

FORTH Diagnostics



This appendix explains FORTH Diagnostic tests. The following topics and tests are described.

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You have access to a number of additional tests in the boot PROM called FORTH Diagnostics. To invoke these tests, you must enter the FORTH Monitor.



Caution – To run the FORTH Diagnostics, you must halt the system in an orderly manner. When the operating system or any other standalone program has already booted, do not press Stop-a to halt the system. Abruptly aborting program execution may cause damage to data files.

D.1 Running the FORTH Diagnostics

1. Save all your work and quit all applications.

Consult your software documentation for instructions on ending a work session and saving your files.

2. If you are using an X terminal, click on the Halt button in the Terminal Controls Panel, and go to Step 4.

3. Halt the operating system.

See the documentation supplied with your operating system for instructions on how to halt it.

♦ **For Solaris 2.x (SunOS 5.x) systems, type:**

```
% su
Password: superuser password
# /usr/sbin/shutdown -y -g60 -i0
```

♦ **For Solaris 1.x (SunOS 4.x) systems, type:**

```
% su
Password: superuser password
# /usr/etc/shutdown -h +1
```

The operating system warns other users of your system of the impending shutdown, and then halts itself after a one-minute delay. If you wish to provide a longer delay, see the man page for `shutdown(1)`.

The system synchronizes the file systems and brings you to the `ok` prompt.

4. Enter `reset` at the `ok` prompt.

5. When you see the system banner, press `Stop-a` to access the FORTH Monitor.

6. Enter `help diag` at the `ok` prompt to get a list of tests that comprise the FORTH Diagnostics.

7. Enter the name of the test you wish to execute.

Figure D-1 shows a list of FORTH Diagnostic tests.

```
ok help diag
  Category: Diag (diagnostic routines)
test  device-specifier ( -- ) run selftest method for specified device
  Examples:
    test /memory      - test memory
    test /iommu/sbus/ledma/le  - test net
    test floppy       - test floppy disk drive
    test net          - test net (device-specifier is an alias)
    test scsi         - test scsi(device-specifier is an alias)
watch-clock          (-- ) show ticks of real-time clock
watch-net            (-- ) - monitor broadcast packets using auto-selected interface
watch-aui            (-- ) - monitor broadcast packets using AUI interface
watch-tpe            (-- ) - monitor broadcast packets using TPE interface
watch-net-all       (-- ) - monitor broadcast packets on all net interfaces
probe-scsi           (-- ) - show attached SCSI devices
probe-scsi-all      (-- ) - show attached SCSI devices for all host adapters
test-all            (-- ) - execute test for all devices with selftest method
test-memory          (-- ) - test all memory if diag-switch? is true, otherwise test memory
                        specified by selftest-#megs
```

Figure D-1 Displaying FORTH Diagnostics

D.1.1 test <alias name>, test <device path>

The `test` command, combined with a device alias or device path name, will execute that device self-test program. If a device has no self-test program, this message will be displayed: `No selftest method for <device name>`. To run the self-test program for a device, type the `test` command followed by the device alias or device path name. An example is shown below.

Note - The floppy disk test shown in the example below does not apply to the SPARC Xterminal 1 system.

```
ok test floppy
Testing floppy disk system. A formatted disk should be in the drive.
Test succeeded.
```

D.1.2 test-all

The `test-all` command tests all devices in the system that have a self-test program. Tests are executed in order, using the device tree (viewed with the `show-devs` command) as reference. Disks, tapes, and CD-ROMs are not tested by `test-all`.

D.1.3 watch-clock

This test reads a register in the NVRAM/TOD (nonvolatile RAM/Time-of-Day) chip on the main logic board and displays the result as a seconds counter. The counter should count from 0 to 59 repeatedly until you interrupt it by pressing any key on the keyboard.

The following screen gives you an example of a `watch-clock` test.

```
ok watch-clock
Watching the 'seconds' register of the real-time clock chip.
It should be 'ticking' once a second.
Type any key to stop
41
```

D.1.4 watch-net, watch-aui, watch-tpe, and watch-net-all

These tests monitor broadcast Ethernet packets on the Ethernet cable(s) connected to the system. Good packets received by the system are indicated by a period (.) displayed on the screen. Errors are indicated with an x and the error description.

For example:

```
ok watch-net
Using AUI Ethernet Interface
  Lance register test -- succeeded
  Internal loopback test -- succeeded
  External loopback test -- Lost Carrier (transceiver cable
problem?) send failed

Using TP Ethernet Interface
  Lance register test -- succeeded
  Internal loopback test -- succeeded
  External loopback test -- succeeded
Looking for Ethernet packets.
'.' is a good packet. "X" is a bad packet.
Type any key to stop.
.....
.....
.....Framing error CRC error X.....
```

Your system has two types of Ethernet interfaces, 10BaseT (also called twisted-pair Ethernet or TPE) and 10Base5 (also called thick Ethernet or AUI). Only one Ethernet interface may be connected at a time. The system can automatically select which interface is connected and active.

The AUI port is first tested by transmitting packets and checking for “no carrier” or response packets. If the AUI test fails, the TPE port is then tested.

Entering `watch-auri` causes this automatic selection to take place. You may see these messages:

```
ok watch-auri
Using AUI Ethernet Interface
  Lance register test -- succeeded
  Internal loopback test -- succeeded
  External loopback test -- Lost Carrier (transceiver cable
problem?) send failed.
ok
```

You may also control the selection of Ethernet interfaces to monitor by using specific commands. Use `watch-tpe` to monitor the 10BaseT (TPE) connection or `watch-auri` to monitor the 10Base5 (thick Ethernet) connection.

For example:

```
ok watch-tpe
Using TP Ethernet Interface
  Lance register test -- succeeded
  Internal loopback test -- succeeded
  External loopback test -- succeeded
Looking for Ethernet packets.
'.' is a good packet. "X" is a bad packet.
Type any key to stop.
.....
.....
```

The `watch-net-all` command monitors Ethernet packets on any Ethernet interface installed in the system. For example, if you have an SBus Ethernet card installed in one of the system SBus slots, `watch-net-all` will start by monitoring Ethernet transmissions detected by that card.

When you interrupt the test on that interface by pressing any key, `watch-net-all` then goes on to test the next Ethernet interface it finds in the system.

For example:

```
ok watch-net-all
/iommu@0,100000000/sbus@0,10001000/ledma@5,8400010/le@5,8c00000

Using AUI Ethernet Interface
Lance register test -- succeeded
Internal loopback test -- succeeded
External loopback test -- Lost Carrier (transceiver cable
problem?) send failed.

Using TP Ethernet Interface
Lance register test -- succeeded
Internal loopback test -- succeeded
External loopback test -- succeeded
Looking for Ethernet packets.
'.' is a good packet. "X" is a bad packet.
Type any key to stop.
.....
.....
ok
```

D.1.5 probe-scsi, probe-scsi-all

The `probe-scsi` test sends an inquiry command to internal and external SCSI devices connected to the system's internal SCSI interface. If a SCSI device is connected and powered up, the target address, unit number, device type, and manufacturer name should be displayed.

Note - This test does not apply to the SPARC Xterminal 1 system.

For example:

```
ok probe-scsi
Target 3
Unit 0 Disk SEAGATE ST1480 SUN04245828 Copyright (c) 1991 Seagate All rights reserved.
```

The `probe-scsi-all` test sends an inquiry command to all SCSI devices on all the SCSI host adapters installed in the system. The first identifier listed in the display is the SCSI host adapter address in the system device tree, followed by the SCSI device identification data.

For example:

```
ok probe-scsi-all
/iommu@0,100000000/sbus@0,10001000/espdma@5,8400000/esp@5,8800000
Target 1
  Unit 0 Disk CONNER CP30548 SUN0535AEBX93081QTT
Target 3
  Unit 0 Disk CONNER CP30548 SUN0535AEBX93081QTT
Target 6
  Unit 0 Removable Read Only device TOSHIBA CD-ROM XM-4101TA289310/16/93
```

D.1.6 module-info

This command reports back the system CPU information including: the microprocessor name, its revision, the speed at which it is running in megahertz, and the SBus speed in megahertz.

For example:

```
ok module-info
CPU FMI,MB86904 Rev. 2.0: 70.0 Mhz
SBus (Divide By 3)      : 23.3 Mhz
ok
```

D.1.7 test-memory

All of the system main memory will be tested if the system `diag-switch?` parameter is true. If the `diag-switch?` parameter is false, this test uses the `selftest-#megs` parameter in NVRAM to determine how much memory to test. The default for the `selftest-#megs` parameter is 1, so only 1 megabyte of memory is tested.

To change the default amount of memory tested using the `selftest-#megs` default parameter, type this command:

```
ok setenv selftest-#megs 256
```

This sets the desired memory size to be tested to 256 megabytes.

When testing the installed memory alone, if `diag-switch?=false`, the `selftest-#megs` parameter takes a default value of 1 megabyte (factory-defined value) or the value you set using `setenv` shown in the example above.

Any whole number may be used up to 256, and if the number exceeds the amount of installed memory, all the installed memory in the system is tested. When the `test-memory` diagnostic is running, the number of megabytes being tested is displayed and counted down to zero during the test.

See the *OpenBoot Command Reference* for a detailed description and step-by-step instructions for the available FORTH Diagnostic tests.

D.2 Returning to the Old-Style Sunmon Compatibility Mode Prompt

If you need to return to the `>` prompt from the FORTH Monitor, type `old-mode` at the `ok` prompt.

```
ok old-mode
>
```

