sun microsystems

READ THIS FIRST
SunDiagnostic Executive (Version 1.2)

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Part No: 800-3288-10
Revision A of 13 October, 1989

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Read This First

Software READ THIS FIRST
SunDiagnostic Executive (Version 1.2)

1. Introduction

This release of the SunDiagnostic Executive™ supports the Sun-3™, and Sun SPARC ™ -based workstations. This document, together with the *SunDiagnostic Executive User's Guide*, provides important information that will help you to use this release.

If you have any problems installing or using the SunDiagnostic Executive (Version 1.2), call Sun Microsystems at: 1-800-USA-4SUN (1-800-872-4786) or at the answer center number for your service region. If you do not know the answer center number, call your local sales office. Have your system's model number, serial number, SunDiagnostic Executive (Version 1.2) release number and tape part number, and Sun operating system (SunOS™) release number ready to give to the dispatcher.

You may also send questions by electronic mail to `sun!hotline`. Be sure to include your name, company, and phone number, along with the information above.

If you have questions about Sun's support services or your shipment, call your sales representative.

- To see the SunOS release number, type: **`cat /etc/motd`**
- If the SunDiagnostic Executive (Version 1.2) is currently installed on your machine, you can see the release number at the top of the first menu when you boot the diagnostic tape, as described in Chapter 2 of the *SunDiagnostic Executive User's Guide*.

2. Added Features

- Support for the Sun-3/80, Sun-3/400 series and new SPARC systems has been added.
- Several new graphics diagnostics have been added to test the VME-based and P4-bus-based 24-bit frame buffers, a low-end graphics accelerator, and the TAAC-1™ graphics accelerator.
- Testing for the CG5 Color Graphics Board is now available under the Color Graphics Diagnostic.
- Diagnostics have been added to support the Sun-3/400 series FPA-Plus board, the ESP SCSI interface, the High Speed Serial Interface Board, the Intelligent Peripheral Interface, Sun-3/80 Parity Memory, the Floppy Disk Controller, the FDDI board, and the SPARCsystem 330 Cache.

3. Generic Booting Problems

Booting From an IPI Controller

You may not boot this version of the Exec from an IPI controller. The next Exec release will support booting from an IPI Controller.

Sun-3 Booting

If you use the L1-A sequence to abort the SunOS on a Sun-3/80, do NOT use the PROM monitor **k1** command; doing so will prevent a subsequent boot-up.

When booting from local devices (`sd` or `st`) on all Sun-3 systems, using L1-A causes an `unclaimed exception` error.

Booting a Sun-4 from Tape

NOTE The Sun-4 workstation does not support the Tapemaster† controller; therefore, the SunDiagnostic Executive (Version 1.2) cannot be booted from a Tapemaster controller on a Sun-4 system.

Booting a Sun-3 from Tape

A few older Sun-3 systems fail to boot or return errors when you try to load software from QIC-24 tapes. If this happens, follow these steps.

1. To check the revision level of the PROM, enter **kb** at the PROM monitor prompt (>).

   In response, the system displays a series of messages, for example:

```
> kb
 ...

Self Test completed successfully.
Sun Workstation, Model some number ROM Rev 2.8, 8MB memory installed
and so on ...
```

2. Compare the ROM revision number (`2.8` in the example) with that listed for your architecture in Tables 1 and 2 on the next page. If the number is less than the minimum level shown, upgrade your PROM as described in step 3. If the number is greater than `1.8` but lower than `2.6`, and you still cannot boot successfully, see the section that follows step 3. See also the *PROM User's Manual.*
3. If an upgrade is needed, you have several options.
   a. You can have Sun install the Boot PROM for you. (The upgrade is free if you have an On-Site Hardware or Comprehensive Support Contract.)
   b. You can order an upgrade kit, and install the Boot PROM yourself. The kit explains how to replace the PROM on your CPU board, a process that takes ten or fifteen minutes.

   Call 800-USA-4SUN, request Field Service, and schedule PROM installation or order a Sun-3 PROM Upgrade Kit. (Outside the USA, call your local support office.)

Tapemaster is a trademark of Ciprico, Inc.

If the revision of your Boot PROM is between `1.8` and `2.6` and you still cannot boot from 1/4″ tape, the problem could be caused by one of the anomalies described here:

- If your system contains a Sysgen controller board and a Wangtek tape drive, and if the tape you are trying to load is *write-protected*, you will receive an error message with status *96A0*.

  To boot, remove the tape from the drive, write-enable the tape by turning the write-protect key so it points *away* from SAFE, mount the tape in the drive, and boot again:

  ```
  > b st(0,0,0)
  ```

  Once the initial boot completes, protect the tape again by turning the write-protect key to SAFE.

  If the boot still fails, contact Hardware Support at 1-800-USA-4SUN. (Outside the USA, call your local support office.)

  Reference FA 136 when you call.

- If you have a Sysgen controller and an Archive tape drive and your PROM revision level is between `1.8` and `2.6`, call Sun as described earlier to request the latest revision PROM.

  Reference FA 135 when you call.

- If you have a Sun-3 workstation with a Sun-2 Mass Storage Subsystem and receive a tape error, call Sun as described earlier.

  Reference FA 137 and 138 when you call.

Table 1 *Minimum PROM Revision Levels**

System Architecture	*Minimum PROM Level*
Sun-3/50	1.8
Sun-3/60	1.6
Sun-3/75	1.8
Sun-3/80	2.9
Sun-3/110	1.8
Sun-3/140	1.8
Sun-3/150	1.8
Sun-3/160	1.8
Sun-3/180	1.8
Sun-3/260	1.8
Sun-3/280	1.8
Sun-3/470	2.9
Sun-3/480	2.9

*Table 2 supercedes this table for some systems and hardware configurations.

Table 2 *Minimum PROM Revisions for Special Configurations*

PROM Level	*Hardware Configuration*
2.7	You use a 7053 VME/SMD disk controller with one of the following workstations: Sun-3/75, Sun-3/140, Sun-3/150, Sun-3/160, Sun-3/180, Sun-3/260, or Sun-3/280.
2.9	Your system has a P4-bus graphics board, such as the CG6 or the CG8.

SunDiagnostic Executive Main Menu "Boot" Option

While running the SunDiagnostic Executive on a standalone Sun-3/60, Sun-3/E, Sun-3/110, a Sun 3/2x0, or Sun-4/150, selecting `Boot` from the Main Menu causes an "unclaimed exception" error.

4. Known Problems with the Software

Sun-3/E Testing

On a Sun-3/E, do not attempt to boot the Exec from a color frame buffer.

The SunDiagnostic Executive supports the following diagnostics when testing a Sun-3/E system:

- CPU
- Memory
- Keyboard/Mouse
- EEPROM Editing Tool
- Video Circuitry
- Video Monitor
- Ethernet II

CPU Diagnostic

When running the CPU diagnostic with Serial Loopback Cables installed, the Exec environment variables should be set as follows:

```
net=on; ttya=off; ttyb=off
```

EEPROM Editing Tool

The EEPROM Editing Tool `All`, `Default`, and `Quick` tests are not functional on Sun-3/400 series systems.

Ethernet Diagnostic

The Ethernet Diagnostic `All`, `Default`, and `Quick` tests are not functional on Sun-3/400 series systems.

In addition, when running the Ethernet diagnostic with Serial Loopback Cables installed, the Exec environment variables should be set as follows:

```
net=on; ttya=off; ttyb=off
```

Keyboard Diagnostic

The Keyboard diagnostic is not functional when a CG6 board is installed in the system.

ESP SCSI Diagnostic

The SCSI Subsystem and ESP SCSI diagnostics can not be used on a SPARCsystem 330 with a front-load tape drive. This problem will be fixed in the next SunDiagnostic Executive release.

SCSI Subsystem Diagnostic

The SCSI Subsystem Diagnostic can only use Disk 0 at target (SCSI ID) 0 and Tape 0 at target (SCSI ID) 4. Disks or tapes at other addresses can not be tested in this release.

When running the SCSI Subsystem Diagnostic on a Sun-3/470, set `cach=dis` to disable the cache. This will allow the diagnostic to access the disk. Future releases will allow this diagnostic to run with cache enabled.

1/2-Inch Tape Diagnostic

The Tapemaster controller and the CDC drive cannot be tested successfully. If you specify `ct0=tm1000` and then perform a test on the CDC 1/2-inch tape drive, an `unclaimed exception` message will be displayed.

5. Documentation Errata and Addenda

The chapters of the *SunDiagnostic Executive User's Guide*, PN 800-3273-10, should be amended by the changes and additions in the following sections.

Chapter 2 — Using the SunDiagnostic Executive

Tape Table of Contents

The tape table of contents for Sun-3 systems, shown on page 11, should be replaced with the following:

Table 3 *MC68020, MC68030 Tape Contents*

Name	*File Number (decimal)*	*Description-Comments*
tpboot.sun3	0	Enables Sun-3 boot from tape
tpboot.sun3x	1	Enables Sun-3/400 Series, Sun-3/80 boot from tape
toc	2	Contains list of contents of this tape
extract_exec	3	Script to copy diagnostics to disk
Copyright	4	Textfile containing copyright notice
exec	5	The SunDiagnostic Executive for Sun-3 architecture
exec3x	6	The SunDiagnostic Executive for Sun-3/400 Series and 3/80
diags	7	Diagnostics Menu and Filenames (used by Exec)
cg6.exec	8	P4 Low-End Graphics Accelerator
cg8.exec	9	P4 24-Bit Frame Buffer Board Diagnostic
cg9.exec	10	VME 24-Bit Frame Buffer Board Diagnostic
color.exec	11	Generic VME Color Board Diagnostic
cpcache.exec	12	Sun-3/400 Series Central Cache Diagnostic
cpu.exec	13	Sun CPU Diagnostic
eeptool.exec	14	EEPROM programming tool
ether.exec	15	Sun Ethernet Diagnostic
ether2.exec	16	Ethernet II Diagnostic
exectest.exec	17	Exec Verification Suite
fdc.exec	18	On-board Floppy Disk Controller Diagnostic
fddi.exec	19	FDDI Board Diagnostic
fpa.exec	20	Sun-3 Floating Point Accelerator Diagnostic
fpa_plus.exec	21	Sun-3/400 Series Floating Point Accelerator Plus Diagnostic
gp1.exec	22	Graphics Processor1/Graphics Buffer Diagnostic
gp2.exec	23	Graphics Processor2 Diagnostic
hsi.exec	24	High Speed Serial Interface Board Diagnostic
iocache.exec	25	Sun-3/400 Series I/O Cache Diagnostic
ipi.exec	26	IPI Disk Subsystem Diagnostic
kb.exec	27	Sun Keyboard Diagnostic
mcp.exec	28	Sun ALM2/MCP Board Diagnostic
mem.exec	29	Sun Memory Diagnostic
mempar.exec	30	Sun-3/80 Parity Memory Diagnostic
mouse.exec	31	Sun Mouse Diagnostic
mti.exec	32	Sun MTI/ALM Board Diagnostic

Table 3 *MC68020, MC68030 Tape Contents— Continued*

Name	*File Number (decimal)*	*Description-Comments*
scsisub.exec	33	SCSI Subsystem Diagnostic
espscsi.exec	34	Sun-3/80 ESP SCSI diagnostic
smd.exec	35	Sun SMD Diagnostic
taac.exec	36	TAAC-1 Accelerator Diagnostic
tape.exec	37	1/2-inch Tape Diagnostic
video.exec	38	Sun Video Diagnostic
vidmon.exec	39	Sun Video Monitor Diagnostic
vme3.exec	40	Sun VME Diagnostic
netcon	41	Network Console Program
logfile	42	Error Log File
eccmem3.diag	43	Standalone ECC Memory Diagnostic
cache3.diag	44	Standalone Cache Memory Diagnostic
Copyright	45	Text file containing copyright notice

The tape table of contents for Sun-4 systems, shown on Page 12, should be replaced with the following:

Table 4 *SPARC Tape Contents*

Name	*File Number (decimal)*	*Description-Comments*
tpboot.sun4	0	Enables boot from tape
Copyright	1	Text file containing copyright notice
toc	2	Contains list of contents of tape
extract_exec	3	Script to copy diagnostics to disk
Copyright	4	Text file containing copyright notice
exec4	5	The SunDiagnostic Executive for Sun-4 architecture
diags4	6	Diagnostic Menu and Filenames (used by Exec)
cg6.4.exec	7	P4 Low-End Graphics Accelerator
cg8.4.exec	8	P4 24-Bit Frame Buffer Board Diagnostic
cg9.4.exec	9	VME 24-Bit Frame Buffer Board Diagnostic
color4.exec	10	Generic VME Color Board Diagnostic
cpcache4.exec	11	Central Processor Cache Diagnostic
cpu4.exec	12	Sun CPU Board Diagnostic
eeptool4.exec	13	EEPROM programming tool
ether4.exec	14	Sun Ethernet Diagnostic
ether2.4.exec	15	Ethernet II Board Diagnostic
exectest4.exec	16	Exec Verification Suite
fddi4.exec	17	FDDI Board Diagnostic
fpu4.exec	18	Sun-4 Floating Point Unit Diagnostic
gp1.4.exec	19	Graphics Processor1/Graphics Buffer Diagnostic
gp2.4.exec	20	Graphics Processor2 Diagnostic
hsi4.exec	21	High Speed Serial Interface Board Diagnostic
ipi4.exec	22	Intelligent Peripheral Interface Diagnostic

Table 4 *SPARC Tape Contents— Continued*

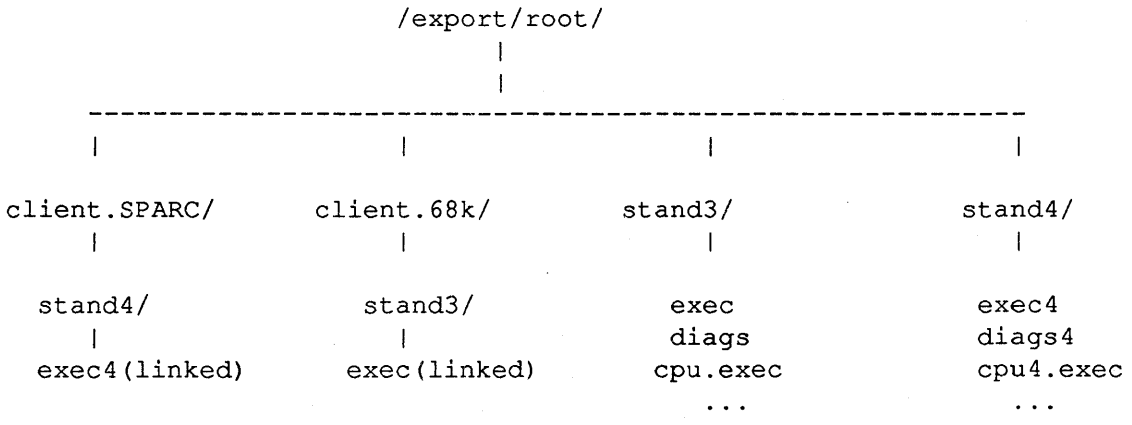
Name	*File Number (decimal)*	*Description-Comments*
kb4.exec	23	Sun Keyboard Diagnostic
mcp4.exec	24	Sun ALM2/MCP Board Diagnostic
mem4.exec	25	Sun Memory Diagnostic
mouse4.exec	26	Sun Mouse Diagnostic
mti4.exec	27	Sun MTI/ALM Board Diagnostic
scsisub4.exec	28	Sun SCSI Subsystem Diagnostic
espscsi4.exec	29	SPARCsystem 330 ESP SCSI Diagnostic
smd4.exec	30	Sun SMD Diagnostic
taac4.exec	31	TAAC-1 Accelerator Board Diagnostic
tape4.exec	32	1/2-inch Tape Diagnostic
video4.exec	33	Sun Video Circuit Diagnostic
vidmon4.exec	34	Sun Video Monitor Diagnostic
vme4.exec	35	Sun VME Diagnostic
netcon4	36	Network Console Program
logfile	37	Error Log File
eccmem4.diag	38	Standalone ECC Memory Diagnostic
cache4.diag	39	Standalone Cache Memory Diagnostic
Copyright	40	Text file containing copyright notice

Loading and Booting the Exec, Section 2.5, Pages 14-22

Please replace the text on pages 16 and 17, from
"Therefore, the Exec and all its diagnostics should be placed....."
to the end of Page 17, with the following text:

The following setup takes up the least memory on the server disk, but assumes that the `/export/root` directory is large enough to hold the contents of both (Sun-3 and SPARC) tapes. The alternative is to place the contents of the tape elsewhere as described later in this text.

For heterogeneous installations, here is an example of a directory structure that would allow dissimilar Sun systems to act as server and client when loading the Exec.



To extract the Exec from tape and create the directory structure, follow these steps:

1. Insert Sun-3/Sun-3/4xx/Sun-3/80 (MC68000) Exec tape in the tape drive, then enter:

```
% su (enter password)
#cd /export/root
#mkdir stand3
#cd stand3
#mt -f /dev/nrdevice rew
#mt -f /dev/nrdevice fsf 3      replace device with st for SCSI, mt for 1/2" tape, etc.
#tar xvf /dev/nrdevice
#extract_exec device
```

2. Now, insert the SPARC tape and enter:

```
#cd /export/root
#mkdir stand4
#cd stand4
#mt -f /dev/nrdevice rew
#mt -f /dev/nrdevice fsf 3  replace device with st for SCSI, mt for 1/2" tape, etc.
#tar xvf /dev/nrdevice
#extract_exec device
```

3. Then, for each client, enter:

   #cd /export/root/*client*

   (Replace *client* with the actual name of the client system.)

4. Next, in the client directories, create the hard links:

   For Sun-3 clients:

```
#mkdir stand3
#cd stand3
#ln /export/root/stand3/exec exec
```

   For Sun-3/4xx and Sun-3/80 clients:

```
#mkdir stand3
#cd stand3
#ln /export/root/stand3/exec3x exec3x
```

   For Sun-4 (SPARC) clients:

```
#mkdir stand4
#cd stand4
#ln /export/root/stand4/exec4 exec4
```

5. Now, two symbolic links are still needed in the top directory:

```
#ln -s /export/root/stand3 stand3
#ln -s /export/root/stand4 stand4
```

6. The boot path will now be as follows:

```
>b ie()/stand3/exec        (for Sun-3 clients)
>b ie()/stand3/exec3x      (for Sun-3/400 and Sun-3/80 clients)
>b ie()/stand4/exec4       (for SPARC-based clients)
```

7. Finally, you must disable the security restrictions from the server to permit the Exec to download the files it needs. To do this, you edit the `/etc/inetd.conf` file.

NOTE To complete this set-up, you must first kill the `inetd` *daemon, and then, after editing the file, restart the daemon.*

A typical file looks like this:

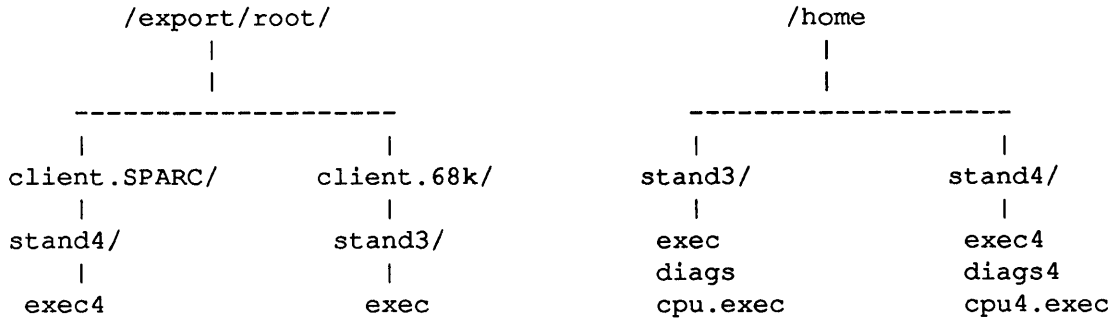
```
# @(#)inetd.conf 1.16 87/11/13 SMI
ftp     stream  tcp     nowait  root    /usr/etc/in.ftpd      in.ftpd
telnet  stream  tcp     nowait  root    /usr/etc/in.telnetd   in.telnetd
shell   stream  tcp     nowait  root    /usr/etc/in.rshd      in.rshd
login   stream  tcp     nowait  root    /usr/etc/in.rlogind   in.rlogind
exec    stream  tcp     nowait  root    /usr/etc/in.rexecd    in.rexecd
finger  stream  tcp     nowait  root    /usr/etc/in.fingerd   in.fingerd
tftp    dgram   udp     wait    root    /usr/etc/in.tftpd     in.tftpd -s /tftpboot
comsat  dgram   udp     wait    root    /usr/etc/in.comsat    in.comsat
talk    dgram   udp     wait    root    /usr/etc/in.talkd     in.talkd
name    dgram   udp     wait    root    /usr/etc/in.tnamed    in.tnamed
```

You must edit the line that contains `tftpd`, removing the `-s` option, so that it looks like this:

```
tftp    dgram   udp     wait    root    /usr/etc/in.tftpd     in.tftpd /tftpboot
```

Using Other Partitions

If there is insufficient space in `/export/root` to accommodate the files on the SunDiagnostic Executive tapes, the contents of these tapes can still be placed in another partition, such as `/home`. However, in that case, `exec`, `exec3x` and `exec4` cannot be hard-linked to a common Exec binary and must exist separately in each client's home directory, like this:



To create the structure shown above, follow these instructions:

1. Insert the Sun-3/Sun-3/4xx/Sun-3/80 (MC68000) Exec tape in the tape drive, then enter:

```
% su (enter password)
#cd /home
#mkdir stand3
#cd stand3
#mt -f /dev/nrdevice rew        replace device with st for SCSI, mt for 1/2" tape, etc.
#mt -f /dev/nrdevice fsf 3
#tar xvf /dev/nrdevice
#extract_exec device
```

2. Insert the SPARC tape and enter:

```
% su (enter password)
#cd /home
#mkdir stand4
#cd stand4
#mt -f /dev/nrdevice rew        replace device with st for SCSI, mt for 1/2" tape, etc.
#mt -f /dev/nrdevice fsf 3
#tar xvf /dev/nrdevice
#extract_exec device
```

3. Now, for each client, enter the following. You do not need to be superuser to do this:

   `#cd /export/root/`*client*

   Replace *client* with the actual name of the client system.

4. Then, for Sun-3 clients:

```
#mkdir stand3
#cd stand3
#cp /home/stand3/exec exec
```

For Sun-3/4xx and Sun-3/80 clients:

```
#mkdir stand3
#cd stand3
#cp /home/stand3/exec3x exec3x
```

For Sun-4 (SPARC) clients:

```
#mkdir stand4
#cd stand4
#cp /home/stand4/exec4 exec4
```

5. Two symbolic links must now be made in the top directory:

```
#cd /
#ln -s /home/stand3 stand3
#ln -s /home/stand4 stand4
```

6. The boot commands are:

```
>b ie() /stand3/exec        (for Sun-3 clients)
>b ie() /stand3/exec3x      (for Sun-3/400 and Sun-3/80 clients)
>b ie() /stand4/exec4       (for SPARC-based clients)
```

NOTE Refer to Step 7 in the previous discussion on editing the `etc/inetd.conf` *file to disable security restrictions from the server and permit the Exec to download the files it needs.*

NOTE If you didn't create the symbolic link as shown in the previous sections, when a client finishes loading it will be unable to access files such as `diags*, *.exec, autoexec`, *and so on, that it needs from the server. Instead, the client will report that the* `/stand/diags` *file is empty.*

Remote Tape

In the section titled "Remote Tape" on Page 18, please replace the example with the following:

```
%su
Password: enter super-user (root) password
#rsh remote_host mt -f /dev/nrdevice8 rew
#rsh remote_host mt -f /dev/nrdevice8 fsf count
#rsh remote_host -n dd if=/dev/nrdevice8 bs=blocksizeb | tar xvfpB -
```

For *device*, use `st` for SCSI tape or `mt` for 1/2-inch tape, and replace *remote_host* with the name of the system that has the tape drive from which you want to load the SunDiagnostic Executive. For *blocksize*, use 126 for SCSI tape or 20 for 1/2-inch tape, and replace *count* with 46 for Sun-3 and Sun-3/400 series installations, and 41 for Sun-4 (SPARC) installations.

Installing a Boot Block

On Page 19, please use these procedures in place of those under "For SunOS 4.x":

For SunOS 4.0 - 4.0.2:

If you want to boot the Exec directly from `/usr/stand`, bootblocks must be installed in the `/usr` partition.

To install a bootblock in `/usr/stand`, use the following sequence:

```
% su
Password: (enter super-user password)
# cp /boot /usr/stand
# cd /usr/mdec
# installboot /usr/stand/boot bootdisk /dev/rpartition
```

For example, installing a bootblock on partition `G` of `sd0`:

```
# installboot /usr/stand/boot bootsd /dev/rsd0g
```

Then, when booting the SunDiagnostic Executive you would use the following command from the PROM monitor:

```
>bsd(0,0,6)/stand/exec
```

For SunOS 4.0.3 and later, add this to Page 19:

To put a bootblock on any partition other that `g`, you may use the previous procedure.

In SunOS version 4.0.3, `/usr/stand` became a link to `/usr/kvm/stand`. This necessitates a change in the installboot and booting procedures.

The procedures follow:

If you want to boot the Exec directly from `/usr/kvm/stand`, bootblocks must be installed in the `/usr` partition.

To install a bootblock in `/usr/kvm/stand`, use the following sequence:

NOTE If `stand` *is a link to* `kvm/stand`, *you must use this procedure; if it is not a link you may use the procedure written for SunOS 4.0 - 4.0.2.*

```
% su
Password: (enter super-user password)
# ls -l stand
lrwxrwxrwx  1 root            9 Aug 14 15:30 stand -> kvm/stand
# cp /boot /usr/kvm/stand
# cd /usr/mdec
# installboot /usr/kvm/stand/boot bootdisk /dev/rpartition
```

For example, installing a bootblock on partition `g` of sd0, you would enter:

```
# installboot /usr/kvm/stand/boot bootsd /dev/rsd0g
```

Then, when booting the SunDiagnostic Executive you would use the following command from the PROM monitor:

```
>bsd(0,0,6)/kvm/stand/exec
```

Booting the Exec

When booting the Exec from `/usr/stand`, a directory named `/usr/stand` MUST actually exist. `/usr/stand` cannot be a symbolic link to another directory.

Booting from Server/Remote Disk -- Chapter 2, Page 21

Please Add this information to that found under "Booting from Server/Remote Disk" on page 21:

Before booting the Exec from a server or a remote disk, make sure that there is only one primary boot server for the unit under test. To verify this, check the `/tftpboot` directory on all servers servicing that network. If you have multiple boot servers, the Exec will fail to find the `diags` file. To remedy this situation, specify the server address (refer to the example on Page 21) instead of using the "shortcut" shown following the host number example. Specifying the host number resolves the "race" condition from both boot servers.

Booting From Tape

In the *Booting From Tape* section of Chapter 2, please add these booting sequences:

For a Sun-3 or Sun-4 (SPARC) system:

```
>b st()
Boot: st(,,5)
```

For a Sun-3/400 Series and Sun-3/80 systems:

```
>b st(0,0,1)      substitute proper device name for st
Boot: st(,,6)
```

For example, the command for a 1/2-inch tape on a Sun-3/400 Series system would be:

```
>b mt(0,0,1)
Boot: mt(,,6)
```

Diagnostics Menu — page 36

`diags` File Modification

The `diags` file that contains the Diagnostics Menu choices should not contain more than 30 entries. Please edit that file to remove entries that represent diagnostics that are not needed.

Diagnostics Menu Changes

The `Default` option on the Diagnostics Menu has been removed.

The Exec Diagnostics Menu for Sun-3, Sun-3/80, and Sun-3/400 series systems, shown on page 37, should be replaced with the following menu:

```
Diagnostic Executive    Rev: 1.2    mm/dd/yy    Diagnostics Menu

CG6.......... P4 Low-End Graphics Accelerator Diagnostic
CG8.......... P4 24-Bit Frame Buffer Diagnostic
CG9.......... VME 24-Bit Frame Buffer Diagnostic
COlor ....... Generic VME Color Board (CG2,CG3,CG5) Diagnostic
CPCache...... CPU Cache (Sun-3/400) Diagnostic
CPU ......... CPU Board Diagnostic
EEprom ...... EEPROM Editing Tool
Ether ....... Ethernet Diagnostic
ETHer2 ...... Ethernet II Board Diagnostic
FDC.......... Floppy Disk Drive Diagnostic
FDDI......... FDDI Board Diagnostic
FPA ......... Sun-3 FPA Board Diagnostic
FPA_Plus .... Sun-3/400 FPA+ Diagnostic
Gp .......... Graphics Processor 1 and Graphics Buffer Diagnostic
GP2 ......... Graphics Processor 2 Diagnostic
MORE         More Diagnostics

Command==>
```

The rest of the Sun-3 menu shown on page 37 should be replaced with the following:

```
Diagnostic Executive    Rev: 1.2    mm/dd/yy    More Diagnostics Menu

HSI ........... High Speed Serial Interface Board Diagnostic
IOCache ......  IO Cache (Sun-3/400) Diagnostic
IPi ........... IPI Board Diagnostic
Kb ............ Keyboard Diagnostic
MCp ........... MCP and ALM-2 Board Diagnostic
Mem ........... Memory Diagnostic
MOuse ......... Mouse Diagnostic
MTi ........... MTI/ALM Board Diagnostic
Parity ........ Parity Memory (Sun-3/80) Diagnostic
SMD ........... SMD Controller/Disk Diagnostic
SUBsystem ..... SCSI Sub-system Diagnostic
ESPscsi........ ESP SCSI (Sun-3/80) Diagnostic
TAAc .......... TAAC Accelerator Board Diagnostics
Tape .......... Pertec 1/2" Tape Diagnostic
Video ......... Video Circuit Diagnostic
Vidmon ........ Video Monitor Diagnostic
VME ........... VME Interface Diagnostic

Command==>
```

The Exec Diagnostics Menu for Sun-4 (SPARC) systems, shown on page 38, should be replaced with the following menu:

```
Diagnostic Executive    Rev: 1.2    mm/dd/yy    Diagnostics Menu

CG6............  P4 Low-End Graphics Accelerator Diagnostic
CG8............. P4 24-Bit Frame Buffer Diagnostic
CG9............. VME 24-Bit Frame Buffer Diagnostic
COlor ......... Generic VME Color Board (CG2,CG3,CG5) Diagnostic
CPCache........ CPU Cache (SPARCstation 330) Diagnostic
CPu ........... CPU Board Diagnostic
EEprom ........ EEPROM Editing Tool
Ether ......... Ethernet Diagnostic
ETHER2 ........ Ethernet II Board Diagnostic
FDDI........... FDDI Board Diagnostic
FPU ........... FPU Diagnostic
Gp ............ Graphics Processor 1 and Graphics Buffer Diagnostic
GP2 ........... Graphics Processor 2 Diagnostic
HSI ........... High Speed Serial Interface Board Diagnostic
IPi ........... IPI Board Diagnostic
MORE           More Diagnostics

Command==>
```

The rest of the Sun-4 menu shown on page 38 should be replaced with the following:

```
Diagnostic Executive    Rev: 1.2    mm/dd/yy    More Diagnostics Menu

Kb ............ Keyboard Diagnostic
MCp ........... MCP and ALM-2 Board Diagnostic
Mem ........... Memory Diagnostic
MOuse ......... Mouse Diagnostic
MTi ........... MTI/ALM Board Diagnostic
SMD ........... SMD Controller/Disk Diagnostic
SUBsystem ..... SCSI Sub-system Diagnostic
ESPscsi........ ESP SCSI Diagnostic (SPARCstation 330)
TAAc .......... TAAC Accelerator Board Diagnostics
Tape .......... Pertec 1/2" Tape Diagnostic
Video ......... Video Circuit Diagnostic
VIDMon ........ Video Monitor Diagnostic
VME ........... VME Interface Diagnostic

Command==>
```

Writing Script Files — Chapter 2, Page 41

Please add this information at the beginning of "Writing Script Files" on Page 41 of the User's Guide.

`tftp Logfile`

Upon boot-up, the Exec attempts to read from a script file named `autoexec`. If this file doesn't exist, the Exec displays and logs an INFO message that says

`tftpboot read failure, file=`*`path`*`/autoexec`

This is normal and expected behavior for the Exec.

Remote Execution and the Network Console — Page 42

Inability to Bind a `netcon` Session

Please add this information to the "Remote Execution and the Network Console" section of Chapter 2, pages 42 and 43:

A standalone workstation starting a `net=on` session uses Reverse Address Resolution Protocol to determine its Internet number. A problem may exist if none of the servers reference the standalone workstation in `/etc/ethers` or in the `yp`. The cross-reference from hostname to Ethernet address is necessary for the standalone workstation to determine its Internet Number.

An incorrect binding may also occur if a system other than the server has the `netcon` client's link in `/tftpboot`. To correct this situation, remove any excess `/tftpboot` links that reference the `netcon` client. A standalone workstation does not require `/tftpboot` links on any server.

Chapter 6 — CPU Diagnostic

When an error occurs in running the *Serial Port* test under the CPU diagnostic, with "stop on error" ON, the program will display the error message and state

```
Press any key to continue
```

If a Control-C is pressed at this point, you will be returned to the Exec Diagnostics menu, and the message:

```
zs decode: unable to decode
```

will be displayed.

Chapter 7 — EEPROM Editing Tool Diagnostic

Add this information to Subsection 7.11, Page 162:

When you choose the **Z**, `Reset EEPROM to all zeros` option on the Main Menu, a submenu displays which allows you to erase or to verify the EEPROM:

```
E               Erase EEPROM
V               Verify EEPROM
```

Chapter 8 — FPA Diagnostic

On pages 168, 169, and 179 of this chapter, it states that the options on the Utilities Menu are not functional. This is incorrect. The options on the Utilities Menu are functional in this release.

Chapter 9 — Sun-3/400 Series FPA-Plus Diagnostic

The tests executed by the Default and Quick Test Sequences on several of the test menus have changed. The description of the *Perform the Default Test Sequence* option on the Control and Path Tests Menu that appears on page 191 should be replaced with the following:

D

The *Perform the Default Test Sequence* option on the Control and Path Tests Menu executes the following tests in sequence:

1. Nack Test
2. Loop Counter Test
3. Pipeline Status Test
4. Operand Data Path Test
5. TI Data Path Test

The default value of `Pass=` is 1.

The description of the *Perform the Quick Test Sequence* option on the Control and Path Tests Menu that appears on page 191 should be replaced with the following:

Q

The *Perform the Quick Test Sequence* option on the Control and Path Tests Menu executes a sequence of the following tests on this menu:

1. Pipeline Status Test
2. Operand Data Path Test
3. TI Data Path Test

The default value of `Pass=` is 1.

The description of the *Perform the Default Test Sequence* option on the RAM Tests Menu that appears on page 195 should be replaced with the following:

D

The *Perform the Default Test Sequence* option on the RAM Tests Menu executes the following tests in sequence:

1. µstore RAM Quick Test
2. µstore RAM Address Unique Test
3. Register File Quick Test
4. Register File Address Unique Test
5. Shadow RAM Test

The default value of `Pass=` is 1.

The description of the *Perform the Quick Test Sequence* option on the RAM Tests Menu that appears on page 196 should be replaced with the following:

Q

The *Perform the Quick Test Sequence* option on the RAM Tests Menu executes a sequence of the following tests on this menu:

1. µstore RAM Quick Test
2. Register File Quick Test
3. Shadow RAM Test

The default value of `Pass=` is 1.

The description of the *Perform the Default Test Sequence* option on the Functional Tests Menu 1 that appears on page 203 should be replaced with the following:

D

The *Perform the Default Test Sequence* option on the Functional Tests Menu 1 executes the following tests in sequence:

1. Micro Store Address Test
2. JMP Address Test
3. Simple Instruction Test
4. Timeout and Retry Test
5. Lock Test
6. Jump Conditions Test

The default value of `Pass=` is 1.

The description of the *Perform the Quick Test Sequence* option on the Functional Tests Menu 1 that appears on page 203 should be replaced with the following:

Q

The *Perform the Quick Test Sequence* option on the Functional Tests Menu 1 executes the following tests:

1. Micro Store Address Test
2. Simple Instruction Test

The default value of `Pass=` is 1.

The description of the *Perform the Default Test Sequence* option on the Functional Tests Menu 2 that appears on page 207 should be replaced with the following:

D

The *Perform the Default Test Sequence* option on the Functional Tests Menu 2 executes the following tests in sequence:

1. Load Pointer Test
2. Pointers (1–4) Test
3. Immed23 Test
4. Pointer Increment/Decrement Test
5. Pointer Five Test
6. TI Operation Test
7. TI Status Test
8. Pipeline Control (timing) Test
9. Pipeline State Machine Test

The default value of `Pass=` is 1.

The description of the *Perform the Quick Test Sequence* option on the Functional Tests Menu 2 that appears on page 207 should be replaced with the following:

Q

The *Perform the Quick Test Sequence* option on the Functional Tests Menu 2 executes the following tests in sequence:

1. Load Pointer Test
2. Pointers (1–4) Test
3. Immed23 Test
4. Pointer Five Test
5. TI Operation Test

The default value of `Pass=` is 1.

Chapter 14 — CG9 Color Graphics Diagnostic

Refer to the `PS` Main Menu choice. The description on Page 326 of the SunDiagnostic Executive User's Guide states that pass/fail statistics will be printed for all commands executed during the current session. This is not true when executing tests from the *Pattern* menu, because the pattern tests are visual; there are no statistics to print.

Chapter 17 — TAAC-1 Applications Accelerator Diagnostic

When running the `TAac` option from the TAAC-1 Diagnostics Main Menu, wait approximately 10-15 minutes for the sequence of memory tests to be completed. The test data sets are quite large and thus require more test time.

Chapter 26 — Sun Ethernet Diagnostic

At the bottom of page 161 in the section entitled "Test Overview," add the following to the list of factors to keep in mind:

3. When running a loopback test, you must have either a null terminated network cable or the loopback connector installed on the CPU board. The pin assignments of the loopback connector are shown in Appendix B. If you run this test with a fully functioning Ethernet, the test may fail intermittently.

This information is also found on Page 642, after the Ethernet Menu, External Loopback test description.

Chapters 29 - 31 — ESP SCSI and SCSI Subsystem

The SCSI3 Host Adapter menu (Page 768 of the SunDiagnostic Executive User's Guide) contains too many entries, causing the top lines on the screen to scroll off the display. This does not affect the operation of the test; it is merely cosmetic.

If no disk is found by SCSI subsystem or ESP SCSI testing, (`scsisub{4}.exec or espscsi4.exec`), a separate menu will come up notifying you of this fact. The SCSI tests use the information from the label on the drive to determine what kind of disk is in the system, and when a valid label is not found (for whatever reason), you must tell the test what to do.

The diagnostics can test a diskless configuration with or without a disk controller. This is done to allow testing of systems in which the disk itself is questionable.

The following example shows what this menu looks like:

```
Command ==>sub
CHECK_CNTR_TYPE: UNKNOWN/NO DISK CONTROLLER INSTALLED
*** UNKNOWN/NO DRIVE INSTALLED, PLEASE SELECT AN OPTION ***
1- Label the drive 0.
2- Format the drive 0.
3- Test diskless configuration.

Which one ?
```

The only valid entries here are **1 , 2 , or 3**. Any other entry results in this message:

```
INVALID ENTRY, PLEASE TRY AGAIN
```

When you enter 1, 2 or 3, the diagnostics asks:

```
Is there a disk controller installed ? [y/n]
```

If you answer **y**, the diagnostic asks:

```
Is Emulex disk controller installed ? [y/n]
```

This choice sets the controller type to either Sysgen or Emulex, depending on whether you answer `n` or `y`, respectively.

If your system has no disk or disk controller, simply respond with **3** and answer **n** to the controller question. The SCSI diagnostic Main Menu will then come up and disk or disk controller testing will not be allowed. The `All` sequence will then automatically test only the tape.

Chapter 29 — ESP SCSI

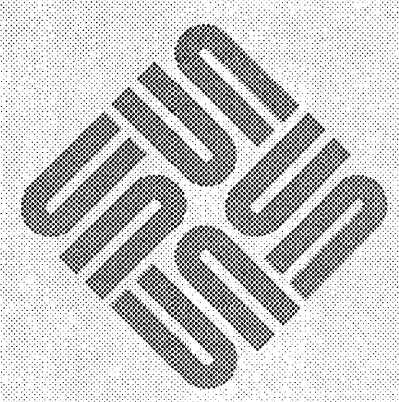
Please replace Chapters 29 and 30 with the following chapter:

29

ESP SCSI Diagnostic

ESP SCSI Diagnostic **27**

29.1. General Description 27
29.2. Hardware Requirements 27
29.3. Starting the Diagnostic 27
29.4. User Interface 27
29.5. The Main Menu 28
29.6. Disk Drive Tests 29
29.7. SCSI Tape Diagnostics 44
29.8. Supported SCSI Commands 52
29.9. Glossary 58



29

ESP SCSI Diagnostic

29.1. General Description

Use the ESP SCSI Diagnostics to verify the functionality of the on-board Extended SCSI Bus Processor chip. The ESP SCSI Diagnostic is similar to the SCSI Subsystem Diagnostic described in the SunDiagnostic Executive User's Guide.

29.2. Hardware Requirements

The following hardware is required to run the ESP SCSI Diagnostic:

- A CPU board with the on-board ESP chip and minimum 4 Mbytes of RAM
- A tested and operational internal embedded SCSI disk drive and/or tape drive
- All hardware supporting the on-board ESP chip previously tested and operational
- A monitor
- A keyboard
- A boot device (local disk, local tape, or remote disk over Ethernet)
- A scratch tape that is NOT write-protected

29.3. Starting the Diagnostic

For information on starting the Exec, refer to Chapter 2, "Using the SunDiagnostic Executive." After you have started the Exec, choose the ESP SCSI Diagnostic from the Diagnostics Menu.

29.4. User Interface

The user interface of the ESP SCSI Diagnostic adheres to the menu standards of the Exec. Each test may be selected from a menu by typing the letter or letters displayed in upper case in the column on the left side of the menu.

29.5. The Main Menu

The ESP SCSI Main Menu is shown below:

```
ESP SCSI SUB-SYSTEM DIAGNOSTICS     Rev: X.X   MM/DD/YY      MAIN Menu

All                 Execute ESP disk and tape tests
Quick               Execute Quick ESP Disk and Tape Tests
DEfault             Default Tests
Drive               Hard Disk Drive Test Menu
Tape Drive          Tape Drive Test Menu
SYSconfiguration    Sub-system configuration
STop on error       Alter Internal Stop on Error Option
Parameters          Set Parameter Menu
?                   Help for Main Menu


Command ==>
```

NOTE *Make sure that the tape you are using for these tests is NOT write-protected. If the diagnostic cannot write to the tape, the test will fail.*

The ESP SCSI Main Menu items are described in the following paragraphs.

All
This selection executes all major tape tests on all attached tape devices, then executes all of the major disk tests on all attached disk devices.

Quick
This selection executes the Quick Tape test on all attached tape devices, then executes the Quick Disk test on all attached disk devices.

DEfault
Entering **de** executes the Default Tape tests on all attached tape devices, then executes all of the Default Disk tests on all attached disk devices.

Drive
Entering **d** allows you to enter a set of disk-oriented menus in which major tests, individual commands, and parameters can be selected. The results are shown in status displays.

Tape Drive
Entering **t** allows you to enter a set of tape-oriented menus in which major tests, individual commands, and parameters can be selected. The results are shown in status displays.

SYSconfiguration
Entering **sys** reinitializes the internal system parameters and reconfigures the attached SCSI devices.

STop on error
Entering **st** allows the alteration of the STOP-ON-ERROR runtime flag.

This program currently halts on any error.

Parameters
This selection will allow the alteration of runtime parameters.

? This selection displays a short message that briefly describes the contents of this menu.

29.6. Disk Drive Tests

The following menu shows the selections for the Disk Drive Tests.

```
SCSI DISK DIAGNOSTICS    Rev:  X.X    11/11/88     MAIN Menu


All           Execute All tests
Quick         Execute Quick Disk Tests
DEfault       Default Disk Tests
Test          TARGET Tests
Cmds          Individual Commands
Init          Initialize TARGET
Format        FORMAT Unit
Parameters    Set Parameter Menu
DP            Display Parameters and Buffers Menu
LDB           Load Buffer With Pattern
?             Help for This Menu.


Command ==>
```

The ESP SCSI Main Menu items are described in the following paragraphs.

All
This selection executes all major Tape tests on all attached tape devices, then executes all of the major Disk tests on all attached disk devices.

Quick
This selection executes the Quick Tape test on all attached tape devices, then executes the Quick Disk test on all attached disk devices.

DEfault
Entering **de** executes the Default Tape tests on all attached tape devices, then executes all of the Default Disk tests on all attached disk devices.

Test
Entering **t** allows you to enter another menu to select a major disk test.

Cmds
Entering **c** allows you to enter another menu to select individual commands to test the default disk drive.

Init

Entering **i** reinitializes the default disk drive. You can change the default disk drive using the *Parameters* selection of this menu or by entering the *Set Parameters* menu.

Format

Entering **f** formats the default disk drive. You can change the default disk drive using the *Parameters* selection of this menu or by entering the *Set Parameters* menu.

Parameters

Entering **p** allows you to enter a set of menus to change the default and run-time parameters.

DP

Entering **dp** allows you to enter a set of menus that display the default and runtime parameters. The displayed data includes the contents of the four internal data buffers and SCSI command-unique input/output buffers.

LDP

Entering **ldp** allows you to select one of the internal data buffers and load a specific data pattern into it.

?

Entering **?** displays a short message that describes the contents of this menu.

Disk Tests Menu

The Disk Tests Menu is displayed after entering **Test** from the SCSI Disk Main Menu. The Disk Drive Tests Menu contains entries that select the available disk drive tests. The Disk Tests Menu is shown below:

```
SCSI Disk Target Diagnostics    Rev: X.X    MM/DD/YY     Main Menu

All             Execute All Tests
Quick           Quick Disk Test
DEfault         Default Disk Tests
SElf            Target Selftest Diagnostic
Bskt            Butterfly Seek Test
Rskt            Random Seek Test
SRonly          Sequential READ ONLY Test
RRonly          Random READ ONLY Test
SWrvt           Sequential Write/Read/Verify Test
RWrvt           Random Write/Read/Verify Test
More            More on Next Menu
Parameters      Set Parameter Menu.
DP              Display Parameters and Buffers Menu
?               Help for This Menu.


Command ==>
```

All
This selection executes all of the major disk tests on all attached disk devices.

Quick
This selection executes the Quick Disk test on all attached disk devices.

DEfault
This selection executes the Default Disk test on all attached disk devices.

SElf
Entering **se** executes the selftest for the default drive. It issues a *send diagnostic* command which uses the default selftest flag.

Bskt
Entering **b** executes the Butterfly Seek Test on the default drive. This test uses two LBA pointers; one initialized to zero, the other initialized to the maximum available LBA for the default drive (obtained via a *read capacity* command). The test then seeks to a pointer and optionally sends a *verify* command to the disk controller. It repeats these operations with the other pointer. Upon successful completion, the first pointer is incremented and the second is decremented. The test completes when the pointers have reached the initial value of the other pointers.

Rskt
Entering **r** executes the Random Seek Test on the default drive. This test generates a random LBA and issues a seek to that LBA. If the default verify flag is not zero, a subsequent *verify* command is issed to the selected disk device. These operations are repeated the number of times specified by the default random operation count.

SRonly
Entering **sr** executes the Sequential Read-Only Test on the default drive. This test starts at the default starting LBA and ends at the default ending LBA. It sequentially reads the LBAs from the disk. This process is nondestructive and relies upon the disk controllers' ability to detect data errors.

RRonly
Entering **rr** executes the Random Read-Only Test on the default drive. This test generates a random LBA within a range bounded by the default starting and ending LBA, then reads the LBA from the disk. This process is nondestructive and relies upon the disk controllers' ability to detect data errors. This process is repeated the number of times specified by the random operation count.

SWrvt
Entering **sw** executes the Sequential Write/Read/Verify Test on the default drive. This test starts at the default starting LBA and ends at the default ending LBA. It sequentially writes a default data pattern on the disk at the current LBA, retrieves the disk-resident LBA into a separate internal data buffer, and then verifies the write and read operation data buffers.

RWrvt

Entering **rw** executes the Random Write/Read/Verify Test on the default drive. This test generates a random LBA within a range determined by the default starting and ending LBA. It then writes a default data pattern on the disk at the current LBA, retrieves the disk-resident LBA into a separate internal data buffer, then verifies the contents of the write and read operation data buffers.

More

Entering **m** advances you to the next associated menu.

Parameters

Entering **p** allows you to enter a set of menus to change the default and run-time parameters.

DP

Entering **dp** allows you to select a set of menus which display the default and runtime parameters.

?

Entering **?** displays a short message that describes the contents of this menu.

Disk Second Test Menu

The SCSI Disk Second Test Menu provides additional disk tests.

```
SCSI Disk Target Diagnostic   Rev: X.X  MM/DD/YY  Second TEST Menu

ONE             Disk Base Test # 1
CS              Compare 8K/56K block, Sequential
CR              Compare 8K/56K block, Random
DR              Disconnect/Reselect Test
DRO             Disconnect/Reselect Test Options
Parameters      Set Parameter Menu
DP              Display Parameters and Buffers Menu
?               Help for This Menu.


Command ==>
```

The items of the Second Disk Target Diagnostic are described below.

ONE

Entering **one** executes a test that verifies all LBAs associated with the selected disk drive. It uses the *verify* command to force the disk controller to perform a CRC Read Check of the LBAs.

CS

Entering **cs** executes a test that sequentially reads one 8kbytes block of data to fill one buffer. It then reads single LBAs to fill a second buffer. It then compares the buffers. This is repeated for a 56 kbyte block and moves sequentially throughout the LBA linear array.

CR

Entering **cr** executes a test that performs the same function as the *CS* test (above), except that it moves randomly through the LBA linear array.

DR

Entering **dr** executes the Disconnect/Reselect disk test. It will only run on attached disks and will attempt to initiate and handle as many 56 kbyte read operations continuously from as many attached disk as is possible. This test **MUST** be halted by you; it won't halt by itself.

DRO

Entering **dro** allows modification of some internal parameters for the Disconnect/Reselect disk test.

Parameters

Entering **p** allows you to enter a set of menus to change the default and run-time parameters.

DP Entering **dp** allows you to select a set of menus which display the default and runtime parameters.

? Entering **?** displays a short message that describes the contents of this menu.

Individual Commands Menu

The Individual Commands Menu contains entries that supports disk testing. The main purpose of this menu is to support user selection and execution of individual SCSI commands. A representation of the actual screen display is shown below.

```
INDIVIDUAL COMMANDS MENU   Rev:  X.X   MM/DD/YY     MAIN Menu


ESP             Initialize ESP
SCSI            Reset SCSI Bus
SELF            Target Selftest Diagnostic
REZero          REZERO Unit
Tur             TEST UNIT READY
SEEK            SEEK
Write           WRITE
Read            READ
CMPB            Compare Internal Buffers
DP              Display Parameters and Buffers Menu
Parameters      Set Parameter Menu.
More            More on Next Menu


Command ==>
```

The following paragraphs describe the entries on the Individual Commands Menu.

ESP

Entering **esp** reinitializes the on-board SCSI controller chip.

SCSI

Entering **scsi** executes a SCSI Bus reset that affects all devices attached to the SCSI Bus. You should expect all such devices to report a Check Condition in the status byte of the first command issued after the SCSI Bus reset. The Check Condition should clear on the second command. You should issue a TEST UNIT READY immediately after the SCSI Bus reset.

SELF

Entering **self** executes a selftest on the default drive. This test issues a SEND DIAGNOSTIC command which uses the default selftest flag.

REZero

Entering **rez** executes a REZERO command. (Refer to the drive's Product Description Manual for a description of this command.)

Tur

Entering **t** executes a TEST UNIT READY command. (Refer to the drive's Product Description Manual for a description of this command.)

SEEK
Entering **seek** executes a SEEK command. (Refer to the drive's Product Description Manual for a description of this command.)

Write
Entering **w** executes a WRITE command. (Refer to the drive's Product Description Manual for a description of this command.)

Read
Entering **r** executes a READ command. (Refer to the drive's Product Description Manual for a description of this command.)

CMPB
Entering **cmpb** compares the internal default write and read buffers.

DP Entering **dp** allows you to select a set of menus which display the default and runtime parameters.

Parameters
Entering **p** allows you to enter a set of menus to change the default and run-time parameters.

More
Entering **m** advances you to the next associated menu.

Individual Commands Menu #2

This menu also provides entries that support disk testing. The main purpose of this menu is to support user selection and execution of individual SCSI commands. A representation of the actual screen display is shown below.

```
INDIVIDUAL COMMANDS MENU   Rev:  X.X    MM/DD/YY    Second Menu


INIT            Initialize TARGET
INQ             INQUIRY
RCAP            READ CAPACITY
RSEN            REQUEST SENSE
MSEL            MODE SELECT
MSEN            MODE SENSE
Verify          VERIFY
STart           START/STOP
DP              Display Parameters and Buffers Menu
Parameters      Set Parameter Menu.



Command ==>
```

The following paragraphs describe the entries on the Individual Commands Menu #2.

INIT
Entering **init** reinitializes the default disk drive.

INQ
Entering **inq** executes an INQUIRY command. (Refer to the drive's Product Description Manual for a description of this command.)

RCAP
Entering **rcap** executes a READ CAPACITY command. (Refer to the drive's Product Description Manual for a description of this command.)

RSEN
Entering **rsen** executes a REQUEST SENSE command. (Refer to the drive's Product Description Manual for a description of this command.)

MSEL
Entering **msel** executes a MODE SELECT command. (Refer to the drive's Product Description Manual for a description of this command.)

MSEN
Entering **msen** executes a MODE SENSE command. (Refer to the drive's Product Description Manual for a description of this command.)

Verify
Entering **v** executes a VERIFY command. (Refer to the drive's Product Description Manual for a description of this command.)

STart
Entering **st** executes a START/STOP command. (Refer to the drive's Product Description Manual for a description of this command.)

DP Entering **dp** allows you to select a set of menus which display the default and runtime parameters.

Parameters
Entering **p** allows you to enter a set of menus to change the default and runtime parameters.

Parameters Menu

The following display is a screen representation of the Parameters Menu.

```
PARAMETER MENU   Rev:  X.X     MM/DD/YY      FIRST Menu


Unit          Target Unit Number
Drive         Target Drive Number
STlba         Starting Logical Block Address
ENDlba        Ending Logical Block Address
Rcnt          Random Operation Count
SEED          Random Seed
Patn          Test Data Pattern
LDB           Load Buffer With Pattern
CMPB          Compare Internal Buffers
CPYB          Copy Buffers
DP            Display Parameters and Buffers Menu
More          More on Next Menu
?             Help for This Menu



Command ==>
```

The following paragraphs describe the entries on the Parameter Menu.

Unit*number*
This entry designates the LUN to be tested. For all currently supported devices, *number* must be ZERO. This is the LUN associated with the CDB.

Drive*number*
This entry designates the SCSI Bus ID address associated with an attached device. *number* may be replaced with drive numbers 0 - 6.

STlba

This entry is the default starting LBA. The minimum value for this parameter is zero. It is set to zero during initialization.

ENDlba

This entry is the default ending LBA. The minimum value for this parameter is zero. It is set to 1000 during initialization. It may be set to a value beyond that available for any particular device. For example, the maximum LBA for a disk can be obtained from a RCAP command.

Rcnt

This entry is the default random operation count parameter. It is used in tests such as the Random Write/Read/Verify Test in which random, valid LBAs are generated and then a write/read/verify operation is performed on that LBA. This determines the number of times the operation is repeated.

SEED

This entry is the default random seed used in to generate random numbers.

Patn

This entry specifies a default pattern and associated parameters.

LDB

Use this entry to specify and load a specific data pattern into one of the internal data buffers.

CMPB

Use this entry to select two of the internal data buffers and compare their contents. The comparison halts on the first error.

CPYB

Use this entry to select two of the internal data buffers and copy it into another selected internal data buffer.

DP

Entering **dp** allows you to enter a set of menus that display the default and runtime parameters. The displayed data includes the contents of the four internal data buffers and SCSI command-unique input/output buffers.

More

Entering **m** advances you to the next associated menu.

? Entering **?** brings up the Help Menu.

Second Parameters Menu

The following display is a screen representation of the Second Parameters Menu.

```
PARAMETER MENU     Rev:  X.X        MM/DD/YY      SECOND Menu

Blen            Block Length
INQ             INQUIRY
RSEN            REQUEST SENSE Parameters
MSEL            MODE SELECT Parameters
MSEN            MODE SENSE Parameters
INTerleave      Format Interleave Factor
Fmtdata         Format Data Pattern
SELF            Selftest Flag, SEND DIAGNOSTIC
More            More on Next Menu
DP              Display Parameters and Buffers Menu


Command ==>
```

Blen

This selection allows you to alter the default block length. **Extreme caution MUST be used when using this parameter.** The currently supported disk devices support only specific block lengths. For example, the internal, embedded-SCSI Quantum device supports 512, 1024, and 2048 byte block lengths only (refer to the Product Description Manual for each device).

INQ

Entering **inq** allows you to enter another menu to alter parameters associated with the INQUIRY command.

RSEN

Entering **rsen** allows you to enter another menu to alter parameters associated with the REQUEST SENSE command.

MSEL

Entering **msel** allows you to enter another menu to alter parameters associated with the MODE SELECT command.

MSEN

Entering **m** allows you to enter another menu to alter parameters associated with the MODE SENSE command.

INTerleave

Entering **INT** allows you to enter interleave parameters used during disk drive formatting.

Fmtdata

Entering **f** allows you to alter the single byte format data pattern used during disk drive formatting. formatting.

SELF

Entering **self** allows you to alter the *selftest* flag used during the SEND DIAGNOSTIC command.

More

Entering **m** brings up the third Parameter Menu.

VF

Entering **vf** allows you to alter the *verify* flag used during the Butterfly Seek Test. If set, this test requests that the disk controller verify the physical storage medium associated with the current LBA after the seek operation has completed.

DP

Entering **dp** allows you to enter a set of menus that display the default and runtime parameters. The displayed data includes the contents of the four internal data buffers and SCSI command-unique input/output buffers.

hird Parameters Menu

The following display is an example of the Third Parameters Menu.

```
  PARAMETER MENU   Rev:  X.X      MM/DD/YY      THIRD Menu

DN              Destructive/Non-Destructive Testing
Xfrt            Type Data Transfer (DMA/non-DMA)
Bskt            Butterfly Seek Test Increment
VF              Verify Flag
SRonly          Seq. Read-only Test Increment
SWrvt           Seq. Read/Verify Test Increment
DP              Display Parameters and Buffers Menu


Command ==>
```

DN Entering **dn** toggles the Destructive/non-Destructive testing option. Destructive Testing destroys data on the tested device.

Xfrt

Entering **x** toggles the data transfer type. The options are DMA and non-DMA. The default is DMA.

Bskt

Entering **b** allows you to alter the Butterfly Seek Test Increment. The range is 1-63,999, and the default is 1001.

VF

Entering **vf** allows you to alter the *verify* flag used during the Butterfly Seek Test. If set, this test requests that the disk controller verify the physical storage medium associated with the current LBA after the seek operation has completed.

SRonly

Entering **sr** allows you to alter the Sequential Read-only Test Increment. The range is 1-63,999. The value is set to 1001 upon initialization.

SWrvt

Entering **sw** allows you to alter the Sequential Write/Read/Verify Test Increment. The range is 1-63,999. The value is set to 1001 upon initialization.

DP

Entering **dp** allows you to enter a set of menus that display the default and runtime parameters. The displayed data includes the contents of the four internal data buffers and SCSI command-unique input/output buffers.

Display Menu

The following display is a screen representation of the Display Menu.

```
PARAMETER AND BUFFER DISPLAY   Rev  X.X   MM/DD/YY   Display Menu


Parms           Display Parameters
MEM             Display Memory
Alter           Alter Memory
DPB             Display a Buffer
ID              Identify Units
INQ             Display INQUIRY
RSEN            Display REQUEST SENSE
MSEL            Display MODE SELECT
MSEN            Display MODE SENSE
RCap            Display READ CAPACITY
MSG             Message Header Information
Global          Global Error
Parameters      Set Parameter Menu
?               Help for this menu


Command ==>
```

The following paragraphs describe the Display Menu options.

Parms
Entering **p** displays the default parameters.

MEM
Entering **mem** displays the contents of a user-specified memory range. The display is presented as 16 lines of 16 bytes per line, each prefaced by the associated memory address.

Alter
Entering **a** allows you to change the contents of one of the four internal data buffers.

DPB
Entering **dpb** allows you to display the contents of one of the four internal data buffers.

ID Entering **id** allows you to identify the devices attached to the SCSI bus. Identification is accomplished by issuing INQUIRY commands to each location on the SCSI bus (refer to the SCSI Standard Specification and the individual Product Description Manuals for a definition of the data associated with the INQUIRY command). The display will present the contents of the common INQUIRY buffer followed by the contents of seven INQUIRY buffers, each associated with an individual SCSI Bus address (identified as Drive 0 through Drive 6).

INQ
Entering **inq** displays the contents of the INQUIRY buffer.

RSEN
Entering **rsen** displays the contents of the REQUEST SENSE buffer.

MSEL
Entering **msel** displays the contents of the of the MODE SELECT buffer.

MSEN
Entering **m** displays the contents of the of the MODE SENSE buffer.

RCap
Entering **rc** displays the contents of the of the READ CAPACITY buffer.

MSG
Entering **msg** displays message header information.

Global
Entering **g** displays the global error counter.

Parameters
Entering **p** allows you to change parameters.

29.7. SCSI Tape Diagnostics

This diagnostic supports the following tape devices:

- HP Model 88780A Front-Loading Tape Drive
- EXABYTE Tape Controller and Drive
- MT02 Tape Controller and Drive

SCSI Tape Diagnostics Main Menu

The SCSI Tape Diagnostics Main Menu is shown below. This menu supports tape system testing.

```
SCSI TAPE DIAGNOSTICS    Rev: X.X    MM/DD/YY      MAIN Menu


All              Execute all Tape tests
Quick            Quick Tape Check
DEfault          Default Tape Tests
Test             TARGET Tests
Cmds             Individual Commands
Parameters       Set Parameter Menu
DP               Display Parameters and Buffers Menu
LDB              Load Buffer With Pattern
?                Help for Main Menu


Command ==>
```

The ESP SCSI Tape Diagnostics Main Menu items are described in the following paragraphs.

All
This selection executes all major tape tests on all attached tape devices.

Quick
This selection executes the Quick Tape test on all attached tape devices, then executes the Quick Disk test on all attached disk devices.

DEfault
Entering **de** executes the default tape tests on all attached tape devices.

Test
Entering **t** allows you to enter another menu to select a major tape test.

Cmds
Entering **c** allows you to enter another menu to select individual commands to test the default tape drive.

Parameters
Entering **p** allows you to enter a set of menus to change the default and run-time parameters.

DP Entering **dp** allows you to enter a set of menus that display the default and runtime parameters. The displayed data includes the contents of the four internal data buffers and SCSI command-unique input/output buffers.

LDP

Entering **ldp** allows you to select one of the internal data buffers and load a specific data pattern into it.

? Entering **?** displays a short message that describes the contents of this menu.

Tape Test Menu

This menu is not currently implemented.

Individual Tape Commands Menu

The Individual Tape Commands Menu supports user selection and execution of individual SCSI tape commands. The Individual Tape Commands Menu is shown below.

```
TAPE INDIVIDUAL COMMANDS MENU    Rev: X.X    MM/DD/YY    1st Menu



SCSI              Reset SCSI Bus
INIT              Initialize TARGET
TOuch             Touch selected device
Tur               Test Unit Ready
INQ               Inquiry
RSEN              REQUEST SENSE
MSEL              MODE SELECT
MSEN              MODE SENSE
REWIND            Rewind Tape
SPACE             SPACE Tape
DP                Display Parameters and Buffers Menu
Parameters        Set Parameter Menu.
More              More on Next Menu


Command ==>
```

The following paragraphs describe the entries on the Individual Tape Commands Menu.

SCSI

Entering **scsi** executes a SCSI Bus reset that affects all devices attached to the SCSI Bus. You should expect all such devices to report a Check Condition in the status byte of the first command issued after the SCSI Bus reset. The Check Condition should clear on the second command. You should issue a TEST UNIT READY immediately after the SCSI Bus reset.

INIT

Entering **init** initializes the on-board SCSI controller chip.

TOuch
Entering **to** executes a TUR and an INQ, then displays the results of the INQ.

Tur
Entering **t** executes a TEST UNIT READY command. Refer to the device's Product Description Manual for a description of this command.

INQ
Entering **inq** queries the attached device and displays the device type.

RSEN
Entering **rsen** executes a REQUEST SENSE command. (Refer to the drive's Product Description Manual for a description of this command.)

MSEL
Entering **msel** executes a MODE SELECT command. (Refer to the drive's Product Description Manual for a description of this command.)

MSEN
Entering **msen** executes a MODE SENSE command. (Refer to the drive's Product Description Manual for a description of this command.)

REWIND
Entering **rewind** executes a REWIND command to the default drive.

SPACE
Entering **space** executes a SPACE command to the default drive.

DP Entering **dp** allows you to select a set of menus which display the default and runtime parameters. Included are the contents of the four internal data buffers and SCSI command-unique buffers.

Parameters
Entering **p** allows you to select a set of menus which display the default and runtime parameters.

More
Entering **m** advances you to the next associated menu.

Individual Tape Commands Menu #2

This Menu also provides entries that support tape drive testing. The main purpose of this menu is to support user selection and execution of individual SCSI commands. A representation of the Individual Tape Commands Menu #2 is shown below.

```
TAPE INDIVIDUAL COMMANDS MENU   Rev: X.X    MM/DD/YY    2nd Menu


WRITE          Write
READ           Read
WFM            Write File Mark
CMPB           Compare Buffer
REV            Read Revision Level
RBlk           Read Block Limit
Erase          Erase Tape
DP             Display Parameters and Buffers Menu
Parameters     Set Parameter Menu.


Command ==>
```

The following paragraphs describe the entries on the Individual Commands Menu #2.

WRITE

Entering **write** executes a tape WRITE command. (Refer to the drive's Product Description Manual for a description of this command.)

READ

Entering **read** executes a tape READ command. (Refer to the drive's Product Description Manual for a description of this command.)

WFM

Entering **wfm** executes a WRITE FILE MARK command. (Refer to the drive's Product Description Manual for a description of this command.)

REV

Entering **rev** executes a READ REVISION LEVEL command. (Refer to the drive's Product Description Manual for a description of this command.)

RBlk

Entering **rb** executes a READ BLOCK LIMIT command. (Refer to the drive's Product Description Manual for a description of this command.)

Erase

Entering **e** executes an ERASE command. (Refer to the drive's Product Description Manual for a description of this command.)

DP Entering **dp** allows you to select a set of menus which display the default and runtime parameters. Included are the contents of the four internal data

buffers and the SCSI command-unique input/output buffers.

Parameters
Entering **p** allows you to enter a set of menus to change the default and run-time parameters.

Parameters Menu

The following display is a screen representation of the first Parameters Menu.

```
   PARAMETER MENU    Rev:  X.X        MM/DD/YY      MAIN Menu


Unit          Target Unit Number
Drive         Target Drive Number
Rcnt          Random Operation Count
Seed          Random Seed
Patn          Test Data Pattern
LDB           Load Buffer With Pattern
CMpb          Compare Buffers
CPyb          Copy Buffers
DP            Display Parameters and Buffers Menu
More          More on Next Menu



Command ==>
```

The following paragraphs describe the entries on the first Parameters Menu.

Unit*number*
This entry designates the LUN to be tested. For all currently supported devices, it must be ZERO. This is the LUN associated with the CDB.

Drive*number*
This entry designates the SCSI Bus ID address associated with an attached device. *number* may be drive 0 - 6.

Rcnt
This is the default random operation count parameter. It is used in tests such as the Random Write/Read/Verify Test in which random, valid LBAs are generated and then a write/read/verify operation is performed on that LBA. This determines the number of times the operation is repeated.

Seed
This entry is the default random seed used in to generate random numbers.

Patn
This entry specifies a default pattern and associated parameters.

LDB

Use this entry to specify and load a specific data pattern into one of the internal data buffers.

CMpb

Use this entry to select two of the internal data buffers and compare their contents. The comparison halts on the first error.

CPyb

Use this entry to select two of the internal data buffers and copy it into another selected internal data buffer.

DP

Entering **dp** allows you to enter a set of menus that display the default and runtime parameters. The displayed data includes the contents of the four internal data buffers and SCSI command-unique input/output buffers.

More

Entering **m** advances you to the next associated Parameters Menu.

Second Parameters Menu

The following display is a screen representation of the Second Parameters Menu.

```
PARAMETER MENU   Rev:  X.X     MM/DD/YY   SECOND Menu

INQ             INQUIRY
RSEN            REQUEST SENSE Parameters
MSEL            MODE SELECT Parameters
MSEN            MODE SENSE Parameters
SELF            Selftest Flag, SEND Diagnostics
VF              Verify Flag
Tokens          Tokens flag
DN              Destructive/non-destructive Testing
Xfrt            Type Data Transfer DMA/non-DMA
XM              Exabyte DMA/non-DMA
GError          Reset Global Error Flag
SELF            Selftest Flag, SEND DIAGNOSTIC
DP              Display Parameters and Buffers Menu

Command ==>
```

The following paragraphs describe the Second Parameter Menu options.

INQ

Entering **inq** allows you to enter another menu to alter parameters associated with the INQUIRY command.

RSEN

Entering **r** allows you to enter another menu to alter parameters associated with the REQUEST SENSE command.

MSEL
Entering **msel** allows you to enter another menu to alter parameters associated with the MODE SELECT command.

MSEN
Entering **msen** allows you to enter another menu to alter parameters associated with the MODE SENSE command.

SELF
Entering **self** allows you to enter another menu to turn on or turn off the *selftest* flag.

VF Entering **vf** allows you to enter another menu to turn on or turn off the *verify* flag. This flag allows you to perform a read/verify write.

Tokens
Entering **t** toggles the *tokens* flag. This flag changes the format of messages displayed on the screen.

DN Entering **dn** allows you to enter another menu to alter parameters associated with destructive and non-destructive testing. Non-destructive testing does not write (destroy) existing data and is the default.

Xfrt
Entering **xfrt** allows you to specify the default type of data transfer operation, either DMA or non-DMA.

XM Entering **xm** displays the current mode for Exabyte data transfer and queries whether you want to change between DMA and non-DMA.

GError
Entering **ge** queries whether you want to reset the Global Errors.

SELF
Entering **self** allows you to alter the *selftest* flag used during the SEND DIAGNOSTIC command.

VF
Entering **vf** allows you to alter the *verify* flag used during the Butterfly Seek Test. If set, this test requests that the disk controller verify the physical storage medium associated with the current LBA after the seek operation has completed.

DP
Entering **dp** allows you to enter a set of menus that display the default and runtime parameters. The displayed data includes the contents of the four internal data buffers and SCSI command-unique input/output buffers.

Display Menu

The following display is a screen representation of the Second Parameters Menu.

```
PARAMETER AND BUFFER DISPLAY  Rev  X.X   MM/DD/YY   Display Menu


PArms            Display Parameters
MEM              Display Memory
Alter            Alter Memory
DPB              Display a Buffer
ID               Identify Units
INQ              Display INQUIRY
RSEN             Display REQUEST SENSE
MSEL             Display MODE SELECT
MSEN             Display MODE SENSE
RCap             Display READ CAPACITY
MSG              Display Message Header Information
Global           Display Global Error Log
Parameters       Set Parameter Menu
?                Help for this Menu


Command ==>
```

The following paragraphs describe the Display Menu options.

PArms

Entering **pa** displays the default parameters.

MEM

Entering **mem** displays the contents of a user-specified memory range. The display is presented as 16 lines of 16 bytes per line, each prefaced by the associated memory address.

Alter

Entering **a** allows you to change the contents of one of the four internal data buffers.

DPB

Entering **dpb** allows you to display the contents of one of the four internal data buffers.

ID Entering **id** allows you to identify the devices attached to the SCSI bus. Identification is accomplished by issuing INQUIRY commands to each location on the SCSI bus (refer to the SCSI Standard Specification and the individual Product Description Manuals for a definition of the data associated with the INQUIRY command). The display will present the contents of the common INQUIRY buffer followed by the contents of seven INQUIRY buffers, each associated with an individual SCSI Bus address (identified as Drive 0 through Drive 6).

INQ
Entering **inq** displays the contents of the INQUIRY buffer.

RSEN
Entering **rsen** displays the contents of the of the REQUEST SENSE buffer.

MSEL
Entering **msel** displays the contents of the of the MODE SELECT buffer.

MSEN
Entering **msen** displays the contents of the of the MODE SENSE buffer.

RCap
Entering **rc** displays the contents of the of the READ CAPACITY buffer.

MSG
Entering **msg** displays messages available about the test including status and error information, and it lists an explanation of all tokens used in message headers.

Global
Entering **dn** displays current global errors and queries whether you want to reset those errors.

Parameters
Entering **p** allows you to change parameters.

29.8. Supported SCSI Commands

The tables in this section list the SCSI commands supported by the

- Internal embedded-SCSI Quantum Disk
- CDC WREN IV SCSI Disk Controller
- HP Model 88780A Front-Loading Tape Drive
- EXABYTE Tape Controller
- MT02 Tape Controller

Internal Embedded-SCSI Quantum Disk

SCSI commands supported by the internal embedded-SCSI Quantum Disk are listed in the following table:

Opcode	Command	Supported
0x00	TEST UNIT READY	Yes
0x01	REZERO UNIT	Yes
0x03	REQUEST SENSE	Yes
0x04	FORMAT UNIT	Yes
0x07	REASSIGN BLOCKS	No
0x08	READ	Yes
0x0A	WRITE	Yes
0x0B	SEEK	Yes
0x12	INQUIRY	Yes
0x15	MODE SELECT	Yes
0x16	RESERVE	No
0x17	RELEASE	No
0x1A	MODE SENSE	Yes
0x1B	START/STOP UNIT	Yes
0x1D	SEND DIAGNOSTIC	Yes
0x25	READ CAPACITY	Yes
0x28	READ EXTENDED	No
0x2A	WRITE EXTENDED	No
0x2B	SEEK EXTENDED	No
0x2E	WRITE AND VERIFY	No
0x2F	VERIFY	Yes
0x37	READ DEFECT DATA	No
0x3B	WRITE BUFFER	No
0x3C	READ BUFFER	No

CDC WREN IV SCSI Disk Controller

SCSI commands supported by the external, shoebox-internal, CDC WREN IV SCSI disk are listed in the following table:

Opcode	Command	Supported
0x00	TEST UNIT READY	Yes
0x01	REZERO UNIT	Yes
0x03	REQUEST SENSE	Yes
0x04	FORMAT UNIT	Yes
0x07	ASSIGN BLOCKS	No
0x08	READ	Yes
0x0A	WRITE	Yes
0x0B	SEEK	Yes
0x12	INQUIRY	Yes
0x15	MODE SELECT	Yes
0x16	RESERVE	No
0x17	RELEASE	No
0x1A	MODE SENSE	Yes
0x1B	START/STOP UNIT	Yes
0x1C	RECEIVE DIAGNOSTIC RESULTS	No
0x1D	SEND DIAGNOSTIC	Yes
0x25	READ CAPACITY	Yes
0x28	READ EXTENDED	No
0x2A	WRITE EXTENDED	No
0x2B	SEEK EXTENDED	No
0x2E	WRITE AND VERIFY	No
0x2F	VERIFY	Yes
0x37	READ DEFECT DATA	No
0x3B	WRITE BUFFER	No
0x3C	READ BUFFER	No

HP Model 88780A Front-Loading Tape Drive

SCSI commands supported by the HP Model 88780A Front-Loading Tape Drive Controller are listed in the following table:

Opcode	Command	Supported
0x00	TEST UNIT READY	Yes
0x01	REWIND	Yes
0x03	REQUEST SENSE	Yes
0x05	READ BLOCK LIMITS	Yes
0x08	READ	Yes
0x0A	WRITE	Yes
0x0D	EXTENDED DIAGNOSTIC	No
0x10	WRITE FILE MARK	Yes
0x11	SPACE	Yes
0x12	INQUIRY	Yes
0x14	RECOVER BUFFERED DATA	No
0x15	MODE SELECT	Yes
0x16	RESERVE	No
0x17	RELEASE	No
0x18	COPY	No
0x19	ERASE	No
0x1A	MODE SENSE	Yes
0x1B	LOAD/UNLOAD	Yes
0x1C	RECEIVE DIAGNOSTIC RESULTS	No
0x1D	SEND DIAGNOSTIC	Yes
0x1E	PREVENT/ALLOW MEDIUM REMOVAL	No
0x1F	READ LOG	No
0x3B	WRITE BUFFER	No
0x3C	READ BUFFER	No

EXABYTE Tape Controller

SCSI commands supported by the EXABYTE Tape Controller are listed in the following table:

Opcode	Command	Supported
0x00	TEST UNIT READY	Yes
0x01	REWIND	Yes
0x03	REQUEST SENSE	Yes
0x05	READ BLOCK LIMITS	Yes
0x08	READ	Yes
0x0A	WRITE	Yes
0x10	WRITE FILE MARK	Yes
0x11	SPACE	Yes
0x12	INQUIRY	Yes
0x14	RECOVER BUFFERED DATA	No
0x15	MODE SELECT	Yes
0x16	RESERVE	No
0x17	RELEASE	No
0x18	COPY	No
0x19	ERASE	No
0x1A	MODE SENSE	Yes
0x1B	LOAD/UNLOAD	Yes
0x1C	RECEIVE DIAGNOSTIC RESULTS	No
0x1D	SEND DIAGNOSTIC	Yes
0x1E	PREVENT/ALLOW MEDIUM REMOVAL	No

MT02 Tape Controller

SCSI commands supported by the external or internal mass storage subsystem, MT02 Tape Controller are listed in the following table:

Opcode	Command	Supported
0x00	TEST UNIT READY	Yes
0x01	REWIND	Yes
0x03	REQUEST SENSE	Yes
0x05	READ BLOCK LIMITS	Yes
0x08	READ	Yes
0x0A	WRITE	Yes
0x10	WRITE FILE MARK	Yes
0x11	SPACE	Yes
0x12	INQUIRY	Yes
0x13	VERIFY	Yes
0x14	RECOVER BUFFERED DATA	No
0x15	MODE SELECT	Yes
0x16	RESERVE	No
0x17	RELEASE	No
0x18	COPY	No
0x19	ERASE	No
0x1A	MODE SENSE	Yes
0x1B	LOAD/UNLOAD	Yes
0x1D	SEND DIAGNOSTIC	Yes
0x1E	PREVENT/ALLOW MEDIUM REMOVAL	No

29.9. Glossary

CDB
: Command Descriptor Block.

CPU
: Central Processing Unit.

COMMAND
: SCSI Bus CDB transfer phase.

DATAIN
: SCSI Bus data transfer phase.

DATAOUT
: SCSI Bus data transfer phase.

Drive
: SCSI Bus ID number for a device.

ESP
: Extended SCSI Processor. The on-board SCSI bus controller chip.

FRU
: Field Replaceable Unit.

LBA
: Logical Block Address.

LUN
: Logical Unit Number.

MSGIN
: SCSI Bus TARGET-to-ESP chip message phase.

MSGOUT
: SCSI Bus ESP-to-TARGET message phase.

STATUS
: SCSI Bus status information transfer phase.

Unit
: LUN in a SCSI CDB.

Chapter 32 — Floppy Diagnostic

Entering A [Control-C] during Floppy Disk testing returns you to the Exec Diagnostics Menu. You must then enter [Esc] to continue.

Chapter 35 — Sun Video Diagnostic

EEPROM Console Setting

Normally, the EEPROM should be set for output to the type of frame buffer under test. For example: Location 01f would contain 00 for a black and white monitor; 12 for a color monitor (CG2, CG3, CG5 or a color daughter board is installed); and 20 when a P4 bus video frame buffer is in use (as in a Sun-3/400 or SPARCsystem 300.)

A system with a high-resolution frame buffer requires that location 016 be set to 13 for a 1600x1280 screen size. Then locations 050 and 051 should contain the hexadecimal values 50 and 22 respectively, to indicate 80 columns and 34 rows.

If the monitor display is not working and the system has a diagnostics switch, you may attach a terminal to Serial Port A (9600 baud) or B (1200 baud), switch the diagnostics switch to "DIAG", reboot the system, and run the video tests from the terminal.

DO NOT SET THE EEPROM FOR OUTPUT TO A SERIAL PORT CONNECTED TO A TERMINAL. Location 01f should never contain a 10 (for output to Serial Port A) during Exec testing. The video diagnostic requires that video output go to a frame buffer. A terminal has no frame buffer.

Loopback Connectors

Appendix B and Chapter 11 of the *SunDiagnostic Executive User's Guide* provide pin assignments for various loopback connectors, making it possible for you to build your own connectors, if necessary. The loopback connectors called for by certain SunDiagnostic Executive tests are also available through Sun Customer Support.

Sun Answer Center Numbers

Sun Microsystems has Answer Centers available throughout the world for questions about both software and hardware support. The list below contains phone numbers for these Answer Centers. If your country is not included in this list, please contact your local Sun sales office.

Country	*Service Region*	*Answer Center Number*
Australia	Sun Australia	(2) 436-4699
Canada		
Central Region:	Ontario	1-800-263-1680
	Ottawa	(613) 723-8510
	Toronto Branch	(416) 490-9490
	Markham (National CSD and Education)	(416) 477-6745
Eastern Region:	New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island, Quebec	1-800-361-1554
	Montreal	(514) 738-4885
Prairies Region:	Saskatchewan, Manitoba	1-800-661-9256 *or* (403) 262-6722
Western Region:	Alberta	1-800-661-3643
	Edmonton	(403) 482-7264
	Calgary	(403) 262-6772
	British Columbia	1-800-663-0440
	Vancouver	(604) 684-4120
France	Paris Sun Microsystems France SA	1 4630 0231
Germany	Munich Sun Microsystems GmbH	89/46008-321
Hong Kong	Sun Asia	(5) 865-1688
Japan	Nihon Sun	(3) 221-7021
	C. Itoh Data Systems	(3) 497-4746
The Netherlands	Soest Sun Microsystems Nederland BV	2155 10326
Sweden	Solna Sun Microsystems AB	8 764 53 29
Switzerland	Zurich Sun Microsystems (Schweiz) AG	1 828 9555
United Kingdom		
European Customer Service:	Surrey Sun Microsystems UK Ltd	276 50183
	Albany Park Sun Microsystems UK Ltd	0276 691974
United States	All, including Puerto Rico	1-800-USA-4-SUN (1-800-872-4786)
Countries Not Listed	All countries outside the USA, Europe, and Northern Africa	(415) 496-6119