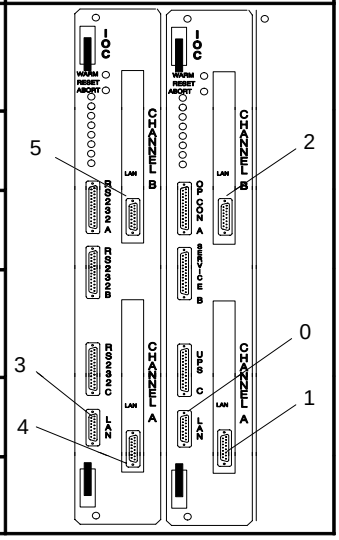
Device	Specification (syntax)	Controller Numbers (internal =0)
First disk drive	**sd(ncsc(**x**),0)**	
Second disk drive	**sd(ncsc(**x**),1)**	
Third disk drive	**sd(ncsc(**x**),2)**	
Fourth disk drive or first CD–ROM	**sd(ncsc(**x**),3)**	
First tape drive	**st(ncsc(**x**),4)**	
Second tape drive	**st(ncsc(**x**),5)**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

IMPORTANT: The specifications in Table 3–6 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 3–7 lists the specifications for LAN controllers you may have in your system configuration.

Table 3–7 Boot specifications for lan devices

Controller (Location)	Specification	Controller Numbers
IOC 0 integrated Ethernet LAN	**dgen(0)**	
IOC 0 expansion LAN	**dgen(1)**	
IOC 0 expansion LAN	**dgen(2)**	
IOC 1 integrated Ethernet LAN	**dgen(3)**	
IOC 1 expansion LAN	**dgen(4)**	
IOC 1 expansion LAN	**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 boot paths."

```
View or Change System Configuration

1  Change default boot paths
2  Set SCSI bus operating parameters
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 3–6 and Table 3–7 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/boot on error

If your operating system comes down unexpectedly (without an operator bringing it down in the controlled fashion described in Chapter 1), the AViiON® 9500 system will automatically run powerup diagnostics and attempt to reboot your operating system from a default boot path.

Systems with auto-reboot/boot on error enabled (the factory default) attempt to boot despite powerup errors during a cold reset. These systems attempt to deconfigure faulty components and bring the system up in a degraded mode. (Refer to Chapter 2 for a more thorough discussion of AViiON 9500 autoboot and deconfiguration features.)

You can disable or enable your system's boot-on-error feature from the Change Default Boot Paths menu. With auto–reboot/boot on error disabled, a 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 boot paths."

```
View or Change System Configuration

1  Change default boot paths
2  Set SCSI bus operating parameters
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 and conform to published SCSI–2 standards. You can use the SCM menus described in this section to define the controller ID and number for dual–initiated systems, and to view or change the data transfer speed of the internal (controller 0, integrated to the IO board) bus.

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, "Set SCSI bus operating parameters."

```
View or Change System Configuration

1  Change default boot paths
2  Set SCSI bus operating parameters
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice–>2
```

2. The system displays the Set SCSI Bus Operating Parameters menu. Select option 1, “Set up dual–initiator SCSI IDs.”

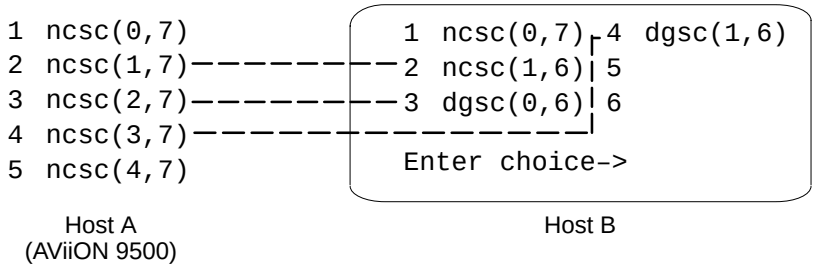
```
Set SCSI bus operating parameters

1 Set up dual-initiator SCSI IDs
2 Change SCSI bus data transfer speed [5 MHz]
3 Return to previous screen

Enter choice(s)->1
```

The system displays a list of valid SCSI controller specifications. If you or another system administrator have not manually entered any specifications, the list contains only the default entry for controller 0. If someone has entered other controller identifications, the list appears similar to the following example, in which the system operator has entered the computer’s specifications for four additional buses:

```
1  ncsc(0,7)            11
2  ncsc(1,7)            12
3  ncsc(2,7)            13
4  ncsc(3,7)            14
5  ncsc(4,7)            15
6                       16
7                       17
8                       18
9                       19
10                      20

Enter choice->
```

Note that in the example above, the system includes four optional SCSI controllers with the default device (controller) ID of 7. 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 controller on every shared bus, and that the second host use device id 6.

The following example compares ID lists in a dual–initiated system configuration with an AViiON 9500 and another AViiON host computer. The lines ———— between list entries indicate physically shared buses. Note that you cannot dual–initiate the internal bus **ncsc(0,7)**.



3. 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 ->
```

4. 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(0,7)                11
2  ncsc(1,7)                12
3  ncsc(2,7)                13
4  ncsc(3,7)                14
5                           15
6                           16
7                           17
8                           18
9                           19
10                          20

Enter choice->5 ↵

Type controller specification ->ncsc(4,7) ↵

Enter choice->
```

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

6. 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.

Changing the integrated SCSI bus data transfer speed

This section describes how to set the data transfer speed for the integrated internal SCSI bus, **ncsc(0)**. Note that the description does *not* cover operating parameters for any optional SCSI–2 buses in your system.

IMPORTANT: Your AViiON 9500 computer does not support fast (10 MHz), single–ended, external SCSI buses. All single–ended buses, including the integrated bus that supports internal devices, are set to 5 MHz by default.

The DG/UX™ operating system will automatically accommodate the slowest device on a given SCSI bus. A bus specified as 10 MHz will operate at only 5 MHz if there is a "slow" device attached to the bus.

1. While in the View or Change System Configuration menu, type **2** and press New Line to select item 2, "Set SCSI bus operating parameters."

```
View or Change System Configuration

1  Change default boot paths
2  Set SCSI bus operating parameters
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice–>2
```

2. The system displays the Set SCSI Bus Operating Parameters Menu. The display shows the current integrated bus speed setting inside square brackets, as follows:

```
Set SCSI bus operating parameters

1 Set up dual–initiator SCSI IDs
2 Change SCSI bus data transfer speed [5 MHz]
3 Return to previous screen

Enter choice(s)–>
```

3. To keep the existing bus speed setting, simply press New Line at the prompt, or select item 3, "Return to previous screen."

4. To reverse the current setting, type **2** and press New Line to select item 2, “Change SCSI bus data transfer speed.”

   If the transfer speed is currently 10 MHz (sometimes called *fast* SCSI), selecting the menu item will change the setting to 5 MHz, or *slow* SCSI. Selecting item 2 will conversely change the seeting from slow bus speed to fast.

5. After you select your bus data transfer speed setting, the SCM immediately displays your new setting in brackets.

```
Set SCSI bus operating parameters

1 Set up dual–initiator SCSI IDs
2 Change SCSI bus data transfer speed [10MHz]
3 Return to previous screen

Enter choice(s)–>
```

Select item 2 again if you wish to toggle the bus speed to its previous setting.

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 1.

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  Set SCSI bus operating parameters
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 console parameters
2     Change service port parameters
3     Return to previous screen
Enter choice(s)–>1 ↵
```

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

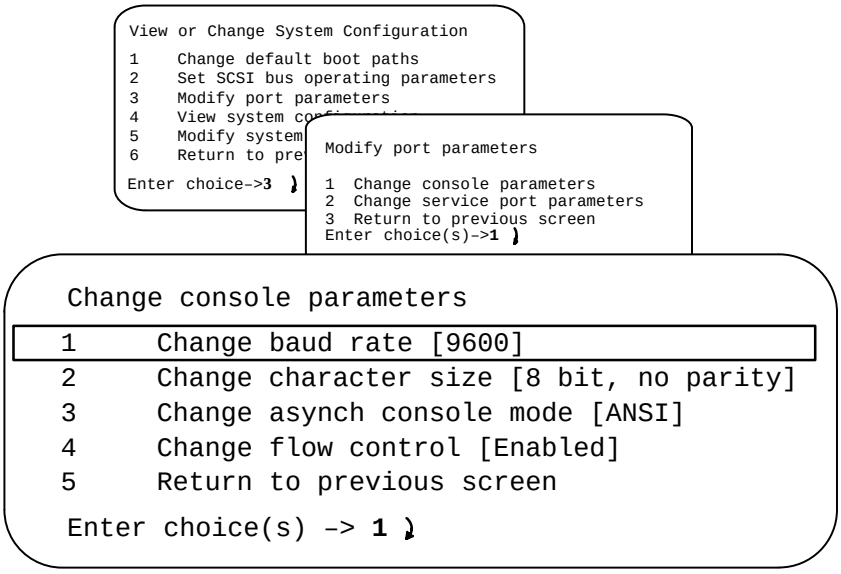
```
Change console parameters

1     Change baud rate [9600]
2     Change character size [8 bit, no parity]
3     Change asynch console mode [ANSI]
4     Change flow control [Enabled]
7     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, and XON/XOFF flow control setting.

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:

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



The system displays the Change Baud Rate menu.

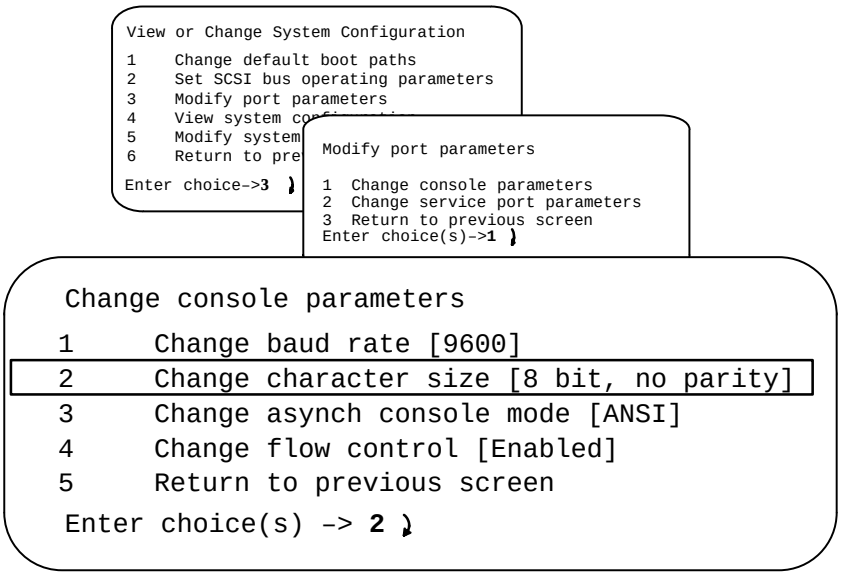
```
Change baud rate

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)–>
```

2. 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 1.

Changing the system console character length

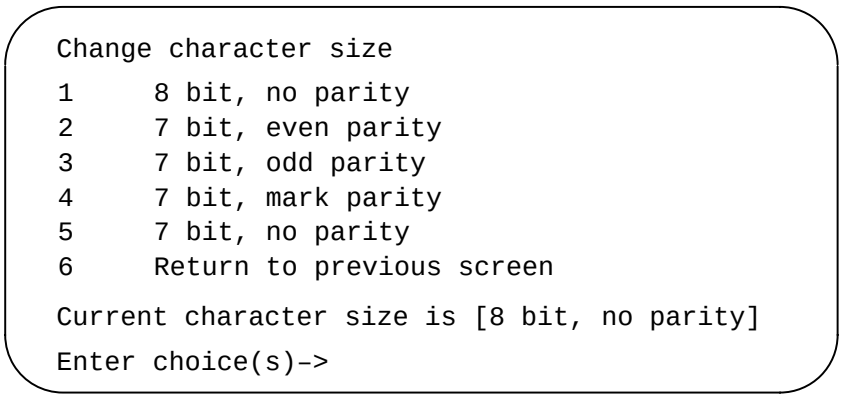
The current system console character length is displayed as part of the "Change character size" selection of the Change Console Parameters menu.



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.



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

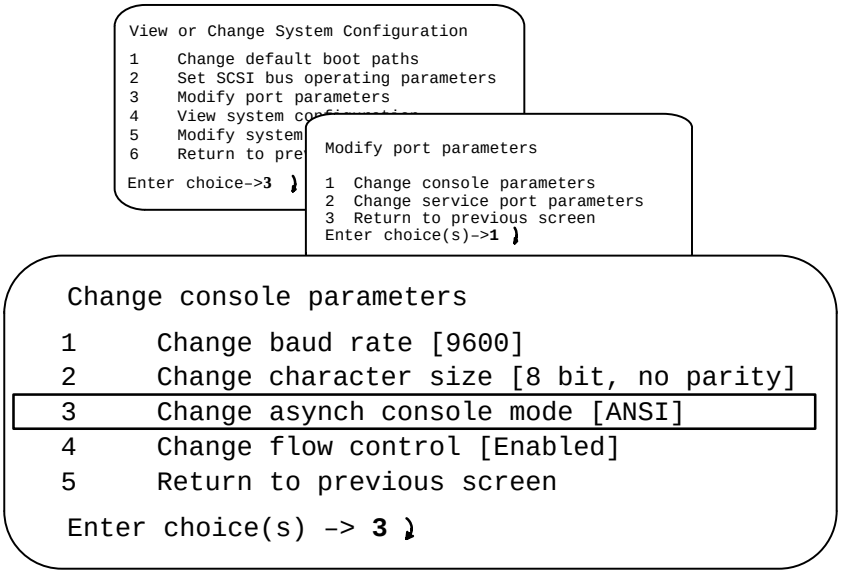
   The new setting will take effect after you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 1.

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 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 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.

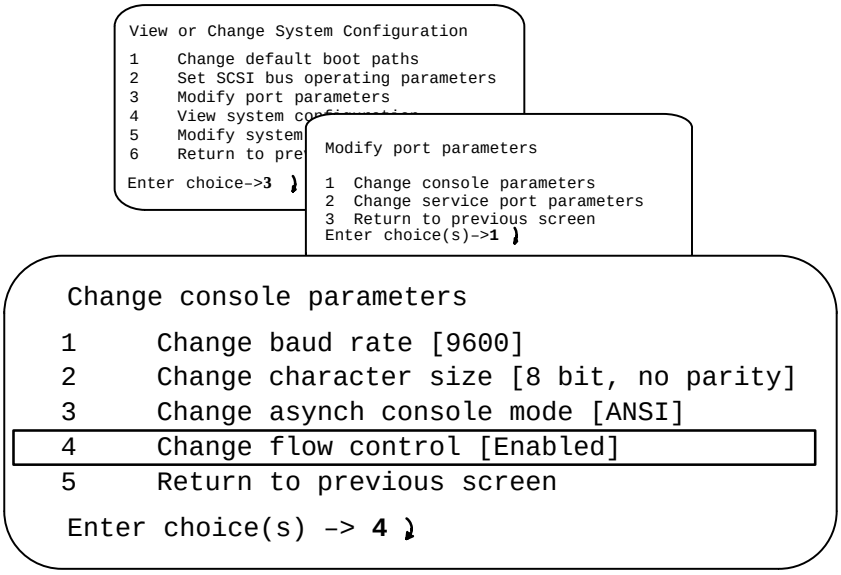
The new console mode will take effect after you reset your hardware. You can reset the computer by using the **reset** command at the SCM prompt or by powering down and restarting the system as described in Chapter 1.

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 1.

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  Set SCSI bus operating parameters
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 console parameters
2     Change service port parameters
3     Return to previous screen
Enter choice(s)–>2 ↵
```

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

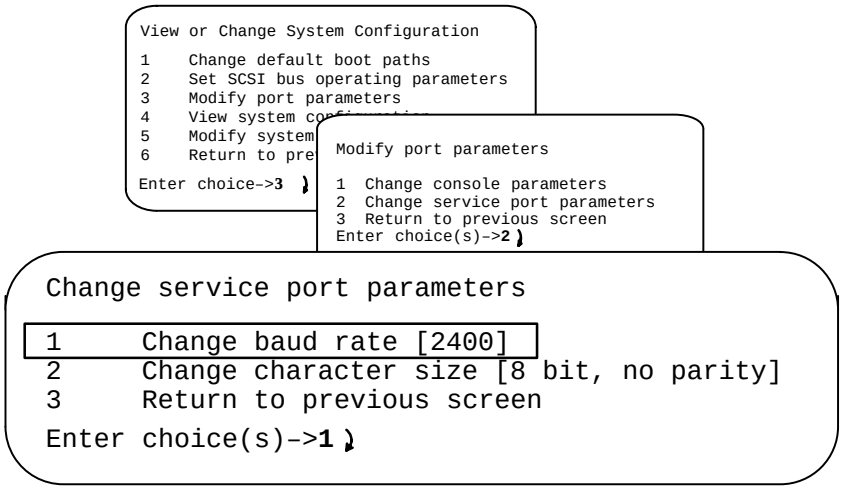
The system displays the Change service port Parameters menu (with current default values in brackets), as follows:

```
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)–>
```

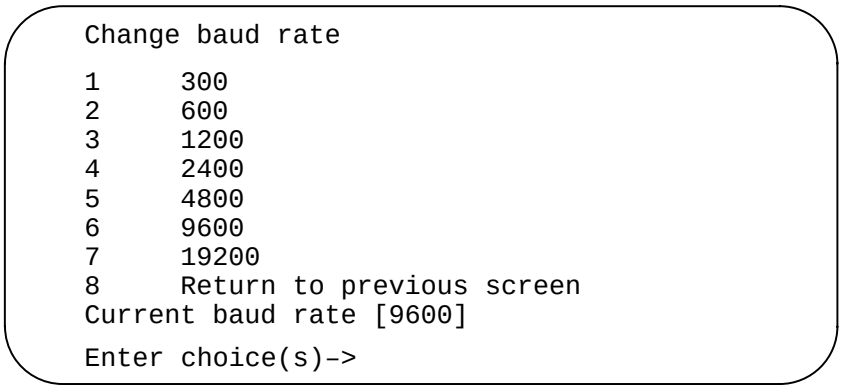
3. Select the item you want to change (baud rate or character length) by entering the item number and pressing New Line. Proceed with the appropriate section that follows.

Changing the service port baud rate

The default baud rate for the service port is 2400 baud. 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).



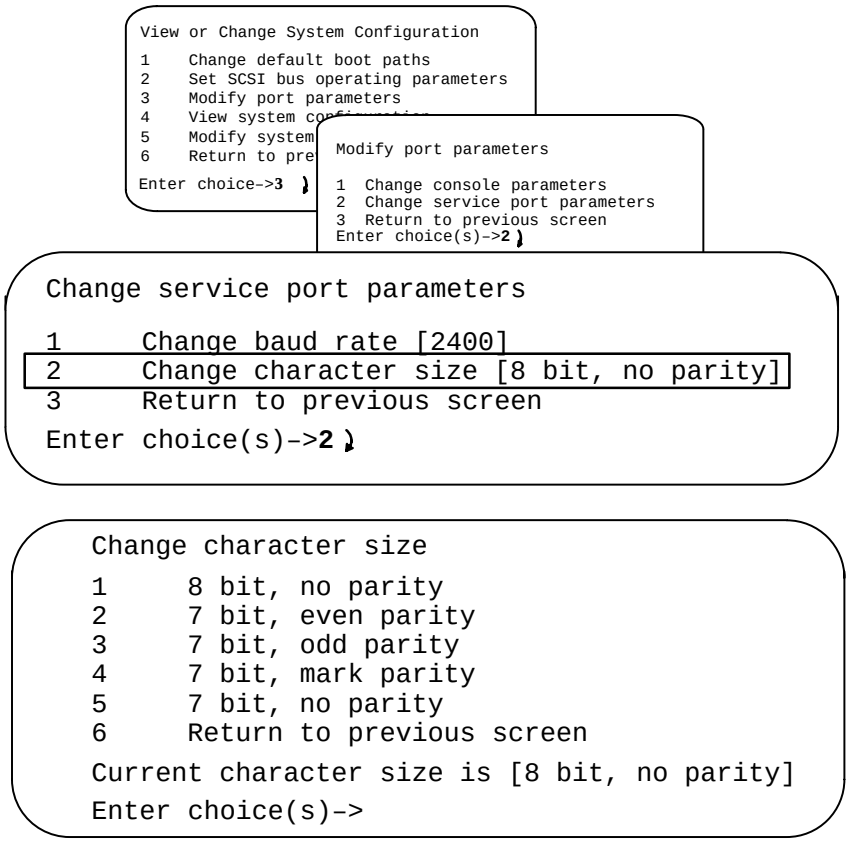
To change the baud rate, type the item number of the baud rate you want, and press New Line.



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 1.

Changing the service port character size

Select item 2, “Change character size” to verify or 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.

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 1.

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  Set SCSI bus operating parameters
3  Modify port parameters
4  View system configuration
5  Modify system parameters
6  Return to previous screen

Enter choice–>4 ↵
```

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

```
Memory size is 256 Mbytes
Top of memory = FFFFFFC
Top of memory available for use = FF9FFFC hex
Memory module 3 contains 256 Mbytes

IOC0 Integrated SCSI:
       Size SCSI bus? [y]n y ↵
       Enter host SCSI ID [7]↵
       ID0: FUJITSU disk drive    Boot specification sd(ncsc(0,7),0)
       ID4: TANDBERG tape drive   Boot specification st(ncsc(0,7),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 9500 series computer systems.

All systems include the AViiON 9500 series computer unit and a system console; most further include internal mass–storage devices, user terminals, modems, printers, CLARiiON storage systems, and LAN–based devices such as workstations.

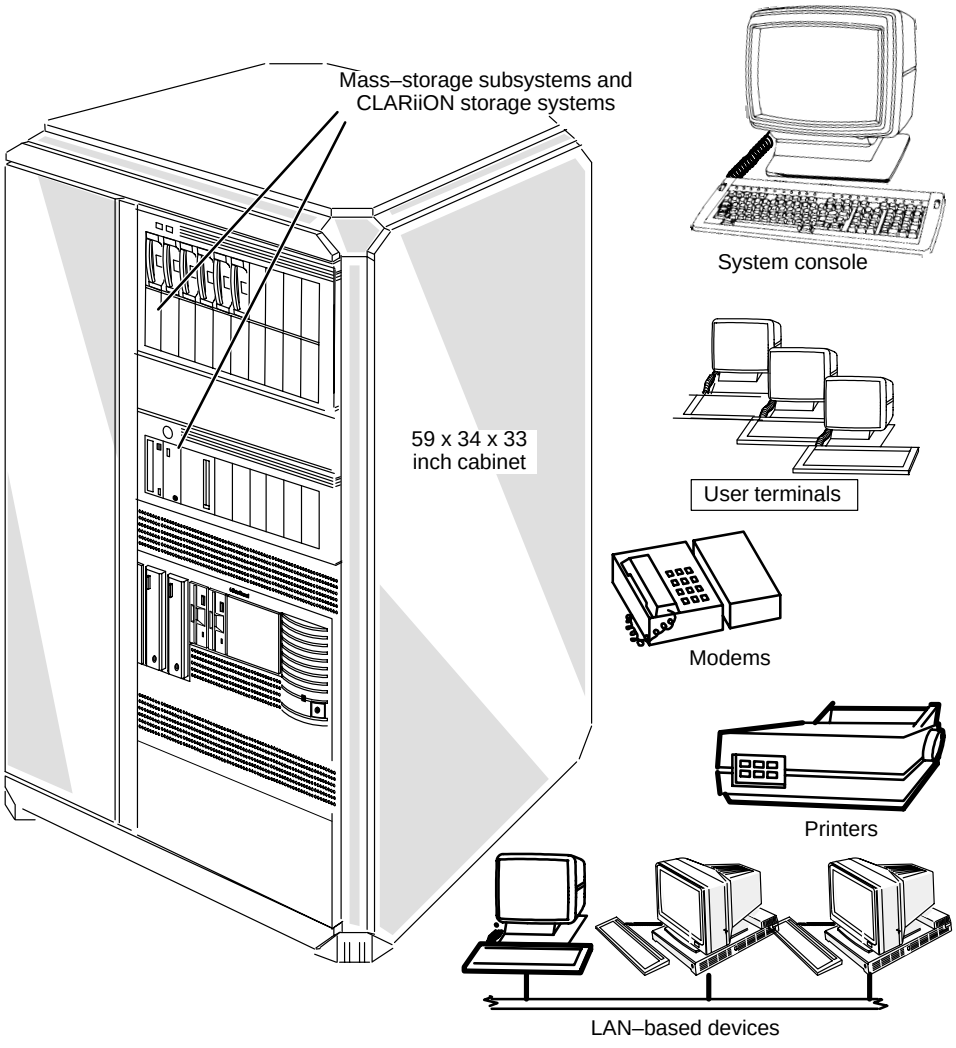


Figure A–1 AViiON 9500 series system components

Basic system

The computer unit comes in a 35–inch high, 17–inch wide, 25.5–inch deep package that includes the power supplies, cooling fans, system processor boards, memory boards, input/output controller board(s), system and VME backplanes and VME system control board. A 34–inch wide, 33–inch deep chassis houses the computer unit and mass–storage options; the chassis may be 59 or 71 inches high.

Minimum standard components

One system processor board
- 2 or 4 Motorola 88110 Central Processing Units per board
- 1 88410 Secondary Cache Controller (256Kbytes) per processor
- 4 processor boards include 32MB of third level cache

One memory controller board supporting maximum of eight 32- or 128-Mbyte memory boards (1-Gbyte total)

One Input/Output Controller (IOC) board supporting
- RS–232–C asynchronous line for system console
- RS–232–C asynchronous AV/Alert service (modem) port
- RS–232–C asynchronous line for Uninterrupted Power Supply
- One integrated SCSI–2 controller for internal devices
- One integrated Ethernet LAN controller
- One VMEbus system control board

9- or 14-slot system backplane printed–circuit board

9-slot system supports maximum of two system processor boards
- includes 6–slot backplane printed–circuit board with VME bus
- 1 slot reserved for VME system control board;
- 5 slots available for VMEbus optional controllers
  - *VME Slot 2 restricted to DGC–supplied boards only*

14-slot system supports maximum of four system processor boards and includes two slots supporting VMEbus repeaters for external VMEbus chassis.

Standard internal mass storage peripheral devices

Single–ended SCSI–2 interface
- Maximum of 4 half–height devices:
  - maximum two half–height 5.25-inch devices ––
    - 600–Mbyte read–only memory compact disk (CD–ROM)
    - or 525 Mbyte quarter-inch cartridge tape drive required
  - maximum of 3 half–height 3.5-inch devices ––
    - 2-Gbyte 4-mm digital audio tape (DAT)
    - .5-Gbyte Winchester hard disk
    - 2-Gbyte Winchester hard disk

Environment

Temperature:
- Operating: 10 °C through 38 °C; 50 °F through 100 °F
- Storage: –40 °C through +65 °C; –40 °F 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

Power supply

Two supplies and power monitor printed–circuit board. A single supply capable of supporting the entire system; both supplies share the following specifications.

1500 W output power, including:
- +5 V dc –– 240 A
- +12 V dc –– 14 A
- –12 V dc –– 1 A

Efficiency .80

Input Watts: 1950 Watts
- Power factor: .97 (minimum at full power)
- Heat dissipation: 6700 BTU/hr maximum
- Inrush current: 150 A maximum for 1/2 line cycle

Single–phase ac

Frequency range 47 Hz through 63 Hz.
- Input range 200–240 V ac: –10%, +15%

Current rating (draw):
- 10 A maximum @ 200 volts

Options

Optional printed–circuit boards

Your computer unit may include a combination of the following optional printed–circuit boards. Board maximums depend on system configuration; note that software restrictions might also apply. For detailed configuration information, contact your Data General representative.

System processors

One, two, or three optional system processor board(s)
2 or 4 Motorola 88110 Central Processing Units per board
1 88410 Secondary Cache Controller (256KB) per processor

Memory expansion

One optional memory controller board supporting
Maximum of eight 32- or 128-Mbyte memory expansion boards per controller — 2 Gbytes maximum per system
ECC with single–bit error correction and double–bit detection

Input/Output

One optional Input/Output Controller (IOC) board supporting:
3 RS–232–C asynchronous lines with modem support
1 integrated SCSI–2 controller (use restricted to reserve)
1 integrated Ethernet LAN controller
2 optional integrated I/O printed–circuit boards:

Communications

Model 7436 Ethernet LAN controller

Mass Storage

Model 7435 SCSI–2 adapter board
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*
Each bus supports 7 devices maximum (all external)

VMEbus options

Systems with internal VMEbus chassis support a maximum of five 6u-format VME printed–circuit boards. 14–slot systems require repeater printed–circuit boards in the computer and one or two external 10–slot VMEbus chassis to support a maximum of 16 6u VME printed–circuit boards.

VDA/255 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

VLCi Ethernet LAN controllers
IEEE 802.3 Ethernet LAN

VSA SCSI-2 controller/adapters
Supports 2 independent buses per board, each bus selectable for single–ended or differential SCSI–2 interface

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

Mass storage options

Each AViiON 9500 series system includes one integrated, single–ended SCSI bus dedicated to internal devices. Any external mass storage options require additional SCSI–2 adaptors. Model 7435 Host Adapters install directly to IOC boards; Model 7430 VSA adapters use the system VMEbus. Each type provides two SCSI–2 buses with each bus selectable for single–ended or differential interface. Supported mass–storage options are listed below; for detailed configuration information, contact your Data General representative.

Internal mass storage

Maximum of four devices *including* standard removable media (CD–ROM, QIC tape, DAT)
3.5–inch single–ended SCSI–2 options *only*
2–Gbyte 4–mm Digital Audio Tape (DAT)
.5–Gbyte Winchester hard disk
2–Gbyte Winchester hard disk

Subsystems and storage systems

CLARiiON disk–array storage system
Requires differential SCSI–2 bus
When housed within computer chassis: 35.6 cm (14 in.) high, 48.3 cm (19 in.) wide
When housed in deskside unit: 61 cm (24 in.) high, 35.6 cm (14 in.) wide, 76.2 cm (30 in.) deep
20 slots supporting 1.0– or .5–Gbyte SCSI disks
Configurable as traditional mass storage or RAID 0, 1, 3, or 5

CLARiiON tape–array storage system
- Requires differential SCSI–2 bus
- 10 half–height, 5.25–inch slots supporting
  - One 5–7 drive 4–mm DAT tape array
  - 3–5 additional SCSI devices on optional second SCSI–2 bus
- When housed within computer chassis: 35.6 cm (14 in.) high, 48.3 cm (19 in.) wide
- When housed in deskside unit: 62.9 cm (24.75 in.) high, 35.6 cm (14 in.) wide, 76.2 cm (30 in.) deep

Combined Storage Subsystem 2 (CSS2/DC)
- 10 half–height slots supporting maximum of seven 5.25–inch SCSI devices (5 full-height, 7 half-height, or combination to 7)
- Single–ended or differential SCSI interface
- Single–ended interface:
  - 1/4–inch cartridge (QIC) tape Multicapacity half–height:
    - read/write QIC 150, 325, 525 Mbytes
  - 2-Gbyte 8-mm archival helical scan cartridge tape (full–height)
  - 2–Gbyte 4–mm Digital Audio Tape (DAT)
    - Half–height 3.5–or 5.25–inch, 5.2– or 8.0–Gbyte capacity
  - 600–Mbyte read–only memory compact disk drive (CD–ROM, half–height)
  - 600–Mbyte rewritable optical disk (full–height)
  - 3.5–inch floppy disk drive with SCSI adapter (half–height)
  - 5.25–inch floppy disk drive with SCSI adapter (half–height)
  - 3.5–inch Winchester hard disk
    - 520–Mbyte (half–height)
    - 2.0 Gbyte (half–height)
- Differential interface:
  - 1–Gbyte (full–height) 5.25–inch Winchester hard disk
- When housed within computer chassis: 22.2 cm (8.75 in.) high, 48.3 cm (19 in.) wide
- When housed in deskside unit: 62.9 cm (24 in.) high, 22.2 cm (8.75 in.) wide, 48.3 cm (19 in.) deep

End of Appendix

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      4400 Computer Drive
      Westboro, MA 01581–9973

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ORDER #	QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE

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6–10 Items	$10.00	$25.00
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Tax Exempt # or Sales Tax (if applicable)
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ORDER TOTAL	
Less Discount See B	–
SUBTOTAL	
Your local** sales tax	+
Shipping and handling – See A	+
TOTAL – See C	

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