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Using AViiON® System Diagnostics

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PRODUCT LINE

Using AViiON® System Diagnostics

014–001863–02

Notice

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014–001863–02

Revision History:

Original Release	– March 1990
First Revision	– August 1990
Second Revision	– August 1991

A vertical bar in the margin of a page indicates substantive technical change from the previous revision.

Preface

This manual describes the AViiON® System Diagnostics software that came with your AViiON computer (called *system diagnostics* throughout this manual). Sections of the manual explain how to use menu–based utilities to verify your computer hardware, test workstation graphics or asynchronous terminal connections, test local area network cabling, and maintain cartridge tapes and diskettes on any model of AViiON hardware.

Although this manual is designed for readers with some technical experience, you do not require knowledge of AViiON or RISC–based computer technology to use the system diagnostics. If you are a system administrator or operator, you can use the system diagnostics to verify the initial installation of your hardware, and to test the system when you suspect a problem and whenever you add or replace a part. Anyone using an AViiON computer system may use the system diagnostics for periodic cartridge tape and diskette maintenance.

Your system diagnostics may not include every utility described in this manual; some menu items differ according to your hardware configuration. We make it clear when text relates to specific models of AViiON hardware.

About this Revision

A vertical bar in the margin of a page indicates substantive technical change from the previous revision. Technical changes in this revision relate to the following:

- New instructions for creating a tape backup of the system diagnostic software (Chapter 1).

- Updated or enhanced descriptions and examples showing supported hardware components or options, including products that recently became available with AViiON computers (Chapters 1, 2, 3, 5, 7).

- Updated references to related documentation for DG/UX customers and those with Remote Assistance contracts (Preface, Chapter 3).

The information in Chapters 4 and 6 remains unchanged.

How We Organized this Manual

This manual presents information as follows.

Chapter 1 Getting Started

This chapter describes the features of the system diagnostics and suggests when to run particular tests and utilities. Sections of this chapter describe the sample AViiON systems used in examples throughout the manual, list keyboard conventions, outline the available menus, and provide instructions for copying the diagnostics from disk to tape or from tape to disk.

Chapter 2 Starting and Stopping the System Diagnostics

This chapter describes how to boot and start the system diagnostic software, and how to exit to the System Control Monitor (SCM) when you are finished using the diagnostics.

Chapter 3 Verifying Your Hardware

This chapter describes the hardware Acceptance test. It shows how to start and stop the test, explains status and error messages, and provides screen examples.

Chapter 4 Testing a Graphics Workstation

This chapter describes how to use the system diagnostics to test the monochrome or color graphics monitor, graphics keyboard, and mouse device connected to an AViiON workstation.

Chapter 5 Testing Terminal Ports

This chapter describes how to use the system diagnostics to test asynchronous connections managed by VAC/16, VDA/128, and VDA/255 controllers installed in an AViiON server system.

Chapter 6 Maintaining Storage Media

This chapter describes how to use system diagnostics to format 5.25– or 3.5–inch diskettes and how to restore proper tension between the reels of quarter–inch cartridge (QIC) tapes.

Chapter 7 Testing Ethernet LAN Cables and Connections

This chapter describes how to test the cable connections between your AViiON computer's Ethernet controllers and transceivers using a Time Domain Reflectometry (TDR) test.

Related Documents

You received a comprehensive documentation package with your AViiON computer system. Those documents specifically mentioned within the text of this manual appear below; they are a small subset of manuals available. Refer to the *Guide to AViiON® and DG/UX™ Documentation* (069–701085) or to the document *Read This First* (069–000519) for a complete description of related hardware and DG/UX operating system documentation. Use *Read This First* if your computer runs Release 4.3x of the DG/UX System (any release prior to 5.40) or a non–Data General operating system. Use the *Guide to AViiON® and DG/UX™ Documentation* if your AViiON computer runs DG/UX Release 5.40 or greater.

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

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

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

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

HPS Downloadable Cluster Controller Technical Manual (014–001813)

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

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

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

Reader, Please Note:

We use the following conventions in this manual:

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

A *multiuser system* or *server* refers to any AViiON hardware model providing services to users via terminal lines and/or a local area network. A *workstation* refers to any single–user AViiON model that provides graphics computing either as a stand–alone station or as a network client to a server system.

A *system console* refers to the keyboard and display device that receives power–up diagnostic test messages and from which you bring up your operating system. In most cases, the system console communicates directly with the computer's system board. A workstation's system console usually consists of the graphics monitor and graphics keyboard. A server's system console usually consists of any asynchronous terminal with an ASCII character set connected to an RS–232–C system board interface.

The term *backplane* refers to the interconnecting printed–circuit board that passes bus and power signals to other boards. The backplane contains connectors into which the boards of the system are plugged. We use the term backplane in the same way as some other documentation uses the term *backpanel*.

In examples we use

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

Additionally, we use these symbols:

Symbol	Means
)	Press the New Line key on a DASHER keyboard; *or* press the Enter or Return key on an IBM PC AT compatible keyboard.
<ESC>	Press the Break/Escape key on a DASHER keyboard; *or* press the Escape key on an IBM PC AT compatible keyboard.
<Ctrl-x>	Press the Ctrl key and lowercase **x** (where **x** is any key) simultaneously. Do not type the brackets or the hyphen.
SCM>	The default System Control Monitor (SCM) prompt on single processor systems.
Jp#*n*/SCM>	The default SCM prompt on computers with more than one processor. *n* is the number of the attached job processor.

Contacting Data General

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

Manuals

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

Telephone Assistance

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

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

Joining Our Users Group

Please consider joining the largest independent organization of Data General users, the North American Data General Users Group (NADGUG). In addition to making valuable contacts, members receive FOCUS monthly magazine, a conference discount, access to the Software Library and Electronic Bulletin Board, an annual Member Directory, Regional and Special Interest Groups, and much more. For more information about membership in the North American Data General Users Group, call 1–800–877–4787 or 1–512–345–5316.

End of Preface

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Chapter 1
Getting Started

You received the AViiON® System Diagnostics software (system diagnostics) with your computer system, either preloaded on disk or on cartridge tape. This chapter provides an overview of the system diagnostics, including the following:

- Description of the features of the diagnostic operating system and suggestions for when to use diagnostic utilities.

- Explanation of interactive menus and keyboard control features.

- Description of the use of sample systems and examples in this manual.

- Instructions for copying the system diagnostic software from tape to disk .

- Instructions for creating a tape backup of the system diagnostic software from disk files.

When to Use the System Diagnostics

The system diagnostics provide menu–based utilities to test any model in the RISC–based AViiON product line. The system diagnostics fully test your computer and all of its hardware components. If there is a hardware problem, the system diagnostics can isolate faults and provide the information necessary for Data General to replace defective parts.

Use the system diagnostics to ensure that your hardware is installed and functioning properly at first installation (you may want to verify your installation before you load any software) and whenever you add or replace a part. After the initial installation, you normally use the system diagnostics only when you encounter or suspect a problem with your computer hardware. You may also choose to run the diagnostics as part of a periodic maintenence schedule even when there are no problems. Table 1–1 lists instances when you might use the system diagnostics, the associated test or utility, and where in this manual that test is described.

Table 1-1 Functions of the System Diagnostics

Situation Requiring Diagnostics	Test or Utility	Where Described
New installation, or a new or replaced part.	Acceptance test	Chapter 3
Suspected problem with a hardware component	Acceptance test	Chapter 3
Workstation graphics appear distorted or unusual.	Graphics tests	Chapter 4
Problem with workstation keyboard.	Keyboard test	Chapter 4
Problem with mouse input.	Mouse test	Chapter 4
Problem with one or more terminal managed by a VME controller.	Terminal tests	Chapter 5
Problem with a printer managed by a VME controller.	Terminal tests	Chapter 5
New or used diskette(s) requires hardware formatting.	Format Diskette utility	Chapter 6
New or used cartridge tape(s) requires adjustment.	Tape Tension utility	Chapter 6
Problem in LAN connections.	TDR test	Chapter 7
Routine maintenance.	Acceptance test	Chapter 3

About the Examples in This Manual

Some AViiON computer systems use a VME interface for peripheral I/O. AViiON workstations use an integrated SCSI bus to manage peripherals. Many AViiON models have *both* integrated SCSI and a VMEbus support. Although this manual does not attempt to illustrate screen messages for *every* AViiON hardware model and configuration, examples do distinguish between systems with and without VMEbus support, since there are significant differences in the way the system diagnostics sizes and initializes computers with VME hardware. Within this manual, the term *server* or *multiuser* system refers to an AViiON model with VME hardware, configured to provide operating system or file services to linked computers or terminals.

Throughout this manual, screen samples describe the system diagnostics features using examples from a standard AViiON desktop workstation configuration and a standard server configuration. Your screen display may not *exactly* match what you see in examples, but you can use the examples and corresponding text explanations to determine how your screen display should appear. Refer to the subsections below for an exact description of the AViiON systems used in manual examples.

If you have questions about your particular hardware configuration while running the system diagnostics, contact the Data General Customer Support Center, as described in the Preface.

The Sample Server System

Screens samples under the heading "server example"or "multiuser/server" provide an example for any AViiON system with VMEbus support in a server or multiuser configuration. The screen samples were generated on a dual–processor AViiON 5000 series server with the following device configuration:

- A Ciprico SCSI device controller managing the following devices:
  - Two hard disk drives
  - Two floppy disk drives
  - One QIC tape drive

- A Ciprico SCSI device controller managing the following devices:
  - Two hard disk drives
  - One QIC tape drive

- One Hawk Ethernet LAN controller

- One VDA/128 host adapter, managing the following devices:
  - Two 16–line cluster controllers
  - One 8–line cluster controller

- One VDC/16 asynchronous terminal controller

- One VSC/4 synchronous controller

The Sample Workstation

Screen samples under the heading "workstation example" provide an example for any AViiON system with *only* an integrated SCSI interface. The screen samples were generated on a single–processor AViiON 300 series workstation with the following device configuration:

- One integrated SCSI device controller managing the following devices:
  - one hard disk drive
  - one floppy disk drive
  - one QIC tape drive

- One monochrome graphics controller

- One integrated Ethernet LAN controller

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Using Keyboard Control

Table 1–2 shows how you can use certain keys and key sequences to control the system diagnostic software while it is running. Refer to the Preface for information about how keyboard symbols are used in this manual.

Table 1–2 Special Keyboard Functions

Keyboard Entry	Function
⟩	Begins execution of prior input. Selects the default at test prompts.
s	Updates status display while the Acceptance test is running. Selects a target controller for executing any test on the Tools menu or Terminal Test menu.
d	Deselects (skips) a controller as a target for executing any test on the Tools menu or the Terminal Test menu.
q	Stops the Acceptance test from executing before it begins.
<ESC>	Exits from the current menu to display the previous menu.
<Ctrl–D>	Interrupts execution of a test and displays the previous menu.
<Ctrl–Q>	Resumes output display that was suspended with the Ctrl–S sequence.
<Ctrl–S>	Suspends output display until you resume it with the Ctrl–Q sequence.

About the System Diagnostic Menus

Figures 1–1 and 1–2 illustrate the menus you can access from the system diagnostics Main Menu. Figure 1–1 shows the items on the Main Menu; Figure 1–2 shows the items on the Tools menu. Refer to Chapters 3 through 7 for information about using the items on each menu.

Some menu options differ according to your AViiON model. For instance, the Tools menu includes utilities to test graphics functions on a workstation that are not available if a graphics monitor, keyboard, and mouse are not connected to your computer system. If you have a Data General remote assistance contract, refer to the *AViiON® Series Systems Automatic Reporting and Remote Assistance User's Guide* for a description of how your system diagnostic menus differ.

You can exit from any menu by selecting its last item number or by pressing the New Line key without selecting an item. You return to the previous menu *except* when you leave the Main Menu; when you exit from the Main Menu, you leave the system diagnostics software and return to the SCM (System Control Monitor) prompt.

```
System Diagnostics
Revision: xx.xx

Data General Corporation
Proprietary Use Only

Main Menu

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

Enter choice [1]:
```

Multiuser/Server System

```
Tools Menu

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

Enter choice [6]:
```

Item 2

Graphics Workstation

```
Tools Menu

1. Format diskettes
2. Run tape adjustment utility
3. View Graphics Tools Menu
4. Test network connection (TDR)
5. Run keyboard test
6. Run mouse test
7. Display help screen
8. Return to Main Menu

Enter choice [8]:
```

Item 3 → Explanation of Menu Selections

Item 4 → SCM>

Item 1

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

Memory
CPU
Integrated DUART Channel A
Integrated DUART Mouse Interface    EXAMPLE
Clock
Integrated LAN                        ONLY
Parallel Printer
Integrated SCSI  Microp 1578-15 Disk (unit: 0)
Integrated SCSI  TEAC 5.25 floppy (LUN 2) (unit: 3)
Integrated SCSI  ARCHIVE Viper 150 Tape (unit: 4)

This test runs for 15 minutes.

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

Figure 1–1 Main Menu

```
░░░░░░ Multiuser/Server System ░░░░░░

Tools Menu

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

Enter choice [6]:
```

Item 4

```
Terminal Test Menu

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

Enter option: [9]
```

```
░░░░░░ Graphics Workstation ░░░░░░

Tools Menu

1. Format diskettes
2. Run tape adjustment utility
3. View Graphics Tools menu
4. Test network connection (TDR)
5. Run keyboard test
6. Run mouse test
7. Display help screen
8. Return to Main Menu

Enter choice [8]:
```

Item 3

```
            Graphics Tools Menu

1.  Test graphic subsystem
2.  Display video adjustment BRIGHT pattern
3.  Display video adjustment CONTRAST pattern
4.  Display video adjustment PARALLEL pattern
5.  Display video adjustment REGULATE pattern
6.  Display video adjustment FLOOD pattern
7.  Display CIRCLES pattern
8.  Display help screen
9.  Exit to Tools Menu

Enter option: [9]
```
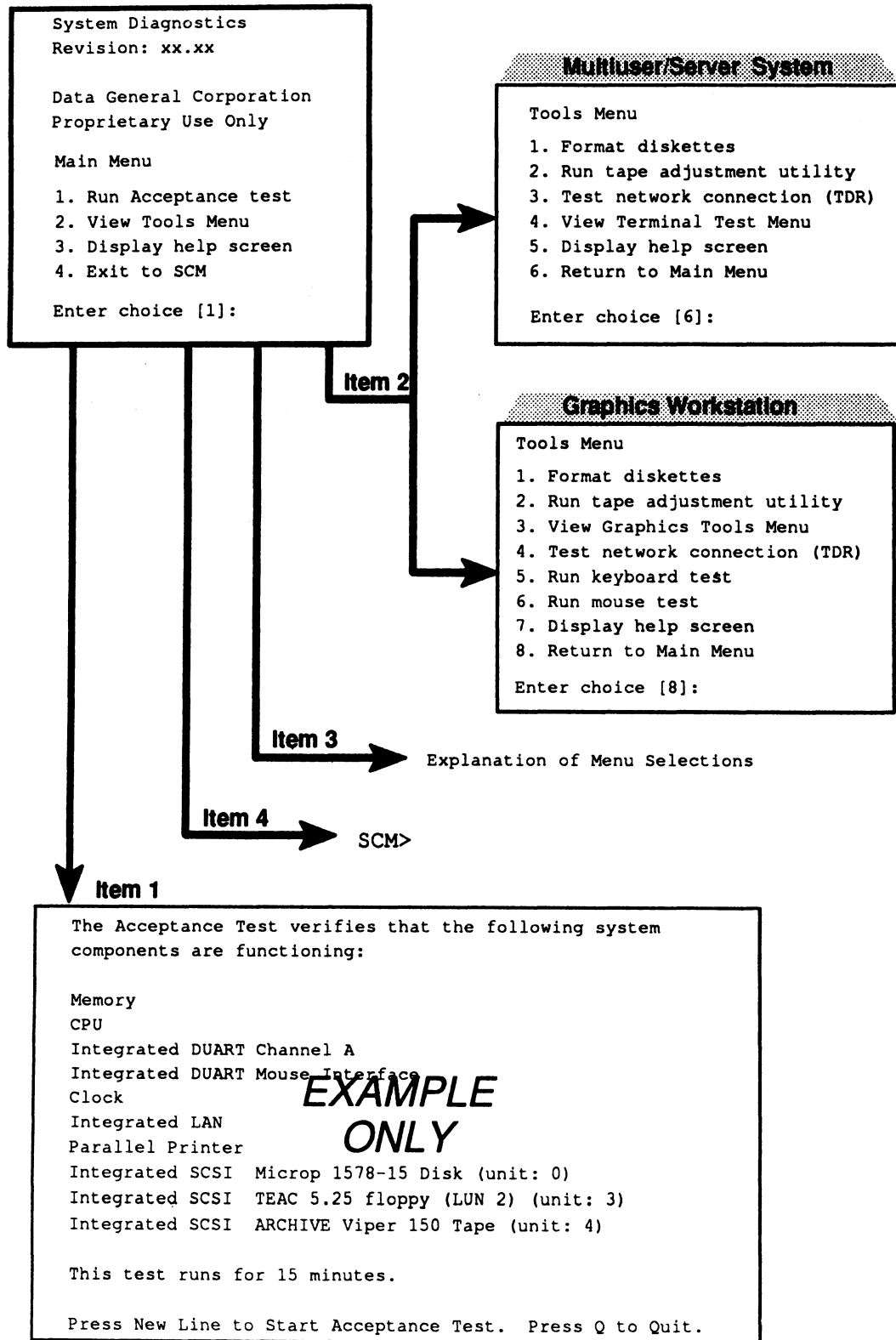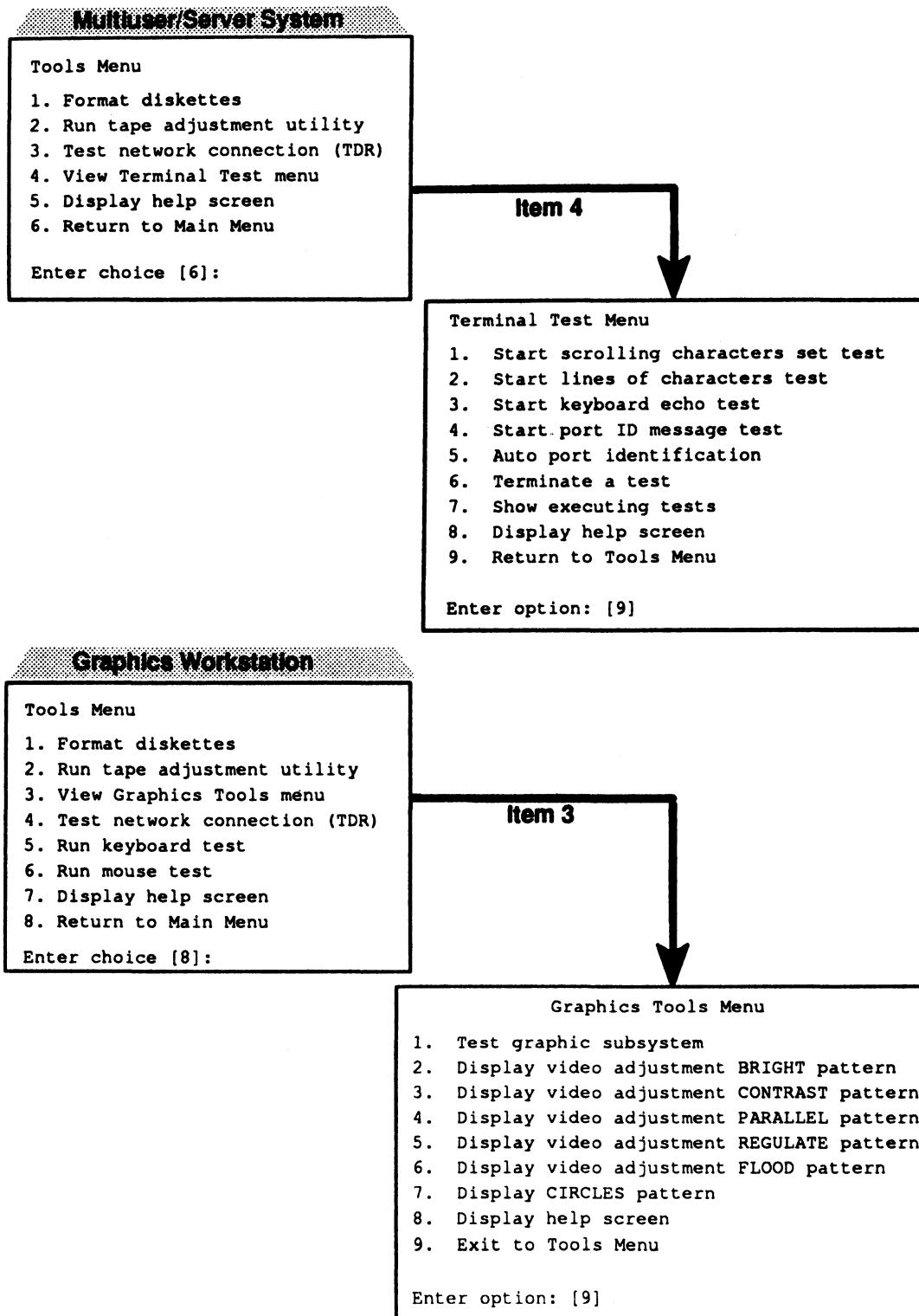
Figure 1–2 Tools Menu

NOTE: If you have a Data General remote assistance contract, refer to the
*AViiON® Series Systems Automatic Reporting and Remote Assistance
User's Guide* for a description of additional Tools menu items.

Copying System Diagnostics to Disk

If your system configuration includes both a QIC tape drive and a hard disk drive, you can use the cartridge tape labeled "AV System Diagnostics" to load the system diagnostics software onto your system disk. Loading the system diagnostics to disk allows you to boot from disk each time you use the system diagnostics.

To copy the contents of the "AV System Diagnostics" cartridge tape to a file called diags in the /usr/stand directory on your system (root) disk, use the UNIX **dd** command, as follows:

> # **dd if=/dev/rmt/0 of=/usr/stand/diags ibs=612b obs=512 conv=sync)**

You can now follow the steps in the section "Booting Diagnostics From Disk" in Chapter 2 whenever you use the system diagnostic software.

Making a Backup Tape

If your system configuration includes both a QIC tape drive and a hard disk drive, you can copy the system diagnostics disk files onto tape. Copying the diagnostics to tape allows you to boot the system diagnostics from tape if there is ever a problem accessing your disk files.

To copy the contents of the "AV System Diagnostics" cartridge tape to a file called diags in the /usr/stand directory on your system (root) disk, use the UNIX **dd** command, as follows:

> # **dd if=usr/stand/diags of=/dev/rmt/4 ibs=512 obs=612b conv=sync)**

You can now follow the steps in the section "Booting Diagnostics From Tape" in Chapter 2 whenever you need to use the system diagnostic backup tape.

End of Chapter

Chapter 2
Starting and Stopping
the System Diagnostics

This chapter describes how to boot the system diagnostics from disk, from cartridge tape, or over a LAN. This chapter also describes how to exit from diagnostics to reboot your operating system.

You start the diagnostic operating system as a stand–alone program. If your computer came with the DG/UX™ operating system preloaded on disk, the system diagnostics software is also preloaded and you can boot from disk. If the system diagnostic software is not installed on disk, you boot the diagnostic operating system from tape. If you have a diskless workstation connected to an AViiON server, you must download system diagnostics to boot your workstation over the network.

If your system diagnostics are provided on cartridge tape, refer to the printed *AV System Diagnostics Release Notice* that accompanies the cartridge tape for any special instructions.

If your system diagnostics are on disk, you can display an electronic copy of the Release Notice. While the DG/UX operating system is running, use the following command line:

> # more /usr/release/diags.rn ⟩

To run the system diagnostics, you must be at the SCM (System Control Monitor) prompt; your operating system cannot be running. Refer to your operating system documentation for instructions on properly shutting down and halting the operating system. If your system is not yet powered on, you can type <**Ctrl–C**> after power–up testing completes to interrupt the automatic boot sequence. As long as you execute the Ctrl–C key sequence *before* the operating system bootstrap takes control of the computer, you can access the SCM prompt in this way.

Once your system displays the SCM prompt, complete the steps in this section. Go to the appropriate section below for booting from disk, from tape, or over a LAN.

Booting from Disk

NOTE: On a DG/UX system, first shut down the operating system as follows:

    # cd /)

    # shutdown -g0 -y)

    # halt -q)

At the SCM prompt, use the SCM **BOOT** command, specifying the device path (the controller and disk drive for the boot disk) and the file path (the name and location of the program, **usr:/stand/diags**) as arguments. Which device path you use depends upon your AViiON computer series and the type of your root disk. Choose the appropriate device path from Table 2–1, then append the file path **usr:/stand/diags** to construct a command line.

CAUTION: *If the **usr** logical disk contains more than one piece, you cannot boot from disk. Use the steps in the next section, "Booting from Tape" instead.*

Table 2–1 Boot Disk Devices

AViiON Series	Drive Type	Device Path
Any with PHU (Peripheral Housing Unit) or CSS2 (Combined Storage Subsystem)	SCSI drive in PHU or CSS2 chassis	**sd(insc(),0)**
Any with High Availability Disk Array (HADA) Subsystem	SCSI drive in HADA chassis	**sd(hada(),0)**
Any with High Availability Disk Array (HADA) Subsystem	Disk Array in HADA chassis	**da(hada(),6)**
400, 3000, 4000 series	Integrated SCSI	**sd(insc(),0)**
400, 530, 3000, 4000, 4600 5000, 6000. 7000, 8000 series	VME SCSI	**sd(cisc(),0)**
530 or 4600 series	Integrated SCSI	**sd(ncsc(),0)**
5000, 6000. 7000, 8000 series	Ciprico ESDI	**cied()**
5000, 6000. 7000, 8000 series	Ciprico SMD	**cimd()**

For example, type the following and press New Line if your SCSI disk controller is integrated on the system board (most workstations).

    SCM> **b sd(insc(),0)usr:/stand/diags**)

Or type the following and press New Line if your SCSI devices are managed by a SCSI adapter installed in a VME option slot.

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

After booting the system diagnostics, go to the "Starting System Diagnostics" section.

Booting from Cartridge Tape

Follow these steps to boot the system diagnostics from cartridge tape.

1. Locate the 150–megabyte QIC (quarter–inch cartridge) tape labeled "AV System Diagnostics." You received the tape with your computer system if you did not purchase a preloaded DG/UX operating system package.

2. Make sure that the write–protect indicator on the cartridge tape points to "SAFE."

3. Insert the cartridge tape into the tape drive. Orient the cartridge tape to the tape drive opening as shown in Figure 2–1.

   NOTE: Figure 2–1 shows tape drives mounted horizontally, such as those in a Peripheral Housing Unit (PHU). Even with a drive mounted vertically, the metal plate (on the bottom of the tape) aligns with the bottom edge of the drive.

4. Gently push the tape into the drive opening; then, push it firmly all the way into the drive until it remains in place. If you have a 150–Mbyte QIC tape drive, slide the load/eject latch to the right (horizontally–mounted drives) or down (vertically–mounted drives) to lock the cartridge tape in place. If you have a multicapacity QIC tape drive, close the drive door.

   You hear the drive make a whirring sound as the read/write heads find the beginning of the cartridge. If you don't hear this sound, the tape is not properly inserted or the drive is not locked; remove the tape and repeat this step.
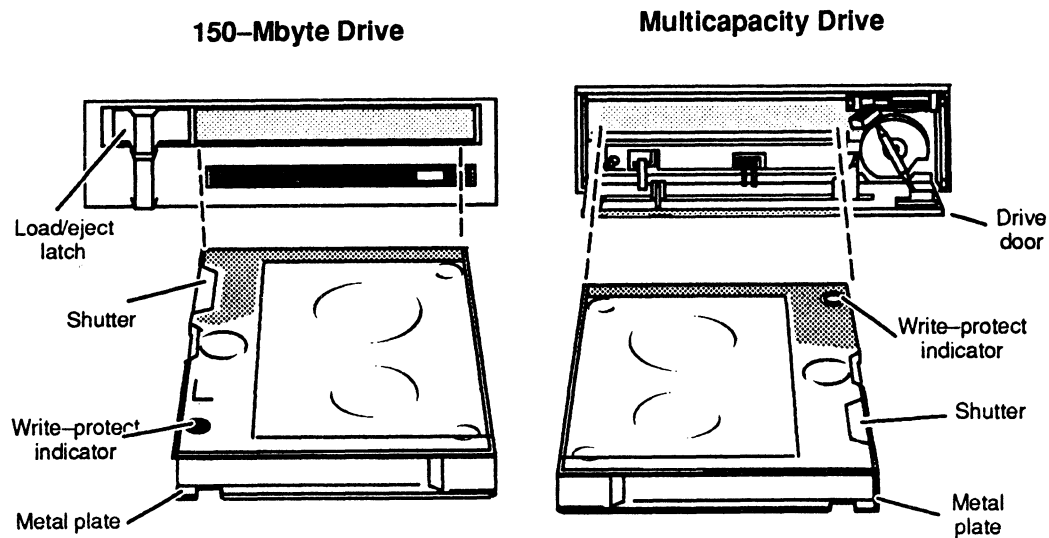
150–Mbyte Drive   **Multicapacity Drive**

Figure 2–1 Inserting QIC Tape

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5.   Shut down your operating system. If your computer is running DG/UX, halt
      the operating system as follows:

      # cd / ⟩
      # shutdown –g0 –y ⟩
      # halt –q ⟩

      If you are not running DG/UX, refer to the documentation that came with the
      operating system for instructions on properly shutting down.

6.   At the SCM prompt, use the SCM **BOOT** command, specifying the device path
      (the controller and SCSI ID number for your tape drive) as an argument.
      Which device path you use depends upon your AViiON computer series and the
      type of your drive's SCSI controller. Choose the appropriate device path from
      Table 2–2.

Table 2–2 Tape Boot Devices

AViiON Series	Drive Type	Device Path
Any with Peripheral Housing Unit (PHU) or Combined Storage Subsystem (CSS2)	SCSI drive in PHU or CSS2 chassis	**sd(insc(),4)**
400, 3000, 4000 series	Integrated SCSI	**sd(insc(),4)**
400, , 530, 3000, 4000, 4600 5000, 6000, 7000, 8000 series	VME SCSI	**st(cisc(),4)**
530 or 4600 series	Integrated SCSI	**st(ncsc(),4)**
Any with High Availability Disk Array (HADA) Subsystem	SCSI drive in HADA chassis	**st(hada(),4)**

For example, type the following and press New Line if your SCSI controller is
integrated on the system board (most workstations).

    SCM> **b st(insc(),4)** ⟩

Type the following and press New Line if your SCSI devices are managed by the
first SCSI adapter installed in a VME option slot.

    Jp#0/SCM> **b st(cisc(),4)** ⟩

Refer to your computer's *Setting Up and Starting* manual for detailed
information about model–specific boot path arguments.

7.   After booting the system diagnostics, proceed with the next section, "Starting
      System Diagnostics."

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Booting over the Network

NOTE: If your system is running DG/UX, halt the operating system as follows:

cd / ⥾
shutdown –g0 –y ⥾
halt –q ⥾

At the SCM prompt, use the SCM **BOOT** command, specifying the device path (the name of your LAN controller) and the file path (the name and location of the program,/**stand/diags**, and, optionally, the Internet address of the server system) as arguments. Which device path you use depends upon your AViiON computer series and the type of LAN controller managing your computer's connection to the server system. Choose the appropriate device path from Table 2–3, then append the file path /**stand/diags** to construct a command line. If there is more than one server on the LAN, insert the Internet address of the server configured to provide services to your computer between the device path and program name.

Table 2–3 LAN Boot Devices

AViiON Series	LAN Type	Device Path
100, 200, 300, 400, 3000, 4000	Integrated Ethernet	**inen()**
530 or 4600 series	Integrated Ethernet	**dgen()**
400, 3000, 4000, 5000, 6000, 7000, 8000 series	VME Ethernet	**hken()**
400, 530, 3000, 4000, 4600, 5000, 6000, 7000, 8000 series	VME Token Ring	**vitr()**

For example, type the following if your LAN connection to the server is managed by an integrated Ethernet controller (most workstations):

SCM> **b inen()/stand/diags** ⥾

Or, type the following to boot the system diagnostics over a LAN managed by the first VLC (VME LAN controller) installed in a VME option slot, from the server system at Internet address **128.111.2.3**

SCM> **bhken()128:111.2.3/stand/diags** ⥾

Refer to your computer's *Setting Up and Starting* manual for detailed information about booting over a LAN using the SCM **BOOT** command.

After booting the system diagnostics, go to the section "Starting System Diagnostics" later in this chapter.

Starting System Diagnostics

After booting the system diagnostics as described in the previous section, follow these steps to start system diagnostics and to display the Main Menu.

1. Once the boot process completes, your system displays the following screen:

```
          Licensed Material - Property of DGC
          Data General Proprietary Diagnostics

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

(C) DATA GENERAL CORPORATION 1989, 1990. 1991
ALL RIGHTS RESERVED
This copyright notice does not constitute or evidence
publication or public disclosure.

Press New Line to proceed.
```

Press New Line when you are ready to clear the screen.

2. The system diagnostics begin by initializing each component found (sized) in your computer system. The following display screen example shows an AViiON 300 series workstation after the sizing and initialization process completes.

Workstation Example

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

    Initializing Operating System for System Diagnostics

    8192 Kbytes system memory
    7258 Kbytes memory available for test
    Single CPU System (Motorola 88100 CPU Rev x)
    1 Instruction Cache (Motorola 88200 CMMU Rev x)
    1 Data Cache (Motorola 88200 CMMU Rev x)
    Initializing Virtual Console
    Initializing Real Time Clock
    Initializing Integrated SCSI
    Initializing Parallel Printer
    Initializing Monochrome Graphics Controller
    Initializing Keyboard
    Initializing Duart
    Initializing Integrated LAN
```

As seen in the example below, systems with VME support first look for controllers at expected addresses on the VME bus, and then report those found.

Server Example

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

Initializing operating system for System Diagnostics

Sizing Controllers on VME Bus:

    SCSI Controller at 0xfffff300          Found
    SCSI Controller at 0xfffff500          Found
    LAN Controller at 0xffff4000           Found
    Synchronous Controller at 0x55b00000   Found
    Asynchronous Controller at 0x60000000  Found
    Asynchronous Controller at 0x60020000  Found

Press New Line to proceed
```

Verify that all installed VME boards appear with the message Found. You don't need to verify board addresses; just be sure that the diagnostic system finds the correct quantity and types of controllers. If the sizing process does not find a controller, make sure that the controllers in your system are properly installed (as described in *Setting Up and Installing VMEbus Options in AViiON® Systems*) or contact Data General for assistance, as described in the Preface.

NOTE: Some systems look for add-on SCSI and LAN controllers integrated in an optional expansion board before continuing with the system initialization, as follows:
```
Sizing Expansion Boards:
            Expansion I/O Board 0    Found
Press New Line to proceed.
```

Press New Line to continue with the system initialization.

```
16384 Kbytes system memory
15109 Kbytes memory available for test
PROM revision xx.xx
Dual CPU System (Motorola 88100 CPU Rev x)
2 Instruction Caches (Motorola 88200 CMMU Rev x)
2 Data Caches (Motorola 88200 CMMU Rev x)
Initializing Virtual Console
Initializing Real Time Clock
Initializing VME Async I/O Board 0
Initializing VME Async I/O Board 1
Initializing VME SCSI Board 0
Initializing VME SCSI Board 1
Initializing Parallel Printer
Initializing Duart
Initializing VME LAN Board 0
Initializing VME Sync I/O Board 0
```

Note that the system diagnostics determines VME board numbers from configuration jumpers on the boards that were sized in the previous screen.

3. Once the system completes sizing and initialization, accept the default responses for the following questions by pressing New Line at the Y/N prompts. (Some systems do not ask about enabling parity checking.)

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

    Enable parity checking for instructions (Y/N) [Y]? )

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

    Enable parity checking for data (Y/N) [Y]? )
    ```

    NOTE: Parity checking must be enabled for the system diagnostics to report data exception errors. With data and instruction caches turned on, diagnostic tests run faster and more efficiently because necessary data and program code is loaded into special high speed memory caches for easy retrieval.

4. Verify the current time at the next prompt, as shown in the following example.

    ```
    Current time is 16:15 Thursday, April 24, 1990.
    Is this correct (Y/N) [Y]?
    ```

    If the date and time are correct, press New Line. If you need to correct the date and time, type N and press New Line. Enter the correct date (mm/dd/yy), and then the correct time (hh:mm) at the prompts. Enter the time in a 24–hour format (as in 16:15 for 4:15 p.m. shown above).

    NOTE: The current time is always reported within the system diagnostics as UTC, Coordinated Universal Time (also referred to as Greenwich Mean Time). Your operating system software keeps track of any offset to UTC for your site; however, the system diagnostics software sets and reads time in the clock chip and cannot use the kernel offset.

5. Next, the system diagnostics software sizes (locates and lists) peripherals connected to initialized controllers. Examine the list carefully; if a peripheral is not listed it could indicate a loose or faulty cable connection, an incorrect device ID, or a serious hardware problem within the device or its controller.

    If the message Drive is NOT READY appears after a listed mass–storage device, place the drive on line. If it is a tape drive, place a write–enabled scratch tape in the tape drive and close the drive.

    If a configured peripheral is missing from the peripheral sizing list, verify the following first, then start the system diagnostics again.

    • All cabling is connected properly and the peripheral is configured according to SCSI device identification (SCSI ID) guidelines, as described in your AViiON series installation manual.

    • The drive is installed correctly, as described in the drive manual.

    If the device is not initialized the second time you start the system diagnostics, contact Data General as described in the Preface.

The following screen examples show the server system and workstation after sizing configured peripherals.

Server Example

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

Current time is xx:xx Tuesday, May 4, 1991. Is this correct (Y/N) [Y]?

Sizing Peripherals....

VME SCSI Board 0:
    Unit 0: Microp 1578-15 UPDG02 Disk Drive found
    Unit 1: Microp 1578-15 UPDG02 Disk Drive found
    Unit 3: TEAC 5.25 Floppy (LUN 0) Disk Drive found
    Unit 3: TEAC 5.25 Floppy (LUN 1) Disk Drive found
    Unit 4: Archive Viper 150 21247-045 Tape Drive found

VME SCSI Board 1:
    Unit (Drive Number) 0: 662 MB ESDI Disk found
    Unit (Drive Number) 1: 662 MB ESDI Disk found
    Unit (Drive Number) 2: 662 MB ESDI Disk found

VME Async Board 0:

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

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

VME Async Board 1:

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


Press New Line to proceed
```

NOTE: Refer to Chapter 5 for information about VME asynchronous controllers and how you can test the connections they manage.

Workstation Example

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

Enable parity checking for instructions (Y/N) [Y]?

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

Enable parity checking for data (Y/N) [N]?

Current time is 16:15 Thursday, April 24, 1990.
Is this correct (Y/N) [Y]?


Sizing Peripherals...

Integrated SCSI:
     Unit 0: Microp 1578-15 UPDG02 Disk Drive found
     Unit 3: TEAC 5.25 Floppy (LUN 0) Disk Drive found
     Unit 4: Archive Viper 150 21247-005 Tape Drive found

Press New Line to proceed.
```

6. Press New Line to continue once you are certain that the peripheral list matches your system configuration. The screen displays the Main Menu.

```
              System Diagnostics
              Revision: xx.xx

              Data General Corporation
              Proprietary Use Only


                      Main Menu

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



              Enter choice [1]:
```

Select item 3, "Display help screen" for a brief on–line description of the menu options. Refer to Chapter 3 for instructions on running the 15–minute Acceptance test. Refer to Chapters 4, 5, 6, and 7 for instructions on running the utilities available from the Tools menu (item 2).

Refer to the next section when you are ready to leave the system diagnostics.

Exiting from System Diagnostics

Follow these steps when you are ready to leave the system diagnostics:

1. While in the system diagnostics Main Menu, select item 4, "Exit to SCM" to enter the System Control Monitor (SCM).

    The system displays the SCM prompt.

    SCM>

    NOTE: In multiprocessor systems, the default SCM prompt displays the number of the attached job processor (Jp#n/SCM>, where n is 0 or 1, the number of the attached job processor).

2. Type **r** and press New Line to reset your system by executing the SCM **RESET** command.

    SCM> **r** ↵

    The screen goes blank for a moment and then displays hardware status values, followed by the SCM prompt. The following example shows Xs where hexadecimal register contents appear.

PSR	XPC	NPC	FPC	DCSH	DMMU	ICSH	IMMU
xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx	N	N	N	N

    SCM>

    NOTE: If your display shows a Y rather than N in any of the last four columns of status values, repeat the **RESET** command.

3. Boot your operating system by entering the **BOOT** command as follows:

    SCM> **b** ↵

    If your system does not include preloaded DG/UX, if you have not installed your operating system on disk, or if the default SCM boot path is not set for your operating system boot path, the boot attempt fails and the system displays the SCM prompt again. Repeat the **BOOT** command, this time including the boot device path and the disk location and filename of your operating system as arguments. Refer to Table 2–1, 2–2, or 2–3 for boot device paths. For example, type the following to boot DG/UX from the disk at SCSI ID 0, managed by a workstation's integrated SCSI controller:

    SCM> **b sd(insc( ),0)root:/dgux** ↵

    Refer to your computer's *Setting Up and Starting* manual (listed in the Preface) for more information on specifying SCM boot devices. ▌

End of Chapter

Chapter 3
Verifying Your Hardware

This chapter describes how to use the 15–minute Acceptance test included with your system diagnostics software. The Acceptance test sizes and verifies proper functioning of your computer system's hardware components.

Run the Acceptance test when your computer system or any component is new, when you suspect a problem with any component, or on a periodic maintenance schedule.

Running the Acceptance Test

After starting the system diagnostics as described in Chapter 2, follow these steps to complete the Acceptance test.

1. While in the Main Menu, type 1 and press New Line to select item 1, "Run Acceptance test." Refer to Chapter 2 for information about starting the system diagnostics and displaying the Main Menu.

```
              System Diagnostics
              Revision: xx.xx

              Data General Corporation
              Proprietary Use Only


                    Main Menu

              1.  Run Acceptance test
              2.  View Tools menu
              3.  Display help screen
              4.  Exit to SCM


              Enter choice [1]:
```

CAUTION: *All tests in this utility are nondestructive EXCEPT the cartridge tape drive test. If you booted the system diagnostics from tape, remove the tape from its drive after you select the Acceptance test item from the System Diagnostics Main Menu; insert a blank or scratch tape during testing.*

The Acceptence test begins by displaying a list of the devices found during initialization. The steps in this chapter provide sample screens for both server and workstation configurations; your screen display will reflect your configuration and may therefore differ from these examples. Refer to Chapter 1 for information about how we use sample systems for examples.

Server Example

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

Memory
Multiple CPU
Integrated DUART Channel B
Clock
VME LAN Board 0
Parallel Printer
VME SCSI Board 0  Microp 1578-15 disk drive (unit: 0)
VME SCSI Board 0  Microp 1578-15 disk drive (unit: 1)
VME SCSI Board 0  TEAC 5.25 Floppy drive (LUN 0)(unit: 3)
VME SCSI Board 0  TEAC 5.25 Floppy drive (LUN 1) (unit: 3)
VME SCSI Board 0  ARCHIVE VIPER 150 tape (unit: 4)
VME SCSI Board 1  Microp 1578-15 disk drive (unit: 0)
VME SCSI Board 1  Microp 1578-15 disk drive (unit: 1)
VME SCSI Board 1  ARCHIVE VIPER 150 tape (unit: 4)
VME Host Adaptor 0
16-line VME Async Board 1
VME Sync Board 0


This test runs for 15 minutes


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

Workstation Example

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

    Memory
    CPU
    Integrated DUART Channel A
    Integrated DUART Mouse Interface
    Clock
    Integrated LAN
    Parallel Printer
    Integrated SCSI  Microp 1578-15 Disk (unit: 0)
    Integrated SCSI  TEAC 5.25 floppy (LUN 0) (unit: 3)
    Integrated SCSI  ARCHIVE Viper 150 Tape (unit: 4)


This test runs for 15 minutes.


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

The Acceptence test verifies all devices listed. Refer to Chapter 2 for information about the sizing and initialization process, or if you think you may have components that are not listed.

2. Press New Line to start the test.

NOTE: If a parallel printer is not connected to your computer unit's parallel printer port, or if a connected printer is off–line, the system diagnostics displays the following message:

```
Parallel printer not found.  TEST WILL BE DESELECTED
```

If you want to test a connected parallel printer that was off–line you will have to repeat the Acceptance test or start the system diagnostics again.

3. Before starting the Acceptance test, the utility displays the following message:

```
CAUTION:  Tape tests destroy all data on the tape.  Please
insert write-enabled scratch tapes for all tape units to
be tested.  Press New Line when ready to proceed.
```

If you booted from tape, remove the AViiON System Diagnostics tape from the drive and insert a blank (scratch) cartridge tape into each tape drive in your system configuration before proceeding. Make sure that scratch tapes are write–enabled since tape tests need to record on the tape. Refer to Chapter 1 for information about removing, write–enabling, and inserting cartridge tapes.

4. Press New Line once you have inserted a write–enabled scratch tape in each tape drive.

If a tape in one of your drives is not write–enabled, you'll see the following message:

```
Media in [unit x] is write protected.
Please press New Line to cancel tape test or insert a
write-enabled scratch tape and press New Line to proceed.
```

Remove the tape from the drive specified as unit x and repeat steps 3 and 4, or press New Line to cancel the tape test on that drive and start the testing.

5. Once the Acceptance test begins, you see an initial General Status Report screen, as seen in the following examples.

Server Example

```
                         General Status Report
Revision: xx.xx                              Total Errors:   0000
Elapsed Time: 00:00:10                       Current Time: 10:12:00

TEST  SUBSYSTEM                  PASS    SOFT    HARD    KBYTES   KBYTES
ID    DESCRIPTION                COUNT   ERRORS  ERRORS  READ     WRITTEN
52    Memory                     0       0       0       0        0
51    Multiple CPU               0       0       0       0        0
50    Integrated DUART           0       0       0       0        0
49    Clock                      0       0       0       0        0
48    VME LAN Board 0            0       0       0       0        0
47    VME SCSI Board 0           0       0       0       0        0
46    VME SCSI Board 1           0       0       0       0        0
45    16-line VME Async Board    0       0       0       0        0
44    VME Sync Board 0           0       0       0       0        0

S - Update General Status Report    Ctrl-D to Stop all Tests
```

Workstation Example

```
                         General Status Report

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

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


48    Memory             0       0       0       0        0
47    CPU                0       0       0       0        0
46    Integrated Duart   0       0       0       0        0
45    Clock              0       0       0       0        0
45    Integrated LAN     0       0       0       0        0
44    Integrated SCSI    0       0       0       0        0


S - Update General Status Report    Ctrl-D to Stop all Tests
```

The Acceptance test assigns a test number to each individual test. Once testing begins, the status report indicates the number of test passes completed for each test, any soft errors detected during testing, and the number of kilobytes read and written.

The General Status Report screen automatically displays updated information every minute, but you can type s to view current statistics at any time during testing.

If any test encounters a serious fault, the Acceptance test halts and you see an error message and fault code or the SCM (System Control Monitor) prompt on your screen. If either of these things happen, write down any text displayed on your screen and contact Data General as described in the Preface.

NOTE: If you have a remote assistance contract and you have enabled the MI callout feature, a hard error initiates an automatic call to the Data General Customer Service Center. Refer to your *AViiON® Series Systems Automatic Reporting and Remote Assistance User's Guide*, listed in the Preface.

The Acceptance test runs for 15 minutes. You must let the Acceptance test run for the full 15 minutes in order to properly test your computer. To stop the testing, press Ctrl–D at any time. This interrupts the current test and invalidates any testing already completed.

6.   At the end of the Acceptance test you see a Final Status Report on your screen, as seen in the examples below. You will receive this final status even if you have interrupted testing, but do not consider the system verified unless the Acceptance test displays the Final Status Report without intervention.

Server Example

```
                        Final Status Report

  Revision: xx.xx                           Total Errors:  0000

  Elapsed Time: 15:00:01                  Current Time: 10:26:34

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

        Press New Line to return to the Main Menu
```

Workstation Example

```
                         Final Status Report

    Revision: xx.xx                      Total Hard Errors:  0000
    Elapsed Time: 00:15:00               Current Time: 10:11:13

    TEST  SUBSYSTEM         PASS   SOFT   HARD   KBYTES   KBYTES
    ID    DESCRIPTION       COUNT  ERRORS ERRORS READ     WRITTEN
     *    Memory             805     0      0     1949     1949
     *    CPU               1732     0      0        0        0
     *    Integrated Duart   932     0      0       90       90
     *    Clock                1     0      0        0        0
     *    Integrated LAN     615     0      0       11       11
     *    Integrated SCSI    107     0      0    23131        0


              Press New Line to Return to Main Menu
```

If you see errors in the SOFT ERRORS column of the Final Status Report, you may want to further test the indicated component. Run the Acceptance test again or, if applicable, use one of the utilities described in Chapters 4 through 7. If you can continue testing without receiving a hard error message or fault code, continue to use your computer system with confidence. If you receive one soft error for each pass of a specific test, notify Data General. Make a note of unrepeated soft errors for future reference, and plan to run the Acceptance test periodically to monitor them; they could indicate a developing problem.

7. Press New Line to return to the system diagnostics Main Menu.

8. To exit from the system diagnostics now, select item 4, "Exit to SCM," from the Main Menu, as described in Chapter 2.

   If you have an AViiON workstation and want to run additional tests on your keyboard, mouse, monitor, or graphics system, refer to Chapter 4 before exiting from the Main Menu. If you have an AViiON server or multiuser system and want to run additional tests on the terminals connected to your computer, refer to Chapter 5 before exiting from the Main Menu. If you want to test your Ethernet LAN connections, refer to Chapter 7 before exiting from the Main Menu. If you want to adjust the tension between cartridge tape reels or format a diskette or optical disk, refer to Chapter 6 before exiting from the Main Menu.

End of Chapter

Chapter 4
Testing a Graphics Workstation

This chapter describes how to test the graphics monitor, keyboard, and mouse device connected to an AViiON workstation.

If you suspect a problem with your graphics display, you can use system diagnostic utilities to test the graphics monitor, keyboard, or mouse components. You run the Keyboard test and Mouse test directly from the Tools menu. You display a Graphics Tools menu from the Tools menu which includes tests for your monochrome or color graphics monitor and the graphics subsystem.

Accessing the Graphics Tools

You access the Graphics Tools menu, the Keyboard test, and the Mouse test from the Tools menu. To enter the Tools menu, do the following:

While in the system diagnostics Main Menu, type **2** and press New Line to select item 2, "View Tools Menu."

NOTE: Refer to Chapter 2 for information about starting the system diagnostics and displaying the Main Menu.

The system diagnostics displays the Tools Menu.

```
                      Tools Menu



        1.  Format diskettes
        2.  Run tape adjustment utility
        3.  View Graphics Tools menu
        4.  Test network connection (TDR)
        5.  Run keyboard test
        6.  Run mouse test
        7.  Display help screen
        8.  Return to Main Menu



        Enter choice [8]:
```

NOTE: Items on the Tools menu vary according to your hardware model. If your Tools menu does not include items 3, 5, and 6 as listed above, you are not using the system diagnostics on a graphics workstation; graphics tests are not available.

Using the Graphics Tools Menu

To run tests on your graphics monitor, do the following:

1. While in the Tools Menu, type **3** and press New Line to select item 3, "View Graphics Tools Menu."

    The system diagnostics displays the menu, as follows:

```
                    Graphics Tools Menu

         1.  Test graphic subsystem
         2.  Display video adjustment BRIGHT pattern
         3.  Display video adjustment CONTRAST pattern
         4.  Display video adjustment PARALLEL pattern
         5.  Display video adjustment REGULATE pattern
         6.  Display video adjustment FLOOD pattern
         7.  Display CIRCLES pattern
         8.  Display help screen
         9.  Exit to Tools Menu

         Enter option: [9]
```

2. Select the test or pattern to run by entering the corresponding item number. Complete the steps in the appropriate section below for the item you select. Select item 8 to view a brief on-line description of each menu item.

3. When a test completes, select another test or pattern, or type **9** and press New Line to return to the Tools menu.

Testing the Graphic Subsystem

Select item 1 to run a 5-minute test on the graphics hardware (bit-block transfers, graphics logic, video timing, graphics registers, programmed transfers to graphics memory, and color). After you select item 1, "Test graphic subsystem," you see the following screen message:

```
    This series of diagnostic tests last several
    minutes.  Your screen will go blank for brief
    periods during testing.  After each subtest a
    message is displayed indicating the subtest status.

    Press New Line to begin.
```

Press New Line to start testing. Several graphics hardware components undergo subtests. If a subtest encounters an error, all testing halts and you see an error message with a fault code on your screen. If this happens, write down the screen message and contact Data General as described in the Preface.

When all testing completes without error, you see the following screen message:

```
Graphics subsystem diagnostic testing complete.
Press New Line to return to the Graphics Tools Menu.
```

Press New Line to return to the Tools Menu, where you can test your monitor's display using one or more of the video adjustment patterns.

Adjusting Video Brightness

Select item 2 to use the BRIGHT pattern to test for proper screen intensity on your graphics monitor. After you select item 2, "Display video adjustment BRIGHT pattern," you see the following instructions in a screen message. You cannot view the screen message once the test pattern appears.

If you have a monochrome monitor, your screen message appears as follows:

```
                          BRIGHT Pattern


Press New Line to display the test pattern.  Then, toggle
the pattern shading from foreground to background by
pressing the Space Bar.

Press New Line again to return to the Graphics Tools Menu.
```

If you have a color monitor, your screen message appears as follows:

```
                     BRIGHT Pattern
Press New Line to display the test pattern.  Then,
toggle the pattern shading from foreground to background
by pressing the Space Bar.  To change the color of
shading, press keys as follows:


                 R=Red
                 G=Green
                 C=Cyan
                 B=Blue
                 Y=Yellow
                 W=White


Press New Line again to return to the Graphics Tools
Menu.
```

After you press New Line, you see the BRIGHT pattern displayed on your screen, as follows:
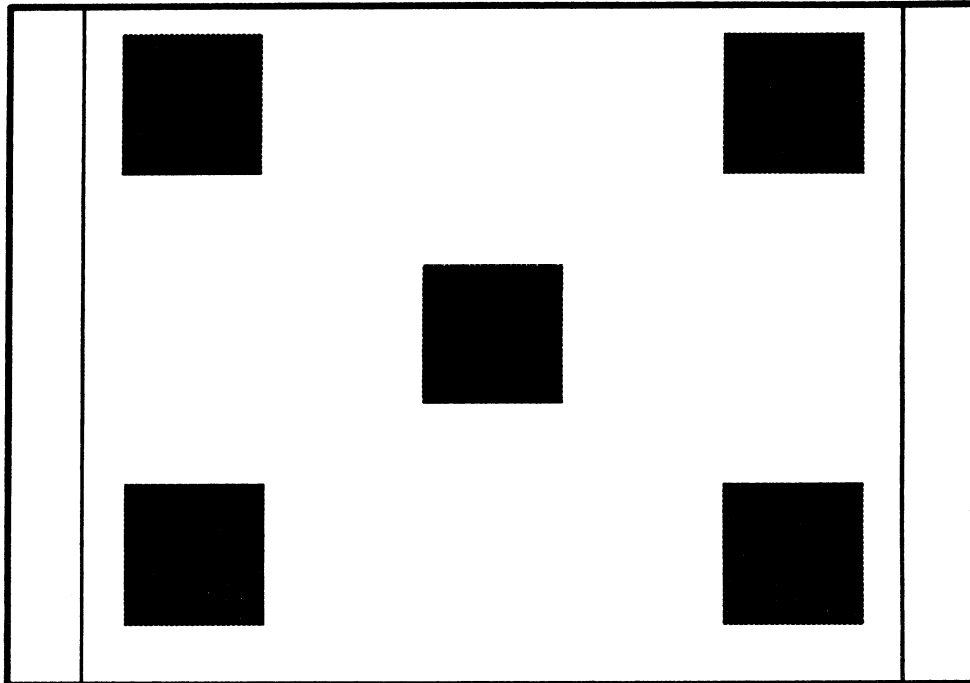
Press the space bar to switch the shading from the center and corner boxes to the spaces between them, as seen below. Press the space bar again to switch the shading back to the first pattern.
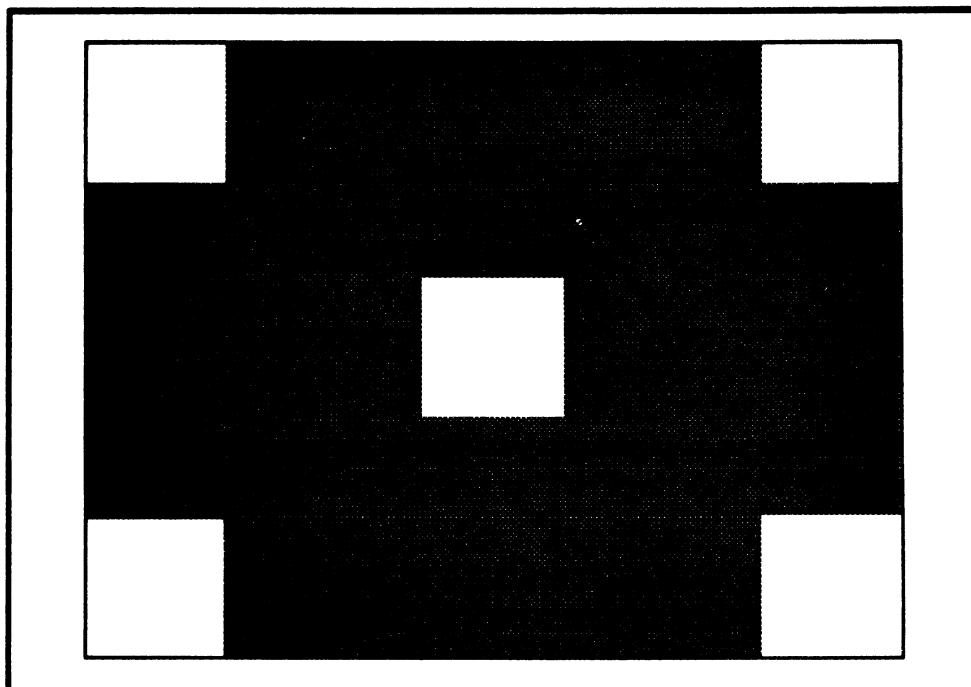
With either BRIGHT pattern displayed, press the following lowercase keys to change the pattern color (if you have a color monitor):

r changes the color to *Red*
g changes the color to *Green*
c changes the color to *Cyan*
b changes the color to *Blue*
y changes the color to *Yellow*
w changes the color back to *White* (the default)

All colors should be distinct and uniform on your screen.

Rotate the brightness control left and right (located beneath the edge of the monitor screen, as shown in Figure 4–1) to adjust the screen display so that shading appears with the proper intensity in both patterns.

Front/Side View

Power switch

+ Brightness −   + Contrast −

Color monitor
degauss switch

Rotate controls left and right
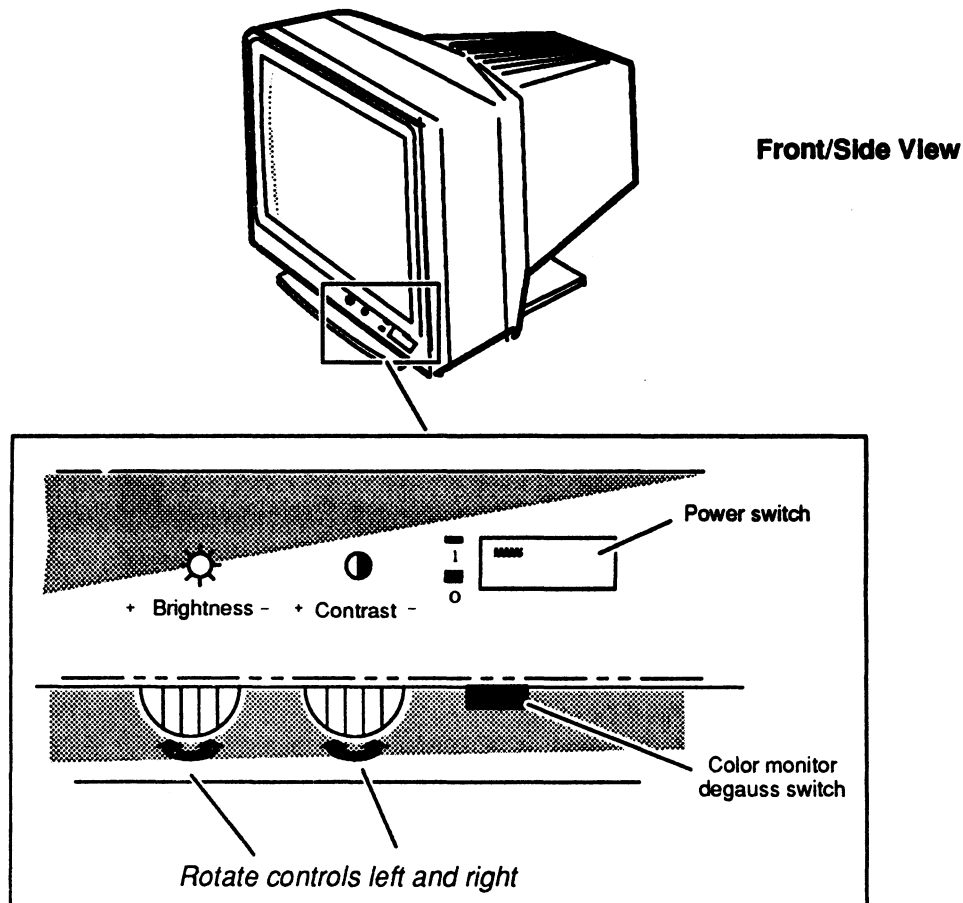
Figure 4–1 Adjusting Monitor Brightness and Contrast

Press New Line to return to the Graphics Tools menu once you have adjusted the screen display brightness to your satisfaction.

Adjusting Video Contrast

Select item 3 to test the screen contrast and intensity of your graphics monitor. After you select item 3, "Display video adjustment CONTRAST pattern," you see the following screen message:

```
Press New Line to display the test pattern.  Use the
monitor BRIGHTNESS and CONTRAST controls to adjust the
screen display until the pattern is distinct.

Press New Line to return to the Graphics Tools Menu.
```

After pressing New Line to begin the test, you see the following screen display:
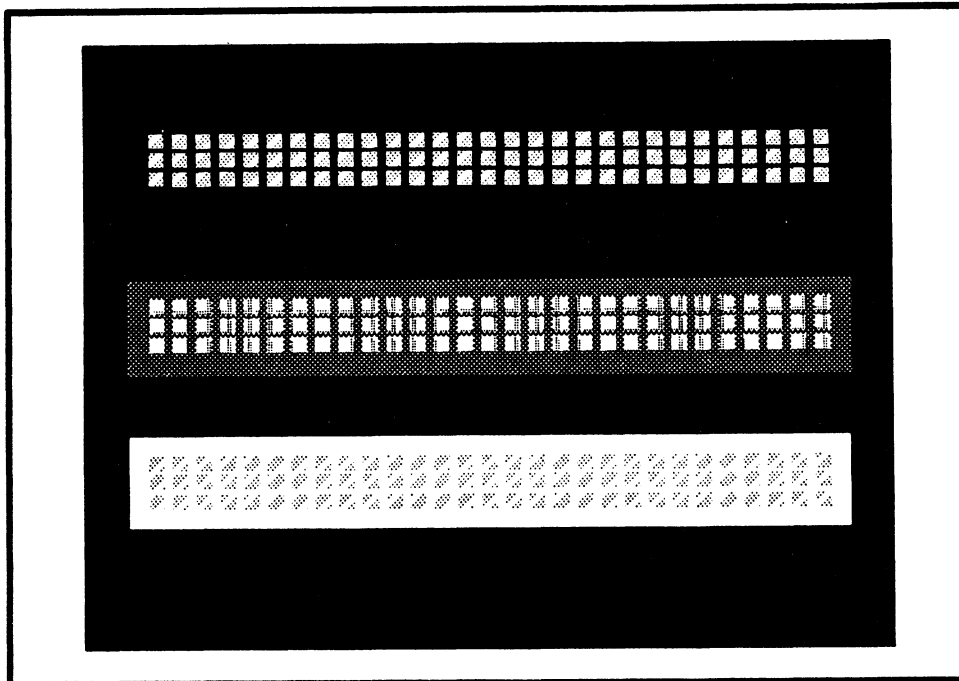
Rotate the Contrast and Brightness controls left or right to adjust your screen display so that all three bars of shading are clear. Both controls are located beneath the edge of the monitor screen, as shown in Figure 4–1 on the previous page.

Press New Line to return to the Graphics Tools menu once you have adjusted the screen display contrast to your satisfaction.

Testing Video Alignment

Select item 4 to test the screen aspect ratio and alignment. After you select item 4, "Display video adjustment PARALLEL pattern," you see the following instructions in a screen message. You cannot view the screen message once the test pattern appears.

If you have a monochrome monitor, your screen message appears as follows:

```
                      PARALLEL Pattern


Press New Line to display the test pattern.  Then, toggle
the pattern shading from foreground to background by
pressing the Space Bar.

Press New Line again to return to the Graphics Tools Menu.
```

If you have a color monitor, your screen message appears as follows:

```
                      PARALLEL Pattern

Press New Line to display the test pattern.  Then, toggle
the pattern shading from foreground to background by
pressing the Space Bar.  To change the color of shading,
press keys as follows:


              R=Red
              G=Green
              C=Cyan
              B=Blue
              Y=Yellow
              W=White


Press New Line again to return to the Graphics Tools Menu.
```

After pressing New Line to begin the test, you see the following screen display:

Press the following lowercase keys to change the pattern color (if you have a color monitor):

      r changes the color to *Red*
      g changes the color to *Green*
      c changes the color to *Cyan*
      b changes the color to *Blue*
      y changes the color to *Yellow*
      w changes the color back to *White* (the default)

All colors should be distinct and uniform on your screen.

If the circles appear as ellipses on your screen, or if shading, color, or pattern is not consistent across your screen, there may be a problem with your monitor; contact Data General, as described in the Preface.

Press New Line to return to the Graphics Tools Menu once you have tested the screen display to your satisfaction.

Testing Voltage Regulation

Select item 5 to test for problems with the voltage regulator or the video power supply. After you select Item 5, "Display video adjustment REGULATE pattern," you see instructions in a screen message. You won't be able to view the screen message once the test pattern appears.

If you have a monochrome monitor, your screen message appears as follows:

```
                        REGULATE Pattern


Press New Line to display the test pattern.  Then, toggle
the pattern shading from foreground to background by
pressing the Space Bar.

Press New Line again to return to the Graphics Tools Menu.
```

If you have a color monitor, your screen message appears as follows:

```
                        REGULATE Pattern
Press New Line to display the test pattern.  Then, toggle
the pattern shading from foreground to background by
pressing the Space Bar.  To change the color of shading,
press keys as follows:

                    R=Red
                    G=Green
                    C=Cyan
                    B=Blue
                    Y=Yellow
                    W=White

Press New Line again to return to the Graphics Tools Menu.
```

After pressing New Line to begin the test, your screen display fills completely with black with a while outline. Press the space bar to toggle from black to white.

Press the following lowercase keys to change the pattern color (if you have a color monitor):

> **r** changes the color to *Red*
> **g** changes the color to *Green*
> **c** changes the color to *Cyan*
> **b** changes the color to *Blue*
> **y** changes the color to *Yellow*
> **w** changes the color back to *White* (the default)

All colors should be distinct and uniform on your screen.

Make sure that all screen shading is distinct, without interference. If shading is inconsistent, or if you notice waves in the screen display, there may be a problem with your monitor's power supply, or the monitor may be placed too close to other electronic equipment; contact Data General as described in the Preface.

Press New Line to return to the Graphics Tools menu once you have tested the screen display to your satisfaction.

Testing Video Convergence

Select item 6 to verify uniform screen intensity and video convergence. After you select item 6, "Display video adjustment FLOOD pattern," you see instructions in a screen message, as shown below. You won't be able to view the screen message once the test pattern appears.

If you have a monochrome monitor, your screen message appears as follows:

```
                      FLOOD Pattern


Press New Line to display the test pattern.  Then, toggle
the pattern shading from foreground to background by
pressing the Space Bar.

Press New Line again to return to the Graphics Tools Menu.
```

If you have a color monitor, your screen message appears as follows:

```
                      FLOOD Pattern
Press New Line to display the test pattern.  Then, toggle
the pattern shading from foreground to background by
pressing the Space Bar.  To change the color of shading,
press keys as follows:


              R=Red
              G=Green
              C=Cyan
              B=Blue
              Y=Yellow
              W=White


Press New Line again to return to the Graphics Tools Menu.
```

After pressing New Line to begin the test, your screen display appears white. Press the space bar to switch from a white screen to a completely shaded screen.

Press the following lowercase keys to change the color of shading (if you have a color monitor):

> **r** changes the color to *Red*
> **g** changes the color to *Green*
> **c** changes the color to *Cyan*
> **b** changes the color to *Blue*
> **y** changes the color to *Yellow*
> **w** changes the color back to *White* (the default)

Make sure that all screen shading is distinct, without interference. When you press the space bar to fill the screen or clear the screen of shading, make sure that shading is consistent. If you notice inconsistent areas in the screen display, there may be a problem with your monitor; contact Data General, as described in the Preface.

Press New Line to return to the Graphics Tools Menu once you have tested the screen display to your satisfaction.

Testing Video Stacking and Shading

Select item 7 to test your graphics monitor's ability to display stacked colors and shading. After you select item 7, "Display CIRCLES pattern," you see the following screen message:

```
              CIRCLES Pattern

Press New Line to display a scrolling circles pattern.
This test is complete when the pattern has stopped
scrolling.

Press New Line again to return to the Graphics Tools
Menu.
```

After pressing New Line to begin the test, your screen begins to fill with circles of shading. It takes at least one minute for the pattern to complete.

NOTE: Do not press New Line more than *once* after the scrolling starts. Pressing New Line once returns you to the Graphics Tools Menu when the pattern is complete. If you press the New Line key more than once, you will exit back through the menu structure, accepting a menu default for each New Line you pressed.

If you have a monochrome monitor, the scrolling circles contain the range of gray–scale shading. If you have a color monitor, the scrolling circles contain a range of standard colors.

When complete, your screen appears as follows:
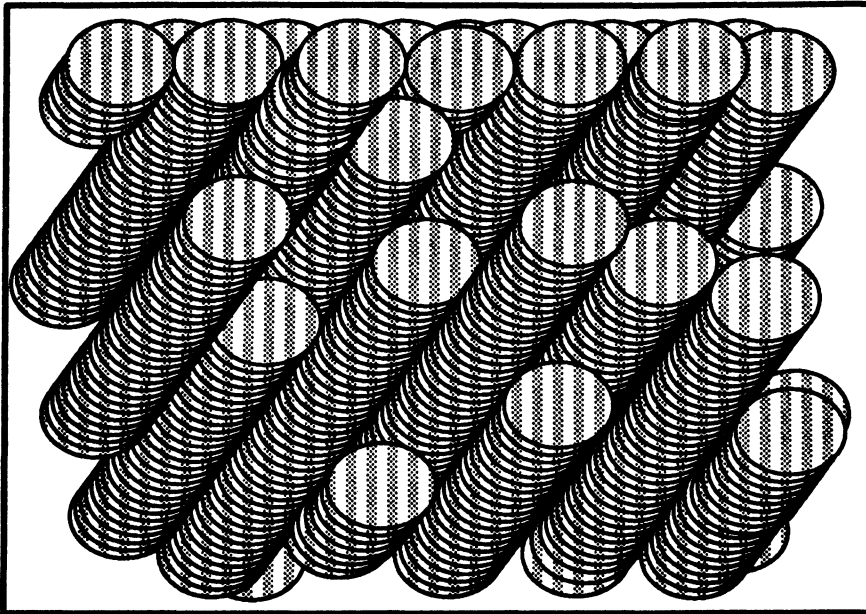
If the circles do appear on your screen at a consistent rate, or if each circle does not contain a distinct color or shade, contact Data General as described in the Preface.
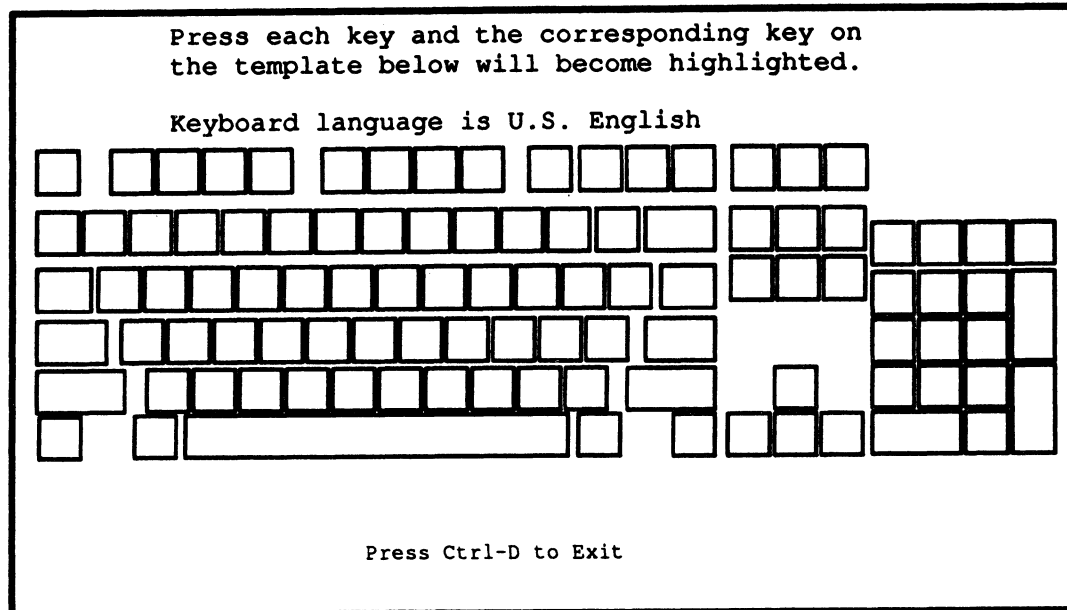
Press New Line to return to the Graphics Tools Menu.

Running the Keyboard Test

To test each key in your graphics keyboard, select the Keyboard test as follows:

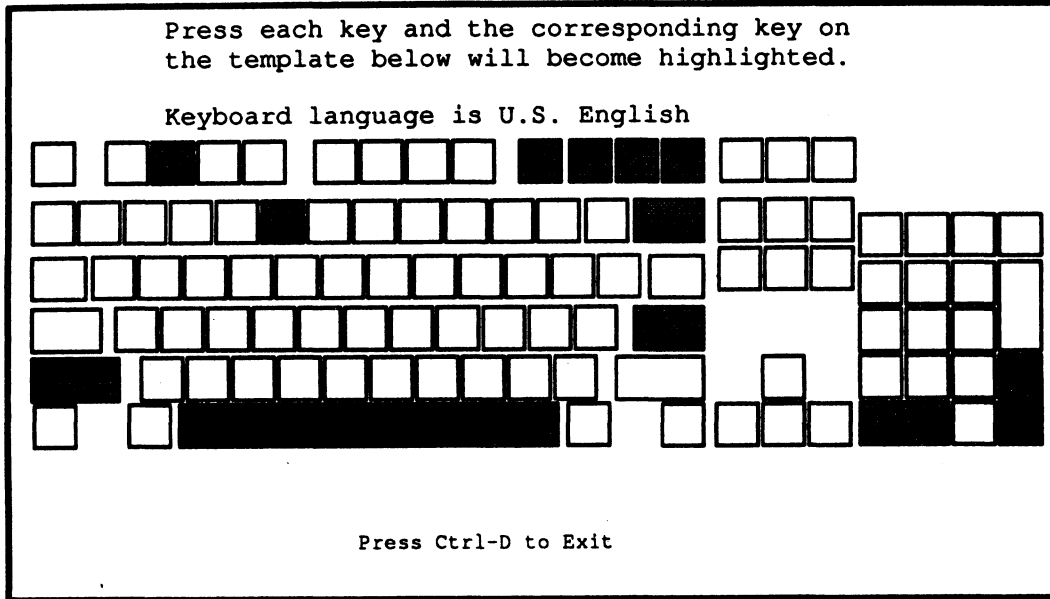1. While in the Tools Menu, type **5** and press New Line to select item 5, "Run Keyboard test."

   The system displays a screen showing a like that of a PC AT, indicating the current keyboard language in text at the top of the screen.

```
Press each key and the corresponding key on
the template below will become highlighted.

Keyboard language is U.S. English
```



```
Press Ctrl-D to Exit
```

   Each time you press a key on your keyboard, the corresponding key on your screen keyboard figure is highlighted and you hear a tone from the computer unit speaker. The display key remains highlighted as long as you hold down the keyboard key. Once you release the key, the tested key on your display remains highlighted in a different shade.

   If any key does not respond as described above, you probably need to clean or replace your keyboard; contact Data General as described in the Preface.

2. Press each key on your keyboard. In the following example, several keys have been tested, indicated by shading; the space bar is currently being tested, indicated by darker shading.

```
      Press each key and the corresponding key on
      the template below will become highlighted.

      Keyboard language is U.S. English
```



```
                    Press Ctrl-D to Exit
```

Every key on the screen keyboard template should be highlighted when you complete the test, as seen below.

```
      Press each key and the corresponding key on
      the template below will become highlighted.

      Keyboard language is U.S. English
```



```
                    Press Ctrl-D to Exit
```
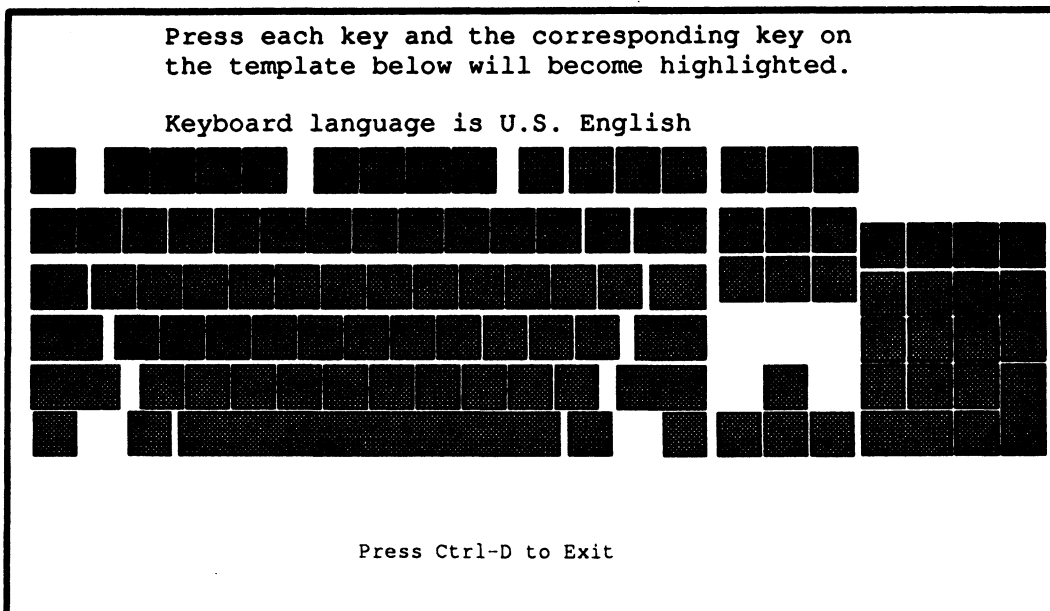
3. Press Ctrl–D to return to the Tools menu when you complete the keyboard test.

Running the Mouse Test

To test your mouse device, select the Mouse test as follows:

1. While in the Tools menu, type **6** and press New Line to select item 6, "Run Mouse test."

    The system diagnostics displays the following screen:

    ```
    Move mouse to test screen positioning.  Press left mouse button to
    highlight left ear.  Press right button to highlight right ear.
    Hold middle button down to draw on screen and highlight nose.


                          Press Ctrl-D to exit
    ```
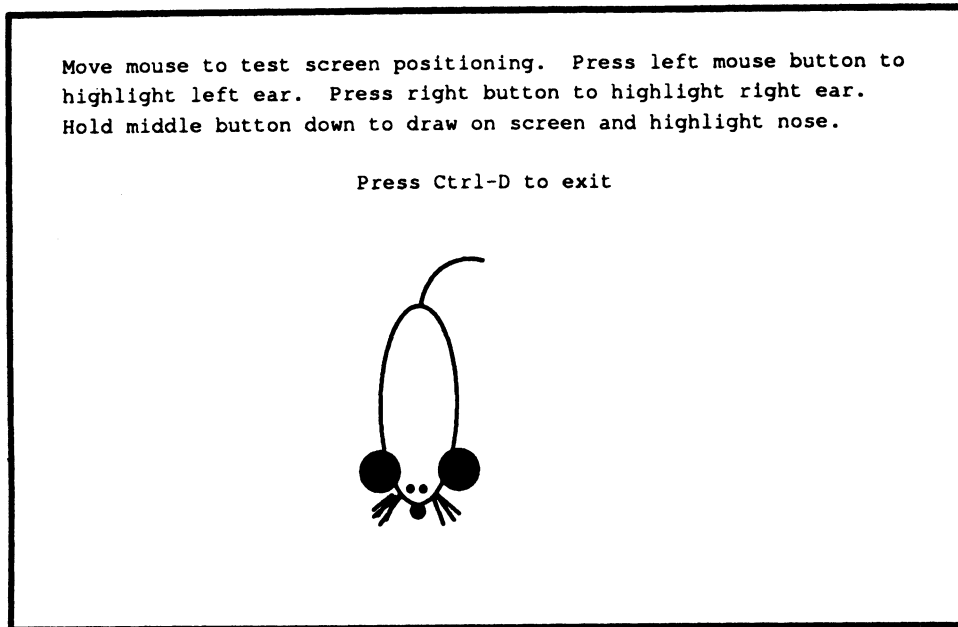

2. Move your mouse device around the mouse pad. The mouse figure on your screen should move in corresponding motion. You hear a beeping sound if you try to move the mouse off the screen.

    If your screen display does not respond as described above when you move your mouse, verify that the mouse cable is properly connected, that the bottom of the mouse is clean and static-free, and that the mouse pad is clean. If the screen mouse still does not reflect motion of the mouse device on the mouse pad, contact Data General as described in the Preface.

3. Press the left mouse button. The left ear of the mouse figure on your screen should change color. Similarly, the right ear changes color when you press the right mouse button. If pressing the left or right buttons do not change the screen mouse ears, contact Data General as described in the Preface.

```
Move mouse to test screen positioning. Press left mouse button to
highlight left ear.  Press right button to highlight right ear.  Hold
middle button down to draw on screen and highlight nose.

                        Press Ctrl-D to exit
```
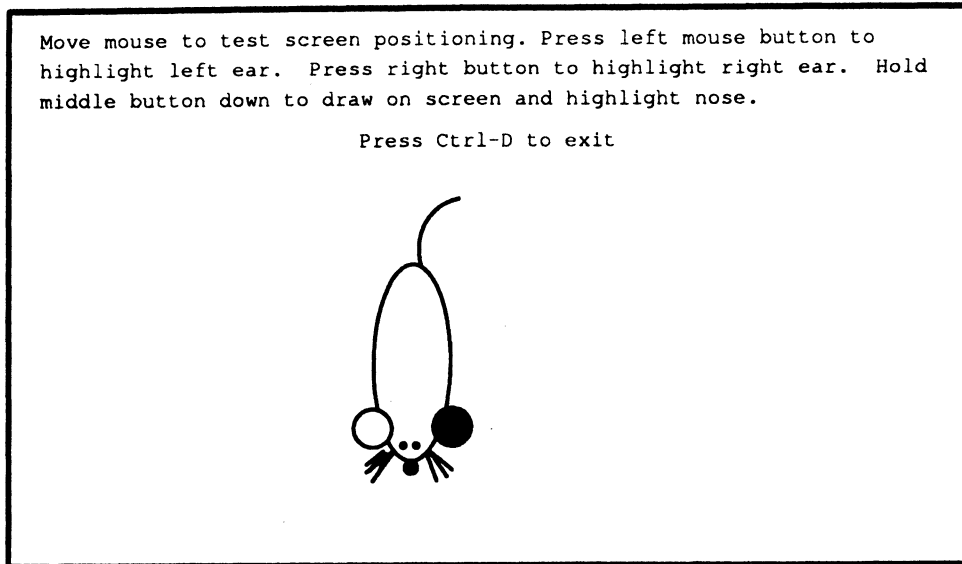

4. Press and hold down the middle mouse button. The nose of the mouse figure on your screen should turn white and you should be able to draw on the screen with the tail of the screen mouse by moving your mouse around the mouse pad. If you cannot draw with the middle button pressed, contact Data General as described in the Preface.

```
Move mouse to test screen positioning.  Press left mouse button to
highlight left ear.  Press right button to highlight right ear.
Hold middle button down to draw on screen and highlight nose.

                        Press Ctrl-D to exit
```
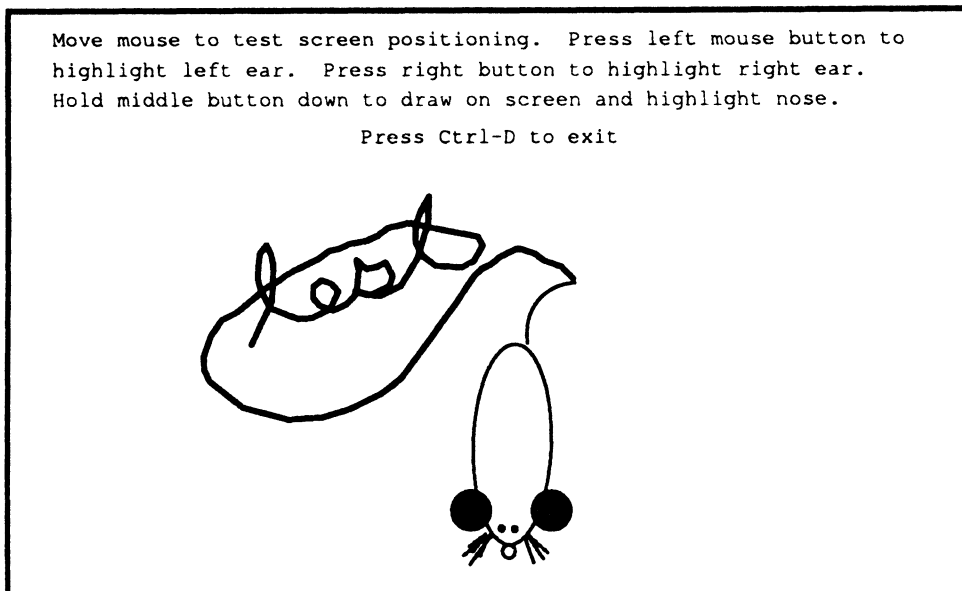

5. Press Ctrl–D to return to the Tools menu when you complete the mouse test.

End of Chapter

Chapter 5
Testing and Identifying
Terminal Ports

This chapter describes how to test the asynchronous connections (*ports*) supplied by VAC/16 asynchronous controllers and VDA/128 or VDA/255 host adapters. The utilities described in this chapter are accessible only if you have an AViiON model with VMEbus support, and one or more of these controllers installed:

- VME Asynchronous Controller (VAC/16). Each VAC/16 board supports a maximum of 16 asynchronous connections; external devices such as terminals, serial printers, or modems connect to ports on attached 8-line junction boxes (*J-boxes*), mounted near your computer unit. System diagnostic sizing and Acceptance Test messages identify this controller as a *16-line Async board*.

- VME Distributed Host Adapter (VDA/128 or VDA/255). Each host adapter supports a maximum of 128 or 255 asynchronous connections; external devices such as terminals, printers, or modems connect to ports on attached VDC/16 and VDC/8P cluster controllers (*cluster boxes* or *nodes*) , mounted up to 1000 feet from your computer unit. System diagnostic sizing and Acceptance Test messages identify these controllers as a *128-line VME Host Adapter* or a *255-line VME Host Adapter*.

    - Each VDC/16 cluster controller provides sixteen RS-232-C serial ports. You can link up to eight VDC/16 cluster boxes to a VDA/128 adapter; you can link up sixteen VDC/16 cluster boxes to a VDA/255 adapter. System diagnostic sizing messages identify the VDC/16 as model *HPS-7088*.

    - Each VDC/8P cluster controller provides eight asynchronous ports and one Centronics parallel printer port. You can link up to sixteen VDC/8P cluster boxes to a VDA/128 adapter; you can link up thirty-two VDC/8P cluster boxes to a VDA/255 adapter. System diagnostic sizing messages identify the VDC/8P as model *HPS-7082*.

Refer to the manual *Setting Up and Installing VMEbus Options in AViiON® Systems* for information about installing VME controllers and the peripherals they manage.

If you suspect a problem with one or more of the terminal or printer ports managed by your VME terminal controllers, you can use the utilities accessible from the Terminal Test Menu to verify that the lines are transmitting and receiving data properly. You can simultaneously test approximately 170 ports using these utilities. Be sure to read the "Using the Terminal Test Menu" and "Identifying and Selecting Ports" sections below before using the utilities for the first time.

Using the Terminal Test Menu

To get to the Terminal Test Menu, first display the Tools Menu from the System
Diagnostics Main Menu. Refer to Chapter 2 for information about starting the
diagnostics and displaying the Main Menu. The Tools Menu appears as follows:

```
Tools Menu

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


Enter choice [6]:
```

NOTE: Items on the Tools Menu vary according to hardware model. If your Tools
menu does not include an item called "View Terminal Test menu," the
asynchronous terminal tests are not available.

Display the Terminal Test Menu by selecting item 4, "View Terminal Test menu,"
from the Tools Menu.

The system displays the Terminal Test Menu, as follows:

```
Terminal Test Menu

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


Enter choice [9]:
```

Select the test you want to run by entering the menu item number and pressing New
Line at the Enter choice prompt. Select item 8, "Display help screen," to view a brief
on–line description of each test on the Terminal Test Menu.

For the Terminal Test utilities to work properly, terminal characteristics (such as baud rate, parity, and data bit settings) for tested terminals must match those of your system console. The Terminal Test utilities expect terminals to be set to ANSI mode, 9600 baud. Your terminals must also have the auto–wrap function enabled. You can view the required terminal characteristics by selecting item 8, "Display help screen," from the Terminal Test Menu.

You can start multiple tests on different sets of terminal lines at the same time, but only one test executes at a time on a particular terminal line. When you start a test on a series of terminal lines, the utility terminates any test currently running on those lines. You see the following message before the new test starts if there are other terminal utilities running:

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

If you start a test on more than approximately 170 terminal lines, or if you start so many simultaneous tests that the utility cannot keep track of all the test processes, the test utility displays the following error message:

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

To continue testing additional lines, you need to select item 6 (described later in this chapter) on the Terminal Test Menu to stop some of the currently executing tests.

When a test completes, press New Line to return to the Terminal Test Menu. From the Terminal Test Menu, press New Line to exit from the terminal utilities and display the Tools Menu. From the Tools menu, you can use the additional diagnostic utilities, or return to the system diagnostics Main Menu. From the Main Menu, you can enter the SCM and then boot your operating system, as described in Chapter 2.

Identifying and Selecting Ports

Each time you start or terminate one of the Terminal Test utilities, the utility prompts you for the following:

- The *board number* of the controller that manages the ports you are testing.

- The unique *port number* or channel number of each tested device.

- The network *cluster address* of the cluster controller box (if you are testing ports supplied by a host adapter).

You see each controller's board number and cluster address (displayed as NET ID) in sizing messages when the system diagnostics first initializes the boards at boot time. Refer to Chapter 2 for information about these sizing messages. The hexadecimal cluster addresses is determined on the cluster box. Refer to the manual *HPS Downloadable Cluster Controller Technical Manual*, listed in the Preface, for information about the cluster box addresses.

Selecting Ports for Testing

Whenever you start a utility (by selecting item 1 through 6 on the Terminal Test Menu), the first prompt asks you for the number of the controller that manages the lines you want to test. On our example system with two terminal controllers (the *16–line Asynch Board 0* and *128–line Host Adapter 1*), the prompt appears as follows:

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

Respond by entering the 0 to select the VAC/16 board only; enter 1 to select the VDC/128. To select both boards, press New Line to choose all boards.

If you selected the board number of a VDA/128 or VDA/255 host adapter, the utility prompts you next for the cluster controller's network address, then for the port number(s) of the line(s) you want to test:

```
Cluster address (xx, yy, zz, [ALL])? ⟩
Port number (1-8, [ALL])?
```

Respond to the first prompt by entering the cluster address of the cluster box whose ports you want to test, or press New Line to choose all cluster boxes. Then, choose the port number(s) for each selected cluster box.

NOTE: If you have an 8–line cluster box with a parallel printer port (VDC/8P), the parallel port number is 8. Select ALL or port number 8 to test the printer port. Make sure the printer is on line and contains paper. If you don't have a parallel printer port on your cluster box, the prompt appears as follows: Port number (1–7, [ALL])?

If you selected a VAC/16 asynchronous controller, the utility prompts you for the port number(s) only:

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

Respond by entering the port number(s) of the lines you want to test.

Before starting any tests on the ports you selected, the utility runs a 30–second board self–test on each controller that has not been previously selected during the current test session. If you exit from the Terminal Test Menu and then return to continue testing, the utility repeats the self–test process. You'll see a message like the following:

```
Running selftest on VME Host Adapter 0
please wait.........
```

Identifying Ports

If you don't know how to respond to the prompts to select ports for testing, you can use items 4 or 5 on the Terminal Test Menu as described below. Item 4, "Start port ID message," tells you which terminals are managed by a particular board. Item 5, "Auto port identification" gives you the board number, cluster address, and port number of any connected terminal.

Using the Port ID Message Test

While in the Terminal Test Menu, type 4 and press New Line at your system console to select item 4, "Start Port ID Message."

You select the board(s) with ports you want to identify. The utility then identifies all active ports it finds for the board(s) you selected and displays the appropriate board number, cluster address (if applicable), and port number on each remote terminal screen (or prints the information on paper if it is a printer port). Since the port identification does not appear on your system console screen, you will need help from someone at the remote device or must view each remote terminal display yourself to record the information.

Using the Auto Port Identification Test

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

The automatic port identification test responds to keystrokes at any connected terminal to identify the port. When you press a key at any remote terminal, both the terminal and system console screen display a message identifying the board and port number of the remote terminal. If the terminal is connected via a cluster controller, the display also includes the cluster controller address.

NOTE: Selecting item 5, "Auto port identification," stops all current terminal test processes.

After you select item 5, the utility displays the following message on the system console screen:

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

Press any key at each terminal you want to test. The board number, cluster address (only if host adapter), and port number appear both on the system console and on the remote terminal screen, as seen in the following examples:

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

Use this test if you suspect trouble with particular ports; it not only identifies the correct board, cluster address, and port number to use when selecting other tests to run on that port, but is itself a test of that port's ability to transmit data from the remote terminal to the computer unit. Refer to the next section "Testing Data Input" to further test the validity of keyboard input.

Testing Data Input

Items 3 and 5 on the Terminal Test Menu receive data from remote terminal lines and display an expected pattern or message. Refer to the "Selecting and Identifying Ports" section earlier in this chapter for a description of item 5, "Auto port identification."

NOTE: If the remote terminals are located a significant distance from the system console, it may be useful to have a second person help with the testing.

Whenever you select a Terminal Test utility, you first must specify the board and port numbers of the devices you want to test, as described in the "Identifying ports" section earlier in this chapter.

If your remote terminal display does not appear as described in this section, make sure that its operating characteristics (such as baud rate, parity, and data bit settings) conform to those of your system console. To view the correct settings, select item 6, "Display help screen," from the Terminal Test Menu. Also make sure the remote terminal is in ANSI mode, has auto-wrap enabled, and passes its self-test. If there is still a problem with the terminal display, contact Data General as described in the Preface.

Using the Keyboard Echo Test

The "keyboard echo test" verifies line input from selected ports to the terminal controller or adapter board.

While in the Terminal Test Menu, type **3** and press New Line to select item 3, "Start keyboard echo test." Select the ports you want to test as described in the "Selecting and Identifying Ports" section. Your system console then displays the message Press New Line to Proceed while the test awaits keyboard input from the targeted port(s).

When you press a key on a selected remote keyboard, the echo test displays a complete screen line of that character on the remote terminal screen. For example, if you press **hi**, your screen display appears as follows:

```
hhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhhh
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
```

Press New Line at the system console to return to the Terminal Test Menu. This test continues indefinitely, displaying the scrolling ASCII characters on remote terminals, until you run another test to that port, or terminate the test by selecting item 6 from the Terminal Test Menu from your system console. You can consider the test successful and complete when the ASCII display covers the screen of each selected remote terminal once.

Using the Lines of Characters Test

The "lines of characters" test verifies line output to selected ports by displaying lines of ASCII characters across the screen of selected remote terminals.

While in the Terminal Test Menu, type 2 and press New Line to select item 2, "Start lines of character test." Select the ports you want to test as described in the "Selecting and Identifying Ports" section, earlier in this chapter. Your system console then displays the message Press New Line to Proceed while one complete set of ASCII characters appears on the remote terminal, scrolling line by line from the *top to the bottom* of the screen.

Each tested terminal screen appears as follows:

```
!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[
|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,-./0123456789:;<
=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdefghijklmnopqrstuv
wxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
XYZ[|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,-./012345678
9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdefghijklmnopqr
stuvwxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
TUVWXYZ[|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,-./01234
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdefghijklmn
opqrstuvwxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,-./0
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdefghij
klmnopqrstuvwxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
LMNOPQRSTUVWXYZ[|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdef
ghijklmnopqrstuvwxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFG
```

Press New Line at the system console to return to the Terminal Test Menu. This test continues indefinitely, displaying the scrolling ASCII characters on remote terminals, until you run another test to that port, or terminate the test by selecting item 6 from the Terminal Test Menu from your system console. You can consider the test successful and complete when the ASCII display covers the screen of each selected remote terminal once.

Testing Data Output

The first two tests on the Terminal Test menu (items 1 and 2) send data to selected ports and display an expected pattern on the remote terminal.

NOTE: If the remote terminals are located a significant distance from the system console, it may be useful to have a second person help with the testing.

Whenever you select a Terminal Test utility, you first must specify the board and port numbers of the devices you want to test, as described in the "Selecting and Identifying ports" section earlier in this chapter.

If your remote terminal display does not appear as described in this section, make sure that its operating characteristics (such as baud rate, parity, and data bit settings) conform to those of your system console. To view the correct settings, select item 6, "Display help screen," from the Terminal Test Menu. Also make sure the remote terminal is in ASNI mode, has auto–wrap enabled, and passes its self–test. If there is still a problem with the terminal display, contact Data General as described in the Preface.

Using the Scrolling Characters Set Test

The "scrolling characters set" test verifies character output to selected ports by displaying a set of ASCII characters scrolling across the screen of selected remote terminals.

While in the Terminal Test Menu, type 1 and press New Line to select item 1, "Start scrolling character set test." Select the ports you want to test as described in the "Selecting and Identifying Ports" section of this chapter. Your system console then displays the message Press New Line to Proceed while complete sets of ASCII characters appear, wrapping characters one by one from the *left to the right* of the screen. Each tested remote terminal screen appears as follows:

```
!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[
|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,-./0123456789:;<
=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdefghijklmnopqrstuv
wxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
XYZ[|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,-./012345678
9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdefghijklmnopqr
stuvwxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
TUVWXYZ[|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,-./01234
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdefghijklmn
opqrstuvwxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,-./0
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdefghij
klmnopqrstuvwxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
LMNOPQRSTUVWXYZ[|]^_~abcdefghijklmnopqrstuvwxyz!"#$%'()*+,
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[|]^_~abcdef
ghijklmnopqrstuvwxyz!"#$%'()*+,-./0123456789:;<=>?@ABCDEFG
```

5-6

Press New Line at the system console to return to the Terminal Test Menu. This test continues indefinitely, awaiting input from the selected remote terminals, until you run another test to those ports, or terminate the test by selecting item 6 from the Terminal Test Menu.

Viewing and Stopping Tests

You can start multiple tests at the same time on different ports. Item 6, "Terminate a test," lets you stop testing on specified ports. Item 7, "Show executing tests," displays a status screen that shows which tests are running on which ports.

NOTE: Running numerous tests simultaneously will slow test performance.

If you start tests on too many ports (more than 170), or start simultaneous tests so that more than approximately 200 test processes are running at one time, you see the following message:

    Out of process ID's. Press New Line to Proceed

In order to test additional ports, you first must terminate some currently executing tests. Once you start tests on multiple ports, the only way to determine where tests are executing is to select item 7, "Show executing tests."

Stopping Tests

Use item 6, "Terminate a test," on the Terminal Test Menu to stop one or more test. To determine which test is currently executing on a particular port or group of ports, first select item 7, "Show executing tests" for a display of all tests that are currently executing.

If you know the board number, port numbers, and (if applicable) cluster address of the ports running the tests you want to stop, type **6** and press New Line to select item 6, "Terminate a test." Select the ports, as described in the "Selecting and Identifying ports" section of this chapter. Your system console then displays the message Press New Line to Proceed while the utility ends whatever test is currently running on the port(s) you specified. Press New Line to return to the Terminal Test menu.

Viewing Current Tests

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

Your system console screen displays each board that the utility has identified on your system and its associated ports; it specifies which terminal test (if any) is currently running on each port.

In the example on the following page, the "port ID message test" is running on all eight ports of the cluster controller at address 01, managed by the host adapter identified as board 0. In addition, the "scrolling characters set test" is running on the first 8 lines of the 16–line asynchronous controller identified as board 1. A period character (.) indicates there are no tests running on that port.

Once you are finished viewing the status of currently executing tests, press New Line to return to the Terminal Test Menu. You can display an updated listing of currently executing tests at any time during terminal testing. However, once you exit from the Terminal Test Menu, all testing stops automatically.

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

        VME Host adapter 0

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

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

        16-line VME Async Controller 1

    PORT    .....................Currently Executing Tests...................

    00-07    S     S     S     S     S     S     S     S
    08-15    .     .     .     .     .     .     .     .

        Press New Line to Proceed
```

Screen Display	Indicates
S	Scrolling character set test is running on that port.
L	Lines of character test is running on that port.
I	Port ID message test is running on that port.
E	Keyboard echo test is running on that port.
[CC]	Cluster controller column head.
PORT	Port (terminal line number) column head.
[xx] (in CC column)	Cluster address.
yy–zz (in PORT column)	Terminal line numbers (ports) whose status is shown in the same row of the display. Each letter shows the current status of ports numbered between yy and zz, where the rightmost letter in the row reports the current status of port zz).
. (period)	No test is running on that port.

End of Chapter

Chapter 6
Maintaining Storage Media

This chapter describes how you can write a hardware format to 5.25–inch and adjust the tension between reels of quarter–inch cartridge (QIC) tapes. You access both utilities from the Tools menu.

To enter the Tools menu, type 2 and press New Line from the System Diagnostics Main Menu to select item 2, "View Tools menu." (Refer to Chapter 2 for information about starting the system diagnostics and displaying the Main Menu.) After you select item 2, the Tools Menu appears, as follows:

Workstations

```
Tools Menu

1.  Format diskettes
2.  Run tape adjustment utility
3.  View Graphics Tools Menu
4.  Test network connection (TDR)
5.  Run keyboard test
6.  Run mouse test
7.  Display help screen
8.  Return to Main Menu

Enter choice [8]:
```

Server/Multiuser Systems

```
Tools Menu

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


Enter choice [6]:
```

NOTE: The items on the Tools Menu vary according to hardware model. The items on your Tools Menu depend upon you hardware configuration; however, the items described in this chapter are the same on every AViiON model.

This chapter describes the first two items on the Tools Menu, "Format diskettes" and "Run tape adjustment utility." Select the last item on the menu or press the ESC key to return to the system diagnostics Main Menu.

Formatting Diskettes

If your system includes one or more diskette drives, you need to use diskettes that contain the proper hardware formatting for your drives. This utility hardware formats diskettes for use with the diskette drives connected to an AViiON computer. You may need to format new diskettes, diskettes you have used with another computer, or used diskettes whose data integrity you suspect.

CAUTION: Remember to save any data you do not want to lose on a separate medium before formatting a diskette you have already used.

To hardware format a diskette, follow the steps below. If you have more than one diskette drive, you can simultaneously format a diskette in each drive.

1. Insert a write–enabled diskette into the drive and close the drive latch. A diskette is write–enabled when the write–enable notch is *uncovered*.

    Figure 6–1 illustrates inserting a write–enabled diskette (A) and closing the latch (B) for a vertically–mounted drive; Figure 6–2 illustrates inserting a diskette and closing the latch in horizontally–mounted drive (such as one in a Peripheral Housing Unit chassis).
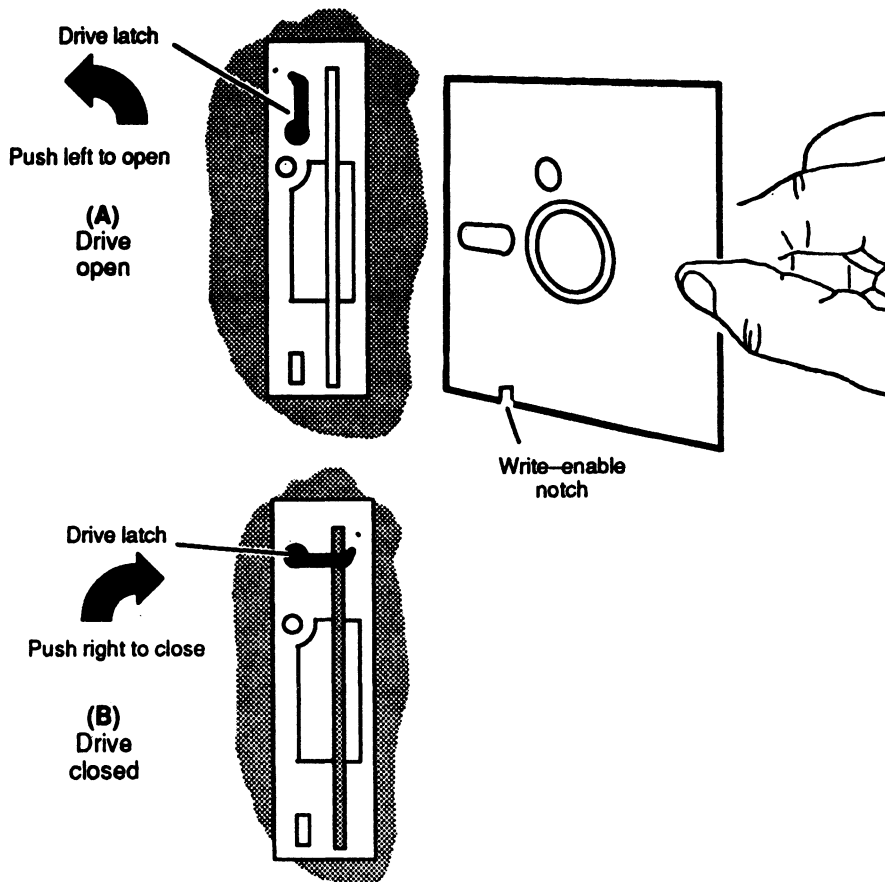
Figure 6–1 Inserting a Diskette in a Vertically–Mounted Drive
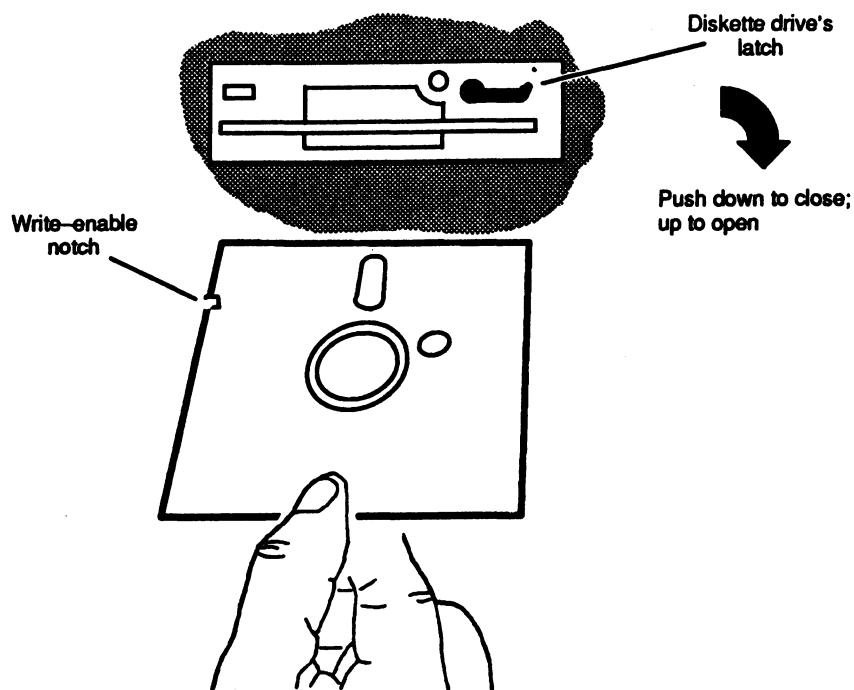
Figure 6–2 Inserting a Diskette in a Horizontally–Mounted Drive

2.   Type 1 and press New Line to select item 1, "Format diskettes" from the Tools
     Menu.

     Your system displays the manufacturer's model name or number, the drive size
       (5.25 or 3.5–inch), the logical unit number (LUN) of the drive, and the unit
       number (SCSI ID) of the SA450/SCSI converter board for each diskette drive it
       finds. Drives are listed by the controller that manages the SCSI converter. The
       utility prompts you to select or bypass each drive for formatting.

     Your screen appears as follows:

```
Target Selection:
-----------------
Enter S to Select, D to Delete, New Line to retain current value


   Integrated SCSI

        TEAC 5.25 floppy (LUN 0) (Unit 3) [Deleted]:


        Press New Line to Start - Press Q to Exit
```

NOTE: The SCSI controller, drive size, manufacturer, and unit numbers of
        diskette drives depend upon your hardware configuration. Screen
        displays in this chapter provide examples only.

3. To select a drive that contains a diskette to format, enter **s** after the drive
    listing. A drive is bypassed (deleted) by default. The message Selected appears
    to the right of the [Deleted]: prompt.

    To skip a drive that doesn't contain a diskette to format, enter **d** after the
    prompt, or simply press New Line to accept the default. The message Deleted
    appears to the right of the prompt.

    The following screen example illustrates one drive selected and one deleted as a
    target for formatting. The selected drive is the first diskette drive (LUN 0) on a
    SCSI converter board set to SCSI ID 3, managed by a workstation's integrated
    SCSI controller.

```
Target Selection:
----------------
Enter S to Select, D to Delete, New Line to retain current value


   Integrated SCSI

       TEAC 5.25 floppy (LUN 0) (Unit 3) [Deleted]: s      Selected
  .    TEAC 5.25 floppy (LUN 1) (Unit 3) [Deleted]:        Deleted



       Press New Line to Start - Press Q to Exit
```

4. After you have selected or deleted each target drive, press New Line to start to
    format the diskettes in the selected drives. The utility then displays the
    following message:

    Initialization for selected diskette(s). Please wait.

    After approximately 30 seconds, the utility lists the first selected drive and
    prompts you to select the format density, as follows:

```
   Input session for Integrated SCSI Unit 3:  TEAC 5.25 (LUN 0)

   Available densities for the 5-1/4 inch drive:

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


   Select density for format (HIGH, LOW, MEDIUM) [HIGH]
```

    The utility sizes the drive each time it prompts you for format density. The
    default density is the last format chosen for that drive.

6-4

NOTE: If a selected drive does not contain a write–enabled diskette or has an open drive latch, you see the following screen warning.

```
****  Media Maintenance Initialization Error  ****

TEAC 5.25 floppy (LUN 0) (Unit 3) on the Integrated SCSI
This diskette not READY.
Cannot execute Media Maintenace for this diskette.

*****************************************************

Press New Line to Proceed
```

Press New Line to return to the Tools Menu. Repeat steps 1–4 after fixing the problem.

5. Press New Line to select the default diskette density, or select a different density and then press New Line. The utility prompts you to verify that you want to format this diskette before continuing further, as shown in the following screen display. Type y and press New Line to continue.

```
Available densities for the 5-1/4 inch drive:

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

Select density for format (HIGH, LOW, MEDIUM) [LOW]  MEDIUM

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

6. If you selected other target drives, repeat steps 4 and 5 to choose the format density and verify formatting for each diskette.

   After you select the density for the last diskette drive and verify that you want to continue, you see the message Formatting........ until each diskette is completely formatted.

   Each diskette takes approximately a minute to hardware format. Your screen appears as follows once hardware formatting is complete:

   ```
   Formatting........ Format complete
   Press New Line to Return to Previous Menu
   ```

7. Press New Line to return to the Tools Menu. From the Tools Menu, you can format additional diskettes, run other diagnostic tools, or return to the system diagnostics Main Menu. From the Main Menu, you can re–enter the SCM and then boot your operating system. If you choose to format additional diskettes, repeat the steps in this section.

Adjusting Cartridge Tape Tension

To establish proper tension between the reels of a new QIC tape before writing to it, or to restore proper tension before writing to a used cartridge tape, follow the steps below.

1. Insert the cartridge tape into its drive and close the drive latch. Refer to the illustrations in Chapter 1 of how to insert a QIC tape.

2. Type 2 and press New Line to select item 2, "Run tape adjustment utility" from the Tools Menu.

    Your system displays the manufacturer's tape drive model name or number, the drive size (150 megabyte), and the unit number (SCSI ID) of the drive for each tape drive it finds. Drives are listed by the controller that manages the drive. The utility prompts you to select or bypass each drive for formatting by typing **s** or **d**. Your screen appears as follows:

```
Target Selection:
-----------------
Enter S to Select, D to Delete, New Line to retain current value


       Integrated SCSI

             ARCHIVE Viper 150 Tape (Unit 4) [Deleted]:
```

    NOTE: The SCSI controller, drive size, manufacturer, and unit numbers of cartridge tape drives depend on your hardware configuration. Screen displays in this chapter provide examples only.

3. Type **s** to select the tape drive displayed. Type **d** or press New Line to accept the default response, deleting that drive as a target for this utility.

```
Target Selection:
-----------------
Enter S to Select, D to Delete, New Line to retain current value
       Integrated SCSI

           ARCHIVE Viper 150 Tape (Unit 4) [Deleted]: d     Deleted

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


           Press New Line to Start - Press Q to Exit
```

The system continues to display each drive found until you have selected or bypassed each tape drive in your system. You can select as many drives as you have configured in your system.

4. Press New Line after the last drive listed to restore proper tape tension to any cartridge tape in the drive(s) you selected.

In the example below, the tape in the ARCHIVE Viper 150 megabyte drive unit 5 will be adjusted; the tape in drive unit 4 will not.

```
Target Selection:
----------------
Enter S to Select, D to Delete, New Line to retain current value


        Integrated SCSI

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



        Press New Line to Start - Press Q to Exit
```

5. Tape tension adjustment takes approximately 4 minutes. While the utility is running, the drive light is illuminated and you can hear the tape reels spin in the selected drive(s). The utility displays the following prompt:

```
Tape Adjustment in Progress - Please wait
```

As each drive completes, you see the following prompt:

```
Adjustment of ARCHIVE Viper Tape (Unit 5) Completed
```

When finished adjusting tension on the last tape, the utility prompts you to return to the Tools menu.

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

Press New Line to return to the Tools Menu. From the Tools Menu, you can use the additional diagnostic utilities, or return to the system diagnostics Main Menu. From the Main Menu, you can enter the SCM and then boot your operating system, as described in Chapter 2.

End of Chapter

Chapter 7
Testing Ethernet LAN Cables and Connections

This chapter describes how you can test your Ethernet LAN (local area network) connections for faults or shorts in the cabling. Follow the steps below to run a Time Domain Reflectometry (TDR) test to detect problems with the Ethernet network hardware connected to your system.

NOTE: The TDR test checks data traveling through transceiver cabling; it does not test the LAN transceiver itself.

1. Display the Tools menu by selecting item 2 from the Main Menu, "View Tools menu." Refer to Chapter 2 for information about starting the system diagnostics and displaying its Main Menu. The system diagnostics displays the Tools Menu:

Workstations

```
            Tools Menu
1.  Format diskettes
2.  Run tape adjustment utility
3.  View Graphics Tools Menu
4.  Test network connection (TDR)
5.  Run keyboard test
6.  Run mouse test
7.  Display help screen
8.  Return to Main Menu

Enter choice [8]:
```

Multiuser/Server Systems

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



Enter choice [6]:
```

NOTE: The items on the Tools Menu vary according to hardware model. Although the item numbers may differ, the utility described in this chapter is available on every AViiON hardware model.

2. Type the item number to select "Test network connection (TDR)" and press New Line.

3. You see a "Target Selection" screen. The system displays each Ethernet controller(s) it finds in your system and prompts you to select or bypass them one by one as a target for testing. Your screen display instructs you to select or bypass controllers by typing s or to select or d to delete a target board.

NOTE: You can only run the TDR test on one controller each time you use this utility.

To test the cable connections for a particular LAN, type **s** when the cursor is positioned at that entry for that board.

To exclude a LAN board from testing, type **d** after the board listing or press New Line when the cursor is positioned at that entry to accept the default response. That board will be deleted as a target for the utility.

The following example shows a server system with two VLC (VME Ethernet LAN) controllers. The second LAN is selected for testing:

```
Target Selection:
-----------------
Enter S to Select, D to Delete, New Line to Retain Current Value




          VME LAN Board 0 [Deleted]:        Deleted
          VME LAN Board 1 [Deleted]: ▪      Selected



     Press New Line to Start - Press Q to Exit
```

4.   After selecting the LAN you want to test, press New Line to start the utility. You see the following prompt:

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

5.   Select a number between 1 and 256, indicating how many times you want to run the test. The amount of time required for each pass depends on your network configuration; you should probably select a low number the first time you run this test on each LAN.

To start by running the test twice, type **2** and press New Line. The utility displays a message after each pass of the test. The message appears as follows if the test finds no hardware faults in your LAN connection:

```
Beginning Execution of TDR Test

TDR Pass Number: 001        TDR Test Passed with NO ERROR
TDR Pass Number: 002        TDR Test Passed with NO ERROR
```

If the test finds a fault, the utility reports an approximation of the distance (in meters) from the transceiver to the cable problem. You see two distances reported. Use the first value ("Ethernet cable") to locate the fault if your LAN uses thick (Teflon®) cabling; use the second value ("Cheapernet cable") if your LAN uses thin (PVC) cabling. A thick cable is approximately 1.5 centimeters (.6 inches) in diameter; a thin cable is approximately .75 centimeters (.3 inches) in diameter. Refer to *Ethernet/IEEE 802.3 Local Area Network Installation Guide* (listed in the Preface) for additional information.

The following shows the same example, this time with a detected error:

```
Number of Passes to Run TDR test (1-256) [1]: 2
        Beginning Execution of TDR Test

TDR Pass Number: 001          TDR Failure - TDR Value: 7
Approximate distance to fault using Ethernet cable: 70 meters
Approximate distance to fault using Cheapernet cable: 59 meters

TDR Pass Number: 002          TDR Failure - TDR Value: 7
Approximate distance to fault using Ethernet cable: 70 meters
Approximate distance to fault using Cheapernet cable: 59 meters
```

You may be able to correct the fault by examing your LAN cabling and securing cable connections and straightening out twists or crimps in the cable line. You may need to replace a cable. Contact Data General as described in the Preface if you discover faults in your cabling and need assistance.

6. At the end of the test, the system prompts you as follows:

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

Press New Line to display the Tools Menu. To test the hardware connections on another LAN, repeat the steps in this chapter. From the Tools Menu, you can use the additional diagnostic utilities, or return to the system diagnostics Main Menu. From the Main Menu, you can enter the SCM and then boot your operating system, as described in Chapter 2.

End of Chapter

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