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Meridian 1

# **Application Module and Intelligent Peripheral Equipment Module**

## **Advanced Maintenance Guide**

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## About this guide

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This guide describes the Standalone System Interactive Diagnostics (SSID) program (which tests and diagnoses Meridian Link and Customer Controlled Routing system problems) and remote maintenance (which you can use to perform diagnosis from a remote site). This guide assumes that you are familiar with the Application Module and IPE Module operating system and with the operation of the devices you want to diagnose and/or test.

The guide contains seven chapters and one appendix.

- “Introduction” provides a high-level description of SSID.
- “SSID basics” describes how to invoke SSID and run its tests and diagnostics.
- “System commands” describes the commands available in menu mode.
- “Confidence, fault, card, and peripheral testing” describes the various types of test that are available with SSID.
- “CPU, memory, and miscellaneous controller card tests” describes the tests available for the MVME147, MVME167, and SMM167 cards.
- “Communication controller card tests” describes tests for the MVME333-2 card.
- “Remote maintenance” describes how to diagnose many software and hardware problems from a remote site.
- “Appendix A” describes the command line mode commands.

## Conventions used in this manual

The following notation conventions are used throughout this document.

<b>bold</b>	User input appears in <b>bold</b> typeface.
<i>italic</i>	Names of variables to which you must assign values (e.g., <i>x.y</i> ) and parenthetical comments on display screens appear in <i>italic</i> typeface.
constant width	System output (e.g., display screens and responses to commands) appear in constant width typeface.
SA:	This symbol indicates the SSID menu mode prompt. Your particular menu mode prompt may be different.
>	This symbol is the prompt used in command line mode, a testing environment intended for advanced users of SSID (refer to “Command line mode”).
<cr>	In most cases, your typed entry is sent to the system for action when you press Return. Where used, <cr> represents the single key that performs the return function.
<^L>	The caret (^) symbol followed by a character such as the letter L represents a control character. You execute control characters by pressing the <CTRL> key and the alphabetic key simultaneously. For example, the control character <^H> moves left on the line one space at a time, deleting characters; it is used to correct typing errors.

*N* The screen displays shown in this document may vary slightly from your system’s screen displays.

*t*  
*e*  
:

Much of the information contained in this manual is accessible online through the help system command. Refer to help in the chapter on “System commands” for details.

---

# Introduction

---

## SSID overview

SSID is a flexible, expandable set of system level tests and fault isolation diagnostics that can detect any hardware problems that may occur in the Application Module and IPE Module. The package is designed to serve the following distinct end user groups:

- *Manufacturing:* Verifies final system configuration by running the components in the actual target environment.
- *Engineering:* Checks and verifies new designs in a particular system configuration.
- *Field Service:* Measures performance and isolates faults in installed systems.

The many features and utilities of SSID are designed to meet the needs of each end user group. Fault isolation is the goal of SSID, and faults can be isolated to a functional block by using the test package. Component level fault isolation (i.e., testing specific integrated circuits or passive components such as resistors or capacitors) is generally beyond the scope of SSID.



**CAUTION**

SSID runs in a standalone environment; it does not interact with the operating system at any time. It can reside on a tape cartridge or within the operating-system root file system. At system boot time (possibly after shutting down the application, powering down, and rebooting the system), you select SSID in place of the operating system. Once booted, SSID has complete control over all hardware and peripherals. SSID also uses remote communication capabilities to allow off-site test and diagnosis via the internal or external modem.

**Features**

SSID possesses capabilities that set it apart from typical test software and enable it to serve a variety of applications. SSID features include the following:

- tests that execute under a real-time, multi-tasking kernel to simulate the target environment in which the operating system normally resides
- programs developed in C language to ensure ease of porting
- the ability to configure test conditions to match changing hardware configurations or to pinpoint a specific fault or measurement state
- elaborate test environment controls for fault isolation
- timer functions to support system performance measurement
- error logger and I/O redirection capabilities for test record keeping

**Concurrent testing**

Most test and diagnostic software packages use sequential testing, that is, one test runs to completion before the next test starts. Sequential testing is easy to use and generally provides good fault coverage. In the VME environment, individual components such as CPU boards, communication boards, or disk controller boards are often tested in this way before being integrated into the final system configuration.

General fault coverage through sequential testing may be acceptable; however, subtle interactions between modules that could appear in an operating system environment may not occur or be exercised at all. SSID provides an additional form of testing to simulate these interactions while still in a controlled environment.

Besides supporting sequential testing, SSID allows concurrent testing, which better simulates the asynchronous nature of the target systems. Concurrent operation in SSID is a blend of real-time execution (interrupt or exception processing), protected sequential execution (kernel operations that help synchronize and protect shared resources), and time-slice execution (each task is allotted a fixed portion of the available CPU time). Each test module or group of modules can execute in any or all modes, limitations being established only by the individual system components. After verifying system integrity with concurrent testing, the risk of additional failures while running with the operating system is significantly reduced or eliminated.

### **Dynamic test configuration**

You can accomplish dynamic, or *run-time*, changes to SSID in three ways as follows:

- Specify the desired test order from the command line.
- Use various SSID utilities to tailor the execution of tests. For example, enable or disable concurrent test mode or select tests to run once or in a loop-continuous mode. (For more information, refer to the `setopt` command in the “System commands” chapter or the `set` command in “Command line mode”.)
- Use the `cf` command line utility. (For more information, refer to “Command line mode”.)

## **I/O support**

SSID provides the end user with a variety of I/O support capabilities. Normal operator-interface, terminal I/O is the obvious start of the I/O system. You can use I/O redirection to read or write the default or standard input, output, and error output functions to any device that has a device driver installed in SSID. A basic error logger function logs and maintains a summary count of errors occurring on each device so that errors that occur during unattended testing are not lost.

## SSID requirements

To run all SSID functions, the following items are required:

### Hardware

- Application Module or IPE Module
- a “known working” MVME147 card, MVME167 card, or SMM167 card
- system console
- write-enabled blank backup tape
- loopback cables (length 3 inches), with pin outs as shown in Table 1

Table 1  
25-pin loopback cable pin out

Male DB-25 connector pin #	Male DB-25 connector pin #
2 (Tx)	3 (Rx)
3 (Rx)	2 (Tx)
4 (RTS)	5 (CTS)
5 (CTS)	4 (RTS)
8 (DCD)	20 (DTR)
20 (DTR)	8 (DCD)

### Software

- Application Module or IPE Module software, which includes SSID as a bootable file on the operating system

Table 2 provides a summary of SSID tests and diagnostics, which are described in the chapters on “Confidence, fault, card, and peripheral testing”, “CPU, memory, and miscellaneous controller card tests”, and “Communication controller card tests” later in this guide.

*N* Table 2 represents the approximate time to run the test type  
only. The time needed to load the SSID and reboot after testing will  
have to be added to these time values.

*e*  
:

**Table 2**  
**Summary of SSID tests and diagnostics**

Test type	Approximate time	Loop-back cable	Write-enabled medium
<b>Confidence test suites</b>			
Quick system check with communication	30 sec–3 min	yes	yes
Quick system check without communication	30 sec–3 min	—	yes
Continuous running check with communication	(up to user)	yes	yes
System installation check with communication	30 min–1 hour	yes	yes
Continuous running intensive I/O	(up to user)	yes	yes
<b>Fault test suites</b>			
OS system panic	10–35 min	—	yes
System halt	10–35 min	—	yes
Memory fault	2–15 min	—	—
Disk fault	45 min–1 hr	—	—
Tape fault	1 hour	—	yes
Communication fault	5–10 min	yes	—
<b>Board tests</b>			
MVME147/147xx monoboard microcomputer	depends on test(s) chosen	yes	some tests
Interactive memory tests	"	—	—
MVME332XT 8 port communication board	"	yes	—
MVME333-2 X.25 controller	"	yes	—
<b>Peripheral test suites</b>			
VME147/327 SCSI tape drive (DESTRUCTIVE)	1 hour	—	yes
VME147/327 SCSI disk drive	25–45 min	—	*
<b>*Note:</b> Destructive tests are available, but you must use them with care.			

---

## SSID basics

---

This chapter explains how to invoke SSID and how to use its menu system for running tests and diagnostics.

**Invoking SSID on an MVME147 system** Following are steps to boot and execute SSID from disk or tape on a system with an MVME147 SBC card. This procedure assumes all users are logged out and all applications have been stopped.

- 1 Press the Reset button on the MVME147 card, and wait for the diagnostic messages to appear, then type **h**.

If the system displays the 147-Diag prompt, type **menu** then press Return.

*In either case, the start-up interrupt menu appears.*

Figure 1  
Start-up interrupt menu

```
1) Continue System Start-up
2) Select Alternate Boot Device
3) Go To System Debugger
4) Initiate Service Call
5) Display System Test Errors
6) Dump Memory to Tape
Enter Menu #:
```

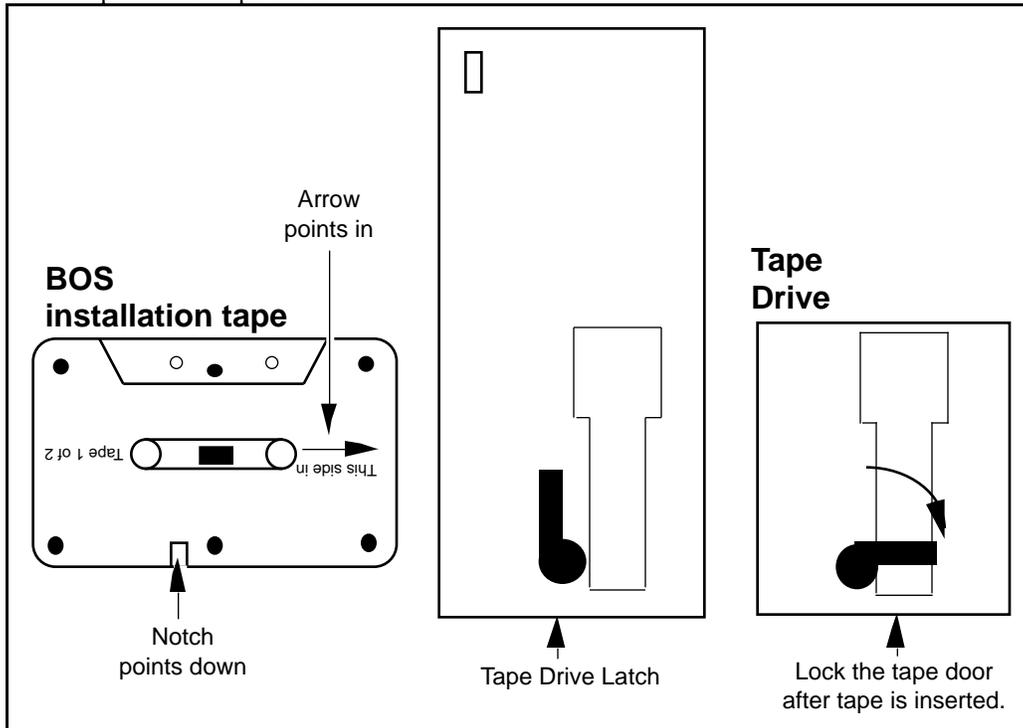
- 2 If you are loading from the hard disk, go to step 3. If not, insert the BOS tape System V/68 BOS R3V7.1 into the tape drive.

## 10 SSID basics

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*The tape indicator light comes on, flashes, and then goes off. Wait for the tape indicator light to turn off before proceeding to the next step.*

Figure 2  
Insert tape into the tape drive



- 3 At the start-up interrupt menu, type **2** and press Return.
- 4 You are prompted to enter the alternate boot device.
  - If you are booting from the hard disk, type **0,0,diag/test147**.
  - If you are booting from tape, type **4,,test147**.

- 5 When the start-up interrupt menu re-appears, type **1** and press Return to continue the system start-up.

*The system starts up. A series of test messages will appear on one line across the screen for approximately 10 minutes. The system start-up messages begin to appear as shown in Figure 10.*

## Invoking SSID on an MVME167 or an SMM167

**system** Following are steps to boot and execute SSID from disk or tape on a system with an MVME167 or SMM167 card. This procedure assumes all users are logged out, all applications have been stopped, and the MVME167 or SMM167 card is not new.

- 1 Press the Reset button on the MVME167 card or the IPE Module, and type **h** as soon as messages start appearing on the console. *The start-up interrupt menu appears.*

*N* If the 167-Diag> prompt appears, type **menu** and press Return.  
*o*  
*t*  
*e*  
*:*

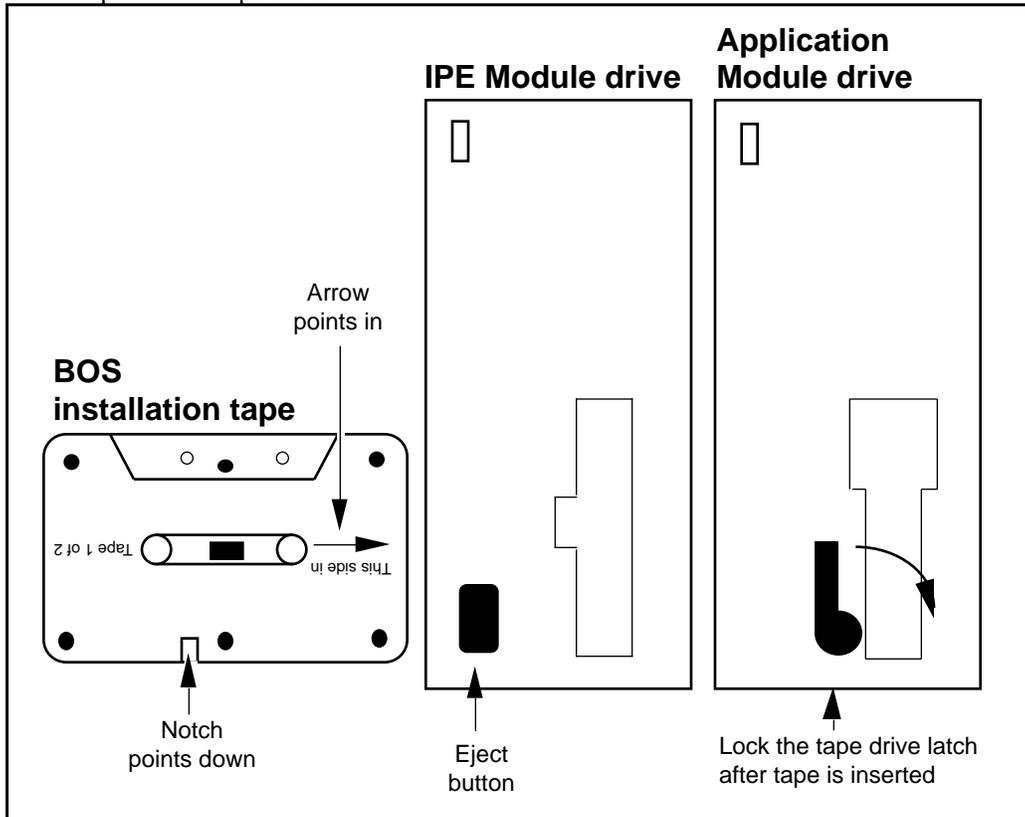
Figure 3

### Start-up interrupt menu

```
1) Continue System Start-up
2) Select Alternate Boot Device
3) Go To System Debugger
4) Initiate Service Call
5) Display System Test Errors
6) Dump Memory to Tape
Enter Menu #:
```

- 2 If you are loading from the hard disk, go to step 3. If not, insert the BOS tape System V/68 BOS R3V7.1 into the tape drive. *The tape indicator light comes on, flashes, and then goes off. Wait for the tape indicator light to turn off before proceeding to the next step.*

Figure 4  
Insert tape into the tape drive



3 At the start-up interrupt menu (Figure 3), type 2 and press Return.

Figure 5  
Alternate boot device prompt

```
Alternate Boot Device (Controller,Drive,File): 0,0,
Change it (Y/N)?
```

- 4 You are prompted to change the alternate boot device (Figure 5). Type **y** and press Return.

Figure 6  
Controller prompt

```
Controller:
```

- 5 You are prompted to enter the controller number (Figure 6). Type **0** and press Return.

Figure 7  
Drive prompt

```
Drive      :
```

- 6 You are prompted to enter the drive number (Figure 7).
  - If you are booting from the hard disk, type **0** and press Return.
  - If you are booting from tape, type **40** and press Return.

Figure 8  
File prompt

```
File      :
```

- 7 You are prompted to enter the file name (Figure 8).
  - If you are booting from the hard disk, type **diag/test167** and press Return.
  - If you are booting from tape, type **test167** and press Return.

*SSID takes approximately two minutes to load.*

Figure 9  
Continue start-up prompt

A rectangular box with a black border containing the text "Continue System Start Up (Y/N)?".

```
Continue System Start Up (Y/N)?
```

- 8 You are prompted to continue start-up (Figure 9). Type **y** and press Return.

*A series of test messages will appear on one line across the screen for approximately 10 minutes. Then system start-up messages appear (as shown in Figure 11).*

## SSID main menu

Once SSID loads, the SSID load menu identifies SSID and some information about the system. The start-up messages on an MVME147 system begin to appear as shown in the following figure.

Figure 10  
MVME147 start-up messages

```

Testing Complete
Autoboot in progress ... To abort hit <BREAK>
Booting from: VME147, Controller 4, Drive 0
Loading: test147

Volume: V/68

IPL loaded at: $001F0000
MVMETAPE IPL Version 1.0

Standalone System Interactive Diagnostics (SSID)
Released Version, Software Product ID: DJ07.30 RM02
Mon Jun 1 15:03:58 MST 1992

System had PMMU installed

Total memory detected = 0x00800000, (8388608 bytes)

Seg      Start      End      Size
0        0x00000000  0x007fffff  0x00800000

Enabling Parity Error Reporting on 147.0
Depress Return to Continue.

```

The following shows the start-up messages on an MVME167 system.

Figure 11  
MVME167/SMM167 start-up messages

```

Testing Complete
Autoboot in progress ... To abort hit <BREAK>
Booting from: VME167, Controller 0, Drive 40
Loading: test167

Volume: V/68

IPL loaded at: $001F0000
MVMETAPE IPL Version 1.0

Standalone System Interactive Diagnostics (SSID)
Released Version, Software Product ID: DJ07.30 RM02
Mon Jun 1 15:03:58 MST 1992

Board Type is "VME167"
MMU enabled.
Data Cache and Instruction Cache enabled.

Total memory detected = 0x01000000, (16777216 bytes)

Seg      Start      End      Size
0        0x00000000  0x00ffffff  0x01000000

Enabling Parity Error Reporting on 167.0
Depress Return to Continue.

```

The start-up messages show, in hexadecimal and decimal, the total memory detected by SSID. In addition, the display shows the start, end, and size of each contiguous block of memory.

SSID then tells you to press Return to continue. You then see the SSID main menu (Figure 12).

```

N      Remove the BOS tape before performing any SSID tests.
o
t
e
:
    
```

**Figure 12**  
**SSID main menu**

```

*****
***** SYSTEM COMMANDS ***** MENU SELECTIONS *****
*   help      remote   disperr  **   confid     bctest   *
*   /         cmdline  version  **   fault      ptest    *
*   disphrd   clear    setopt   **                               *
*   view      slctdev  gotobug  **                               *
*****
Current Menu is / - "System monitor"
help          - Using Diagnostics          (informational screens)
confid        - Confidence Testing         (test suites)
fault         - Test Selection by Fault    (test suites)
bctest        - Test by Board              (individual board tests)
ptest         - Peripheral Testing         (test suites)
ptesti        - Peripheral Testing         (test suites)
continued
cmdline       - Command Line Operations    (operations for advanced users)
SA:
    
```

The command review block (the upper part of the menu display) provides a quick reference to the SSID system. It is divided into System Commands and Menu Selections.

System commands perform functions unrelated to testing. You can execute a system command any time a test is not in progress by typing its name. Commands are explained further in the “System commands” chapter.

*N* The command review block is not shown in the menu displays on this manual.

*t*

*e*

:

You use menu selections to access the menus that prompt you for information necessary to perform the tests and diagnostics. Table 3 describes the menu selections. The chapter on “Confidence, fault, card, and peripheral testing” discusses the confid, fault, and ptest menu selections; the chapters on “CPU, memory, and miscellaneous controller card tests” and “Communication controller card tests” cover bdtest menu selections.

**Table 3**  
**Menu selections**

Selection	Description
<b>confid</b>	Test suites that verify total system health. They are useful at initial system installation and after a major system-component replacement (refer to the chapter on “Confidence, fault, board, and peripheral testing”).
<b>fault</b>	Test suites that test and diagnose specific system failures (refer to the chapter on “Confidence, fault, board, and peripheral testing”).
<b>bdtest</b>	Individual tests that verify operation of specific boards in the system. Such testing is especially valuable whenever a board is replaced (refer to the chapter on “Confidence, fault, board, and peripheral testing”).
<b>ptest/ ptesti</b>	Test suites that test and diagnose disks and tape devices attached to the system (refer to the chapter on “Confidence, fault, board, and peripheral testing”).

## Guidelines for using SSID

The following guidelines will assist you in using SSID:

- Press Return after every keyboard selection.

- Correct typing errors by using <^h> or pressing Backspace (ASCII code hex 08).
- Stop a display from scrolling off the screen by using <^s> (ASCII code, hex 13). Resume scrolling with <^q> (ASCII code, hex 11). Terminals supported by Northern Telecom have a hold screen function key that stops and restarts scrolling.
- Before executing any test or test suite, read the help item or relevant section of this manual. Remember that some tape tests destroy the data on the tape.
- Before executing any test suite, view the individual tests making up the suite by using the view command described in the “System commands” chapter.
- Access any menu by typing its name and pressing Return.
- When you make a selection from a confid, fault, ptest or ptesti menu, a suite of tests is performed; each bctest menu selection executes only one test.
- SSID allows you to set various test options, such as verbose mode, concurrent mode, and display-all-errors mode. Refer to the setopt command in the “System commands” chapter for details.
- If SSID executes a test requiring a loopback cable without the cable installed, the test or diagnostic may execute improperly. If this happens, install the cable and reboot SSID.
- If SSID executes a test requiring a scratch tape without the scratch tape installed, the test or diagnostic may execute improperly. If this happens, install the scratch tape and reboot SSID.

## Terminating SSID

When stopping an SSID test or the program itself, follow the guidelines listed below.

- Stopping a test



**CAUTION**

Using the Break key sometimes causes diagnostics to become corrupted. If this happens, reboot SSID.

Press the Break key (ASCII code, hex 0) to stop an SSID test. Any errors detected by the test or test suite before the test stops will NOT appear in the error log.

- Powering off a console

Never power off or remove the system console while executing SSID tests. If this happens, reboot SSID.

- Stopping SSID

To exit the SSID program, power off or reset the system. No disk should be under test during power off; however, you may reset the system during a disk test.

---

## System commands

---

You can use system commands to perform functions unrelated to testing any time a test is not in progress. Commands are summarized in Table 4 and described in detail in this chapter.

**Table 4**  
**System commands**

Command	Description
help	Displays the help menu, which gives access to online information.
/	Returns to the SSID main menu.
disphrd	Displays the boards whose presence is sensed by SSID.
remote	Allows dial-in to a remote terminal connected to a modem.
cmdline	Exits the menu mode to perform various tasks.
clear	Clears all system error logs (unless <i>local</i> to a test) and pass counters.
disperr	Lists the accumulated error summary and the pass count.
version	Displays the current revision data for SSID.
setopt	Sets options for tests.
view	Displays the individual tests making up any confidence, fault, or peripheral suite.
slctdev	Allows the display and online reconfiguration of SCSI controllers and devices. Required only if you do not have the default SCSI devices and/or target addresses.

## 24 System commands

---

gotobug	Allows the user to exit SSID and return to the Diag prompt (e.g., 147Diag>). At the BUG prompt, enter <b>g&lt;cr&gt;</b> to return to SSID.
---------	---

## Help

This command displays the main help menu. Once in the help program, you can access online information about SSID operations and all SSID tests and test suites. This manual is based on the information in the help program.

To access the main help menu, type the following:

SA: **help**

Press Return. The following menu appears:

Figure 13  
Main help menu

```

Main Help Menu
1) How To Use System Diagnostics
2) Confidence Testing ("confid")
3) Testing of Specific Faults ("fault")
4) Testing of Individual Boards ("bdtest")
5) Peripheral Testing ("ptest")
Enter topic number or "6" to return to system test menu:
```

The following describes each topic in the help menu:

1) How to use system diagnostics

Items in this section provide general information about system commands and guidelines for using SSID menus.

2) Confidence testing (confid)

Items in this section describe the confidence checks that verify total system health. The tests are useful at initial system installation and after a major system component replacement. Refer to the chapter on “Confidence, fault, card, and peripheral testing” for details.

3) Testing of specific faults (fault)

Items in this section describe tests and diagnostics that deal with a specific system failure. For example, if you decide to run the OS System Panic test because you received an operating system panic message, the OS System Panic item will provide you with information about the test before you run it. Refer to the chapter on “Confidence, fault, card, and peripheral testing” for details.

4) Testing of individual cards (bdtest)

Items in this section describe tests which verify the operation of a specific card in the system. Such testing is valuable whenever you replace a card. Refer to the chapters on “CPU, memory, and miscellaneous controller card tests” and “Communication controller card tests” for details.

5) Peripheral testing (ptest)

Items in this section describe test suites and diagnostics available for disks and tape devices attached to the system. Refer to the chapter on “Confidence, fault, card, and peripheral testing” for details. Individual tests in the test suites can be run separately through the bdtest menu (refer to the chapters on “CPU, memory, and miscellaneous controller card tests” and “Communication controller card tests” for details).

**/ (slash)**

This command returns the SSID program to the System Monitor (home) menu. To access the home menu, type the following:

SA: /

Press Return. The main SSID menu appears (Figure 14), showing the System Monitor menu as the current menu.

**Figure 14**  
**Main SSID menu**

```

*****
***** SYSTEM COMMANDS ***** MENU SELECTIONS *****
*   help      remote   disperr  **   confid    bdtest   *
*   /         cmdline   version  **   fault     ptest    *
*   disphrd   clear     setopt   **                               *
*   view      slctdev                **                               *
*****

Current Menu is / - "System monitor"
help                - Using Diagnostics
confid              - Confidence Testing
fault               - Test Selection by Fault
bdtest             - Test by Board
ptest              - Peripheral Testing
ptesti             - Peripheral Testing continued
cmdline            - Command Line Operations
loggers            - Loggers and Scanners
SA:

```

## disphrd

This command displays the boards whose presence is sensed by SSID when it probes to determine which VME boards are installed. (If a board is completely dead, it may not be recognized.) The display is identical to the main bdttest menu.

To display the hardware in your system, type the following:

SA: **disphrd**

Press Return. A display similar to the following appears for an MVME147 system:**Figure 15**

### Display of hardware in an MVME147 system

```
Current Menu is /bdtest - "Tests by Board"

147.0      - VME147 Board Tests
mem.0      - Memory Test
320.0      - VME320 Disk Controller Tests
G330.0     - VME330 GSP LAN Board Test
333.0      - VME333 WAN Communications Board Test

SA:
```

A display similar to the following appears for an MVME167 system:

**Figure 16**  
**Display of hardware in an MVME167/SMM167 system**

333p.0	- VME333p Communications Board Test
1x7lp.0	- VME1x7 Printer Port Test
1x7sp.0	- VME1x7 Comm Port Tests
1x7lan.0	- VME1x7 LAN Tests
1x7scsi.0	- VME1x7 SCSI Tests
mem.0	- Memory Test

## remote

For systems with an internal modem, this command allows you to run diagnostics at a remote terminal connected to a modem. In addition, the remote command allows connection to a remote terminal on port 2 of the host CPU transition board. Once you are connected to the remote terminal, you see all keyboard activity and screen displays concurrently. All your keystrokes are echoed to the remote site and vice versa. Likewise, you or the person at the remote terminal can perform all SSID functions.

While connected to the remote terminal, you can choose a conversation mode that allows you to communicate via typed messages to the individual at the remote terminal. SSID ignores all activity done in conversation mode.

To initiate the remote link, type the following:

SA: **remote**

Press Return. The following prompt appears: "Is the remote a terminal or modem (t/m)?"

If you request a remote terminal connection (t), the remote command connects you to port 2 of the host CPU transition board at 9600 baud. The terminal connection is complete when the previous SSID menu reappears. All SSID functions you perform are visible on the remote terminal and the person at the remote terminal can perform any SSID function.

If you request a remote modem connection (m), the following prompt appears: "Is modem already connected (y/n)?"

If the modem is connected, type **y** and press Return. The following prompt appears: "Remote link up. Depress Return to Continue." You are now linked to the remote modem.

If the modem is not connected, type **n** and press Return. You are prompted to enter the phone number. When you enter the phone number, include the following symbols as needed:

**T** tone dial (default)  
**P** pulse dial (rotary)  
, wait two seconds  
= pause and search for another dial tone

For example:

**PO,,,6023214567**

where **P** indicates a pulse dial telephone and **,,,** requests a six-second delay after dialing the **0**. The delay gives the PBX time to connect your call to an outside line.

If the connection is successful, the following prompt appears: "Remote link up. Depress Return to Continue." You are now linked to the remote modem.

If there are problems connecting to the remote modem, you may receive one of the following messages:

```
Hanging Modem up
Retrying      (the remote command retries four times)
Enter phone number:
```

```
Remote link failed:
DIALING
NO ABT      (ABT = answer back tone)
```

```
Remote link failed:
DIALING
BUSY
```

```
Remote link failed:
DIALING
NO DIAL TONE
```

To disconnect the remote link or enter conversation mode, type the following:

SA: **remote**

Press Return. You are then prompted, as follows: “Do you wish to disconnect the remote link (y/n)?” If you type **y** and press Return, the prompt “Depress Return to Continue” appears and the remote link is disconnected.

If you type **n** and press Return, you are prompted, as follows: “Do you wish ‘Conversation Mode’ (y/n)?”. Type **y** and press Return. Press Return again followed by a period when ready to exit Conversation Mode.

## cmdline

This command causes SSID to exit the menu mode and enter another testing environment, the command line mode. (Refer to “Command line mode” for a discussion of the command line mode.) Once in command line mode, type **set menu** and press Return to return to menu mode.

*N* This command is intended for advanced users of SSID.  
*o*  
*t*  
*e*  
*:*

## clear

This command clears all system error logs and pass counters. Once a test fails, the `SYSTEM TEST FAIL` message displays. You must use the `clear` command to continue testing (unless you have enabled the `continue-on-error` test option as described in “setopt” later in this chapter. The `clear` command does not clear local error logs such as those used for MVME147 SCSI errors (refer to MVME147 SCSI test descriptions for further information).

To clear error logs and pass counters, type the following:

SA: **clear**

Press Return. You are prompted to enter one of the following:

- **a** to clear all logs
- the menu selection number of the individual log to be cleared

- **q** to quit

Type the appropriate response and press Return.

The following message appears:

Depress Return to continue.

Press Return again. Notice that the clear command does not issue a message stating that the logs and counters have been cleared. Use the disperr command before and after the clear command to see its effect. Figure 17 shows a typical example of what appears on the screen when the disperr command is used:

**Figure 17**  
**Clear command display**

```
SA: disperr <cr>
Pass-Count = 0
 /bdtest/320.0/hd.1           :error=0, fatal=1
 /bdtest/320.0/hd.0           :error=5, fatal=2
*****      SSID ERROR LOG MENU      *****
1) 320.0/hd.1           2) 320.0/hd.0
Enter "a" to display all logs, the number from list above
to clear only one log or "q" to quit: q
Depress Return to Continue <cr>
SA: clear <cr>
*****      SSID ERROR LOG MENU      *****
1) 320.0/hd.1           2) 320.0/hd.0
Note: The individual device error logs will be out of
      sync with the error log count summary if all of the
      logs are not cleared.
Enter "a" to clear all logs, the number from list above
to clear only one log or "q" to quit: a
(The previous menu is displayed.)
SA: disperr <cr>
Pass-Count = 0
Depress Return to Continue <cr>
```

## disperr

This command lists the accumulated error summary and the pass count.

To display all errors, type the following:

SA: **disperr**

```
Pass-Count = 0  
Depress Return to Continue
```

Press Return. The example in the previous section (the clear command) shows a disperr command output.

## version

This command displays the current revision and date/time of creation for SSID as shown in the following example:

**Figure 18**  
**Current version and date/time of creation for SSID**

```
SA: version <cr>  
Standalone System Interactive Diagnostics (SSID)  
Released Version, Software Product ID: DJ07.30 RM02  
Mon Jun 1 14:56:43 MST 1992  
  
Depress Return to Continue <cr>
```

## setopt

This command allows you to enable or disable the test options listed below:

**lc** loop-continue (default: disabled)

When enabled, this variable causes SSID to repeat a test or test suite continuously until you press the break key (ASCII code, hex 0).

**le** loop-on-error (default: disabled)

When enabled, this variable causes SSID to repeat a failing test until the test passes. It is useful if you want to see an error occur repeatedly.

**li** loop-on-intermittent-error (default: disabled)

When enabled, this variable causes SSID to repeat a test that fails randomly.

**vb** verbose mode (default: enabled)

When enabled, this variable determines how much status and error information displays while tests are running. When the variable is disabled, SSID suppresses information about individual tests; only the execution time and test outcome (passed or failed) display.

**ce** continue-on-error (default: disabled)

When enabled, this variable causes a test to continue to run even when an error has been detected. When ce is disabled, SSID stops after the current test completes if an error has occurred. Enable ce if you want to see all possible errors in a given test suite or sequence.

**ae** display-all-errors (default: disabled)

When enabled, this variable permits the display of all errors that result from data comparisons during a test. If you are interested only in whether a test passes or fails, disable ae so that only the first data comparison error message displays.

**dp** display packets (default: disabled)

When enabled, this variable displays packet activity as it occurs. When disabled, no packets are displayed unless an error occurs. On the MVME147, this option is used to display SCSI packets if an error occurs during execution of the packet. (A packet is a block of data containing commands and control information and will vary in content between controllers—refer to the appropriate card information in the chapters on “CPU, memory, and miscellaneous controller card tests” and “Communication controller card tests”.) The figure below shows a packet as it might be displayed if dp were enabled.

Figure 19  
Packet with dp enabled

cmd	-p	stat	_p	pkt_no	cmd	type	am	dw	pu	su	pri_addr	sec_addr
01		ff		00000005	2001	02	05	01	00	00	00000000	0000ffff
count	ctrl0	ctrl1	ctrl2	comp_st	ss	ls	rcnt	pri_sadr	sec_sadr			
00000096	ffff	ffff	ffff	c2000000	00	00	0000	0000a4fe	00000000			
term_cnt	stat0	stat1	stat2									
00000000	0000	4031	0000									

**con** concurrent mode (default: enabled)

When enabled, this variable allows multiple tests to be run on the current command line concurrently or in parallel. Disable con if you want to run a group of tests on the command line sequentially.

**time** display elapsed time (default: disabled)

When enabled, this variable displays the elapsed time of the test or test suite in the following format:

Execution time (hrs:min:sec.ms) = hrs:min:sec.ms

This information is not shown if time is disabled.

**menu** prompt by menu (default: enabled)

This option causes SSID to return to the previous menu screen after the execution of any command, test, or test suite. Switching to command line mode automatically disables this option.

*N* Most confid, fault, ptest, and ptesti test suite options are set in the test scripts themselves and are, therefore, unaffected by option settings made using the setopt command.

*e*

To change any of the preceding test options, type the following:

SA: **setopt**

Press Return. A display similar to the following appears.

**Figure 20**  
**Option settings**

```
SA: setopt
Setopt
Current option settings are: (This display shows the default settings.)
1)          lc - disabled loop-continue
2)          le - disabled loop-on-error
3)          li - disabled loop-on-intermittent-error
4)          vb - enabled verbose-mode
5)          ce - disabled continue-on-error
6)          ae - disabled display all errors
7)          dp - disabled display packet
8)          con - enabled concurrent-mode
9)          time - disabled execution-time
10)         menu - enabled prompt by menu
11)         set all options to default setting
12)         to exit setopt
           (This example shows how to disable the verbose mode option.)
Enter the number of the option to be changed: 4<cr>

vb - enabled verbose-mode
Enter: 1 to enable or 2 to disable: 2<cr>

           (The setopt display screen reappears with verbose mode disabled.)

Enter the number of the option to be changed: 12<cr> (to exit setopt.)
Depress Return to Continue <cr>
```

## view

The view command displays the individual board tests making up any confidence, fault, or peripheral test suite. Note that the tests are not run with the view command, which is a display-only command.

To display any confidence suite, type the following:

SA: **view confid**

Press Return. The confidence menu displays. Type the number of the suite you wish to view and press Return. If you select confidence test 1, a display similar to the following appears:

**Figure 21**  
**Confidence suite**

```
Quick System Confidence Check with Comm.:  
set +vb -ce +time;mem.0 2;131.0;320.0/hd.0 01;332-0/sp.0;350.0/tp.0  
c0120c0120  
Do you wish to select another confid script for viewing?  
y - reselect, n - exit view
```

The suite displays in the same format used to specify multiple card tests. Refer to “Performing Multiple Card Tests” in the chapter on “Confidence, fault, card, and peripheral testing”. Testing environment options set with the setopt command does not affect options in confid/fault and peripheral tests. For more information, refer to “Command line mode”.

If you want to view another confidence suite, type **y** and press Return. The confidence screen redisplay, and you can enter the number of the desired suite.

To exit the view confidence suites, type **n** and press Return; the menu present when view confid was entered redisplay. After exiting the view command, select suites to run them instead of display.

You may use the view command in a similar manner for fault (view fault) and peripheral (view ptest, view ptesti) suites.

The view command is not available for board tests.

## slctdev

This command displays the current SCSI configuration for all configurable controllers, and allows you to select different devices for each target address.

To display and/or change the SCSI configuration, type the following:

SA: **slctdev**

Press Return. A display similar to the following appears for an MVME147 system:

**Figure 22**  
**SCSI configuration selection menu (MVME147)**

```
Select from the following:

q) Quit slctdev program
1) 147.0
2) 327.0
3) 327.1

Enter Selection:
```

A display similar to the following appears for an MVME167/SMM167 system:

**Figure 23**  
**SCSI configuration selection menu (MVME167/SMM167)**

```
Select from the following:

q) Quit slctdev program
1) 1x7scsi.0

Enter Selection:
```

Type the menu number of the controller for which SCSI devices are to be configured and press Return. The current SCSI configuration for the selected controller displays, as shown in the following typical display (Figure 24).

**Figure 24**  
**Current SCSI configuration**

```
CURRENT DEVICE CONFIGURATION
Current configuration for target[0]: System V/68 CDC III 150 MB SCSI
Current configuration for target[1]: NONE
Current configuration for target[2]: NONE
Current configuration for target[3]: NONE
Current configuration for target[4]: Archive Streaming Tape Drive
Current configuration for target[5]: NONE
Current configuration for target[6]: NONE

DEPRESS RETURN TO CONTINUE
```

Press Return to display the first target menu similar to the following, which, although for an MVME147 system, is similar to that for an MVME167/SMM167 system:

**Figure 25**  
**First target menu**

```

                                SYSTEM COMMANDS
Select a controller for target 0 from the following list:
- 512 byte sectors:  SYSTEM V/68 and V/88 hard disks and DSHD floppies
- 256 byte sectors:  VERSAdos hard disks and SYSTEM V/68 and V/88 DSDD floppies
 1 * CDC III (150MB) 512 byte sectors      2 - Mic1375 (150MB) 512 byte sectors
 3 - CDC IV (300 MB) 512 byte sectors      4 - CDC V (600MB) 512 byte sectors
 5 - Seagate (40MB) 512 byte sectors       6 - Seagate (85MB) 512 byte sectors
 7 - Swift (104MB) 512 byte sectors       8 - Swift (172MB) 512 byte sectors
 9 - CDC III (150MB) 256 byte sectors     10 - CDC IV (300MB) 256 byte sectors
11 - Seagate (40MB) 256 byte sectors      12 - Seagate (85MB) 256 byte sectors
13 - 655KB 5.25" Floppy 256 byte sectors  14 - 1.2MB 5.25" Floppy 512 byte sectors
15 - 750KB 3.5" Floppy 512 byte sectors   16 - 1.5MB 3.5" Floppy 512 byte sectors
17 - 2.9MB 3.5" Floppy 512 byte sectors   18 - 1.2MB 5.25" Floppy 256 byte sectors
19 - ARCHIVE or TEAC Streamer            20 - KENNEDY 9 Track Tape 96X0
21 - EXABYTE 2GB Tape

r - no controller          n - go to next controller
b - start over at controller 0  q - quit selection program

```

The display lists all possible devices for target address 0. The entry number followed by an asterisk (\*) specifies the currently selected device for the target address on the screen. To select a different device for the displayed target address, type the number associated with the desired device and press Return. The selections for the next target address then display. If you do not want to change the device for the target address you are currently viewing, press Return to go to the next target address.

To remove a configured device from a SCSI target address, type **r** and press Return. To restart the configuration for this controller at SCSI target 0, type **b** and press Return. To exit from configuration for this controller, type **q** and press Return.

After displaying the device options for all target addresses or after quitting (by typing **q** and pressing Return), the CURRENT DEVICE CONFIGURATION message displays again, showing the changes made with the slctdev command; press Return to redisplay the slctdev menu. Select another controller to configure or type **q** and press Return to exit from the slctdev command.

All SSID tests now reflect the changes just made. Note, however, that the ptest scripts work only if target addresses 0, 1, 2, 3, and 6 are disk drives, and target addresses 4 and 5 are tape drives.

## **gotobug**

This command returns the user to the Diag prompt (for example, 147-Diag>) to execute bug commands. As long as a reset has not been executed, you can return to SSID at the point where the gotobug command was executed by entering **g** and pressing Return. If memory locations containing code were modified, it may be necessary to reboot SSID.

---

## Confidence, fault, card, and peripheral testing

---

### Confidence testing

Confidence testing verifies total system health by running a dynamically configured suite of tests. Before performing a confidence test, read this chapter or read the help screens related to confidence testing. Both sources describe the various confidence test suite available through the `confid` menu. You can display the individual tests making up the suites with the `view` command.

To access the `confid` menu, type the following:

SA: **`confid`**

Press Return. The following display appears (Figure 26):

**Figure 26**  
**confid menu**

```
Current Menu is /confid - "Confidence Testing"
1          - Quick System Confidence Check with Comm.
2          - Quick System Confidence Check without Comm.
3          - Continuous Running Confidence Check with Comm.
4          - System Installation Confidence Check with Comm.
5          - Continuous Running Intensive I/O check with Comm.
(Tests 1 through 5 require write-enabled tapes installed in all tape drives attached to the system.)
(Tests 1, 3, 4, and 5 require loopback cables.)
SA:
```

Install loopback cables, if required, then type your selection and press Return. The tests run. After the tests complete, you are prompted to press Return to continue. Press Return to go to the confid menu. To go to the System Monitor menu, type / and press Return.

### Quick system confidence checks

The Quick System Confidence Checks (menu selections 1 and 2) verify that all major system components are healthy. The tests take from 30 seconds to three minutes depending on system memory and disk configuration.

There are two types of Quick System Confidence Check. The first type tests the system with communication boards connected. To run this test suite, loopback cables are required on ports 1 and 2 of each MVME332XT communication board and on ports 1 and 3 of each MVME333-2 X.25 communication board. Loopback cable pin outs are described in the "Introduction" chapter.

Connect the loopback cables as follows:

```
MVME332XT :      SP1 <-----> SP2
MVME333-2 X.25 :  SP1 <-----> SP3
```

The second type of Quick System Test does not include communication testing and can be run without loopback cables.

Both Quick System Confidence Checks require write-enabled tapes installed in all tape drives attached to the system.

### **Continuous running confidence check and continuous running intensive I/O check**

This confidence check (also known as Continuous Burn-In) allows you to observe what happens to the system after many hours of continuous use. It reruns a specific set of tests until the break key is pressed. This confidence check requires loopback cables on all port pairs of all MVME332XT boards and on ports 1 and 3 of each MVME333-2 X.25 communication board. Loopback cable pin outs are described in the "Introduction" chapter.

Connect the loopback cables as follows:

```
MVME332XT :    SP7 <-----> SP2  
                SP5 <-----> SP6  
                SP3 <-----> SP4  
                SP1 <-----> SP2
```

```
MVME333-2 X.25 :  SP1 <-----> SP3
```

### **System installation confidence check**

You can run this confidence test after system installation to verify the total system, including communication. The test takes 30 minutes to one hour depending on system memory and disk configuration. This confidence check requires loopback cables on ports 1 and 2 of each MVME332XT communication board and on ports 1 and 3 of each MVME333-2 X.25 communications board. Loopback cable pin outs are described in the "Introduction" chapter.

```
MVME332XT :    SP7 <-----> SP8  
                SP5 <-----> SP6  
                SP3 <-----> SP4  
                SP1 <-----> SP2
```

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---

**MVME333-2 X.25 :** SP1 <-----> SP3

## Fault testing

Fault testing checks and diagnoses specific system failures by running a dynamically configured suite of tests. Before performing a fault test, read this chapter or read the help screens related to fault testing. Both sources describe the various fault test suites available through the fault menu. The individual tests making up the suites may be displayed with the view command.

The fault menu contains test suites used to diagnose specific system failures. These suites test the requested category intensively and check the interaction between other related components in the system. For example, if the operating system reports a memory fault, run the memory fault test. This test intensively tests system memory and checks the interaction with disk and CPU operations.

To access the fault menu, type the following:

SA: **fault**

Press Return. The following display appears (Figure 27):

**Figure 27**  
**Fault testing menu**

```
Current Menu is /fault - "Test Selection by Fault"
1          - Test to be run for OS System Panic
2          - Test to be run for System Halt
3          - Memory Fault Test
4          - Disk Fault Test
5          - Tape Fault Test
6          - Communication Fault Test
(Tests 1 and 5 require write-enabled tapes installed in all tape drives attached to the system.)
SA:
```

Install a write-enabled tape, if required, then type your selection and press Return. The tests run. After the tests complete, you are prompted to press

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---

Return to continue. Press Return to go to the fault menu. To go to the System Monitor menu, type / and press Return.

## OS system panic

Run this test suite if an operating system panic is reported. The test suite performs an intensive memory test with short disk, tape, and CPU tests, ensuring complete system test. You must install write-enabled tapes in all tape drives attached to the system. In a minimal system configuration, the tests take approximately 35 minutes.

*N* No communication board or communication line testing is  
 performed.  
*t*  
*e*  
 :

The following display (Figure 28) shows a sample OS system panic test sequence that is initiated by typing the following and pressing Return in response to the fault menu shown in “Fault testing” earlier in this chapter.

SA: 1

**Figure 28**  
**Sample OS system panic test sequence**

```

/bdtest/131.0      1)interrupter      .....starts
/bdtest/131.0      1)interrupter      .....passed
.
.
.
.
/bdtest/204.0/mem.0  9)Long AA/55 Pattern .....starts
/bdtest/204.0/mem.0  9)Long AA/55 Pattern .....passed

PASS-0, FATAL-000, ERROR-000, 0:02:50.0
/bdtest/204.0/mem.0 : running
Execution time (hrs:min:sec.ms) = 0:30:04.180
*** SYSTEM TEST PASSED ***
Depress Return to Continue <cr>
(Press <cr> to return to the main fault menu.)

```

### System halt

Run this test suite if the system-fail LED (light-emitting diode) on the CPU board is lit, or if the system stopped with no error indication.

The test suite performs intensive memory tests with short disk, tape, and CPU tests, ensuring complete system test coverage. You must install write-enabled tapes in all tape drives attached to the system. In a minimal system configuration, the tests take approximately 35 minutes.

*N* No communication board or communication line testing is  
*o* performed.  
*t*  
*e*  
:

### Memory fault test

Run the memory fault test if an operating system panic message about memory appears. The test suite determines if there is a problem with the RAM chips, VMEbus, VSBbus, ECC logic, or parity logic.

*N* You must perform all SST tests to correctly test *all* memory.  
*o*  
*t*  
*e*  
:

### Disk fault test

Run this test suite if any type of disk fault is reported. The tests ensure complete system test coverage by performing intensive disk testing on the first disk drive of every disk controller in the system, as well as short memory and CPU testing. In a minimal system configuration, the tests take approximately one hour.

### Tape fault test

Run this test suite if any type of tape fault is reported. The tests ensure complete system test coverage by performing intensive tape testing on the first tape drive on every tape controller in the system, as well as short disk, memory and CPU testing. You must install write-enabled tapes in all tape drives attached to the system. In a minimal system configuration, the tests take about one hour.

### **Communication fault test**

Run this test suite if any type of communication fault is reported. The test suite automatically tests all properly configured communication boards in the system.

The test suite performs the following tests on the first port pair (1 and 2) on each MVME332 communication board:

- 0) ext loop back
- 1) single char loop back
- 2) break detection
- 3) abort read
- 4) abort write/read
- 5) echo
- 6) full duplex
- 7) overrun
- 8) parity error
- 9) hw flow control

Loopback cables are required on the first port pair to run this test suite. Loopback cable pin outs are described in the “Introduction” chapter.

If the port pair in error is not the first port pair, you can still test it through the bctest menu. Find the appropriate board test menu under bctest (for example, 332.0/sp.2) and specify the test sequence by typing the following and then pressing Return:

SA: **0123456789**

The first port pair (1 and 2) of the MVME332XT board are tested as follows:

- |                    |                       |
|--------------------|-----------------------|
| 1) open port a     | a) DCD a -> b         |
| 2) open port b     | b) DCD b -> a         |
| 3) loopback a -> b | c) baud rate a -> b   |
| 4) loopback b -> a | d) baud rate b -> a   |
| 5) full duplex     | e) parity a -> b      |
| 6) event a -> b    | f) parity b -> a      |
| 7) event b -> a    | g) frame a -> b       |
| 8) break a -> b    | h) frame b -> a       |
| 9) break b -> a    | i) HW flow ctl a -> b |
|                    | j) HW flow ctl b -> a |

Loopback cables are required on the first port pair to run this test suite. Loopback cable pin outs are described in the "Introduction" chapter.

For additional information, refer to MVME332XT Asynchronous Communications Controller in the chapter on "Communication controller board tests".

## Card testing

Card testing verifies the operation of a specific card in the system. Before performing a card test, read the section containing information about the card you plan to test or read the help screens related to card testing. Both sources describe the various card tests available through the `bdtest` menu. The `view` command is not available for card tests, although it appears in the menus on the screens.

To access the `bdtest` menu, type the following:

SA: **bdtest**

Press Return. A display similar to the following appears (Figure 29), showing all the boards in your system recognized by SSID:

**Figure 29**  
**bdtest main menu**

```
Current Menu is /bdtest - "Tests by Board"
147.0      - VME147 Board Tests
mem.0     - Memory Test
320.0     - VME320 Disk Controller Tests
G330.0    - VME330 GSP LAN Board Test
333.0     - VME333 WAN Comm. Board Test
x333.0    - VME333 X.25 Comm. Board Test
SA:
```

The `bdtest` main menu varies from system to system, displaying those boards that SSID has found in the system. SSID finds the boards during the boot sequence when it probes the VMEbus for each board in the system. If a board is completely dead, it does not appear in the menu. If a board is known to be in the system but is not displayed in the `bdtest` menu, check for proper board and backplane strapping and proper board seating. If the board is still not displayed, replace it.

It is possible to configure the SSID menu selections so that you can access menus for cards that are not actually in the system. Refer to cf in “Command line mode” for details on how to change the card configuration.

To perform specific tests on an individual card, type the card number as displayed in the bctest main menu and press Return. If you have more than one card of the same type, the first card in the series is designated *board\_number.0*, the second *board\_number.1*, the third *board\_number.2*, for example, 333.0, 333.1, 333.2. Notice that these cards are listed in the menus in reverse order; the last card in the series is shown first.

Once a specific test starts, its progress and status display on the screen. If an error occurs, error information appears followed by a fail message. After a sequence of tests is run, a “System Test Pass” or “System Test Fail” message displays. If the tests and their status scroll off the screen, use the disperr command to review any failures.

*N* Once a test fails, the “System Test Fail” message displays.  
*d* Type the system command, **clear**, to continue testing.  
*t*  
*e*  
:

### Performing multiple card tests

Unlike the confid, fault, ptest, and ptesti menus that display test suites, the bctest menus display individual tests. Choosing a test from a bctest menu causes only a single test to be performed. However, you can specify multiple tests; type each test identifier (the number or letter preceding the test name) without spaces and press Return.

If, for example, the current menu is the hd.0 test selection menu, you can type the following and press Return to run both the Recalibrate and Quick confidence read tests.

SA: **01** (no spaces between test numbers)

Just as you can specify multiple tests on a single command line, you can also specify tests from other bctest menus with tests from the current menu on a single command line. When using this feature of SSID, separate the test groups with a semicolon (;) and include the test directory of the other

bdtest. For example, assume that hd.0 is still the current menu. If you type the following command:

SA: **01;esdi.0 01234**

(a semicolon between test groups; a space between esdi.0 and 01234)

and press Return, SSID will run the Recalibrate and Quick confidence read tests from the hd.0 menu followed by the ESDI controller tests, 0 through 4, on the first ESDI controller. Notice that it is not necessary to identify the full path name of the test from the other menu (that is, /bdtest/323.0/esdi.0).

The remaining chapters explain the tests available in bdtest and show the test selection menus. Use this information as a reference if you decide to run multiple bdtest options from a single command line.

## Peripheral testing

Peripheral testing verifies the operation of system peripherals by running a suite of tests. Before performing a peripheral test suite, read this chapter or read the help screens related to peripheral testing. Both sources describe the various peripheral test suites available through the ptest and ptesti menus. The ptest menu displays the first 12 peripheral tests available. The ptesti menu displays the tests numbered 13 through 24 (if there are that many available). The individual tests making up the suites may be displayed with the view ptest and view ptesti commands.

To access the ptest menu, type the following:

SA: **ptest**

Press Return. A display similar to the one shown in Figure 30 appears.

**Figure 30**  
**ptest main menu**

```
Current Menu is /ptest - "Peripheral Testing"
1      - 147 SCSI LUN 0,0 Test
2      - 147 SCSI LUN 1,0 Test
3      - 147 SCSI LUN 2,0 Test
4      - 147 SCSI LUN 3,0 Test
5      - 147 SCSI LUN 4,0 Test
6      - 147 SCSI LUN 5,0 Test
7      - 147 SCSI LUN 6,0 Test
8      - VME320 Winchester Drive 0,0 Test
9      - VME320 Winchester Drive 0,1 Test
10     - VME320 Winchester Drive 1,0 Test
11     - VME320 Winchester Drive 1,1 Test
12     - VME320 Floppy Drive 0,2 Test (DESTRUCTIVE)
ptesti - Next menu. (displays additional drive test suites such as ESDI drive tests.)
SA:
```

The drives listed in the ptest and ptesti menus are numbered using a *target,drive* (for SCSI) logical unit numbering scheme. Table 5 summarizes the numbering scheme.

Table 5  
Logical unit numbers

MVME147 SCSI LUN target,drive	Device target,drive physical addresses
0,0	SCSI target 0, drive 0
1,0	SCSI target 1, drive 0
2,0	SCSI target 2, drive 0
3,0	SCSI target 3, drive 0
4,0	SCSI target 4, drive 0
5,0	SCSI target 5, drive 0
6,0	SCSI target 6, drive 0

### VME147 SCSI tape drive test suite



#### CAUTION

This Test Suite performs tests that destroy data on the tape.

Before starting this test suite, insert a write-enabled, scratch tape into the tape drive. Choose the ptest menu item that corresponds to the SCSI Tape Test. The test suite runs in the following order for VME147:

- 0) Init
- r) Retention
- w) Write/Read EOT
- 0) Init

To run individual tests in this suite or for a description of the tests, refer to SCSI tape tests in “MVME147 CPU” in the chapter on “CPU, memory, and miscellaneous controller card tests”.

### **VME147 SCSI hard disk drive test suite**

Choose the ptest menu item that corresponds to the SCSI Hard Disk Test. The test suite runs in the following order:

- 0) Recalibrate
- 1) Confidence test
- 2) Read entire Disk
- 3) Random read Disk
- 4) Ping-Pong read Disk

To run individual tests in this suite or for a description of the tests, refer to the SCSI hard disk tests in the chapter on “CPU, memory, and miscellaneous controller card tests”.

### **VME167 SCSI ptest test suite**

No device testing is available for the MVME167/SMM167 SCSI controller using the ptest or ptesti menu. To test any attached SCSI device, use

```
/bd/1x7scsi.0/scsix
```

(in which *x* is the peripheral number). For more information, refer to “MVME167/SMM167 single board computer” in the chapter on “CPU, memory, and miscellaneous controller card tests.”

---

## CPU, memory, and miscellaneous controller card tests

---

This chapter describes the card tests available for CPU and memory cards, as well as miscellaneous cards, such as graphics and utility cards. Each section describes the tests available for a particular controller card, the card's test configuration, and, in some cases, the error codes associated with the card. For an introduction to card testing, refer to "Card Testing" in the chapter on "Confidence, fault, card, and peripheral testing".

### MVME147 single board computer

The following tests are available for the MVME147 single board computer: LANCE tests, serial port tests, Enable MMU (Memory Management Unit), line printer test, SCSI tape tests, SCSI hard disk tests, and VMEchip interrupter tests.

The SCSI tape tests verify SCSI tape controller operation by performing write and read tests on the SCSI tape drives.

The SCSI hard disk tests verify SCSI disk controller operation by performing a non-destructive, read-only test on the SCSI hard disk drive unless the user enables destructive tests with `cf`. The SCSI disks to be tested must be initialized (formatted or have an operating system file system on them). Refer to the operating system documentation for information on formatting or select the format test from the SCSI drive menus.

When a SCSI hard disk test displays an error, it also displays the command that failed, the physical sector, and other information about the controller and drive status. This information is saved in a local error log that is not cleared by the system command, `clear`.

To access the test menus for the MVME147 card, type the following:

SA: **147.0**

Press Return. A display similar to the following appears (Figure 31):

**Figure 31**  
**Test menus for MVME147 card**

```
Current Menu is /bdtest/147.0 - "VME147 Board Tests"
psp                - 147 Serial Port Tests
mmu                - Enable MMU
plp                - 147 Line Printer Tests
scsi6              - SCSI Ctrlr 6 LUN 0 Tests
scsi5              - SCSI Ctrlr 5 LUN 0 Tests
scsi4              - SCSI Ctrlr 4 LUN 0 Tests
scsi3              - SCSI Ctrlr 3 LUN 0 Tests
scsi2              - SCSI Ctrlr 2 LUN 0 Tests
scsi1              - SCSI Ctrlr 1 LUN 0 Tests
scsi0              - SCSI Ctrlr 0 LUN 0 Tests
intrp              - 147 Interrupter Test
lan147             - 147 LANCE Tests
SA:
```

The test selection menus for the mmu, plp, and scsi tests are shown in Figure 32:

**Figure 32**  
**Test selection menus for mmu, plp, and scsi tests**

```

SA:  mmu<cr>                (to access the mmu test selection menu)
Selections for Test "Enable MMU"
    0) Enable MMU                (Once the MMU is enabled, it cannot be disabled.)
SA:  plp<cr>                  (to access the line printer test selection menu)
Selections for Test "147 Line Printer Test"
    o) Printer Output            (outputs pattern with length/#lines specified in cf)
SA:  psp<cr>                  (to access serial test selection menu)
Selections for Test "147 Serial Port Tests"
    1) Internal-loopback         (internal loopback tests on ports 3 and 4)
    9) External-loopback         (external loopback between ports 3 and 4)
SA:  intrp                    (to access VMEchip interrupter test selection menu)
Selections for Test "147 Interrupter Test"
    1) interrupter               (VMEchip interrupter test)
SA:  lan147                   (to access LANCE test selection menu)
Selections for Test "147 LANCE Tests"
    1) LANCE Init                (initialize LANCE chip)
    2) LANCE Internal Loopback    (internal loopback and DMA test)
    a) Display LANCE address in NVRAM (shows contents of NVRAM location
                                       containing LANCE address)

```

#### **Enable MMU—mmu**

Turns on the MMU so that all future memory accesses are done using the MMU. The only way to turn the MMU off again is to power cycle and reboot the system.

#### **Printer output—plp**

Sends a predefined character string as output to a printer attached to the MVME147 parallel port. You can change the number of lines to print and the length of each line to print by entering command line mode, executing cf 147.0/plp, and changing the displayed values. The default is 56 lines of 132 characters each.

**Internal loopback—psps**

Puts each port of the serial controller chip into internal loopback mode and transfers and verifies a predefined character string. You can change the number of characters to transfer by entering command line mode, executing `cf 147.0/psp` and changing the displayed value. The default value is 1024 characters.

**External loopback—psp**

Places port 1 of the serial controller chip in receive mode, port 2 in transmit mode, and then transfers and verifies a predefined character string. If this process completes successfully, port 1 is placed in transmit mode, port 2 into receive mode, and the test is repeated. You can change the number of characters to transfer by entering command line mode, executing `cf 147.0/psp` and changing the displayed value. The default is 1024 characters.

**Interrupter—intrp**

Checks interrupt levels 1, 2, 4, and 5 of the VMEchip for local interrupts.

**LANCE Init—lan147**

Checks the ability of the LANCE chip to read an initialization block from memory and configure itself accordingly. No data is transferred other than the initialization block.

**LANCE Internal Loopback—lan147**

Checks the ability of the LANCE chip to access the transmit and receive rings and to transfer data to/from the LAN buffers. The LANCE chip is placed into internal loopback mode and transfers a predefined character string. You can change the number of characters by entering command line mode, executing `cf147.0/lan147`, and changing the displayed value. The default value is 1024. The total number of characters to be transmitted is broken into small packets so that multiple packets are transferred.

**Display LANCE address in NVRAM—lan147**

Displays the contents of the LANCE address location in NVRAM preceded by the default address assigned to Motorola. If the NVRAM location contains `0x183e1`, the test displays `0x08003e2183e1`.

The test selection menu for the tape tests is as follows:

**Figure 33**  
**SCSI tape test menu**

```
SA:  scsi4<cr>
Selections for Test "147 SCSI Ctrlr 4 LUN 0 Tests"
(write-enabled scratch tape required)
(This menu is the same for all SCSI tape tests.)
 0) Init                (returns tape to BOT)
 1) Write Log/EOF      (short write test)
 2) Read Log/EOF      (short read test; run after test 1)
 3) Write/Read EOF    (reads if write passes)
 r) Retension          (fast forward, then rewind the tape)
 s) Erase              (remove ALL data from tape and rewind)
 w) Write/Read EOT    (reads if write passes)
 t) Write EOT          (long write test)
 v) Read EOT           (long read test; run after test t)
 g) Confidence Test   (verifies SCSI interface to drive)
 i) Inquiry            (displays the vendor and drive ID)
 e) Displays Error Log (displays the local error log)
 l) Clear Error Log    (clears the local error log)
 m) Mode Sense         (displays drive mode info)
```

#### **Init**

This test attaches to the tape drive and rewinds the tape.

#### **Write Log/EOF**

This test rewinds the tape, then writes two short files and a file mark.

#### **Read Log/EOF**

This test rewinds the tape, then reads two short files from the tape. If the data read is not the same as written in the Write Log/EOF test, the test fails.

#### **Write/Read EOF**

This is a combination of Write Log/EOF and Read Log/EOF.

**Retention**

For tape devices that support retention, this test rewinds and retensions the tape. For devices that do not support retention, this test rewinds the tape.

**Erase**

This test rewinds the tape, erases the tape to EOT, then rewinds the tape again.

**Write EOT**

This test rewinds the tape, then writes blocks containing an incrementing pattern to EOT, writes a file mark, then rewinds the tape.

**Read EOT**

This test rewinds the tape, then reads the tape to EOT or a file mark, then rewinds the tape. If the data read is not the same as written in the Write EOT test, the test fails.

**Write/Read EOT**

This is a combination of Write EOT and Read EOT.

**Confidence Test**

This test verifies that the device can be accessed via the SCSI bus.

**Inquiry**

This test displays the drive type, vendor ID, product ID, and product revision level obtained by performing a SCSI inquiry command.

**Display Error Log**

Refer to the section on Display error log later in this chapter.

**Clear Error Log**

Clears the local error log. This has no effect on the system error log, which must be cleared by the system-level clear command.

**Mode Sense**

This test performs an MVME147 SCSI firmware mode sense and displays the drive attributes, controller type, drive type, and number of bytes per block.

The test selection menu for the SCSI disk tests is as shown in Figure 34:

**Figure 34**

**SCSI disk test menu**

```
SA: scsi0<cr> (to access the first SCSI hard disk test)
Selections for Test "147 SCSI Ctrlr 0 LUN 0 Tests"
 0) Recalibrate (seeks to and reads sector 0)
 1) Confidence test (reads, first sector, last sector, then first sector)
 2) Read entire Disk (reads twice and verifies every sector on the disk)
 3) Random read 5% of Disk (randomly reads 5% of the sectors on the disk)
 4) Ping-Pong read disk (reads start, then end, then start +1, then end -1, etc.)
 r) Read a Sector (queries user for sector; accepts hexadecimal or decimal input)
 s) Read a range of Sectors (queries user for sector range)
 c) Read Capacity (displays drive capacity in sectors)
 i) Inquiry (displays vendor and drive ID)
 e) Display Error Log (displays local error log)
 l) Clear Error Log (clears local error log)
```

**Recalibrate**

This test seeks sector zero and then reads sector zero, simulating a recalibrate command.

**Confidence Test**

Reads the first sector, the last sector, then the first sector on the disk.

**Read entire Disk**

Reads the entire disk sequentially from sector zero to the last sector. Each read is done twice and the results compared.

**Random read 5% of Disk**

Reads randomly selected blocks of sectors. Approximately 5% of the available sectors are read. Each read is done twice and the results compared.

**Ping-Pong read Disk**

Reads the entire disk in the following sequence: sector zero, the last sector, sector one, sector (last - 1), sector two, sector (last - 2), and so on until every sector has been read twice, once from each direction. Each read is done twice and the results compared.

**Read a Sector**

Requests user input of the number of the sector to be read, verifies that the sector is valid, and if so, reads the sector twice and compares the results.

**Read a range of Sectors**

Requests user input of the number of a sector at which it begins reading, verifies that the sector numbers are valid, then reads the block of sectors twice, comparing the results.

**Read Capacity**

Displays the drive capacity, in sectors. The display is in both hexadecimal and decimal.

*N* SCSI hard disk drives of the same type do not always have the same number of available sectors, but the numbers should be close in value (for example, within 200 sectors of each other).

*e*  
:

**Inquiry**

Displays the drive type, vendor ID, product ID, and product revision level obtained by performing a SCSI inquiry command.

**Display Error Log**

Refer to the section “Display error log” later in this chapter.

**Clear Error Log**

Clears the local error log. This has no effect on the system error log, which must be cleared by the system-level clear command.

### Display error log

The first 20 SCSI errors occurring on each drive are saved in the Error Log. After completion of SCSI tests, you can display the Error Log for each drive using this menu option. The drive must be ready, that is, the tape must be installed, for this command to execute. The system clear command only clears the system error log—it does not clear this device error log. If no errors occurred on this device, type **e** and press Return and you will see the following (Figure 35):

**Figure 35**  
**Display error log**

```
SA:  e
/bdtest/147.0/scsi4  e) Display Error Log      ...starts
End of SCSI Error Log
/bdtest/147.0/scsi4  e) Display Error Log      ...passed
*** SYSTEM TEST PASSED ***
```

A display similar to the following (Figure 36) displays if errors occurred on this device:

**Figure 36**  
**Error log display**

```

SA: e
/bdtest/147.0/scsi4 e) Display Error Log .....starts
Command          Code/Sector      Error Message
WRITE            0x00000027      PROTECTED_MEDIA
                  Class 7 Sense is controller-dependent.
                  Refer to vendor manuals to decode.
                  f0 00 07 00 00 00 80 06 00 00 00 00 00 00 00
                  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                  00 00 00 00 00 00 00 00 00 00 00 00 00 00
Command          Code/Sector      Error Message
TAPE_ATTACH      0x00000022      DEVICE_NOT_READY
Press RETURN for next page
                  Class 7 Sense is controller-dependent.
                  Refer to vendor manuals to decode.
                  f0 00 07 00 00 00 80 06 00 00 00 00 00 00 00
                  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
                  00 00 00 00 00 00 00 00 00 00 00 00 00 00
Command          Code/Sector      Error Message
TAPE_ATTACH      0x00000022      DEVICE_NOT_READY
Press RETURN for next page
Command          Code/Sector      Error Message
TAPE_ATTACH      0x00000022      DEVICE_NOT_READY
Command          Code/Sector      Error Message
TAPE_ATTACH      0x00000022      DEVICE_NOT_READY
Press RETURN for next page
End of SCSI Error Log
/bdtest/147.0/scsi4 e) Display Error Log .....passed
***SYSTEM TEST FAILED***
Depress Return to Continue

```

## Destructive disk tests

Destructive hard disk tests are available from the menu by going into the command line mode and executing `cf` for each SCSI device you want to execute destructive tests.



### CAUTION

Destructive disk tests destroy all data on the drive, including operating system and application software. Both BOS and the application software could be destroyed. Be extremely careful with test selection after enabling destructive tests with the `eval` flag and/or the `set test scripts` command.

If you change the `eval` flag to 1, the following tests (Figure 37) appear on the Hard Disk menu:

**Figure 37**

### Destructive hard disk tests

```
f) Format Hard Drive (DESTRUCTIVE) (formats drive)
a) Assign Alternate (DESTRUCTIVE) (adds defects to the drives defect list)
w) Write All Sectors (DESTRUCTIVE) (writes all sectors)
x) Wr/Rd/Compare Sectors (DESTRUCTIVE) (writes, reads, verifies all sectors)
y) Wr/Rd/Compare Tracks (DESTRUCTIVE) (same as test x but reads by tracks)
z) Set Test Scripts (toggles confid 5 to 1 from destructive tests)
```

### Format hard drive (DESTRUCTIVE)

Formats the disk using the same parameters used during read tests (that is, if the drive is configured as 256 bytes per sector, the drive is formatted using these parameters).

*N* This is a diagnostic format only. You must format the drive by the operating system before use by the operating system.

*t*

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---

*e*  
:

**Write all sectors (DESTRUCTIVE)**

Writes all sectors on the hard disk.

**Wr/Rd/Compare Sectors/Tracks (DESTRUCTIVE)**

Writes each sector/track with a unique pattern, reads the sector/track into a buffer and verifies that the pattern read is the same pattern that was written. This test takes a long time in sector mode (can be more than 24 hours depending on disk capacity). Track mode is much faster, taking less than 30 minutes on most drives.

**Set tests scripts**

Used to reconfigure confid string 5 (Continuous Running Intensive I/O check with Comm.) for destructive testing on hard and floppy disks with the eval flag set to 1. The destructive mode flag for 147 SCSI devices is toggled each time this command is executed at any disk menu. If destructive mode is enabled, the following message displays:

WARNING:

```
DESTRUCTIVE DISKS TESTS FOR ALL 147 SCSI FLOPPY AND HARD  
DISKS WITH THE EVAL FLAG SET HAVE BEEN ADDED TO CONFID  
#5 AND FAULT SCRIPTS.
```

If destructive mode for 147 SCSI devices is disabled, the following message displays:

```
ALL 147 DISK CONFID AND FAULT SCRIPTS ARE NOW READ ONLY
```

Destructive test warning messages are disabled during confid 5 testing to allow unattended destructive tests.

Using the view confid command shows destructive tests for all 147 disks, but the destructive tests are only run on drives with the eval flag set to 1. Any disk with the eval flag set to 0 displays the following message (where X is the SCSI controller ID and Y is the drive LUN):

```
Unable to perform test on 147 target X drive Y - eval flag not set
```

Normally, destructive disks display a warning message and ask the user if they want to continue before any destructive tests are run. This warning message can be overridden by using cf to change the confid flag to 1. If the confid flag is set to 1, no warning messages display.

## MVME147 board test configuration

The MVME147 board test configuration is shown in Figure 38. Refer to the cf command in “Command line mode” for information on modifying this configuration.

**Figure 38**  
**MVME147 board test configuration**

```
SA: cmdline
> cf 147.0
/bdtest/147.0 configuration
  base[0xffffe1000] = 0xffffe1000?<cr>           # base address of pcc chip
  level [0-7] = 6?<cr>                           # default interrupt level
  mode [0] = 0?<cr>                               # can not be
  warning msgs [0] = 0?<cr>                       # changed by user

> cf 147.0/psp
>bdtest/147.0/psp configuration
  xfer size [0-1024] = 1024 ?<cr>                # size per transfer

> cf 147.0/scsi0
/bdtest/147.0/scsi0 configuration
  Ctrlr number [0] = 0 ?<cr>                      # SCSI target number
  phy-drive [0-3] = 0 ?<cr>                       # drive number
  vector number [0-0xff] = 0x4d ?<cr>            # SCSI fw vector number
  Conf flag 0-Warnings ON 1-Warnings OFF [0-1] = 0 ?
<cr>                                              # disable warning
  Eval flag 0-NO write 1-WRITE TESTS [0-1] = 0 ? 0
<cr>                                              # enable destructive tests

> cf plp
/bdtest/147.0/plp configuration
  line length [0-136] = 132 ?<cr>                # length of line print
  number lines [0-4096] = 56 ?<cr>              # number of line print

> cf lan147
/bdtest/147.0/lan147 configuration
  xfer size [0-1024] = 1024 ?<cr>
```

> **set menu**

## MVME147 error messages

### General error messages

**XXXXX memory not available**

**XXXXX YYYYYY memory not available**

**XXXXX YYYYYY No memory for buffer**

Indicates that no memory was available when a buffer was requested by test XXXXX. YYYYYY indicates the specific function within a test, if available. Possibly there are too many tests running, defective memory or 147 card.

**XXXXX YYYYYY No system semaphore**

**XXXXX YYYYYY no semaphores available**

Indicates that no semaphore was available when requested by test XXXXX. YYYYYY indicates the specific function within a test, if available. Possibly there are too many tests running, defective memory or 147 card.

**PCCchip is programmed for Lvl 7 IRQ on bus error**

Indicates the PCCchip Bus Error Interrupt Control register has been programmed to generate a level 7 IRQ when a bus error occurs. This indicates a problem on the 147 card as SSID disables the interrupt during initialization at boot time.

**Error in setvec from XXXXX (YYYYY, ZZZZZ)**

**\*\*Help setvec failed in XXXXX (YYYYY)**

**\*\*Help setvec failed in XXXXX (YYYYY)**

Indicates an error occurred while SSID was attempting to set interrupt vectors. XXXXX indicates the SSID function where the error occurred. YYYYYY indicates the vector address SSID was attempting to change so that interrupt handler ZZZZZ is executed when the interrupt occurred. This indicates a problem on the 147 card.

**Error in setvec in usrinit for 147 LANCE**

Indicates an error occurred while setting up interrupt handler for the 147 LANCE chip. This indicates a problem on the 147 card.

**Name of this routine is cpux147. Some program accessed the Location Monitor adrs \$FFFE0000 thru\$FFFEFFFF.**

Indicates that the location monitor was accessed when it should not have been accessed. Some card in the system is incorrectly accessing memory.

**SSID fatal error: get \_stbl() - unrecognized SCC channel address**

**SCC channel address = 0XXXXXX**

**SSID IS NOW HALTED**

An interrupt was received through the vector assigned to the SCC chips but an invalid SCC channel address (XXXXXX) was received. Some device in the system is interrupting through the wrong vector or an SCC is returning an incorrect channel address. You must reboot the system for any further action to occur.

**System Test error: Unrecognized SCC interrupt**

**SCC interrupt status = XXXXX**

**SSID IS NOW HALTED**

An interrupt was received through the vector assigned to the SCC chips but an invalid interrupt status was received. Indicates a problem with the SCC chip(s) on the 147 card. The system is halted and must be rebooted for any further action to occur.

**XXXXX Max number of errors exceeded**

The device indicated by XXXXX has exceeded the maximum number of allowed errors. No additional errors will be logged for this device.

**XXXXX SIGLP\_IRQ failed**

**XXXXX TIME\_OUT -- SIGLP\_IRQ**

**XXXXX LMO\_IRQ failed**

**XXXXX TIME\_OUT -- LMO\_IRQ**

**XXXXX LM1\_IRQ failed**

**XXXXX TIME\_OUT -- LM1\_IRQ**

**XXXXX SIGHP\_IRQ failed**

**XXXXX TIME\_OUT -- SIGHP\_IRQ**

Indicates failure of the VMEchip interrupter test. Possibly a defective VMEchip or 147 card. XXXXX indicates the 147 card “intrp” test.

**XXXXX TIMEOUT**

Indicates a test on device XXXXX timed out before the device interrupted with completion status. This can indicate a problem with device XXXXX or possibly the loopback cable is loose if the device is a serial port.

## SCSI error messages

### **SCSI timeout - no response from target X drive Y**

The SCSI command was sent but the device did not interrupt with completion status in the time period allowed by SSID for completion of the command. X indicates the SCSI target ID (controller), Y indicates the LUN (device) ID. This message also occurs if the SCSI bus is hung. Try the BUG reset command or power cycle the system.

### **ERROR: XXX: IRQ handler packet not Que'd!**

This message occurs if the SCSI device interrupts after a timeout has occurred or when SSID is not waiting for an interrupt from the device. XXX indicates from which SCSI device the interrupt was received. Try resetting the SCSI bus or power cycling the system and rebooting SSID. If the error continues, SSID could have a timeout that is too short or the SCSI device or 147 SCSI interface could be defective. Also check SCSI cabling and SCSI bus termination.

### **UNDEFINED SCSI CMD: XXXXX**

Indicates an error during testing of a SCSI device. An undefined command (XXXXX) was indicated as failing. Possibly caused by defective memory or SCSI interface on 147 card.

### **UNDEFINED SCSI STATUS: XXXXX**

A SCSI device returned status of XXXXX, which is undefined in the SCSI status tables. Refer to the vendor manual for the device for further information.

### **XXXXX Unable to read disk capacity**

SSID was unable to execute the SCSI Read Capacity command on the device indicated by XXXXX. Indicates defective SCSI device or device that does not support this command or defective SCSI interface on 147 card.

### **Target number X out of range - must be between 0 and Y**

The selected SCSI target number is less than 0 or greater than the maximum allowed. This error can occur if an incorrect value is entered in the configuration structure using the cf command or if the SCSI device table in memory has been overwritten. Target addresses are between 0 and 6.

**No device assigned for target X**

The device pointer in the SCSI device table is null. This occurs if the SCSI device table in memory has been overwritten.

**Invalid device type X for target Z**

The device type X in the SCSI device table is invalid for target number Z. This occurs if the SCSI device table in memory has been overwritten.

**XXXXX The drive selected is invalid**

The selected SCSI drive number is invalid for device XXXXX. This error can occur if an incorrect value is entered in the configuration structure using the cf command or the SCSI device table in memory has been overwritten.

**Unable to perform test on 147 target X drive Y - eval flag not set**

Indicates that the destructive test will not be run on SCSI target X (controller) drive Y (LUN). This message displays during confid/fault tests for drives that are not enabled for destructive tests.

**LANCE error messages**

**XXXXX LANCE test invalid on this board**

SSID has determined that no LANCE chip exists on the 147 card and therefore, no LANCE tests are supported.

**NO LANCE detected on this board**

Indicates that no LANCE tests will be run on 147 cards that do not contain a LANCE chip.

**XXXXX 147 LANCE YYYYY FAILED**

Indicates a failure of 147 LANCE tests (XXXXX). YYYYY indicates the failing test.

**REG XX EXP: YY GOT: ZZ**

Indicates an unexpected reading from LANCE register XX during testing. SSID expected to read YY from the register but instead read ZZ.

### 147 LANCE TESTS ERROR # XXX

Indicates a LANCE test failure where XXX is one of the following:

1	147 board resource timeout
2	147 board ram parity error
3	147 board unexpected exception
4	147 board invalid test command from host
8	147 board ACFAIL
20	csr error - set with one
40	csr error - set with zero
60	csr error - can't set with one
80	csr error - can't clear with one
100	csr error - can't clear with zero
120	csr error - cleared with one
140	csr error - cleared with zero
160	csr error - unexpected bits on
164	csr error - unexpected bits on
168	csr error - unexpected bits on
172	csr error - unexpected bits on
176	csr error - unexpected bits on
180	csr error - unexpected bits on
184	csr error - unexpected bits on
188	should have STOP set, strt & INIT clear
189	CSR read while INIT bit set
191	IDON not set after INIT
192	INTR not set after INIT
193	unexpected bits on after INIT
194	RXON or TXON not set after START
195	unexpected bits on after START
196	IDON not set
197	unexpected bits on after INIT
198	no packet received
199	TINT not set after transmit
200	transmit interrupt count invalid
201	receiver interrupt count invalid
202	missed packet interrupt count invalid
203	expected packet not received
204	expected packet not received
205	net too busy - retry test

206	buffer space unavailable
207	buffer space unavailable
208	not enough transmit buffer
209	all transmit buffers used up
210	unexpected transmission error
211	expected transmission error not occurred
212	babbling transmitter
213	memory error in transmission
214	collision error after transmit
215	unexpected receive error
216	expected receive error not occurred
217	memory error in receive
218	received and sent data not match
219	trailing data bytes missing
220	rmd1 has end of packet set only
221	bad CRC found in received packet
222	RINT not set after transmit in loopback
223	Expected packet not received
224	Transmitter should be disabled
225	Unexpected packet transmitted
226	Receiver should be disabled
227	Unexpected packet received

### **Serial port error messages**

#### **XXXXX Data miscompare**

Indicates a mistake in comparison of data during serial port tests.

### **Parallel printer error messages**

**plp Printer status: ACK xxx present,  
FAULT xxx present, SELECT xxx present  
PAPER/EMPTY xxx present, BUSY xxx present**

where xxx is either *is* or *is not* to indicate the presence/absence of the indicated status signal.

### SCSI packet display

If an error occurs during execution of a SCSI packet and the display packet (dp) is disabled, a message similar to the following (Figure 39) appears:

**Figure 39**

**Error message when dp is disabled**

```
/bdtest/147.0/scsi0      2) Read entire Disk      ..... starts
PASS=0, FATAL=000, ERROR=000 0:00:43 /bdtest/147.0/scsi0 : waiting
Final Status Code 23 NONRECOVERABLE_(HARD)_ERROR
SCSI COMMAND 0, READ
Error on SCSI target 0 drive 0
SECTOR Adrs 0x00007c2d
/bdtest/147.0/scsi0      2) Read entire Disk      .....failed
NONRECOVERABLE_(HARD)_ERROR 0x00007c2d
*** SYSTEM TEST FAILED ***
```

In Figure 39, the final status code 23 indicates that a non-recoverable or hard error occurred while executing a SCSI read command on SCSI target 0, drive 0. The read error occurred on sector 0x00007c2d.

When the test is completed, a recap of the errors displays, listing the error type and the sector at which the error occurred.

If the display packet (dp) option is enabled, additional information similar to Figure 40 appears:

**Figure 40**  
**Error message when dp is enabled**

```

/bdtest/147.0/scsi0      2) Read entire Disk      .....starts
PASS-0, FATAL-001, ERROR-000  0:00:43 /bdtest/147.0/scsi0  : waiting
SCSI PKT STATUS 0-3 40 23 80 00
Stat0: Final_status :External_stat_Valid :rte_return: No_restart_cmd:
No_que'ed_packet : Bit_Res_Low : Bit_Res_Low : Bit_Res_Low :
Final Status Code 23 NONRECOVERABLE_(HARD)_ERROR
Stat2: Phase code 00
Stat3: Bit_Res_Low :Bit_Res_Low :_:_:
:_ :_ :Bit_Res_Low :
SCSI COMMAND 0, READ
Error on SCSI target 0 drive 0
SECTOR Adrs 0x00007c2d
/bdtest/147.0/scsi0      2) Read entire Disk      .....failed

NONRECOVERABLE_(READ)_ERROR 0X00007c2d
***SYSTEM TEST FAILED***

```

The additional information in Figure 40 includes the following:

```
SCSI PKT STATUS 0-3 40 23 80 00
```

The values of the SCSI status bytes 0 through 3 are 40, 23, 80, and 00. The balance of the display defines the status represented by these bytes. You can also use Figures 41 and 42 and Table 6 to decode the status bytes.

```
Stat0: Final_status
```

This is final, not intermediate, status.

```
:External_stat_Valid
```

External status information is valid and available to the test program.

:rte\_return

An rte is required by the test program to continue processing from where an interrupt occurred.

Bit\_Res\_Low

The bit is reserved and should be 0.

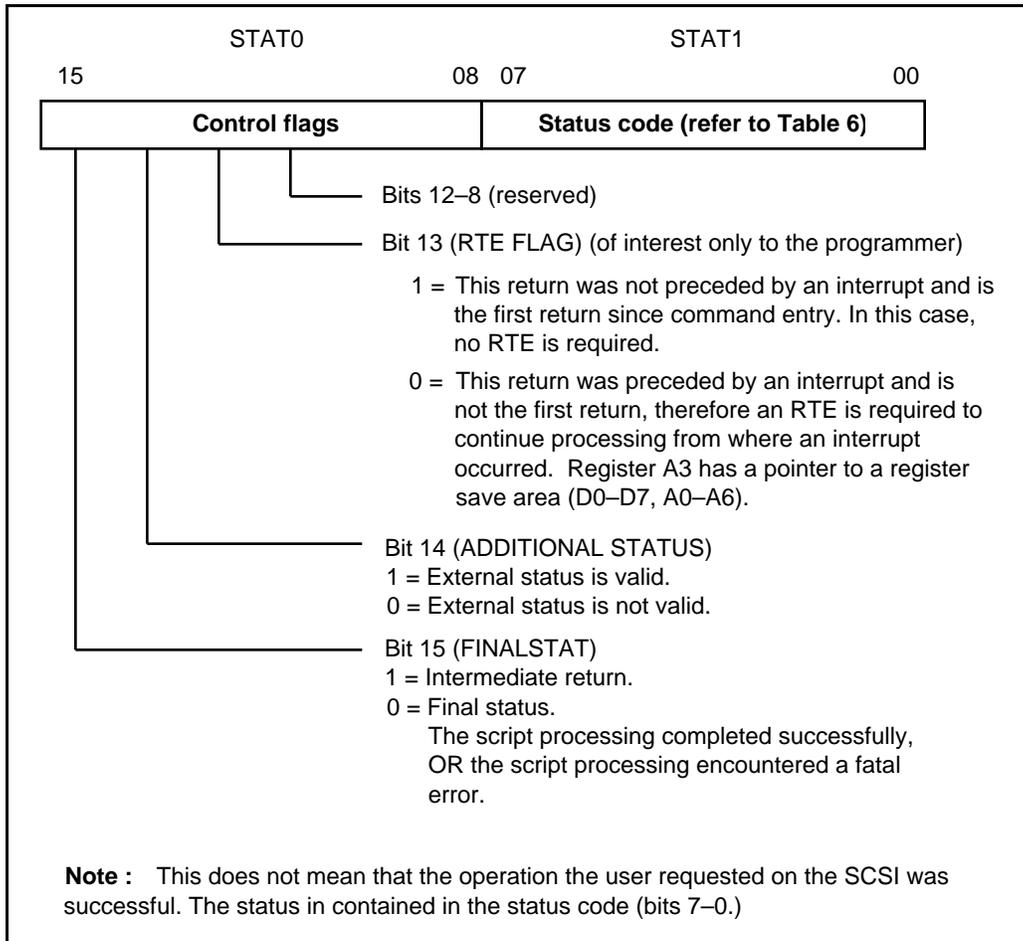
Stat2: Phase code 00

The SCSI bus phase in which the error occurred.

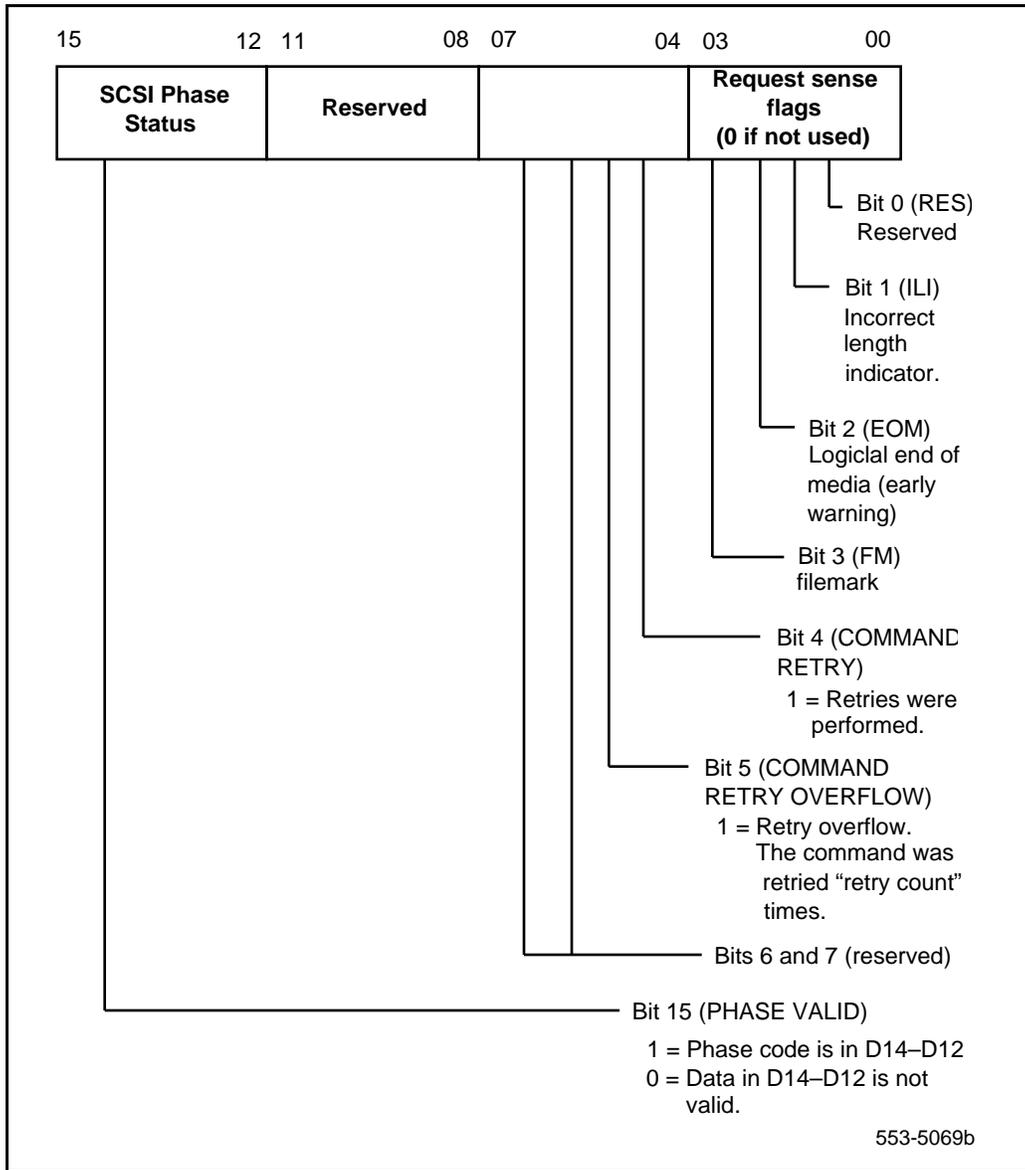
Stat3: Bit\_Res\_Low...:Bit\_Res\_Low:

An interpretation of status byte 3. In this example there is no pertinent information.

**Figure 41**  
**MVME147 SCSI packet return status**



**Figure 41**  
**MVME147 SCSI packet return status (continued)**



**Table 6**  
**Packet status codes**

Code	Meaning	Notes
Intermediate return codes		
\$02	Wait for interrupt, command door open. OK to send new commands for other devices to firmware.	1
\$04	A message has been received. User must interpret.	1
Final return codes		
\$00	GOOD. Script processing is OK.	2
\$01	Undefined problem.	2
\$02	Reserved	2
\$03	Interrupt handler was entered with no pending IRQ (\$FFFE0788).	2
\$04	Re-selection not expected from this TARGET.	2
\$05	TARGET thinks it is working on linked commands but the command table does not.	2
\$06	Linked command has error status code; command aborted.	2
\$07	Received an illegal message.	2
\$08	The message we have tried to send was rejected.	2
\$09	Encountered a parity error in data-in phase, command phase (TARGET only), status phase, or message-in phase. (Refer to bits 15-12 of second status word.)	2
\$0A	SCSI bus RESET received.	2

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---

\$0B	Command error (bad command code, bad timing, or command door was closed when a command was received) = 00. Custom SCSI sequence: controller level not equal to "147 local level", or interrupt not on. Format: format with defects on a controller type not supported. Controller reset: controller not SCSI type. Space (tape): undefined mode. Mode select (tape): undefined controller type. Mode sense (tape): undefined controller type.	2
\$0C	Size error (invalid format code).	2
—continued—		

**Table 6**  
**Packet status codes (continued)**

Code	Meaning	Notes
\$0D	Bad ID in packet or local ID (\$FFFE07A6).	2
\$0E	Error in attach (not previously attached, bad device LUN, unsupported controller, target SCSI address conflicts with initiator).	2
\$0F	Busy error (device has a command pending).	
\$10	Byte Count Error. There is disagreement between initiator and TARGET about the number of bytes that are to be transferred. If bit 15 status = 1, then bits 12–14 contain the phase code.	2
\$11	Received a BERR* while in DMA mode from a device that did not respond fast enough.	2
\$12	Selection time-out. TARGET does not respond.	
\$13	SCSI protocol violation. Controller reset: controller not SCSI.	2
\$14	Script mismatch. CHECK STATUS. If SCSI status within Command Table (offset \$14 for custom sequence, otherwise \$64) is zero, then assume script mismatch, otherwise use SCSI packet status.	2
\$15	Script mismatch. The TARGET sequence of operation did not match the script.	2
\$16	Illegal SCSI state machine transition.	2
\$17	Command has been received (TARGET role).	2
\$18	Script complete in TARGET role.	2
\$19	Script complete and new command loaded (TARGET role).	2
\$1A	TARGET module called. TARGET role not supported.	2
\$1B	TARGET module rejected an initiator message and returned with this status to a particular LUN service routine.	2

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---

\$1C	TARGET module sent a check status with an "illegal request" sense block to some initiator because the particular LUN that the initiator wanted was not enabled.	2
—continued—		

**Table 6**  
**Packet status codes (continued)**

Code	Meaning	Notes
\$1D	TARGET module sent a busy status to the calling initiator because the particular LUN that the initiator wanted was already busy servicing a command.	2
\$1E	Reserved and unused.	2
\$1F	Reserved.	2
Request-Sense-Data Error-Class 7 Codes (Controller-Dependent)		
\$20	NO SENSE. Indicates that there is no specific sense key information to be reported for the designated logical unit.	2, 3
\$21	RECOVERED ERROR. Indicates that the last command completed successfully with some recovery action performed by the TARGET. Details can be determined by examining the additional sense bytes and information bytes.	2, 3
\$22	NOT READY. Indicates that the logical unit addressed cannot be accessed. Operator intervention may be required to correct this condition.	2, 3
\$23	MEDIUM ERROR. Indicates that the TARGET detected a non-recoverable error condition that was probably caused by a flaw in the medium or an error in recording data.	2, 3
\$24	HARDWARE ERROR. Indicates that the TARGET detected a non-recoverable hardware failure (for example, controller failure, device failure, parity error, etc.) while performing the command or during self test.	2, 3
\$25	ILLEGAL REQUEST. Indicates that there was an illegal parameter in the command descriptor block or in the additional parameters supplied as data.	2, 3

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\$26	UNIT ATTENTION. Indicates that the removable media may have been changed or the TARGET has been reset.	2, 3
—continued—		

**Table 6**  
**Packet status codes (continued)**

Code	Meaning	Notes
\$27	DATA PROTECT. Indicates that a command that Reads or Writes the medium was attempted on a block that is protected from this operation.	2, 3
\$28	BLANK CHECK. Indicates that a write-once read-multiple device or a sequential access device encountered a blank block while reading or a write-once read multiple device encountered a non-blank block while writing.	2, 3
\$29	VENDOR UNIQUE. Used for reporting vendor unique conditions.	2, 3
\$2A	COPY ABORTED. Indicates that a copy or a copy and verify command was aborted due to an error condition.	2, 3
\$2B	ABORTED COMMAND. Indicates that the TARGET aborted the command. The initiator may be able to recover by trying the command again.	2, 3
\$2C	EQUAL. Indicates a search data command has satisfied an equal comparison.	2, 3
\$2D	VOLUME OVERFLOW. Physical EOM. Indicates that a buffered peripheral device has reached an end-of-medium and data remains in the buffer that has not been written to the medium. A recover buffered data command may be issued to read the unwritten data from the buffer.	2, 3
\$2E	MISCOMPARE. Indicates that the source data did not match the data read from the medium.	2, 3
\$2F	RESERVED. This sense key is reserved.	2, 3
	SCSI Status Returned in Status Phase	
\$31	SCSI status = \$02. CHECK.	2, 4
\$32	SCSI status = \$04. CONDITION MET.	2, 4

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\$34	SCSI status = \$08. BUSY.	2, 4
\$38	SCSI status = \$10. INTERMEDIATE/GOOD.	2, 4
\$3A	SCSI status = \$14. INTERMEDIATE/CONDITION MET/GOOD.	2, 4
—continued—		

**Table 6**  
**Packet status codes (continued)**

Code	Meaning	Notes
\$3C	SCSI status = \$18. RESERVATION CONFLICT.  Request-Sense-Data Error-Classes 0-6 Codes  (Controller-Dependent)	2, 4
\$40	NO ERROR STATUS.	2, 5, 6
\$41	NO INDEX SIGNAL.	2, 5, 6
\$42	NO SEEK COMPLETE.	2, 5, 6
\$43	WRITE FAULT.	2, 5, 6
\$44	DRIVE NOT READY.	2, 5, 6
\$45	DRIVE NOT SELECTED.	2, 5, 6
\$46	NO TRACK 00.	2, 5, 6
\$47	MULTIPLE DRIVES SELECTED.	2, 5, 6
\$49	CARTRIDGE CHANGED.	2, 5, 6
\$4D	SEEK IN PROGRESS.	2, 5, 6
\$50	ID ERROR. ECC error in the data field.	2, 5, 7
\$51	DATA ERROR. Uncorrectable data error during a read.	2, 5, 7
\$52	ID ADDRESS MARK NOT FOUND.	2, 5, 7
\$53	DATA ADDRESS MARK NOT FOUND	2, 5, 7
\$54	SECTOR NUMBER NOT FOUND	2, 5, 7
\$55	SEEK ERROR.	2, 5, 7
\$57	WRITE PROTECTED.	2, 5, 7
\$58	CORRECTABLE DATA FIELD ERROR.	2, 5, 7
\$59	BAD BLOCK FOUND.	2, 5, 7

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\$5A	FORMAT ERROR (Check track command.)	2, 5, 7
\$5C	UNABLE TO READ ALTERNATIVE TRACK ADDRESS.	2, 5, 7
—continued—		

**Table 6**  
**Packet status codes (continued)**

Code	Meaning	Notes
\$5E	ATTEMPTED TO DIRECTLY ACCESS AN ALTERNATE TRACK.	2, 5, 7
\$5F	SEQUENCER TIME OUT DURING TRANSFER.	2, 5, 7
\$60	INVALID COMMAND.	2, 5, 8
\$61	ILLEGAL DISK ADDRESS.	2, 5, 8
\$62	ILLEGAL FUNCTION.	2, 5, 8
\$63	VOLUME OVERFLOW.	2, 5, 8
<p><b>Note 1:</b> Intermediate return codes. Bit 15=1, actual word=\$80xx, \$90xx, etc.</p> <p><b>Note 2:</b> Final return codes.</p> <p><b>Note 3:</b> Sense key status codes for request-sense-data error—class 7. An offset of \$20 is added to all sense codes.</p> <p><b>Note 4:</b> The SCSI status sent from the controller is ANDed with \$1E, shifted right one bit, and \$30 added.</p> <p><b>Note 5:</b> Sense key status codes for request-sense-data error—classes 0–6. An offset of \$40 is added to all sense key codes.</p> <p><b>Note 6:</b> Drive error codes.</p> <p><b>Note 7:</b> Controller error codes.</p> <p><b>Note 8:</b> Command errors.</p>		

## MVME167/SMM167 single board computer

The following tests are available for the MVME167/SMM167 single board computer: LAN tests, serial port tests, line printer tests, and SCSI device tests.

There are four test menus for the MVME167/SMM167 card, one for each function on the card: printer port, serial communications port, LAN, and SCSI device. Each function can be separately enabled or disabled using the cf command.

To access the test menus for the MVME167/SMM167 card, type the following:

SA: **bdtest**

Press Return. A display similar to the following (Figure 42) appears:**Figure**

42

### MVME167/SMM167 board test

```
Current Menu is /bdtest - "Tests by Board"
  1x7lp.0          - VME1x7 Printer Port Tests
  1x7sp.0          - VME1x7 COMM Port Tests
  1x7lan.0         - VME1x7 LAN Tests
  1x7scsi.0        - VME1x7 SCSI Tests
  mem.0           - Memory Test
SA:
```

### Printer port tests

The test selection menu for the 1x7lp test is shown in Figure 43:**Figure 43**

#### Printer port test

```
SA: bdtest/1x7lp.0<cr>          (to access the printer port intermediate menu)
Current Menu is /bdtest/1x7lp.0 - "VME1x7 Printer Port Tests"
  llp0          - VME1x7 Printer Port Tests (intermediate menu)
```

The default test selection menu for the llp0 test is shown in Figure 44:

**Figure 44**  
**Printer port default test menu**

```
SA: bdtest/1x7lp.0/lp0<cr>      (to directly access the printer port selection menu)
Selections for Test "VME1x7 Printer Port Tests"
  1) Polled loopback
  2) Interrupt loopback
  D) Display error log
  C) Clear error log
  x) Add/Remove from confid
```

#### **Polled loopback**

The printer port is tested by setting output signals to known states and verifying the input signals are in the expected state. This test requires an external printer loopback to execute correctly.

#### **Interrupt loopback**

The same as polled loopback, except that the expected interrupt is also checked. This test requires an external printer loopback to execute correctly.

#### **Display error log**

The local error log stores all information for the Printer Port Tests. All errors print to the screen at the time of the error, and also store in the error log. Although the error may have scrolled off the screen, the error information can be viewed by using this display option.

#### **Clear error log**

This command clears the errors logged in the local error log during execution of the tests. The system error log is not cleared by this command. Use the system-level clear command to clear the system error log; this command also gives you the option of clearing the local error log.

#### **Add/Remove from confid**

This command allows you to add or remove this test from the SSID scripts (confidence scripts).

You can use the `cf` command to turn on an alternate test selection menu. To enable this menu, set loopback mode to 0 and output only mode to 1 when prompted by the `cf` command. The alternate test selection menu for `llpo` is shown in Figure 45.

**Figure 45**  
**Printer port alternate test menu**

```
SA: bdtest/1x7lp.0/llp0<cr>      (to directly access the printer port selection menu)
Selections for Test "VME1x7 Printer Port Tests"
  1) Polled output to printer
  2) Interrupt output to printer
  D) Display error log
  C) Clear error log
  x) Add/Remove from confid
```

#### **Polled output to printer**

The printer port is tested by sending the following test pattern to the printer:

The quick brown fox jumped over the lazy dog.

The Busy and Acknowledge signals are polled to determine when a character can be sent to the printer. Any errors, including paper errors, are recorded as fatal errors.

#### **Interrupt output to printer**

The same as polled loopback, except that the expected interrupt is also checked.

#### **Display error log**

The local error log stores all information for the Printer Port Tests. All errors print to the screen at the time of the error, and also store in the error log. Although the error may have scrolled off the screen, the error information can be viewed by using this display option.

**Clear error log**

This command clears the errors logged in the local error log during execution of the tests. The system error log is not cleared by this command. Use the system-level clear command to clear the system error log; this command also gives you the option of clearing the local error log.

**Add/Remove from confid**

This command allows you to add or remove this test from the SSID scripts (confidence scripts).

**Serial port tests**

The test selection menus for the 1x7sp test are shown in Figure 46:

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**Serial port test menu**

```
SA: bdtest/1x7sp.0<cr>      (to access the serial port intermediate menu)
Current Menu is /bdtest/1x7sp.0 - "VME1x7 Comm Port Tests"

lsp7          - VME1x7 Comm Port 7 Tests (Intermediate Menu)
lsp6          - VME1x7 Comm Port 6 Tests (Intermediate Menu)
lsp5          - VME1x7 Comm Port 5 Tests (Intermediate Menu)
lsp4          - VME1x7 Comm Port 4 Tests (Intermediate Menu)
lsp3          - VME1x7 Comm Port 3 Tests (Intermediate Menu)
lsp2          - VME1x7 Comm Port 2 Tests (Intermediate Menu)
lsp1          - VME1x7 Comm Port 1 Tests (Intermediate Menu)
lsp0          - VME1x7 Comm Port 0 Tests (Intermediate Menu)
```

To access the serial port intermediate menu, use the menu as shown in Figure 47:

**Figure 47**  
**Serial port intermediate menu**

```
SA: bctest/1x7sp.0<cr>
Selections for Test "VME1x7 Comm Port 3 Tests"

0) Execute tests 1-9
1) Internal send/receive
2) Internal baud rate
3) Internal framing error
4) Internal break detect
5) External send/receive
6) External baud rate
7) External framing error
8) External break detect
9) External handshake
a) Autodetect handshake
c) Display CD2401 version
d) Display detected handshake
D) Display Error Log
C) Clear Error Log
z) Add/Remove from confid
```

**Internal send/receive**

Transmits data in internal loopback mode, receives it, and compares it to what was transmitted. The test operates at 9600 baud, with no parity, eight bits per character, and one stop bit.

**Internal baud rate**

The same as Internal send/receive except that the test executes at each of the following baud rates: 50, 110, 300, 600, 1200, 2400, 4800, 7200, 9600, 19200, 38400, 56000, and 64000.

**Internal framing error**

Transmits data in internal loopback mode, receives it, and checks for a framing error. The test operates with transmitter set to 4800 baud, receiver set to 9600 baud, eight bits per character, odd parity, and one stop bit.

**Internal break detect**

Transmits a break in internal loopback mode, receives it, and checks for a break being detected. The test operates at 9600 baud, with no parity, eight bits per character, and one stop bit.

**External send/receive**

The same as Internal send/receive except that the test executes with an external loopback attached to the transition card.

**External baud rate**

The same as Internal baud rate except that the test executes with an external loopback attached to the transition card.

**External framing error**

The same as Internal framing error except that the test executes with an external loopback attached to the transition card.

**External break detect**

The same as Internal break detect except that the test executes with an external loopback attached to the transition card.

**External handshake**

Tests external handshake connections. This test does one autodetect of external handshake connections and then uses that detected configuration to test against. For the test to pass, a minimum of one handshake path must exist and not change for the duration of the test. This test requires an external loopback attached to the transition card.

**Autodetect handshake**

Detects and displays current detected connections and the current state of the handshake connections. This test requires an external loopback attached to the transition card.

**Display CD2401 version**

Reads and displays the CD2401's version.

**Display detected handshake**

Displays the detected handshake connections. This test requires an external loopback attached to the transition card.

**Display error log**

Displays all information for the Printer Port Tests stored in the local error log . All errors print to the screen at the time of the error, and also store in the error log. Although the error may have scrolled off the screen, the error information can be viewed by using this display option.

**Clear error log**

Clears the errors logged in the local error log during execution of the tests. The system error log is not cleared by this command. Use the system-level clear command to clear the system error log; this command also gives you the option of clearing the local error log.

**Add/Remove from confid**

Allows you to add or remove this test from the SSID scripts (confidence scripts).

## LAN tests

The test selection menus for the 1x7lan are shown in Figure 48. **Figure 48**

### LAN test menu

SA: **bdtest/1x7lan.0<cr>** (to access the LAN intermediate menu)

Current Menu is /bdtest/1x7lan.0 - "VME1x7 LAN Tests"

lan - LAN Tests (Intermediate Menu)

SA: **bdtest/1x7lan.0/lan<cr>** (to access the LAN test selection menu)

Selections for Test "LAN Tests"

- 1) LAN Addressing Function
- 2) LAN Dump of Registers
- 3) LAN Self Test
- 4) LAN Receive Frame Area Ready
- 5) LAN Internal Loopback
- 6) LAN External Loopback
- 7) LAN Command Chaining
- 8) LAN Transceiver Loopback
- a) Display Ethernet Address in NVRAM
- t) Time Domain Reflectometry
- D) Display Error Log
- C) Clear Error Log

### LAN Addressing Function

The first portion of this test reads NVRAM to determine what the assigned Ethernet address is. If it does not fall within the range of addresses assigned to Motorola Ethernet products, a fatal error occurs. Next, the address found in NVRAM is written into the LAN chip. Lastly, the test checks that the value stored in the LAN Ethernet Address Register is the same as the address just written.

### **LAN Dump of Registers**

The LAN Dump test verifies that the contents of various LAN registers can be placed in a memory area specified by SSID. This verifies some of the data paths through the chip to RAM. This test also proves that the initialization of the LAN chip was successful. If the dump test fails, it may mean that the memory pointers stored in the LAN chip are invalid. Running other LAN tests when the dump test has failed may result in the LAN chip writing to invalid memory locations. This problem only occurs if the user changes the option settings to force SSID to continue on error. Normal SSID operation halts testing if the Dump of Registers test fails.

### **LAN Self Test**

The LAN Self-Test tests ROM, parallel registers, bus throttle timers, and internally the serial subsystem. The self test also causes the microcomputer to issue an internal diagnose command.

### **LAN Receive Frame Area Ready**

The Receive Frame Area (RFA) Ready test verifies that activating the receive unit within the LAN chip prepares the receiver buffers. If successful, the receiver interrupts the processor when the Receive Frame Area is ready.

*N* Any user data received from an active LAN connection is lost.

*t* The RFA Ready test should always be run prior to the Loopback Test.

*e*

*:*

### **LAN Internal Loopback**

During Internal Loopback tests, one packet of data is transmitted, looped back, and received by the LAN chip. The loopback of signals occurs within the Intel 82596 LAN chip itself. No data is propagated beyond the 82596 chip. The transmit clock is divided by 4 during this type of loopback test. The size of the data packet is 3 times the size of the receive and transmit buffers, in order to verify that the LAN chip can chain both receive and transmit buffers. If the received data does not match the transmitted data, an error occurs.

### **LAN External Loopback**

During External Loopback tests, one packet of data is transmitted, looped back, and received by the LAN chip. The loopback of signals occurs within the Intel 82c501 chip, which is connected to the LAN chip itself. Note that this test verifies operation of the LAN circuitry's serial interface, but does not test all the way out to the DB15 LAN connector. No loopback cable or terminator of any type is required for this test. No data is propagated beyond the 82c501 chip.

### **LAN Command Chaining Test**

This test verifies that the command unit in the Intel 82596 LAN chip can independently execute two sequential commands in a Command Block List. This test also sends individual commands to the LAN circuitry, verifying that each command has worked prior to moving on to the next command.

### **LAN Transceiver Loopback**

During Transceiver Loopback tests, one self-addressed packet of data is transmitted, looped back, and received. A properly terminated transceiver is required for this test. Although any properly terminated, inactive network will suffice, the following equipment list is provided for the user's benefit:

- Transceiver Cable
- Thinnet Transceiver
- Tee Connector for Thinnet Cable
- Network Cable Terminators (need 2)

This test may fail if run on an active network; if a broadcast packet should happen to come across the network during execution of this loopback test, the test will fail. This test is not part of the confidence test suites.

### **Display Ethernet Address in NVRAM**

This menu item prints the card's Ethernet address, which is stored in NVRAM, to the screen.

### **Time Domain Reflectometry**

Time Domain Reflectometer (TDR) Testing determines the integrity of the network cabling connected to the card under test. This test is not part of the confidence test suite.

Using functions embedded in the Intel 82596 LAN chip itself, the following conditions can be detected and displayed:

- No Problem
- Short on the Ethernet Cable
- Problem with the Transceiver or Transceiver Cable
- Open on the Ethernet Cable



**CAUTION**

It is strongly recommended that all other LAN tests pass before you execute the TDR test on an active network. This test sends a packet out onto the network; doing so with faulty hardware could produce unpredictable results.

Because this is primarily a test of cabling outside of the system, errors are not logged for any of the three error conditions noted above. If, however, the 82596 returns an invalid condition code, such as if no condition bits were set, the test logs an error.

For valid test results, the transceiver used must return transmitted data on the receive pair and activate the Carrier Sense signal while transmitting. For transceivers that do not activate the Carrier Sense, the test indicates a problem with the transceiver or transceiver cable regardless of the condition of the cable.

The calculation of distance to the cable failure depends on the network cable being a standard trunk or transceiver cable with a nominal velocity of propagation of approximately 79%. The distance values displayed are approximate.

The packet that is sent out on the network is a misaligned packet, whose source and destination addresses are both equal to the LAN address of the card under test (from NVRAM). The 82596 LAN chip itself controls the format and content of the packet.

**Display error log**

The local error log stores all information for the LAN tests. All errors print to the screen at the time of the error, and also store in the error log.

Although the error may have scrolled off the screen, the error information can be viewed using this display option.

**Clear error log**

This command clears the errors logged in the local error log during execution of the tests. The system error log is not cleared by this command.

Use the system-level clear command to clear the system error log; this command also gives you the option of clearing the local error log.

**SCSI device tests**

To access the test selection menus for the 1x7scsi test, type the following and press Return:

SA: **1x7scsi.0**

A display similar to Figure 49 appears:

**Figure 49**  
**SCSI test list**

```
Current Menu is /bdtest/1x7scsi.0 - "VME1x7 SCSI Tests"

scsi7          - VME1x7 SCSI 7 Tests
scsi6          - VME1x7 SCSI 6 Tests
scsi5          - VME1x7 SCSI 5 Tests
scsi4          - VME1x7 SCSI 4 Tests
scsi3          - VME1x7 SCSI 3 Tests
scsi2          - VME1x7 SCSI 2 Tests
scsi1          - VME1x7 SCSI 1 Tests
scsi0          - VME1x7 SCSI 0 Tests
controller     - VME1x7 Controller Self Tests

SA:
```

To execute the controller test suite, select controller from the menu. The following menu (Figure 50) appears:

**Figure 50**  
**SCSI controller test menu**

```
SA: controller<cr>                (to access the controller menu)
Selections for Test "VME1x7 Controller Self Tests"

    B) Reset the SCSI BUS                (DEBUG only)
    R) Reset the NCR SCSI Controller     (DEBUG only)
SA:
```

These tests are primarily for debug and should be used only if the MVME167/SMM167 fails to respond to SCSI commands.

To execute any hard disk test suite, select the appropriate SCSI ID from the 1x7scsi.0 menu and the menu shown in Figure 51 appears:

**Figure 51**  
**SCSI hard disk test menu**

```
SA: scsi0<cr>                    (to access the first SCSI hard disk test)
Selections for Test "VME1x7 SCSI ID 0 Tests"
 1) Hard Disk Confidence test          (reads first sector, last sector, then first sector)
 2) Read entire Hard Disk              (reads every sector on the disk)
 3) Hard Disk Random Read              (randomly reads 5% of sectors on the disk)
 4) Hard Disk Ping-Pong Read           (reads start, then end, then start +1, then end -1, etc.)
 5) Device Self Tests                 (executes device self-tests)
r) Read a Sector                       (reads selected sector; accepts hexadecimal or decimal input)
s) Read a Block of Sectors             (reads selected block; accepts hexadecimal or decimal input)
c) Read Capacity                       (displays drive capacity in sectors)
i) Inquiry                             (displays vendor and model)
s) Request Sense                       (reads and displays drive request sense information)
SA:
```

**Hard Disk Confidence Test**

Reads the first sector, the last sector, then the first sector on the disk. Each read is done twice and the results compared.

**Read Entire Hard Disk**

Reads the entire disk sequentially from sector zero to the last sector. Each read is done twice and the results compared.

**Hard Disk Random Read**

Reads randomly selected blocks of sectors. Approximately 5% of the available sectors are read. Each read is done twice and the results compared.

**Hard Disk Ping-Pong Read**

Reads the entire disk in the following sequence: sector zero, the last sector, sector one, sector (last - 1), sector two, sector (last - 2), and so on until every sector has been read twice, once from each direction. Each read is done twice and the results compared.

**Device Self Tests**

Issues a SCSI self test command. If the device fails its internal self tests, an error message is printed. Some devices do not support this command and fail with illegal command status.

**Read a Sector**

Requests user input of the number of the sector to be read, verifies that the sector is valid, and if so, reads the sector twice and compares the results.

**Read a Block of Sectors**

Requests user input of the number of a sector at which it begins reading, verifies that the sector numbers are valid, then reads the block of sectors twice, comparing the results.

**Read Capacity**

Displays the drive capacity, in sectors. The display is in both hexadecimal and decimal.

*N* SCSI hard disk drives of the same type do not always have the same number of available sectors, but the numbers should be close in *t*

value (for example, within 200 sectors of each other).

:

### **Inquiry**

Displays the drive type, vendor ID, product ID, and product revision level obtained by performing a SCSI inquiry command.

### **Request Sense**

Displays the drive's request sense information. The information is obtained by performing a SCSI request sense command.

To execute any SCSI tape test suite, select the appropriate SCSI controller from the 1x7scsi.0 menu and the menu shown in Figure 52 appears:

**Figure 52**  
**SCSI tape test menu**

```
SA:  scsi4<cr>
Selections for Test "VME1x7 SCSI ID 4 Tests"
(write-enabled scratch tape required)

1) Tape Confidence Test          (verifies presence of media and does rewind)
2) Write/Append/Read Tape Files (write/append/read/compare test)
3) Write/Read to EOT            (write/read/compare test on entire tape)
4) Read Entire Tape             (reads, without verification, all data on tape)
5) Device Self Tests            (executes device self tests)
r) Tape Retension               (if supported by the drive, retensions media)
e) Erase Tape                   (removes all data from the tape then rewinds)
b) Tape Block Data              (displays drive block size information)
i) Inquiry                      (displays drive vendor and model)
s) Request Sense                (reads and displays drive request sense information)
u) Unload and Eject the Media   (unloads the tape)
SA:
```

### **Tape Confidence Test**

Tests that the tape drive is ready and contains a tape. If so, it rewinds the tape.

### **Write/Append/Read Tape File**

At the beginning of the media, the test writes two files. Each file consists of two blocks of data with one file mark. The test then rewinds the tape and issues a space to End-Of-Data (EOD). At EOD, a file with two blocks of data and a file mark is written or appended. The test again rewinds the tape, and then reads the tape, verifies the data blocks, and checks for the file mark. Finally, it checks for EOD before rewinding the tape. If the test fails, an error message is printed.

### **Write/Read to EOT**

From the beginning of the media, this test writes a file onto all the remaining media. The tape is then rewound and the data read and compared with the written data patterns. This requires a write-enabled tape.

### **Read Entire Tape**

From the beginning of the media, this test reads every file on the tape until either blank media or the end of the media is encountered. No data verification is done. This merely confirms that all the media is readable.

### **Device Self-Tests**

This test issues a SCSI self-test command. If the device fails its internal self tests, an error message is printed. Some tape drives do not support this command and fail with an illegal command status. For this reason, the confidence test scripts for tapes do *not* include this test.

### **Tape Retension**

This test issues a SCSI retention command to the tape drive. On some devices, this test requires more than one hour to complete. On drives that do not support (or need) retensioning, such as the EXABYTE streaming cartridge tape drive, no tape movement takes place and the test simply passes.

**Erase Tape**

Beginning at the start of the media, all tape contents are erased. A write-enabled tape is required. On some devices, this test requires more than one hour to complete.

**Tape Block Data**

This test displays the tape drive's block size information obtained by performing a read block limits command and a mode sense SCSI command.

**Inquiry**

This test displays the drive type, vendor ID, product ID, and product revision level obtained by performing a SCSI inquiry command.

**Request Sense**

This test displays the drive's request sense information. The information is obtained by performing a SCSI request sense command.

**Unload and Eject the Media**

This test unloads the tape from the tape drive. If the drive supports tape ejection, the tape is ejected from the drive. Tape unloading is accomplished by performing a SCSI unload command.

### MVME167/SMM167 Card Test Configuration

Each of the four major test functions (serial communications, LAN, SCSI, and printer port) can be separately enabled or disabled through the use of the cf command. The configuration relating specifically to the MVME167/SMM167 is shown in Figure 53.

**Figure 53**  
**MVME167/SMM167 test configuration 1**

```
> cf
/bdtest configuration
1x7lp [0-1] = 1 ?           (MVME1x7 Printer Port testing)
1x7sp [0-1] = 1 ?           (MVME1x7 Serial Port testing)
1x7lan [0-1] = 1 ?         (MVME1x7 LAN testing)
1x7scsi [0-1] = 1 ?        (MVME1x7 SCSI testing)
```

All MVME167/SMM167 card test configurations are shown in Figure 54.

**Figure 54**  
**MVME167/SMM167 test configuration 2**

```
> cf 1x7lp.0
/bdtest/1x7lp.0 configuration
  base[%0x10] = 0xFFFEce00 ?           (GCSR address)

> cf 1x7lp.0/llp0
>bdtest/1x7lp.0/llp0 configuration
  Port is testable 0-False, 1-True [0,1] = 1
  Test in loopback mode 0-False [0,1] = 1
  Test in output only mode 0-False [0,1] = 0
  Columns per line to print [1-300] = 80
  Lines per page to print [1-1000] = 66
  Pages to print [0,1] = 1
  Use FormFeed 0-False [0,1] = 1
  Carriage Return after LineFeed 0-False [0,1] = 1
```

— continued —

**Figure 54**  
**MVME167/SMM167 test configuration 2, continued**

```

> cf 1x7sp.0
/bdtest/1x7sp.0 configuration
    base[%0x10] = 0xFFFEce00 ?                (GCSR address)

> cf 1x7sp.0/lsp3
/bdtest/1x7sp.0/lsp3 configuration
    Port number [3] = 3
    Port is testable 0-False [0,1] = 1
    Port can do sync 0-False [0,1] = 0
    Port should drive clk 0-False [0,1] = 0
    Port should receive clk 0-False [0,1] = 0
    TX/RX encoding 0-NRZ,1-NRZI,2-Manchester [0,1,2] = 0
    Synchronous baud rate [300,1200,2400,4800,9600,19200] = 9600

> cf 1x7lan.0
/bdtest/1x7lan.0 configuration
    base[%0x10] = 0xFFFEce00 ?                (GCSR address)
    level [0-7] = 4 ?                        (unused value)
    mode [0] = 0 ?                          (cannot be changed by user)
    warning msgs [0] = 0 ?                  (cannot be changed by user)

> cf 1x7lan.0/lan
/bdtest/1x7lan.0/lan configuration
    xfer size [0-1024] = 1024 ?              (unused value)

> cf 1x7scsi.0                                (To configure parameters for the VME1x7 SCSI port)
/bdtest/1x7scsi.0 configuration
    base[%0x10] = 0xFFFEce00 ?                (GCSR address)
    level [0-7] = 4 ?                        (Default interrupt level)
    SCSI ID [0-7] = 7 ?                      (SCSI ID for the NCR chip)
    mode [0] = 0 ?                          (cannot be changed by user)
    warning msgs [0] = 0 ?                  (cannot be changed by user)
    Device timeout-secs [1-240] = 70 ?
    Debug Flag [0-15] = 0 ?                  (Debug mode flag)

To set the parameters for each individual device, use cf 1x7scsi.0/scsi m:

```

— continued —

**Figure 54**  
**MVME167/SMM167 test configuration 2, continued**

```
> cf 1x7scsi.0/scsi0 (To configure the first SCSI device)
/bdtest/1x7scsi.0/scsi0 configuration
Ctrlr number [0] = 0 ? (SCSI controller number)
phy-drive [0-7] = 0 ? (drive number)
Maximum sector size [0-10000] = 512 ? (Used to set block size for tapes and
sector/xfer [1-128] = 64 ? number of blocks to transfer)
W Data Pattern = 0x0 ? (Write/Read data pattern)
Device type flag [0] = 0 ? (Program device type flag)
(Hard disk formatting)
Eval flag:Write/Expert mode (0-Off 1-On) (destructive test flag)
[0-1] = 0 ?
Conf flag:Warning messages (0-On 1-Off) (To turn user warning about
[0-1] = 0? destructive disk tests on and off)
Write Type (0-1%,1-All,2-Random,3-Ping) (Selects the test that will be
[0-3] = 0 ? available on the expert menu)
```

 **CAUTION**  
Setting the Eval flag to 1(On) changes the device test menu so that it will include destructive tests and expert commands.

## Hard disk expert tests

If the Eval flag is set to 1 (On), the MVME167/SMM167 hard disk test menu is expanded to include destructive tests and menu items for closer disk control (as shown in Figure 55).

**Figure 55**  
**MVME167/SMM167 hard disk expert tests**

```
SA: 1x7scsi.0/scsi0<cr>          (to access the expert hard disk test)
Selections for Test "VMElx7 SCSI ID 0 Tests"
1) Hard Disk Confidence test      (reads first sector, last sector, then first sector)
2) Read entire Hard Disk         (reads every sector on the disk)
3) Hard Disk Random Read         (randomly reads 5% of sectors on the disk)
4) Hard Disk Ping-Pong Read      (reads start, then end, then start +1, then end -1, etc.)
5) Device Self Tests             (executes device self tests)
r) Read a Sector                 (reads selected sector; accepts hexadecimal or decimal input)
s) Read a Block of Sectors       (reads selected block; accepts hexadecimal or decimal input)
d) Display Defect Lists          (displays manufacturer's and other defects)
v) Mode Sense/Select            (does SCSI Mode Sense, Mode Select test)
w) User Selected Write Test (DESTRUCTIVE) (test set by device test configuration)
f) Format Disk (DESTRUCTIVE)     (not compatible with operating system)
x) Reassign a Block (DESTRUCTIVE) (re-assigns defective logical block, adds to defect list)
c) Read Capacity                 (displays drive capacity in sectors)
i) Inquiry                      (displays vendor and model)
s) Request Sense                 (reads and displays drive request sense information)
t) Test Unit Ready              (tests whether drive is ready)
m) Display Mode Sense            (displays the drive's Mode Sense data)
z) Set Confid Test Script        (modifies confid 5 script to allow destructive testing)

SA:
```

### Test Unit Ready

Performs a SCSI test unit ready command on the drive. If the drive is currently ready, the test passes. If the drive is not ready, the test fails, displaying information about the failure. Note that this test may fail once and pass every time after that. This is the nature of a SCSI test unit ready command. This test only indicates a drive's ready state.

### **Display Mode Sense**

Displays the mode sense information from the drive. Prompts for the type of mode sense information: current values, changeable values, default values, and saved values. Note that some drives do not support all four types and cause this test to fail.

### **Display Defect Lists**

Displays the manufacturer's and the grown lists of hard disk defects. The following are prompts for the type of format required:

1. A Block Format is defined by SCSI-2 as a 4-byte defective block address that contains the defect. This format is not supported by all hard disk drives. The command will automatically change the format to the Bytes from Index format for drives that do not support the Block format.
2. A Physical Sector Format is defined by SCSI-2 as an 8-byte sector defect location, consisting of a 3-byte cylinder number, a 1-byte head number, and a 4-byte defect sector number for each defect.
3. A Bytes from Index Format is defined by SCSI-2 as an 8-byte defect location, consisting of a 3-byte cylinder number, a 1-byte head number, and a 4-byte defect location value from the index for each defect.

The manufacturer's defect list, called the Primary Defects List is displayed first, followed by the Grown Defects List. Exit from this command by typing **e** or **E** and pressing Return during format selection, or by typing **q** or **Q** and pressing Return at the "Depress RETURN or ENTER key to continue" prompt.

### **Mode Sense/Select**

Performs a SCSI mode sense command on the drive. The received mode sense information is then used in a mode select command. Then the test performs another mode sense command and compares the results of the two mode sense commands.

**User-Selected Write Test**

Performs the write test defined as a result of the device test configuration variable Write Type (described in the section “MVME167/SMM167 Card Test Configuration” earlier in this chapter). The Write Type variable can be set to one of four values. Then, depending on the value of the variable, the name and type of test are then set. The test name and type are defined for the following Write Type values:

1. Write Last 1% (DESTRUCTIVE)—This test writes then reads and verifies approximately the last 1% of the sectors on the hard disk. Though this is a quick write verification, it is still extremely dangerous. Use extreme caution.
2. Write All Sectors (DESTRUCTIVE)—This test sequentially writes, reads, and verifies every sector on the disk. This test destroys all data on the disk. Use extreme caution.
3. Random 50% Write (DESTRUCTIVE)—This test randomly selects 50% of the sectors to write, then read and verify. This test randomly destroys data on the disk. Use extreme caution.
4. Ping-Pong Write (DESTRUCTIVE)—This test writes, reads, and verifies the entire disk in the following sequence: sector zero, the last sector, sector one, the last-but-one sector, and so on until every sector has been written and read from each direction. This test destroys all data on the disk. Use extreme caution.

**Format Disk (DESTRUCTIVE)**

Formats the entire hard disk. Before formatting, the test asks if you would like to retain the grown list of defects. If the answer is not to retain it, the sectors in the list are returned to the list of usable sectors, the grown list is zeroed, and the disk formatted as perfect (bad sector mapping is handled by the controller). This test destroys all data on the disk. Use extreme caution.



**CAUTION**

This format is not compatible with any operating system. It should be used only as a diagnostic procedure.

**Re-assign a Block (DESTRUCTIVE)**

Re-assigns the selected block of defective sectors and records the block in the grown defect list (if such a list is supported). This can destroy data on the disk. No attempt is made to recover data from the re-assigned block. Use extreme caution.

**Set Confid Test Script**

Modifies confid 5 (Continuous Running Intensive I/O Check) test script to include destructive tests for this hard disk. Destructive mode is toggled each time this command is performed. If destructive mode is enabled, the following message is displayed:

```
CAUTION: Destructive disk tests for drive n have been
         added to confidence and fault test scripts!!!
```

If destructive mode is disabled, the following message is displayed:

```
DRIVE N TEST SCRIPTS ARE NOW READ ONLY
```

Destructive test warning messages are disabled during confid 5 testing to allow unattended destructive tests.

## Tape drive expert tests

If the Eval flag is set to 1 (On), the MVME167/SMM167 tape drive test menu is expanded to include destructive tests and menu items for closer disk control (as shown in Figure 56).

**Figure 56**  
**MVME167/SMM167 tape drive expert tests**

```
SA: 1x7scsi.0/scsi4<cr>
Selections for Test "VME1x7 SCSI ID 4 Tests"
(write-enabled scratch tape required)

1) Tape Confidence Test           (Verifies presence of media and does rewind)
2) Write/Append/Read Tape Files  (Write/Append/Read/Compare test)
3) Write/Read to EOT             (Write/Read Compare test on entire tape)
4) Read Entire Tape              (Reads, without verification, all data on tape)
5) Device Self Tests             (Executes device self tests)
r) Tape Retension                (If supported by the drive, retensions media)
e) Erase Tape                    (Removes ALL data from the tape then rewinds)
b) Tape Block Data               (Displays drive block size information)
i) Inquiry                       (Displays drive vendor and model)
m) Display Mode Sense            (Displays the drive's Mode Sense data)
s) Request Sense                 (Reads and displays drive request sense information)
t) Test Unit Ready               (Tests whether drive is ready)
u) Unload and Eject the Media    (Unloads the tape)
SA:
```

### Display Mode Sense

Displays the mode sense information from the drive. Prompts for the type of mode sense information are current values, changeable values, default values, and saved values. Note that some drives do not support all four types and will cause this test to fail.

### **Test Unit Ready**

Performs a SCSI test unit ready command on the drive. If the drive is currently ready, the test passes. If the drive is not ready, the test fails, displaying information about the failure. Note that this test may fail once and pass very time after that. This is the nature of a SCSI test unit ready command. This test only indicates a drive's ready state.

## **MVME167/SMM167 error messages**

### **Printer port test error messages**

The YYYY in the following messages represents a value specific to the error.

**System Error: Unable to allocate system's memory.**

**System Error: Unable to initialize error log.**

**System Error: Unable to record error into error log.**

**Error: Request for 0xYYYY bytes of system memory failed.**

**Error: Request for system semaphore failed.**

The operating system could not supply the resource.

**Internal code error: The error number of YYYY is invalid.**

**Error: Input buffer is empty.**

**Error: Unable to setup printer BUSY interrupt handler.**

**Error: Unable to setup printer Paper Error interrupt handler.**

**Error: Unable to setup printer SELECT interrupt handler.**

**Error: Unable to setup printer FAULT interrupt handler.**

**Error: Unable to setup printer Acknowledge interrupt handler.**

**Error: Unable to release printer BUSY interrupt handler.**

**Error: Unable to release printer Paper Error interrupt handler.**

**Error: Unable to release printer SELECT interrupt handler.**

**Error: Unable to release printer FAULT interrupt handler.**

**Error: Unable to release printer Acknowledge interrupt handler.**

**Internal ERROR: Invalid encoded irq handler error message 0xYYYY.**

An invalid parameter has been passed between functions in the test program. This could indicate that the test program or its data has been corrupted. Possible causes could be bad memory or a bad data transfer from another device in the system has corrupted the memory.

**Error: Test timed out waiting for printer to become ready after printer reset.**

**Error: Unexpected status from printer reset.**

**Error: Test timed out waiting for printer to become ready.**

**Error: Printer not ready.**

**Error: Test timed out waiting for printer ACKNOWLEDGE.**

**Error: Printer error occurred during printing.**

**Error: Test timed out waiting for printer to finish current page.**

The printer is doing something unexpected. Possible causes could be paper out error or paper path error.

**Error: The PCC2 printer interface is indicating an unexpected interrupt.**

**Error: The BUSY bit is not a one as expected.**

**Error: The Paper Error bit is not a one as expected.**

**Error: The SELECT bit is not a one as expected.**

**Error: The FAULT bit is not a one as expected.**

**Error: The Acknowledge bit is not a one as expected.**

**Error: The Interrupt Status bit is not a one as expected.**

**Error: The BUSY bit is not a zero as expected.**

**Error: The Paper Error bit is not a zero as expected.**

**Error: The SELECT bit is not a zero as expected.**

**Error: The FAULT bit is not a zero as expected.**

**Error: The Acknowledge bit is not a zero as expected.**

**Error: The Interrupt Status bit is not a zero as expected.**

**Error: An unexpected BUSY interrupt occurred.**

**Error: An unexpected Paper Error interrupt occurred.**

**Error: An unexpected SELECT interrupt occurred.**

**Error: An unexpected FAULT interrupt occurred.**

**Error: An unexpected Acknowledge interrupt occurred.**

**Error: An expected BUSY interrupt did not occur.**

**Error: An expected Paper Error interrupt did not occur.**

**Error: An expected SELECT interrupt did not occur.**

**Error: An expected FAULT interrupt did not occur.**

**Error: An expected Acknowledge interrupt did not occur.**

The printer is doing one of the above unexpectedly. Possible causes could be the loopback is not connected, is bad, or is incorrect; or there is a hardware failure.

**Error: The Printer interrupt status bit is not set.**  
**Error: The BUSY interrupt pending bit is not set.**  
**Error: The Paper Error interrupt pending bit is not set.**  
**Error: The SELECT interrupt pending bit is not set.**  
**Error: The FAULT interrupt pending bit is not set.**  
A hardware failure.

### Serial port test error messages

Nearly all serial port test error messages are logged to an error log.

The YYYY in the following messages represents a value specific to the error.

**Error: Request to open port failed.**

Indicates that a test cannot be performed on the port because it is the SSID console port (or host port when in concurrent mode). A less likely cause is an invalid parameter has been passed between functions in the test program. This could indicate that the test program or its data has been corrupted because of bad memory or a bad data transfer from another device in the system.

**Error: Unable to init async defaults.**

**Error: Unable to init internal loopback mode.**

**Error: Request to release port failed.**

**Error: Unable to clear status.**

**Error: Unable to init transmitter and/or receiver to YYYY baud.**

**Error: Unable to init even parity, 1 start/stop bit(s), and 8 bit character.**

**Error: Unable to init tx to YYYY baud.**

**Error: Unable to init rx to YYYY baud.**

**Error: Unable to init Break sequence.**

An invalid parameter has been passed between functions in the test program. This could indicate that the test program or its data has been corrupted because of bad memory or a bad data transfer from another device in the system.

**Error: Multiple outputs are connected together on port YYYY.  
Possible causes of the failure might be: a bad loopback, an incorrect loopback, or a hardware failure.**

As stated in the message, possible causes are a bad loopback, an incorrect loopback, or a hardware failure.

**Error: No handshake connections detected.**

Possible causes could be that a loopback is not connected, or there is a bad loopback, an incorrect loopback, or a hardware failure.

**Error: Port YYYY, current handshake connections do not match the original:**

**Original:**

**CTS connects to RTS. Current signal state of CTS is NOT ASSERTED.**

**DCD connects to DTR. Current signal state of DCD is NOT ASSERTED.**

**Current:**

**CTS connects to UNKN. Current signal state of CTS is NOT ASSERTED.**

**DCD connects to UNKN. Current signal state of DCD is NOT ASSERTED.**

Possible causes could be that the loopback has been disconnected, there is an intermittent loopback, or there was a hardware failure.

**Error: YYYY unexpected Framing error(s) occurred.**

**Error: YYYY unexpected Break(s) detected.**

Possible causes could be that there is an intermittent loopback or there was a hardware failure.

**Error: YYYY unexpected Parity error(s) occurred.**

**Error: YYYY unexpected Overrun error(s) occurred.**

Cause is a hardware failure.

**Error: Test timed out waiting for data, 0 characters received.**

If the count is zero characters, check that the loopback is still connected.

Causes are a bad loopback or a hardware failure.

**Error: Data miscompare: tx data 0x54 rx data 0x53, buffer offset 0.**

Cause is hardware failure.

**Error: Test failed at YYYY baud.**

When the internal and external rate test fails, this error message indicates the test's baud rate.

**Error: Expected Framing error not detected.**

**Error: Expected Break not detected.**

Possible causes could be that there is an intermittent loopback, a missing loopback, or there was a hardware failure.

**Error: Internal code error port number out of range.**

**Error: Internal code error program trying to queue greater than 16 characters.**

**Internal code error. The error number of YYYY is invalid.**

An invalid parameter has been passed between functions in the test program. This could indicate that the test program or its data has been corrupted because of bad memory or a bad data transfer from another device in the system.

**Error: Initializing work structure failed.**

**t2401\_getwrk(1) memory request for 0xYYYY bytes failed.**

**Error: Request for system semaphore failed.**

**System Error. Unable to allocate system's memory.**

**System Error. Unable to initialize error log.**

**Error log not available.**

**System Error. Unable to record error into error log.**

The SSID operating system cannot supply the requested resource.

## LAN test error messages

Nearly all serial port test error messages are logged to an error log. Each logged error is assigned a hexadecimal error code.

### **Unable to initialize LAN Error Log.**

#### **Unable to Allocate LAN Intr Semaphore.**

#### **0xffffffff4, LAN: Mem couldn't be allocated.**

The named system resource was not available or was malfunctioning. Possible cause could be that too many tests are running or the MVME167/SMM167 card is defective. These three errors may not be logged.

#### **0xffffffff3, LAN: can't claim interrupt vector.**

#### **0xffffffff2, LAN: can't relinquish interrupt vec.**

An error occurred while SSID was attempting to set up one of the two LAN interrupts. The most probable cause is a defective MVME167/SMM167 card.

#### **0xffffffff1, Freecore failed in release\_lan\_mem!**

An error occurred while the LAN test was trying to relinquish (free) the system memory it had used. The memory that was not freed will not be tested by the system memory test until the malfunction is corrected. Resetting the system is strongly recommended prior to beginning another pass of SSID. The most probable cause of this failure is a defective MVME167/SMM167 card.

#### **Ethernet Address in hex: xxxxxxxyyyyy**

Does not always indicate an error but is printed as part of the error message for an incorrect Ethernet Address. xxxxxxx is usually 08003E2 (indicating a Motorola Ethernet product), and yyyyy indicates the card. The 12-digit address can be modified using the ROM Debugger CNFG command.

#### **0xffffffff0, Ethernet Address may be incorrect.**

##### **Ethernet Address not Motorola assigned.**

##### **Use ROM Debugger CNFG command to fix it.**

The first seven digits of the Ethernet address are not 08003E2, as assigned. This may mean that the NVRAM on the MVME167/SMM167 card has not been initialized or is defective. If the address has been modified

intentionally, it may be necessary to use the cf command to configure the LAN test or to temporarily modify the address to start with 08003E2.

**0xfffffef, Invalid System Configuration Pointer.**

**0xfffffee, lan\_cuc\_cmd\_write: Command out of limits...**

**0xfffffe9, lan\_ruc\_cmd\_write: Command out of limits...**

An SSID code variable has been corrupted. The most probable cause is the memory into which SSID has been loaded.

**0xfffffd4, Warning: it took 2 tries to free memory.**

When the LAN test tried to return memory to the kernel's free memory pool, the first attempt failed. The second attempt was successful. This is only a warning and subsequent testing should not be affected.

**0xfffffed, No interrupt after Channel Attention.**

**0xfffffec, No interrupt received after Address Setup.**

**0xfffffeb, Init failed, BUSY byte never zeroed.**

**0xfffffea, LAN command word always busy.**

**0xfffffe8, Lan chip couldn't accept Address Setup.**

**0xfffffe7, Lan chip didn't complete Address Setup.**

**0xfffffe6, Write of Ethernet Address to LAN failed.**

**0xfffffe5, lan\_dump: Status ok bit not 0.**

**0xfffffe4, lan\_dump: Dump never completed.**

**0xfffffe3, Dump Addr not found in Dumped Data.**

**0xfffffe2, Addr of System Control Block not found.**

**0xfffffe1, LAN Selftest never completed.**

**0xfffffe0, LAN Selftest, selftest bit failure.**

**0xfffffdf, LAN Selftest, diagnose bit failure.**

**0xfffffde, LAN Selftest, bus timer bit failure.**

**0xfffffdd, LAN Selftest, register result bit failure.**

**0xfffffdc, LAN Selftest, rom test bit failure.**

**0xfffffdb, Receive Unit Command didn't complete.**

**0xfffffda, Receive Unit Status indicates Not Ready.**

**0xfffffd9, Incorrect Receiver Values in Dump Area.**

**0xfffffd8, Configuration for Loopback test failed.**

**0xfffffd7, Data Received does not match Transmitted Data.**

At address=xxxxxxx, expected data was: xx

actual data was: xx

**0xfffffd6, Receiver not ready for Loopback test.**

**0xfffffd5, No Interrupt after data transmission.**  
**0xfffffd3, Sysbus Byte incorrect in dumped data.**  
**0xfffffd2, Transmit Command did not complete correctly.**  
**0xfffffd1, Chained Commands did not complete correctly.**  
**0xfffffd0, Chip reconfigure did not complete .**  
**0xfffffcf, TDR Test results are invalid.**

A malfunction occurred in the LAN circuitry. The most probable cause is a defective MVME167/SMM167 card.

### SCSI test error codes and messages

The SCSI test modules print out error messages when unexpected test conditions are detected. If a SCSI test detects an error, the contents of the SCSI sense packet and the interpretation of the error code are both displayed.

#### SCSI sense packet

Following is a typical example of a SCSI sense display (Figure 57):

**Figure 57**  
**SCSI sense packet**

/bdtest/lx7scsi.0/scsi0	First pass read error	<i>LINE 1</i>
/bdtest/lx7scsi.0/scsi0	Fatal read error	<i>LINE 2</i>
At block 221219 (0x36023),		<i>LINE 3</i>
0x03, Non-recoverable media error		<i>LINE 4</i>
Sense code: 0x11, Sense qual: 0x0		<i>LINE 5</i>
/bdtest/lx7scsi.0/scsi0		
Read sectors 221219-221283 (0x36023-0x36063): failed		<i>LINE 6</i>

#### LINE 1

indicates the SCSI device that failed and whether the failure occurred on the first read, second read, write, or read following write.

**LINE 2**

indicates the SCSI device that failed and whether the failure is fatal or recoverable.

**LINE 3**

contains the logical block number of the error.

**LINE 4**

contains the SCSI Sense Key and the interpretation of the error code.

**LINE 5**

contains the additional sense code and sense qualifier for the error.

**LINE 6**

contains the SCSI device that failed, the substest that failed, and the range of sectors being accessed, both in decimal and hexadecimal.

The following table gives a further explanation of the SCSI Sense Key found in LINE 4 above. Refer to the SCSI specification or the product specification for the drive that failed for information about the additional sense code and sense qualifier in LINE 5.

**Table 7**  
**Sense keys**

<b>Key (Hex)</b>	<b>Error Description</b>
\$00	No sense. Indicates that there is no specific sense key information to be reported. This would be the case for a successful command or a command that received Check Condition or Command Terminated because one of the filemark, End-of-Media, or Illegal-Length-Indicator bits is set to one.
\$01	Recovered error. Indicates the last command completed successfully after recovery actions performed by the target. Examine additional sense bytes and information field for details. When several errors occur during one command, the choice of which error to report (first, last, most severe) is device specific.

\$02	Not ready. Indicates that the logical unit addressed cannot be accessed. Operator intervention may be required to correct this problem.
------	--

— **continued** —

**Table 7**  
**Sense keys, continued**

Key (Hex)	Error Description
\$03	Media error. Indicates that the command terminated with a non-recovered error condition, probably caused by a flaw in the medium or an error in the recorded data. This sense key may also be returned if the target is unable to distinguish between a flaw in the medium and a specific hardware error (sense key \$04).
\$04	Hardware error. Indicates that the target detected a non-recoverable hardware failure (such as a controller failure, a device failure, or a parity error) while performing the command or during a self-test.
\$05	Illegal request. Indicates that there was an illegal parameter in the command descriptor block or in the additional parameters supplied as data for some commands. This may indicate memory failure in the CPU or in the device controller card.
\$06	Unit attention. Indicates that the removable medium may have been changed or the target has been reset.
\$07	Data protect. Indicates that an attempt was made to read or write to a block that is protected from that operation. The read or write was not performed.
\$08	Blank check. Indicates that either 1) a sequential access or write-once device encountered blank medium or a format-defined end-of-data indication while reading, or 2) a write-once device encountered a non-blank medium while writing.
\$09	Vendor specific.
\$0A	Copy aborted. Indicates that a copy, compare, or copy and verify command was aborted due to an error condition on the source device, the destination, or both.
\$0B	Aborted command. Indicates that the target aborted the command.
\$0C	Equal. Indicates that a search data command has satisfied an equal comparison.
\$0D	Volume overflow. Indicates that a buffered peripheral device has reached the end-of-partition and data that has not been written to the medium may remain in the buffer.

\$0E	Miscompare. Indicates that the source data did not match the data read from the medium.
\$0F	Reserved.

**Table 8**  
**SCSI firmware error codes**

<b>Code (Hex)</b>	<b>Error Description</b>
\$00	Good. The NCR firmware has successfully completed the command and no corrective action is necessary.
\$01	NOP. The NCR firmware was sent a command with no command mode bit set. The user may have intentionally issued this command, in which case the returned status indicates the desired no operation action has occurred. Otherwise the user has issued a command in error and must set one of the mode request bits.
\$02	SCSI bus reset. The NCR firmware either has been issued or has detected a SCSI bus reset. All commands currently outstanding to the NCR firmware at the time of the SCSI bus reset are terminated with this status, leaving the NCR device queues empty. All commands terminated by this reset may be re-issued by the SSID driver at its discretion.
\$03	Device reset. This status is returned only for target mode commands outstanding to the NCR firmware. SSID does not support target mode operation.
\$04	Abort. This status is returned only for target mode commands outstanding to the NCR firmware. SSID does not support target mode operation.
\$05	Abort tag. This status is returned only for target mode commands outstanding to the NCR firmware. SSID does not support target mode operation.
\$06	Clear queue. This status is returned only for target mode commands outstanding to the NCR firmware. SSID does not support target mode operation.

\$07	Data overflow. The command was aborted because of a data overflow that occurred on either a DATA-OUT phase or a DATA-IN phase for non-scatter gather-type commands. A data overflow occurs if the supplied byte count is exhausted but the SCSI bus remains in the DATA-OUT or DATA-IN phase. For the DATA-IN phase, the NCR firmware reads the remaining data from the target device into a bit bucket before terminating the command. For the DATA-IN phase, the NCR firmware writes 0x0E bytes until the DATA-IN phase terminates.
— continued —	

**Table 8**  
SCSI firmware error codes, continued

Code (Hex)	Error Description
\$08	Data underrun. The command was aborted because of a data underrun that occurred on either a DATA-OUT phase or a DATA-IN phase for non-scatter gather-type commands. A data underrun occurs if the current data transfer completes but the byte count is not exhausted.
\$0B	Bad queue depth. This status is returned when the command tries to set the queue depth greater than 255 (the value allowed by SCSI-2).
\$0C	Selection timeout. The command was aborted because the NCR firmware could not select a SCSI device within 250 milliseconds.
\$0D	Reselection timeout. The command was aborted because the NCR firmware could not reselect a SCSI device within 250 milliseconds.
\$0E	Bus error. The command was aborted because a bus error occurred during a DATA phase to or from the local memory bus of the MVME167/SMM167. The NCR firmware terminates the SCSI bus DATA-IN phase by dumping the remaining data, and terminates the DATA-IN phase by writing an error pattern.
\$0F	Bus error. The command was aborted because a bus error occurred during a NON-DATA phase to or from the local memory bus of the MVME167/SMM167.
\$10	Illegal instruction. The command was aborted because the chip attempted to execute an illegal instruction.

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- |      |   |
|------|---|
| \$11 | Unexpected disconnect. The command was aborted because an unexpected disconnect occurred.   |
| \$12 | Unexpected phase change. The command was aborted because an unexpected phase change occurred.   |
| \$13 | SCSI bus hung. The command was aborted because the SCSI bus hung during the command. This status is caused by any SCSI bus phase other than the selection phase where a device did not respond within 250 milliseconds. |

**Table 9**  
**SCSI firmware errors—initialization errors**

<b>Code</b>	<b>Initialization error description</b>
\$09	Clock fast. The initialize command was aborted because the clock speed was greater than 75MHz. The clock speed must be within the range 25-75MHz (0x32353030-0x37353030).
\$0A	Bad clock parameter. The initialize command was aborted because of an invalid clock speed parameter. The clock speed must contain valid ASCII characters of the decimal values between 0-9 (0x30-0x39).
\$1E	Script patch. The initialization was aborted because the NCR chip failed to patch the NCR scripts. This failure may be caused by a bus error, an abort, or an illegal NCR script instruction.
\$1F	No SCSI bus. The initialization was aborted because the SCSI bus was found to be in an illegal state. This state could be because the NCR chip is not physically attached to a SCSI bus. Another cause of this error is that the SCSI bus is not terminated properly. A third possibility is that a device connected to the bus is driving the bus to an invalid state.

**Table 10**  
**SCSI firmware errors—protocol violation errors**

<b>Code</b>	<b>Protocol violation error description</b>
\$14	Protocol violation #1. The command was aborted because the target device transitioned to some other SCSI bus phase than the expected data phase (either data-in or data-out).
\$15	Protocol violation #2. The command was aborted because the expected data phase was in the wrong direction. For example, if a data-in phase was expected, a data-out phase occurred.
\$16	Protocol violation #3. The command was aborted because an incorrect phase occurred following a selection.
\$17	Protocol violation #4. The command was aborted because an incorrect phase occurred following a message-out phase.
\$18	Protocol violation #5. The command was aborted because an incorrect phase occurred following a data phase (either data-in or data-out).
\$19	Protocol violation #6. The command was aborted because an incorrect phase occurred following a command phase.
\$1A	Protocol violation #7. The command was aborted because an incorrect phase occurred following a status phase.
\$1B	Protocol violation #8. The command was aborted because an incorrect phase occurred following a restore pointer message.
\$1C	Protocol violation #9. The command was aborted because an incorrect phase occurred following a save data pointers message.
\$1D	Protocol violation #A. The command was aborted because the expected identify message phase after reselection did not occur.

## Interactive memory tests

The SSID interactive memory tests are designed to run interactively with other card tests. The memory diagnostics perform extensive tests of the memory card logic, RAM Chips, VSBbus interface, and VMEbus interface.

System memory cards must be strapped correctly for the interactive memory tests to work properly. The tests assume that memory is contiguous; any gaps that are found are assumed to be bad RAM. Likewise, any overlap in memory addresses is assumed to be bad RAM. Therefore, when testing a system with on-board RAM, the address of the first memory card (add-on memory) must begin at the address boundary of the onboard RAM. For information on proper strapping of memory cards, refer to the System Manual for your particular system.

The interactive memory tests work in the following manner:

- The tests examine the diagnostic kernel's free list to determine which block of memory to test. Starting with the first block in the free list, the tests determine whether or not a memory block has already been tested. If it has not been tested, the memory tests access a predetermined portion of the memory block. The amount of memory accessed depends on the size of the contiguous block. The memory test continues in this way until all available free memory has been tested.
- At this point the memory tests check the process table to determine if other processes (using memory not yet tested) are running. The memory tests cannot access this untested memory until the processes quit. While waiting to access the memory, the memory tests take a free block and repeatedly test it. When all other processes quit, the memory tests access the remaining untested memory, test it, and then stop.
- Memory tests check all contiguous RAM except the block of memory where SSID is loaded. SSID does not check parity because SST performs this test at system start-up time.
- If a memory card is failing, the interactive memory test displays a message identifying the bad address on the memory card. In some cases, the tests also display the expected and actual data. The interactive memory tests do not size memory but rather use the free memory found by the diagnostics kernel at start-up time.

To access the test menus for the memory tests, type the following:

SA: **mem.0**

A display similar to that shown in Figure 58 appears:

**Figure 58**  
**Memory test menu**

```
Selections for Test "Memory Test"
2) Interactive AA/55 Pattern
3) Interactive 00/FF Pattern
4) Interactive C3/3C Pattern
5) Interactive Cross Address Test
6) Interactive Walking Ones
7) Interactive Walking Zeros
8) Interactive X Move
9) Burn-in Memory Test
```

The following briefly explains the tests:

2) through 8)

By default, these tests perform the indicated pattern on every longword. All of RAM is written to and a verification read is performed.

It is possible to change the memory configuration to test address increments other than every longword, thereby changing the execution time of the memory tests. Refer to the cf command in "Command line mode" for details.

9) Burn-in Memory Test

This test performs tests 2 through 8 on each block of memory, using the increment value defined in the memory configuration to determine which longwords are tested. Since interactive memory tests run until all other card tests have finished, only one memory test can be run in any given set of card tests. By combining all of the memory tests into this one option, all of the memory tests can run concurrently with other card tests.

### Interactive memory test configuration

The interactive memory test configuration is shown below. Refer to the `cf` command in “Command line mode” for information on modifying this configuration.

```
SA: cmdline
>cf mem.0
/bdtest/mem.0 configuration
  walk__step = 1 ?           #address increment value
>set menu
```

---

## Communication controller card tests

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This chapter describes the card tests available for communication controller cards. Each section describes the tests available for a particular controller card, the card's test configuration, and, in some cases, the error codes associated with the card. For an introduction, refer to "Card Testing" in the chapter on "Confidence, fault, card, and peripheral testing".

### MVME333-2 X.25 controller

The MVME333 test software supports a wide range of firmware types and card positions. The software supports as many as 19 cards with the following names and addresses:

333a.0	0xFFFF3800	333b.0	0xFFFF3900	333C.0	0xFFFF3A00
333d.0	0xFFFF3B00	333e.0	0xFFFF3C00	333f.0	0xFFFF3D00
333g.0	0xFFFF3E00	333h.0	0xFFFF3F00	333i.0	0xFFFF4000
333j.0	0xFFFF4100	333k.0	0xFFFF4200	333l.0	0xFFFF4300
333m.0	0xFFFF4400	333n.0	0xFFFF4500	333o.0	0xFFFF4600
333p.0	0xFFFF4700	333q.0	0xFFFF4800	333r.0	0xFFFF4900
333s.0	0xFFFF4A00				

Three types of firmware are supported by the test: CE1, CE3, and X.25. These types are supported by all of the above addresses in any combination. When the first of the following tests is run, that test probes all of the above addresses and identifies each card in the system. The test then cross-loads each card and saves the status of all cards. Each type of firmware has its own crossloader interface, which loads an object module from the host's memory into the MVME333 memory. The object module then takes control of the MVME333 by loading itself into the card and then initializing itself.

All test reports about the communication ports are relative to the MVME333 communication integrated circuits (ICs). The ports are labeled 1 through 6. Port 1 is the A port of the first Z8530 communication IC, port 2 is the B port of the first Z8530, and so on. A transition card manual will be needed to determine the external connections of all signals. Each transition card has different and possibly configurable connections.

To access the test menus for the first MVME333 X.25 controller, type the following:

SA: **333a.0**

Press Return.

A display similar to Figure 59 appears:

**Figure 59**  
**Test menu for first MVME333-2 X.25 controller**

```
Current Menu is /bdtest/333a.0 - "VME333 Communications Board Test"
sp.0          - Serial Port Pair
SA:  sp.0<cr>      (to access the test selection menu)
                    (The following menu is displayed for all MVME333 controllers)
    0) Board Confidence Test
    1) Board Hardware Test
    2) Internal Loopback Test
    3) External Loopback Test
    b) Display EIA Signal Status
    d) Display Loopback Connection
    y) Display Board Type and Address
                    NOTE: Only asynchronous mode is tested
SA:
```

### **Board Confidence Test**

Transfers a 1024-byte command block to the MVME333's on-board memory, sets status, and writes the block back to the host's memory. The test then verifies the returned block.

### **Board Hardware Test**

Executes a write/read register test on the MVME333's ICs.

### **Internal Loopback Test**

Executes an internal loopback test on the MVME333's ICs. External loopbacks are not required for this test.

Note that this test transmits data on the Transmit Data pin of the transition card at variable baud rates and stop-bit settings. External connections other than loopbacks should be disconnected if this poses a problem.

### **External Loopback Test**

Executes an external loopback test on the MVME333's communication channels. External loopbacks are required for this test. The test automatically detects the loopback connections and reports them back as part of the test. The test fails if no loopbacks are present.

Note that the test passes if only one loopback is present even if the connections are not correct. Before executing the external loopback test, perform the display loopback connections test to determine if the connections are correct.

Note also that the CE1 firmware comes up in its debug mode if there is a loopback connected to port 1. Thus cards with CE1 firmware cannot test port 1 in external loopback mode.

### **Display EIA Status**

Executes a get EIA status test, which returns the current EIA status for the communications channels (that is, the states of the CTS, DCD, and DSR input signals).

### **Display Loopback Connections**

Reports the current, detected and external loopback connections.

### Display Board Type and Address

Displays the card's type (CE1, CE3, or X.25) and the card's address in the system.

### MVME333 X.25 card test configuration

The MVME333 card test configuration is shown in Figure 60. Refer to the cf command in "Command line mode" for information on modifying this configuration.

**Figure 60**

**MVME333-2 X.25 board test configuration**

```
> cf x333.0
/bdtest/333.0 configuration
  base[%0x100] = 0xffff3b00 ?<cr>          # base address
  am[0x0d, 0x3d] = 0x0d ?<cr>            # address modifier
  level[0-7] = 1 ?<cr>                   # default interrupt level
  sp[0-1] = 1 ?<cr>                      # test available
```

### **MVME333 X.25 transition card loopback connections**

External loopback tests require loopback cables, which should be connected as follows:

MVME333 X.25 Card                      MVME705B Transition Card

SP1 <-----> SP3

### **MVME333-2 X.25 error messages**

The following is a description of MVME333 error messages.

#### **333a.0/sp.0: This board does not exist on the system**

The card has not been detected by the program.

#### **333a.0/sp.0: This board's firmware is unknown by the test package**

The card's start-up status does not match any of the known start-up status values.

#### **333a.0/sp.0: This board is in an error state and no more testing can be executed on it**

The card is in an unknown error state and is not responding to the test.

#### **333a.0/sp.0: This board is reporting a power up error condition**

The card has a power-up self-test failure. No more testing can be done on the card.

#### **333a.0/sp.0: Download failed for X.25 board**

The error may not be for this card because all cards are downloaded by the first test. The first test to detect the failure of the download reports the failure.

### Status packet display

To provide sufficient status information, the contents of the packet display when there is an error status returned by the VME33X. The packet is also displayed when there is a data comparison error detected by the test. The English translated error code in the main status and the extended status fields display after the packet display. You can also force this packet to display every command and status with or without error by typing **set dp** and pressing Return in command line mode (refer to “Command line mode”). To clear the flag, type **set -dp** and press Return. Figure 61 is a typical example of the packet display.

**Figure 61**  
**Status packet display**

```

Packet address = 1f9aa8, ID = sp.0
| flnk |cmd |port| saddr | len |stat|term| rlen |
|ffffff|01 | 01 |000187b8|00000400| 0c | 00 |00000010|
error: Rx queue overrun

```

The message after `error:` is interpreted directly from the status returned by the controller. Each field of the packet display is defined as follows:

- `flnk` is one longword that is used internally by the VME33X firmware for packet linking purposes. `flnk` does not need to be set nor monitored by the host.
- `cmd` is one byte set by the host. `cmd` is a code number that specifies the command. Valid command codes are \$01 to \$07 and \$0B to \$13.
- `port` is one byte set by the host. `port` is a number that specifies the serial port affected by the command. Valid port numbers are \$01 to \$06 for the MVME331 and \$01 to \$08 for the MVME332.
- `sad` is one longword (4 bytes) set by the host. `sad` defines the start address of a data area in system memory for command use. Such data may be characters to be transmitted or received, configuration tables, or other additional command parameters. Valid start addresses are any system RAM addresses accessible by the controller.

- `len` is one longword set by the host. `len` defines the size of a data area in system memory for command use. Such data may be characters to be transmitted or received, configuration tables, or other additional command parameters. The sum of `sad` and `len` must not exceed the system RAM addresses accessible by the communications controller. The maximum value for `len` is `$7fffffff`.
- `stat` is one byte returned by the VME33X. `stat` is a status code number that is zero when the command has been completed successfully. In the case of abnormal terminations, `stat` indicates the condition that aborted the command.
- `term` is one byte returned by the VME33X. `term` is used with the read and write commands and is the character that caused command termination. `term` can be the previously defined terminating character or the bad character in the case of a parity or framing error.
- `r1en` is one longword returned from the VME33X. `r1en` is used by commands that involve the transfer of data to or from system memory. `r1en` is the number of bytes read from or written to system RAM at the time of command termination. In the case of abnormal command terminations, `r1en` can be used by the host to update the `sad` and `len` fields, and to reissue the command that continues the previous aborted operation.

**Non-fatal errors**

SSID records both fatal and non-fatal errors. To see the error count, use the `fe` command in command mode (refer to “Command line mode”). The non-fatal errors are the errors that could be corrected by software retry. In the case of the VME33X, all errors are considered fatal errors.

### Fatal errors

Fatal errors are hard, non-recoverable errors. In the VME33X test, all errors are fatal errors and fall into the following categories:

- Errors flagged in the status returned by VME33X.
- Data comparison errors.
- Timeout errors that occur when a packet is not returned by the controller after a certain time.

## MVME332XT asynchronous communications controller

These tests check all port pairs on the MVME332XT communication boards. These tests require loopback cables, which should be connected as follows:

```
SP7 <-----> SP8
SP5 <-----> SP6
SP3 <-----> SP4
SP1 <-----> SP2
```

All tests, except the baud rate tests, are executed with the ports set to 38.4K baud.

No specific download test is provided for the MVME332XT board; however, a download is performed as part of the hardware flow control test, providing a check of the download capability of the board.

To access the test menus for the first MVME332XT communication board, type the following:

SA: **x332.0**

Press Return. The display shown in Figure 62 appears:

**Figure 62**  
**Test menus for first MVME332XT board**

```

Current Menu is /bdtest/x332.0 - "VME332xt Async Comm"
sp.3          - Serial Port Pair
sp.2          - Serial Port Pair
sp.1          - Serial Port Pair
sp.0          - Serial Port Pair

SA:  sp.0<cr>  (to access the test selection menu for the communications ports SP1 and SP2)
1) open port a          a) DCD a -> b
2) open port b          b) DCD b -> a
3) loopback a -> b      c) baud rate a -> b
4) loopback b -> a      d) baud rate b -> a
5) full duplex          e) parity a -> b
6) event a -> b         f) parity b -> a
7) event b -> a         g) frame a -> b
8) break a -> b         h) frame b -> a
9) break b -> a         i) HW flow ctl a -> b
                       j) HW flow ctl b -> a

This menu is displayed for all communication port pairs on the MVME332XT boards.
SA:

```

A description of the MVME332XT tests follows.

- 1) open port a
- 2) open port b

These tests open and then close a port as a simple *board alive* check.

- 3) loopback a -> b
- 4) loopback b -> a

Transmit and receive data between two ports, comparing the results.

- 5) full duplex

Checks that data can be transmitted to and received at both ports simultaneously.

6) event a -> b

7) event b -> a

Verify that the ports return the correct event packets when interrupt and quit signals are received. Event packets are used for communication between the operating system and MVME332XT board.

8) break a -> b

9) break b -> a

Force a break in the line and verify a "break detect" message is received.

a) DCD a -> b

b) DCD b -> a

Cause DCD to be negated on one port and verify that the other port detects the loss of DCD.

c) baud rate a -> b

d) baud rate b -> a

Verify each port at baud rates of 50, 75, 110, 300, 1200, 2400, 4800, 9600, 19.2K, and 38.4K.

e) parity a -> b

f) parity b -> a

Generate a parity error on one port and check to see if it is detected by the other port.

g) frame a -> b

h) frame b -> a

Set one port to 4800 baud and the other to 9600 baud, transfer data from one port to the other, and verify that a framing error is detected.

i) HW flow ctl a -> b

j) HW flow ctl b -> a

Set each port to use hardware flow control, transfer data from one port to the other, and compare the results.

## MVME332XT board test configuration

The MVME332XT board test configuration is shown in Figure 63. Refer to the cf command in “Command line mode” for information on modifying this configuration.

**Figure 63**  
**MVME332XT board test configuration**

```

> cf x332.0
/bdtest/x332.0 configuration
  base[%0x10000] = 0xff780000      # base address
  am[0x0d, 0x3d] = 0xd           # address modifier
  level[0-7] = 2                 # default interrupt level
  sp[0-4] = 4                    # number of communication port pairs

> cf x332.0/sp.0
/bdtest/x332.0/sp.0 configuration
  port a no[1-7] = 0             # serial port number
  port b no[1-7] = 1            # serial port number
  xfer size[0-2000] = 1024      # buffer size

```

## MVME332XT error messages

### ring buffer allocation exceeds 64k

The ring buffer allocation exceeds the available MVME332XT dual ported RAM area of 64K.

### Initialization error

Board initialization was unsuccessful.

### TIMEOUT

A timeout has occurred. This could happen if a packet is sent to the MVME332XT, but the expected status packet is not returned within a certain period of time.

### port open timeout

A serial port open command is sent to the MVME332XT, but no response is received within a certain period of time.

**dev never ready**

A serial port is expected to have DCD asserted status from the MVME332XT, but the DCD is never asserted.

**Free packet pool is empty**

The test requests a free packet but none is available. This could happen if there is memory corruption.

**DCD did not NEGATE**

DCD is expected to be negated on a serial port, but it is not.

**DCD did not ASSERT**

DCD is expected to be asserted on a serial port, but it is not.

**not enough memory**

There is not enough system memory available for the test to use. This could be a real memory shortage or memory corruption.

**no INTR event**

An INTR event is expected from a serial port, but the INTR event is never reported by the MVME332XT event packet.

**no QUIT event**

A QUIT event is expected from a serial port, but the QUIT event is never reported by the MVME332XT event packet.

**missing BRK INTR**

A break interrupt is expected from a serial port, but the MVME332XT never reported one.

**cannot execute downloaded code**

A piece of code is downloaded to the MVME332XT for execution, but the MVME332XT detected an error and the code was not executed successfully.

**parity mark did not work**

The parity mark option is selected, but the MVME332XT did not mark parity as expected when a parity error occurs.

**at addr=xxxxxxx, expect=xxxxxxx, read=xxxxxxx**

A data comparison is detected. The location of the error and the expected and read values are displayed.

**cannot download code**

A piece of code is downloaded to the MVME332XT dual ported memory, but the download was not successful.

**Board does not exist**

The host accesses the MVME332XT and a bus error occurs.

**board init timeout**

An initialization packet is sent to the MVME332XT, but no status is returned after an extended period of time.

**Controller never ready**

The MVME332XT indicates in its CSR space that the controller is never ready.

**create channel failed**

The buffer pipe communication channel between the MVME332XT and the host cannot be established. This could happen if: 1) the controller is never ready, 2) the channel establishment protocol is never completed between the host and the MVME332XT, or 3) a bad status is reported by the MVME332XT.

**init packet failed**

The initialization packet is sent to the MVME332XT, but the initialization was not successful.

**board stay busy**

The MVME332XT CSR indicates that the board is staying busy. If the BUSY bit stays set, it will prevent the host from establishing a buffer pipe channel for host and MVME332XT communication.

**TAS never ready**

The MVME332XT CSR indicates that the board always has its TAS (test and set) bit set. If the TAS bit stays set, it will prevent the host

from establishing a buffer pipe channel for host and MVME332XT communication.

**wait for VSTAT timeout**

The MVME332XT VSTAT bit in its CSR is not set during channel creation. This indicates that the MVME332XT is not able to complete the channel creation protocol due to board malfunction.

**channel bad status**

The channel creation was not successful. The channel is created so that the host and the MVME332XT can communicate through it.

---

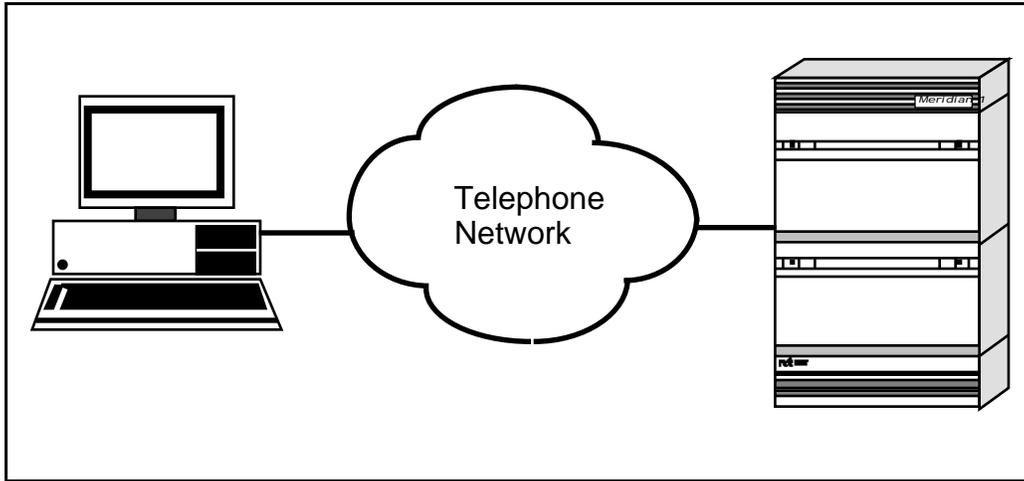
## Remote maintenance

---

This chapter explains how to set up and use a personal computer or Video Display Terminal (VDT) with a modem to dial up to and interact with an Application Module or an IPE Module. This enables you to diagnose many software or hardware problems from a remote site, such as a centralized support center. You can perform most of the operations, administration, and maintenance functions that are available to an on-site technician. You can also transfer files, for example downloading code patches or uploading error logs for further investigation.

Figure 64 shows an Application Module or IPE Module within a Meridian 1 system being accessed by a personal computer at a support center.

**Figure 64**  
**Remote maintenance**



Remote maintenance provides the following capabilities:

- access to an unattended customer's Application Module or IPE Module
- ability to log in as mlusr, maint, or disttech and perform all display, configuration, and functions available to those users
- upload files from an Application Module or IPE Module for later diagnosis or analysis
- download files to an Application Module or IPE Module to aid in isolating potential problems
- perform comprehensive confidence tests on hardware components

With few exceptions, you, the support center technician, can perform all functions otherwise performed locally at the customer's site. You will need assistance of a technician on-site in the following circumstances:

- to initialize the session connection when the operating system is not booted
- to insert or remove a tape
- to check or move hardware

- to power up the Application Module or IPE Module

## Setup and configuration

In order to access an Application Module or IPE Module from a remote site, you require a terminal (VDT or personal computer), a modem, and access to a telephone line.

### Terminal requirements

Depending on the applications being supported, any of the following computing devices may be used:

- a Video Display Terminal (VDT) providing DEC VT220 emulation.
- an IBM®-compatible PC meeting these minimum requirements:
  - an IBM® PC, XT, AT or PS/2 computer (or compatible)
  - at least 256K of available RAM
  - at least one floppy-disk drive, or at least one floppy-disk drive and one hard-disk drive
  - a monochrome monitor with a monochrome display adapter; a composite monitor with a Color Graphics Adapter; an Enhanced Color Display with an Enhanced Graphics Adapter; or a monitor and display adapter compatible with any of these
  - at least one serial port if using an external modem
  - running Reflection 4+
- an Apple Macintosh (running Reflection X, if CCR is being supported)
- a Motorola Delta Series Workgroup Computer System
- an Application Module or IPE Module

### Terminal setup

The terminal should be configured as follows:

- Transmit Baud Rate = 2400 (assuming a 2400 baud modem)
- Receive Baud Rate = Transmit
- Flow Control + XON/XOFF

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- Data Bits = 8
- Parity = None
- Stop Bits = 1
- Local Echo = No
- Emulation = VT220

### **Terminal emulation software**

Software version and package requirements differ depending on the type of terminal used

#### **VDT**

If transferring files, the terminal should include emulation software supporting both DEC VT100 terminal emulation and the Kermit file transfer protocol.

#### **IBM-compatible PC**

Terminal emulation packages which run on an IBM compatible PC and support the above requirements are listed below:

- Crosstalk Mark.4 from DCA/Crosstalk
- ProComm Plus from DataStorm Technologies
- Reflection 4 from Walker Richer & Quinn. Reflection 4 provides DEC VT220 terminal emulation.

*N* If an IBM-compatible PC is used it should at least run PC-DOS  
*or* MS-DOS version 2.0 or later.

*t*

*e*

*:*

#### **Apple Macintosh**

A terminal emulation package that will run on an Apple Macintosh and support the above requirements is MicroPhone by Software Venture Corporation.

#### **Kermit**

Kermit from Columbia University is available for the Motorola Delta Series Workgroup Computer System, the Application Module, and the IPE Module.

Kermit is loaded on the Application Module and IPE Module, and distributed along with OA&M software, which is currently provided on the application tape.

### Software configuration

The terminal emulation software should be configured as follows:

- Baud Rate = 2400
- Parity = None
- Data Bits = 8
- Stop Bits = 1
- Emulation = VT100 (or VT220)
- Duplex = Full
- Flow Control = On

### Modems

A modem connection, either internal or external, from your VDT or personal computer is required for dialup access. The modem should:

- support 300, 1200, and preferably 2400 baud rate
- be compatible with the standard Hayes command set (not mandatory, but preferable)
- be connected to a switched telephone network

The modem included with the Application Module is a Motorola MVME732 based on a UDS 2242980 modem. The modem included with the IPE Module is a Universal Data Systems (UDS) 2440 A/D modem. The MVME732 operates asynchronously at data rates of 0 to 300, 600, 1200 or 2400 baud rate.

*N* Regardless of which modem you select, the modems at both  
*ends* must be configured identically for dial-up capability to work  
properly.

*e*

*:*

## Using Application Module commands

The following pages provide more detailed information on remote maintenance capabilities.

### **maint commands**

All maint commands can be issued from a remote site. However, some commands may require some on-site assistance for the command to work properly. The following table identifies the maint commands that may require on-site assistance. Any maint commands not listed in the table do not require any on-site assistance.

*N* Not all of these commands apply to both Meridian Link and eCCR applications. For more information on these commands, refer to the Application Module commands chapter in the *Application Module and Intelligent Peripheral Equipment Module Diagnostic and Maintenance Guide* (553-3211-510).

**Table 11**  
**Maint commands that require on-site assistance**

Command	Assistance required
admin/mlusr	Most mlusr commands can be run unassisted, but the loopback test command needs on-site assistance.
backdata/rstdata backfiles/rstfiles backconfig	Requires tape insertion. Ensure that a tape will be inserted in the machine at the appropriate time if you are scheduling a backup.
conshare	Requires on-site assistance if the cable to console port is not attached.
powerdown	You will need assistance to restore/reboot the system.

### **mlusr commands**

All mlusr commands can be safely issued from a remote site. You may issue the “monitor” command, but the results are displayed only on the main Application Module or IPE Module console.

### **ccrusr session**

As long as the remote terminal is VT220-compatible, a user session will proceed as though you were on-site.

## Using remote maintenance

You can use remote maintenance when the Application Module or IPE Module is in any of the following states:

1. The Application Module or IPE Module is powered on, the operating system is booted, and the application is running successfully.
2. The Application Module or IPE Module is powered on, the operating system is booted, but the application is not running either because it has not been started, it is not functional, or some hardware component required by the application is not functional.
3. The Application Module or IPE Module is powered on, but the operating system is not booted, either because the boot process was halted, some portion of the operating system is damaged, or some hardware component required by the operating system is not functional.

*N* If you have problems preventing the Application Module or IPE Module from being powered on, refer to the troubleshooting flowcharts in *Application Module and Intelligent Peripheral Equipment Module Diagnostic and Maintenance Guide* (553-3211-510).

:

## General procedure

The following procedure describes, in general terms, the steps used in establishing connection to the customer's Application Module or IPE Module. It assumes that the terminal is equipped with terminal emulation software, connected to a modem, and that the modem is connected to a switched telephone network.

- 1 Power on the terminal and modem.
- 2 Start terminal emulation software. Change the values to match the configuration information provided earlier.
- 3 Dial the Application Module or IPE Module modem.  
*The modem may be internal (if the Application Module contains an MVME712AM card) or external. You may be able to log in directly to an Application Module or require the assistance of an on-site technician in completing the connection.*
- 4 Perform a diagnostic session.
- 5 When you have finished, terminate the session by hanging up.

The next few pages illustrate some typical remote maintenance sessions. These are intended as a guideline only, and your individual session might look quite different. Refer to the documentation provided with your terminal emulation software for more information.

Also, these pages do not show terminal emulation software commands because these vary widely between software packages.

## Sample session 1

In this session, the customer's Application Module or IPE Module is powered up and has booted the operating system successfully.

You, the remote support technician, are

- to dial into the customer's Application Module or IPE Module
- to verify the connection by performing a simple command
- to retrieve a trace file from the Application Module or IPE Module for analysis
- to send a binary patch file to the Application Module or IPE Module
- to install the patch file to replace an application
- to end remote maintenance

### Dialing into a customer's Application Module or IPE Module

The table below illustrates a sample connection procedure, using a terminal emulation package to dial into a customer's Application Module or IPE Module. The first column illustrates what you might see on the screen, with your input in **bold** type. The second column provides relevant information.

*N* In the following sample sessions, commands from the Hayes command set are sent directly to the modem.

*t*  
*e*  
*:*

**Table 12**  
**Sample session dialing in to a customer's Application Module or IPE Module**

Screen display input and responses	Notes
ATE1 S7=255 S11=55 V1 X1 S0=0 OK	Modem setup information, which differs for every terminal emulation package used (and, in some cases, will not be displayed on the terminal).
<b>atdt &lt;telephone number&gt;</b>	Enter the dial command along with the telephone number of the customer's Application Module or IPE Module
CONNECT 2400	Response indicates that connection is successful. The baud rate may be different or may not be shown.
login: <b>disttech</b>	Remote terminals receive a login prompt. Only the system console (directly connected to the Application Module or IPE Module) receives a Console login prompt.
System V/68 Release R3V6 M68030 Version 900205 sysV68 Copyright (c) 1984 AT&T Copyright (c) 1985 Motorola, Inc. All Rights Reserved  *** erase = # kill = @ intr = DEL quit = ^  ***  disttech>	System messages appear, followed by the disttech> prompt.

*Perform diagnostic session on the Application Module or IPE Module.*

### Performing a simple command

This is a simple example in which you, at the remote terminal, enter a command for the Application Module or IPE Module. In the following table, column 1 shows what you see on the screen. Your input is in **bold** type.

**Table 13**  
**Sample session 1—entering a command**

Screen display—input and responses	Notes
disttech> <b>maint</b>	Login to maint.
maint> <b>diskuse</b>	Type the command and press Return.
<pre>FILE SYSTEM USAGE AS OF 01/07/93 10:40:35  File          Free      Total      Percent System        Blocks    Blocks     Full ----- /              16370     40000      59% /usr           97476     184484     34%</pre>	The output from the diskuse command appears.
maint> <b>exit</b> disttech>	Exit from maint.

## Retrieving (uploading) a file

In this procedure, you start Kermit and use it to get a file (for example, a trace file) from the Application Module or IPE Module and upload it to your terminal.

In the following table, column 1 shows what you see on your screen. Your input is in **bold** type.

**Table 14**  
**Sample session 1—retrieving a file**

Screen display—input and responses	Notes
disttech> <b>cd <i>dirname</i></b>	Change directories before uploading or downloading files. <i>dirname</i> is the complete name of the directory containing the file to be retrieved.
disttech> <b>kermit</b> C-Kermit, 4E(072) 24 Jan 89 AT&T System III/System V Type ? for help	Start Kermit.
Perform the commands appropriate to your terminal emulation software to set up to transfer text files.	See “Example of a command sequence” for an example.
C-Kermit> <b>set file type text</b>	Set up Kermit to transfer text files (executable files).
C-Kermit> <b>server</b>  (Kermit prompts you to escape back to your local system to close the connection.)  C-Kermit> <b>^c</b>	Start the server. All commands must now arrive as valid Kermit packets from the terminal emulation software. Kermit announces that the server is starting.

**Table 14**  
**Sample session 1—retrieving a file, continued**

Screen display—input and responses	Notes
Perform the commands appropriate to your terminal emulation software to get a file, then, after the file has been received, to finish.	Refer to the documentation for your terminal emulation software for more information on using Kermit commands.  The server ends.
C-Kermit> <b>quit</b> disttech>	End Kermit and return to the disttech> prompt.

## Sending (downloading) a file

In this procedure, you start Kermit and use it to download a file (for example, a binary patch file) to the Application Module or IPE Module.

In the following table, column 1 shows what you see on your screen. Your input is in **bold** type.

**Table 15**  
**Sample session 1—sending a file**

Screen display—input and responses	Notes
disttech> <b>mkdir tmp</b> disttech> <b>cd tmp</b>	Create a temporary directory to store the file.  Change directories before uploading or downloading files.
disttech> <b>kermit</b>	Start Kermit.
C-Kermit, 4E(072) 24 Jan 89 AT&T System III/System V Type ? for help	
Perform the commands appropriate to your terminal emulation software to set up to transfer binary files.	See “Example of a command sequence” for an example.
C-Kermit> <b>set file type binary</b>	Set up Kermit to transfer binary files.
C-Kermit> <b>server</b>  (Kermit prompts you to escape back to your local system to close the connection.)  C-Kermit> <b>^c</b>	Start the server. Escape back to your terminal. All commands must now arrive as valid Kermit packets from the terminal emulation software. Kermit announces that the server is starting.

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<p>Perform the commands appropriate to your terminal emulation software to send a file, then, after the file has been received, to finish.</p>	<p>Refer to the documentation for your terminal emulation software for more information on using Kermit commands. The server ends.</p>
<p>C-Kermit&gt; <b>quit</b> disttech&gt;</p>	<p>End Kermit and return to the disttech&gt; prompt.</p>

## Installing the patch file

After the binary patch file has been downloaded to the Application Module or IPE Module, the following procedure installs the binary file, named admin.

**Table 16**  
**Sample session 1—installing a patch file**

Screen display—input and responses	Notes
<pre>disttech&gt; mv admin /usr/mlusr/bin/admin mv: /usr/mlusr/bin/admin: 755 mode? y disttech&gt; chmod 755 /usr/mlusr/bin/admin disttech&gt; chown mlusr /usr/mlusr/bin/admin disttech&gt; chgrp other /usr/mlusr/bin/admin</pre>	<p>Install the binary file in the /usr/mlusr/bin directory and allow only mlusr to modify it.</p>

## Ending a remote maintenance session

The following table illustrates the end of a session, in which you log out of any login IDs and exit the terminal emulation session.

**Table 17**  
**Sample session 1—ending a remote maintenance session**

Screen display—input and responses	Notes
<i>Finish performing diagnostic commands and log out of any login IDs.</i>	
<pre>disttech&gt; exit</pre>	<p>Indicate that you wish to end the session by exiting the disttech login.</p>

NO CARRIER	The terminal emulation software indicates that you are no longer connected to the Application Module or IPE Module.
<i>Perform the commands appropriate to your terminal emulation software to hang up and exit the session.</i>	

### Example of a command sequence

The following table lists a series of commands used by a terminal emulation software package. This is provided for information only and may not represent commands used by your terminal emulation software package in any way.

**Table 18**  
**Sample session 1—example of a command sequence**

Sample emulation command	Description
<Alt>-s	Access setup facility
k	Kermit
h	file type
b<cr> or t<cr>	binary or text
<esc>	back up to previous menu
s	save
<esc>	exit setup facility

## Sample session 2

In this session, the customer's Application Module or IPE Module is powered on but the operating system has not booted. You, the remote support technician, do not know the condition of the hardware.

For this type of session, you will need a technician at the customer's site. The steps are

- You start a remote maintenance session.
- The on-site technician will initiate a service call.
- You will begin a diagnostic session.
- You will load SSID and start an SSID diagnostic session.
- You will end the remote maintenance session.

*N* The following tables show input and responses for a system with an MVME147 card. Input and responses for a system with an MVME167/SMM167 card will be similar.

*e*  
:

### Dialing in at the firmware level

The table below illustrates a sample connection procedure, using a terminal emulation package to dial in to a customer's Application Module or IPE Module. In the following table, the first column shows what you might see on the screen, with your input in **bold** type. The second column provides relevant information.

**Table 19**  
**Sample session 2—dialing in at the firmware level**

Screen display—input and responses	Notes
ATE1 S7=255 S11=55 V1 X1 S0=0 OK	Modem setup information, which differs for every terminal emulation package used (and, in some cases, will not be displayed on the terminal).
<b>atdt &lt;telephone number&gt;</b>	Enter the dial command along with the telephone number of the customer's Application Module or IPE Module.
CONNECT 2400	Response indicates that connection is successful. The baud rate may be different or may not be shown.

### On-site assistance

In this procedure, the on-site technician initiates a service call and completes the connection for the remote maintenance session. In the following table, the first column shows what the on-site technician might see on the screen. The technician's input is in **bold** type.

**Table 20**  
**Sample session 2—on-site assistance (1)**

On-site screen display—Input and response	Notes
On-site technician resets the Application Module or IPE Module.	
Copyright Motorola Inc. 1988, 1989, 1990, 1991, All Rights Reserved MVME147 Monitor/Debugger Release 2.42 - 8/1/91 CPU running at 25 MHz FPC passed test MMU passed test COLD Start Sizing system memory Onboard RAM start = \$00000000, stop = \$007FFFFF No offboard RAM detected	System start-up messages appear at the console.
<b>h</b>	The on-site technician halts the system start-up during the firmware tests.

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<ul style="list-style-type: none"><li>1) Continue System Start-up</li><li>2) Select Alternate Boot Device</li><li>3) Go To System Debugger</li><li>4) Initiate Service Call</li><li>5) Display System Test Errors</li><li>6) Dump Memory to Tape</li></ul> Enter Menu #: <b>4</b>	The on-site technician chooses to initiate a service call.
— continued —	

**Table 20**  
**Sample session 2—on-site assistance, continued**

On-site screen display—Input and response	Notes
Is the modem: 0-UDS, 1-Hayes, 2-Manual, 3-Terminal; Your Selection 0? <b>2</b>	The on-site technician chooses the appropriate modem type.
Do you want to change the Baud Rate from 1200 (Y/N)? <b>y</b>	The on-site technician chooses to change the baud rate. (If connection has been established at the baud rate indicated in the prompt, enter <b>n</b> .)
Baud rate [300,1200,2400,4800,9600,19200] 1200 ? <b>2400</b>	(This prompt only appears if the response to the previous prompt was <b>y</b> .) The on-site technician chooses a new baud rate.
Is the modem already connected to Customer Service (Y/N) ? <b>y</b>	The on-site technician indicates that the telephone connection has been established.
Control A to exit Concurrent Mode  1) Continue System Start-up 2) Select Alternate Boot Device 3) Go To System Debugger 4) Initiate Service Call 5) Display System Test Errors 6) Dump Memory to Tape 7) Start Conversation Mode Enter Menu #:	These prompts appear on both screens and the system is in dual-console mode, where input is accepted and responses are displayed at both the remote and local sites.  Boot the operating system or run the diagnostics from either console.

**Running a diagnostic test remotely** In this procedure, you run diagnostics on the customer's Application Module or IPE Module. You and the on-site technician can see the results.

In the following table, column 1 shows what you and the on-site technician see. Your input is in **bold** type.

**Table 21**  
**Sample session 2—running diagnostics remotely**

Screen display—input and responses	Notes
1) Continue System Start-up 2) Select Alternate Boot Device 3) Go To System Debugger 4) Initiate Service Call 5) Display System Test Errors 6) Dump Memory to Tape 7) Start Conversation Mode  Enter Menu #: <b>3</b>	Use the system debugger.
147-Diag> <b>sst</b>	Start the system self test.
RTC Real Time Clock Test ... Running	The system runs a series of tests.  The tests end.
147-Diag> <b>menu</b>  1) Continue System Start-up 2) Select Alternate Boot Device 3) Go To System Debugger 4) Initiate Service Call 5) Display System Test Errors 6) Dump Memory to Tape 7) Start Conversation Mode  Enter Menu #:	Return to the start-up interrupt menu.

*N* If you want to end the session at this point, see “Ending a firmware-level session” and refer to the table on ending a non-SSiD session.

*e*

:

**Loading and running SSiD** In this procedure, you boot SSiD from the hard disk and execute an SSiD command.

In the following table, column 1 shows what you and the on-site technician see. Your input is in **bold** type.

**Table 22**  
**Sample session 2—loading and running SSiD**

Screen display—input and responses	Notes
1) Continue System Start-up 2) Select Alternate Boot Device 3) Go To System Debugger 4) Initiate Service Call 5) Display System Test Errors 6) Dump Memory to Tape 7) Start Conversation Mode  Enter Menu #: <b>2</b>	Change the alternate boot device.
Enter Alternate Boot Device: <b>0,0,diag/test 147</b>	The message and response for an MVME167/SMM167 system are different. See the chapter on “SSiD Basics” for more information.

1) Continue System Start-up 2) Select Alternate Boot Device 3) Go To System Debugger 4) Initiate Service Call 5) Display System Test Errors 6) Dump Memory to Tapes 7) Start Conversation Mode  Enter Menu #: 1	Continue start-up.
— continued —	

**Table 22**  
**Sample session 2—loading and running SSID, continued**

Screen display—input and responses	Notes
	SSID then boots. When SSID is loaded, the SSID main menu appears (see the chapter on “SSID Basics”).
SA: <b>disphrd</b>	Use the SSID disphrd command to test whether a card has gone bad.
147.0 - VME147 Board Tests mem.0 - Memory Test X333.0 - VME333 X.25 Communication Board Test	SSID displays a list of tests based on the cards detected by the disphrd command (see the chapter on “SSID Basics”).
<i>Perform other diagnostics as required.</i>	

### Ending a firmware-level session

There are two procedures for ending a firmware-level session; one procedure ends an SSID session, the other ends a non-SSID session.

The following procedure ends an SSID session. In the following table, column 1 shows what you see. Your input is in **bold** type.

**Table 23**  
**Sample session 2—ending an SSID session**

Screen display—input and responses	Notes
Finish performing SSID tests.	
SA: <b>remote</b>	Use the SSID remote command to end the session.
Do you wish to disconnect the remote link (y/n) <b>y</b>	The on-site technician regains control at the Application Module or IPE Module console.
<i>Perform the commands appropriate to your terminal emulation software to hang up and exit from the session.</i>	

The following procedure ends a non-SSID session; that is, a firmware-level session in which SSID is not booted.

**Table 24**  
**Sample session 2—ending a non-SSID firmware-level session**

Screen display—input and responses	Notes
<i>Finish performing diagnostic commands.</i>	
147-Diag> <b>menu</b>	The 147-Diag> prompt appears when you use the system debugger to perform diagnostics.
1) Continue System Start-up 2) Select Alternate Boot Device 3) Go To System Debugger 4) Initiate Service Call 5) Display System Test Errors 6) Dump Memory to Tape Enter Menu #: <b>4</b>	Choose the service call option from the firmware-level menu.
Do you wish to disconnect the remote link (Y/N) ? <b>y</b>	Indicate that you wish to disconnect your call.  The on-site technician regains control at the local Application Module or IPE Module system console.
<i>Perform the commands appropriate to your terminal emulation software to hang up and exit the session.</i>	

---

## Appendix A: Command line mode

---

Command line mode is the testing environment on which the menu system is based. Designed for advanced users, command line mode offers many features not available within the menu system. In command line mode you can set test options directly on the command line, run a sequence of tests from different test menus, and configure the cards in the system.

To enter command line mode, type **cmdline** and press Return.

SA: **cmdline**

>

The > prompt indicates that you are in command line mode. To run any of the SSID tests, simply type the name of the test and the test identifier(s). Typing the test name with no test identifier and pressing Return runs a preselected series of non-destructive tests. To find out which test options are available for a given test, type the name of the test followed by a minus (-) sign.

Examples:

> **smd.1 0123** (Run tests 0, 1, 2, and 3 on the second SMD disk drive.)

> **131.0** (Run all preselected tests on the first MVME131 controller.)

> **esdi.0 -** (List the test options available for the first MVME323 disk drive.)

To return to menu mode, type **set menu** and press Return.

> **set menu**

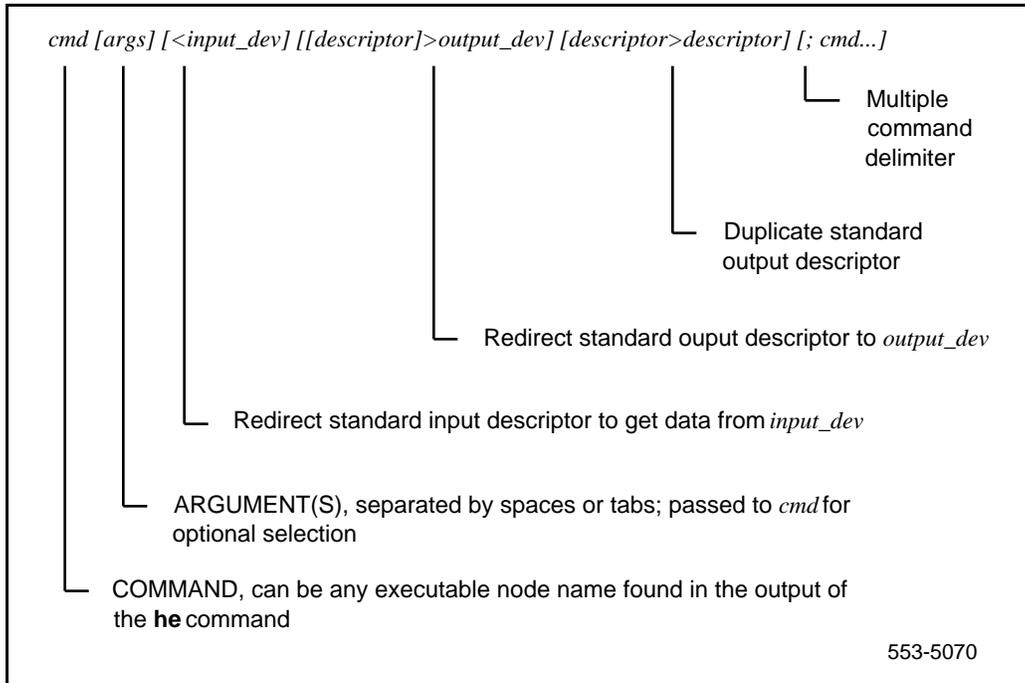
SA:

## Command line format

Command line commands have the following format as shown in Figure 65:

Figure 65

### Command line command format



where:

- [ ]** = optional field
- ...** = repeatable field
- <** = input redirection
- >** = output redirection
- input\_dev** = input device such as sp0 (console port)
- output\_dev** = output device such as pr (printer) or log (logger)
- descriptor** = device descriptor

Standard device descriptors:

- 0** = input descriptor (default for input redirection)
- 1** = output descriptor (default for output redirection)
- 2** = error output descriptor

After receiving a user's command, the command line monitor evaluates its format, opens the I/O devices if needed for redirection, builds a list of arguments, updates the system status, traverses through the directory tree if the command field is a directory node, and finally gives control to all test nodes under the command tree.

## I/O redirection

I/O redirection is a mechanism that allows the user to specify input and output devices on the command line. In a typical computer system, input comes from the terminal keyboard and output goes to the terminal screen. I/O redirection allows the user to change the source of input or the destination for output by specifying a new source and/or destination on the command line.

In SSID, output is sent to a logical device called standard output or error output, both of which default to the system console. Typical output from a program is sent to standard output, while error messages are sent to error output. All input is taken from a logical device called standard input, which defaults to the user's terminal keyboard.

Standard output and error output can be redirected to another terminal or the error logger. Error output can be sent to standard output or to another destination. Standard input can be redirected from another terminal or the error logger. At the present time, all tests may not adhere to the error output path for errors but instead send errors to standard output. A future release of SSID will correct this problem.

Examples:

- 1) Redirect standard output from the `he` command to the line printer.  
**he > pr**
- 2) Redirect standard input to come from the error logger:

**echo < log**

- 3) Recalibrate the first Winchester disk (test 1) and redirect the error output to the error logger.

**hd.0 1 2 > log**

- 4) Set loop continuous, run the default tests on the first Winchester disk, and store the error output in the error logger.

**set lc; hd.0 2 > log** (Note the semicolon separating the commands)

- 5) Run the default tests on the first MVME333 and redirect both standard output and error output to the printer.

**x333.0 > pr 2 > 1**

The first part of the command (x333.0>pr) redirects the standard output to the printer. The second part (2 > 1) redirects error output (descriptor 2) to be the same destination as the standard output (descriptor 1), which is redirected to the printer in the first part of the command.

## Command structures

To determine the tests available for a particular device, use the **he** (help) command, which displays the command directory tree. The tree structure allows you to concentrate on a particular test suite once the directory has been identified. Typing **he card\_number** and pressing Return allows you to view the test suite associated with that card. Refer to the first two examples in the **he** command description later in this chapter.

When an executable node name, whether directory or test, is invoked as a command, every subnode under its tree structure is also a part of the command invocation. Typing the following causes both **hd.0** and **fd.0** to be executed simultaneously or sequentially depending on how the system's environment is set up. Command line arguments are also passed to each subnode for as many levels as are constructed in the tree.

**320.0**

Arguments passed to the test module may allow specific subtest selection from the test module. The hd.0 and fd.0 subtest menus are obtained by using the following command:

**he hd.0 fd.0**

A display similar to the following (Figure 66) appears:

**Figure 66**  
**Hard disk and floppy disk menus**

```
bdtest/320.0/hd.0          t--x   Winchester Disk
  0) Recalibrate
  1) Quick confidence read
  2) Read entire OS disk
  3) Random read OS disk
  4) Pingpong read OS disk
  d) Display OS bad tracks

bdtest/320.0/fd.0        t--x   Floppy Disk
  0) Recalibrate
  1) Quick confidence read
  2) Read entire OS disk
  3) Random read disk
  4) Pingpong read disk
  p) Partial W/R DESTRUCTIVE
  w) Fully W/R DESTRUCTIVE
  f) Format disk
```

The numbered subtest selections are the default test sequences that run if no test selection is specified. (This convention applies only when there are less than 11 default selections, such as, 0 through 9.) For example, tests 0 through 4 run if command hd.0 or 320.0 is invoked, but only test 2 runs if the command is hd.0. You can only invoke a subtest selection preceded by a letter by explicitly passing the selection letter as an argument to the test module from the command line. Test selections can be in any order and grouped into one or more arguments. You can enter multiple selections and

repeat a selection any number of times. Each selection is executed in the order it appears on the command line.

Examples:

- 1) Run all default tests (0 through 4) on the first hard disk.

**hd.0 or 320.0**

- 2) Run several hard disk tests and several floppy disk tests.

**320.0/hd.0 23d; 320.0/fd.0 4pw**

- 3) Run the hard disk test 0 (Recalibrate) once, test 4 (Pingpong read OS disk) three times, and test 1 (Quick confidence read) and test 3 (Random read OS disk) twice.

**hd.0 0 444 1313**

### **Test progress display**

When a command is executed in command line mode, it performs a table look-up on its own test selection menu against its arguments. If the argument matches any entry in the table, it displays a banner including the command pathname, test description, and the word starts (see Figure 67). It then calls the appropriate routine for the selection. Upon completion of the routine, the command displays the previous banner but ends with the word “passed” or “failed”.

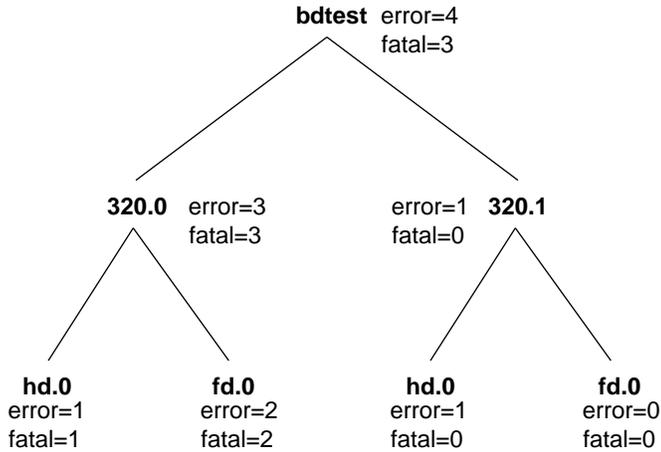
**Figure 67**  
**Test progress display**

pathname	selection	description	result
/bdtest/320.0/fd.0	0)	Recalibrate	..... starts
/bdtest/320.0/hd.0	0)	Recalibrate	..... starts
/bdtest/320.0/fd.0	0)	Recalibrate	..... passed
/bdtest/320.0/fd.0	2)	Read entire OS disk	..... starts
/bdtest/320.0/hd.0	0)	Recalibrate	..... passed
/bdtest/320.0/hd.0	1)	Quick confidence read	..... starts
/bdtest/320.0/fd.0	2)	Read entire OS disk	..... passed
/bdtest/320.0/hd.0	1)	Quick confidence read	..... passed
/bdtest/320.0/fd.0	3)	Random read OS disk	..... starts
/bdtest/320.0/hd.0	2)	Read entire OS disk	..... starts
/bdtest/320.0/fd.0	3)	Random read OS disk	..... passed
/bdtest/320.0/hd.0	2)	Read entire OS disk	..... passed
/bdtest/320.0/hd.0	3)	Random read OS disk	..... starts
/bdtest/320.0/fd.0	4)	Pingpong read OS disk	..... starts
/bdtest/320.0/fd.0	4)	Pingpong read OS disk	..... passed
/bdtest/320.0/hd.0	3)	Random read OS disk	..... passed
/bdtest/320.0/hd.0	4)	Pingpong read OS disk	..... starts
/bdtest/320.0/hd.0	4)	Pingpong read OS disk	..... passed

### Test result display

Figure 67 illustrates a typical output of the successful completion of all subtests in the 320.0 test module. This output is sent to the standard output device, which is the user console if there is no I/O redirection on the command line.

SSID maintains fatal and non-fatal error counters for each node above the test nodes. For the directory structure shown in Figure 68, counters are maintained for hd.0, fd.0, 320.0, and bdtest. If an error occurs in any part of a test, the monitor updates the fatal and non-fatal error counters for each node above that test. Therefore, the total number of errors for the 320.0 node equals the number of errors in both the fd.0 and hd.0 tests, as illustrated in Figure 68.



If the error is caused by bad return status from the MVME320, the entire ECA (or packet) data structure displays on the standard error device. Figure 69 shows the typical output for such an error.

**Figure 69**  
Typical error display

```

/bdtest/320.0/fd.0      3) Scan          ..... starts
|cmd|stat|ext |rtry|rcnt|dma|op|buf_addr|len |xfer|cyl |hd|sec|ccyl| | |
|03 | 01 |0008| 00 | 00 |00 |00|001f96b0|0400|0000|0006|00|0d |0006|
|n0|n1|n2|n3|n4|n5|s1|fill|type|surf|sec/trk|step|hst|hlt|seek|lwc |
|00|00|00|00|36|03|01| e5 | 05 | 02 | 10  | 0c |46 |46 | 00 |0028|
|prec|ecc0|ecc1|ecc2|aec0|aec1|aec2|wrk0|wrk1|wrk2|wrk3|wrk4|wrk5|
|0028|0000|0000|0000|0000|0000|0000|0000|8888|8e8c|8480|0000|0000|0000|
error: Nonrecoverable error, No identifier found.
/bdtest/320.0/fd.0      3) Scan          ..... failed
  
```

If the error is caused by the data comparison, the output shows where the data mismatch occurred in the buffer, as illustrated in Figure 70.

**Figure 70**  
**Data comparison error**

```
/bdtest/320.0/hd.0      3) Partial W/R      ..... starts
/bdtest/320.0/hd.0      At address-001aff00, expect=44, read=00
/bdtest/320.0/hd.0      3) Partial W/R      ..... failed
```

Along with all above messages, a system status message periodically displays on the system console, reporting pass count, error count, elapsed time, and test activity as illustrated in Figure 71.

Note that this type of message only displays if SSID is operating in concurrent mode (default condition), and at least one test has been dispatched in the system. Also note that this message is only terminated by pressing a carriage return without the LINE FEED. Therefore, it always stays at the same place on the screen. This preserves the previous information, and provides a clear picture of progress through the tests.

**Figure 71**  
**System status message**

```
PASS=3, FATAL=0, ERROR=01  0:00:20.130  /bdtest/320.0/hd.0: running
```

Finally, a composite status message displays at the completion of all tests to indicate the overall test results as illustrated in Figure 72.

```
*** SYSTEM TEST PASSED ***   or   *** SYSTEM TEST FAILED ***
```

The error count message remaining on the screen reflects the results of the last test to complete; it is not a summary of all tests run.

## Command descriptions

Table 25 summarizes the commands available in command line mode. Following the table, each command is explained in detail.

**Table 25**  
**Command line mode commands**

Command	Description
<b>ce</b> [ <i>test</i> ]	Clears error counters for the specified test. If no test is specified, all error counters are cleared. This command performs the same function as the clear command does in menu mode.
<b>dml</b>	Displays the actual detected installed memory (before allocations for SSID or the system).
<b>cf</b> [ <i>card</i> ] [ <i>test</i> ]	Allows you to change the configuration of cards and tests recognized by SSID. The cf command with no option accesses the system level configuration (see Figure 43).
<b>echo</b> <i>argument</i>	Echoes <i>argument</i> to the standard output. This command is similar to the operating system's echo command.
<b>fe</b> [ <i>card</i> ]	Finds errant test. Displays the number of errors and fatal errors for all tests that have been run since reset or the last ce (or clear in menu mode) command. This command provides the same information as the disperr command available in menu mode.
<b>he</b> [ <i>card</i> ]	Help command. Displays the command structure of SSID. You can use the information given by he to bypass the SSID menus and initiate a test directly from the command line.
<b>ml</b>	Displays the memory free list in hexadecimal format. Lists one line for each contiguous segment of memory.
<b>reconf</b>	Reconfigures test scripts for the confid, fault, ptest, and ptesti suites. Configuration information is taken from the system configuration list accessed by using cf with no <i>option</i> .

<b>set</b> [ $\pm$ <i>option</i> ]	Sets <i>option</i> for the test indicated on the command line. A preceding plus sign (+) or no prefix before <i>option</i> enables it; a preceding minus sign (-) disables <i>option</i> . Without <i>option</i> , the set command displays the current test options in command line mode.
<b>set menu</b>	Returns SSID to menu mode and the SA: prompt.

In addition, the system commands `disphrd`, `remote`, `help`, and `version` can be executed while in command line mode.

## ce

Clear error counters

### Syntax

**ce** [*test*]

### Description

This command clears the error counter for the specified test module. If no test module name is specified, all error counters are cleared. SSID maintains an error counter for each test module. These error counters are cleared at start-up and may be cleared at other times by using the `ce` command (or the `clear` command in menu mode). No output is provided to confirm that the error counters have been cleared. Use the `fe` command (or the `disperr` command in menu mode) to confirm that errors have been cleared.

### Example

1) Clear all error counters.

```
> ce
```

2) Clear the error counter for the `fd.0` test suite.

```
> ce fd.0
```

## cf

Configure SSID

### Syntax

**cf** [*card*] [*test*]

**Description**

This command allows you to change variables that control many aspects of SSID execution. These variables include quantity and selection of cards in the system configuration, type of peripherals available for test, base addresses, interrupt levels, address modifiers, and so on.

SSID has three levels of configuration variables: system, card, and test. The `cf` command with no option accesses the system level configuration; `cf card` accesses the card level configuration; and `cf test` accesses the test level configuration.

Configuration variables at all three levels are presented one line at a time. Lines containing configuration variables end with a question mark (?). Changes to configuration variables are entered following the question mark. Pressing Return leaves the current variable unchanged and displays the next line in the configuration. It is not possible to scroll up in a configuration display. If you pass over a line you wish to change, finish listing the display and invoke the `cf` command again.

The configuration displays show the range of legal values for each configuration variable and the current value. The default configuration is set up based on the hardware detected when SSID is booted. At start-up, all configuration variables are initialized to default values. The default values are placed in a configuration file that may be changed to remove cards from the displays and (using the `reconf` command) the test suites. (Note you must execute the `reconf` command before exiting command line mode to affect test scripts.) Sometimes, the range of values in the menu may be further restricted by the hardware configuration. Refer to the hardware user's manual for each card or peripheral being configured to determine proper values.

## System configuration

The system level configuration display is similar to the screen in Figure 73.

**Figure 73**  
**System configuration list**

```

> cf
/bdtest configuration
  050 [0-1] = 0 ?           # number of MVME050
  13x [0-1] = 1 ?           # number of MVME13x
  mem [0-1] = 1 ?           # memory test enabled
  320 [0-2] = 1 ?           # number of MVME320
  321 [0-2] = 0 ?           # number of MVME321
  323 [0-2] = 0 ?           # number of MVME323
  G330 [0-1] = 0 ?          # number of MVME330GSP
  T330 [0-1] = 0 ?          # number of MVME330TCP
  331 [0-4] = 0 ?           # number of MVME331
  333 [0-4] = 1 ?           # number of MVME333
  335 [0-2] = 1 ?           # number of MVME335
  336 [0-1] = 1 ?           # number of MVME336
  350 [0-2] = 1 ?           # number of MVME350
  355 [0-1] = 0 ?           # number of MVME355
  360 [0-2] = 1 ?           # number of MVME360
>

```

You may alter the configuration to include a new card or to remove an existing card that you do not want to have tested. Refer to Example 1 in “Card and test configuration” in the following section.

## Card and test configuration

To display the configuration variables for a given card, type the following:

```
> cf card.n
```

and press Return (where *n* is the number of the card in the series with 0 designating the first card). For example, 360.1 refers to the second MVME360 card.

To display the configuration variable for a given test, type the following:

> **cf test**

and press Return. If a particular test is associated with more than one card in the system configuration, you may need to specify the card as well as the test (for example, cf 331.0/sp.0 to distinguish it from 332.0/sp.0).

The acceptable range of input values is represented as the following:

- 0x     Hexadecimal. 0x100 is the hexadecimal number 100 or 256 in decimal. Numbers not preceded by 0x are decimal.
- %     Modulo. %0x100 indicates that the value of a variable must be modulo 256 or 0x100.
- Range. 0-7 represents any number in the range of 0 through 7.
- b, w, l   Bus width. b is byte, w is word, and l is longword.

*N*     You cannot configure a test until a card is configured to include that test; likewise, you cannot change a card configuration unless the system configuration includes that card.

*e*  
:

**Examples**

## 1) Changing System Configuration

Make it possible to run the communication fault test only on the MVME332 card although the system has both an MVME332 and MVME333-2 card.

```
> cf
/bdtest configuration
    355 [0-1] = 0 ? <cr>
    360 [0-2] = 1 ? <cr>
    350 [0-2] = 1 ? <cr>
    333 [0-4] = 1 ? 0 <cr>
    332 [0-4] = 1 ? <cr>
```

(Continue pressing the <cr> until the > prompt reappears.)

Once the system configuration list has been changed, the test scripts for the confid, fault, ptest, and ptesti test suites must be reconfigured based on the new information. Refer to the following reconf command description.

## 2) Changing Default Drive Type

Change the default drive type for the first MVME320 from Micropolis to Toshiba.

```
> cf 320.0 <cr>
/bdtest/320.0 configuration
    base [%0x400] = 0xffffb000 ? <cr>
    am [0x0d,0x3d] = 0x3d ? <cr>
    level [0-7] = 5 ? <cr>
    data bus width [b,w,l] = 1 ? <cr>
    type OMicropolis lToshiba [0,1] = 0 ? <cr>
        (Type 1 to select a Toshiba drive.)
```

(Continue pressing the <cr> key until the > prompt reappears.)

3) Selecting Address Increment Value for Memory Tests

Change the default address increment value for the memory tests from testing every longword to every fourth longword.

```
> cf mem.0 <cr>
/bdtest/mem.0 configuration
    walk_step = 1 ? 4 <cr>
```

4) Changing Default Drive Size

Change the size of the first floppy disk drive from 655K to 1.2 Mb.

```
> cf 320.0/fd.0 <cr>
/bdtest/320.0/fd.0 configuration
(Only parameters requiring changes are shown here.)
sector/xfer [1-16] = 16 ? 15 <cr>
size (inch) [5,8] = 5 ? 8 <cr>
no. of sector/track = 16 ? 15 <cr>
sector size [128, 256, 512] = 256 ? 512 <cr>
```

## dml

Display detected memory list

### Syntax

**dml**

### Description

This command displays the actual detected installed memory for the system. Unlike the ml command, the dml command probes memory before making any allocations for SSID. Therefore, it displays an accurate map of all memory installed in the system. Each block of contiguous space takes one line to display and all memory, contiguous or not, is represented.

### Examples

Display detected memory.

```
> dml
```

```
Total memory detected = 0x00400000, (4194304 bytes)
```

Seg	Start	End	Size
0	0x00000000	0x001fffff	0x00200000
1	0x00400000	0x005fffff	0x00200000

In this example, the total detected memory installed in the system is 4 megabytes, displayed in both hex and decimal. This is made up of two contiguous segments of memory as itemized.

- The first segment starts at address 0, ends at address 1fffff and is 200000 bytes long.
- The second segment starts at address 400000, ends at address 5fffff and is also 200000 bytes long.

The gap between the end address of segment 0 (200000) and the start address of segment 1 (3fffff) constitutes a hole detected in the RAM address space.

## echo

Echo message to standard output

### Syntax

**echo** [*argument*]

### Description

This command echoes an argument to standard output. It is especially useful for examining the error log.

### Examples

1) Output a character string to the terminal.

> **echo Good morning!**

2) Displays the error log on the terminal by redirecting input from the error log.

> **echo < log**

**fe**

Find errant test

**Syntax**

**fe** [*test*]

**Description**

Like the disperr command in menu mode, the fe command displays the number of errors and fatal errors for all tests that have run since reset or the last ce command (or clear command in menu mode). If a test name is specified, only errors for that test and those under it display.

**Examples**

1) Display all errors.

```
> fe
/bdtest/320.0/fd.0      :error=1,   fatal=1
/bdtest/320.1/fd.0      :error=3,   fatal=1
/bdtest/320.1/fd.1      :error=5,   fatal=1
```

2) Display only errors from MVME320.0 tests.

```
> fe 320.0
/bdtest/320.0/fd.0      :error=1,   fatal=1
```

**he**

Online help

**Syntax****he** [*test*]**Description**

This command displays a description of *test* and each subtest under it. If *test* is not specified, the entire SSID command structure, starting with root, displays.

The mode characters in the he command display are interpreted as:

d = directory	r = read
t = test	w = write
D = device	x = executable

Use <^s> to stop the display from scrolling off the screen. Resume scrolling with <^q>.

**Examples**

- 1) Display the entire SSID command structure.

> **he**

```

/          d--- System monitor
  help    t--x  Using Diagnostics
  confid  d---  Confidence Testing
  .       .
  .       .
/bdtest   d--- Tests by Board
  131.0   t--x  VME131 68020 CPU Tests
  204.0   d--x  VME204 Computer System Memory Tests
  320.0   d--x  VME320 Disk Controller Tests
  .       .
  .       .
/bdtest/204.0 t--x VME204 Computer System Memory Tests
  mem.0   t--x  Memory Test
  .       .
  .       .

```

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---

```
/cmdline          d--- Command Line Operations
  mcs/            d---  MCS options
  dv/            drw-  I/O devices
  opt/           d---  System options
/cmdline/mcs     d---  MCS options
  reconf         t--x  Reconfigure test scripts
  version        t--x  @(#)confile.src version date
  setopt         t--x  Set test options
  remote         t--x  Remote Diagnostic Link
  disphrd        t--x  Display known hardware
/cmdline/dv      drw-  I/O devices
  log            Drw-  logger
  spi            Drw-  host port
  sp0            Drw-  console port
  pr             Drw-  printer 050
/cmdline/opt     d---  System Options
  he             t--x  help !!!!!
  fe             t--x  find errant test
  cf             t--x  configure test
  ml             t--x  memory free list
  ce             t--x  clear error counters
  set            t--x  set variables
  echo           t--x  display msg
```

2) Display a test with descriptions of each subtest.

> **he 320.0**

```
/bdtest/320.0    d--x  VME320 Disk Controller Tests
  hd.1           t--x  Winchester Disk
  hd.0           t--x  Winchester Disk
  fd.1           t--x  Floppy Disk
  fd.0           t--x  Floppy Disk
```

---

**ml**

Display memory free list

**Syntax**

**ml**

**Description**

This command displays the current allocation of available memory under SSID. SSID dynamically allocates memory on an as-needed basis. Areas of available memory are not necessarily contiguous. The memory free list contains one line for each contiguous segment of memory. `head` is the starting memory location, and `size` is the number of bytes of contiguous memory starting at the head address.

**Example**

1) Display available memory.

```
> ml
```

```
Free memory list
```

```
head =      13150, size = e85bo
```

```
head =      fb800, size = 400
```

In this example, the first segment starts at address 13150 and is e85bo bytes long; it thus ends with address fb6ff. The second segment starts at address fb800 and is 400 bytes long; it thus ends with address fbbff. The memory between fb700 and fb800 (100 bytes) is currently allocated to some task within SSID.

## **reconf**

Reconfigure the menu mode test suites

### **Syntax** **reconf**

### **Description**

The reconf command reconfigures the confid, fault, ptest, and ptesti test suites to reflect changes made in the system configuration list (see Figure 43). If the reconf command is not executed after changing the system configuration list, the test suites do not recognize the added or deleted card(s). The bctest menus, on the other hand, automatically incorporate changes to the system configuration list.

### **Example**

- 1) Reconfigure test scripts confid, fault, ptest, and ptesti to reflect a change in the system configuration list.

> **reconf**

---

## set

Set environment options

### Syntax

**set** [ $\pm$ *option*]

### Description

The set command views or changes the state of options that control the operation of SSID. When *option* is not specified, the set command displays the current status of the test options. When *option* is preceded by a plus sign (+) or nothing, it is enabled. When preceded by a minus sign (-), *option* is disabled.

In command line mode, the options lc, le, ce, and time are volatile; that is, they must be set on the current command line, but they will return to their default values after processing of the command line is complete. The remaining values are non-volatile, holding their current values until changed by the set command.

### Examples

1) Display the current list of options.

> **set**

```
lc - disabled loop-continue
le - disabled loop-on-error
li - disabled loop-on-intermittent-error
vb - enabled verbose-mode
ce - disabled continue-on-error
ae - disabled display all errors
dp - disabled display packet
con - enabled concurrent-mode
time - disabled execution-time
menu - enabled prompt by menu
```

Refer to the description of the setopt command in the chapter on “System commands” for an explanation of these options.

- 2) Enable the option `lc` to cause SSID to loop continuously in the `tp.0` test.

> **set lc;tp.0**

When the test is complete, `lc` is again disabled.

- 3) Disable the verbose mode, enable the display of elapsed time, and run test 1 on the first Winchester disk drive.

> **set -vb time;hd.0 1**

*N* Option settings made using the `set` command are valid in command line mode only; option settings made using the `setopt` command are valid in menu mode only but do not affect the options used in the `confid/fault` and `peripheral` test scripts.

:

## **set menu**

Return to menu mode

### **Syntax**

**set menu**

### **Description**

This command returns SSID to menu mode, displaying the last screen that was accessed before the cmdline command was executed. Menu mode provides confidence, fault, and peripheral test suites not available in command line mode.

### **Example**

1) Exit command line mode.

> **set menu**

SA:

---

## List of terms

---

**board testing**

Testing that verifies operation of a specific board in the system. Board testing is valuable whenever a board is replaced.

**ce**

A command line mode command that clears error counters for the specified test. If no test is specified, all error counters are cleared. This command performs the same function as clear does in menu mode.

**cf**

A command line mode command that allows you to change the configuration of boards and tests recognized by SSID. cf with no option accesses the system level configuration. Refer to Appendix A for details.

**clear**

A system command that clears all error logs and pass counters.

**cmdline**

A system command that accesses command line mode. Command line mode offers features not available in menu mode, such as the capability to change configuration variables, reconfigure test suites, and list the entire SSID command structure.

*N* Command line mode is reserved for advanced users of SSID.  
*o*  
*t*  
*e*  
*:*

**command packet**

A set of parameters sent to a board or module to cause it to execute a specific command. A command packet might contain a command to read data, the code for the device to read data from, and the amount of data to read.

**command review block**

The upper portion of SSID menus that serves as a reminder of the SSID commands you can select when not testing.

**concurrent testing**

Testing that allows tests to run together, using time slicing for maximum use of the CPU for each test.

**confidence testing**

Testing that verifies total system health by running a dynamically configured suite of tests; it is useful at initial system installation and after a major system component replacement.

**destructive test**

A test that modifies the data stored on a storage device attached to a board. Do not do destructive testing on a disk until you have backed up the data or the disk drive replaced.

**diagnostic**

A kind of test that probes a device that has failed a go/no-go test to find the cause of the failure.

**disperr**

*(display error)* A system command that lists the accumulated errors and the pass count. If no errors occurred, only the pass count is shown.

**disphrd**

*(display hardware)* A system command that displays the boards whose presence is sensed by SSID. (If a board is completely dead it may not be recognized.)

**dml**

A command line mode command that displays the actual installed memory for the system.

**echo**

A command line mode command that echoes a given argument to the standard output. This command is similar to the operating system's echo command.

**fault isolation**

The process of eliminating conditions and hardware components until the failing part and the test that causes the failure are identified.

**fault testing**

Testing that checks and diagnoses specific system failures by running a dynamically configured suite of tests.

**fe**

A command line mode command that finds errant tests. fe displays the number of errors and fatal errors for all tests that have run since reset or the last ce (or clear in menu mode ) command. This command provides the same information as the disperr command available in menu mode.

**hard error**

Also known as fatal error, an error that is repeatable and cannot be corrected. Hard errors include nonexistent controller or device, illegal command, media not in place, or soft errors for which the retry count has been reached.

**he**

A command line mode command that displays the command structure of SSID. You can use the information given by he to bypass the SSID menus and initiate a test directly from the command line.

**help**

A system command that accesses the help program. Once in the help program, you can access online information concerning SSID operations, tests, and test suites.

**interference**

In SSID, interference refers to situations in which the activity of one board causes failures in another board. Sometimes failures occur only if the interfering board is running a specific test. However, just the presence of the interfering board in the system may be sufficient in other cases. In certain circumstances, the presence of a module may even hide a failure in another module or cause multiple problems to show up at the same time.

**intermittent failure**

A failure that occurs at random rather than in a predictable pattern. The time between failures may be a few seconds or a few days.

**ml**

A command mode command that displays the memory free list. ml lists one line for each contiguous segment of memory.

**non-destructive test**

A test that does not modify the data on a storage device attached to a board. It is not necessary to back up data contained on a device undergoing non-destructive testing.

**peripheral testing**

Testing that checks and diagnoses disk drives and tape devices attached to the system by running a dynamically configured suite of tests.

**reconf**

A command mode command that reconfigures test scripts for the confid, fault, ptest, and ptesti suites.

**remote**

A system command that allows connection to a remote terminal connected to a modem or to a remote terminal on port 2 of the MVME707. Once connected to the remote site, all keyboard and display functions are in parallel. All SSID functions can then be performed from the remote site.

**set**

A command line mode command that displays current test options, and sets test options directly on the command line.

**set menu**

A command line mode command that returns SSID to menu mode and the SA: prompt.

**setopt**

A system command that allows you to enable or disable test options such as loop-on-error, verbose mode, and concurrent mode.

**soft error**

Also known as non-fatal error, and error that may not occur again if the same operation is repeated. If the configured number of soft error retries is performed without getting correct data, then a hard (fatal) error has occurred.

**test**

A program that determines whether or not a device is performing correctly by subjecting it to go/no-go situations.

**version**

A system command that displays the current revision data for SSID.

**view**

A system command that displays the individual board tests making up any confidence, fault, or peripheral suite.

**VME**

Versa Module Eurocard. VMEbus is an industry standard, high performance, 32-bit computer bus.

---

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---

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## **Application Module and Intelligent Peripheral Equipment Module**

### **Advanced Maintenance Guide**

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