HEWLETT-PACKARD

Using Mass Storage Diagnostics with the HP-IL Interface

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Printing History

New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition or a new update is published. No information is incorporated into a reprinting unless it appears as a prior update; the edition does not change when an update is incorporated.

Many product updates do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correspondence between product updates and manual updates.

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Typographical Conventions

The following typographical conventions are used in this manual:

Example	Meaning
b	eight binary digits (one byte)
n	a decimal number
x	an ASCII text character
HH	a hexadecimal number
hh:mm:ss	a time variable for hours:minutes:seconds
`Start Applic`	a P.A.M. label
Return	a key on the Portable PLUS keyboard
Bold	a term defined in the glossary or an important word
Italic	an emphasized word, the title of a document, or a comment within a command example
`text`	a message displayed on the Portable PLUS screen or printed by the system printer
`{text}`	an alternate message displayed on the Portable PLUS screen or printed by the system printer
`(1 - n)`	a range of acceptable values for a command parameter
`[V]`	a default value for a command parameter
Y	a user response to a diagnostic prompt

Note Notes contain important information.

Caution Caution messages appear before procedures which, if not observed, could result in loss of customer data.

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1

General Information

This manual provides information on how to use off-line mass storage diagnostic programs with the HP Portable PLUS Personal Computer and the HP-IL/SCSI Interface. The mass storage diagnostic programs aid service-trained personnel in the analysis and repair of mass storage **devices** to the level of field-replaceable units. The following mass storage devices are included in Hewlett-Packard mass storage system products, and use the Small Computer System Interface **(SCSI)**:

- **Hard disk drives**
- **Digital audio tape (DAT) drives**
- **Rewritable optical disk drives**
- **CD-ROM drives**

Note

Service-trained personnel *must* have the appropriate CE Handbook and this manual with them, whenever they are testing a mass storage system product. CE Handbooks contain device-specific information on internal diagnostics, logs, and REQUEST SENSE codes.

This chapter provides an overview of SCSI, plus information on the mass storage diagnostic programs, setting up diagnostic equipment, and running a diagnostic session.

SCSI Overview

The Small Computer System Interface (SCSI) is an industry-standard interface designed to support multiple hosts and multiple peripherals of various types. The SCSI standard defines the physical, electrical, and functional elements of the interface. This includes the hardware, command set, and channel protocol required to implement SCSI.

Targets and Initiators

Up to eight devices can be connected to a SCSI bus. However, communication on the bus is allowed between only two devices at any one time. When two devices communicate with each other on the bus, one acts as an **Initiator** and the other acts as a **Target**. The Initiator originates an operation and the Target performs the operation. Certain SCSI bus functions are assigned to the Initiator and certain bus functions are assigned to the Target. The Initiator may arbitrate for control of the bus and select a particular Target. Once selected, the Target controls the transfer of all information on the data bus.

Note

In this manual, the term "Initiator" refers to the HP Portable PLUS and the term "Target" refers to the mass storage device being tested.

Bus Phases

Communication over the SCSI bus is managed using a set of bus phases. The typical transaction begins with the selection phase, during which a communication link is established between the Initiator and the Target. The command phase is then entered and the Initiator sends a command to the Target, which performs the specified operation. If the command involves a data transfer, the data phase begins and information is transferred between the Initiator and Target. The transaction concludes with the status phase, during which the Target sends a status byte to the Initiator indicating the result of the operation just completed. If problems are encountered during command

execution, the Target logs the appropriate sense data and alerts the Initiator with the proper status.

SCSI IDs

Each device on the bus is assigned its own data bus signal line as a **SCSI ID**. This ID serves as the address mechanism that allows one device to select another device. In some multi-device SCSI configurations, the SCSI ID is also used to resolve contention for the bus through the use of a prioritized arbitration scheme.

Bus Configuration

Electrically, the SCSI bus comprises an 8-bit data bus with parity. Nine additional signal lines are used to manage the bus and coordinate the flow of information. Devices are connected to the bus using a 50-conductor cable. The devices are daisy-chained together with all signals common between all devices. The SCSI bus driver configurations may be differential or single-ended. The maximum allowable cable length is 6 meters for single-ended; 25 meters for differential.

SCSI Documentation

The following documentation provides additional information on the operation of the SCSI bus:

- *HP Common SCSI Interface Specification*, part no. 5959-3911
- *Small Computer System Interface: ANSI X3T9.2/82-2 (Rev 17B) and ANSI X3.131.86*
- *Common Command Set (CCS) of the Small Computer System Interface (SCSI): ANSI X3T9.2/85-52 (Rev 4.3)*

Diagnostic Programs

The following paragraphs provide information on the following mass storage diagnostic programs: SCSIDISK, DDSDIAG, SCSIMO, SCSICD. These diagnostic programs transfer data and commands between a SCSI device and an HP Portable PLUS via a **HP-IL**/SCSI interface to test servo, read/write, and controller functions of the device.

Products Supported

Table 1-1 provides information on the products and devices supported by the mass storage diagnostic programs. Each diagnostic program supports one device included in disk storage or mass storage systems.

Note

The mass storage diagnostic programs cannot be ordered by part number. They reside on a system in Disk Storage Systems Division and must be downloaded from that system into your HP Portable PLUS computer. The part numbers in Table 1-1 are provided *only* for the purpose of reporting defects in the diagnostic programs.

Table 1-1. Products and Devices Supported

Program	SCSIDISK	DDSDIAG	SCSIMO	SCSICD
Part Number	5010-0568S	C1511-90931	5010-0570S	5010-0571S
Device Supported	Hard Disk Drive	DAT[1] Drive	Rewritable Optical[2] Disk Drive	CD-ROM Drive
HP 79XX Family Disk Storage Systems Supported	7957S 7958S 7959S	None	None	None
HP Series 6000 Mass Storage Systems Supported	Model 330S Model 660S	Model 330S Model 660S	Model 330S Model 660S	Model 330S Model 660S

[1] *DAT drives store data on digital audio tape in digital data storage (DDS) format.*

[2] *Rewritable optical disk drives store data on removable magneto-optical (MO) disk media.*

Diagnostic Features

The mass storage diagnostic programs include commands which provide the following important diagnostic features:

- Internal **self-test** diagnostic routines.
- **Media tests.**
- Reassignment of defective blocks on media (SCSIDISK and SCSIMO only.)
- Access to **Maintenance logs** (SCSIDISK and DDSDIAG only).
- Error and **fault** reporting.

Internal Diagnostics

The DIAGNOSTICS command invokes internal self-test diagnostic routines resident within controller firmware. These diagnostic routines perform small functional tests of the servo, read/write, and controller functions of the device. The CE Handbook for each product contains information on the status of self-test indicators when self-test diagnostics pass and fail.

Media Tests

Media tests are powerful tools to determine the integrity of the media and read/write circuitry. The RO MEDIA TEST command enables the user to perform read-only media tests, and the WTR MEDIA TEST command enables the user to perform write-then-read media tests.

Block Reassignment

The SCSIDISK and SCSIMO diagnostic programs include the REASSIGN BLOCK command, which enables the user to reassign a defective block to a spare track on the media.

Error and Fault Reporting

If a command fails to complete successfully, the device returns a status of Check Condition. The Initiator then displays a failure message, followed by the extended sense bytes for the failed command.

The user can also request the status of a device at any time with the REQUEST SENSE command. The CE Handbook for the device includes the codes for the REQUEST SENSE extended sense data fields supported by the device.

Maintenance Logs

The ACCESS LOGS command in the SCSIDISK diagnostic program provides access to the following Maintenance logs: Usage Log, Data Error Log, and Hardware Error Log. The CE Handbook for the product being tested contains device-specific information about hard disk drive Maintenance logs.

The ACCESS LOGS command in the DDSDIAG diagnostic program provides access to the following Maintenance logs: Fault Log, Error Rate Log, and Tape Log. The CE Handbook for the product being tested contains device-specific information about digital audio tape drive Maintenance logs.

Setting Up Diagnostic Equipment

The following paragraphs provide information on loading diagnostic programs into an HP Portable PLUS and connecting diagnostic equipment to a mass storage system.

Note

The mass storage diagnostics were designed for use with the HP Portable PLUS. However, with the proper HP-IL interface and software, they can also be used with the HP 150 or Vectra PC (refer to "Equipment Required").

Equipment Required

The following equipment is required to test mass storage system devices with mass storage diagnostic programs:

- HP Portable PLUS Computer
- HP Series 82241 AC Adapter (refer to Table 1-2)
- HP-IL/SCSI Interface Assembly, part number 5061-3066 (includes the HP-IL/SCSI Interface, the Field Service SCSI Cable, and the *Using Mass Storage Diagnostics with the HP-IL Interface* manual)
- SCSI Terminator, part number 1252-2297
- HP 82167B HP-IL Cables
- HP-IL Printer (optional)

Note

If you are using the HP 150, you need to install the following:

- HP 45643A HP-IL/Parallel Card for HP 150
- HP Series 100 Extended I/O Applications, part number 45643-13001

Note

If you are using the HP Vectra PC, you need to install the following:

- HP 82973A HP-IL Interface Card for HP Vectra PC
- HP 82973A HP-IL Interface Software for HP Vectra PC, Rev. E, part number 82973-12005

Caution

Use only a Hewlett-Packard Series 82241 AC Adapter to provide power to the HP-IL/SCSI Interface. Table 1-2 lists the adapters approved for use with the HP-IL/SCSI Interface.

Table 1-2. AC Adapters

AGENCY	COUNTRY	MODEL	INPUT	OUTPUT
UL	U.S.A.	82241A	120 Vac, 20 VA	9 Vac, 13.5 VA
CSA	CANADA	82241A	120 Vac, 20 VA	9 Vac, 13.5 VA
TUV/GS	W. GERMANY	82241AB	220 Vac, 20 VA	9 Vac, 13.5 VA
FEI	FINLAND	82241AB	220 Vac, 20 VA	9 Vac, 13.5 VA
SEMKO	SWEDEN	82241AB	220 Vac, 20 VA	9 Vac, 13.5 VA
NEMKO	NORWAY	82241AB	220 Vac, 20 VA	9 Vac, 13.5 VA
DEMKO	DENMARK	82241AB	220 Vac, 20 VA	9 Vac, 13.5 VA
SEV	SWITZERLAND	82241AB	220 Vac, 20 VA	9 Vac, 13.5 VA
SEC	AUSTRALIA	82241AG	240 Vac, 20 VA	9 Vac, 13.5 VA
MITI	JAPAN	82241AJ	100 Vac, 20 VA	9 Vac, 13.5 VA

Loading Diagnostic Programs

Note

The instructions for loading diagnostic programs into your HP Portable PLUS are not included in this manual. The instructions reside on a system at Disk Storage Systems Division, and can be obtained by performing the steps below.

To obtain information on how to load the mass storage diagnostic programs into your HP Portable PLUS, perform the following steps:

1. Send an HPDESK message to address DSSDISK. An auto answer message will automatically be returned to your HPDESK number.
2. At the `Intray >` prompt, list the items to see which item number corresponds to `AUTO ANSWER MESSAGE`.
3. Read the auto answer message.

Connecting Equipment

Figures 1-1 and 1-2 show how to connect the equipment required to use the mass storage diagnostic programs with the HP Portable PLUS. If you are connecting a printer to the Portable PLUS, refer to the following documentation for configuration information: *Using the Portable PLUS* (reorder number 45711-90002) and the user manual for the printer you are connecting.

To connect the diagnostic equipment to the mass storage system, perform the following steps:

1. Remove ac power from the computer system.
2. Set the LINE~ switch on the mass storage system to the 0 (out) position.
3. Disconnect the SCSI bus cable(s) from the mass storage system.
4. Connect the field service SCSI cable to the HP-IL/SCSI interface. Make sure the connector on the field service SCSI cable is properly oriented before connecting it to the interface (see Figure 1-1).
5. Connect the other end of the field service SCSI cable to a SCSI connector on the rear panel of the mass storage system.
6. Connect the SCSI terminator to the other SCSI connector on the rear panel of the mass storage system.
7. Connect the computer and the printer to the HP-IL/SCSI interface using HP-IL cables (see Figure 1-2). If the printer is not being used, connect the computer to the HP-IL/SCSI interface as shown in Figure 1-1.
8. Connect the cable from the ac adapter to the input power connector on the HP-IL/SCSI interface.

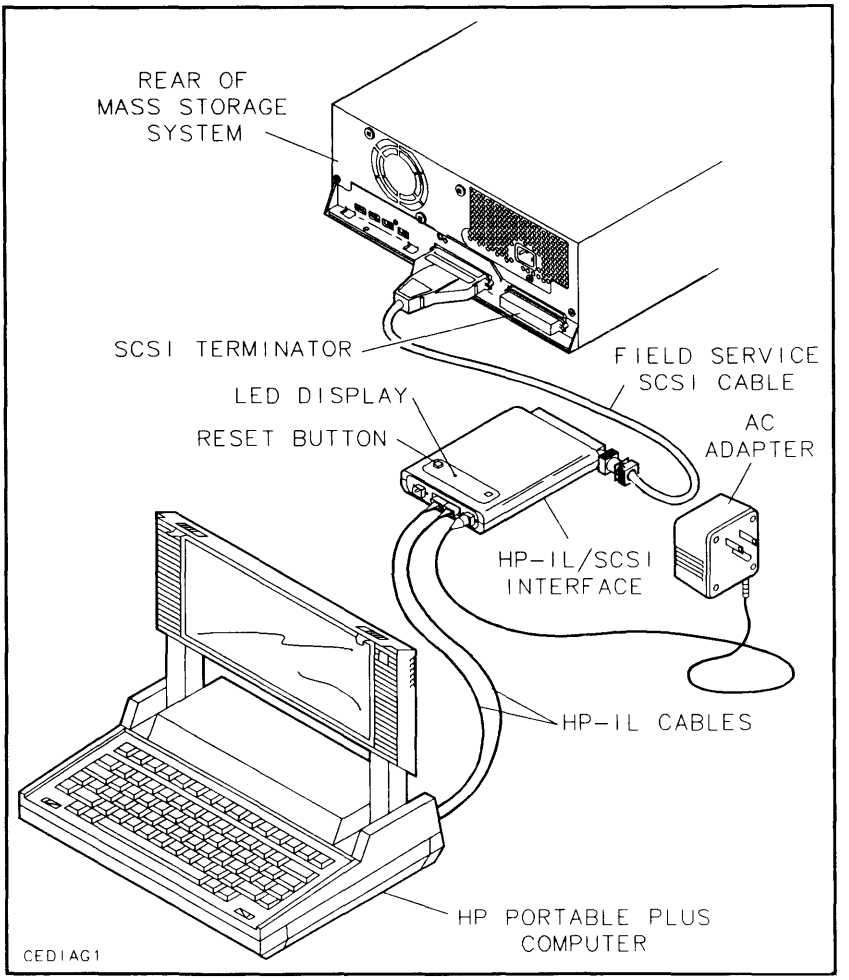

Figure 1-1. Diagnostic Equipment Connections with Portable PLUS Only

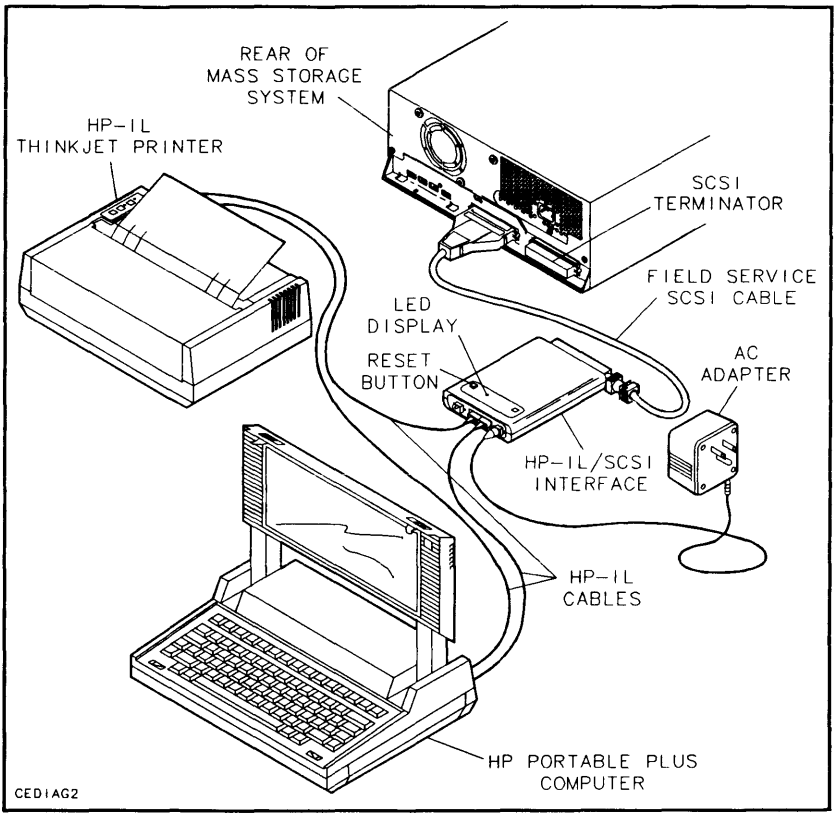

Figure 1-2. Diagnostic Equipment Connections with Printer and Portable PLUS

Testing Equipment

After connecting the diagnostic equipment, you should perform a power-on test of the equipment as follows:

1. Plug the Series 82241 AC Adapter into a suitable ac source.
2. Monitor the LED display on the HP-IL/SCSI interface module as the module performs its internal self-test. Successful execution of the self-test routine is indicated when the LED indicator flashes five times and then goes off.
3. If the module passes its self-test, go to step d. A module self-test failure may be caused by a problem with the field service cable connecting the module and the drive. Check the cable carefully then press the module Reset button to restart the self-test routine. If the self-test routine fails again, the module is probably defective. Replace the module and begin again at step a.
4. Switch on power to the disk storage or mass storage system, Portable PLUS, and printer (if used). Check for normal operation of all the equipment and the disk storage or mass storage system.

Note

Even though a device may fail its power-on self-test, the diagnostic program for the device may still be used to troubleshoot the device. If the device responds to a REQUEST SENSE command, failure information can be retrieved from the device.

Running a Diagnostic Session

A diagnostic session is defined as a period of time during which a diagnostic program starts running on an HP Portable PLUS, commands are entered from the command prompt, and a diagnostic program is ended by returning to the `A:\` prompt.

The following paragraphs provide information on starting a diagnostic session using one of the mass storage diagnostic programs to test a mass storage device, entering commands during a diagnostic session, printing the dialog from a diagnostic session, and ending a diagnostic session. After ending a diagnostic session, you can start a new diagnostic session using a different diagnostic program to test another mass storage system device.

Starting a Session

To start a diagnostic session, perform the following steps:

1. Select **DOS Commands** in the P.A.M. main menu.
2. Press **Start Applic**.
3. At the `A:\` prompt, change the directory to the one where the diagnostic program is stored.
4. Type the name of the diagnostic program (`SCSIDISK`, `DDSDIAG`, `SCSIMO`, or `SCSICD`) and press (Return). The name of the diagnostic program, copyright, version, and part number is displayed at the top of the screen with the following prompt:

   ```
   Enter Initiator ID (0-7)[7]:
   ```

5. Enter the desired Initiator ID and press (Return). The ID can be any value from 0 to 7. When connected to a single drive, the Initiator ID must be different than the ID assigned to the Target. When connected to a SCSI bus, the Initiator ID must be different from the addresses of all other active devices on the bus. The default Initiator ID is 7.
6. The following prompt is displayed:

   ```
   Enter SCSI Target ID (0-7)[0]:
   ```

7. Enter the Target ID and press (Return). The Target ID must correspond to the setting of the SCSI address switch on the drive under test. If necessary, refer to the appropriate drive documentation for help in interpreting the address switch setting. The default Target ID is 0.

Note

If you need to change the Initiator ID or the Target ID, use the ID command (refer to Table 1-3).

---

8. Depending on which diagnostic program is loaded, one of the following command prompts is displayed:

```
SCSIDISK>
DDSDIAG>
SCSIMO>
SCSICD>
```

9. The program is now ready to accept commands from the user.

Command Description Format

The following format is used in chapters 2 through 5 to describe mass storage diagnostic commands. Chapters 2 through 5 contain detailed information on the commands included in the SCSIDISK, DDSDIAG, SCSIMO, and SCSICD diagnostic programs. The HELP command can be used to display a list of all the commands available in a diagnostic program, along with a brief description of the commands.

COMMAND NAME

COMMAND ABBREVIATION

Description

The Description section explains the function and operation of the command.

Examples

The Examples section provides examples which show the operation of the command and the user interface. If there are several examples, each example is usually preceded with a bulleted explanation. However, examples that are simple or self-explanatory may not be preceded with bulleted explanations.

Related Commands

The Related Commands category lists all commands which are functionally related to the command being described. If there are no functionally related commands, this category will not appear.

Entering Commands

Note

Diagnostic commands are not case sensitive. The following commands are equivalent: REQUEST SENSE, REQuest sense, Request Sense, request sense.

At the diagnostic command prompt, a command can be entered using the abbreviated form of the command or the full command name in any combination of upper case and lower case letters. Table 1-3 provides a matrix of the mass storage diagnostic programs and the commands in this manual.

Note

Whenever you need information about the mass storage device you are testing, you can enter the INQUIRY command. The INQUIRY command will display the Target ID, which is the SCSI address of the device you are testing, as well as the following device-specific information:

- Product ID
- Firmware revision
- Maximum address
- Block (or record) size

Printing a Session

Normally, the dialog that occurs while a command is being executed is displayed on the Portable PLUS screen. If you want to print the dialog, perform the following steps:

1. Type `OUTPUT` at the command prompt and press (Return).
2. Type `PRN` and press (Return).

To redirect the dialog to the console screen, perform the following steps:

1. Type `OUTPUT` and press (Return).
2. Type `CON` and press (Return).

Ending a Session

When you want to end a diagnostic session, type `EXIT` and press (Return). The `A:\` prompt will then appear.

Table 1-3. Command Matrix

SCSIDISK	DDSDIAG	SCSIMO	SCSICD
ACCESS LOGS	ACCESS LOGS		
ADDRESS			
CAPACITY		CAPACITY	CAPACITY
CLEAR LOGS	CLEAR LOGS		
DEFECT LIST		DEFECT LIST	
DIAGNOSTIC	DIAGNOSTICS	DIAGNOSTIC	DIAGNOSTIC
	ERASE		
EXIT	EXIT	EXIT	EXIT
FORMAT UNIT		FORMAT UNIT	
HELP	HELP	HELP	HELP
ID	ID	ID	ID
INQUIRY	INQUIRY	INQUIRY	INQUIRY
	LOAD		
		LOOPBACK	
MODE SELECT	MODE SELECT		
	MODE SENSE	MODE SENSE	MODE SENSE
OUTPUT	OUTPUT	OUTPUT	OUTPUT
PHYSICAL			
READ DATA	READ DATA	READ DATA	READ DATA

Table 1-3. Command Matrix (continued)

SCSIDISK	DDSDIAG	SCSIMO	SCSICD
READ FULL BLOCK			
REASSIGN BLOCK		REASSIGN BLOCK	
REQUEST SENSE	REQUEST SENSE	REQUEST SENSE	REQUEST SENSE
	RESET		
	REWIND		
RO MEDIA TEST	RO MEDIA TEST	RO MEDIA TEST	RO MEDIA TEST
SEEK		SEEK	SEEK
	SPACE		
	TEST UNIT READY		
	UNLOAD		
	VENDOR GROUP		
VERIFY		VERIFY	
	WRITE DATA		
	WRITE FILEMARKS		
WTR MEDIA TEST	WTR MEDIA TEST	WTR MEDIA TEST	

2

SCSIDISK Commands

This chapter provides information on the commands included in the SCSIDISK diagnostic program.

The SCSIDISK diagnostic program transfers data and commands between a hard disk drive and an HP Portable PLUS via a HP-IL/SCSI interface. Hard disk drives store data on nonremovable disk media.

ACCESS LOGS

AC

Description

The ACCESS LOGS command displays the contents of the Data Log or the Hardware Error Log, which reside on the Target's maintenance track. The Data Log includes the Usage Log and the Data Error Log.

The Target records the occurrence of events such as data errors and hardware faults on the maintenance track. Detailed information concerning how the Target manages the maintenance log is product specific and is included in the CE Handbook for the product.

The logical addresses are displayed in either block or three-vector mode as defined by the ADDRESS command. Corresponding physical addresses can also be displayed using the PHYSICAL command.

Usage Log Contents

The Area field indicates what portion of the Target's media is covered by the log data. An Area of "Volume" indicates that the log refers to the entire Target.

The Access Count field indicates the number of times the media was accessed since the last hardware error occurred or the log was cleared. This field is reset to zero each time an entry is added to the Hardware Error log. To determine the total number of media accesses, the Hardware Error log Access Count entries must be combined with the Usage log Access Count field. If no Hardware Error log entries are included in the maintenance log, the Usage log Access Count field reflects the total number of media accesses. The number of accesses represented by the Access Count field are shown in table 3-1.

The Blocks Accessed field is the count of the blocks read over the entire disk drive.

The First Retry Count field indicates the number of instances when the data recovery algorithm was forced to perform data read retries and the data was recovered on the first retry.

The Multiple Retry Count field indicates the number of times data was not recovered on the first retry. This field is incremented only once per complete recovery action, not once for each individual retry within a multiple-retry recovery.

Data Error Log Contents

The Logical Block Address field contains the address of a data block that encountered multiple read retries during one or more data error recovery attempts.

The Error Type field indicates the type of data error the block encountered. The contents of this field is product specific.

The Count field is incremented each time the specified block is uncorrectable or requires multiple retries in a given transaction. This field is incremented only once for each data recovery attempt.

The Error byte encodes specific data error information. Because the coding is bit-significant, multiple errors at the same location will have their respective bits merged into the reported byte. The content of this byte is product specific.

Hardware Error Log Contents

The Logical Block Address field contains the address of the data block that the disk drive was attempting to access when the error occurred.

The Internal Device Status field contains an error code corresponding to the additional sense code returned by the REQUEST SENSE command. The values in the Access Count field must be combined with the values of the Access Count field in the Usage log to yield the total number of media accesses. The number of accesses represented by the Access Count field are shown in Table 2-1.

Table 2-1. Hard Disk Drive Access Count Range Values

VALUE (HEX)	MINIMUM OF ACCESS RANGE	MAXIMUM OF ACCESS RANGE
0	No Accesses	No Accesses
1	1	1
2	2	10
3	11	100
4	101	1,000
5	1,001	10,000
6	10,001	100,000
7	100,001	500,000
8	500,001	1,000,000
9	1,000,001	5,000,000
A	5,000,001	10,000,000
B	10,000,001	50,000,000
C	50,000,001	100,000,000
D	100,000,001	500,000,000
E	500,000,001	1,000,000,000
F	1,000,000,001	>1,000,000,001

Examples

- The following example shows how to read the Data log, which includes the Usage log and the Data Error log. Logical addresses are displayed in block mode.

```
SCSIDISK> ACCESS LOGS

Types of logs:
   D - Data Log
   H - Hardware Error Log

Which log [D]? D

Usage and Data Error Log
========================

Area = xxxxxxxxx
Access Count = n
Blocks Accessed = n
First Retry Count = n
Multiple Retry Count = n

     Logical        Error
  Block Address     Type   Count    Error
================  =====  =====   ========

        n           xxxxx    n        b
```

- The following example shows how to read the Hardware Error log. Logical addresses are displayed in three-vector mode.

```
SCSIDISK> ACCESS LOGS

Types of logs:
   D - Data Log
   H - Hardware Error Log

Which log [D]? H
```

ACCESS LOGS

```
Hardware Error Log
==================

     Logical          Internal    Access
 Cyl  Head  Sect   Device Status   Count
================  =============  ======
  n     n     n          HH          n
```

Related Commands

ADDRESS
PHYSICAL

ADDRESS

AD

Description

The ADDRESS command controls the mode in which logical addresses are displayed: block or three-vector. This command can also be used to convert a logical address from one mode to the other.

The Target's media is logically organized as a contiguous series of data blocks. Each block is assigned a value, beginning with zero and increasing to a maximum number which represents the last addressable data block. Each logical block address corresponds to a logical three-vector address, represented by cylinder, head, and sector values.

The program can display logical addresses in either mode. The ADDRESS command controls the state of an address in the diagnostic program. The address flag determines whether logical addresses will be displayed in block or three-vector mode. The ADDRESS command can also be used to convert a logical block address to its three-vector equivalent, or vice versa.

The ADDRESS command controls the display of logical addresses only. The display of physical addresses is controlled with the PHYSICAL command. Unlike logical addresses, physical addresses can only be displayed in three-vector mode. The relationship between each address type and its addressing mode is shown below:

Table 2-2. Address Modes Versus Address Types

Addressing Mode	Address Type
Three-Vector	Physical or Logical
Block	Logical

In the following examples, the user defines the desired logical addressing mode, block (B) or three-vector (V). The specified address is then converted and displayed in the desired mode. The address flag is also set to display

all subsequent logical addresses in the same mode. To change the return addressing mode without performing an address conversion, simply use default values for all address prompts. The default addressing mode is three-vector.

Examples

- The following example shows how to convert a three-vector address to a block address, which sets the return addressing mode to block mode.

```
SCSIDISK> ADDRESS

Do you want the result to be a Block or Vector address (B/V)[V]? B

Cylinder address (0 - n)[n]? n

Head address (0 - n)[n]? n

Sector address (0 - n)[n]? n

Cylinder n, Head n, Sector n

  is Block n

The return addressing mode is now set to BLOCK.
```

- The following example shows how to convert a block address to a three-vector address, which sets the return addressing mode to three-vector mode.

```
SCSIDISK> ADDRESS

Do you want the result to be a Block or Vector address (B/V)[V]? V

Enter block address (0 - n)[n]: n
```

```
Block address n

  is Cylinder n, Head n, Sector n

The return addressing mode is now set to THREE-VECTOR.
```

Related Commands

ACCESS LOGS
CAPACITY
DEFECT LIST

CAPACITY

CA

Description

The CAPACITY command allows the Initiator to determine the maximum capacity of the Target. The Target returns the address of its last addressable logical block. The address is displayed in block or three-vector mode as defined by the ADDRESS command. The current block size and the drive capacity are also displayed.

Although the physical capacity of the Target remains fixed, the address of the last data block is determined by block size. The larger the block size, the lower the address of the last addressable logical block.

Examples

- The following example shows how the Target returns the address of its last addressable logical block. The address is displayed in block mode.

```
SCSIDISK> CAPACITY

Maximum Block Address = n

Block Length = n

Drive Capacity = n bytes
```

- The following example shows the address of the last logical block displayed in three-vector mode.

```
SCSIDISK> CAPACITY

Maximum Address:  Cyl = n, Head = n, Sector = n

Block Length = n

Drive Capacity = n bytes
```

Related Commands

ADDRESS

CLEAR LOGS

CLR

Description

The CLEAR LOGS command clears the Target's Data Log (Data Error Log), Usage Log, and Hardware Error Log.

Examples

```
SCSIDISK> CLEAR LOGS

CAUTION! This command will destroy service-related
         information. The Data log, Usage log, and
         Hardware Error log will be cleared.

Do you wish to continue (Y/N) [N]? Y

All logs cleared.
```

Related Commands

ACCESS LOGS

DEFECT LIST

DEF

Description

The DEFECT LIST command displays the Target's primary defect list or growing defect list, which may include addresses on the following tracks:

- Maintenance tracks
- Spare tracks
- User Data tracks
- Log tracks
- Defect List tracks

There is also an option that allows both defect lists to be stored to files in the Portable PLUS. The primary defect list is stored in a file called PLIST.SAV, and the growing defect list is stored in a file called GLIST.SAV.

Both defect lists return the logical address field in either block or three-vector mode as defined by the ADDRESS command. In three-vector mode a sector value of "all" indicates that the entire track has been spared. The corresponding physical address can also be displayed using the PHYSICAL command.

Note

No logical address is provided for spare track, maintenance track, or log track entries. These tracks can only be accessed using physical addressing.

The primary defect list contains the addresses of the permanent media defects that were identified in the factory during the manufacturing process.

DEFECT LIST

The growing defect list contains the addresses of media defects that are identified after the hard disk drive is installed at a customer site. This includes media defects that are identified by the Initiator during formatting and media defects that are specified in REASSIGN BLOCK commands. The growing defect list does not include the primary defect list.

Examples

- The following example shows how to display the growing defect list. The logical address field is displayed in three-vector mode.

Note

In the example below, the address of the spare track is not displayed because the spare track is not included in the user data area of the disk. Spare tracks only have physical addresses. To display the physical address of a spare track, you must use the PHYSICAL command.

```
SCSIDISK> DEFECT LIST

Defect List options:

  G - display growing defect list
  P - display primary defect list
  B - display both lists
  S - store lists to files

Which option [G]? G
```

```
Growing Defect List:

    Logical
Cyl  Head  Sect       Type
===============   ============
 n     n     n     User Data
                   Spare Track
 n     n     n     User Data
```

- The following example shows how to display the primary defect list. The logical address field is displayed in block mode and includes the current block size. When an entire track has been spared, the logical blocks on the spared track are displayed as a range of blocks.

```
SCSIDISK> DEFECT LIST

Defect List options:

  G - display growing defect list
  P - display primary defect list
  B - display both lists
  S - store lists to files

Which option [G]? P

Primary Defect List:

  Logical Block Address
   (Block Size = n)          Type
 ======================   ===========
           n               User Data
         n - n             User Data
```

DEFECT LIST

- The following example shows how the primary defect list is displayed if the physical addressing mode has been enabled by the PHYSICAL command. The logical address field is displayed in block mode, as defined by the ADDRESS command, and the physical address field is displayed to the right.

```
SCSIDISK> DEFECT LIST

Defect List options:

  G - display growing defect list
  P - display primary defect list
  B - display both lists
  S - store lists to files

Which option [G]? P

Primary Defect List:

  Logical Block Address                      Physical
    (Block Size = n)          Type       Cyl  Head  Sect
 ======================   ===========   ==============
          n                User Data      n     n     n
          n                User Data      n     n     n
```

- The following example shows how to store the primary defect list and growing defect list to Portable PLUS files.

```
SCSIDISK> DEFECT LIST

Defect List options:

  G - display growing defect list
  P - display primary defect list
  B - display both lists
  S - store lists to files

Which option [G]? S

Created file is PLIST.SAV.

Created file is GLIST.SAV.
```

Related Commands

ADDRESS
PHYSICAL

DIAGNOSTIC

DI

Description

The DIAGNOSTIC command invokes the Target's power-on self-test diagnostic sequence. A loop option allows the diagnostic to be repeated a specified number of times.

Note

Refer to the CE Handbook for the device being tested for device-specific error codes that correspond to self-test failures.

Examples

```
SCSIDISK> DIAGNOSTIC

Enter the loop count (1 - 256) [1]? n

Send Diagnostic  Pass = n
```

EXIT

E

Description

The EXIT command stops execution of the SCSIDISK program and returns the A:\ prompt.

Examples

```
SCSIDISK> EXIT

End of Program.

A:\
```

FORMAT UNIT

F

Caution

The FORMAT UNIT command will destroy user data or maintenance track information on the disk. You should back up all user data before executing the FORMAT UNIT command.

Description

The FORMAT UNIT command formats the Target media so that all data blocks can be accessed. When formatting all of the media surfaces, all user data is lost and all log information is cleared. The FORMAT UNIT command can also be used to reformat the Target maintenance track only, without formatting user data tracks.

A successfully executed FORMAT UNIT command installs the current MODE SELECT operating parameters as the Target's saved values. Therefore, before executing a FORMAT UNIT command on all media surfaces, the current values of the Target's changeable parameters should be checked to ensure they are set to the desired values.

Prior to formatting all media surfaces, the user must define what defect information to retain. If all spares are kept, the primary defect list and the growing defect list are both saved. If only primary spares are retained, the primary defect list is kept but the growing defect list is deleted.

In some situations it may be necessary to reformat only the maintenance track or one of the maintenance tracks. The FORMAT UNIT command includes an option to do this. Refer to the appropriate CE Handbook for details on how the Target responds to reformatting of these tracks.

Examples

- The following example shows how to format the media and retain all spares.

```
SCSIDISK> FORMAT UNIT

CAUTION! THIS COMMAND WILL DESTROY DATA.

Do you want to:

  A = retain All spares
  P = retain only Primary spares
  M = reformat Maintenance/log track only
  E = Exit

Option [E]? A

CAUTION! THIS COMMAND WILL DESTROY ALL DATA ON THE DISK.

Formatting will take approximately n minutes.

Do you wish to continue (Y/N) [N]? Y

Formatting in progress ... (hh:mm:ss)

Formatting completed.      (hh:mm:ss)

Formatting took n minutes and n seconds.
```

Note

The program displays the exact time the formatting started. If the formatting has not completed in a reasonable amount of time, the FORMAT UNIT command will time-out and terminate.

- The following example shows how to reformat the maintenance track only.

```
SCSIDISK> FORMAT UNIT

CAUTION! THIS COMMAND WILL DESTROY DATA.

Do you want to:

  A = retain All spares
  P = retain only Primary spares
  M = reformat Maintenance/log track only
  E = Exit

Option [E]? M

Do you want to:

  L = reformat the Log track
  M = reformat a Maintenance track
  E = Exit

Option [E]? M

CAUTION! This command will destroy all mode operating parameters.
         Mode Select is required to restore operating parameters
         following this command.

Are you certain you wish to continue (Y/N) [N]? Y
```

- The following example shows how to reformat the log track.

```
SCSIDISK> FORMAT UNIT

CAUTION! THIS COMMAND WILL DESTROY DATA.

Do you want to:

  A = retain All spares
  P = retain only Primary spares
  M = reformat Maintenance/log track only
  E = Exit

Option [E]? M

Do you want to:

  L = reformat the Log track
  M = reformat a Maintenance track
  E = Exit

Option [E]? L

Are you certain you wish to continue (Y/N) [N]? Y

Head address (0 - n) [n]? n
```

Related Commands

MODE SELECT

HELP

H

Description

The HELP command displays a list of all the commands supported by the SCSIDISK program, along with a brief description of each command. The list of commands is displayed one screen at a time. Press the space bar to display each successive screen.

To enter a command, type the full command name shown in the left-hand column or type the abbreviated form of the command shown as upper-case letters within the full command.

Examples

```
SCSIDISK> HELP

ACcess logs          - Display the Usage log, Data Error log,
                       or the Hardware Error Log.

ADdress              - Convert block address to vector, etc.

CApcity              - Determine capacity of Target.

CLeaR logs           - Clear ALL of the drive logs.
CLR

DEFect list          - Display either the growing or the
                       primary defect list.

DIagnostic           - The Target will execute its internal
                       diagnostics.

Exit                 - Exit the program.

Format unit          - Format the media.
```

Help	- Display this help file.
ID	- Change SCSI Initiator ID or Target ID.
INquiry	- Display Target and program parameters.
Mode Select MS	- Modify the Target's parameters.
Output	- Directs the output to the console, printer, or file.
Physical	- Enable or disable the display of physical addresses.
Read Data RD	- Display the contents of a selected block.
Read Full block RF	- Read entire block and display the header, data and ECC field contents. ECC field contents.
REASsign block	- Reassign a defective block.
REQuest sense	- Read Sense data from Target, format and display the results.
RO media test	- Perform Read-Only Media Test.
Seek	- Issue the SCSI Seek command. You can select random, alternate, single, or butterfly seeks.
Verify	- Selected or random area of Target is verified by ECC check only.
WTR media test	- Perform Write-Then-Read Media Test.

ID

ID

Description

The ID command is used to change the SCSI ID of the Initiator or the SCSI ID of the Target. The Initiator is the HP Portable PLUS and the Target is the hard disk drive being tested.

The SCSI ID of the Target (Target ID) must match the SCSI address of the hard disk drive being tested. The SCSI address of the hard disk drive is either set at the factory, or is set by the operator when the hard disk drive is installed into the mass storage system. (Refer to the appropriate CE Handbook for information on setting the hard disk drive SCSI address switches.) The default Target ID value is zero.

The SCSI ID of the Initiator (Initiator ID) must match the SCSI address of the HP-IL/SCSI interface. The default Initiator ID value is seven.

Examples

```
SCSIDISK> ID

Enter Initiator ID (0-7)[7]? n

Enter SCSI Target ID (0-7)[0]? n
```

Related Commands

INQUIRY

INQUIRY

IN

Description

The INQUIRY command instructs the Target to return its parameter information. This information is then displayed, along with the settings of various program variables.

The INQUIRY command returns a Check Condition status if the Target cannot return the requested data. Inquiry data will be returned even though the Target may not be ready for other commands.

If an INQUIRY command is received from an Initiator with a pending Unit Attention condition (before the Target reports a Check Condition status), the Target executes the INQUIRY command but does not clear the Unit Attention sense key. This is also true for a pending Hardware Error sense key.

The following example includes a general description of the information returned by the INQUIRY command. The actual values returned by the Target are product specific and are listed in the appropriate CE Handbook.

The first block of information shown in the example contains information describing the Target. The Direct Access Device field indicates whether the Target uses fixed or removable media. The Vendor ID, Product ID, and Firmware Revision fields are all product specific. The HP-IL/SCSI Revision field indicates the revision of firmware installed in the HP-IL/SCSI interface module.

The second block of information displays the current setting of various program parameters. The program parameters include SCSI Initiator ID, SCSI Target ID, block size, physical address display setting, addressing mode (block or three-vector), and selected output device.

The final block of information describes Target addressing and capacity parameters. This information is product specific and is listed in the appropriate CE Handbook.

Examples

```
SCSIDISK> INQUIRY

  Direct Access Device  = Fixed Media
  Vendor ID             = xx
  Product ID            = {C2212A} {C2213A}
  Firmware Revision     = xxxx
  HP-IL/SCSI Revision   = xxxx

  SCSI Initiator ID     = n
  SCSI Target ID        = n
  Physical Addresses    = {Enabled} {Disabled}
  Address Mode          = {Three-Vector} {Block}
  Output Device         = xxxxxxx

  Max Block Address     = n
  Max Cylinder Address  = n
  Max Head Address      = n
  Max Sector Address    = n
  Bytes Per Track       = n
  Block Size            = n bytes
```

Related Commands

ID

MODE SELECT

MS

Description

The MODE SELECT command provides a means for the Initiator to define various Target operating parameters. During SCSIDISK program initialization, the SCSIDISK diagnostic program determines which Target parameters are changeable. These values can then be changed using the MODE SELECT command.

The MODE SELECT command updates the current operating parameters. The only changeable values supported are the following Error Recovery values: Read Retry Count and Recovery Time Limit.

The Retry Count specifies the number of times that the Target should attempt its read recovery algorithm.

The Recovery Time Limit is the maximum time that the Target will attempt error recovery actions in order to correctly recover data. This field is defined in one (1) millisecond increments.

Examples

- The following example shows how to modify the Target's changeable parameters.

```
SCSIDISK> MODE SELECT

Select the value of the following parameters:

Retry Count (0 - 255)[8]? n
Recovery Time Limit (0 - 255)[255]? n

Current parameters have been modified.
```

OUTPUT

O

Description

The OUTPUT command directs the program output to the Portable PLUS console, a printer, or a file. All command prompts continue to be displayed on the Portable PLUS console, but output information is directed to the specified device or file. The OUTPUT command is useful for recording the results returned by a specific command. For example, when performing an ACCESS LOGS command, the contents of the logs can be printed or stored in a file for later examination. The default output device is the console (CON).

The output file can have an extension of three characters in length (for example, test.txt).

Note

When directing output to a ThinkJet Printer connected to a Portable PLUS, the printer will respond to the PRN setting.

Examples

- The following example shows how to direct output to the printer.

```
SCSIDISK> OUTPUT

Enter output file, printer ID (PRN), or console (CON)
[CON]: PRN

Output directed to PRN.
```

- The following example shows how to direct output to a file called LIST1.

```
SCSIDISK> OUTPUT

Enter output file, printer ID (PRN), or console (CON)
[CON]: LIST1

Output directed to LIST1.
```

- The following example shows how to direct output to the console.

```
SCSIDISK> OUTPUT

Enter output file, printer ID (PRN), or console (CON)
[CON]: CON

Output directed to console.
```

PHYSICAL

P

Description

The PHYSICAL command enables or disables the display of physical address information each time the command is executed. The program always displays logical address information in the mode defined by the ADDRESS command. If physical addressing is enabled, the program also displays physical addresses in three-vector mode.

The data tracks on the disk media are organized as a contiguous series of logical blocks. Each logical block corresponds to a physical location on the media. The two addresses differ because physical addressing takes into account the presence of nondata tracks (spare tracks and maintenance tracks) and logical addressing does not. The exact relationship between logical and physical addresses is product specific.

Examples

- The following example shows how to enable the display of physical addresses, then disable the display of physical addresses.

```
SCSIDISK> PHYSICAL

Physical addresses enabled.

SCSIDISK> PHYSICAL

Physical addresses disabled.
```

Related Commands

ACCESS LOGS
DEFECT LIST

READ DATA

RD

Description

The READ DATA command transfers one block of data from the Target to the Initiator. The data is displayed on the currently defined output device. The logical block address can be specified in either block or three-vector mode. The ASCII representation of the data is displayed on the right side of the screen.

If the seek performed during the read operation is successful, the Target checks for errors and performs read retries, if necessary. Unrecoverable data errors cause the read operation to terminate with the transmission of data up to, but not including, the unrecoverable physical block. This may cause partial transmission of a logical block, but no erroneous data will be transferred to the Initiator.

Examples

- The following example shows how to read a block of data from an HP 7957S, 7958S, or 7959S disk drive.

```
SCSIDISK> READ DATA

Do you want Block or Vector addressing (B/V)[V]? B

Enter block address (0 - n)[n]: n

Data (hex):
   1:  HH HH HH HH HH HH HH HH HH HH
  11:  HH HH HH HH HH HH HH HH HH HH
  21:  HH HH HH HH HH HH HH HH HH HH
    .
    .
    .
 251:  HH HH HH HH HH HH
```

Note

The ASCII representation of the hex data field is also displayed on the right-hand side of the screen.

Related Commands

READ FULL BLOCK

READ FULL BLOCK

RF

Description

The READ FULL BLOCK command displays the following information fields for the specified logical or physical block: header, data, and ECC. The type of track (user or spare) on which the block resides is also displayed. The Target's block size and format is product specific and is listed in the appropriate CE Handbook.

Note

Certain areas on the Target's media lie outside the logical address range. These areas include spare tracks, log tracks, and maintenance tracks. Physical addressing must be used when executing a READ FULL BLOCK command on these areas of the media.

Examples

- The following example shows how to read one full block from an HP 7957S, 7958S, or 7959S hard disk drive using physical block addressing. If logical block addressing is used, the block address is still displayed in logical three-vector format.

```
SCSIDISK> READ FULL BLOCK

Access physical or logical addresses (P/L)[L]? P

Physical cylinder address (0 - n)[n]? n

Head address (0 - n)[n]? n
```

READ FULL BLOCK

```
Sector address (0 - n)[n]? n

{Logical Cyl}  = n
Physical Cyl   = n
Logical Head   = n
Logical Sector = n
{Defective Field spare track}
{Defective Factory spare track}
{Reserved}
{Spare track assigned in Field. (Growing defect)}
{Spare track assigned in Factory. (Primary defect)}
{User track}
{Log track}
{Maintenance track}
{Unassigned spare track}

Header values(hex):
   1: HH HH HH HH

Data (hex):
   1:  HH HH HH HH HH HH HH HH HH HH
  11:  HH HH HH HH HH HH HH HH HH HH
  21:  HH HH HH HH HH HH HH HH HH HH
    .
    .
    .
 251:  HH HH HH HH HH HH

ECC bytes (hex):
   1:  HH HH HH HH HH HH
```

Note

The ASCII representation of the hex data field is also displayed on the right-hand side of the screen.

- The following example shows how to read one full block from an HP C2212A or C2213A hard disk drive using physical block addressing. If logical block addressing is used, the block address is still displayed in logical three-vector format.

Note

In this example, the following typographical conventions apply: Message lines in curly brackets ({}) are alternative message lines that may appear on the Portable PLUS screen. Message lines without curly brackets are messages that always appear on the Portable PLUS screen.

```
SCSIDISK> READ FULL BLOCK

Access Physical or Logical addresses (P/L)[L]? P

Physical cylinder address (0 to n)[n]? n

Head address (0 to n)[n]? n

Sector address (0 to n)[n]? n
```

The following message line will appear only if the block is a logical address and the block has been spared:

```
{New location:}
```

The block address of the block being read will always appear:

```
Physical Cyl    = n
{Logical Cyl    = n}
         Head   = n
Logical Sector = n
```

If the block has been spared, the following message lines will appear:

```
{Spared physical cyl = n}
{Spared head         = n}
```

If the block has not been spared, one of the following message lines will appear:

```
{User data track}
{Maintenance track}
{Log track}
{Defect List track}
{Unassigned spare track}

Track has not been spared.
```

If the spare sector on the track has been used, the following message line will appear:

```
{Spared sector = n}
```

If the spare sector on the track has not been used, the following message will appear:

```
{Spare sector has not been used.}
```

The following header, data, and ECC fields will always appear:

```
Header values(hex):
   1: HH HH HH HH HH HH

Data (hex):
   1:  HH HH HH HH HH HH HH HH HH HH
  11:  HH HH HH HH HH HH HH HH HH HH
  21:  HH HH HH HH HH HH HH HH HH HH
    .
    .
    .
 512:  HH HH HH HH HH HH

ECC bytes (hex):
   1:  HH HH HH HH HH HH
```

Note

The ASCII representation of the hex data field is also displayed on the right-hand side of the screen.

Related Commands

READ DATA

REASSIGN BLOCK

REAS

Description

The REASSIGN BLOCK command relocates defective logical data blocks to a new location on one of the Target's spare tracks.

A specific logical block address may be reassigned more than once. Thus, a logical block can be assigned to successive physical addresses until no more spare locations remain on the media. The address for each reassigned block is added to the Target's growing defect list, which can be displayed using the DEFECT LIST command.

On Targets that support both sector and track reassignment, the user has the option of reassigning only the defective block or the entire track on which the defective block resides. Targets that support only track reassignment always reassign the entire track. The type of reassignment supported is product specific and is defined in the appropriate CE Handbook. Regardless of which type of reassignment is performed, the data in the specified defective block, or blocks, is lost.

The REASSIGN BLOCK command includes a defect list containing the address of the block to be reassigned. The defect list may contain more than one defective block, but all blocks in the list must originate from the same physical track. The Target locates the track containing the defective blocks and attempts to transfer data from that track to a new track. Data from the blocks included in the defect list is not transferred to the new track, and will be lost. Only the data from the remaining nondefective blocks is read and rewritten to the new track.

If while moving the data, the Target discovers a defective block not included in the defect list, the operation fails and returns a Check Condition status and a sense key of Medium Error. The additional sense code is set to Unrecovered Data Read Error and the Address Valid bit is set in the sense data. The Information Bytes contain the logical block address of the new defect.

When a reassignment fails in this manner, the user has two options: include the newly discovered defective block in the defect list and try the reassignment again, or reassign the entire track. Including the new block in the defect list causes the Target to attempt the reassignment again. If no additional defective blocks are discovered on the track, the reassignment completes successfully. However, if another defective block is discovered, the command fails again and re-enters the error routine described above. The reassignment will not complete successfully until all defective blocks on the track are included in the defect list.

If the user elects to reassign the entire track, all blocks on the track are added to the defect list and the reassignment performed. Because all blocks are included in the defect list, no data is copied from the original track to the new track. All data on the original track is lost. Reassigning the entire track may be desirable if the user suspects a track contains multiple defective blocks, and the loss of all data on the track is not critical.

All blocks on the track, excluding those to be reassigned, are verified following the reassignment. If the verification fails, the data will be reassigned to another physical location. If this second reassignment operation fails, the command is terminated with Check Condition status, a sense key of Medium Error, and an additional sense code of Spare Operation Failed. In this case, the media configuration remains as it was prior to the command. This indicates that the spare track on which the original verify failed is defective. Multiple failures of this command probably indicate a hardware failure.

If the Target has insufficient spare media to reassign a defective block, the REASSIGN BLOCK command terminates with Check Condition status and Medium Error sense key. The additional sense code is set to No Defect Spare Location Available. The address of the first logical block not reassigned is returned in the Information Bytes of the sense data.

In general, media defects occur on one media surface, but they may affect several adjoining physical blocks on one or more cylinders. They tend to occur repeatedly at the same logical block addresses. Groups of logical blocks may be affected by the same defect, but overall, defective logical blocks should be randomly distributed across the media.

It is possible that hardware degradation or failure could result in Data Error log entries. This situation can be recognized by observing the rate at which data errors occur, and watching correlation in the positions of the errors generated. Hardware degradation is suspected if the rate of data error

generation increases dramatically over a short period. If errors at particular logical block addresses are not repeatable, or if errors occur continuously over all media, drive electronics are suspect. If errors are correlated with the head address, the Head Disk Assembly (HDA) is suspect.

Note

After the REASSIGN BLOCK command has been executed, you should always check the defect list with the DEFECT LIST command. The track that was reassigned should appear in the Growing Defect list.

Examples

Note

If physical block size is not equal to logical block size, the following message is displayed:

```
The block size does not equal the physical block size.
Therefore all data on the track will be lost.
```

- The following example shows how to reassign an entire track on a Target that supports track reassignment only (HP 7957S, 7958S, and 7959S). Three-vector addressing is used to identify the defective block.

```
SCSIDISK> REASSIGN BLOCK

This drive supports track reassignment only.

Data on the defective track will be lost.

Do you wish to continue (Y/N) [N]? Y
```

```
Do you want Block or Vector addressing (B/V)[V]? V

Do you wish to:
   A) Add a block to the defect list.
   B) Add all blocks on a track to the defect list.
   C) Exit.
```

If choice A is entered, only one block of data will be lost. If choice B is entered, all the data on the track will be lost. In either case, the entire track will be reassigned.

```
Enter choice [C] : B

Enter the address of the defective track.

Cylinder address (0 - n)[n]? n

Head address (0 - n)[n]? n

Sector address (0 - n)[n]? n

Reassignment was successful.

Wish to reassign another block (Y/N) [N]? N
```

- The following example shows how to reassign two blocks on a Target that supports block and track reassignment (HP C2212A and C2213A). The Target attempts to reassign a block, but fails because another defective block is discovered on the same track. The Initiator displays the extended sense data, including the address of the newly discovered defective block. The user then adds the new defective block to the defect list and reassigns the new block. Since no new additional defective blocks are found, the REASSIGN BLOCK command completes successfully.

```
SCSIDISK> REASSIGN BLOCK

Data on the defective block will be lost.

Do you wish to continue (Y/N) [N]? Y
```

REASSIGN BLOCK

```
Do you want Block or Vector addressing (B/V)[V]? V

Do you wish to:
A) Add a block to the defect list.
B) Add all blocks on a track to the defect list.
C) Exit.

Enter choice [C] : A

Enter the address of the defective block.

Cylinder address (0 - n)[n]? n

Head address (0 - n)[n]? n

Sector address (0 - n)[n]? n

Command Failed.

Sense bytes (hex):

  Bytes 0 to 2:  HH HH HH
  Information:   HH HH HH HH
  Bytes 7 to 17: HH HH HH HH
                 HH HH HH HH
                 HH HH HH
  Derrors:       HH HH HH HH

Sense Key  = Medium Error
Sense Code = Unrecovered Data Read Error

Error Address:
  Cyl = n  Head = n  Sector = n

The reassign was not successful.
You can attempt further sparing.

Data on the defective block will be lost.
```

```
Do you wish to continue (Y/N) [N]? Y

Do you wish to:
   A) Add another block to the defect list.
   B) Add all blocks on a track to the defect list.
   C) Exit.

Enter choice [C] : A
```

The prompt sequence for the address of the new defective block is repeated.

```
Reassignment was successful.

Wish to reassign another block (Y/N) [N]? N
```

- The following example shows how to reassign a block, then reassign the entire track where the block resides on a Target that supports block and track reassignment (HP C2212A and C2213A). The Target attempts to reassign a defective block, but fails because another defective block is discovered on the same track. The Initiator displays the extended sense data, including the address of the newly discovered defective block. The user then adds all the blocks on the track to the defect list, thus causing the entire track to be reassigned. This option destroys *all* data on the reassigned track.

```
SCSIDISK> REASSIGN BLOCK

Data on the defective block will be lost.

Do you wish to continue (Y/N) [N]? Y

Do you want Block or Vector addressing (B/V)[V]? V

Do you wish to:
   A) Add a block to the defect list.
   B) Add all blocks on a track to the defect list.
   C) Exit.

Enter choice [C] : A

Enter the address of the defective block.
```

```
Cylinder address (0 - n)[n]? n

Head address (0 - n)[n]? n

Sector address (0 - n)[n]? n

Command Failed.

Sense bytes (hex):

  Bytes 0 to 2:  HH HH HH
  Information:   HH HH HH HH
  Bytes 7 to 17: HH HH HH HH
                 HH HH HH HH
                 HH HH HH
  Derrors:       HH HH HH HH

Sense Key  = Medium Error
Sense Code = Unrecovered Data Read Error

Error Address:
  Cyl = n  Head = n  Sector = n

The reassign was not successful.
You can attempt further sparing.

Data on the defective block will be lost.
Do you wish to continue (Y/N) [N]? Y

Do you wish to:
   A) Add another block to the defect list.
   B) Add all blocks on a track to the defect list.
   C) Exit

Enter choice [C] : B

Enter the address of the defective track.
```

```
Cylinder address (0 - n)[n]? n

Head address (0 - n)[n]? n

Sector address (0 - n)[n]? n

If you continue, all data from this track will be lost.

Cylinder = n
Head = n

Do you wish to continue (Y/N) [N]? Y

Reassignment was successful.

Wish to reassign another block (Y/N) [N]? N
```

Related Commands

DEFECT LIST

REQUEST SENSE

REQ

Description

The REQUEST SENSE command instructs the Target to return 22 bytes of extended sense data. Refer to the appropriate CE Handbook for the REQUEST SENSE sense key codes, additional sense codes, and device error codes. This command is similar in function to the CS/80 Request Status command.

The Target accumulates sense information for each command executed. If an abnormal condition occurs during execution, the Target records the appropriate information in the sense data and returns a status of Check Condition. In response, the Initiator automatically issues a REQUEST SENSE command to retrieve the sense data, which is then displayed for evaluation by the user.

When the Target receives a REQUEST SENSE command it returns the sense data and then clears all sense information. Because the Initiator automatically issues a REQUEST SENSE command in response to Check Condition status, sense data is always cleared following a command failure. If the user executes a REQUEST SENSE command following a failed command, the Target returns a No Sense sense key indicating that the sense data has been cleared.

Although the REQUEST SENSE command will normally return no sense data, the command may be useful in certain other situations. A REQUEST SENSE command can be used to determine if a suspect Target is capable of responding to a command. Also, a failed REQUEST SENSE command may generate additional valuable status information.

If a nonfatal error occurs during execution of a REQUEST SENSE command, the Target returns the sense data with Good status. If a fatal error occurs during a REQUEST SENSE command, the returned sense data may be invalid; therefore, Check Condition status is reported.

After the sense data is returned, all conditions are cleared except for a Unit Attention sense key if power-on verification failed. In this case, the Hardware Error sense key is set by the Target for the first REQUEST SENSE command

and Unit Attention is set for the subsequent command. This is done to ensure that diagnostic failures and reset conditions are observed. The REQUEST SENSE command is executed even if the drive is reserved to another Initiator.

Examples

```
SCSIDISK> REQUEST SENSE

Sense bytes (hex):

  Bytes 0 to 2:  HH HH HH
  Information:   HH HH HH HH
  Bytes 7 to 17: HH HH HH HH
                 HH HH HH HH
                 HH HH HH
  Derrors:       HH HH HH HH

Sense Key  = xxxxxxxxx
Sense Code = xxxxxxxxx
```

RO MEDIA TEST

RO

Description

The RO (read-only) MEDIA TEST command checks the integrity of the Target's media by reading data from the media and checking the data for errors. Channel errors can also be detected during a read only media test. A RO MEDIA TEST command does not destroy any user data.

When executing the RO MEDIA TEST command, the Target reads data from the specified area of the media and detects and logs any media errors that occur. If the channel is included in the test, the Target transfers the data from the media to the Initiator which checks for channel errors. Channel errors may be caused by system cabling or the interface circuits in the Target itself.

If the channel is excluded from the test, the Target still detects and logs all data errors, but no data is transferred to the Initiator. Thus, no channel errors are checked for when testing only the Target. This feature helps isolate channel problems from drive hardware problems.

Errors detected during a read-only media test are entered in the Data Error log. The contents of the Data Error log can be retrieved using the ACCESS LOGS command. A command option allows the user to clear the Data Error log (and the rest of the maintenance log as well) before executing the media test. If the user elects to clear the log, the program executes a CLEAR LOGS command before proceeding with the read-only media test.

The user can explicitly define the portion of the media to be tested, or allow the test to be performed over a random area of the media. When performing a random area test, a read-only media test is performed on 2000 data blocks selected at random over the disc media. The random addresses are generated by the program using a starting value known as a seed. When performing multiple passes of a random read-only media test, the user can select the same seed for each pass or reset the seed to a new value. By using the same seed, the same pattern of random addresses is repeated for each pass of the read-only media test. This means that the same 2000 addresses are tested during each

pass. If the seed is reset at the beginning of each pass, an entirely new set of addresses will be tested during each pass.

The area of media tested is determined by the starting address and the test area as follows:

- **Sector** - the starting address identifies the sector to be tested.
- **Track** - the test begins at the starting address and continues until the end of the track is reached.
- **Cylinder** - the test begins at the starting address and continues to the end of the track. The next sequential head is selected and the corresponding track on that data surface is tested in its entirety. The process continues until the corresponding track on the last data surface is tested.
- **Head** - the test begins at the starting address and continues until the end of the track is reached. The Target then seeks to the next track on the same data surface and tests the entire track. This process continues until the last track on the selected data surface (head) is tested.
- **Volume** - the test begins at the starting address and continues until the end of the track is reached. The Target then proceeds to test all remaining tracks until the end of the volume is reached. The tracks are tested in cylinder mode.
- **User Defined** - the test begins at sector 0 of the specified starting track and continues to the last sector on the specified ending track. To avoid channel delays, the addresses must be entered in three-vector format and are limited to entire tracks; no individual sectors can be specified. The testing is performed in cylinder mode or surface mode as defined by the user.

A loop option allows the media test to be performed multiple times to compare results of media errors. When looping, the Target tests the media to the end of the specified area then returns to the starting address and begins the test again. The starting address should be chosen carefully to ensure that suspect areas of the media do not go untested.

Examples

- The following example shows how to perform a read-only media test on a specified data track using three-vector addressing. The channel is included in the test.

```
SCSIDISK> RO MEDIA TEST

Clear ALL logs (Y/N)[N]? N

Choose method:
  C = Media and Channel Test
  I = Isolate Target from Channel

Enter the method [C]: C

Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: S

Test area:
  S = Sector
  T = Track
  C = Cylinder
  H = Head
  V = Volume
  U = User Defined

Enter the test area [T]: T

Do you want Block or Vector addressing (B/V)[V]? V

Enter starting address:
  Cylinder (0 - n)[n]: n
  Head (0 - n)[n]: n
  Sector (0 - n)[n]: n
```

```
Enter the loop count (1 - 256)[1]: n

Read-Only Media Test, loop = n
Test area = Track starting at Cyl n, Hd n, Sect n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a read-only media test in cylinder mode on a user-defined portion of the media. The starting and ending addresses are identified by cylinder and head values only. The channel is included in the test.

```
SCSIDISK> RO MEDIA TEST

Clear ALL logs (Y/N)[N]? N

Choose method:
  C = Media and Channel Test
  I = Isolate Target from Channel

Enter the method [C]: C

Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: S
```

```
Test area:
  S = Sector
  T = Track
  C = Cylinder
  H = Head
  V = Volume
  U = User Defined

Enter the test area [T]: U

Mode of test:
  S = Surface mode
  C = Cylinder mode

Enter the test mode [C]: C

Enter starting address:
  Cylinder (0 - n)[n]: n
  Head (0 - n)[n]: n

Enter ending address:
  Cylinder (0 - n)[n]: n
  Head (0 - n)[n]: n

Enter the loop count (1 - 256)[1]: n

Read-Only Media Test, loop = n
Test area = Cylinder mode starting at Cyl n, Hd n, Sect 0
                          ending at Cyl n, Hd n, Sect n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a read-only media test on a random portion of the media. The same seed is specified, thus ensuring that the random addresses are repeatable when running multiple passes of the test. The channel is not tested in this example.

```
SCSIDISK> RO MEDIA TEST

Clear ALL logs (Y/N)[N]? N

Choose method:
  C = Media and Channel Test
  I = Isolate Target from Channel

Enter the method [I]: I

Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: R

Type of random test:
  S = Same seed for each pass
  R = Reset seed for each pass

Random test type [R]? S

Enter the loop count (1 - 256)[1]: n

Random Read-Only Media Test, loop = n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

Related Commands

ACCESS LOGS
CLEAR LOGS

SEEK

S

Description

The SEEK command instructs the Target to seek to a specified address or series of addresses. A loop parameter allows any of the seek options to be repeated a specified number of times. This command is useful for testing the servo circuitry.

The following types of seeks can be performed:

- **Single Seek** - the Target seeks to the specified address.
- **Random Seek** - the Target seeks to a random address.
- **Alternate Seek** - the Target seeks between two specified addresses.
- **Butterfly Seek** - the Target performs a series of seeks over an entire disk surface. The Target first performs a full-length seek from the minimum track to the maximum track. The Target then seeks back to the minimum track plus 1. The Target again reverses direction, seeking to the maximum track minus one. This process continues with the length of each subsequent seek being reduced by one track until the center of the disk surface is reached. The process is then reversed with each seek increasing by one track until the minimum and maximum tracks are reached. The butterfly seek can be performed on individual heads or all heads sequentially from the lowest head address to the highest.

Examples

- The following example shows how to perform a single seek.

```
SCSIDISK> SEEK

Types of seeks:
  S = Single seek
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type [S]: S

Do you want Block or Vector addressing (B/V)[V]? B

Enter block address (0 - n)[n]: n

Enter the loop count (1 - 256)[1]: n
```

- The following example shows how to perform a random seek.

```
SCSIDISK> SEEK

Types of seeks:
  S = Single seek
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type [S]: R

Enter the loop count (1 - 256)[1]: n
```

- The following example shows how to perform an alternate seek between two addresses.

```
SCSIDISK> SEEK

Types of seeks:
  S = Single seek
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type [S]: A

Enter Address #1:

Do you want Block or Vector addressing (B/V)[V]? B

Enter block address (0 - n)[n]: n

Enter Address #2:

Enter block address (0 - n)[n]: n

Enter the loop count (1 - 256)[1]: n
```

- The following example shows how to perform a butterfly seek.

```
SCSIDISK> SEEK

Types of seeks:
  S = Single seek
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type [S]: B

Enter head (0 - n, all)[0]: n

Enter the loop count (1 - 256)[1]: n

Pass n started

Butterfly seek on head n in progress.

Pass n completed
```

VERIFY

V

Description

The VERIFY command instructs the Target to perform a data verification on a section of the media. The data is verified by ECC check only; a compare is not performed. This allows many marginal data errors previously masked by **CRC** to be detected using the VERIFY command. A verification does not destroy user data.

Errors detected during a verification are entered in the Data Error log. The contents of the Data Error log can be retrieved using the ACCESS LOGS command. A command option allows the user to clear the Data Error log (and the rest of the maintenance log as well) before executing the verification. If the user elects to clear the log, the program executes a CLEAR LOGS command before proceeding with the verification.

The user can explicitly define the portion of the media to be verified, or allow the verification to be performed over a random area of the media. When performing a random area test, verification is performed on 2000 data blocks selected at random over the disc media. The random addresses are generated by the program using a starting value known as a seed. When performing multiple passes of a random verification, the user can select the same seed for each pass or reset the seed to a new value. By using the same seed, the same pattern of random addresses is repeated for each pass of the verification. This means that the same 2000 addresses are verified during each pass. If the seed is reset at the beginning of each pass, an entirely new set of addresses will be verified during each pass.

When specifying the area of media to be verified, the portion of media verified is determined by the starting address and the test area as follows:

- **Sector** - the starting address identifies the sector to be verified.
- **Track** - the verification begins at the starting address and continues until the end of the track is reached.
- **Cylinder** - the verification begins at the starting address and continues to the end of the track. The next sequential head is selected and the corresponding track on that data surface is verified in its entirety. The process continues until the corresponding track on the last data surface is verified.
- **Head** - the verification begins at the starting address and continues until the end of the track is reached. The Target then seeks to the next track on the same data surface and verifies the entire track. This process continues until the last track on the selected data surface (head) is verified.
- **Volume** - the verification begins at the starting address and continues until the end of the track is reached. The Target then proceeds to verify all remaining tracks until the end of the volume is reached. The tracks are verified in cylinder mode.
- **User Defined** - the verification begins at sector 0 of the specified starting track and continues to the last sector on the specified ending track. One track of data is verified at a time up to the ending track. The addresses must be entered in three-vector format and are limited to entire tracks; no individual sectors can be specified. The verification is performed in cylinder mode or surface mode as defined by the user.

A loop option allows the media verification to be performed multiple times to compare results. When looping, the Target verifies the media to the end of the specified area then returns to the starting address and begins the verification again. The starting address should be chosen carefully to ensure that suspect areas of the media do not go unverified.

Examples

- The following example shows how to verify the data on a specified track. Block addressing is used and the logs are not cleared.

```
SCSIDISK> VERIFY

Clear ALL logs (Y/N)[N]? N

Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: S

Test area:
  S = Sector
  T = Track
  C = Cylinder
  H = Head
  V = Volume
  U = User Defined

Enter the test area [T]: T

Do you want Block or Vector addressing (B/V)[V]? B

Enter starting block address (0 - n)[n]: n

Enter the loop count (1 - 256)[1]: n

Verify Test, loop = n
Test area = Track starting at Block n

CTRL Y can be used to break, but will reset ALL
devices on the bus.
```

```
Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a verification on a user defined section of the media. The starting and ending addresses must be identified using three-vector addressing and do not include sector values. The verification is conducted in cylinder mode.

```
SCSIDISK> VERIFY

Clear ALL logs (Y/N)[N]? N

Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: S

Test area:
  S = Sector
  T = Track
  C = Cylinder
  H = Head
  V = Volume
  U = User Defined

Enter the test area [T]: U

Mode of test:
  S = Surface mode
  C = Cylinder mode

Enter the test mode [C]: C
```

```
Enter starting address:
  Cylinder (0 - n)[n]: n
  Head (0 - n)[n]: n

Enter ending address:
  Cylinder (0 - n)[n]: n
  Head (0 - n)[n]: n

Enter the loop count (1 - 256)[1]: n

Verify Test, loop = n
Test area = Cylinder mode starting at Cyl n, Hd n, Sect 0
                          ending at Cyl n, Hd n, Sect n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a verification on a random section of the media. The same seed is specified, thus ensuring that the random addresses are repeatable when running multiple passes of the test.

```
SCSIDISK> VERIFY

Clear ALL logs (Y/N)[N]? N

Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: R
```

```
Type of random test:
  S = Same seed for each pass
  R = Reset seed for each pass

Random test type [R]? S

Enter the loop count (1 - 256)[1]: n

Random Verify Test, loop = n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

Related Commands

ACCESS LOGS
CLEAR LOGS

WTR MEDIA TEST

WTR

Caution

The WTR MEDIA TEST command will destroy user data on the area of the media that is tested. You should back up all user data before executing the WTR MEDIA TEST command.

Description

The WTR (write-then-read) MEDIA TEST command checks the integrity of the Target media and optionally the channel hardware. A selected data pattern is written to the media and then read back and checked for errors. Both media errors and channel errors can be detected during a write-then-read media test.

When performing a write-then-read media test with channel compare, the Initiator transfers a data pattern to the Target, which writes the data to the specified location. The Target then reads the data and transfers it back to the Initiator. The Target detects and logs all media errors that occur during the write and read operations. As the data is being transferred over the channel, the Initiator compares the write data patterns and the returning read data. Any compare errors that occur are detected and reported by the Initiator. Channel compare errors may be caused by system cabling or the interface circuits in the Target itself.

Media errors detected during the write-then-read media test are entered in the Data Error log. The contents of the Data Error log can be retrieved using the ACCESS LOGS command. A command option allows the user to clear the Data Error log (and the rest of the maintenance log as well) before executing the media test. If the user elects to clear the log, the program executes a CLEAR LOGS command before proceeding with the write-then-read media test.

WTR MEDIA TEST

The program offers an option to disable the compare function of the write-then-read media test. With compare disabled, media defects are still detected by the Target, but channel errors are not detected by the Initiator. This feature significantly reduces the amount of time required to perform a write-then-read media test. Disabling the compare function may be useful if the channel hardware is known to be good and the user is only interested in locating media defects as quickly as possible.

The type of data pattern used during a write-then-read media test is determined by whether a channel compare is being performed. If channel compare is disabled, the test is performed using a data block filled with a fixed data pattern. The user can define the data pattern value or allow the Target to use its own internal pattern. The internal data pattern used by the Target for the test is product specific and is listed in the appropriate CE Handbook.

When performing a channel compare, the Initiator generates a changing data pattern using a 9-bit circular shift register. The user can specify the starting pattern value or allow the Initiator to use a worst-case default pattern. The starting data pattern value is loaded into the lower 8 bits of the shift register and a parity bit is appended creating a nine-bit data pattern. The test employs odd channel parity, using the parity bit to ensure the 9-bit register contains an odd number of 1s. The Initiator then transfers the contents of the register to the Target. As each byte is transferred, the Initiator shifts the register one position to the left from LSB to MSB, then transfers the next byte. This creates an alternating pattern of nine different values with each value repeating itself every ninth byte. The operation of the data pattern shift register is shown in Table 2-3. The example shown in the figure assumes an initial user-defined value of 05h.

The user can explicitly define the portion of the media to be tested, or allow the test to be performed over a random area of the media. When executing a random area test, a write-then-read media test is performed on 2000 data blocks selected at random over the disc media. The random addresses are generated by the program using a starting value known as a seed. When performing multiple passes of a random write-then-read media test, the user can select the same seed for each pass or reset the seed to a new value. By using the same seed, the same pattern of random addresses is repeated for each pass of the write-then-read media test. This means that the same 2000 addresses are tested during each pass. If the seed is reset at the beginning of each pass, an entirely new set of addresses will be tested during each pass.

Table 2-3.
Data Pattern for WTR MEDIA TEST with Channel Compare

1*	0	0	0	0	0	1	0	1	Byte 0 = 05h**
0	0	0	0	0	1	0	1	1	Byte 1 = 0Bh
0	0	0	0	1	0	1	1	0	Byte 2 = 16h
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
1	1	0	0	0	0	0	1	0	Byte 9 = 82h
1	0	0	0	0	0	1	0	1	Byte 10 = 05h***
0	0	0	0	0	1	0	1	1	Byte 11 = 0Bh
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.

**Odd parity.*

***Value of initial data pattern.*

****Initial data pattern repeats itself every nine bytes.*

Note

When interpreting the data patterns, remember that all bits are rotated through the entire 9-bit register, but only the lower eight bits comprise the actual data transferred between the Initiator and the Target. The ninth bit is used for parity only.

WTR MEDIA TEST

The area of media tested is determined by the starting address and the test area as follows:

- **Sector** - the starting address identifies the sector to be tested.
- **Track** - the test begins at the starting address and continues until the end of the track is reached.
- **Cylinder** - the test begins at the starting address and continues to the end of the track. The next sequential head is selected and the corresponding track on that data surface is tested in its entirety. The process continues until the corresponding track on the last data surface is tested.
- **Head** - the test begins at the starting address and continues until the end of the track is reached. The Target then seeks to the next track on the same data surface and tests the entire track. This process continues until the last track on the selected data surface (head) is tested.
- **Volume** - the test begins at the starting address and continues until the end of the track is reached. The Target then proceeds to test all remaining tracks until the end of the volume is reached. The tracks are tested in cylinder mode.
- **User Defined** - the test begins at sector 0 of the specified starting track and continues to the last sector on the specified ending track. To avoid channel delays, the addresses must be entered in three-vector format and are limited to entire tracks; no individual sectors can be specified. The testing is performed in cylinder mode or surface mode as defined by the user. To save time when testing large areas of media, the user should consider using the Head or Volume test area parameters rather than the User Defined.

A loop option allows the media test to be performed multiple times to compare results of media errors. When looping, the Target tests the media to the end of the specified area then returns to the starting address and begins the test again. The starting address should be chosen carefully to ensure that suspect areas of the media do not go untested.

Examples

- The following example shows how to perform a write-then-read media test on a specified data cylinder using a user-defined data pattern. The starting address is identified using block mode addressing. A compare is performed so both the Target and channel are tested.

```
SCSIDISK> WTR MEDIA TEST

Clear ALL logs (Y/N)[N]? N

Compare options:
  N = No compare (faster)
  C = Compare

Enter compare option [N]: C

Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: S

Test areas:
  S = Sector
  T = Track
  C = Cylinder
  H = Head
  V = Volume
  U = User Defined

Enter the test area [T]: C

Do you want Block or Vector addressing (B/V)[V]? B

Input starting block address (0 - n)[n]: n
```

```
Sources of the pattern are:
  W = Worst-case pattern
  U = User selected pattern

Enter the pattern source [W]: U

Enter decimal value (0 - 255) or hex value (!00 - !FF)[1]: !HH

Enter the loop count (1 - 256)[1]: n

Write-Then-Read Media Test, loop = n
Test area = Cylinder starting at Block n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a write-then-read media test on a user defined portion of the media. The starting and ending addresses must be identified using three-vector addressing and do not include sector values. The test is conducted in cylinder mode and uses the default worst-case data pattern.

```
SCSIDISK> WTR MEDIA TEST

Clear ALL logs (Y/N)[N]? N

Compare options:
  N = No compare (faster)
  C = Compare

Enter compare option [N]: N
```

```
Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: S

Test area:
  S = Sector
  T = Track
  C = Cylinder
  H = Head
  V = Volume
  U = User Defined

Enter the test area [T]: U

Mode of test:
  S = Surface mode
  C = Cylinder mode

Enter the test mode [C]: C

Enter starting address:
  Cylinder (0 - n)[n]: n
  Head (0 - n)[n]: n

Enter ending address:
  Cylinder (0 - n)[n]: n
  Head (0 - n)[n]: n

Sources of the pattern are:
  I = Internal test pattern
  U = User selected pattern

Enter the pattern source [I]: I
```

```
Enter the loop count (1 - 256)[1]: n

Write-Then-Read Media Test, loop = n
Test area = Cylinder mode starting at Cyl n, Hd n, Sect 0
                          ending at Cyl n, Hd n, Sect n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a write-then-read media test over a random area of the media. The same seed is specified, thus ensuring that the random addresses are repeatable when running multiple passes of the test. The test disables compare and uses the Target's internal test data pattern.

```
SCSIDISK> WTR MEDIA TEST

Clear ALL logs (Y/N)[N]? N

Compare options:
  N = No compare (faster)
  C = Compare

Enter compare option [N]: N

Test type:
  S = Selected area
  R = Random area

Enter the test type [S]: R
```

```
Type of random test:
  S = Same seed for each pass
  R = Reset seed for each pass

Random test type [R]? S

Sources of the pattern are:
  I = Internal test pattern
  U = User selected pattern

Enter the pattern source [I]: I

Enter the loop count (1 - 256)[1]: n

Random Write-Then-Read Media Test, loop = n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

Related Commands

ACCESS LOGS
CLEAR LOGS

3

DDSDIAG Commands

This chapter provides information on the commands included in the DDSDIAG diagnostic program.

The DDSDIAG diagnostic program transfers data and commands between a digital audio tape (DAT) drive and an HP Portable PLUS via a SCSI/HP-IL interface. DAT drives store data on removable DAT cassettes in **DDS format**. Figure 3-1 shows one-partition and two-partition digital data storage formats for digital audio tape.

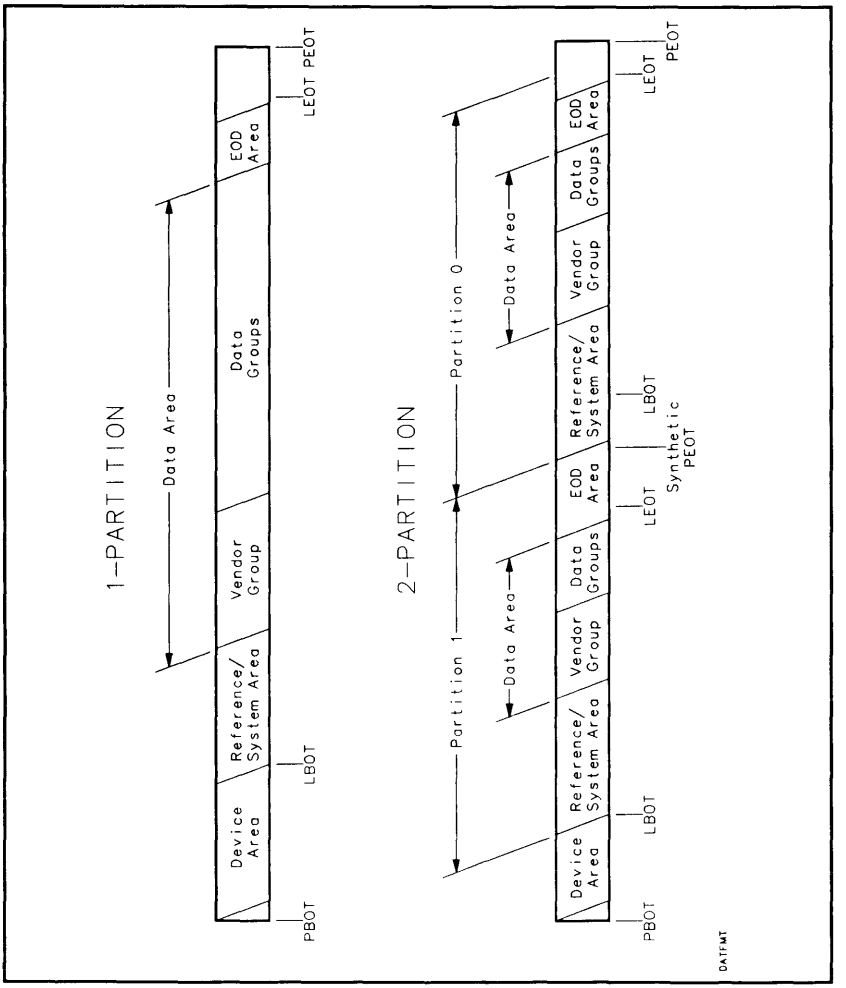

Figure 3-1. Digital Data Storage Tape Formats

3-2 DDSDIAG Commands

ACCESS LOGS

A

Description

The ACCESS LOGS command displays the Fault Log, Error Rate Log, or Tape Log.

Examples

Note **RAW** is an abbreviation for **Read-After-Write.**

```
DDSDIAG> ACCESS LOGS

  ACCESS LOGS UTILITY

    Logs available:

      0 - All logs
      1 - Fault log
      2 - Error-Rate log
      3 - Tape log

    Which log (0,1,2,3)? [0] 0

  FAULT LOG DATA
```

```
                  Error   Error
Event   Time       Set    Code
-----------------------------
  1     0:54:29    0       137
  2     0:55:14    1       151
```

Event 1 is the oldest event in the log. Time is in hours after power-on. Refer to the tables in "DAT Drive Hardware Error Codes" for the error sets and corresponding error codes.

```
  Next Page (Y/N)? [Y] Y

ERROR-RATE LOG DATA

  Number of groups written ..................  102
  Number of write soft errors ...............  0
  Total number of RAW retries ...............  0
  Number of write hard errors ...............  0

  Number of groups read .....................  309
  Number of groups corrected using C3 ECC ...  0
  Number of read soft errors ................  0
  Total read retry count ....................  0
  Number of read hard errors ................  0

  Next Page (Y/N)? [Y] Y

TAPE LOG DATA

  Current number of groups written ..........  0
  Current RAW retries .......................  0
  Current number of groups read .............  3
  Current C3 ECC retries ....................  1
```

"Current" refers to the current tape load.

```
Previous number of groups written ..... 0
Previous RAW retries ..................... 0
Previous number of groups read ........... 3
Previous C3 ECC retries .................. 0
```

"Previous" refers to the last tape load.

```
Total number of groups written ........... 10659
Total RAW retries ........................ 0
Total number of groups read .............. 72
Total C3 ECC retries ..................... 1
```

"Total" is the total since the tape was initialized, including the current load.

```
Load count ............................... 17
```

Related Commands

RO MEDIA TEST
WTR MEDIA TEST

DAT Drive Hardware Error Codes

The following tables list the hardware error codes for the DAT drive. The hardware error codes are divided into the following error code sets:

Set 0: Runtime/Operational Status Codes

Set 1: Drive Controller Diagnostic Error Codes

Set 2: Buffer Controller Error Codes

Set 3: Interface Controller Error Codes

Set C: Multi-Controller Error Codes

Note

All error codes are decimal numbers. Some numbers are used in more than one error code set.

Table 3-1.
DAT Drive Error Code Set 0: Command Reject Error Codes

Code	Description
0	No error
1	No tape is loaded
2	Drive is not online
3	Drive is not offline
4	The loaded cassette is write-protected
5	A cassette is loaded; no access to test
6	No fast searches allowed beyond EOD
7	Drive is in Diagnostic mode
8	Drive is not in Diagnostic mode
9	Drive is not streaming
10	The format is invalid for reading
11	The format is invalid for writing
12	Not at LBOT for writing Lead-In area
13	Cannot space reverse at LBOT
14	Writes not possible after a hard error
15	Ambles cannot be written at LBOT
16	Invalid command
17	Invalid parameter
18	Invalid test or configuration number
19	Test not accessible by host
20	Test aborted by a reset
21	Excessive moisture detected
22	Tried to write too many SSMs
23	The target ID is invalid
24	Requested record length too long
25	Tape position wrong for error-rate test
26	Power-on self-test running
27	(Reserved)
28	Buffer empty; record can't be retrieved
29	No partition 1 on a 1-Partition tape
30	Requested partition 1 is too small
31	Requested partition 1 is too big

Table 3-2. DAT Drive Error Code Set 0: Read Error Codes

Code	Description
48	Buffer overrun
49	>2 uncorrectable tracks
50	2 uncorrectable tracks
51	1 uncorrectable track
52	C3 ECC IC failure during read
53	Position lost during Select Partition
54	Position lost during repositioning
55	Too many errors; can't read Sub-area
56	Group count has not incremented
57	Format ID is not DDS
58	Format violation detected
59	Overwritten group read
60	Re-read group; faulty RAW rewrite
61	Encountered blank tape
62	Can't find group during search
63	Can't find the start of the group
64	Mechanism status time-out

Table 3-3. DAT Drive Error Code Set 0: Write Error Codes

Code	Description
80	Buffer underrun
81	Too many RAW rewrites; write aborted
82	Can't append; can't find last frame
83	Drive Controller found byte parity error
84	C3 ECC IC failure during write
85	(Reserved)
86	Unknown error on write
87	No EOD bit set in last byte of buffer
88	JSTL timeout at start of formatting

Table 3-4.
DAT Drive Error Code Set 0: Servo/Mechanism Error Codes

Code	Description
112	Tape Drive Module connectivity XBUSY
113	Tape Drive Module connectivity XACK
118	Illegal switch pattern
119	Moisture has been detected
120	12 V supply too high
121	12 V supply too low
122	Reel driver supply too high
123	Reel driver supply too low
128	Position sensor error
129	Unthread to stop >6 seconds
130	Stop to unthread >6 seconds
131	Stop to FWD >2 seconds
132	FWD to stop >2 seconds
136	Compartment loading time >6 seconds
137	Compartment unloading time >6 seconds
138	Compartment at mid-position at power-up
145	No T-reel frequency generation detected
146	T-reel frequency generation loopback too high
147	T-reel frequency generation loopback too low
148	No S-reel frequency generation detected
151	No T-reel nor S-reel frequency generation
153	S-reel frequency generation loopback too high
154	S-reel frequency generation loopback too low
155	S-reel FG <14 after thread
156	S-reel FG <14 after unthread
157	No S-reel free-wheel after thread
158	No S-reel free-wheel after unthread
161	Switching pulse ramp too slow
162	No drum phase lock after speed change
163	Lost drum phase lock at constant speed

Table 3-4.
DAT Drive Error Code Set 0: Servo/Mechanism Error Codes
(continued)

Code	Description
164	Drum speed >5040 rpm
165	Drum speed <300 rpm
166	Drum slowed down too fast
177	Capstan speed ramped too slow
178	Capstan speed ramped too fast
179	Capstan too fast (speed servo)
180	Capstan too slow (speed servo)
181	Capstan too fast (speed and phase servo)
182	Capstan too slow (speed and phase servo)
183	Capstan too fast (speed and ATF servo)
184	Capstan too slow (speed and ATF servo)
185	Capstan direction detected too late
186	No capstan direction change detected
189	Signal processor error
191	PEOT detected

Table 3-5. DAT Drive Error Code Set 0: Buffer Error Codes

Code	Description
192	Pop parity error
193	Push parity error
194	Byte count mismatch
195	Prior error reject
197	Zero-byte record read or requested
200	Tape position sync. mismatch
201	Format discontinuity
202	Invalid pointer found
203	Contents of access table incomplete
204	The access table was incomplete
205	Improper byte count sum
206	Incomplete block access table
207	Fatal error

Table 3-6.
DAT Drive Error Code Set 0: HP-IB Interface Error Codes

Code	Description
224	Request Device Select Jump expected
225	Data byte expected error
226	Missing End or Identify error
227	Command phase error
228	Cold load protocol error
229	HP-IB sequence protocol error
230	End complete expected error
231	End data expected error
232	Improper secondary error
233	Misplaced data byte error
234	Loopback protocol error
235	Self-test protocol error
236	HP-IB parity error
237	Reset by operator error
238	Data parity error
240	Invalid tape command
241	Self-test failure
242	Invalid utility command
243	Utility CCL command reject
245	Invalid tape command parameter

Table 3-7.
DAT Drive Error Code Set 1: HP-IB Drive Controller Diagnostic Error Codes

Code	Description
0	No error
1	ROM checksum error
2	RAM test error (destructive)
3	RAM test error (non-destructive)
4-7	(Reserved)
9	Microprocessor test error
17	C3 ECC IC register error
18	C3 ECC IC interrupt error
32	Sub-Area microprocessor connectivity error
33	Sub-Area microprocessor test error
34	Sub-Area microprocessor interrupt error
48	Static S-reel frequency generation failure
49	Static t-reel frequency generation failure
50	Static drive voltage loopback failure
51	Static rotary encoder failure
52	Static drum frequency generation failure
53	Static position sensor failure
54	Static capstan frequency generation failure
55	Static switch failure
58	Mechanism microprocessor register failure
59	Mechanism microprocessor RAM failure
60	Mechanism microprocessor ROM failure
61	Mechanism microprocessor timer failure
112	MD connectivity XBUSY
113	MD connectivity XACK
114	MD connectivity XBSY and XACK
115	MD bus or register failure
118	Illegal switch pattern
119	Moisture detected
120	12V supply too high

Table 3-7.
DAT Drive Error Code Set 1: HP-IB Drive Controller Diagnostic Error Codes (continued)

Code	Description
121	12V supply too low
122	Reel driver voltage too high
123	Reel driver voltage too low
128	Position sensor error
129	Time unthread to stop >6 seconds
130	Time from stop to unthread >6 seconds
131	Time from stop to FWD ≥2 seconds
132	Time from FWD to stop ≥2 seconds
136	Compartment loading time >6 seconds
137	Compartment unloading time >6 seconds
138	Compartment mid-position at power-up
144	No T-reel frequency generation detected
145	T-reel frequency generation loopback too high
146	T-reel frequency generation loopback too low
151	No S-reel frequency generation detected
152	No T-reel nor S-reel frequency generation
153	S-reel frequency generation loopback too high
154	S-reel frequency generation loopback too low
155	S-reel FG <14 after thread
156	S-reel FG <14 after unthread
157	No S-reel free-wheel after thread
158	No S-reel free-wheel after unthread
161	Switching pulse ramp too slow
162	No drum phase lock after speed change
163	Lost drum phase lock at constant speed
164	Drum speed >5040 rpm
165	Drum speed <300 rpm
166	Drum slowed down too fast
177	Capstan speed ramped too slow
178	Capstan speed ramped too fast

Table 3-7.
DAT Drive Error Code Set 1: HP-IB Drive Controller Diagnostic Error Codes (continued)

Code	Description
179	Capstan too fast (speed servo)
180	Capstan too slow (speed servo)
181	Capstan too fast (speed and phase servo)
182	Capstan too slow (speed and phase servo)
183	Capstan too fast (speed and ATF servo)
184	Capstan too slow (speed and ATF servo)
185	Capstan direction detected too late
186	No capstan direction change detected
189	Signal processor error
191	PEOT detected

Table 3-8.
DAT Drive Error Code Set 2: Buffer Controller Error Codes

Code	Description
1	ROM checksum error
2	RAM test error (destructive data)
3	Ram test error (non-destructive)
4	Complete RAM test error
5-8	(Reserved)
9	Microprocessor test error
51	Parity error in Push data
52	Parity error in Pop data
53	Error found in pre-fetch circuitry
54	Pop data mismatch in buffer fn. test
55	Push end-of-data status error
56	Push interrupt circuit error
57	Pop end-of-data status error
58	Pop interrupt circuit error
62	Error in the buffer dynamic RAM test

Table 3-8.
DAT Drive Error Code Set 2: Buffer Controller Error Codes
(continued)

Code	Description
70	Error in Push CER of buffer USM
71	Error in Push CUR of buffer USM
72	Error in Push CLR of buffer USM
73	Error in Push AER of buffer USM
74	Error in Push AUR of buffer USM
75	Error in Push ALR of buffer USM
76	Error in Pop CER of buffer USM
77	Error in Pop CUR of buffer USM
78	Error in Pop CLR of buffer USM
79	Error in Pop AER of buffer USM
80	Error in Pop AUR of buffer USM
81	Error in Pop ALR of buffer USM
255	Interface not responding: CER = counter extend register CUR = counter upper register CLR = counter extend register AER = address extend register AUR = address upper register ALR = address lower register

Table 3-9.
DAT Drive Error Code Set 3: Interface Controller Error Codes

Code	Description
1	ROM checksum error
2	RAM test error (destructive data)
3	RAM test error (non-destructive)
4	Complete RAM test error
5-8	(Reserved)
9	Micro-processor test error
70	HP-IB controller loopback error
71	End or Identify test error
72	Inbound FIFO jammed
110	Error in write loopback with good data
111	Error in read loopback with good data
112	Parity error in write loopback not detected
113	Parity error in read loopback not detected
114	Loopback compare error
255	Interface controller not responding

Table 3-10.
DAT Drive Error Code Set C: Multi-Controller Error Codes

Code	Description
8-13	(Reserved)
14	On-board dual-port RAM test error
15	Off-board dual-port RAM test error
102	Pop count mismatch in loopback
103	Push count mismatch in loopback
104	Parity error not detected in loopback
105	Data mismatch in loopback
106	Buffer overrun not detected
107	Buffer underrun not detected
110	Error in write loopback with good data
111	Error in read loopback with good data
112	Parity error in write loopback not detected
113	Parity error in read loopback not detected
200	Loopback timeout

CLEAR LOGS

C

Description

The CLEAR LOGS command clears the Fault Log and the Error Rate Log, which reside in controller RAM.

Note

- The Tape Log cannot be cleared.
- The Fault Log and Error-Rate log must be cleared simultaneously.

Examples

```
DDSDIAG> CLEAR LOGS

  CLEAR LOGS UTILITY

                    ** WARNING **
  THIS COMMAND WILL DESTROY SERVICE RELATED INFORMATION

    Clear Fault and Error-Rate logs (Y/N)? [N] Y

  FAULT AND ERROR-RATE LOGS CLEARED
```

Related Commands

ACCESS LOGS

DIAGNOSTICS

D

Description

The DIAGNOSTICS command executes the power-on internal self-test diagnostic sequence. If a tape is loaded in the drive, the self-test diagnostic sequence is shorter because high speed checks of the reel motors are not performed.

Note

Refer to the CE Handbook for the device being tested for device-specific error codes that correspond to self-test failures.

Examples

```
DDSDIAG> DIAGNOSTICS

  SCSI SEND DIAGNOSTIC COMMAND

    Loop Count (0 - 4) [1]: 1
```

The loop count values have the following meanings:

0 repeats the test continuously.
1 performs the test once.
2 performs the test 10 times.
3 performs the test 100 times.
4 performs the test 1000 times.

```
  Performing internal power-on diagnostics: Loop 1

  DIAGNOSTIC TESTS FAILED
```

```
Sense bytes (hex):

Bytes 0 to 2 ..... 70 00 40
Information ..... 00 00 00 00
Bytes 7 to 11 ..... 00 00 00 00 00
Sense Code & Qualifier .. 00 04
Sub-assembly ..... 00

Sense key : No Sense
Sense code: BOM/P detected
EOM condition (End/Beginning of partition)
```

Related Commands

RESET

ERASE

ER

Description

The ERASE command causes part or all of the remaining data within a **partition** to be erased, starting at the current position. The user can select one of two erase modes: mode 1 and mode 2.

Note

If you want to erase the whole tape, the REWIND command should be executed first.

If mode 1 is selected, all the data remaining in a partition is erased. Any data before the current position is retained. A Mode 1 erase can take up to 2 hours for a single-partition tape, and can be stopped using a reset command.

If mode 2 is selected, only the next 25 frames are cleared. The drive will write an **EOD** at this point if the next command involving tape motion causes the drive to change direction.

Note

- Data that is in the buffer waiting to be written to the current logical position, is written to the tape before the erase is executed.
- After the ERASE command is sent to the DAT drive, the program returns the `DDSDIAG>` prompt while the drive performs the erasure.

Examples

- The following example shows how to erase 25 frames of a digital audio tape:

```
DDSDIAG> ERASE

  SCSI ERASE DATA COMMAND

    Mode 1 .. Erase to end of tape and rewind
    Mode 2 .. Erase 25 frames

    Enter erase mode (1 or 2) [1]: 2

  Performing mode 2 data erase...

  MODE 2 ERASE COMPLETED SUCCESSFULLY
```

Related Commands

REWIND

EXIT

EX

Description

The EXIT command stops execution of the DDSDIAG program and returns the `A:\` prompt.

Examples

```
DDSDIAG> EXIT

PROGRAM TERMINATED

A:\
```

HELP

H

Description

The HELP command displays information about the DDSDIAG commands.

Examples

```
DDSDIAG> HELP

  DDSDIAG HELP SCREEN

  Access logs     - Display the drive Tape log, Error-Rate
                    log or Fault log.

  Clear logs      - Clear the Fault and the Error-Rate logs.

  Diagnostics     - Execute the drives internal diagnostics.

  ERase           - Erase part or all of the data in the
                    current partition.

  EXit            - Exit this program.

  ID              - Change the host ID or the drive ID.

  INquiry         - Display the drive and program parameters.

  Load            - Thread the tape and put the drive online.

  Mode Select     - Change the drive's media and
  MSEL              configuration parameters.

  Mode Sense      - Read the drive's media and configuration
  MSEN              parameters.
```

```
Output          - Direct the output to the console, the
                  printer or a file.

Read Data       - Read a specified amount of data from the
                  drive starting at the current position.

REQuest sense   - Read and display sense data from the
                  drive.

RESet           - Issue a bus reset to the drive.

REWind          - Rewind the tape to LBOT.

RO media test   - Perform read-only media test.

Space           - Space over a specified number of records,
                  filemarks or save-set marks, in either
                  direction or move to EOD.

Test            - Test if the drive is ready for media
                  related commands.

Unload          - Unload the tape.

Write Data      - Write a specified amount of data to the
WD                drive starting at the current position.

Write Filemark  - Write a specified number of filemarks or
WF                save-set marks starting at the current
                  position.

WTR media test  - Perform a WTR media test.
```

ID

ID

Description

The ID command changes the host (Initiator) ID or the drive (Target) ID.

Examples

```
DDSDIAG> ID

  CHANGE ID UTILITY

    Enter the initiator ID (0-7) [7]: 7

    Enter the new target ID (0-7) [0]: 0
```

Related Commands

INQUIRY

INQUIRY

IN

Description

The INQUIRY command displays information about drive parameters.

Examples

```
DDSDIAG> INQUIRY

  DRIVE PARAMETER DATA

    Sequential access device - Removable Media

    Vendor ID ........................... HP
    Product ID .......................... HP35450A

    SCSI Interface Revision level ....... A200
    Manufacturing date code ............. 0590

    Drive Controller Firmware Revision ... 157
    Buffer Controller Firmware Revision .. 3
    SCSI Controller Firmware Revision .... 2

    Maximum Record length ............... 1677215
    Minimum Record Length ............... 1
    Current Record Size ................. 0

    Current Host ID ..................... 7
    Current Drive ID .................... 0

  DRIVE PARAMETER DATA RETRIEVAL SUCCESSFUL
```

Related Commands

ID
MODE SENSE
VENDOR GROUP

LOAD

L

Description

The LOAD command loads and threads the tape, positions it at **LBOT**, and places the drive online.

Note

The load sequence lasts about 25 seconds. During the load sequence, the read/write circuitry in the drive and the tape are tested.

Examples

```
DDSDIAG> LOAD

  SCSI LOAD TAPE COMMAND

    Tape loading ...

  TAPE LOADED SUCCESSFULLY
```

Related Commands

LOAD

MODE SELECT

MSEL

Description

The MODE SELECT command enables the operator to select the following tape and drive configuration parameters:

- Drive Data Transfer
- DDS Format
- Tape Partitioning

The following Drive Data Transfer parameters can be selected:

- **Buffered mode**
- **Record** length

The following DDS Format parameters can be selected:

- **N-Group writing** value
- Report **save-set marks**
- Active partition

Note

To alter the DDS Format parameters or to partition a tape, the tape must be at LBOT. If the tape is not at LBOT, you must issue a REWIND command before the Mode SELECT command can be executed.

The following Tape Partitioning parameters can be selected:

- One-partition formatting
- Two-partition formatting

Caution 

One-partition and two-partition tape formatting will destroy all user data on the tape.You should back up all user data before formatting the tape.

Examples

- The following example shows how to select Drive Data Transfer parameters:

```
DDSDIAG> MODE SELECT

  SCSI MODE SELECT COMMAND

    Mode Select Parameters:

      0 - Drive Data Transfer
      1 - DDS Format
      2 - Tape Partitioning

                  ** NOTE **
    For Parameters 1 and 2, the tape must be rewound.

    Which parameters (0,1,2)? [0] 0

  DRIVE DATA TRANSFER PARAMETERS

    Buffered Mode required (Y/N)? [Y] Y
```

Buffered mode provides immediate response on write commands. It is the default setting, and is recommended for normal use.

```
    Record length (bytes) (0 - 16777215) [4096]: 2048
```

8192 is the maximum number of bytes the Portable PLUS buffer can hold during a Read operation.

If you set a record equal to 0, you cannot use variable mode with the WRITE DATA command.

```
DRIVE DATA TRANSFER PARAMETER CONFIGURATION SUCCESSFUL
```

- The following example shows how to select DDS Format parameters:

```
DDSDIAG> MODE SELECT

  SCSI MODE SELECT COMMAND

    Mode Select Parameters:

      0 - Drive Data Transfer
      1 - DDS Format
      2 - Tape Partitioning

                ** NOTE **
    For Parameters 1 and 2, the tape must be rewound.

    Which parameters (0,1,2)? [0] 1

  DDS FORMAT PARAMETERS

    Enter N-Group Writing value (0 - 7) [0]: 2
```

N-Group Writing causes the drive to write N copies of every data **group** *to tape as an optional error-avoidance technique.*

```
    Report Save-Set Marks (Y/N)? [Y] N
```

If you specify "No" for reporting save-set marks, the drive ignores both filemarks and save-set marks.

```
    Which partition do you want active (0,1)? [0] 1

  DDS FORMAT PARAMETER CONFIGURATION SUCCESSFUL
```

- The following example shows how to select Tape Partitioning parameters:

Note

A large single or 2-partition formatting operation, such as the one in the following example, will last up to 2 hours.

```
DDSDIAG> MODE SELECT

  SCSI MODE SELECT COMMAND

    Mode Select Parameters:

      0 - Drive Data Transfer
      1 - DDS Format
      2 - Tape Partitioning

                  ** NOTE **
    For Parameters 1 and 2, the tape must be rewound.

    Which parameters (0,1,2)? [0] 2

  TAPE PARTITIONING PARAMETERS

    Do you want to format a 2-partition tape (Y/N)? [Y] Y

                  ** WARNING **
       FORMATTING A TAPE WITH 2-PARTITIONS WILL
      DESTROY DATA CURRENTLY WRITTEN ON THE TAPE

    Do you want to continue (Y/N)? [N] Y

    Enter the size of the second partition
    (1 - 860 Mbytes) [100]: 860
```

A large second partition will take up to two hours to format.

```
Tape partitioning in progress ...

TAPE PARTITION PARAMETER CONFIGURATION SUCCESSFUL
```

Related Commands

MODE SENSE

MODE SENSE

MSEN

Description

The MODE SENSE command reads and displays the tape and drive configuration parameters.

Examples

```
DDSDIAG> MODE SENSE

  SCSI MODE SENSE COMMAND

    * Indicates a parameter that you can configure through
      MODE SELECT

    Hewlett-Packard / Sony DDS-Format

    Drive Data Transfer Parameters
    * Buffered Mode ............................ Enabled
      Partially full buffer write to tape delay .. 5 secs
    * Current record length (Bytes) ............. 4096

    DDS Format Parameters
      Read-After-Write (RAW) ..................... Enabled
      C3 ECC Error Correction .................... Enabled
    * N-Group Writing value ...................... 1
    * Save-Set Mark reporting .................... Enabled
    * Current Active Tape Partition .............. 1

    Tape Partitioning Parameters
    * Number of Partitions ....................... 2

  MODE SENSE COMMAND COMPLETE
```

Related Commands

MODE SELECT

OUTPUT

O

Description

The OUTPUT command directs output to the Portable PLUS console, a printer, or a file.

Examples

```
DDSDIAG> OUTPUT

  OUTPUT UTILITY

    Enter output file name, printer (PRN), or console (CON)
    [CON]: PRN

  OUTPUT DIRECTED TO PRINTER
```

READ DATA

RD

Description

The READ DATA command reads a specified number of data bytes from the tape, starting at the current position. The user can select either fixed record mode, or variable record mode.

If Fixed Record mode is selected, the following message is displayed:

```
ENSURE RECORD SIZE HAS BEEN CONFIGURED
    THROUGH THE MODE SELECT COMMAND.
```

In order for the drive to operate in fixed record mode, you must have set a record size greater than zero. Otherwise, the command will produce an error. If you want to change or set a record size, terminate the READ DATA command by typing `Q`, and then use the MODE SELECT command to set the record size you require. If save-set mark reporting is enabled when the drive reads a **filemark**, a Check Condition status will be returned, and the Mark and Valid bits will be set within the sense data. Upon termination, the media will be logically positioned after the filemark (**PEOT** side).

Note

The READ DATA command with default data length set takes about 10 seconds to complete execution.

Examples

```
DDSDIAG> READ DATA

  SCSI READ DATA COMMAND

    Fixed or Variable Record mode (F/V)? [V] V
```

If the data was written in Fixed Record mode, you must specify Fixed Record mode for the READ DATA command. If the data was written in Variable Record mode, you may specify either Fixed or Variable Record mode.

```
    Enter amount of data to be read (0 - 8192 bytes) [8192]: 1024

  Reading Data ...

    Do you wish to see the data (Y/N)? [Y] Y

     Byte:      Read Data (hex)
     -----------------------------------
        1: HH HH HH HH HH HH HH HH HH HH
       11: HH HH HH HH HH HH HH HH HH HH
       21: HH HH HH HH HH HH HH HH HH HH
         .
         .
         .
     1021: HH HH HH HH

    Next page (Y/N)? [Y] Y

  SCSI READ DATA COMMAND SUCCESSFUL
```

Related Commands

READ DATA
RO MEDIA TEST

REQUEST SENSE

REQ

Description

The REQUEST SENSE command instructs the Target to return 14 bytes of extended sense data after a failure or Check Condition status. Refer to the appropriate CE Handbook for the REQUEST SENSE sense key codes, additional sense codes, additional sense code qualifiers, and field replaceable unit codes.

Note

If the REQUEST SENSE command is executed after the drive has been power-cycled, one of the following messages will be displayed:

```
WARNING: Tape present but not loaded.
Please issue tape load command.

WARNING: Tape not present. Please insert
tape and issue load command.
```

Note

The drive does not automatically load a tape after a power cycle, so you must issue a LOAD command before the tape can be accessed. The same applies if you insert a tape immediately after a power-cycle.

Examples

```
DDSDIAG> REQUEST SENSE

  SCSI REQUEST SENSE COMMAND

    Sense bytes (hex):

    Bytes 0 to 2 ..... 70 00 40
    Information ..... 00 00 00 00
    Bytes 7 to 11 ..... 0B 00 00 00 00
    Sense code & qualifier .. 00 04
    Sub-assembly ..... 00

    Sense key : No Sense
    Sense code: BOM/P detected
    EOM condition (End/Beginning of partition)
```

RESET

RES

Description

The RESET command issues a bus reset to the drive. The drive performs a power-on self-test when the reset occurs.

Caution

The RESET command resets all peripherals on the SCSI bus, not just the tape drive.

Caution

The RESET command performs destructive RAM tests during the power-on self-test. Destructive RAM Tests will destroy the Fault log and Error-Rate log. During a normal power-on self-test, non-destructive RAM tests are performed. For a complete list of the power-on self-test sequence, refer to the CE Handbook for the product you are testing.

Examples

```
DDSDIAG> RESET

  SCSI BUS RESET COMMAND

    Are you sure that you want to reset the bus (Y/N)? [N]Y

  A SCSI BUS RESET HAS BEEN ISSUED
```

Related Commands

DIAGNOSTICS

REWIND

REW

Description

The REWIND command rewinds the tape to LBOT of the current partition.

Note

- Before rewinding the tape, the drive writes any buffered data to the tape and appends an EOD marker to the data.
- If you want to change partitions, use the MODE SELECT command.

Examples

```
DDSDIAG> REWIND

  SCSI REWIND COMMAND

    Rewinding tape ...

  REWIND COMPLETED SUCCESSFULLY
```

Related Commands

ERASE

RO MEDIA TEST

RO

Description

The RO MEDIA TEST command performs a read-only media test starting from the beginning of the tape or from EOD. Information about errors which occurred during a read-only media test are stored in the Error Rate Log. The Error Rate Log should be reset before performing a media test so that any errors that occur during the test are unique to that test only. If you want to read the Error Rate Log, use the ACCESS LOGS command after the test has finished.

Note

A RO MEDIA TEST command takes 12 seconds to complete execution.

Examples

- The following example shows how to perform a single read-only media test on 20 groups, starting at LBOT.

```
DDSDIAG> RO MEDIA TEST

  READ-ONLY MEDIA TEST UTILITY

    Do you want to reset the Error-Rate log (Y/N)? [N] Y

    Starting positions:

      0 - from EOD
      1 - from LBOT
```

```
Where do you want to start reading from (0,1)? [0]  1

How many groups do you want to read (0 - 10435)? [100]  20
```

A group count of 0 will read to EOD or PEOT.

```
Loop count (0 - 4) [1]: 1
```

The loop count values have the following meanings:

0 repeats the test continuously.
1 performs the test once.
2 performs the test 10 times.
3 performs the test 100 times.
4 performs the test 1000 times.

```
Performing Read-only media test ...

READ-ONLY MEDIA TEST COMPLETED
```

Related Commands

ACCESS LOGS
CLEAR LOGS
WTR MEDIA TEST

SPACE

S

Description

The SPACE command moves ("spaces") the tape a specified number of records, filemarks, or save-set marks in either direction, or moves to EOD. **Sequential filemarks** are filemarks with no intervening save-set marks. Sequential save-set marks are those with no intervening filemarks.

Note

- After the tape has been spaced to EOD, subsequent write commands will write data starting at EOD. In order to avoid writing over user data which has been written before EOD, you should space to EOD, then issue a WRITE DATA command.
- If Report Save-Set Marks is enabled with the MODE SELECT command, Sense data will appear on the screen for every tape mark that is detected. To move past them, you must use the REQUEST SENSE command to clear the Sense data for each mark.
- If Report Save-Set Marks has been disabled, the SPACE command will not detect tape marks, and the command will fail with a Blank Check status.

Examples

```
DDSDIAG> SPACE

  SCSI SPACE COMMAND

    Spacing options:

      0 - Space over Records
      1 - Space over Filemarks
      2 - Space over Sequential Filemarks
      3 - Space to EOD
      4 - Space over Setmarks
      5 - Space over Sequential Setmarks

    Select spacing option (0,1,2,3,4,5) [3]: 1

    Directions:

      0 - towards BOT
      1 - towards EOT

    Which direction (0,1)? [1] 1

    Space over how many Filemarks (0 - 32767)? [0] 20

  Spacing over 20 Filemarks

  SPACING COMMAND COMPLETED SUCCESSFULLY
```

Related Commands

MODE SELECT

TEST UNIT READY

T

Description

The TEST UNIT READY command checks the drive to ensure that it is ready for a media-related command. The drive is *not* ready if the following conditions exist:

- The tape is being loaded.
- The tape is being unloaded.
- The tape is unloaded but not ejected.
- The tape is unloaded and ejected.
- The tape is loaded but not threaded.

If any of these conditions exist, the appropriate sense key and Additional Sense Code are displayed and decoded. If the TEST UNIT READY command is executed after the drive has been power-cycled, one of the following messages is displayed:

```
WARNING: Tape present but not loaded.
Please issue tape load command.

WARNING: Tape not present. Please insert
tape and issue load command.
```

Note

The drive does not automatically load a tape after a power cycle, so you must issue a LOAD command before the tape can be accessed. The same applies if you insert a tape immediately after a power-cycle.

Examples

```
DDSDIAG> TEST UNIT READY

  SCSI TEST UNIT READY COMMAND

  THE DEVICE IS READY
```

Related Commands

LOAD
UNLOAD

UNLOAD

U

Description

The UNLOAD command rewinds the tape to LBOT. The tape will then usually be ejected. However, if the host has previously sent a SCSI PREVENT MEDIA REMOVAL command, the tape will remain locked in the drive.

After receiving the UNLOAD command, the drive performs the following sequence:

1. Writes data in the buffer to the tape and appends EOD.
2. Rewinds the tape to LBOT.
3. If the tape is write-enabled, the updated Tape Log is written back to tape from the drive controller RAM.
4. Rewinds the tape to PBOT and unthreads the tape.
5. Ejects the cassette unless a PREVENT MEDIA REMOVAL command was previously sent by the host computer. In this case, the cassette is retained in the drive and a LOAD command must be issued before the drive can accept commands which access the tape.

Examples

```
DDSDIAG> UNLOAD

  SCSI UNLOAD TAPE COMMAND

    Eject tape cassette (Y/N)? [Y] Y

  Unloading tape...

  TAPE UNLOADED AND EJECTED SUCCESSFULLY
```

Related Commands

LOAD

VENDOR GROUP

V

Description

The VENDOR GROUP command displays the **Vendor Group** of the current tape.

Note

The format for the date and time displayed by the VENDOR GROUP command is as follows:

hours:minutes:seconds
day/month/year

Examples

```
DDSDIAG> VENDOR GROUP

  READ VENDOR GROUP COMMAND

  Reading vendor group ...

    Vendor Group Information:

    Serial Number of initializing DDS-Format drive .... 1234A56789
    Date and time the tape was first written to ....... 20/12/90
                                                        10:35:59
    Tape label/identifier (contents of partition) ..... HP35450A
```

The format of this information depends on the customer's system.

```
    READ VENDOR GROUP COMMAND SUCCESSFUL
```

Related Commands

INQUIRY

WRITE DATA

WD

Caution

The WRITE DATA command will destroy user data on the area of the tape where the data is written. You should back up all user data before executing the WRITE DATA command.

Description

The WRITE DATA command writes a specified number of data records on the tape, starting at the current position.

Examples

- The following example shows how to write 10 variable-length records of data, using a worst case test pattern:

```
DDSDIAG> WRITE DATA

  SCSI WRITE DATA COMMAND

                  ** WARNING **
        THIS COMMAND WILL DESTROY DATA CURRENTLY
                 WRITTEN ON THE TAPE

     Do you wish to proceed (Y/N)? [N] Y

     Fixed or Variable Record mode (F/V)? [V] V

        ENSURE RECORD SIZE HAS BEEN CONFIGURED
           THROUGH THE MODE SELECT COMMAND
```

```
Enter the number of records to write
(0 - 32767) [8192]: 10

Test patterns:

  0 - all zeros
  1 - all ones
  2 - alternating ones and zeros
  3 - rotating data bytes (0,1,2,...,255)
  4 - pseudo-random data
  5 - worst case (C6H)
  6 - user defined

Enter test pattern (0,1,2,3,4,5,6) [4]: 3

Writing data ...

SCSI WRITE DATA COMMAND SUCCESSFUL
```

- The following example shows how to write 10 fixed-length records of data, using a user-defined test pattern:

```
DDSDIAG> WRITE DATA

SCSI WRITE DATA COMMAND

                ** WARNING **
      THIS COMMAND WILL DESTROY DATA CURRENTLY
              WRITTEN ON THE TAPE

Do you wish to proceed (Y/N)? [N] Y

Fixed or Variable Record mode (F/V)? [V] F

   ENSURE RECORD SIZE HAS BEEN CONFIGURED
      THROUGH THE MODE SELECT COMMAND

Enter the number of records to write
(0 - 32767) [8192]: 8192
```

```
Test patterns:

  0 - all zeros
  1 - all ones
  2 - alternating ones and zeros
  3 - rotating data bytes (0,1,2,...,255)
  4 - pseudo-random data
  5 - worst case (C6H)
  6 - user defined

Enter test pattern (0,1,2,3,4,5,6) [4]: 6

Enter 8 bytes for the data pattern (hex).
HEX values are to be preceded with !
```

To enter hex characters, precede the data byte with an exclamation point (!), otherwise numbers will be treated as decimal, and letters will cause an 'invalid data' error.

```
!00 !0A !0B !0C !0D !0E !0F !00

Writing data ...

SCSI WRITE DATA COMMAND SUCCESSFUL
```

Related Commands

READ DATA
WTR MEDIA TEST

WRITE FILEMARKS

WF

Description

The WRITE FILEMARKS command writes a specified number of filemarks or save-set marks, starting at the current position on the tape.

Examples

```
DDSDIAG> WRITE FILEMARKS

  SCSI WRITE FILEMARKS COMMAND

    What do you want to write:

      0 - Filemarks
      1 - Save-Set Marks

    Which mark (0,1)? [0] 1

    How many Save-Set Marks do you want to write
    (0 - 65536)? [10] 5

  Writing Save-Set Marks ...

  SCSI WRITE FILEMARKS COMMAND SUCCESSFUL
```

WTR MEDIA TEST

WTR

Caution

The WTR MEDIA TEST command will destroy user data on the area of the tape that is tested. You should back up all user data before executing the WTR MEDIA TEST command.

Description

The WTR (write-then-read) MEDIA TEST command performs a write-then-read media test starting from the beginning of the tape or from EOD. Information about errors which occurred during a write-then-read media test are stored in the Error Rate Log. The Error Rate Log should be reset before performing a media test so that any errors that occur during the test are unique to that test only. If you want to read the Error Rate Log, use the ACCESS LOGS command after the test has finished.

Note

- One loop of a write-then-read media test with default parameters takes about 4.5 minutes to complete execution.
- A full volume write-then-read media test takes about 4 hours to complete execution.

Examples

- The following example shows how to perform 10 loops of a write-then-read media test, starting at LBOT and writing 20 groups with a worst case test pattern:

```
DDSDIAG> WTR MEDIA TEST

  WRITE-THEN-READ MEDIA TEST UTILITY

              ** WARNING **
        THIS COMMAND WILL DESTROY DATA
        CURRENTLY WRITTEN ON THE TAPE

    Do you wish to proceed (Y/N)? [N] Y

    Do you want to reset the Error-Rate log (Y/N)? [N]  Y

    Starting positions:

      0 - From EOD
      1 - From LBOT

    Where do you want to start from (0,1)? [0] 1
```

Start at EOD if you wish to preserve any data on the tape.

```
    How many groups do you want to write (0 - 10435)? [100]  20
```

A group count of 0 will write to PEOT.

```
     Test patterns:

       0 - all zeros
       1 - all ones
       2 - alternating ones and zeros
       3 - rotating data bytes (0,1,2,...,255)
       4 - pseudo-random data
       5 - worst case (C6H)
```

```
Enter test pattern (0,1,2,3,4,5) [4]: 5

Loop count (0 - 4) [1]: 1
```

The loop count values have the following meanings:
0 repeats the test continuously.
1 performs the test once.
2 performs the test 10 times.
3 performs the test 100 times.
4 performs the test 1000 times.

```
Performing Write-Then-Read media test ...

WRITE-THEN-READ MEDIA TEST COMPLETED
```

Related Commands

ACCESS LOGS
CLEAR LOGS
RO MEDIA TEST

4

SCSIMO Commands

This chapter provides information on the commands included in the SCSIMO diagnostic program.

The SCSIMO diagnostic program transfers data and commands between a rewritable optical disk drive and an HP Portable PLUS via a HP-IL/SCSI interface. Rewritable optical disk drives store data on removable magneto-optical disk media.

CAPACITY

CA

Description

The CAPACITY command allows the Initiator to determine the maximum capacity of the Target. The Target returns the block address of its last addressable logical block. The current block size and the drive capacity are also displayed.

Although the physical capacity of the Target remains fixed, the address of the last data block is determined by block size. The larger the block size, the lower the address of the last addressable logical block.

Examples

```
SCSIMO> CAPACITY

Maximum Block Address = n

Block Length = n

Drive Capacity = n bytes
```

Related Commands

INQUIRY

DEFECT LIST

DEF

Description

The DEFECT LIST command displays the Target's primary defect list or secondary defect list. The DEFECT LIST command is similar to the CS/80 Spare Table command.

Note

The secondary defect list is only available on media that has been certified by the initiator with Format Mode 3.

The primary defect list contains the addresses of the permanent media defects that were identified in the factory during the manufacturing process.

The secondary defect list contains the addresses of media defects that are identified after the rewritable optical disk drive is installed at a customer site. This includes media defects that are identified by the Initiator during formatting and media defects that are specified in REASSIGN BLOCK commands.

An option allows the user to store the selected list to a file. The default file name for the primary defect list is PLIST.SAV. The default file name for the secondary defect list is SLIST.SAV.

Examples

- This example shows how to display the primary and the secondary defect lists.

```
SCSIMO> DEFECT LIST

Defect types:

  A - (all) primary defect list and secondary defect list
  P - primary defect list

Which list (P/A) [A]? A

Store lists to files (Y/N)[N]? N

Primary and Secondary Defect List:

Track Number   Sector Number
============   =============
     n               n
```

- This example shows how to display the primary defect list.

```
SCSIMO> DEFECT LIST

Defect types:

  A - (All) primary and secondary defect lists
  P - primary defect list

Which list (P/A) [A]? P

Store lists to files (Y/N)[N]? N
```

```
Primary Defect List:

Track Number    Sector Number
============    ==============
     n               n
```

DIAGNOSTIC

DI

Description

The DIAGNOSTIC command invokes the Target's power-on self-test diagnostic sequence. A loop option allows the diagnostic to be repeated a specified number of times.

Note

Refer to the CE Handbook for the device being tested for device-specific error codes that correspond to self-test failures.

Examples

```
SCSIMO> DIAGNOSTIC

Enter the loop count (1 - 256)[1]? n

Send Diagnostic  Pass = n
```

EXIT

E

Description

The EXIT command stops execution of the SCSIMO program and returns the A:\ prompt.

Examples

```
SCSIMO> EXIT

End of Program.

A:\
```

FORMAT UNIT

F

Caution

The FORMAT UNIT command will destroy user data on the disk. You should back up all user data before executing the FORMAT UNIT command.

Description

The FORMAT UNIT command formats the Target media so that all data blocks can be accessed. When formatting the entire media, all user data is lost.

Note

The FORMAT UNIT command will format the media with the current format mode displayed by the MODE SENSE command.

A successfully executed FORMAT UNIT command installs the current MODE SELECT operating parameters as the Target's saved values. Therefore, before executing a FORMAT UNIT command on the entire media, the current values of the Target's changeable parameters should be checked to ensure they are set to the desired values.

Prior to formatting all media surfaces, the user must define what defect information to retain. If all spares are kept, the primary defect list and the secondary defect list are both saved. If only primary spares are retained, the primary defect list is kept but the secondary defect list is deleted.

Examples

- This example shows how to format the media and retain all spares.

```
SCSIMO> FORMAT UNIT

*******************************************************
*  FORMAT UNIT WILL CERTIFY THE ENTIRE MEDIUM.        *
*  Defective blocks encountered will be reassigned.   *
*******************************************************

Do you want to:

  A = retain All current reassigned blocks
  P = retain only Primary reassigned blocks
  E = Exit

Option (A/P)[E]? A

Formatting in progress ... (hh:mm:ss)

Formatting completed.      (hh:mm:ss)
```

Note

If the formatting has not completed in a certain amount of time, the FORMAT UNIT command will time-out and terminate.

HELP

H

Description

The HELP command displays a list of all the commands supported by the SCSIMO program, along with a brief description of each command. The list of commands is displayed one screen at a time. Press the space bar to display each successive screen.

To enter a command, type the full command name shown in the left-hand column or type the abbreviated form of the command shown as upper-case letters within the full command.

Examples

```
SCSIMO> HELP

CApacity          - Determine capacity of Target.

DEFect list       - Display either the growing or the
                    primary defect list.

DIagnostic        - The Target will execute its internal
                    diagnostics.

Exit              - Exit the program.

Format unit       - Format the media.

Help              - Display this help file.

ID                - Change SCSI Initiator ID or Target ID.

INquiry           - Display Target and program parameters.
```

Loopback	- Perform a write and read loopback to buffer.
Mode sense	- Display internal device parameters.
Output	- Directs the output to the console, printer, or file.
Read Data	- Display the contents of a selected block.
REASsign block	- Reassign a defective block.
REQuest sense	- Read Sense data from Target, format and display the results.
RO media test	- Perform Read-Only Media Test.
Seek	- Issue the SCSI Seek command. You can select random, alternate, or butterfly seeks.
Verify	- Selected or random area of Target is verified by ECC check only.
WTR media test	- Perform Write-Then-Read Media Test.

ID

ID

Description

The ID command is used to change the SCSI ID of the Initiator or the SCSI ID of the Target. The Initiator is the HP Portable PLUS and the Target is the rewritable optical disk drive being tested.

The SCSI ID of the Target (Target ID) must match the SCSI address of the rewritable optical disk drive being tested. The SCSI address of the rewritable optical disk drive is either set at the factory, or is set by the operator when the rewritable optical disk drive is installed into the mass storage system. (Refer to the appropriate CE Handbook for information on setting the rewritable optical disk drive SCSI address switches.) The default Target ID value is zero.

The SCSI ID of the Initiator (Initiator ID) must match the SCSI address of the Portable PLUS. The default Initiator ID value is seven.

Examples

```
SCSIMO> ID

Enter Initiator ID (0-7)[7]? n

Enter SCSI Target ID (0-7)[0]? n
```

Related Commands

INQUIRY

INQUIRY

IN

Description

The INQUIRY command instructs the Target to return its parameter information. This information is then displayed, along with the settings of various program variables.

The INQUIRY command returns Check Condition status if the Target cannot return the requested data. Inquiry data will be returned even though the Target may not be ready for other commands. The INQUIRY command is executed with no error reported even if the Target is reserved by, or to, a different Initiator.

If an INQUIRY command is received from an Initiator with a pending Unit Attention condition (before the Target reports Check Condition status), the Target executes the INQUIRY command but does not clear the Unit Attention sense key. This is also true for a pending Hardware Error sense key.

The following example includes a general description of the information returned by the INQUIRY command. The actual values returned by the Target are product specific and are defined in the appropriate CE Handbook.

The first block of information displayed contains information describing the Target. The Direct Access Device field indicates whether the Target uses fixed or removable media. The Vendor ID, Product ID, Firmware Revision, and Drive Version fields are all product specific. The HP-IL/SCSI Revision field indicates the revision of firmware installed in the HP-IL/SCSI interface module.

The second block of information displays the current setting of various program parameters. The program parameters include SCSI Initiator ID, SCSI Target ID, and selected output device.

The final block of information describes Target addressing and capacity parameters.

Examples

```
SCSIMO> INQUIRY

Inquiry Values:

  Direct Access Device  - Removable Media
  Vendor ID             = xx
  Product ID            = 650/A
  Firmware Revision     = xxxx
  Drive Version Byte 1  = xxxx
  Drive Version Byte 2  = xxxx
  Drive Version Byte 3  = xxxx
  Drive Version Byte 4  = xxxx
  HP-IL/SCSI Revision   = xxxx

  SCSI Initiator ID     = n
  SCSI Target ID        = n
  Output Device         = xxxxx

  Max Block Address     = n
  Block Size            = n bytes
```

Related Commands

ID

LOOPBACK

L

Description

The LOOPBACK command writes a data pattern from the Initiator's data buffer to the Target's data buffer, reads the data pattern received by the Target, and compares the data pattern received to the data pattern sent.

If a data compare error is detected, a message is displayed which indicates the bit in error according to the following scheme:

0 = bit not in error

1 = bit in error

Examples

```
SCSIMO> LOOPBACK

LOOPBACK COMMAND

Enter the loop count (1 - 256)[1]? n

Writing Buffer Data
Reading Buffer Data
Comparing Bytes
```

If data compare errors are detected at bit positions 0 and 3, for example, the following message is displayed:

```
          Decimal   Decimal  Bit Positions
          Value     Value    In Error
Byte #    Trans     Rcvd       76543210
======    =====     =====    ==========
  n         n         n        00001001
```

MODE SENSE

M

Description

The MODE SENSE command displays internal drive parameters.

Examples

- The following example shows all the page control fields reported for each page type:

```
SCSIMO> MODE SENSE

Page Control Field:

  0 - report current values
  1 - report changeable values
  2 - report default values
  3 - report saved values

Enter page control (0 - 3)[0]? n

Page types:

   1 - Error Recovery Parameters
   2 - Disconnect/Reconnect Parameters
  32 - Format Parameters
  63 - All Pages

Enter page (1, 2, 32, 63)[63]? 63
```

```
Page 1 - Error Recovery Parameters
         {Current Values}
         {Changeable Values}
         {Default Values}
         {Saved Values}
---------------------------------
Byte 2      = b
Retry Count = n
Reserved    = n
Reserved    = n
Reserved    = n
Reserved    = n


Page 2 - Disconnect/Reconnect Parameters
         {Current Values}
         {Changeable Values}
         {Default Values}
         {Saved Values}
---------------------------------------
Buffer Full Ratio  = n
Buffer Empty Ratio = n
Reserved           = n
Reserved           = n


Page 32 - Format Parameters
          {Current Values}
          {Changeable Values}
          {Default Values}
          {Saved Values}
-----------------------------
Format Mode                    = n
Byte 3 Format Mode Specific    = n
Byte 4-7 Format Mode Specific  = n
Byte 8-11 Format Mode Specific = n
```

Related Commands

MODE SELECT

OUTPUT

O

Description

The OUTPUT command directs the program output to the Portable PLUS console, a printer, or a file. All command prompts continue to be displayed on the Portable PLUS console, but output information is directed to the specified device or file. The OUTPUT command is useful for recording the results returned by a specific command. For example, when performing an ACCESS LOGS command, the contents of the logs can be printed or stored in a file for later examination. The default output device is the console (CON).

The output file can have an extension of three characters in length (for example: test.txt).

Note

When directing output to a ThinkJet Printer connected to a Portable PLUS, the printer will respond to the PRN setting.

Examples

- The following example shows how to direct the program output to the printer.

```
SCSIMO> OUTPUT

Enter output file, printer ID (PRN), or console (CON)
[CON]: PRN

Output directed to PRN.
```

- The following example shows how to direct the program output to a file called LIST1.

```
SCSIMO> OUTPUT

Enter output file, printer ID (PRN), or console (CON)
[CON]: LIST1

Output directed to LIST1.
```

- The following example shows how to direct the program output to the console.

```
SCSIMO> OUTPUT

Enter output file, printer ID (PRN), or console (CON)
[CON]: CON

Output directed to console.
```

READ DATA

RD

Description

The READ DATA command transfers one block of data from the Target to the Initiator. The data is displayed on the currently defined output device. The logical block address is specified in block mode.

If the seek performed during the read operation is successful, the Target checks for hardware errors and reports or retries any such error. Unrecoverable data errors cause the read operation to terminate with the transmission of data up to, but not including, the unrecoverable physical block. This may cause partial transmission of a logical block, but no erroneous data will be transferred to the Initiator.

Examples

```
SCSIMO> READ DATA

READ DATA COMMAND

Enter block address (0 - n)[n]: n

Enter number of blocks to read (1 - n)[n]: n

Enter the loop count (1 - 256)[1]: n

Data (hex):
   1:  HH HH HH HH HH HH HH HH HH HH
  11:  HH HH HH HH HH HH HH HH HH HH
  21:  HH HH HH HH HH HH HH HH HH HH
    .
    .
    .
1021:  HH HH HH HH
```

Related Commands

RO MEDIA TEST

REASSIGN BLOCK

REAS

Description

The REASSIGN BLOCK command relocates defective logical data blocks to a new location on the Target's spare media. This enables defective blocks to be avoided during subsequent data transfers.

A specific logical block address may be reassigned more than once; thus, a logical block can be assigned to successive physical addresses until no more spare locations remain on the media. The address for each reassigned block is added to the Target's secondary defect list, which can be viewed using the DEFECT LIST command.

The REASSIGN BLOCK command includes a defect list containing the address of the block to be reassigned. The defect list may contain more than one defective block. The Target locates the track containing the defective block(s) and attempts to transfer data from the track to a new track. Data in the defective block(s) included in the defect list is not transferred to the new track.

If the Target has insufficient spare media to reassign a defective block, the REASSIGN BLOCK command terminates with Check Condition status and Medium Error sense key. The additional sense code is set to No Defect Spare Location Available. The address of the first logical block not reassigned is returned in the Information Bytes of the sense data.

Examples

```
SCSIMO> REASSIGN BLOCK

Number of defects to input (1 - 255)[1]? n

Enter block address (0 - n)[n]? n
```

Related Commands

DEFECT LIST

REQUEST SENSE

REQ

Description

The REQUEST SENSE command instructs the Target to return 20 bytes of extended sense data. Refer to the appropriate CE Handbook for the REQUEST SENSE sense key codes, additional sense codes, and device error codes. This command is similar in function to the CS/80 Request Status command.

The Target accumulates sense information for each command executed. If an abnormal condition occurs during execution, the Target records the appropriate information in the sense data and returns a status of Check Condition. In response, the Initiator automatically issues a REQUEST SENSE command to retrieve the sense data, which is then displayed for evaluation by the user.

When the Target receives a REQUEST SENSE command it returns the sense data then clears all sense information. Because the Initiator automatically issues a REQUEST SENSE command in response to Check Condition status, sense data is always cleared following a command failure. If the user executes a REQUEST SENSE command following a failed command, the Target returns a No Sense sense key indicating that the sense data has been cleared.

Although the REQUEST SENSE command will normally return no sense data, the command may be useful in certain other situations. A REQUEST SENSE command can be used to determine if a suspect Target is capable of responding to a command. Also, a failed REQUEST SENSE command may generate additional valuable status information.

If a nonfatal error occurs during execution of a REQUEST SENSE command, the Target returns the sense data with Good status. If a fatal error occurs during a REQUEST SENSE command, the returned sense data may be invalid; therefore, Check Condition status is reported.

After the sense data is returned, all conditions are cleared except for a Unit Attention sense key if power-on verification failed. In this case, the Hardware Error sense key is set by the Target for the first REQUEST SENSE command

and Unit Attention is set for the subsequent command. This is done to ensure that diagnostic failures and reset conditions are observed. The REQUEST SENSE command is executed even if the drive is reserved to another Initiator.

Examples

```
SCSIMO> REQUEST SENSE

Sense bytes (hex):

  Bytes 0 to 2 :  HH HH HH
  Information  :  HH HH HH HH
  Bytes 7 to 17:  HH HH HH HH
                  HH HH HH HH
                  HH HH HH
  Error Code   :  HH HH

Sense Key  = xxxxxxxxx
Sense Code = xxxxxxxxx
```

RO MEDIA TEST

RO

Description

The RO MEDIA TEST command checks the integrity of the Target's media and the complete data path to the device by reading data and checking for errors.

The user can define the area of the media to be tested, or allow the test to be performed over a random area of the media. When performing a random area test, a read-only media test is performed on 20 data blocks selected at random over the media. The random addresses are generated by the program using a starting value known as a seed.

The area of the media to be tested is specified by the starting address and the following area parameters:

- **Sector** - the starting address specifies the block to be tested.
- **Volume** - the test begins at the starting address and continues until the end of the volume is reached.
- **User Defined** - the test begins at the specified starting address and continues to the last specified address.

A loop option allows the read-only media test to be performed multiple times. When looping, the Target tests the media to the end of the specified area then returns to the starting address and begins the test again.

Examples

- The following example shows how to perform a read-only media test on a selected area of the media.

```
SCSIMO> RO MEDIA TEST

************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]? S

Test area:
  B = Block
  V = Volume
  U = User Defined

Enter the test area (B/V/U)[B]? B

Enter block address (0 - n)[n]? n

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

Test area = Block starting at block n

CTRL Y can be used to break, but will reset ALL
devices on the bus.
```

```
Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a read-only media test on a user-defined area of the media. The starting and ending addresses must be identified using block addressing.

```
SCSIMO> RO MEDIA TEST

************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]? S

Test area:
  B = Block
  V = Volume
  U = User Defined

Enter the test area (B/V/U)[B]? U

Enter starting block address: (0 - n)[n]? n

Enter ending block address: (0 - n)[n]? n

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n
```

```
Test area = User Defined starting at block n and
            ending at block n.

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a read-only media test on a random area of the media. The same random addresses are tested when performing multiple loops of the test.

```
SCSIMO> RO MEDIA TEST

************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]? R

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

Related Commands

WTR MEDIA TEST

SEEK

S

Description

The SEEK command instructs the Target to seek to a specified address or series of addresses. A loop parameter allows any of the seek options to be repeated a specified number of times. This command is useful for testing the servo circuitry.

The following types of seeks can be performed:

- **Random Seek** - the Target seeks to a random address.
- **Alternate Seek** - the Target seeks between two specified addresses.
- **Butterfly Seek** - the Target performs a series of seeks over an entire disk surface. The Target first performs a full-length seek from the minimum track to the maximum track. The Target then seeks back to the minimum track plus 1. The Target again reverses direction, seeking to the maximum track minus one. This process continues with the length of each subsequent seek being reduced by one track until the center of the disk surface is reached. The process is then reversed with each seek increasing by one track until the minimum and maximum tracks are reached.

Examples

- The following example shows how to perform a random seek.

```
SCSIMO> SEEK

**************************
*  Seek commands may take  *
*  several minutes.        *
*  Enter E to exit.        *
**************************
```

```
Types of seeks:
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type (R/A/B)[A]: R

Enter the loop count (1 - 256)[1]: n

Pass n started  (hh:mm:ss)
Pass n completed  (hh:mm:ss)
```

- The following example shows how to perform an alternate seek between two addresses.

```
SCSIMO> SEEK

*****************************
*  Seek commands will take  *
*  several minutes.         *
*  Enter E to exit.         *
*****************************

Types of seeks:
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type (R/A/B)[A]: A

Enter address #1:

Enter block address (0 - n)[n]: n

Enter address #2:

Enter block address (0 - n)[n]: n
```

```
Enter the loop count (1 - 256)[1]: n

Pass n started  (hh:mm:ss)
Pass n completed  (hh:mm:ss)
```

- The following example shows how to perform a butterfly seek.

```
SCSIMO> SEEK

****************************
*  Seek commands will take  *
*  several minutes.         *
*  Enter E to exit.         *
****************************

Types of seeks:
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type (R/A/B)[A]: B

Enter the loop count (1 - 256)[1]: n

Pass n started  (hh:mm:ss)
Pass n completed  (hh:mm:ss)
```

VERIFY

V

Description

The VERIFY command instructs the Target to perform a data verification on a section of the media. The data is verified by ECC check only; a compare is not performed. This allows many marginal data errors previously masked by CRC to be detected using the VERIFY command. A verification does not destroy user data.

The user can explicitly define the portion of the media to be verified, or allow the verification to be performed over a random area of the media. When performing a random area test, verification is performed on 20 data blocks selected at random over the disc media. The random addresses are generated by the program using a starting value known as a seed.

The area of the media to be tested is specified by the starting address and the following area parameters:

- **Sector** - the starting address specifies the block to be tested.
- **Volume** - the test begins at the starting address and continues until the end of the volume is reached.
- **User Defined** - the test begins at the specified starting address and continues to the last specified address.

A loop option allows the media test to be performed multiple times. When looping, the Target tests the media to the end of the specified area then returns to the starting address and begins the test again.

Examples

- The following example shows how to verify the data on a specified track. Block addressing is used and the logs are not cleared.

```
SCSIMO> VERIFY

*********************************
*  Verify Data command may take  *
*  several minutes.              *
*                                *
*  Enter E to exit.              *
*********************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]: S

Test area:
  B = Block
  V = Volume
  U = User Defined

Enter the test area [B]: B

Enter block address (0 - n)[n]: n

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

Test area = Block starting at block n

CTRL Y can be used to break, but will reset ALL
devices on the bus.
```

```
Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to verify the data on a user defined section of the media.

```
SCSIMO> VERIFY

*********************************
*  Verify Data command may take  *
*  several minutes.              *
*                                *
*  Enter E to exit.              *
*********************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]: S

Test area:
  B = Block
  V = Volume
  U = User Defined

Enter the test area (B/V/U)[B]: U

Enter starting block address: (0 - n)[n]: n

Enter ending block address: (0 - n)[n]: n

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n
```

```
User Defined
Test area = Volume starting at block n and
            ending at block n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to verify the data on a random section of the media. The same random addresses are tested when performing multiple loops of the test.

```
SCSIMO> VERIFY

**********************************
*  Verify Data command may take  *
*  several minutes.              *
*                                *
*  Enter E to exit.              *
**********************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]: R

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

CTRL Y can be used to break, but will reset ALL
devices on the bus.
```

```
Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

Related Commands

READ DATA

WTR MEDIA TEST

WTR

Caution

The WTR MEDIA TEST command will destroy user data on the area of the media that is tested. You should back up all user data before executing the WTR MEDIA TEST command.

Description

The WTR (write-then-read) MEDIA TEST command checks the integrity of the Target media and the complete data path to the device by writing, then reading data and checking for errors.

When a write-then-read media test is performed, the data pattern used is the internal data pattern contained in firmware on the rewritable optical controller.

The user can define the area of the media to be tested, or allow the test to be performed over a random area of the media. When performing a random area test, a media test is performed on 20 data blocks selected at random over the media. The random addresses are generated by the program using a starting value known as a seed.

The area of the media to be tested is specified by the starting address and the following area parameters:

- **Sector** - the starting address specifies the block to be tested.
- **Volume** - the test begins at the starting address and continues until the end of the volume is reached.
- **User Defined** - the test begins at the specified starting address and continues to the last specified address.

A loop option allows the media test to be performed multiple times. When looping, the Target tests the media to the end of the specified area then returns to the starting address and begins the test again.

Examples

- The following example shows how to perform a write-then-read media test on a selected area of the media. The channel is included in the testing.

```
SCSIMO> WTR MEDIA TEST

************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]? S

Test area:
  B = Block
  V = Volume
  U = User Defined

Enter the test area (B/V/U)[B]? B

Enter block address: (0 - n)[n]? n

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

Test area = Block starting at block n
```

```
CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a write-then-read media test on a user-defined area of the media. The starting and ending addresses must be identified using block addressing.

```
SCSIMO> WTR MEDIA TEST

************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]? S

Test area:
  B = Block
  V = Volume
  U = User Defined

Enter the test area (B/V/U)[B]? U

Enter starting block address: (0 - n)[n]? n

Enter ending block address: (0 - n)[n]? n

Enter the transfer size in blocks (1 - n)[1]: n
```

```
Enter the loop count (1 - 256)[1]: n

Test area = User Defined starting at block n and
            ending at block n.

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- The following example shows how to perform a write-then-read media test on a random area of the media. The same random addresses are tested when performing multiple loops of the test.

```
SCSIMO> WTR MEDIA TEST

************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]: R

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

CTRL Y can be used to break, but will reset ALL
devices on the bus.
```

```
Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

Related Commands

RO MEDIA TEST

5

SCSICD Commands

This chapter provides information on the commands included in the SCSICD diagnostic program.

The SCSICD diagnostic program transfers data and commands between a CD-ROM drive and an HP Portable PLUS via a HP-IL/SCSI interface. CD-ROM drives store data on removable Compact Disc (CD) media.

Note

The SCSICD diagnostic program *cannot* be used to test Compact Disc media which has been recorded with music or other audio information. If a SCSICD command is used to test an audio track, the command will fail with the following sense code: `Not CD-ROM Data Track`.

CAPACITY

CA

Description

The CAPACITY command allows the Initiator to determine the maximum capacity of the Target. The Target returns the block address of its last addressable logical block. The current block size and the drive capacity are also displayed.

Although the physical capacity of the Target remains fixed, the address of the last data block is determined by block size. The larger the block size, the lower the address of the last addressable logical block.

Examples

```
SCSICD> CAPACITY

Maximum Block Address = n

Block Length  = n

Drive Capacity = n  bytes
```

Related Commands

INQUIRY

DIAGNOSTIC

DI

Description

The DIAGNOSTIC command invokes the Target's power-on self-test diagnostic sequence. A loop option allows the diagnostic to be repeated a specified number of times.

Note

Refer to the CE Handbook for the device being tested for device-specific error codes that correspond to self-test failures.

Examples

```
SCSICD> DIAGNOSTIC

Input the loop count (1 - 256) [1]? n

Send Diagnostic  Pass = n
```

EXIT

E

Description

The EXIT command stops execution of the SCSICD program and returns the A:\ prompt.

Examples

```
SCSICD> EXIT

End of Program.

A:\
```

HELP

H

Description

The HELP command displays a list of all the commands supported by the SCSICD program, along with a brief description of each command. The list of commands is displayed one screen at a time. Press the space bar to display each successive screen.

To enter a command, type the full command name shown in the left-hand column or type the abbreviated form of the command shown as upper-case letters within the full command.

Examples

```
SCSICD> HELP

CApacity          - Determine capacity of Target.

DIagnostic        - The Target will execute its internal
                    diagnostics.

Exit              - Exit the program.

Help              - Display this help file.

ID                - Change SCSI Initiator ID or Target ID.

INquiry           - Display Target and program parameters.

Mode sense        - Display internal device parameters.

Output            - Directs the output to the console,
                    printer, or file.
```

HELP

```
REAd (RD)          - Display the contents of a selected
                     block.
REQuest sense      - Read Sense data from Target, format and
                     display the results.

RO media test      - Perform a Read Only Media Test.

Seek               - Issue the SCSI Seek command. You can
                     select random, alternate, or butterfly
                     seeks.
```

ID

ID

Description

The ID command is used to change the SCSI ID of the Initiator or the SCSI ID of the Target. The Initiator is the HP Portable PLUS and the Target is the hard disk drive being tested.

The SCSI ID of the Target (Target ID) must match the SCSI address of the CD-ROM drive being tested. The SCSI address of the CD-ROM drive is either set at the factory, or is set by the operator when the CD-ROM drive is installed into the mass storage system. (Refer to the appropriate CE Handbook for information on setting the CD-ROM drive SCSI address switches.) The default Target ID value is zero.

The SCSI ID of the Initiator (Initiator ID) must match the SCSI address of the Portable PLUS. The default Initiator ID value is seven.

Examples

```
SCSICD> ID

Input Initiator ID (0-7)[7]? n

Input SCSI Target ID (0-7)[0]? n
```

Related Commands

INQUIRY

INQUIRY

IN

Description

The INQUIRY command instructs the Target to return its parameter information. This information is then displayed, along with the settings of various program variables.

The INQUIRY command returns a Check Condition status if the Target cannot return the requested data. Inquiry data will be returned even though the Target may not be ready for other commands.

If an INQUIRY command is received from an Initiator with a pending Unit Attention condition (before the Target reports Check Condition status), the Target executes the INQUIRY command but does not clear the Unit Attention sense key. This is also true for a pending Hardware Error sense key.

The following example includes a general description of the information returned by the INQUIRY command. The actual values returned by the Target are product specific and are defined in the appropriate CE Handbook.

The first block of information displayed contains information describing the Target. The Direct Access Device field indicates that the Target uses removable media. The Vendor ID, Product ID, and Firmware Revision fields are all product specific. Drive Version bytes 1, 2, 3, and 4 indicate the version numbers of the firmware installed in the CD-ROM drive, and the HP-IL/SCSI Revision field indicates the revision of firmware installed in the HP-IL/SCSI interface module.

The second block of information displays the current setting of various program parameters. The program parameters include SCSI Initiator ID, SCSI Target ID, and selected output device.

The final block of information describes Target addressing and capacity parameters.

Examples

```
SCSICD> INQUIRY

Inquiry Values:

  Read Only Device      - Removable Media
  Vendor ID             = xx
  Product ID            = xxxxx
  Firmware Revision     = xxxx
  Firmware Date         = nn/nn/nn
  HP-IL/SCSI Revision   = xxxx

  SCSI Initiator ID     = n
  SCSI Target ID        = n
  Output Device         = xxxxxxx

  Max Block Address     = n
  Block Size            = n bytes
```

Related Commands

CAPACITY
ID

MODE SENSE

M

Description

The MODE SENSE command displays internal drive parameters.

Examples

- The following example shows all the page control fields reported for each page type:

```
SCSICD> MODE SENSE

Page Control Field:

  0 - report current values
  1 - report changeable values
  2 - report default values
  3 - report saved values

Enter page control (0 - 3)[0]? n


Page types:

   1 - Error Recovery Parameters
   2 - Disconnect/Reconnect Parameters
  63 - All Pages

Enter page (1, 2, 32, 63)[63]? 63

Block Descriptor
----------------
Logical Blocks = n
Block Size     = n
```

```
Page 1 - Error Recovery Parameters
         {Current Values}
         {Changeable Values}
         {Default Values}
         {Saved Values}
---------------------------------
Byte 2               = b
Retry count          = n
Correction Span      = n
Head offset          = n
Data Strobe Offset   = n
Recovery Time Limit = n


Page 2 - Disconnect/Reconnect Parameters
         {Current Values}
         {Changeable Values}
         {Default Values}
         {Saved Values}
---------------------------------------
Buffer Full Ratio = n
Buffer Empty Ratio = n
Bus Inactivity Limit = n
Disconnect Time Limit = n
Connect Time Limit = n
```

OUTPUT

O

Description

The OUTPUT command directs the program output to the Portable PLUS console, a printer, or a file. All command prompts continue to be displayed on the Portable PLUS console, but output information is directed to the specified device or file. The OUTPUT command is useful for recording the results returned by a specific command. For example, when performing an ACCESS LOGS command, the contents of the logs can be printed or stored in a file for later examination. The default output device is the console (CON).

The output file can have an extension of three characters in length (for example: test.txt).

Note

When directing output to a ThinkJet Printer connected to a Portable PLUS, the printer will respond to the PRN setting.

Examples

- This example shows how to direct the program output to the printer.

```
SCSICD> OUTPUT

Enter output file, printer ID (PRN), or console (CON)
[CON]: PRN

Output directed to PRN.
```

- This example shows how to direct the program output to a file called LIST1.

```
SCSICD> OUTPUT

Enter output file, printer ID (PRN), or console (CON)

[CON]: LIST1

Output directed to LIST1.
```

- This example shows how to direct the program output to the console.

```
SCSICD> OUTPUT

Enter output file, printer ID (PRN), or console (CON)

[CON]: CON

Output directed to console.
```

READ DATA

RD

Description

The READ DATA command transfers one block of data from the Target to the Initiator. The data is displayed on the currently defined output device. The logical block address is specified in block mode.

If the seek performed during the read operation is successful, the Target checks for hardware errors and reports or retries any such error. Unrecoverable data errors cause the read operation to terminate with the transmission of data up to, but not including, the unrecoverable physical block. This may cause partial transmission of a logical block, but no erroneous data will be transferred to the Initiator.

Examples

```
SCSICD> READ DATA

Enter block address (0 - n)[n]: n

Enter number of blocks to read (1 - 256)[1]: n

Enter the loop count (1 - 256)[1]: n

Data (hex):
   1:  HH HH HH HH HH HH HH HH HH HH
  11:  HH HH HH HH HH HH HH HH HH HH
  21:  HH HH HH HH HH HH HH HH HH HH
    .
    .
    .
1021:  HH HH HH HH
```

Related Commands

RO MEDIA TEST

REQUEST SENSE

REQ

Description

The REQUEST SENSE command instructs the Target to return 18 bytes of extended sense data. Refer to the appropriate CE Handbook for the REQUEST SENSE sense key codes and additional sense codes. This command is similar in function to the CS/80 Request Status command.

The Target accumulates sense information for each command executed. If an abnormal condition occurs during execution, the Target records the appropriate information in the sense data and returns a status of Check Condition. In response, the Initiator automatically issues a REQUEST SENSE command to retrieve the sense data, which is then displayed for evaluation by the user.

When the Target receives a REQUEST SENSE command it returns the sense data and then clears all sense information. Because the Initiator automatically issues a REQUEST SENSE command in response to Check Condition status, sense data is always cleared following a command failure. If the user executes a REQUEST SENSE command following a failed command, the Target returns a No Sense sense key indicating that the sense data has been cleared.

Although the REQUEST SENSE command will normally return no sense data, the command may be useful in certain other situations. A REQUEST SENSE command can be used to determine if a suspect Target is capable of responding to a command. Also, a failed REQUEST SENSE command may generate additional valuable status information.

If a nonfatal error occurs during execution of a REQUEST SENSE command, the Target returns the sense data with Good status. If a fatal error occurs during a REQUEST SENSE command, the returned sense data may be invalid; therefore, Check Condition status is reported.

After the sense data is returned, all conditions are cleared except for a Unit Attention sense key if power-on verification failed. In this case, the Hardware Error sense key is set by the Target for the first REQUEST SENSE command and Unit Attention is set for the subsequent command. This is done to ensure

that diagnostic failures and reset conditions are observed. The REQUEST SENSE command is executed even if the drive is reserved to another Initiator.

Examples

```
SCSICD> REQUEST SENSE

Sense bytes (hex):

  Bytes 0 to 2:  HH HH HH
  Information:   HH HH HH HH
  Bytes 7 to 17: HH HH HH HH
                 HH HH HH HH
                 HH HH HH

Sense Key  = xxxxxxxxx
Sense Code = xxxxxxxxx
```

RO MEDIA TEST

RO

Description

The RO (read-only) MEDIA TEST command checks the integrity of the Target's media by reading data and checking for errors.

The user can specify the area of the media to be tested, or allow the test to be performed over a random area of the media. When performing a random area test, a read-only media test is performed on 20 data blocks selected at random over the media. The random addresses are generated by the program using a starting value known as a seed.

The area of media to be tested is specified by the starting address and the following area parameters:

- **Sector** - the starting address specifies the block to be tested.
- **Volume** - the test begins at the starting address and continues until the end of the volume is reached.
- **User Defined** - the test begins at the specified starting address and continues to the last specified address.

A loop option allows the media test to be performed multiple times. When looping, the Target tests the media to the end of the specified area then returns to the starting address and begins the test again.

Examples

- This example shows how to perform a read-only media test on a selected area of the media.

```
SCSICD> RO MEDIA TEST

*************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
*************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]? S

Test area:
  B = Block
  V = Volume
  U = User Defined

Enter the test area (B/V/U)[B]? B

Enter block address (0 - n)[n]? n

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

Read-Only Media Test, loop = 1

Test area = Block starting at n

CTRL Y can be used to break, but will reset ALL
devices on the bus.
```

```
Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- This example shows how to perform a read-only media test on a user-defined area of the media.

```
SCSICD> RO MEDIA TEST

************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]? S

Test area:
  B = Block
  V = Volume
  U = User Defined

Enter the test area (B/V/U)[B]? U

Enter starting block address (0 - n)[n]? n

Enter ending block address (0 - n)[n]? n

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

Read-Only Media Test, loop = 1
```

```
Test area = User Defined starting at block n and
            ending at block n.

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

- This example shows how to perform a read-only media test on a random area of the media. The same random addresses are tested when performing multiple loops of the test.

```
SCSICD> RO MEDIA TEST

************************************************
*  Media Test commands may take several minutes.  *
*  Full volume tests may take several hours.      *
*  Enter E to exit.                               *
************************************************

Test type:
  S = Selected area
  R = Random area

Enter the test type (S/R)[S]? R

Enter the transfer size in blocks (1 - n)[1]: n

Enter the loop count (1 - 256)[1]: n

Random Read-Only Media Test, loop = n

CTRL Y can be used to break, but will reset ALL
devices on the bus.

Test started  (hh:mm:ss)
Test stopped  (hh:mm:ss)
```

Related Commands

READ DATA

SEEK

S

Description

The SEEK command instructs the Target to seek to a specified address or series of addresses. A loop parameter allows any of the seek options to be repeated a specified number of times. This command is useful for testing the servo circuitry.

The following types of seeks can be performed:

- **Random Seek** - the Target seeks to a random address.
- **Alternate Seek** - the Target seeks between two specified addresses.
- **Butterfly Seek** - the Target performs a series of seeks over an entire disk surface. The Target first performs a full-length seek from the minimum track to the maximum track. The Target then seeks back to the minimum track plus 1. The Target again reverses direction, seeking to the maximum track minus one. This process continues with the length of each subsequent seek being reduced by one track until the center of the disk surface is reached. The process is then reversed with each seek increasing by one track until the minimum and maximum tracks are reached. The butterfly seek can be performed on individual heads or all heads sequentially from the lowest head address to the highest.

Examples

- The following example shows how to perform a random seek.

```
SCSICD> SEEK

*****************************
*  Seek commands will take  *
*  several minutes.         *
*  Enter E to exit.         *
*****************************
```

```
Types of seeks:
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type (R/A/B)[A]: R

Enter the loop count (1 - 256)[1]: n

Pass n started (hh:mm:ss)
Pass n completed (hh:mm:ss)
```

- The following example shows how to perform an alternate seek between two addresses.

```
SCSICD> SEEK

*****************************
*  Seek commands will take  *
*  several minutes.         *
*  Enter E to exit.         *
*****************************

Types of seeks:
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type (R/A/B)[A]: A

Enter address #1:

Enter block address (0 - n)[n]: n

Enter address #2:

Enter block address (0 - n)[n]: n

Enter the loop count (1 - 256)[1]: n
```

```
Pass n started (hh:mm:ss)
Pass n completed (hh:mm:ss)
```

- The following example shows how to perform a butterfly seek.

```
SCSICD> SEEK

*****************************
*  Seek commands will take  *
*  several minutes.         *
*  Enter E to exit.         *
*****************************

Types of seeks:
  R = Random seek
  A = Alternate seek
  B = Butterfly seek

Select the seek type (R/A/B)[A]: B

Enter the loop count (1 - 256)[1]: n

Pass n started
Pass n completed
```

Glossary

Address
A unique number determined by a switch setting on the SCSI bus. Each device on a bus must be set to an address number, so the host computer (the Initiator) can identify which device is currently active or addressed.

Backup
A process for copying data from the disk or tape of one device to the disk or tape of another device to prevent the loss of important customer data.

BOM
Beginning Of Media (see PBOT).

BOP
Beginning Of Partition (see LBOT).

BOT
Beginning Of Tape (see LBOT and PBOT). This term is used only to indicate the direction in which a digital audio tape is moving.

Buffered Mode
The mode by which a digital audio tape (DAT) drive responds immediately to write commands. If buffered mode is selected, the drive reports a Good status on a write command as soon as the data block has been transferred to the buffer. Buffered mode is the default mode for a DAT drive.

C3 ECC
A Level 3 Error Correction Code which adds an extra error correction facility to digital audio tape (DAT) drives to allow any two tracks in a group to be corrected. C3 ECC is only used when a raw data error is too big to be corrected by C1 and C2 ECC.

CD-ROM Drive

A random access read-only mass storage device that uses the same removable media technology consumers use in audio Compact Disc players. The CD-ROM drives referred to in this manual include a semiconductor laser for reading and writing data optically, and an embedded controller with a single-ended SCSI interface. (The spelling of Compact Disc with a "c" for *disc* is an accepted industry standard for audio media. In this manual, however, the term *disk* is used when referring to hard disk drives and rewritable optical disk drives.)

Channel

A single path along which digital signals are sent.

CRC

Cyclic Redundancy Check. The CRC circuitry on the controller board in a disk drive generates a binary code which is used to detect data errors. During a write operation, the data string for each sector shifts through the CRC circuit in a cyclical manner to produce a high order polynomial. The data string is divided by the polynomial, and the remainder is a 2-byte CRC code. The code is then written into the CRC field, which is appended to the sector as the sector is written. During a read operation, the CRC field is regenerated and compared with the CRC field which was generated when the sector was written. If the CRC fields match, the data is assumed correct. If the CRC fields do not match, then the controller attempts to correct the data (see ECC).

DAT

Digital Audio Tape. Digital audio tape is identical to the media used in the audio industry. A single cassette holds up to 1.3 Gigabytes of digital data written in digital data storage (DDS) format.

DAT Drive

A sequential access streaming mass storage tape device that stores data on removable DAT cassettes in digital data storage (DDS) format. The DAT drives referred to in this manual use helical-scan technology to record data on digital audio tapes, and include an embedded tape controller with a single-ended SCSI interface.

DDS Format

Digital Data Storage Format is a standard data formatting scheme for tape, originally developed by Hewlett-Packard and Sony Corporation. DDS format is used by the digital audio tape (DAT) drive.

Device

Any mass storage system peripheral included in a mass storage system product.

Diagnostic Session

A period of time during which a diagnostic program starts running on an HP Portable PLUS, commands are entered from a command prompt, and a diagnostic program is ended by returning to the `A:\` prompt.

ECC

Error Correction Code. The ECC circuitry in a disk drive generates a binary code which is used to detect and correct data errors. During a write operation, the ECC circuitry generates a binary code which contains error correction information. The code is then written into the ECC field, which is appended to the sector as the sector is written. During a read operation, the ECC field is regenerated and compared to the ECC field generated when the sector was written. If the ECC fields do not match, a data error is detected and the ECC fields are used to correct the data.

EOD

End Of Data. EOD specifies the point on a digital audio tape (DAT) where the data ends. If a DAT drive starts writing data before the first EOD, a second EOD will be created. However, the DAT drive only recognizes the EOD nearest to the beginning of the tape. All data after that point is ignored by the drive. A two-partition tape has an EOD for each partition.

EOM

End Of Media (see PEOT).

EOP

End Of Partition (see LEOT).

EOT

End Of Tape (see LEOT and PEOT). This term is used only to indicate the direction in which a digital audio tape is moving.

Fault
A failure within a device caused by a malfunctioning printed circuit assembly or a mechanical assembly.

Filemark
A mark which an Initiator instructs a digital audio tape (DAT) drive to write on a digital audio tape, normally to define the end of a file. A filemark is hierarchically inferior to a save-set mark.

Group
A set of frames with a fixed data capacity. A group contains one index, and can also contain several records, partial records, filemarks, and save-set marks.

Hard Disk Drive
A random access mass storage device that stores computer data on nonremovable disk media. The hard disk drives referred to in this manual include a rotary actuator, read/write heads, and an embedded hard disk drive controller with a single-ended SCSI interface.

HP-IL
Hewlett-Packard Interface Loop. A digital serial interface primarily used for portable Hewlett-Packard instruments and computers.

Initiator
The SCSI device that requests an operation be performed by another device on the bus. In this manual, the term Initiator refers to the HP Portable PLUS computer.

Internal Diagnostics
A sequence of tests stored in device firmware. The test sequence is performed whenever a device is switched on (see Self-test).

LBOT
Logical Beginning Of Tape. The point where a digital audio tape (DAT) drive starts writing data to a tape. The LBOT provides a reference point for the tape. On a two-partition tape, each partition has a LBOT.

LEOT

Logical End Of Tape. The point on a digital audio tape before PEOT, which warns the Initiator to stop writing data. On a two-partition tape, each partition has an LEOT.

Maintenance Log

An area used by the Target to record the occurrences of internal events, such as data errors and hardware faults. The maintenance log, which is usually stored both in controller RAM and on the media, is accessible to the Initiator upon request.

Mass Storage System

A Hewlett-Packard product which includes a power supply, internal SCSI devices, and the associated cables and parts.

Media Reassignment

The process of physically relocating a logical data block from one area of the disk media to another. Media reassignment (also known as sparing) is used to reduce data errors by moving data from a defective area of the media to a spare location reserved for reassignment.

Media Test

A test process used to evaluate the integrity of the disk media. A read-only (RO) media test reads data from the media and checks for errors. A write-then-read (WTR) media test writes data to the media then immediately reads it back to ensure accuracy. Both tests are valuable for locating defective or marginal media locations.

N-Group Writing

A method of writing on a digital audio tape in which each group of data is written N times so that there are N consecutive copies on the tape. N is any value from 0 through 7, and is selected by software. N-group writing improves data integrity, but speed and data capacity are sacrificed.

Partition

An independent area on a digital audio tape on which data can be written and read.

PBOT
Physical Beginning Of Tape. The point on a digital audio tape when it is unthreaded and can be ejected from a DAT drive cassette port.

PEOT
Physical End Of Tape. The point on a digital audio tape where the magnetic part of the tape joins the trailer part of the tape. On a two-partition tape, Partition 1 has a synthetic PEOT which mimics the function of the real PEOT in Partition 0.

RAW
An abbreviation for read-after-write (see Read-After-Write).

Read-After-Write
A method of transferring data to a digital audio tape which improves data integrity by reading frames immediately after they are written and rewriting frames if they are in error.

Record
A logical collection of data on a digital audio tape, which is defined by the Initiator. The DDS format supports variable-length records, so that several short records can be written in one group, and a long record can span several groups.

Rewritable Optical Disk Drive
A random access mass storage device that stores computer data on removable magneto-optical (MO) media. The rewritable optical disk drives referred to in this manual include an optical head which contains a laser diode, and a controller with a single-ended SCSI interface.

Save-set Mark
A mark written to a digital audio tape as a reference point to which the digital audio tape drive can perform a fast-search. The meaning of a save-set mark depends entirely on the software being used. Save-set marks are hierarchically superior to filemarks.

SCSI
Small Computer System Interface. An industry-standard interface which defines mechanical, electrical, and functional requirements for connecting small computers to each other and to computer peripherals.

SCSI ID
A bit-significant identification number which corresponds to a SCSI data bus line and to the SCSI address of an Initiator or a Target.

Self-test
An internal diagnostic test sequence which is performed whenever a device is switched on. Internal tests stored in device firmware are performed, and their completion status of pass or fail is returned via the front panel indicators on the mass storage system.

Sense Data
Detailed information describing an abnormal condition encountered by the Target during the preceding command. The Target generates sense data for each command and passes the data to the Initiator when requested to do so.

Sequential Filemarks
A series of filemarks with no intervening save-set marks on a digital audio tape.

Target
The SCSI device that performs the operation requested by the Initiator. In this manual the Target is the disk drive under test.

Target ID
The identification number of a data bus signal line corresponding to the SCSI address of a Target.

Vendor Group
The first group of a data area in any partition on a digital audio tape. The Vendor Group contains the information about the digital audio tape (DAT) drive which formatted the partition, or the drive which first wrote the partition.

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