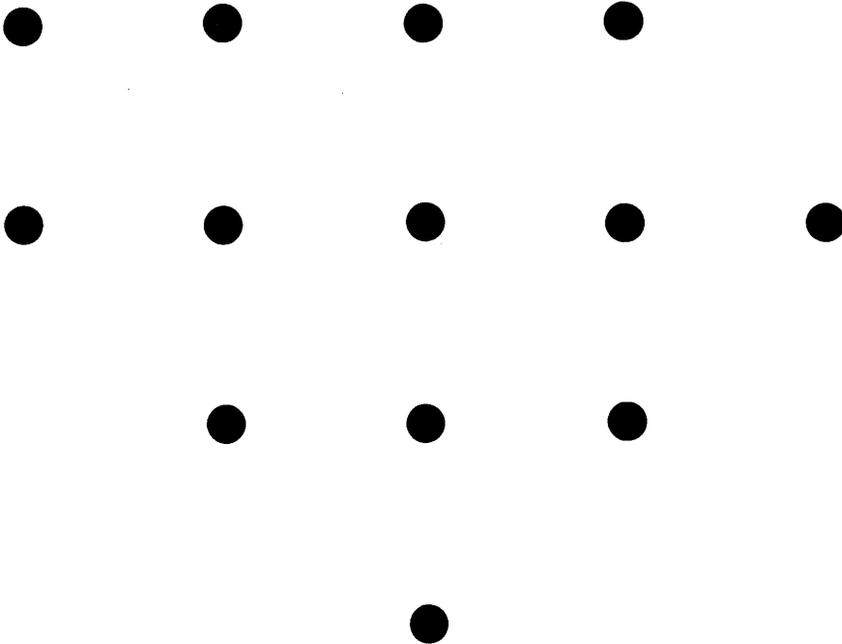


SunDiag User's Guide



The Sun logo, Sun Microsystems, Sun Workstation, NFS, and TOPS are registered trademarks of Sun Microsystems, Inc.

Sun, Sun-2, Sun-3, Sun-4, Sun386i, SPARCstation, SPARCserver, NeWS, NSE, OpenWindows, SPARC, SunInstall, SunLink, SunNet, SunOS, SunPro, and Sun-View are trademarks of Sun Microsystems, Inc.

UNIX is a registered trademark of AT&T; OPEN LOOK is a trademark of AT&T.

All other products or services mentioned in this document are identified by the trademarks or service marks of their respective companies or organizations, and Sun Microsystems, Inc. disclaims any responsibility for specifying which marks are owned by which companies or organizations.

SunIPC is a trademark of Sun Microsystems

SunLink is a trademark of Sun Microsystems

ALM is a trademark of Sun Microsystems

Copyright © 1988-1989 Sun Microsystems, Inc. – Printed in U.S.A.

All rights reserved. No part of this work covered by copyright hereon may be reproduced in any form or by any means – graphic, electronic, or mechanical – including photocopying, recording, taping, or storage in an information retrieval system, without the prior written permission of the copyright owner.

Restricted rights legend: use, duplication, or disclosure by the U.S. government is subject to restrictions set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 52.227-7013 and in similar clauses in the FAR and NASA FAR Supplement.

The Sun Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees.

This product is protected by one or more of the following U.S. patents: 4,777,485 4,688,190 4,527,232 4,745,407 4,679,014 4,435,792 4,719,569 4,550,368 in addition to foreign patents and applications pending.

Contents

| | |
|---|----------|
| Chapter 1 Introducing Sundiag | 1 |
| 1.1. An Overview | 1 |
| 1.2. What This Manual Contains | 2 |
| 1.3. Hardware and Software Requirements | 2 |
| 1.4. Setting Up | 2 |
| SunView-Based Remote Interface | 2 |
| 1.5. Starting and Exiting Sundiag | 3 |
| Exiting Sundiag | 5 |
| | |
| Chapter 2 Using Sundiag With SunView | 7 |
| 2.1. The Sundiag Window | 7 |
| The Control Panel | 9 |
| Control Panel Buttons | 9 |
| Start/Stop | 9 |
| Reset/Suspend/Resume | 10 |
| The Quit Button | 10 |
| The Print Button | 10 |
| The Logfiles Button | 10 |
| The Schedule Button | 12 |
| The Options Button | 12 |
| The Optfiles Button | 14 |
| EEPROM Option Menu | 15 |
| Intervention Mode | 18 |
| Default, All or None | 18 |

| | |
|---|-----------|
| Devices Section of Control Panel | 19 |
| The Test Status Panel | 20 |
| The Console Window | 20 |
| The Performance Monitor | 21 |
| 2.2. Running Sundiag Tests | 21 |
| Chapter 3 Using Sundiag With the TTY Interface | 23 |
| 3.1. Starting Sundiag From a Terminal | 23 |
| Scrolling | 25 |
| Re-drawing the Screen | 25 |
| Backgrounding Sundiag | 26 |
| 3.2. Control Panel Commands | 26 |
| [START] | 26 |
| [OPTIONS] | 26 |
| [STATUS] | 26 |
| [SCHEDULE] | 26 |
| [OPTFILES] | 26 |
| [STOP] | 27 |
| [QUIT] | 27 |
| [RESET] | 27 |
| [SUSPEND] | 27 |
| [RESUME] | 27 |
| [EEPROM] | 27 |
| [LOGFILES] | 27 |
| [HELP] | 27 |
| [NEXT] | 27 |
| [INTERVENTION] | 28 |
| [TESTS] | 28 |
| 3.3. To Enable/Disable Individual Tests | 28 |
| 3.4. The Options Menu | 29 |
| 3.5. The Status Display | 31 |
| 3.6. The Option Files Menu | 32 |
| 3.7. The Log Files Menu | 33 |

| | |
|--|-----------|
| 3.8. TTY Mode Test Options | 35 |
| Chapter 4 Using Sundiag with Online Commands | 37 |
| 4.1. Standard Online Command Options | 37 |
| 4.2. Tests Supported by the Online Command Interface | 38 |
| Chapter 5 Test Descriptions | 39 |
| 5.1. Memory Options | 39 |
| 5.2. CPU Options | 40 |
| 5.3. Disk Options | 44 |
| 5.4. Tape Tests | 46 |
| 5.5. Other Options | 50 |
| Unbundled Product Tests | 53 |
| Multiple Terminal Interface Tests | 56 |
| 5.6. Adding Your Own Tests | 57 |
| Appendix A Loopback Connectors and Utilities | 59 |
| Serial Port Loopback Connectors | 59 |
| Serial Port Loopback Connector | 59 |
| RS-232 Loopback Cable | 60 |
| Utilities | 63 |
| what_rev | 63 |
| Index | 65 |

Tables

| | |
|---|----|
| Table 3-1 TTY Command Characters | 25 |
| Table 4-1 Online Command Tests and ID Numbers | 38 |

Figures

| | |
|---|----|
| Figure 2-1 Sundiag Window | 8 |
| Figure 2-2 Control Panel | 9 |
| Figure 2-3 Logfiles Menu | 10 |
| Figure 2-4 Test Schedule Menu | 12 |
| Figure 2-5 System Option Menu | 13 |
| Figure 2-6 Optfiles Menu | 14 |
| Figure 2-7 EEPROM Option Menu | 15 |
| Figure 2-8 Example Option Menu | 19 |
| Figure 2-9 Test Status Panel | 20 |
| Figure 2-10 Performance Monitor | 21 |
| | |
| Figure 3-1 Main Display on a Terminal | 24 |
| Figure 3-2 System Option Display | 29 |
| Figure 3-3 Status Display | 31 |
| Figure 3-4 Option Files Menu | 32 |
| Figure 3-5 Log File Menu | 33 |
| Figure 3-6 TTY Error Log | 34 |
| Figure 3-7 TTY Info Log | 35 |
| Figure 3-8 TTY Test Options Menu | 36 |
| | |
| Figure 5-1 Physical Memory Option Menu | 39 |
| Figure 5-2 Virtual Memory Option Menu | 40 |
| Figure 5-3 CPU Serial Port Test Options | 41 |
| Figure 5-4 Nettest Option Menu | 42 |

| | |
|---|----|
| Figure 5-5 Audiotest Option Menu | 44 |
| Figure 5-6 Disk Option Menu Example | 45 |
| Figure 5-7 CDtest Option Menu | 46 |
| Figure 5-8 SCSI Tape Option Menu (Exabyte) | 47 |
| Figure 5-9 SCSI Tape Option Menu (half inch front-load) | 48 |
| Figure 5-10 Quarter Inch Tape Option Menu | 48 |
| Figure 5-11 Graphics Option Menu | 52 |
| Figure 5-12 SunIPC Option Menu | 53 |
| Figure 5-13 SunLink Communication Processor 2 Option Menu | 55 |
| Figure 5-14 High Speed Serial Interface Option Menu | 56 |
| | |
| Figure A-1 Loopback Connector Plugs | 60 |
| Figure A-2 RS-232 Loopback Cable | 61 |

Introducing Sundiag

1.1. An Overview

The Sundiag On-line System Exerciser provides a SunView-based user interface for the tests formerly executed under the Sun System Diagnostic known as `sysdiag`, and for Sundiag tests written for new Sun products. The manual supports the version of Sundiag shipped with the SunOS version 4.1. The program may be found in the `/usr/diag/sundiag` directory if diagnostics were loaded during software installation.

With this new, easy to use System Exerciser, you can select tests and test options with a click of the mouse, and you can easily create your own test environment and save it for future use.

*NOTE We assume that you are familiar with the SunView window system. If you are not familiar with Sun's window system, please refer to the **SunView Beginner's Guide** before running Sundiag.*

Sundiag's `tty` interface makes it possible to use Sundiag from a terminal attached to a serial port, or from a modem. This feature requires that you type in commands instead of using the mouse, and displays one screen of information at a time. It is designed, however, to emulate the window system whenever possible; you still "toggle" various choices, entering a single letter instead of clicking the mouse. Chapter 3 describes the `tty` interface.

If you are remotely logging in to a Sun system from another Sun system, you may run Sundiag with the SunView interface. The "Setting Up" section explains how to set up your software for this feature.

Sundiag probes the system kernel for installed hardware devices, then automatically displays the devices it found on the control panel, with selected tests for each device on the test status panel. This feature provides a quick check of hardware/software setup. That is, if you know that a particular device — such as a disk drive or an optional PC board — is physically present in the system, yet Sundiag does not display the device on the control panel, it is likely that the kernel has not been configured to recognize that device.

Sundiag may be used to verify the configuration, functionality and reliability of most Sun hardware controllers and devices. To pinpoint specific hardware failures, use the Sundiagnostic Executive.

1.2. What This Manual Contains

This manual begins with general information about Sundiag and any special requirements for its use. Next, in Chapter 2, we describe start-up and exit procedures and the windows you can expect to see. Then the manual describes setting up test options, which will vary according to the hardware installed in the system under test, and explains how to customize your test sequence, and how to run a test.

Chapter 3 is devoted to the `tty` interface and tells you what to expect when you run Sundiag from a terminal or a remote log-in.

Chapter 4 contains information on the command line Sundiag interface.

Chapter 5, a library of test descriptions, tells you what each test does, and includes test specific procedures. The Test Description section will change with each revision of this document, as new Sun products are introduced.

Finally, an appendix provides CPU board serial port loopback connector pin assignments.

1.3. Hardware and Software Requirements

Sundiag may be used on any Sun-3 or Sun-4 hardware configuration that has SunOS version 4.0.2 or later installed. The operating system kernel must be configured to support all peripherals that are to be tested. Some hardware may require a non-standard swap space (`sd0b`, `xd0b`, and so on) size. For minimum space requirements, refer to the software requirements shown in the hardware installation manual. An incorrect quantity of swap space may cause some Sundiag tests to fail.

Some of the tests that execute under Sundiag require loopback connectors. Contact Sun Customer Support for information on a loopback connector kit. Pin assignments for standard RS232 loopback connectors are shown in Appendix A.

For tape tests, you may need 1/2-inch or 1/4-inch scratch (write/read) tapes.

For disk tests, be sure there is enough space on your disk partition.

This diagnostic is designed to run in a SunView environment, but may be used from a terminal attached to a serial port. Chapter 3 describes the user interface when running in `tty` mode.

1.4. Setting Up

You will need to log in as super-user (`root`) in order to run Sundiag. Sundiag also needs to write the log and error files to the `/var/adm/sundiaglog` directory, which should be owned by `root`.

SunView-Based Remote Interface

If you want to run Sundiag remotely *with* the SunView interface, you must perform the steps described in the next few paragraphs. The remote host must be running RPC for the SunView interface to work.

1. Log in remotely (`rlogin`) to the *remotehost*.
2. Change to the Sundiag directory.

3. Become super-user (root) and start the Sundiag remote execution server (`sd_rexd`):

```
remotehost% su
password: enter super-user password
remotehost# cd /usr/diag/sundiag
remotehost# sd_rexd
```

4. Now you must export your root directory to be mounted by `remotehost`.

If the "/" partition is not being exported on *myhost*, you must put the "/" entry in the `/etc/exports` file and export it:

```
myhost# exportfs -a
```

Now do a `ps -ax` from the command line and see if `nfsd` and `rpc.mountd` are running. If not, then you can manually start them:

```
myhost# /usr/etc/nfsd 8
```

```
myhost# /usr/etc/rpc.mountd
```

5. Now, back on your own system, set your path variable so that the `remotehost` `sundiag` directory is in your path (even if it does not exist on *myhost*):

```
myhost# set path=($path /usr/diag/sundiag)
```

6. Finally, execute `sundiag` on the remote host from your system with the `-h` option:

```
myhost# sundiag -h remotehost
```

NOTE When using the remote Sundiag interface, the frame buffer tests are not fully functional.

1.5. Starting and Exiting Sundiag

It is best to start Sundiag from a SunView window so that you are not left with a blank SunView canvas when you exit the diagnostic. If you are not running SunView when you start Sundiag, but you are logged in on the workstation under test, the SunView window system is automatically started and the Sundiag window is painted on the screen. However, when you exit Sundiag, the window disappears, but `sunview` is still running, meaning that you are left with a blank screen.

If you either log in remotely (`rlogin`) or log in from a serial port, Sundiag automatically runs in `tty` mode. Chapter 3 discusses the `tty` interface.

After reading the "Using Sundiag" chapter, from a SunView window, enter commands such as those shown below:

```
%su enter password
#cd /usr/diag/sundiag
#sundiag [-Cmptv][-a|-h hostname][-o option_file][-k kernel_name]
```

To start Sundiag, you may simply enter `sundiag` and then `[Return]`, or you may add the arguments shown. You may also enter the complete path to the `sundiag` directory, rather than changing directories as shown below. For example, you could enter:

```
%su  enter password
#/usr/diag/sundiag/sundiag
```

The optional arguments above shown in italics may be used as follows:

-a *hostname*

This argument tells Sundiag to run in automated test mode. This argument requires special Sun automated test equipment and is intended for use by Sun manufacturing.

- C** This flag redirects the UNIX console output from any existing console window to the Sundiag console sub-window. If you are using the `tty` interface, the UNIX console message will be displayed in the message line of the status screen.

-k *kernel name*

This argument allows the user to specify the customized kernel name that was used to boot up the system. The default kernel name is `/vmunix`. Since the `rstatd` that the performance monitor requires is hard wired to use `/vmunix` as kernel name, the performance monitor is disabled when the `-k` option is specified.

-o *saved_options_file*

This option directs Sundiag to use a specific "saved option" file. (Refer to "The **Optfiles** Button" for more information on this file.) If you do not use the `-o` argument, Sundiag uses the default option file `.sundiag`, if it exists.

- t** This option instructs Sundiag to run in `tty` mode. For information on running Sundiag in this mode, refer to Chapter 3.

- m** This option ensures that a device file is created on the workstation under test for all devices found during the kernel probe. When Sundiag creates the missing device files, it uses the major/minor device numbers and permissions that are already declared in `/dev/MAKEDEV`.

- p** This argument tells Sundiag to ignore the kernel probe for devices. This argument is intended for use when running user-defined tests found in your `.usertest` file.

- v** This argument suppresses the Sundiag start-up messages so that they do not interfere with the display when SunView windows are coming up. This argument may be used in your `.sunview` file.

-h *remote_host*

This command is used when you are set up to remotely test the system you name (shown above as *remote_host*) while using the SunView interface on your own system. Refer to "SunView Based Remote Interface" in the "Setting Up" section for information on setting up your software to implement

this feature.

Generic Tool Arguments

Refer to `sunview(1)` in the *SunOS Reference Manual* for examples of generic tool arguments that may be used on the Sundiag command line when running in SunView mode.

Exiting Sundiag



To exit Sundiag from a SunView window, first click on the **Stop** button to stop any tests that are running, then click on the **Quit** button. After asking for verification, the Sundiag window will disappear.

You may also use the standard method of “quitting” a SunView window; that is, clicking **RIGHT** on the Sundiag window header and choosing **Quit** from the pop-up menu.

If you want to continue testing and have your screen free for other uses, simply drag the mouse to **Close** from the window header menu and release the mouse button. A Sundiag icon (as shown in the left margin) will now appear on your screen, which you can monitor for test failures — if the icon has an X across it, a test has found an error.

To exit Sundiag from a terminal or remote log-in, type in **q** for “quit”.

NOTE While Sundiag is running, we recommend that you do not run any other programs or software that use the same hardware devices that Sundiag is testing. In particular, when the virtual memory test is running, there may not be enough free memory to run any other programs. However, the **Reserve** option in the virtual memory menu lets you specify the amount of memory you want to reserve from being tested. This allows you to free up memory to run another application while running Sundiag.

Using Sundiag With SunView

2.1. The Sundiag Window

This chapter discusses using Sundiag from a SunView window. Refer to Chapter 3, “Using Sundiag With the TTY Interface” for information on using Sundiag from a terminal or from a modem. The “Setting Up” section in Chapter 1 explains how to perform a remote log-in over a network and run Sundiag with the SunView interface described here. When you start Sundiag, a SunView window appears on your screen, divided into four main windows. These “sub-windows” consist of:

- A control panel with buttons, cycle items and pop-up menus for manipulation of test parameters and options. Pop-up text sub-windows, available from the control panel, are for viewing Sundiag or operating system log files.
- A status window that lets you know how the tests are progressing.
- A console window that displays operating system messages and test messages and allows you, as super-user, to use SunOS commands.
- A performance monitor panel that displays the performance statistics for the system under test.

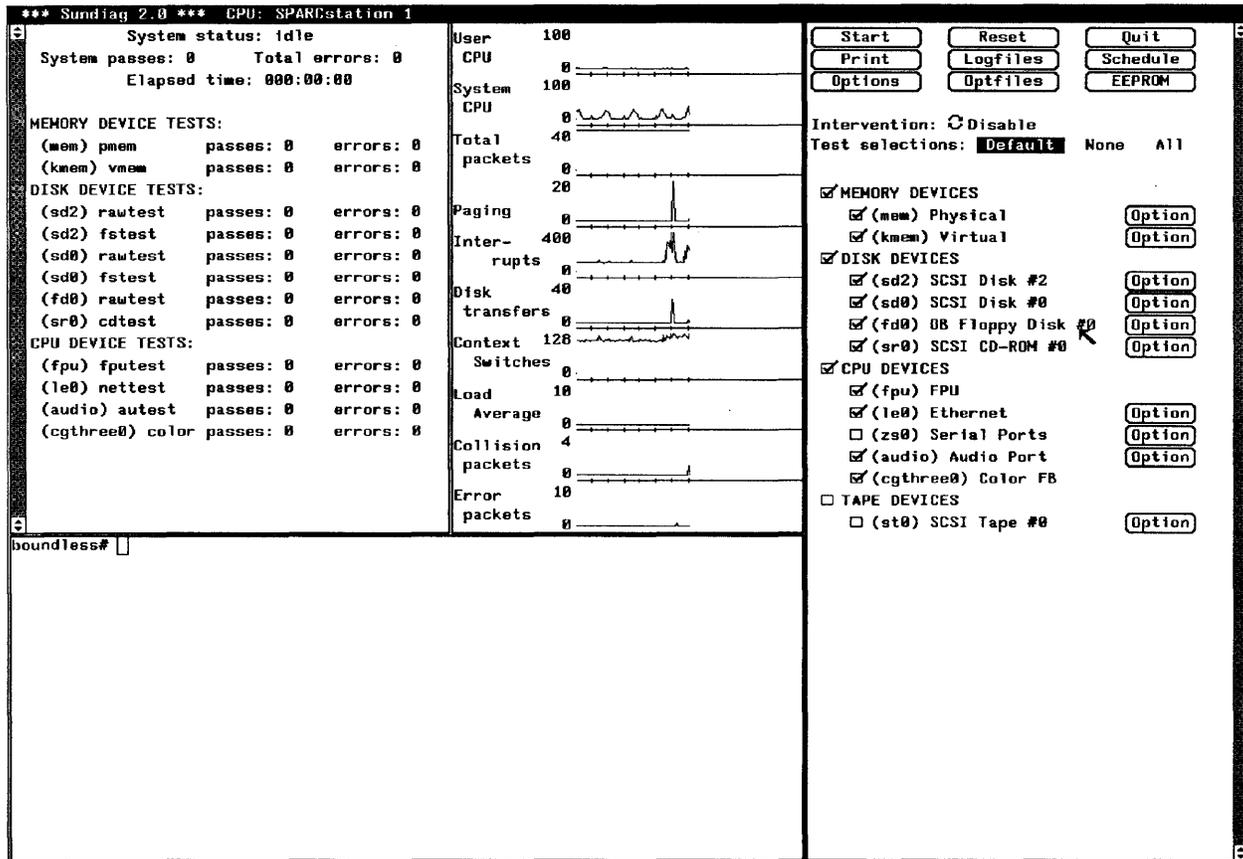
The Sundiag window looks something like this:

Figure 2-1 Sundiag Window

Status Window

Performance Meter

Control Panel



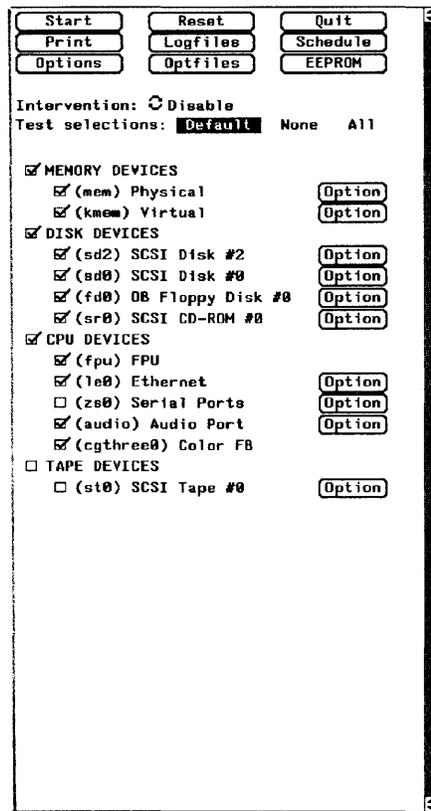
↑
Console Window

You can close the Sundiag window to an icon, as previously described. If one of the tests detects an error condition, an "X" appears over the icon.

The Control Panel

The contents of the lower part of the control panel are dependent on system configuration. Here is an example of the control panel part of the Sundiag window for a Sun-3 system that contains a floating point chip and a floating point accelerator board, as well as SCSI disks and tape, and a SunIPC™ board. The check marks mean that the device is enabled for testing.

Figure 2-2 Control Panel



The default condition of the control panel enables all the devices found during the kernel probe for all tests that do not require intervention or special manufacturing test equipment. Sundiag runs these tests if you choose the **Start** button.

Control Panel Buttons

Buttons such as **Options**, **Optfiles**, and **Schedule** become inoperative and appear shaded on the control panel after testing has started, meaning that the options they represent are valid only when tests are stopped. The following paragraphs describe the various buttons, cycle and text items that appear on the control panel.

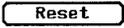
Start/Stop

Start

When you push the **Start** button, Sundiag runs all currently enabled tests, and the wording on the button changes to **Stop**, so that you can click to stop the tests. System status on the Status Panel changes from **idle** to **testing**. When you click on the **Stop** button, all tests are stopped, the button changes back to **Start**, and the system status changes to **stopping**, and then **idle**.

When you press the **Start** button, the **Reset** button changes to **Suspend** so that you can suspend testing without actually stopping the test program.

Reset / Suspend / Resume



The reset button resets to zero the passes and error count for each test, in addition to resetting system passes and total errors. This is a valid option only while tests are stopped.

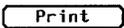
As previously explained, once tests are started, this option becomes **Suspend**. If you click on **Suspend**, test status in the status window changes to "suspended", and the **Suspend** button changes to **Resume**. When you are ready to resume testing, simply click on the **Resume** button. After you stop testing, the button will again read **Reset**.

The **Quit** Button



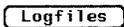
Click on the **Quit** button to exit Sundiag. All processes are stopped, and the diagnostic is exited.

The **Print** Button



This button runs the SunView screen dump process, with the output directed to the printer you have selected using the **Options** button.

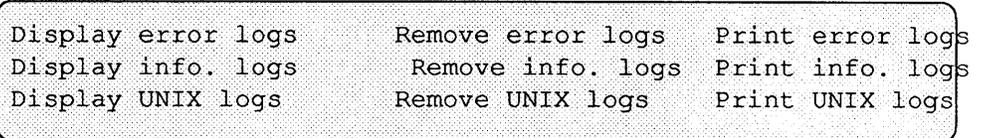
The **Logfiles** Button



Clicking LEFT on the **Logfiles** button brings up a window that displays the error log messages contained in the `sundiag.error` file. You may resize, move or quit this window in the standard SunView way.

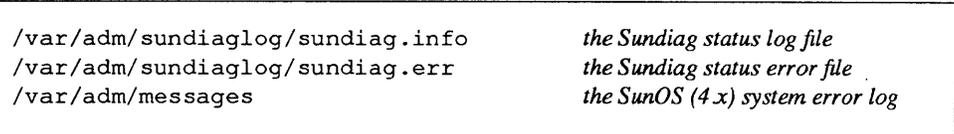
When you click RIGHT on the **Logfiles** button and hold it down, you will see a menu of choices for viewing, deleting or printing Sundiag and SunOS log files:

Figure 2-3 *Logfiles Menu*



Slide the mouse to your choice and release the button. When you choose to display any of the logs, a text subwindow for viewing log files appears. This window has a scrollbar and all the features of a standard SunView text window.

The ASCII files you can view in this window are:



If you choose to remove a log file, the program asks you for confirmation before truncating the file(s):

```
OK to remove sundiag error log
```

The Status Log File, `sundiag.info` contains Sundiag messages about starting and stopping, and so on, in addition to Sundiag test messages. The Error Log File, `sundiag.err`, contains test messages classified as error messages as well as the test start/stop times.

The format for test messages in either an info or error log file is:

```
TTT.VV.SSS.EEEE date time device test [ERROR/FATAL/INFO/WARNING]: message
```

A typical message might look like this:

```
009.33.999.9025 12/13/89 18:54:49 xx0 fstest ERROR: not enough
trace blocks on xy0
```

TTT, the leading three digits of the message format, is the test identifier. *VV* is the two digit test version identifier and *SSS* is the subtest identifier. *EEEE* is the error identifier of which, the leading digit is the priority identifier (message type) and the last three digits are the message identifier. The message type identifier number translates into one of the following messages depending on the number displayed:

```
9: ERROR
7: INFO
5: WARNING
3: FATAL
```

device is the device under test where the error occurred and *test* is the name of the test that reports the error. *date* and *time* tell you when the error occurred. The *message* will vary, depending on the type of test in which the error occurred.

Refer to the table "Online Command Tests and ID Numbers" in Chapter 4 for a list of tests and their corresponding ID numbers.

The format of Sundiag messages is:

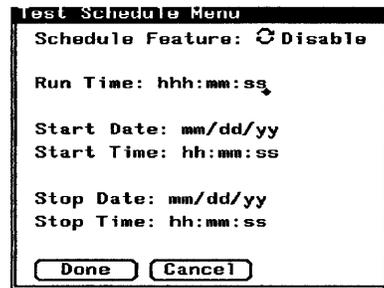
```
TTT.VV.SSS.EEEE date time hostname sundiag [ERROR/FATAL/INFO/
WARNING]: message
```

When Sundiag probes for devices upon power-up, a message is displayed if any problems are found. Its format is:

```
TTT.VV.SSS.EEEE date time hostname probe [ERROR/FATAL/INFO/WARNING]
```

The **Schedule** Button


If you press this button, a pop-up appears. The *Test Schedule Menu* allows you to specify the start and stop times and dates for Sundiag to activate.

Figure 2-4 *Test Schedule Menu***Schedule Feature:**

You can enable or disable the schedule feature with this field. Cycle the arrows to toggle Enable and Disable.

Start Date:

You enter the start date for your next scheduled test in this field. To enter data in this field, click on the mm/dd/yy to the right of the Start Date option, backspace the prompt and enter the data. Be sure you enter the diagonals when you enter your start date. For example: **08/24/89**

Start Time:

Enter the start time for your next scheduled test in this field. Click on the hh:mm:ss to the right of the Start time option, backspace the prompt and enter the data. Be sure you enter the colons when you enter the start time. For example: **10:30:00**

Stop Date:

Enter the stop date for your next scheduled test in this field. Click on the mm/dd/yy to the right of the Stop Date option, backspace the prompt and enter the data. Be sure you remember the diagonals when you enter the data.

Stop Time:

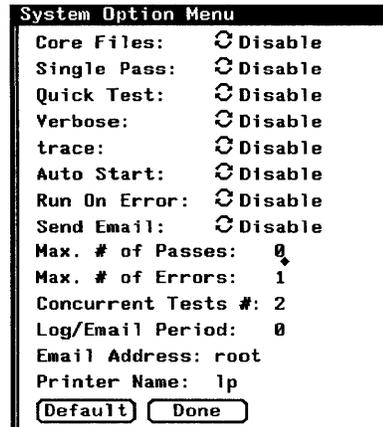
You enter the stop time for your next scheduled test in this field. Click on the hh:mm:ss to the right of the Stop time option, backspace the prompt and enter the data. Remember to enter the colons when entering the stop time.

The **Options** Button


This button sets various global test options, such as whether core files are enabled or disabled, and whether or not the tests should run on an error condition.

When you click on this button, a menu that looks like this appears:

Figure 2-5 *System Option Menu*



You may choose from this menu only while tests are stopped. Cycle the items (click LEFT on the circular arrows) to enable or disable each option. The System Option items are described below.

Core files

When you click on **Disable** the tests will try to capture the signals that cause core dumps, meaning that you will receive informative messages instead of a core file.

Single Pass

If you enable this option, all Sundiag tests will execute one time only.

Quick Test

When you enable this option, a short version of the enabled tests is executed.

Verbose

When enabled, more diagnostic messages are printed in the console window while tests are running.

Trace

When enabled, the test programs are traced down by function names. Messages are printed in the console window while the tests are running.

Auto Start

To eliminate the need to press the **Start** button to start Sundiag tests, do the following;

1. Enable the **Auto Start** option.
2. Save the global and test options (using the **Optfiles** facility, described in the next subsection) to a specified option file.
3. Specify the saved option file (using the `-o` argument) when you type in the command line to invoke Sundiag. Sundiag will then immediately start testing after it paints the screen.

Run On Error

If you enable this option, Sundiag will keep running the failed tests until "**Max. # of Errors**" is reached.

Max. # of Passes

If you enable this option, Sundiag will keep running the passed tests until "**Max. # of Passes**" is reached.

Concurrent Tests #:

Type in the number of tests you want to run concurrently in each device category after the

Concurrent Tests #:

text item. Point at the item and click LEFT to place the text caret after the colon.

Send Email

Use this option to enable/set the mode (*periodic/onerror/both*) of the automatic send mail feature.

Log/Email Period

This option allows you to set the time period you want the Email error message to be sent (if enabled) and to enable/set the periodic status log. To set the **Log/Email Period**, click on the zero and type in the number of minutes. The time is always set in minutes so you must calculate the exact number of minutes whether you want minutes, hours or days for your time frame. A 0 setting means the log/email period function is disabled.

Email Address

This option tells Sundiag where to send the Email message. The default is **root**. To change the address, just click on **root** and type in the new address.

Printer Name:

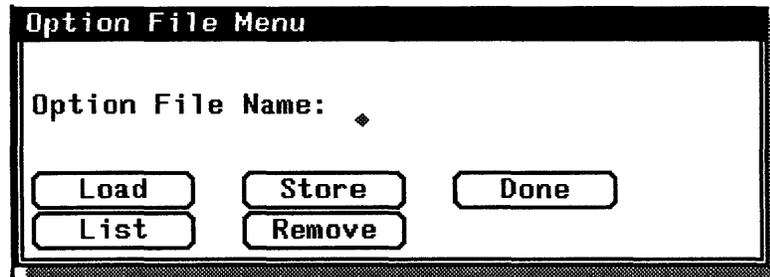
Type in the name of the printer you want to use when you click on the **Print** button. The name should match an entry in your `/etc/printcap` file, such as "lp1" or the name of the host to which the printer is attached. If you do not specify a printer, Sundiag will use the printer specified with the `PRINTER` environment variable. If there is no `PRINTER` variable (in `.login` for example), Sundiag will print on the printer specified by the `lp` entry in your `/etc/printcap` file. Any printer you specify must exist in the `printcap` file.

The Optfiles Button

Clicking LEFT on the **Optfiles** button brings up a menu of actions you may perform on the option files that exist in the `/var/adm/sundiaglog/options` directory. The options stored in these files are those you have chosen from the System Options Menu and those chosen from the control panel for specific tests. The **Optfiles** button works only when tests are stopped.

The menu looks something like this:

Figure 2-6 *Optfiles Menu*



Click **RIGHT** on **List** and hold the button down to view a list of the existing option files. The options that are saved in these files are those you set with the **Options** button, as well as the individual options chosen for each test.

If you choose **Store** from the menu, and then **Load**, the next time you **Start** the tests, the options you saved will be used, and the Control Panel will reflect those choices.

Choose **Remove** to remove the named option file. A pop-up menu will ask you if you are sure you want to remove the file.

You may type in the name of the file you want to create or load after the **Option File Name:** text item. `.sundiag` is the name of the default option file. If you invoke Sundiag without the `-o` option, the `.sundiag` file is used, if it exists.

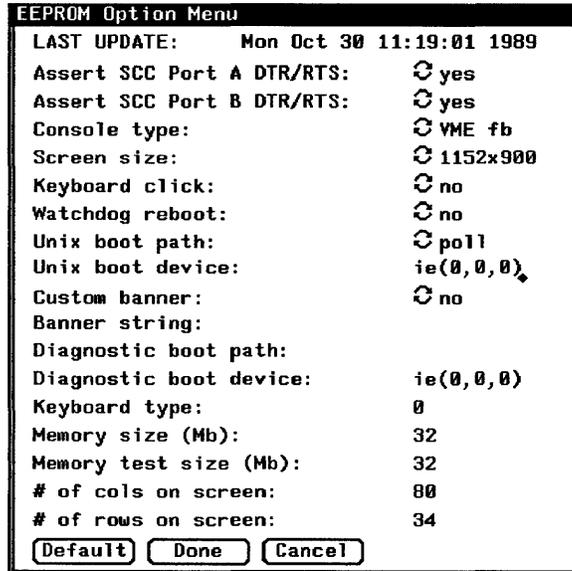
When you are finished, click on **Done** and the Option File Menu will disappear.

EEPROM Option Menu

EEPROM

The EEPROM is a chip in the CPU board which stores system configuration information. The EEPROM tool gives you a SunView-based interface to the EEPROM chip. It allows you to modify the various options shown on the menu screen. When you click on the **EEPROM** button, the new EEPROM Option Menu will appear:

Figure 2-7 *EEPROM Option Menu*



LAST UPDATE

This line contains the date from the last EEPROM update. It is automatically updated when you click on the **Done** button.

Assert SCC Port A DTR/RTS:

You can select whether the SCC Port A will have the DTR and RTS signals asserted during the initialization. The SCC is on the CPU board. The arrows cycle between true and false. True asserts the signals and false does not.

Assert SCC Port B DTR/RTS:

This option does exactly the same for SCC Port B as the above option does for SCC Port A.

Console Type

You can cycle the arrows through a selection of consoles. The choices are:

- on board fb frame buffer on CPU board
- ttya Serial Port A console
- ttyb Serial Port B console
- P4 fb frame buffer

- VME fb frame buffer on VME bus

Screen size:

To change to one of the special screen sizes, you also need to change the CPU board. You can cycle through the following selections:

| | |
|------------------|-----------------------------|
| 1152x900 | standard screen size |
| 1600x1280 | high resolution screen size |
| 1024x1024 | special square screen |
| 1440x1440 | special square screen |

Keyboard click:

The Keyboard click option lets you select whether or not the keyboard makes noise when you type. Cycling the arrows turns the click on with true and turns it off with false.

Watchdog reboot:

True causes a power-on reset after a watchdog reset. False causes the reset to fall into the Boot PROM monitor.

Unix boot path:

You cycle **poll** or **EEPROM** to select whether the boot prom will poll for devices in your system or use an EEPROM selectable boot for loading SunOS. If you select the EEPROM option, the boot device is specified in the SunOS boot device field. You toggle the circular arrows for poll or EEPROM.

Unix boot device:

You can specify a command string that will boot SunOS from a specified device. This field is used if you chose the EEPROM option from the Unix boot path. To enter data in this field, backspace the prompt and type in the command string.

Custom logo:

The Custom Logo option lets you select the eighty byte banner string you have entered to be displayed instead of the Sun logo and first line of the power-up display. You cycle the arrows to select true and false. True selects the banner and false selects the Sun logo and banner.

Banner string:

Enter the 80 character banner that you want to replace the Sun logo and power-up banner. To enter data in this field, click to the right of the Banner String option and type the data when the prompt appears. To replace the Sun logo, refer to the PROM User's Manual.

Diagnostic boot path:

If you want to boot a specific program when the diagnostic switch is on DIAG, enter the path to that program. For example, you might enter: **/stand/exec**. To enter data in this field, click to the right of the **Diagnostic Boot Path** option and type the data when the prompt appears.

Diagnostic boot device:

If you want to boot from a specific device when the diagnostic switch is set to DIAG, enter the device and controller, unit and partition numbers. For

example, to boot from a Xylogics disk, controller, disk, and partition 0, enter: **xy (0, 0, 0)**. To enter data in this field, backspace the prompt and type in the command string.

Keyboard type:

This single byte option lets you signify a non-Sun keyboard type. To enter data in this field, backspace the prompt and type in the data.

Memory size (Mb):

You can select the total number of Megabytes installed on your system with this option. To enter data in this field, click on the number to the right of the option, backspace the prompt and type in the data.

Memory test size (Mb):

You can specify the total number of memory the Boot Prom self tests will test prior to booting SunOS. To enter data in this field, click on the number to the right of the option, backspace the prompt and type in the data.

of cols on screen:

To change the setting, click on 80, which is the default, backspace the prompt and type in the data. This field applies only to high resolution screens.

of rows on screen:

This field also applies only to high resolution screens. To change the setting, click on 34, the default, backspace the prompt and type in the data.

Intervention Mode

Intervention: Enable

This cycle item disables/enables all the tests that require user intervention or special test equipment. The intervention mode assumes that all tests are executed with standard cables and other equipment available in the field.

Default, All or None

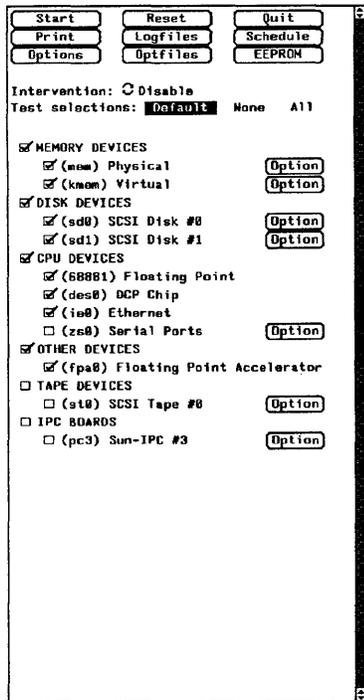
Test Selections: Default None All

Initially, the control panel highlights **Default** mode, meaning that all the devices that do not require intervention are enabled for testing.

Clicking on **All** enables testing of all the devices installed in the system *if* intervention mode is chosen. In this case, you must provide the necessary test equipment for the devices you want to test.

If you click on **None**, All the devices enabled by default are “disabled” and the program waits for you to select the devices you want to test. If you choose **None** and then click on the **Start** button, the Test Status window will show “0” test results.

Devices Section of Control Panel



This part of the control panel is generally divided into categories such as MEMORY DEVICES, DISK DEVICES, CPU DEVICES, OTHER DEVICES, TAPE DEVICES, and special boards. The options shown are the result of the kernel probe that is done before your Sundiag window comes up, and the items shown will vary with each system configuration. Each device found has a check mark when enabled for testing (as shown to the left of this text). The device is enabled or disabled when you point at the toggle area and click LEFT.

If a device is enabled during testing, the test(s) are started as soon as possible. If an enabled device is disabled during testing, the test(s) stop immediately.

Test Option Buttons

Each device with configuration options has an **Option** button to the right of its name. When you click LEFT on that button, a small option menu pops up. All option menus share these fields:

Configurations:

Sub-Tests:

Options:

Default **Done**

If you click on **Default**, check marks will appear in front of the standard default tests, as shown above, and when you start testing, the options that are checked will be used. In Figure 2-8, the menu shows that SCSI disk #0 has a 71MB capacity and that its controller ID is sc0 (the first controller board). This information comes from the operating system kernel. This test offers read-only and read/write testing. In this case, both types of testing are enabled, as signified by the check marks.

Figure 2-8 *Example Option Menu*



Refer to the “Test Description” section for test specific option menu choices. When you are ready to view another option menu, click on **Done** and the option

menu will disappear. You may view only one option menu at a time.

The Test Status Panel

This panel shows the SunOS device name and the test name for each device under test, along with a running total of test passes and errors. The tests are grouped by device type, and an actively running test is marked with an asterisk. The test status panel looks something like this:

Figure 2-9 *Test Status Panel*

```

System status: idle
System passes: 0      Total errors: 0
Elapsed time: 000:00:00

MEMORY DEVICE TESTS:
(mem) pmem      passes: 0      errors: 0
(kmem) vmem     passes: 0      errors: 0
DISK DEVICE TESTS:
(sd2) rawtest   passes: 0      errors: 0
(sd2) fstest    passes: 0      errors: 0
(sd0) rawtest   passes: 0      errors: 0
(sd0) fstest    passes: 0      errors: 0
(fd0) rawtest   passes: 0      errors: 0
(sr0) cdtest    passes: 0      errors: 0
CPU DEVICE TESTS:
(fpu) fputest   passes: 0      errors: 0
(le0) nettest   passes: 0      errors: 0
(audio) autest  passes: 0      errors: 0
(cgthree0) color passes: 0      errors: 0

```

The results displayed in this window are stored in special log files, discussed under “The Log File Button”.

The message following `System status:` at the top of the display changes as described previously under “Start/Stop” and “Reset/Suspend/Resume”.

`System passes:` always shows the least number of passes that any test has completed. In other words, if the `pmem` test has completed two passes while all other tests have completed four passes, the status panel will show

```
System passes: 2
```

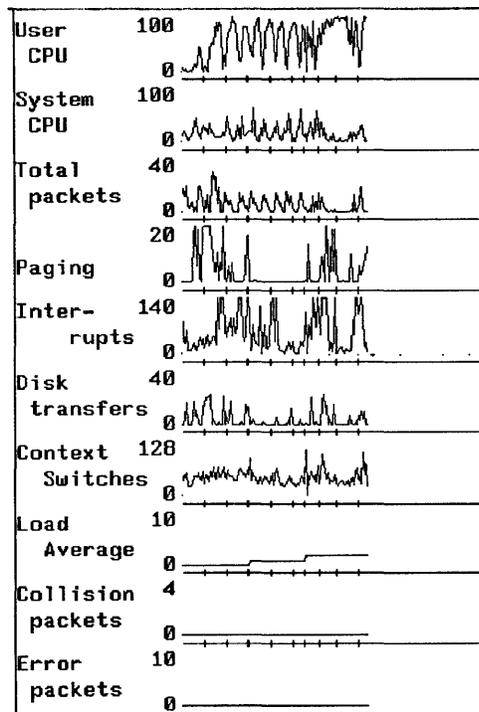
The Console Window

The Console Window appears in the lower left corner of the Sundiag window. You may enter SunOS commands from this window, and if you use the `-C` option when you bring up Sundiag, all the SunOS messages that would normally appear in your system console window will appear in the Sundiag Console Window. If Sundiag was started from "monitor" mode (outside Sunview) `-C` will become default since there is no console window available. If another console window is opened afterward, Sundiag will be deprived of the console and will not be able to get it back even if the new console window is closed later.

The Performance Monitor

The performance monitor is the same as that provided by the SunOS `perfme-`
`ter` utility, and provides a graphic display of system performance statistics. The
`perfmeter` looks something like this:

Figure 2-10 *Performance Monitor*



2.2. Running Sundiag Tests

You have logged into the system under test as superuser (`root`) and entered the appropriate command line (as described in Chapter 1, Section 1.5). You have brought up the Sundiag window and checked the devices shown in the control panel against the devices you know to be physically present in the system. If there were any discrepancies, you should check the boot-up information in the `/var/adm/messages` file to make sure that SunOS sees all of your hardware devices. (The on-board MC68881 (Sun-3) and FPU (Sun-4) floating point devices do not show up in the SunOS boot messages.) If the SunOS does not recognize your hardware device, you need to check the hardware and the SunOS kernel configuration. If you use the `-m` option when entering the command line, Sundiag will make the appropriate device files if they are missing.

You have chosen from the system and test options offered, and perhaps even created a special global Options file that you may **Load** before you begin testing, or specify with the `-o` option when you first invoke Sundiag.

When you are satisfied that the software configuration agrees with the hardware configuration, and that a check mark appears beside every device you want to test, simply click on the **Start** button. Or, if you have enabled the **Auto Start** option from the System Option menu and saved an options file, simply type `sundiag -o options_filename` from a SunView window.

Using Sundiag With the TTY Interface

This chapter describes the interface available when you execute Sundiag from a terminal attached to a serial port or from a modem. All the buttons displayed on the SunView version of Sundiag have command equivalents in `tty` mode. For more information on a particular command, please refer back to Chapter 2. Note that, if you are logging in remotely over the Ethernet from a Sun system, you may run Sundiag with the SunView interface. Refer to the “Setting Up” section in Chapter 1 for more information.

3.1. Starting Sundiag From a Terminal

Whether you are remotely logged-into a workstation that contains the `sundiag` directory, or whether you are running Sundiag from a terminal attached to such a workstation, you type in the command line described under “Starting and Exiting Sundiag” at the beginning of this manual. The `-C` option is the only option NOT AVAILABLE when using the Sundiag `tty` interface.

After changing to the `sundiag` directory, you may simply enter **sundiag**. The program will sense that you are logging in from a terminal interface and will automatically bring up the `tty` version of the control panel. You will see this brief message

```
Starting probing routine, please wait...
```

and then a display that looks something like the example on the following page.

Figure 3-1 *Main Display on a Terminal*

```

-----
Sundiag 2.0 CPU:SPARCstation 1                System status: idle
-----
[START] [OPTIONS] [STATUS] [SCHEDULE] [OPTFILES] [STOP] [QUIT]
[RESET] [SUSPEND] [RESUME] [EEPROM] [LOGFILES] [HELP] [NEXT]

[INTERVENTION]: Disable           [TESTS]: DEFAULT [NONE/ALL]

MEMORY DEVICES
->(mem) Physical           [OPTION]
->(kmem) Virtual          [OPTION]
DISK DEVICES
->(sd2) SCSI Disk #2      [OPTION]
->(sd0) SCSI Disk #0      [OPTION]
->(fd0) 0B Floppy Disk #0 [OPTION]
->(sr0) SCSI CD-ROM #0    [OPTION]
CPU DEVICES
->(fpu) FPU
->(le0) Ethernet           [OPTION]
(zs0) Serial Ports        [OPTION]
->(audio) Audio Port      [OPTION]
->(cgthree0) Color FB
TAPE DEVICES
(st0) SCSI Tape #0       [OPTION]

-----
Command: 
Message:
-----

```

All of the commands shown in brackets at the top of the display may be entered after the cursor at the bottom of the display. You may enter the entire command in upper or lower case, or you may use the single letter that corresponds to each command, as shown on the table that follows:

Table 3-1 *TTY Command Characters*

| <i>Command</i> | <i>Character to Enter</i> |
|----------------|---------------------------|
| start | s |
| options | o |
| status | a |
| schedule | m |
| optfiles | f |
| stop | t |
| quit | q |
| reset | r |
| suspend | p |
| resume | u |
| eeprom | e |
| logfiles | l |
| help | h |
| next | n |
| intervention | i |
| tests | c |

Scrolling

All the commands function as described for the SunView buttons. The `next` command provides a means of viewing a display that is too long to fit on one terminal screen. When you have reached the end of the display, the `next` command takes you back to the beginning of the display. Simply enter a new command to exit from the loop.

When you enter the first character of a command, the screen is cleared of any messages at the bottom of the screen.

Re-drawing the Screen

If you want to redraw the screen, enter `[Control-L]`.

Some of the command choices cause a visible change to the display. For example, if `intervention` mode showed on the screen as “Disabled”, when you enter `i`, or **intervention**, the display changes to `Enable`, and tests started now would run in `intervention` mode.

When tests are actively running, an asterisk appears before the test name, as it does when in `SunView` mode.

Some commands bring up a secondary display that replace the existing one. You may type `d` for `Done` from most of these displays and thereby return to the “control panel” display, as we shall call the display you see when you start Sundiag.

The Sundiag `tty` interface attempts to simulate all the windows you see when you use the SunView interface, one at a time. In some cases, features are combined for your convenience. For example, the “control panel” display also shows whether or not a test is in progress, and whether or not a test has failed. A secondary display either shows all available control panel commands in addition to those available from the level you are on, or provides a `Done` command to return

you to the original display. One exception is that, when you choose to Display a log file, the Sundiag `tty` interface uses `vi` to display the file. You must then use the `ex` command

```
:q
```

to exit from that display.

Backgrounding Sundiag

After you have brought Sundiag up, using the `tty` interface, you can enter `[Control-x]` (hold down the `[Control]` key while pressing `x`) and Sundiag will continue to run in the background, freeing your screen for other functions. You may also log out of the remote system after placing Sundiag in background mode.

To bring Sundiag back into view, simply log back into the remote system, if necessary, and enter `sundiagup`. You should see a pass and error count, followed by the Sundiag display.

3.2. Control Panel Commands

NOTE After you type in any of these commands, enter a carriage return.

This section gives a brief description of what to expect when you enter each of the commands shown in brackets at the top of the screen. The commands are presented as they appear on the screen, from left to right.

[START]

This command may be typed in as `start` or, simply `s`. After you have selected the tests and entered the system level and test level options of your choice, you must enter “start” to begin testing. Tests begin immediately, and the `Status` at the top of the screen changes to `testing`.

[OPTIONS]

Entering `options` or just `o` from the main “control panel” display brings up a menu of global, system level options that affect every test. Refer to “The Options Menu” for an example of the display and a description of each choice.

[STATUS]

Entering `status` or simply `a` brings up an informative display about the tests in progress, and so on. Refer to “The Status Display” for an example.

[SCHEDULE]

Entering `schedule` or `m` brings up a display of scheduling options. Refer to “The Test Schedule Menu” in Chapter 2 for an example.

[OPTFILES]

Entering either `optfiles` or `f` from the main, “control panel” display brings up a display from which you may save global options chosen with the `Options` command. Refer to “The Option Files Menu” for an example of this display.

[STOP]

Entering either `stop` or the character `t` stops all testing. While Sundiag is stopping the tests in progress, the top right of the screen reads:

```
System status: stopping
```

When all tests are stopped, the System status is `idle`.

If you want to stop an individual test, you simply type in the test name:

```
Command: mem
```

```
Message:
```

If a test is already stopped, typing in its name starts the test and typing the test name again stops the test once more.

[QUIT]

Entering `quit` or just the character `q` exits the Sundiag `tty` interface. If you have remotely logged in, you must also change directories to your remote entry point and exit the remote log-in.

[RESET]

Entering `reset` or just the character `r` resets to zero the passes and error count for each test, in addition to resetting system passes and total errors. This is a valid option only while tests are stopped.

[SUSPEND]

Entering `suspend` or just the character `p` suspends all testing until you enter `resume` or the character `u`. When you enter this command, the System status at the top of the screen changes to `suspended`.

[RESUME]

Enter `resume` or the character `u` to resume testing after you entered the `suspend` command. The System status display will then change to `testing`.

[EEPROM]

Enter `EEPROM` or the character `e` brings up a menu of EEPROM options. Refer to “The EEPROM Option Menu” in Chapter 2 for an example.

[LOGFILES]

Entering `logfiles` or just the character `l` brings up a display of operations you can perform on the log files Sundiag has stored in the `/usr/adm/sundiaglog` directory. Refer to “The Log Files Menu” for an example of the display and a description of the options.

[HELP]

This option is not available at this time.

[NEXT]

Entering `next` or just the character `n` displays the next screen of information when a second screen is needed. When you reach the end of the display, enter `n` again to page back to the beginning of the display, or enter a new command from those in brackets at the top of the screen.

[INTERVENTION]

When you enter **intervention** or **i** from the "control panel" display, the **[INTERVENTION] : text** item toggles from **Disable** to **Enable** or from **Enable** to **Disable**. When you enable intervention mode you may choose tests that require special loopback connectors. If the mode is not enabled and you try to enable a test that requires it, a message at the bottom of the screen will tell you to enable intervention mode.

[TESTS]

When you enter

tests default

or

c d

a -> symbol appears before each default test, meaning that those tests will run when you enter **start**.

If you enter

tests none

or

tests n

no tests are enabled, and all the -> symbols disappear from the test names.

If you enter

tests all

or

tests: a

and **[INTERVENTION]** is disabled, all tests that do not require user intervention are enabled; an arrow appears before each. If intervention mode was enabled before you entered **all**, all tests displayed are enabled.

3.3. To Enable/Disable Individual Tests

If you do not want to run the pre-selected default tests, or all the tests, you may enable or disable any of the tests listed, simply by entering the test name as shown in parentheses. For example, if there is no -> symbol in front of the display:

(mem) Physical [OPTION]

You may enter **mem** to enable the Physical Memory test. An arrow will immediately appear before the test name. Entering **mem** again disables the test and removes the arrow. Tests that do not have an arrow in front of the test name will not run when you enter **start**. As mentioned earlier in this text, you can also enter a test's name to stop an individual test in progress, or start a new test.

3.4. The Options Menu

Entering **options** from the main display brings up a display that looks something like this:

Figure 3-2 *System Option Display*

```

-----
Sundiag 2.0 CPU:SPARCstation 1          System status: idle
-----
                << System Option Menu >>

                [DEFAULT(f)] [DONE(d)] [HELP(h)]

                [COREFILE(o)]:  Disable
                [SINGLEPASS(s)]:  Disable
                [QUICKTEST(q)]:  Disable
                [VERBOSE(v)]:    Disable
                [TRACE(t)]:      Disable
                [AUTOSTART(a)]:   Disable
                [RUNERROR(r)]:   Disable
                [SENDMAIL(m)]:   Disable
                [MAXPASSES(x)]:   0
                [MAXERRORS(y)]:  1
                [CONCURRENT(c)]:  2
                [LOGPERIOD(l)]:   0
                [EADDRESS(e)]:   root
                [PRINTER(p)]:    lp

Command: options
Message:
-----

```

The commands shown on this display may be entered either as complete words, or with the characters displayed in parentheses after each command word.

These commands correspond to the **Options** button menu choices described in the SunView “Control Panel” section in Chapter 2. For descriptions of the system options, please read that section.

When you enter **default** or **f**, the pre-selected, default system options are enabled. The display should show **enabled** after each default option.

To exit from this display, enter **done** or simply **d**.

The corefile (o), single pass (s), quick test (q), verbose (v), auto start (a) and run on error (r) options toggle from **disable** to **enable** when you enter the command. For example, if the display shows

```
[COREFILE]  disable
```

and you enter **corefile** or **o**, the option of having a core dump saved in a file is enabled, and the display changes to **Enable**. When you enter the command again, the display changes back to **Disable**, and the tests will attempt to capture the signals that cause core dumps. You will receive informative messages instead of a **core** file.

In order to change the maximum number of errors Sundiag will allow before stopping tests, you must enter

```
maxerrors some_number
```

or simply

```
m some_number
```

When you press **(Return)** the number you have entered will appear after [MAXERRORS] :.

In order to specify the maximum number of tests you want Sundiag to execute concurrently, you must enter

```
concurrent some_number
```

or

```
c some_number
```

In order to specify where you want your screendumps printed when you enter the **Print** command in Sundiag's SunView mode, you must enter the printer name, as it appears in your `/etc/printcap` file. For example:

```
printer lp1
```

You may also simply enter

```
p printer_name
```


3.6. The Option Files Menu

When you enter **optfiles** or **f** from the “control panel” display, this sort of menu is offered:

Figure 3-4 *Option Files Menu*

```

-----
Sundiag 2.0 CPU:SPARCstation 1 System status: idle
-----
                << Option File Menu >>

      [DONE(d)] [HELP(h)]
      [LOAD(l)] [STORE(s)] [REMOVE(r)] [NEXT(n)]
      [NAME(m)]:

Available option files:
<none>

-----
Command: optfiles
Message:
-----

```

This menu provides the opportunity to load and store the global system options and the individual test options you have selected. The default option file is `.sundiag`. You may create option files with different names, and use the `-o` option when you invoke Sundiag, in order to use the options specified in the named file. Any command you enter will apply to the file named after

[NAME] :

In other words, if you want the presently selected options to be stored in the `.sundiag` file, listed after [NAME] :, enter `store` or `s`. If you want to remove the `.sundiag` file, enter `remove` or `r`. If you want to use the options stored in the named file the next time you run Sundiag tests, enter `load` or `l`.

If you want to create a new option file, simply enter

name *newfilename*

and the name you enter will be echoed after [NAME] :. To save the new file, enter `store`.

The option files named in this display are stored in the `/var/adm/sundiaglog/options` directory. If there are more files than the screen is able to display at one time, enter `next` or `n` to page forward. When you want to return to the previous display, enter `done` or `d`.

3.7. The Log Files Menu

When you enter `logfiles` or `l` from the “control panel” display, a menu such as this comes up:

Figure 3-5 *Log File Menu*

```

-----
Sundiag 2.0 CPU:SPARCstation 1                System status: idle
-----
                << Log File Menu >>
                [DONE(d)] [HELP(h)]
                [DISPLAY(l)] [REMOVE(r)] [PRINT(p)]
                [NAME(m)]: ERROR [INFO(i)/UNIX(u)]
-----
Command: [l]ogfiles
Message:
-----

```

When you type in **error**, **info**, or **unix** after typing **name**, you have selected the type of file you wish to view and possibly edit. When you enter **error** and then **display**, for example, the `/var/adm/sundiaglog/sundiag.err` file is displayed in the `vi` editor format. You may use `vi` commands such as `(Control-f)` or `(Control-b)` to page forward and backward through the file. In order to return to the Log File Menu, you must use the command:

```
:q
```

If you have edited the file, and you want to save the changes, enter

```
:wq or ZZ
```


The character in brackets next to the sub-test or option may be entered to toggle the option or subtest from `Enable` to `Disable`. Entering the character again toggles the option or sub-test back from `Disable` to `Enable`.

Here is a sample option menu:

Figure 3-8 *TTY Test Options Menu*

```
-----  
Sundiag 2.0 CPU:SPARCstation 1          System status: idle  
-----  
      << Test Options - Physical Memory >>  
      [DEFAULT(f)] [DONE(d)] [HELP(h)]  
  
      Configurations:  
      Amount: 8 MB  
  
      Sub-tests: None  
  
      Options:  None  
  
-----  
Command: mem o  
Message:
```

Using Sundiag with Online Commands

This chapter describes the interface available when you want to execute Sundiag tests from the SunOS command prompt. It is not necessary to invoke any form of Sundiag. The only prerequisite to using Sundiag with the online commands is changing into the sundiag directory, although some of the tests can be run from anywhere if the Sundiag directory is in the command path.

4.1. Standard Online Command Options

Every Sundiag test is able to handle eight standard command arguments. The common line usage is: **testname** *test_specific command arguments, standard command arguments*

Refer to Chapter 5 "Test Descriptions" for arguments.*test_specificcommand*

The standard command arguments are:

| | |
|------------|------------------|
| s | Sundiag mode |
| c | enable core dump |
| p | single pass only |
| r | run on error |
| q | quick test |
| u | list usage |
| v | verbose mode |
| d | debug mode |
| t | trace mode |
| h hostname | RPC hostname |

Sundiag mode s is used when the test was executed from Sundiag, all the Sundiag messages will go through RPC services. For running tests in this mode, you can't specify 's'.

enable core dump c allows a core dump file to be created when/if a system crash happens.

single pass only p skips test loops (if any) in the tests.

run on error r continues the next test sequence instead of exiting in case of error.

quick test q makes the test run as fast as possible. Only the critical part of the test is performed.

list usage u shows you how to run the test. It displays three parts: command line usage, standard arguments and routine specific arguments.

list usage u shows you how to run the test. It displays three parts: command line usage, standard arguments and routine specific arguments.

verbose mode v displays verbose messages regarding the test. These messages tell you exactly what is happening while the testing process is going on.

debug mode d displays debug messages from the test. These messages provide more sophisticated information (mainly for test programmers).

trace mode t displays messages which allow you to trace down function calls and the sequences being used by the test code.

hostname h This is used together with the Sundiag mode when you are remotely set up to test the system you name while using the Sunview interface on your own system. This option should never be specified from the online command mode.

4.2. Tests Supported by the Online Command Interface

The following table shows the tests supported by the Online Command Interface. For further information regarding these tests, refer to the "Test Descriptions" of Chapter 5.

Table 4-1 *Online Command Tests and ID Numbers*

| | | | |
|------------|----|----------|----|
| sundiag | 0 | probe | 1 |
| autest | 2 | c24 | 3 |
| cdtest | 4 | cg5test | 5 |
| cg6test | 6 | color | 7 |
| dcptest | 8 | fstest | 9 |
| rawtest | 10 | fpatest | 11 |
| fptest | 12 | mc68881 | 13 |
| gpptest | 14 | gp2test | 15 |
| ipctest | 16 | mono | 17 |
| nettest | 18 | newtest | 19 |
| printer | 20 | pmem | 21 |
| pptest | 22 | sptest | 23 |
| sunbuttons | 24 | sundials | 25 |
| sunlink | 26 | taactest | 27 |
| tapetest | 28 | tvlttest | 29 |
| vmem | 30 | | |

Test Descriptions

This chapter of the manual will expand as new tests are added. Here is a brief description of the function of the present Sundiag tests, organized similarly to the Control Panel options.

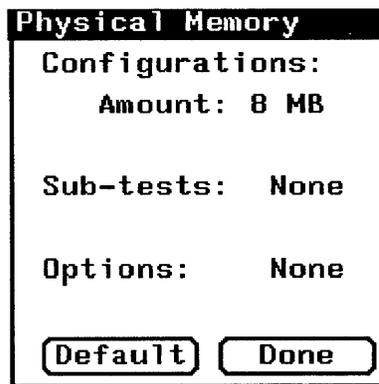
5.1. Memory Options

These tests are shown on the control panel under MEMORY DEVICES.

Physical (*pmem*)

This test locates parity errors, hard and soft ECC errors, memory read errors, and addressing problems. Through the memory device, it maps, then reads a page repeatedly throughout memory. If you click on the **Option** button for **Physical (mem)**, this menu comes up:

Figure 5-1 *Physical Memory Option Menu*



Online command arguments : none.

Virtual (*vmem*)

This test checks virtual memory, that is, the combination of physical memory and the swap partition(s) of the disk(s), by allocating, writing and then reading as much virtual memory as feasible. It uses the SunOS `valloc` (page aligned) system call. This test also detects parity errors, memory read errors, addressing problems and displays the corresponding virtual and physical memory addresses on failure. Because this test puts a significant burden on the operating system while it is running, there is a configurable “wait time” option, so that you may control the time interval between `vmem` sessions.

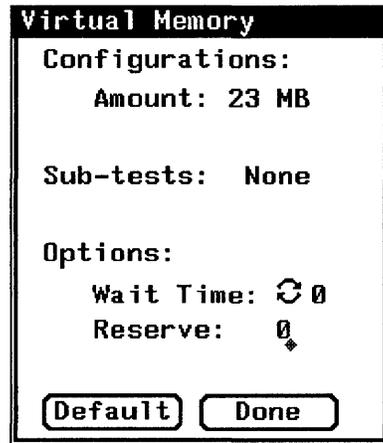
You may cycle

Wait Time: ↻ 0

from zero to 30, 60 or 90 seconds.

The **Reserve:** option lets you specify the amount of memory you want to reserve from being tested. You use this option if you need extra memory to use another application while running Sundiag on your system. Click on the number to the right of the **Reserve** option, backspace and enter the data. The program normally reserves 2.5MB by default. The **Reserve** option can be used to reserve memory in addition to the default. Here is an example of the Virtual Memory Option menu:

Figure 5-2 *Virtual Memory Option Menu*



Online command arguments: vmem U, M, m, r, page, cerrs, nerrs, any standard arguments.

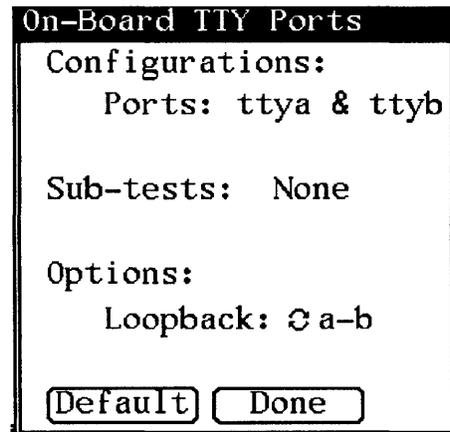
vmem specific arguments (defaults):

U is the test description. **M** is a pattern modifier. **m** is the number of Mbytes of memory to reserve for OS instead of default. **R** is the number of Mbytes of memory to reserve in addition to the default. **page** tells the write/read memory to proceed one page at a time. **Cerr**s tells the test to simulate a number of contiguous errors. **Nerr**s tells the test to simulate a number of noncontiguous errors.

5.2. CPU Options

Tests such as *dcp*, *Ethernet*, *devtest*, *fptest*, and *MC68881* show up on the control panel under CPU DEVICES. Before you click on the **Options** button opposite **Serial Ports (zs0)**, you must enable **Intervention Mode**. The option menu for the CPU board serial ports looks something like this:

Figure 5-3



The loopback choices refer to serial port testing. You must use loopback connectors (described in Appendix A) to connect the CPU board ports you choose. The default is to link ports A and B with a loopback cable, as indicated by a-b.

If you choose **a** only or **b** only, Sundiag tests just that port, and expects a loopback connector on that port.

If you choose **a b**, Sundiag tests ports A and B separately, and expects a loopback connector on each port.

dcptest

This test checks the functionality of the Data Ciphering Processor when it is present on the CPU board. There are no test options associated with this device.

The DCP test uses DES (Data Encryption Standard) hardware (AM9568) to implement the NBS Data Encryption Standard. It encrypts in Electronic Code Book (ECB) mode, which encrypts blocks of data independently. It also uses Cipher Block Chaining (CBC) mode, which chains together successive blocks and protects against insertions, deletions and substitutions of blocks, as well as regularities in the cipher text.

The test checks both CBC and ECB modes, with high bit and low bit parity for the encryption key, with two sets of data: a table with zero to all bits turned on, as well as some standard ASCII data. *dcp* also checks the encryption of the maximum number of bytes in one call, and the “quick” mode.

Online command arguments : none.

pptest

This test checks the parallel port interface for the Sun-3/80.

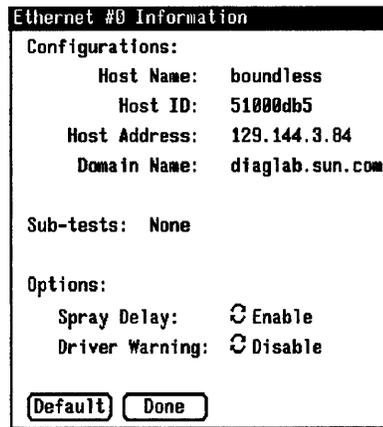
Online command arguments : none.

nettest

This test checks the functionality of the Ethernet hardware on the system CPU board, as well as the functionality of separate Ethernet boards. The Sun workstation under test must be attached to an Ethernet with at least one other system on the network for this test to be meaningful. This test appears as **Ethernet** on the control panel, under **CPU DEVICES**. Clicking the

Options button for **Ethernet** brings up the following menu:

Figure 5-4 *Nettest Option Menu*



Online command arguments: **nettest net, allnets, D, W, any standard arguments**.

nettest specific arguments (defaults):

net is the net interface board to test. **allnets** means all available net interface boards. **D** is a time delay for the spray test. The default is 0. **W** is a flag to allow printing of warning messages.

If the **SprayDelay** cycle panel item option is enabled, a delay is set between sending each packet. A delay increases heavy activity on the net. The default value for the **SprayDelay** option is enabled. To avoid cluttering the console window, warning messages are printed on the console only if the **DriverWarning** cycle panel item option is enabled. The default for this option is disabled.

Initially, the Ethernet internal driver error counts are checked. After running the **broadcastnets** test, the **spray** test, the **UDP** (Internet User Datagram Protocol) **transmit** test, and the **fdi** (Fiber Distributed Data Interface) test, if applicable, the internal driver error counts are checked again for any differences.

the *nettest* **broadcastnets** test uses a raw socket with the **ICMP** protocol (Interface Control Message Protocol), specifically with **ICMP_ECHO** and **ICMP_ECHOREPLY** message types. This test sends out an **ICMP_ECHO** message on a valid network interface and expects to hear a reply from some other host besides itself (localhost loopback). Due to the low-level of **ICMP** protocol, only one Ethernet test can execute on a system at one time.

The test assumes a broadcast network, as opposed to a point-to-point network. It obtains the network interface configuration, retrieves the interface flags to see if the network is "up" or "down," and obtains the broadcast address. The test ignores the **me0** network if it exists for one or more **IPC** boards.

The spray and UDP tests stress test the standard transmit and receive paths. Using RPC, `nettest_spray` sends a one-way stream of packets to the first valid host that replies from the broadcast test (an ICMP_ECHO message on a valid network interface.) In the UDP test, no connection to the remote host/port is made. UDP datagrams are sent directly.

`nettest` waits for replies for a given period of time, counts the replies and checks to make sure they have the same data as that sent. If no replies come from hosts other than the test host, an error condition is recorded.

fputest

This test checks the floating point unit on Sun SPARC systems. It performs the following:

- FSR Register Test
- Registers Test
- NACK Test
- Move Registers Test
- Positive to Negative Test
- Negative to Positive Test
- Absolute Test
- Single Precision Integer to Floating Point Test
- Double Precision Integer to Floating Point Test
- Single Precision Floating Point to Integer Test
- Double Precision Floating Point to Integer Test
- Single Precision Round Toward Zero Test
- Double Precision Round Toward Zero Test
- Single to Double Precision Format Conversion Test
- Double to Single Precision Format Conversion Test
- Single and Double Precision Addition, Subtraction, Multiplication, Division and Compare Tests
- Single and Double Precision Compare and Exception if Unordered Tests
- Branching and no Branching on Condition Instructions Tests
- Single and Double Precision Chaining Tests
- Weitek Status Tests
- Lock Test
- Single and Double Precision Datapath Tests
- Timing (load) Test
- Linpack Test

Online command arguments : none.

Floating Point

This test checks the floating point coprocessor (on Sun-3 systems only). It is listed on the control panel as **68881(2) Floating Point**. The test verifies that the device exists, checks the EEPROM, then performs a short series of single and double precision calculations, checking the answer after each computation. There are no test options associated with this device.

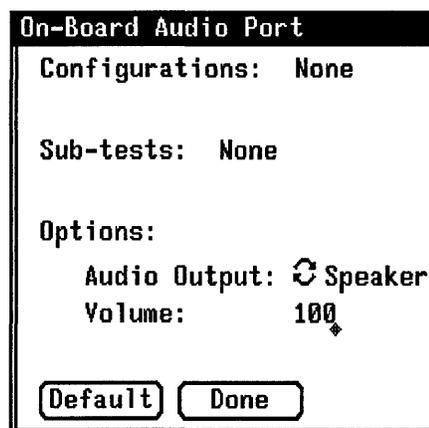
Online command arguments : none.

Audio (*autest*)

This test checks the MAP registers in the audio chip. You can set volume and output to specified options and play whatever is in the `audiotest.data` file. You set the volume by entering 0 to 255 in the volume field. You toggle the Audio between "Speaker" and "Other". The default sends the audio output to the built-in speaker.

Here is an example of the Audiotest Option Menu:

Figure 5-5 *Audiotest Option Menu*



Online command arguments : **autest** **V**, **O**, any standard arguments.

autest specific arguments (defaults):

V specifies the audio volume. The range is 0 through 255. **O** specifies the audio output (speaker/jack).

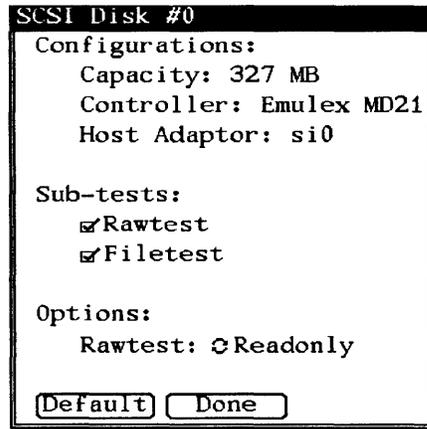
5.3. Disk Options

rawtest

This test performs read-only and read-write tests on local disks, using generic SunOS routines. **DISK DEVICES**.

This test supports all types of Sun disk drives, such as SCSI disks, native or SCSI floppy, Xylogics 7053, and so on. The type of drive under test is named at the top of the option menu. For example, when an Intelligent Peripheral Interface is installed on the system under test, the Disk Option Menu header will name the IPI or the ID. If you click on a control panel disk **Option** button, this sort of menu comes up:

Figure 5-6 Disk Option Menu Example



Online command arguments: **rawtest**, **D**, any standard arguments.

rawtest specific arguments (defaults):

D specifies the device name.

You may choose read-only testing, read-write testing, or both. If you choose read-only testing, *rawtest* is executed in read-only mode. If you choose read-write testing, *rawtest* test is executed in read-write mode.

The read-write disk *rawtest* may zap the disk data during a power failure.

fstest

This test exercises the disk controller and drive. It writes two .5 MB files with random data in `/tmp`, then reads and compares them. If the system has no `/tmp` directory, *Sundiag* creates a `/tmp-disktop-sd` directory to fill with random data, and removes it when you exit. *Sundiag* selects the drive by issuing the SunOS command `df` and uses each local drive listed. A new feature auto-mounts any disk with a file system on it; therefore the disks to be tested must contain valid file systems.

Online command arguments: **fstest D, p (s, 0, 1, a, 5, r)**, any standard arguments.

fstest specific arguments (defaults):

D is the device name. **p(s,0,1,a,5,r)** is the data pattern with the following arguments: **s** sequential, **0** all zeros, **1** all ones, **a** all a's, **5** all fives and **r** random.

cdtest

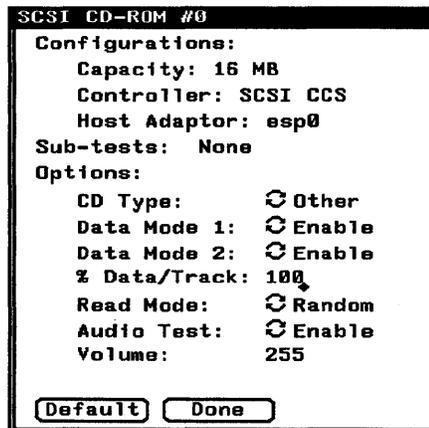
This test checks the CD table of contents and, when the proper CD is specified, will verify the table of contents matches its own TOC table. The test will also, for each track, determine if it is a data mode 1, data mode 2 or audio track.

You toggle through the options in the CD type field. The default is "0." The

"Data Mode 1" and Data Mode 2" fields allow you to enable or disable the test for either track. For percentage of data or track, enter a value from 0 through 100. Read Mode lets you select "Random" or "Sequential." You can enable the audio test by toggling "Enable" in the Audio Test field. The volume is adjusted by entering a value from 0 through 255 in the "Volume" field.

Here is an example of the `cdtest` menu:

Figure 5-7 *CDtest Option Menu*



Online command arguments: `cdtest D, S, R, P, V, T`, any standard arguments.

cdtest specific arguments (defaults):

D is the name of the raw device. **S** tells the test to skip tracks (data1, data2 or audio). **R** specifies the read access (random or sequential). **P** is the percentage of data to be tested. You can specify 0 through 100. **V** is the audio volume control. You can specify 0 through 255. The default is 255. **T** is the type of CD used for the test (sony2, hitachi4, cdassist, pdo, other).

5.4. Tape Tests

tapetest

Use a standard scratch tape for this test.

The *tapetest* rewinds the tape, erases it, writes a pattern to a specified number of blocks (or, for a SCSI tape, writes to the end of the tape). It then rewinds the tape and reads/compars the information just written. The test expects a device name and number of sectors as input parameters, and first writes to the device from a 126x512 byte buffer, then from a 512-byte buffer for any "left-overs".

NOTE *If you have a tape drive in your system, load a blank tape before you start Sundiag. If you fail to do so, Sundiag will show*

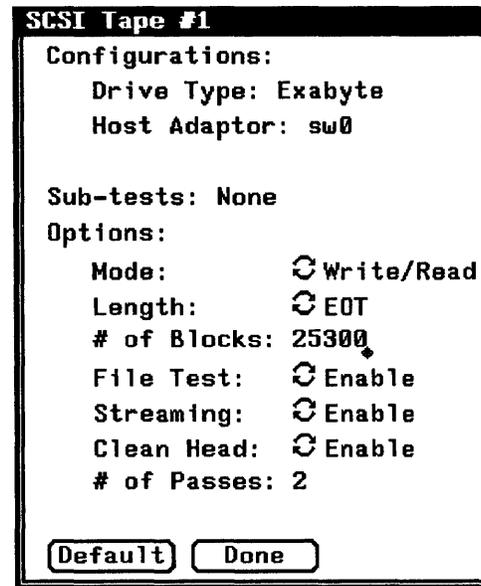
```
drive type:unknown
```

on the option menu for the tape test.

Sundiag now supports exabyte and front-load tape drive testing. The option pop-ups for those drives are shown in the examples below.

When you click on the tape test **Option** button, this sort menu is presented:

Figure 5-8 *SCSI Tape Option Menu (Exabyte)*



Online command arguments: `tapetest /dev/, b, sq, nr, ro, ns, ft, rc, any standard arguments.`

tapetest specific arguments (defaults):

`/dev/` is the name of tape device (required). `b` is the block count. You specify the number of blocks to be tested. `sq` tells the test to switch the tape format. `nr` specifies no retention. `ro` specifies a read only test. `ns` tells the test no tape sleep. `ft` enables a file test and `rc` enables a reconnect test.

The example above depicts the option menu for an exabyte tape drive. This menu differs from other tape drive option menus in that it has no format or reconnect option choices.

If the drive is a half inch front-load tape drive, this sort of option menu would appear:

Figure 5-9 *SCSI Tape Option Menu (half inch front-load)*

```

SCSI Tape #1
Configurations:
  Drive Type: HP-88780
  Host Adaptor: sw0

Sub-tests: None
Options:
  Density:       6250-BPI
  Mode:         Write/Read
  Length:       EOT
  # of Blocks: 25300
  File Test:    Enable
  Streaming:    Disable
  Clean Head:   Enable
  # of Passes: 5

```

The regular quarter-inch tape drive menu looks like this:

Figure 5-10 *Quarter Inch Tape Option Menu*

```

SCSI Tape #8
Configurations:
  Drive Type: Emulex MT-02
  Host Adaptor: sw0

Sub-tests: None
Options:
  Format:       QIC-11
  Mode:        Write/Read
  Length:      EOT
  # of Blocks: 25300
  File Test:   Enable
  Streaming:   Disable
  Reconnect:   Disable
  Retension:   Enable
  Clean Head:  Enable
  # of Passes: 5

```

Format :

QIC-11 and QIC-24 are tape formats that this test uses when it writes to the scratch tape you have inserted. QIC-11 uses a 1-byte block ID, while QIC-

24 uses 4 bytes, meaning that each block on a QIC-24 tape is uniquely identifiable.

Density:

This option is available for half inch tapes. It toggles among 800, 1600 and 6250 BPI's.

Use a standard scratch tape for this test.

QIC-11 format is the default testing format. If you cycle through the options, you may choose QIC-24 only, or both of QIC-11 and QIC-24 formats. If you choose both, the test will first write one pass to the tape in QIC-11 format, and then write a second pass over it in QIC-24 format.

Mode:

If you toggle to `Write/Read`, the test first writes the to tape and then reads it back to compare.

If you toggle to `Readonly`, the test assumes the tape has been properly written and merely reads and compares, which is useful to check head alignment.

Length:

If you choose the `Long` testing length, the SCSI tape tests 70,000 blocks of the tape. If you choose `Short`, only the first 1000 blocks are tested. If you choose `EOT`, the entire tape length is tested.

of Block:

If you selected "specified" under the `Length` option, you must enter the number of blocks you wish to test.

File Test:

The *tape file* test writes three files, rewinds and then reads part of the first file and forward spaces to the start of the second file, reads the second file, forward spaces to the start of the third file, and tries to read to the end of that file. For SCSI tapes only, the test then tries to back space to the start of the second file and read it.

Streaming:

When streaming is enabled, the test performs the `Write/Read` at top speed to "stream" to tape.

Reconnect:

When you enable **Reconnect**: from the option menu, Sundiag attempts to check whether or not disconnect/reconnect is working, on a Sun-3/50 or on a system with a SCSI3 board and both SCSI disk and tape devices. The test forks a child process to test the SCSI disk, which sets up a signal handler to catch a signal from the parent process. It then sleeps for three seconds, reads in two blocks from the disk, sleeps again, and expects to have received a signal from the parent process in the interim. The parent process retensions the tape and then notifies the child.

Clean Head:

If you want to enable head cleaning, cycle the arrows to **Enable**.

of Pass:

If you have enabled the head cleaning option, you must enter the number of test passes Sundiag should execute before suspending testing to provide time to clean the tape drive head.

5.5. Other Options

Other boards, when installed in the system, will be listed on the control panel under the board name. The option buttons will vary. The following paragraphs provide a few examples of the tests for optional boards.

color

This test checks the CG2 and CG4 frame buffer and color map on the system's color board (if it is installed). The test sets up the window system so that the background windows remain intact, then sets up the color map so all color permutations are displayed. It writes a pixrect of a certain color and dimension to the screen and verifies that the locations in the frame buffer are the same read as written. The test then zooms forward and backward through the color map, twenty colors at a time, checking after each change to the color map, and finally restoring the input characteristics and the screen.

Online command arguments : **color D**, any standard arguments.

color specific arguments (defaults):

D specifies the name of the color device (required).

NOTE *In order to exit prematurely from the color test, enter **Control-C** on the keyboard. The test that is running will be killed, and the Sundiag screen will be re-displayed. To disable the entire test sequence, click on the box in front of the color test.*

c24

The *c24* test checks the CG8 24-bit, P4-bus frame buffer. To verify that the CG8 board is working properly, the test executes several pixrect calls on the frame buffer and compares the result against a memory pixrect. CG8 roping, vector drawing, puts and gets, look up table writing and reading, regions, and memory testing are all tested. There is no option menu for this test.

Online command arguments : none.

fpatest

This test checks the floating point accelerator board (on Sun-3 systems only). It performs the following tests:

- Immediate Errors Register Test
- Inexact Error Mask Register Test
- Load Pointer Register Test
- Mapping RAM Test
- Microstore RAM Test
- Upper and lower halves of Register RAM tests
- Simple Instruction Test
- Test for Shadow RAM present context

- Pointer Test
- Pointer Increment and Decrement Test
- Lock Test
- NACK Test
- F+ Test
- Micro-store Register Test
- Wstatus Register Test
- Weitek Data Path Test
- Weitek Operation Test
- Weitek Status Test
- Jump Conditions Test
- Timing (load) Test
- Linpack Test

Online command arguments : **fpatest menu**, **np**, any standard arguments.

fpatest specific arguments (defaults):

menu specifies the menu mode for the test. **np** specifies the number of passes.

gpmtest

This test checks the GP1 (gpone0a) board, with or without a graphics buffer board, if they are installed.

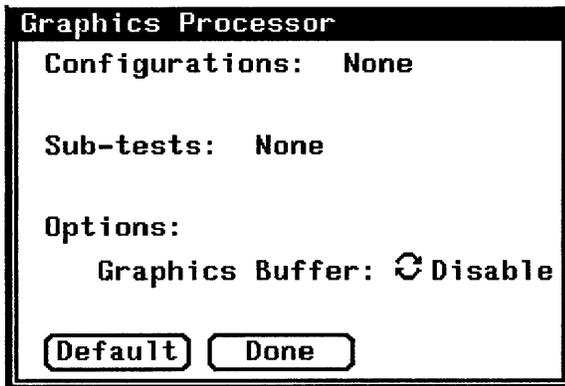
NOTE This test can be executed **ONLY** when `gpconfig` **HAS NOT** been initialized from the `rc.local` file, due to limitations with the test's microcode.

*If the test is to be restarted after a reboot, remove the *gp* device in /dev. After the reboot, recreate the device.*

The test first opens the `/dev/vme24` device, allocates some space, maps in the graphics processor, and initializes it. It then runs a series of tests for each part of the Graphics Processor and Graphics Buffer. It tests the Viewing Processor first, followed by the Painting Processor and the Graphics Buffer.

The graphics option menu looks something like this:

Figure 5-11 Graphics Option Menu



Online command arguments : none.

gp2test

NOTE This test can be executed **ONLY** when `gpconfig` HAS been initialized from the `rc.local` file.

The test first opens the `/dev/vme24d32` device, allocates some space, maps in the graphics processor and tries to write to it, to verify that a Graphics Processor2 (GP2) is installed. The test then probes to determine if it is running on a single or double monitor system, and sets up the SunView desktop appropriately. `gp2test` is a series of tests for different parts of the GP2 board. It first utilizes diagnostics that are present in the board's microcode to test the hardware. Then it tests the GPCI matrix duplication commands, multiplying two matrices together, testing rotation around the X, Y and Z axis, multiplying the depth, and finally checking all results. It then tests the GPCI commands `GP1_MUL_POINT_FLT_3D` and `GP1_MUL_POINT_INT_3D`, transforming some 3D points in a matrix and checking the results. It tests the `GP1_PROC_LINE` command, instructing the GP2 to take some 3D coordinates and clip them to the view port, and then checks the result. Finally, `gp2test` calls the functions that display polygons on the screen.

Online command arguments : none.

taactest

The TAAC-1 is a high performance graphics accelerator card. Its applications range from mathematical modeling to image processing. The on-line diagnostic for the TAAC-1 attempts to test all the functional blocks. These include the floating point circuitry, video RAMDAC, RAM, and so on. The TAAC diagnostic under Sundiag automatically tests the various functional blocks and logs the errors accordingly. It does not test the video analog circuitry, which requires visual verification. There is no option menu for this test.

Online command arguments : none.

Unbundled Product Tests

ipctest

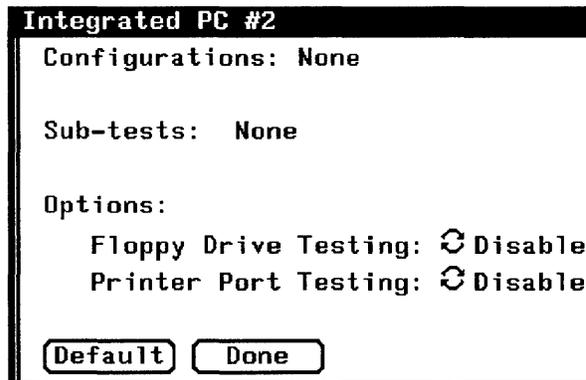
This test checks the SunIPC floppy drives, printer ports, and the general functionality of the SunIPC coprocessor board(s) (Sun-3 only: pc0, pc1, pc2, pc3). It attempts to start `pctool` for the specified SunIPC device.

The printer portion of the test requires installation of loopback connectors.

If you're testing more than one IPC board, you need to copy the `pc.bat` file that was released with the Sundiag 1.3.1 to your `/usr/pctool/sysex` directory. You may occasionally get a "parsing argument" error message when simultaneously testing more than one IPC board if you use the `pc.bat` file in release 1.2.1.

Clicking on the IPCBOARDS **Option** button brings up this menu:

Figure 5-12 SunIPC Option Menu



Online command arguments : `ipctest #, D, P`, any standard arguments.

ipctest specific arguments (defaults):

`#` is the number of IPC boards to be tested. `D` enables floppy drive testing. `P` enables printer port testing.

CAUTION Under Floppy Drive Testing, only Drive “B” is tested. Do not insert a diskette in Drive “A”; doing so causes this test to fail.

sundials

This test checks SunDials (an input device consisting of 8 knobs)
sundials verifies the connection between the dialbox and serial port.

NOTE The presence of SunDials hardware is not detected during the device probe upon Sundiag startup; therefore *sundials* does not automatically appear on the control or status panels, even though the test is included in the sundiag directory.

Refer to the “Adding Your Own Tests” section and create a `usertest` file for *sundials* before you attempt to execute the test. Here is an example of a `.usertest` entry for *sundials*:

Sundials, sundials, sd

sundials also has an interactive mode that places eight knobs in a Sun-View window to track the movement of the individual knobs. The interactive mode is executed with the following command

```
% sundials diag
```

Online command arguments : none.

This test will not pass unless you install the correct loopback connectors or port to port cables on the ports you are testing. Connect the ports you specify from the option menu.

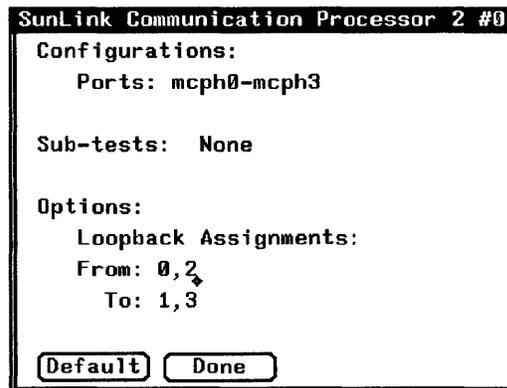
sunlink

For more information on installing the HSI board, installing loopback connectors, and connecting V.35 devices, refer to *Installation, User Diagnostics, and Servicing for the SunLink High-speed Serial Interface Board* and *Configuration Procedures for the SunLink High-speed Serial Interface Board*.

This test checks the SCP and SCP2 board(s) (dcp0, dcp1, dcp2, dcp3), the SunLink MCP board(s) (mcp0, mcp1, mcp2, mcp3), and the High Speed Serial Interface (hs0, hs1). It tests the SDLC protocol on these boards. To do this, the test down-loads the DCP microcode, initializes the selected channel and then configures the selected channel to the SDLC protocol. Next, the test opens a datagram socket and tries to change the socket so that it will receive sync mode information from it. It then opens the ports, transmits a buffer of special data, receives the data back and checks it, and finally, gathers statistics from the socket.

When you click on the SCP option button, this sort of menu pops up:

Figure 5-13 *SunLink Communication Processor 2 Option Menu*



Online command arguments : **sunlink device, p(c,i,d,r), i, k, st, any standard arguments.**

sunlink specific arguments (defaults):

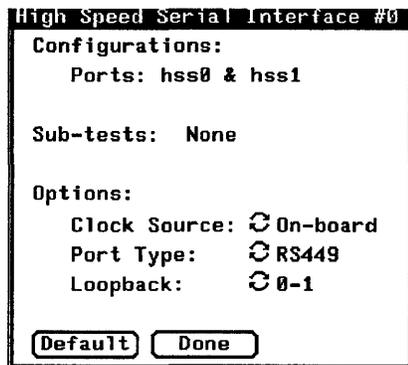
device specifies the sunlink port to be tested. **p** sets the data pattern. You can choose from the following: **pc** specifies character (0x55), **pi** is incrementing, **pd** is decrementing and **pr** is random. **i** tells the test to run an internal loopback. **k** specifies load dcp kernal and **st** tells the test to display sunlink status only.

When selecting the SCP2 loopback assignments, the “To” port number is connected to the “From” port shown directly above it. For example, in the option menu shown above, ports 0 and 1 are looped, and ports 2 and 3 are looped. If port 3 were not specified, ports 0 and 1 would be linked and port 2 would be looped to itself:

From: 0, 2
To: 1

When you click on the **Options** button for the HSI board, this sort of pop-up menu is displayed:

Figure 5-14 *High Speed Serial Interface Option Menu*



Refer to the High Speed Serial Interface hardware manuals for information on loopback connectors.

Multiple Terminal Interface Tests

printer

The printer test checks the printer ports on the MCP(ALM2) board(s) (mcpp0, mcpp1, mcpp2, mcpp3). For each port, the test opens the /dev/mcpp[0-3] device, puts it in raw and self-test loopback modes, asserts all ones on the data lines, and looks for the PE status signal. It then walks a zero through the odd data lines (Bits 1,3,5 and 7), and checks the PE status for each. Finally it re-asserts all ones again, and walks a zero through the even data lines (bits 2,4,6,8).

Online command arguments : **printer (p0, p1, p2, p3)**, any standard arguments.

printer specific arguments (defaults):

(p0,p1,p2,p3) specifies the printer port to be tested. The default is p0.

sptest

This test checks the system's on-board serial ports (zs0, zs1), as well as any Multi-Terminal Interface (MTI/ALM1) boards (mti0, mti1, mti2, mti3), or MCP(ALM2) boards (mcp0, mcp1, mcp2, mcp3). It writes data to the source device and then reads it back from the receiver device, verifying the data after each byte sent.

Online command arguments : **sptest device**, any standard arguments.

sptest specific arguments (defaults):

device specifies which serial port(s) to test.

5.6. Adding Your Own Tests

If you have created a test to run under Sundiag, you must create the file `.usertest` in the `/usr/diag/sundiag` directory and place the following information in it:

device_name_label, testname, command-line arguments

Replace *device_name_label* with whatever “user-friendly” device name you want to be displayed on the control panel for your test. Sundiag will place the SunOS device name in parentheses next to the name you have chosen.

Replace *testname* with the actual name of the file that contains your test. It will be used as the test name on the status panel.

Replace *command-line arguments* with whatever command-line arguments you would like Sundiag to fork and use to execute your test.

Loopback Connectors and Utilities

Serial Port Loopback Connectors

The Serial Port Loopback connectors are designed to connect serial port A to serial port B of a Sun CPU board for testing purposes. The Transmit/Receive, RTS/CTS, and DTR/DCD signal lines are cross connected between the two ports.

The RS-232 Loopback cable is used to test the serial ports of assembled systems. This appendix contains pin designations for these connectors. To obtain a loopback connector kit, contact Sun Customer Support.

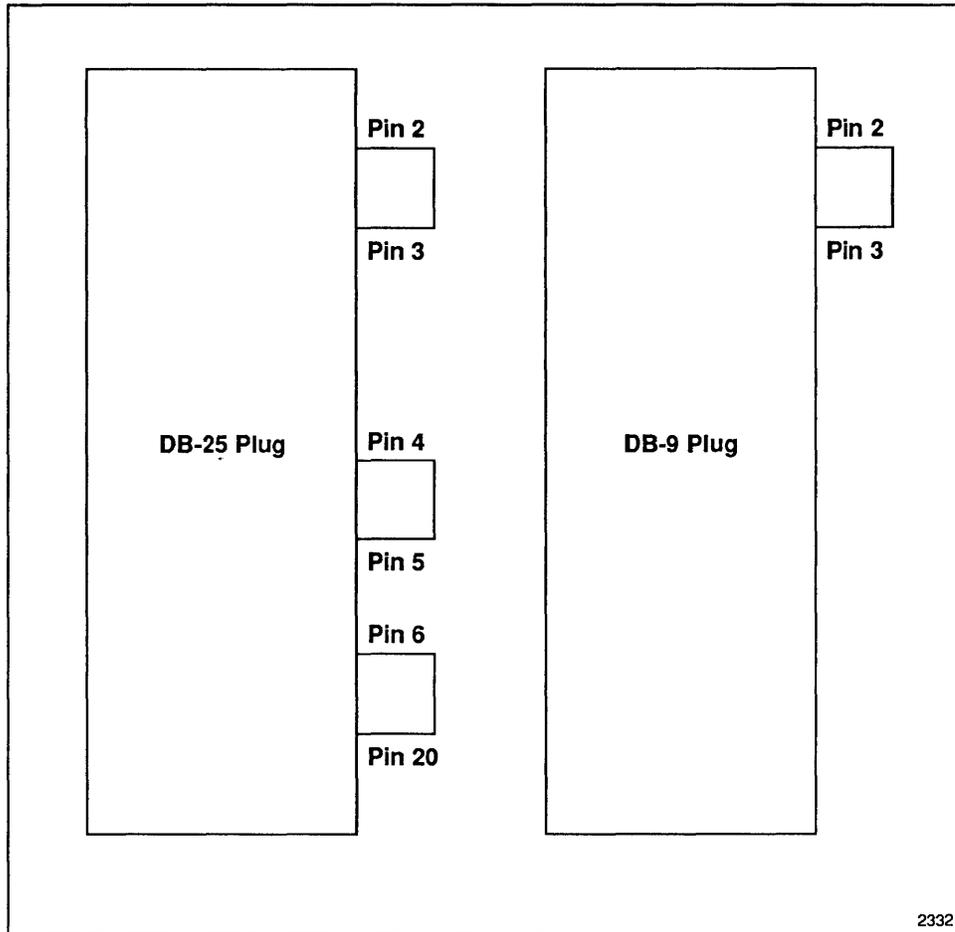
Serial Port Loopback Connector

The RS-232 Loopback Connector is a specially wired male DB-25 connector. It is plugged in to a serial port in the back of a system under test. It is wired as follows:

Connect pin2 to pin3
Connect pin4 to pin5
Connect pin6 to pin20

See the following figure:

Figure A-1 *Loopback Connector Plugs*



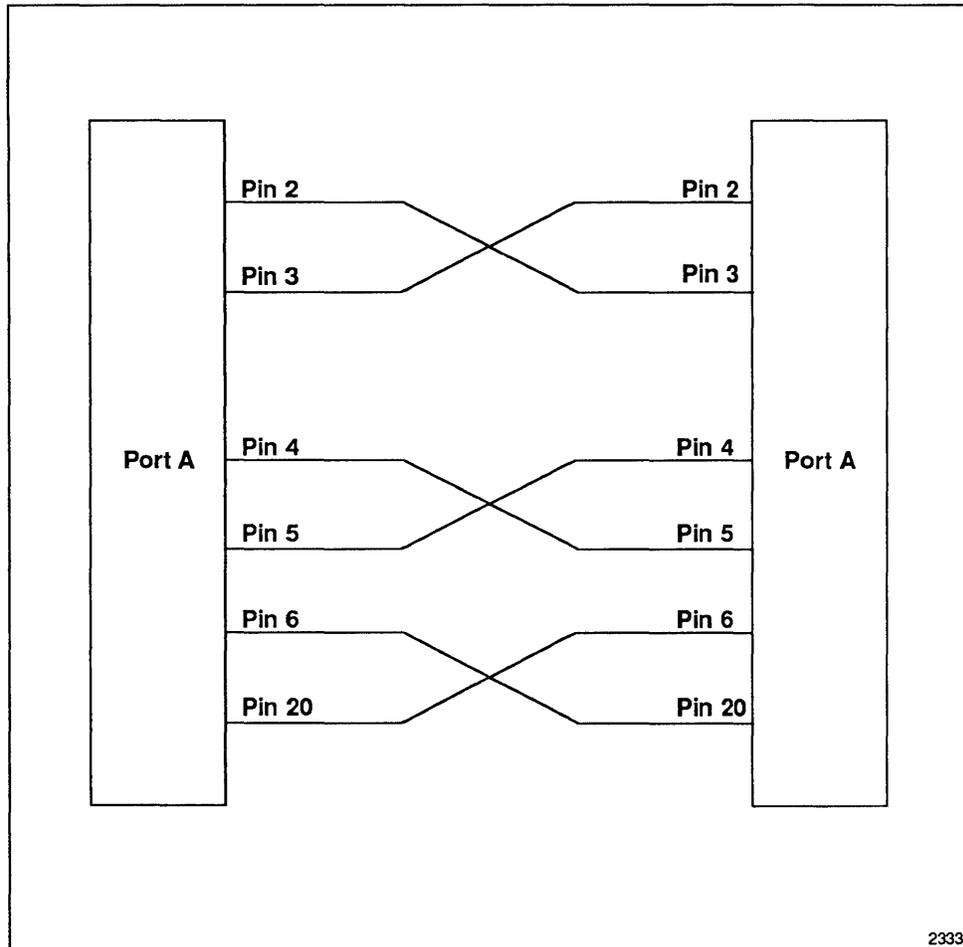
RS-232 Loopback Cable

The RS-232 Loopback Cable is a specially wired cable with two male DB-25 connectors at each end. It is plugged into a pair of serial ports in the back of the system under test. The cable is wired as follows:

- Connect pin2 to pin3
- Connect pin3 to pin2
- Connect pin4 to pin5
- Connect pin5 to pin4
- Connect pin6 to pin20
- Connect pin20 to pin6

See the following figure:

Figure A-2 *RS-232 Loopback Cable*



The DB-25 to DB-9 connector is wired as follows:

Connect pin2 to pin2
 Connect pin3 to pin3
 Connect pin7 to pin5

The DB-9 to DB-9 connector is wired as follows:

Connect pin2 to pin3
 Connect pin3 to pin2
 Connect pin4 to pin6
 Connect pin5 to pin5
 Connect pin7 to pin8
 Connect pin8 to pin7

The complete loopback diagram is:

| PIN | NAME | PIN | NAME |
|-----|------|-----|------|
| 1 | STB | 15 | ERRN |
| 14 | AFX | 13 | SLCT |
| 16 | ININ | 12 | PAPE |
| 17 | SLC | 10 | ACKN |
| 9 | D7 | 11 | BSYN |

NOTE Loopback connectors must be wired properly and connected firmly for the Serial Port Tests to work correctly. Miswired, poorly soldered, or missing loopback connectors can lead to erroneous diagnostic error messages when diagnostics are executed.

Utilities

what_rev

This utility provides version control facilities and is provided in the Sundiag directory with the release. Its purpose is to allow you to determine which files in your sundiag directory are different from those officially released.

When you enter the command `what_rev`, you receive a report of the differences between the officially released files and those files in your Sundiag directory.

The `-v` option gives you the version of Sundiag and the `-h` option provides you with a usage message.

Index

Special Characters

what_rev, 59
cdtest, 46

2

24-bit color test, 50

A

ALM testing — Sundiag, 56
autest, 44

B

buttons

- control panel, 9
- Logfiles**, 10
- Optfiles**, 14
- Options**, 12
- Print**, 10
- Quit**, 10
- Reset/Suspend/Resume**, 10
- Schedule**, 11
- shaded, 9
- Start/Stop**, 9
- test options, 19

C

CG8 Sundiag test, 50
check marks, 19
choosing

- test options, 19
- what to test, 19

color test — Sundiag, 50
connectors — test, 59
console window — Sundiag, 20
control panel, 9, 19
creating custom tests, 56
custom Sundiag tests, 56

D

Data Ciphering Processor test, 41
deleting log files, 11
diagnostics — *sundiag, 1 thru 63*
disk testing — Sundiag, 44
display

- error log, 10

dumping to the printer, 10

E

error messages, 10
Ethernet Sundiag test, 42
exiting Sundiag, 5, 10, 27

F

FDDI test, 42
files — Sundiag, 14
floppy testing — Sundiag, 53
fpatest, 50
FPC test, 43
fputest, 43

G

gp2test, 52
gpmtest, 51
graphics processor testing, 51

H

HSI testing, 54

I

ipctest, 53
IPI test, 44

K

kemel probe, 1

L

log files

- removing, 11, 35
- viewing, 10, 32

loopback connectors, 59

- cable, 60

M

MC68881 test, 43
MC68882 test, 43
MCP testing — Sundiag, 56
memory tests, 39

O

option buttons, 19
option files, 14, 26, 32

P

perfmeter, 20
pmem, 39
printing screen contents, 10

Q

quitting Sundiag, 5, 10, 27

R

remote Sundiag use, 2
removing log files, 11
resetting
 error count, 10, 27
 pass count, 10, 27
 test parameters, 10
resuming tests, 10, 27

S

SCP testing, 54
screen dumps, 10
selecting
 a Sundiag mode, 18
 test options, 19
serial port testing, 56
SF9010FPC test, 43
sptest, 56
starting
 Sundiag, 3
 Sundiag from a terminal, 21 *thru* 26
 Sundiag tests, 9, 26
status — Sundiag test, 20, 26, 31
stopping Sundiag tests, 9, 26
 .sundiag, 32
Sundiag
 control panel, 19
 creating tests, 56
 icon, 5
 Online Commands, 37
 options, 12
 overview, 1
 performance monitor, 20
 remote use, 2
 test descriptions, 39
 test status, 20
 tty interface, 21 *thru* 36
 window description, 7
sundiag.err, 11
sundiag.info, 11
SunDials, 53
suspending tests, 10
system exerciser, 1 *thru* 63

T

tape testing — Sundiag, 44
terminal
 configuration, 63
test results — Sundiag, 20
testing
 ALM/MCP, 56
 CG8, 50

testing, *continued*

 color board, 50
 DCP, 41
 disk and tape, 44
 Ethernet, 42
 FPA board, 50
 graphics processor boards, 51
 HSI, 54
 IPI, 44
 MC68881, 43
 MC68882, 43
 memory, 39
 SCP, 54
 serial ports, 40, 56
 SF9010FPC, 43
 SunDials, 53
 SunIPC, 53
 under Sundiag, 39 *thru* 57
tty interface
 enabling tests, 28
 global options, 29
 option files, 32
 OPTIONS command, 26
 quitting Sundiag, 27
 START command, 26
 stopping tests, 26
 test options, 35
 using Sundiag, 1, 21

U

utilities, 59, 63

V

/var/adm/messages, 10
/var/adm/sundiaglog, 2, 10, 14
/var/adm/sundiaglog/options, 32
viewing error logs, 10, 32

W

window description, 7

Notes

Notes

Notes

Systems for Open Computing™

Corporate Headquarters
Sun Microsystems, Inc.
2550 Garcia Avenue
Mountain View, CA 94043
415 960-1300
TLX 37-29639

**For U.S. Sales Office
locations call:**
800 821-4643
In CA: 800 821-4642

European Headquarters
Sun Microsystems Europe, Inc.
Bagshot Manor, Green Lane
Bagshot, Surrey GU19 5NL
England
0276 51440
TLX 859017

Australia: (02) 413 2666
Canada: 416 477-6745
France: (1) 40 94 80 00

Germany: (089) 95094-0
Hong Kong: 852 5-8651688
Italy: (39) 6056337
Japan: (03) 221-7021
Korea: 2-7802255
New Zealand: (04) 499 2344
Nordic Countries: +46 (0)8 7647810
PRC: 1-8315568
Singapore: 224 3388
Spain: (1) 2532003
Switzerland: (1) 8289555
The Netherlands: 033 501234

Taiwan: 2-7213257
UK: 0276 62111

**Europe, Middle East, and Africa,
call European Headquarters:**
0276 51440

**Elsewhere in the world,
call Corporate Headquarters:**
415 960-1300
Intercontinental Sales

