Quantum®

DLT*tools*

Product Manual

Version 2.6

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Preface

About This Manual

This comprehensive Read Me First user manual provides detailed information as well as procedures for using the utilities found under the **DLT***tools* program package. The manual is organized into chapters, beginning with the basics and moving on to more advance topics. To help you learn and use these programs, this manual is organized by tasks. Beginning with the program installation, and moving on to program features.

Before starting to use these programs, you should be aware of the hardware and software requirements that are needed to run successfully. You should have a working knowledge of the computer and its operating conventions. If you need to review these techniques, refer to the documentation that came with your DLT™ Tape Drive.

Conventions

Numbered lists (1., 2., ...) indicate steps, which imply an explicit sequential order.

If there is a continuation to the next page,

The *Continues...* icon appears in the lower right corner.

Continues...

Before You Begin

Before you can use any of the utilities under **DLT***tools*, you must meet the following software requirements:

- Running MSDOS Operating System (version 5.0 or later)

  
  Note: DLTtools is a MS-DOS 16bit executable program that is intended to run under the MSDOS OS. The software has also been testing under Windows95 using the NCRC810 SCSI Host Adapter..

- SCSI host adapter compatible with ASPI DOS (ex. Adaptec 1540 Adapter)
  - Adaptec ASPI DOS Manager Installed (software package).
  - ASPI4DOS.sys if the host has ADAPTEC 1540, 1640,
  - ASPI8DOS.sys if the host has ADAPTEC 2940/2944
  - ASPI2DOS.sys if the host has ADAPTEC 1520
  - ASPIEDOS.sys if the host has a 1740 running in extended mode

Continues...


Note: include the above system file in the config.sys file to support the needed SCSI controller.

- Mouse recommended but not required
- Memory requirements:
  - DLTtools: 405K base memory.
  - DLTdiag: under 400K base memory

  Base memory requirements may change from version to version due to functionality changes in either program.

THE KEYBOARD

- The keys on your keyboard may not be labeled exactly as they are in this manual. All key names are shown using small capital letters. For example, the Control key is shown as CTRL; the Escape key is shown as ESC.

- Text that you are required to type on the keyboard is shown in the lowercase font similar to what you would see on your screen. The text to be typed is preceded by the word *Type* and followed by the Key(s) to press:

  Example: Type: A:\install<Enter>

  A single or combined keystroke will appear in angle brackets (< >). An example of this would be the enter key "<enter>" or the control c function "<CTRL-C>".

  Example: <enter>, <CTRL-C>

- Keystroke combinations appear in one set of angle brackets and are joined by a plus sign (+).

  Example:
  <SHIFT + F1>: means to hold down the SHIFT key while pressing F1,
  <ALT, F, A>: means to press and release each of these keys in order: first ALT, then F, and then A.

Note: If you are using a mouse, the following terms are used:

Click	Press the mouse button once.
Double- Click	Press the mouse button twice (quickly).
Check/Unchecked	Click on the check Box (☐) or press <Spacebar>

Backing Up Your Master Disks

Before installing or upgrading your software, write-protect the original diskette, **make a copy** of it.

Chapter 1

Introduction

The **DLT*tools*** program gives the user ability to view or alter various parameters and data of a DLT tape drive. Functions such as a code load, mode pages editor and log page viewer is available. The user can use either a mouse or a keyboard for accessing menu options and commands. All the programs found under the DLTtools package have the same user interface.

Features and Benefits

Ease of Use

- Windows-based Solution-includes pull-down menus, icon, and an icon selection bar. The menu Bar setup allows a quick navigation and a straightforward file selection system for program operation.
- Context Sensitive Help- help information specific to the current cursor position can be obtained by pressing F1 key
- All menus are accessed by pressing ALT-Z, where the Z is the highlighted letter of the menu. For example, the “Setup” menu is pulled down by ALT-S. Items within menus and dialog boxes can be selected by pressing keys that are highlighted. Ex.: The sniff function can be executed by pressing the “n” hot key once in the setup menu.
- The menu bar is activated by pressing the F10 Key
- All fields are selected by pressing Tab.
- The check boxes can be toggled by pressing the space bar.

  The user can also scroll the check boxes and radio buttons by using the arrow keys.
- The last line on the user screen is called the STATUS LINE. It displays information about hot keys and memory in bytes.
- The line on top of a STATUS LINE is called INFORMATION LINE. It displays the currently selected device; the states of global protection; current SCSI Specification of the selected device and the execution status of each SCSI command the user Executes.
- Press ESC to put this help screen away or click the mouse on the button in the upper left corner. The user can use either a mouse or a keyboard for accessing the menu.

System Requirements

The following are the minimum requirements for running **DLT*tools***:

Software Requirements

- MSDOS Operating System, version 5.0 or later.
- ASPI based manager
  - Adaptec based system. ASPIxDOS.SYS Manager Installed, (reference to “Before You Begin”)
  - NEC CAM based systems. DOSCAM.SYS and ASPICAM.SYS must be loaded on your system.

Hardware Requirements

- SCSI host adapter compatible with ASPI DOS

  (reference to “Before You Begin” for compatibility)
- DLT device connected to the host adapter
- Mouse recommended, not required
- Memory requirements: 640K bytes conventional memory, any extended a plus

How to Use This Manual

This manual provides detailed installation and operating instructions for the *DLTtools* program group. The chapters in this manual contained the following information:

Chapter 2 This chapter includes a software overview, step-by-step instructions to install the software, instructions on starting the software, and description of the main menu.

Chapter 3 This chapter includes a description of the Setup, Function, Page and Information menu, It will also cover all sub menus found under the main selections.

Instructions Given in This Manual

The instructions given in this manual are written for users performing the operations using a mouse. If you are familiar with keyboard commands, you can perform the same operations using the keyboard.

Chapter 2

Getting Started

Installing the Software

To install the *DLTtools* software, follow these steps:

1. Create a directory on your system disk

Example:

mkdir \DLTtools"

2. Copy the distribution file to this directory.

The file name for distribution should be "DLTT(V)(P).exe"

The (V) is the version and (P) is the patch. The current release may or may not have a patch code but all releases will have a version.

This is a self-extracting program. It will produce the following files:

dlttools.exe - Main program for DLTtools. It is used to view/change data from drive. This is a DOS executable file and used a 16bit ASPI manager.

dltdiag.exe - Main program for DLTdiag. It contains all diagnostic functions used to test the DLT. It is a DOS executable file that works under a 16bit ASPI manger.

dlthelp.hlp - Contact help file. When any of the main line programs are started they will read this file. Used when ever the F1 key is pressed

cl_help.exe - Command line help program. This is a standalone program to give the user help on the command line functions found in any of the main DLT programs. This program works only with the DOS system. It is a DOS executable file

dlttr49.txt - Release notes. Always package in ASCII text form. Naming convention are dlt = DLT produces, t = tools, r = release notes, the rest of the name is reserved for the version level. In this case "49" is the current version4.9. letter in the revision are patches to the main release.

There are also collections of batch files to control the drives from the command line.

The main program "DLTtools.exe" will not run if it can not find "DLThelp.hlp". In a DOS environment add the DLTtools directory to the path variable in the autoexec.bat file and reboot the system. If this is not done then some operation may not work properly.

Program Startup

1. Any of the DLTtools programs can started from any directory as long as current directory falls in the system search path. The directory that you start the program in is considered to be the "current" directory. The help file "dlthelp.hlp" must lie in the search path because there is no directory information used when this file is open for read.

2. When the disclaimer screen is displayed and you have finished reading, press “Esc” key and begin your next operation. In past versions of the DLTtools the user was left to pull up the needed screens to operate the program. In the newer version If the user changes information in one screen that other screens need then these screens will be automatically for the user. In the case of “start up” the adapter screen then the device screen are displayed.
3. There are switches that are available in both the Command Line Interface (CLI) and Character cell User Interface (CUI) for the startup command line.

   /PROT . is a startup switch to turn off the software protection. By default the software protection is on.

   /LIB … This flag is to turn off device checking during the “Move Media” and “Read Element Status” commands. This flag has no effect on another areas of the program.

   /win … to start the CUI. If any startup command switch is used this switch is needed to start the CUI

   Syntax:

   DLTtools /prot /win

   This command will turn off the software protection and start **DLT*tools*** using the CUI interface.

DLT*tools Menus Bar*

An attempt was made to highlight command functions from menu functions. The following chapter is setup to show that under a menu selection there are sub functions. Some are commands (underlined) and some lead to other menus.

After starting **DLT*tools***, a Menu bar will be displayed across the top of your screen:

The Menu Bar contains the following sub-menu selections:

Setup

This menu supplies function to allows the user to configure **DLT*tools*** controls and system functions Under this menu the following can be found:

Device Select/Show

A function that will display devices found on the selected SCSI bus.

Drive Protection

A software protection.

Host Adapter Select/Show

A function to show or choose a host adapter that is on the system.

Change Directory

Allows the default directory to be changed.

DOS Shell

A function to run the DOS command shell.

EXIT

Terminates the **DLT*tools*** program.

Functions

This menu contains function (underlined) and sub menus that control drive functions. sub-menu are: CONTROLS, LOAD/UNLOAD and UPDATE. Functions are Test Unit Ready and Device Reset.

Test Unit Ready

Allows testing the read/write readiness of a device.

Device Reset

Reset the selected device by through the host adapter.

DLT CoreDump

A function to dump the selected devices memory to disk.

CONTROLS >

This menu contains control screens to any function found in DLTtools.

Dump file size

Control file size during a core dump function.

FUP Density Change

Control media density

LOAD/UNLOAD

This menu allows the user to load and unload the tape cartridge that is in a standalone drive.

Tape Load

To load tape from the cartridge to drive.

Tape Unload

To unload tape from the drive back into the cartridge.

Move Medium

To move cartridge to and from magazine and tape drive..

UPDATE

This menu provides firmware-updating capabilities to the selected DLT Tape drive over the SCSI Bus or through the creation of a binary firmware image tape which can be used to update the tape drive.

Load Firmware

To update the firmware of a drive.

Make FUP Tape

To build a firmware update tape.

PAGES

This menu is the entry for all page commands to the tape drive. Sub menus are mode and log.

MODE

This menu allows the user to edit selected device's mode pages, to save the current pages, to restore the default or saved values. Under this selection there are *View/edit, restore and View EE-ROM Parameters*. *View/Edit* will bring up a window that allows the user to select the mode page that is to be displayed. Under the "MODE" menu the user can now select to view the EEROM parameter list in a scrolling window.

The Mode Pages that are available are:

- Read-Write Error Recovery
- Disconnect-Reconnect
- Control Mode
- Data Compression
- Device Configuration
- Medium Partition
- EEROM Parameter (Write Only)
- Generic Page Viewer

LOG

This is the Log Pages menu that provides the ability to view device's log data, clear log counters and display supported Log Pages.

Selections here are:

Supported	Displays the supported log pages for the selected device
Display	Show the requested log page
Clear	Clears the device error and performance counters

SENSE

This menu that provides a user the ability to view device data from function that fall outside the Mode and log page area.

Selections are:

Request Sense	Displays information that is return in the request sense command.
Mode Sense	Displays information that is return in the mode sense command
Read Element Status	Displays the information returned from the read element status command for medium transport (1), Storage Element (2) or the Data Transport Element (4).

DLT*diag Menus Bar*

An attempt was made to highlight command functions from menu functions. The following chapter is setup to show that under a menu selection there are sub functions. Some are commands (underlined) and some lead to other menus.

After starting **DLT*diag***, a Menu bar will be displayed across the top of your screen:

The Menu Bar contains the following sub-menu selections:

Setup

This menu supplies function to allows the user to configure **DLT*diag*** controls and system functions Under this menu the following can be found:

Device Select/Show

A function that will display devices found on the selected SCSI bus.

Drive Protection

This is a software protection switch.

Host Adapter Select/Show

A function to show or choose a host adapter that is on the system.

EXIT

Terminates the **DLT*diag*** program.

Functions

This menu contains function (underlined) and sub menus that control drive functions. Functions are “Test Unit Ready” and “Device Reset” alone with a sub-menu for “DIAGNOSTIC”.

Test Unit Ready

Allows testing the read/write readiness of a device.

Device Reset

Reset the selected device by through the host adapter.

Store to tape

Copies a file to tape then verifies the copies are the same.

Retrieve from tape

Copies the data found on tape to a file with verification.

DIAGNOSE

This menu allows the user to execute application-based diagnostics. Under this menu you can find the following:

Send Diagnostic

Sends a diagnostic request to the selected device.

Receive Diagnostic

Retrieve information about the diagnostic.

Request Sense

Retrieve and displays request sense data from the selected device

DLT Ping

A function to read and write memory in the selected device

DLT CoreDump

A function to dump the selected devices memory to disk.

Rebuild Directory

Reads users data tapes from the Bottom of Tape to End of Data.

Go-Nogo

A functional test of the tape drive

Loader Test

A test for autoloaders that marks tapes and moves then in a random selection pattern.

Commons Menus

Information

About

Displays information about the program, current revision and build date.

Support

Displays supported information for this program.

Display at the Bottom of Your Screen

The STATUS LINE is the last line on the display screen. It displays information about hot keys and memory in bytes

The INFORMATION LINE is the line on top of the STATUS LINE. It displays the currently selected device; the state of global protection; current SCSI Specification of the selected device and the execution status of each SCSI command the user Executes.

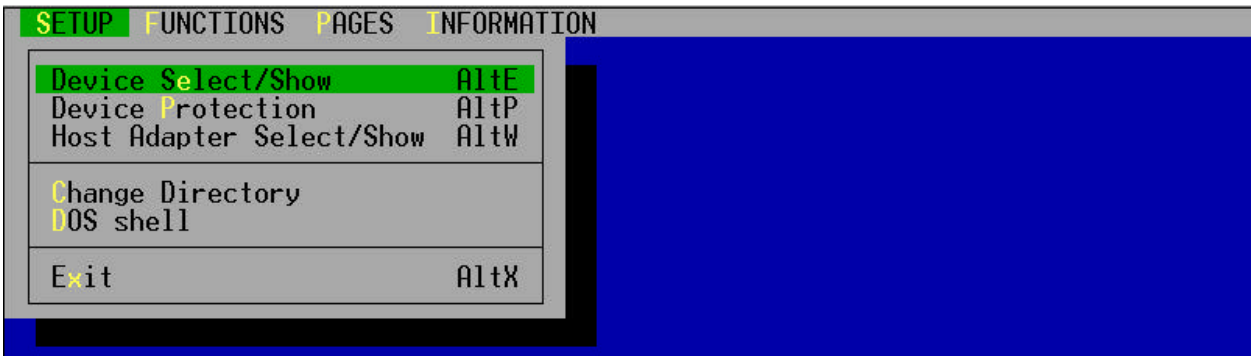
Chapter 3

Basic Operations

Under the Basic Operations both DLTtools and DLTdiag are covered in order. Because of the many differences between the two programs, each program will be covered completely before moving to the other.

Operations for DLT*tools*

SETUP Menu



Device Select/Show

This selection will display the devices that are found on the selected SCSI adapter bus. The user can select any of the devices or exit the window. Inquiry data can be retrieved in this selection. Once the device is selected all subsequent operations will be performed on that selected device. The user may click the information box to display the inquiry data and vendor unique inquiry data on the selected drive.

The information that is displayed, “Inquiry Response Data” and “Vendor Unique Data” can be found in the DLT tape drive product manual under the “Inquiry” (12H) “Drive Inquiry Response” and “Vendor Unique Inquiry Data” sections**.**

Device Protection

This is a software protection. It is always enabled when the program starts With protection on, operations that write to the device are not allowed. Current protection is always displayed on the INFORMATION LINE.

Host Adapter Select/Show

This selection allows the user to select a different host adapter if more than one are installed. When selecting this option, the number of the host adapters is determined when the system was powered up. The user is allowed to select one adapter at a time . The default is host adapter 0.

Change Directory

Changes the default directory from which files are listed on the display.

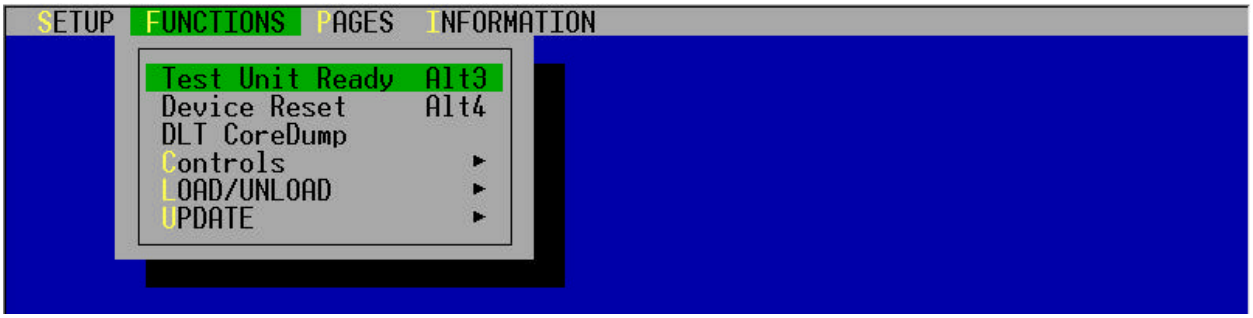
DOS Shell

This option lets the user exit to DOS and returns to **DLT*tools*** without losing the environment information.

EXIT

This option lets the user end the **DLT*tools*** program.

FUNCTIONS Menu



TEST UNIT READY

The Test Unit Ready Option sends a SCSI Test Unit Ready command to the selected device. This tests the state of the device to determine if it is ready to receive media access commands. Good status is returned if the device can accept READs and WRITEs. If the device is not ready, CHECK CONDITION is returned with the appropriate sense keys and qualifiers.

DEVICE RESET

The reset option will instruct the selected Host Adapter to reset the device. There is no SCSI command sent to the device; the reset is done through the adapter.

DLT CoreDump

This function is to allow a picture to take of the internal memory of the DLT drive. This is an engineering function and not used normally. The function will dump the contents of the drives internal memory to disk. There three file created. The naming convention is:

lramXX.vvv, dramXX.vvv, dltt.vvv

The “lram”, “dram” and “dltt” parts of the names are the memory areas that were dumped to this file. The “XX” is the file count and “vvv” is the version of the firmware that this dump is.

Under most drives the lram will be 2K bytes the dram will be 4 or 8 M bytes and the dltt is 512 bytes

If you are ask to use this function that you do not change the naming of the files. If multiple dumps are needed then use a directory tree to isolate each dump.

The maximum disk space needed for this function to work is 10Mbytes.

CONTROLS

This menu contains control screens to any function found in DLTtools.

Currently there are:

“Dump file size” This is to control the file size of the code dump function. It allows the user to chose between full size file dump or floppy (1.4Mbytes) size dump files.

“FUP Density Change” This is to control the density that is written to the media cartridge. Its primary function is to change the density on a DLT7000 from its native density of 35GB to the native density of 20GB for the DLT4000. This allows the user to build firmware update tape for the DLT4000 on a

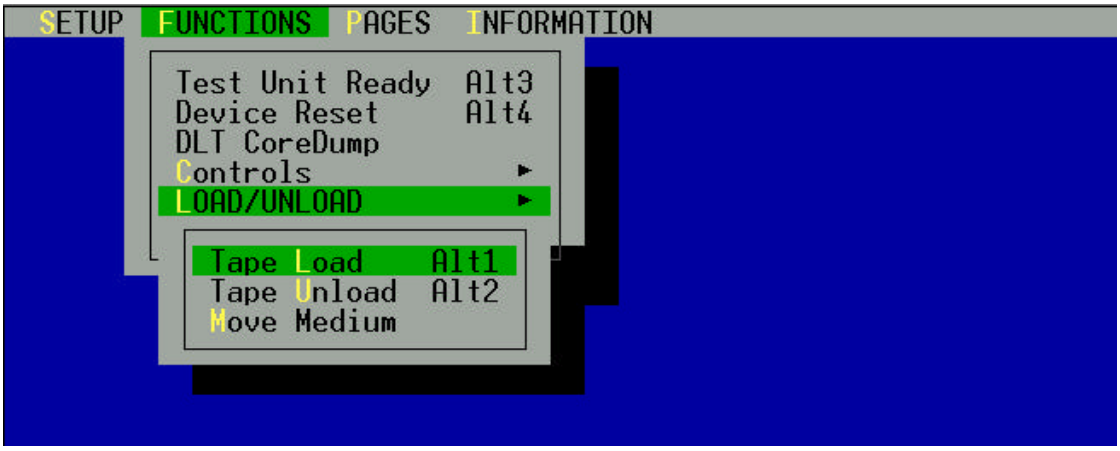
DLT7000 drive. This function is active only when the selected drive is a DLT7000 and there is DLTtape IV cartridge in it. This function will not perform normally if the user changes the density using the front panel switches.

LOAD/UNLOAD

With these functions, the user may load and unload a tape in a DLT drive.

The LOAD function will instruct the drive to move the beginning of the tape from the cartridge to the take up reel and to position the tape such that BOT is at the head.

The UNLOAD means that if the unit is a standalone drive this functions will cause the drive to return the tape to the cartridge and set the drive to the "Operate Handle" mode. In an "Autoloader"' and on the first pass of the magazine, the "UNLOAD" function will also cause the cartridge to be moved from the drive back to its place in the magazine and the next cartridge (in order) be moved to the drive and loaded.



TAPE LOAD

The Tape Load sends a SCSI Load command to the selected drive to load the media in the tape cartridge. This command does not support the autoloader units. In this case, the tape load command will fail.

TAPE UNLOAD

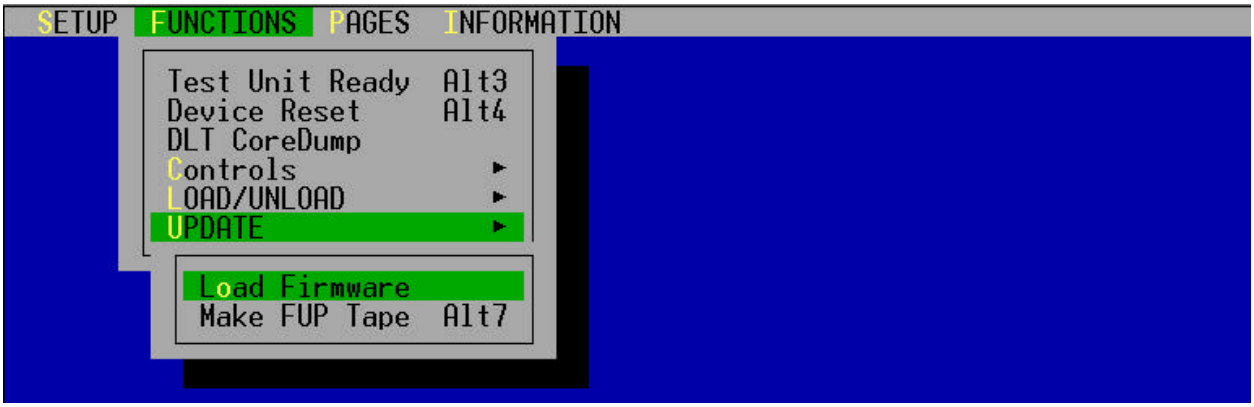
The tape Unload sends a SCSI Unload command to the selected device to unload the media in the tape cartridge. This command does not support the autoloader units. In this case, the tape unload command will unload the tape, the loader part will then take the tape and return it to the magazine. The next tape is then placed in the drive an loaded. This will continue till the last tape in the magazine has been cycled.

MOVE MEDIUM

The selection will bring up the main Move Medium Window. It allows the user to input the source and destination addresses (location) for the drive and cartridge in a loader magazine. Addresses starts at 10 HEX for the drive and 100HEX for the first slot of the magazine. These number increment by one. The address for the magazine will be 100, 101, 102, …. The same is true for the drive (10, 11, …) but this will only happen in a library unit.

Note: *Once the Move Medium command is used the Tape load and unload command will not function and no error are reported.*

UPDATE



LOAD FIRMWARE

When this selection is picked the user can select a firmware file to load. This is done through a windowing system that will display all the file in the current directory. If the directory needs to change, the used may either enter the full path of the directory needed or return to the setup menu and change the directory through the “change directory” selection.

When the LOAD FIRMWARE option is chosen the following message will appear in a popup screen: “Firmware update in process, please wait do not power cycle the drive."

It is very important that the drive does not loss power during a firmware update. This is because the internal system is overlaying itself with the new image. If power is lost before the update is completed the drive will become inoperative and must be returned to the factory for reinsertion of the firmware.

The normal time out for this function is set to 5 minutes.

The firmware files are binary image and must have one of the following sizes.

FILE SIZE (Kbytes)	DEVICE TYPE
256	THZ01(DLT260, THZ02(DLT600)
576	DLT2000, DLT4000
648	DLT7000
128	DLTstor

Note: You MUST wait until the Status Update is completed. A popup screen will prompt the user “firmware update successfully completed.” If you power cycle the drive while the update is in progress you will permanently damage the drive. It will need to be returned to the factory.

MAKE FUP TAPE

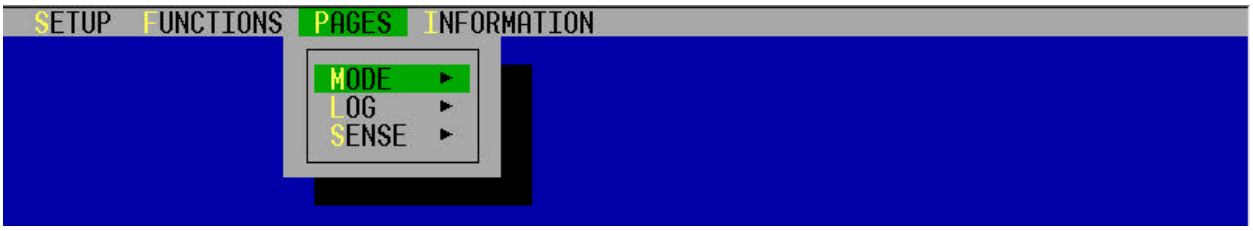
This selection allows the user to select and write a firmware code file to the tape that is loaded in a selected device. The tape can then be used to update the drive firmware without having it attached to a system. ***The DLT drive must be in uncompressed mode to properly make the firmware update tape.*** If the drive supports compression, **DLT*tools*** will disable the compression automatically provided the user has not selected the density from front panel. If the user has selected the density from front panel then he must manually select an uncompressed density. If the tape is not formatted then the drive will format it when it is issued a SCSI write command (this is part of the Make FUP Tape process). The DLT tape must not be write protected. This function does not have an DOS command line function.

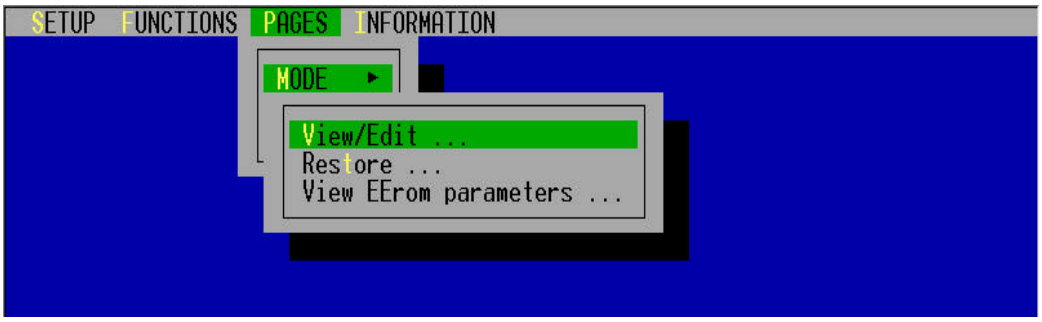
Also see "***CONTROLS/ FUP Density Change"*** for more information on building FUP tapes.

NOTE on DIAGNOSE

The diagnose menu has been removed from DLTtools and placed in it's own program "DLTdiag". This was done to reduce the size of either so not to interfere with system operations or hog system resources. This selection is a feeble (at best) attempt to link to the DLTdiag program. In some cases the link will not work and the user will need to run DLTdiag directly

PAGES MENU





MODE MENU

VIEW/EDIT

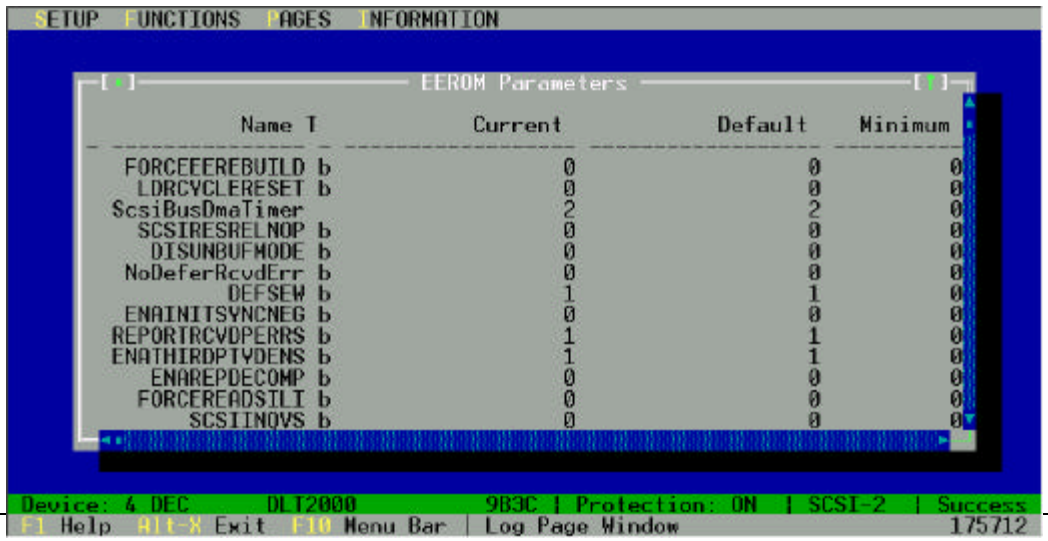
User can edit Current Mode Pages of the selected device. After a page is selected it will be displayed. The user can edit fields designated as changeable by the device. All bit fields are represented by a check box, which can be set on/off. All non-bit fields contain DECIMAL INTEGER data, unless otherwise specified.

RESTORE

Copies either the default pages or saved pages into the current pages.

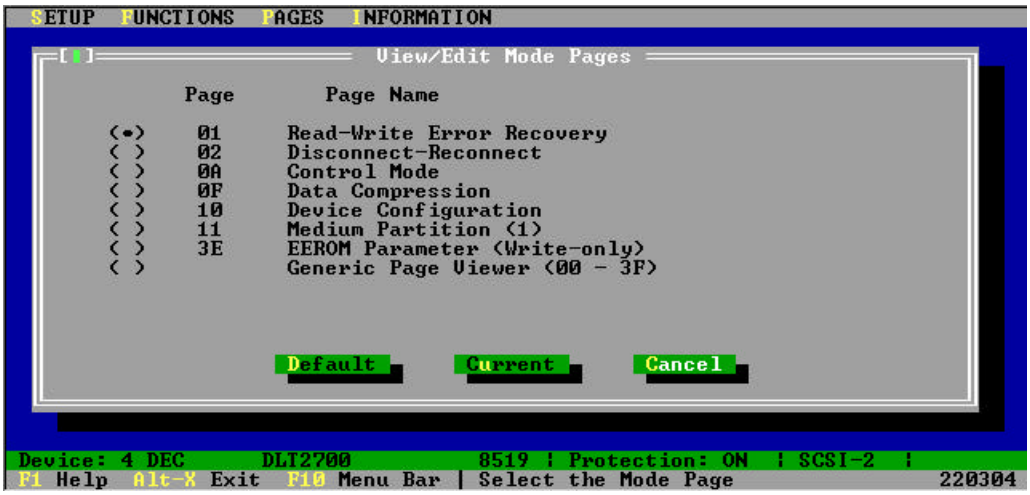
View EPROM Parameters

The user can use this selection to view the EPROM parameters that are stored in the drive. See you product manual for more information on these parameters.



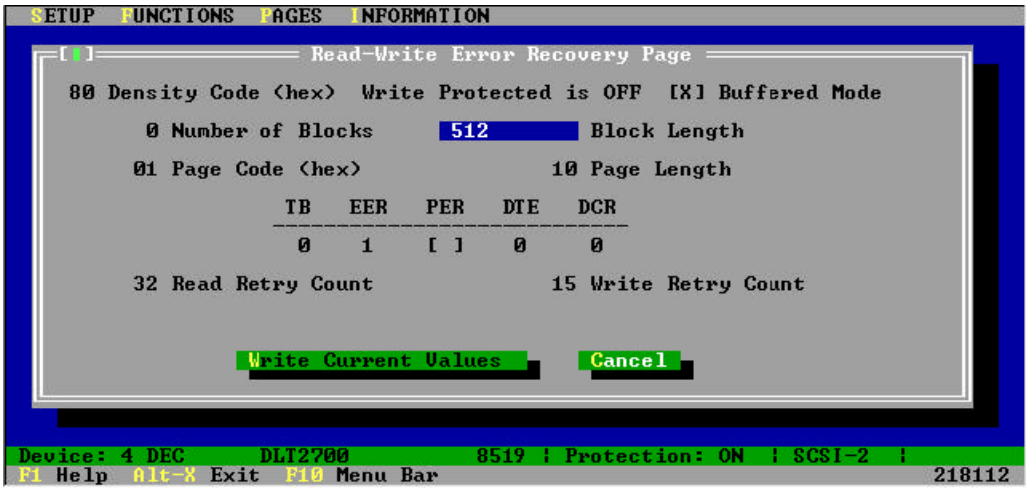
MODE SELECT PAGES

The MODE SELECT pages set the device parameters. Each page has a 2-byte header, which identifies the page code and indicates the number of bytes in that page.



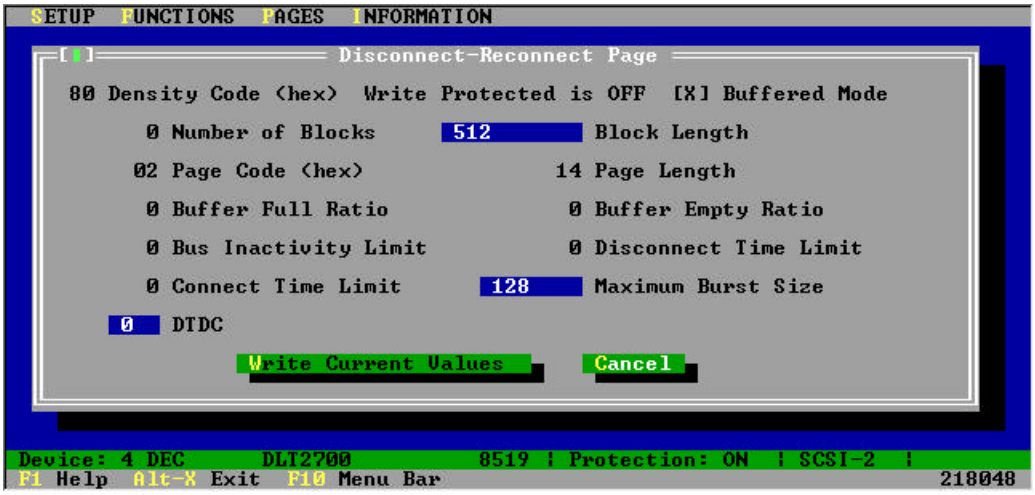
READ/WRITE ERROR RECOVERY PAGE (01h)

This selection will display information about the read and write retry count. Other information can be retrieved from this screen such as block length, write protection. In this page, only the Post Error (PER) flag parameter is changeable. If PER is set, Check Conditions will be created, with Sense Key of Recovered Error, and VU Sense Data detailing the cause. Normally, these events should be rare, and only occur if the recovered write or read retry rates reach excessive levels.



DISCONNECT/RECONNECT PAGE (02h)

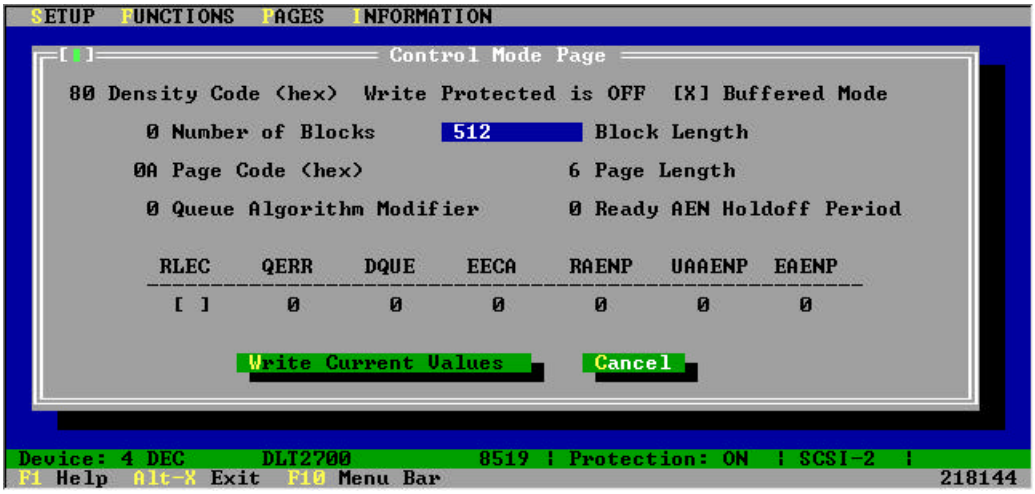
The drive reports the Disconnect/Reconnect Page, which has the following format:



In this page, only the Maximum Burst Size parameter is changeable.

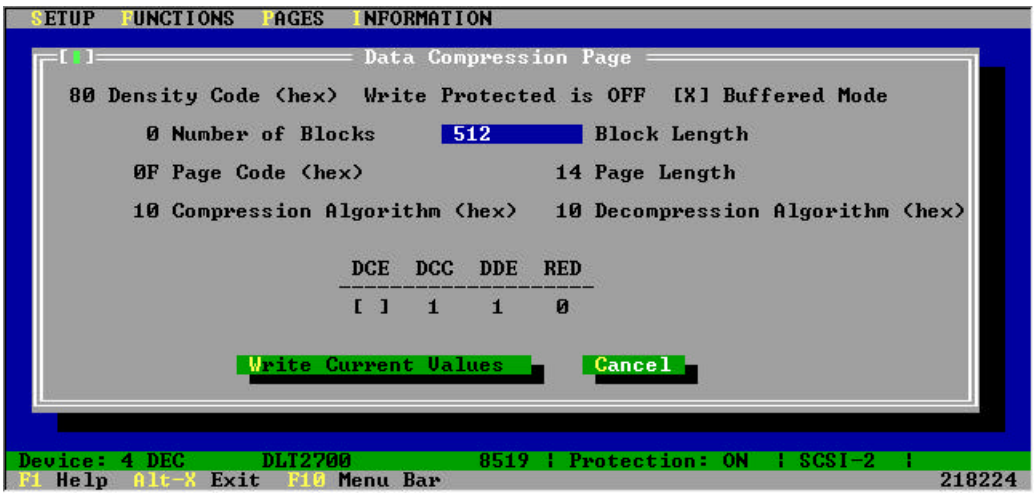
CONTROL MODE PAGE (0Ah)

The control mode page provides controls over several features such as tagged queuing, extended contingent allegiance, asynchronous event notification, and error logging. The control mode page is returned by the DLT drive in the following format:



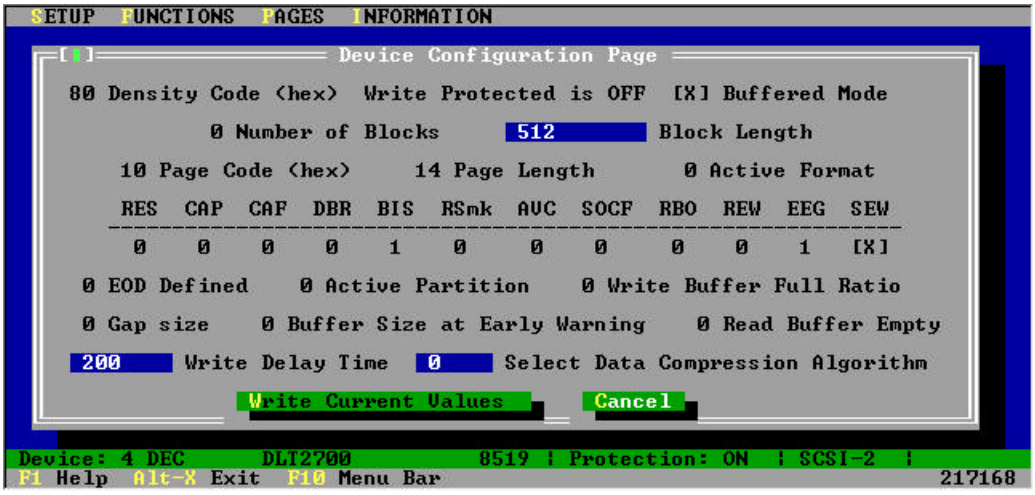
A report log exception condition (RLEC) bit of one specifies the target shall report log exception conditions. An RLEC bit of zero specifies the target shall not report log exception conditions.

DATA COMPRESSION PAGE (0Fh)



DEVICE CONFIGURATION PAGE (10h)

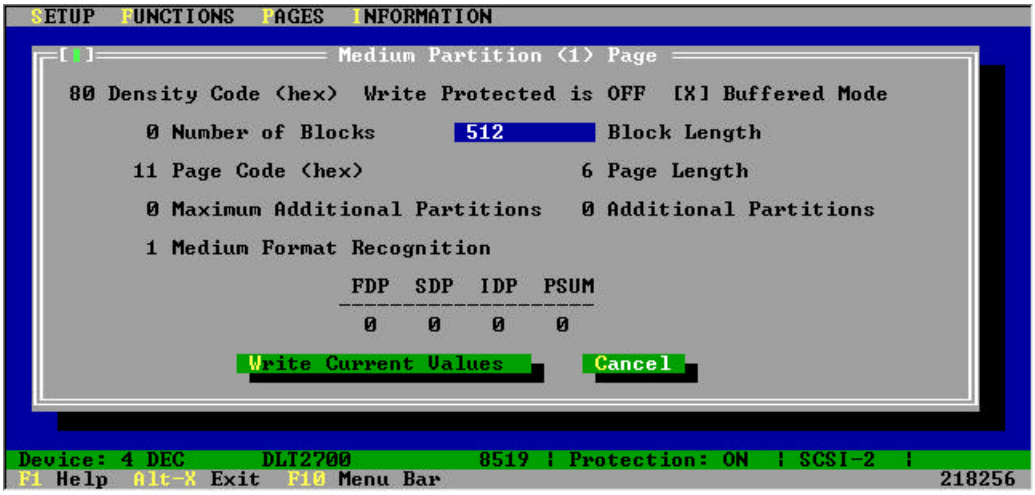
The drive returns the Device Configuration Page, which has the following format:



In this page, only the Write Delay Time and Select Data Compression Algorithm parameters are changeable.

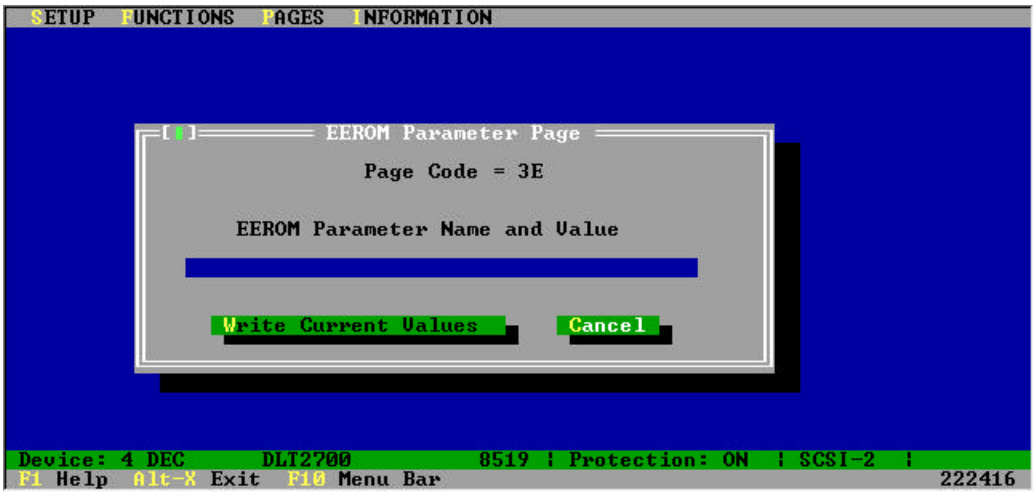
MEDIUM PARTITION PAGE (11h)

The drive returns the Medium Partitions Parameter Page, which has the following format:



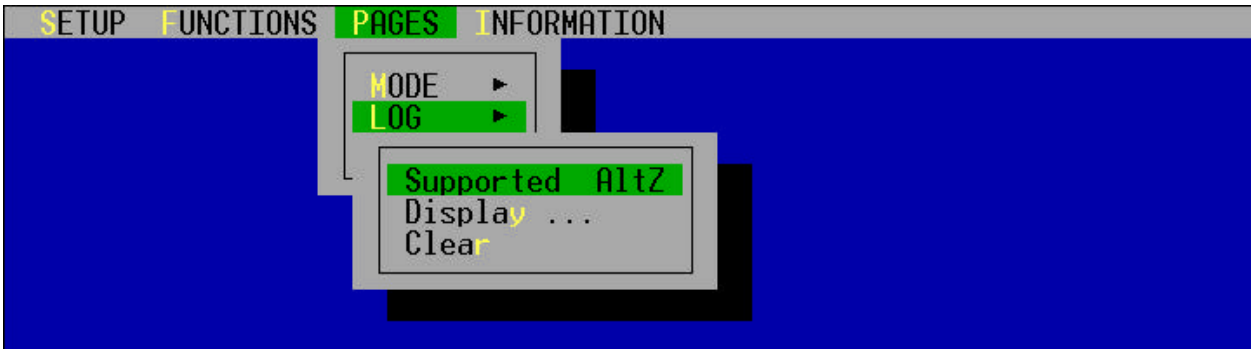
EEROM VENDOR UNIQUE PAGE (3Eh)

The drive supports a vendor unique page, which the user can use to modify savable parameters. Only one savable parameter may be changed per Mode Select command. It has the following format:



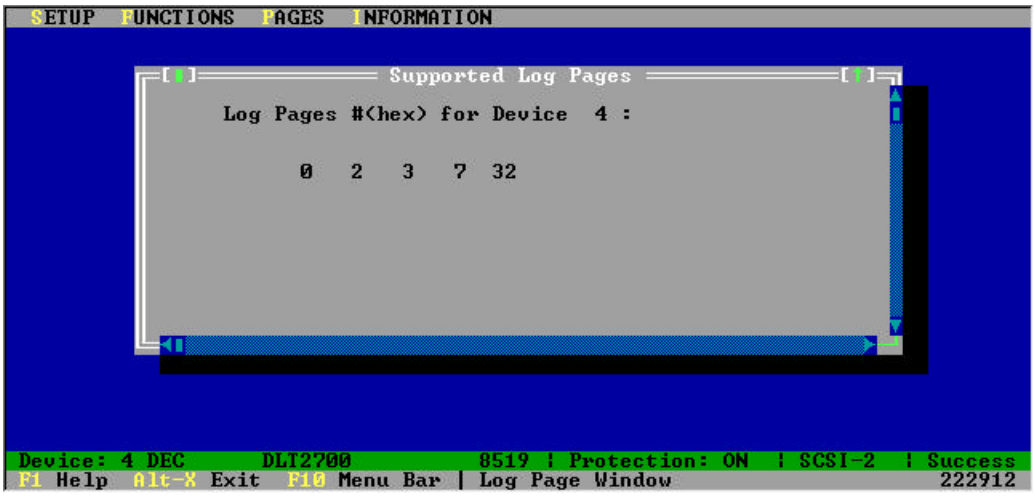
The ASCII string has a parameter name, followed by one or more space characters, a parameter value, and an ASCII line feed or null character. When the string is parsed the parameter value will be interpreted as indicated in the following table. The parameter name may be in upper or lowercase. See your DLT product manual for more information on the parameter list.

LOG MENU



LOG PAGES SUPPORTED

This option will display supported Log Pages for the selected device as reported in device's Log Page 0.



The following is a description of supported pages.

Page Code	Page Description
00h	List of Supported Pages Page
02h	Write Error Counter Page
03h	Read Error Counter Page
07h	Last n Errors Events Page
32h	Compression Ratio Page

DISPLAY LOG PAGES

Display of the requested Log Page parameter by parameter for the supported log pages.

READ/WRITE ERROR LOG SENSE PAGE FORMAT (PAGE 2 AND 3)

Each Log page begins with a 4-byte header followed by a number of log parameter blocks, each block of 8 bytes except for parameter code 5h.

The log parameter block for the Parameter total bytes processed (5h) is 12 bytes, since the parameter value is 8 bytes long.

	7	6	5	4	3	2	1	0
0	Reserved		Page Code					
1	Reserved							
2	(MSB)							
3	Page Length							(LSB)

Log Parameter(s)

	7	6	5	4	3	2	1	0
0	(MSB)							
1	Parameter Code							(LSB)
2	DU	DS	TSD	ETC	TMC	Rsvd		LP
3	Parameter Length							
4 | 11	(MSB) Parameter Value							(LSB)

PARAMETER CODES SUPPORTED FOR READ/WRITE ERROR LOG SENSE PAGE 2 AND 3

Parameter Code	Description
00h	Errors corrected with substantial delays
01h	Errors corrected with possible delays
02h	Total rewrites or rereads
03h	Total errors corrected
04h	Total times correction algorithm processed
05h	Total bytes processed
06h	Total uncorrected errors
8000h	Vendor Unique

Parameter codes 00h, 01h, and 04h will always return a value of zero.

LAST n ERROR EVENTS PAGE (PAGE 07h)

This page returns one parameter at a time that consists of the ASCII text for the specified event log. The Parameter Number field in the CDB specifies the log event to return. The log events EEROM are numbered 0 to 255, after which the number wraps back to 0, and only a limited number of events are stored at a given time (up to 14). The log event returned is the one whose number is equal to, or the first one greater than, the Parameter Number specified in the CDB.

	7	6	5	4	3	2	1	0
4	(MSB)							
5	Parameter Code							(LSB)
6	DU	DS	TSD	ETC	TMC		0	LP
7	Parameter Length (n-8)							
8								
...	Hex ASCII string for Event n							
n								

READ/WRITE COMPRESSION RATIO PAGE (PAGE 32h)

PAGE HEADER

	7	6	5	4	3	2	1	0
0	Reserved		Page Code					
1	Reserved							
2	(MSB)							
3	Additional Length							(LSB)

The additional length field specifies the number of bytes available and depends on the parameters requested.

PARAMETER CODES SUPPORTED

Parameter Code	Description
00h	Read Compression Ratio x 100
01h	Write Compression Ratio x 100
02h	Mbytes Transferred to Host
03h	Bytes Transferred to Host
04h	Mbytes Read from Tape
05h	Bytes Read from Tape
06h	Mbytes Transferred from Host
07h	Bytes Transferred from Host
08h	Mbytes Written to Tape
09h	Bytes Written to Tape

PAGE FORMAT

Parameter block for parameter code 00 and 01

	7	6	5	4	3	2	1	0
0	(MSB)							
1	Parameter Code							(LSB)
2	DU	DS	TSD	ETC	TMC		Rsvd	LP
3	02h							
4	(MSB)							
5	Compression Ratio x 100							(LSB)

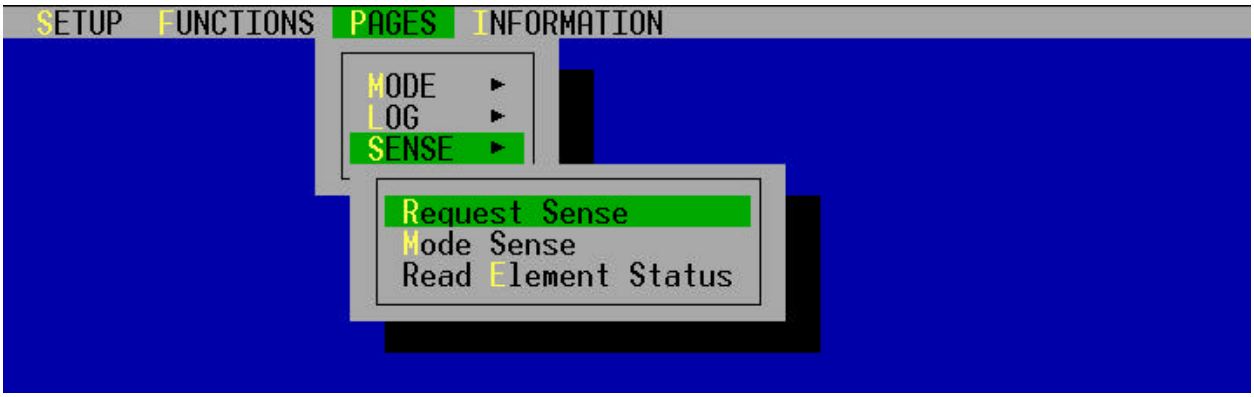
Parameter block for parameter codes 02 through 09

	7	6	5	4	3	2	1	0
0	(MSB)							
1	Parameter Code							(LSB)
2	DU	DS	TSD	ETC	TMC		Rsvd	LP
3	04h							
4	(MSB)							
5	Counter Value							
6								
7								(LSB)

CLEAR LOG PAGE COUNTERS

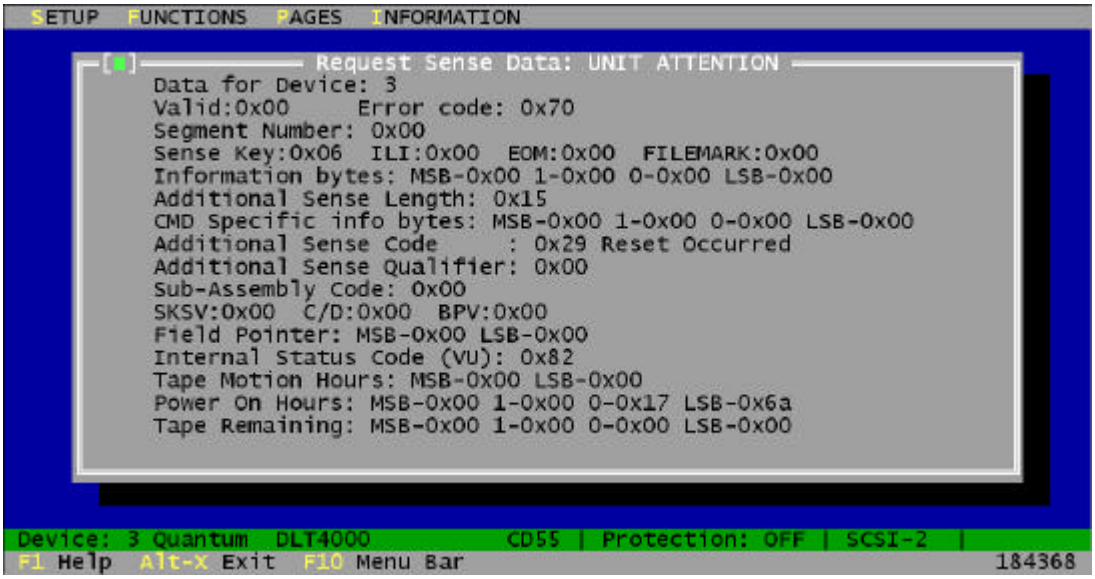
This option will zero the device's error and performance counters. Refer to the device specification for a description of these counters.

SENSE MENU



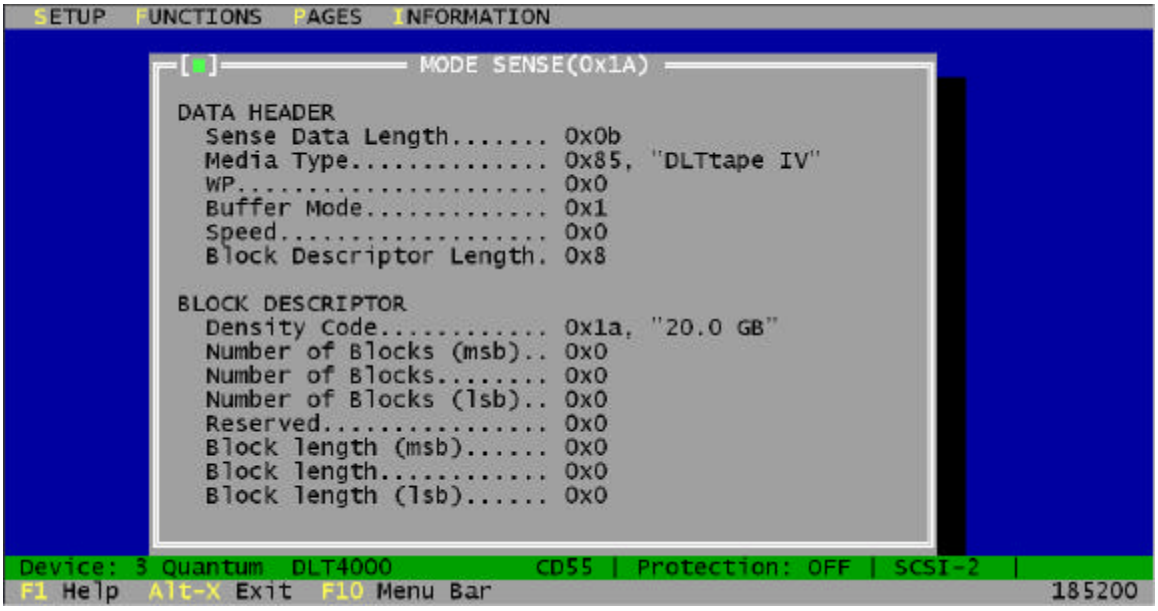
Request Sense

This function will retrieve the request sense data from the selected device and display it for the users viewing. The lay out of the data follows the structure of the data return by the device with the exception of the ASC and ASCQ codes. It the program can it will display the ASCII text for the codes just under the line that has the codes on it. Other then this exception the information will be:



Mode Sense

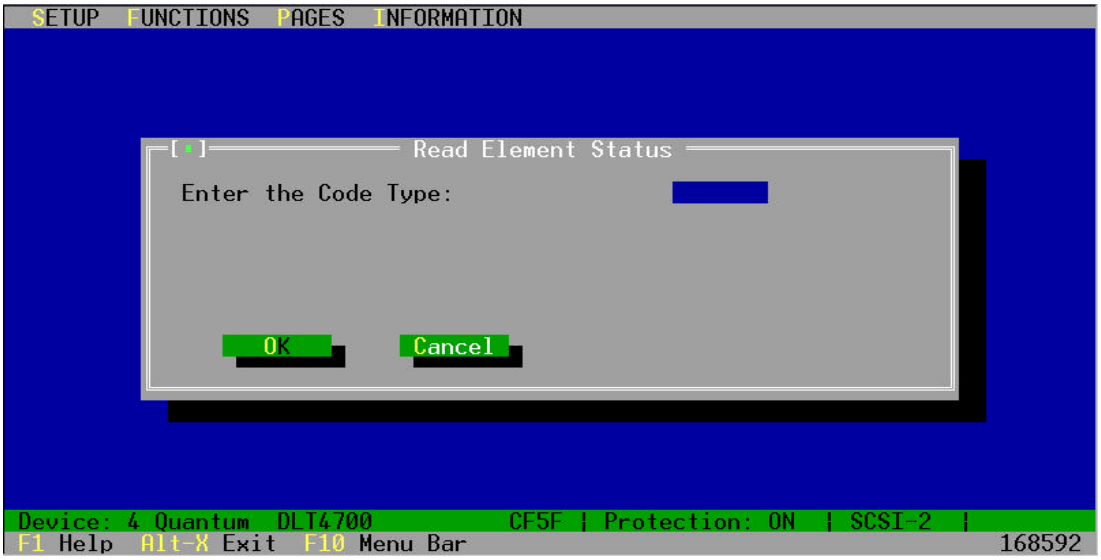
This menu pick will retrieve the Mode Sense information from the selected device and display it as follows:



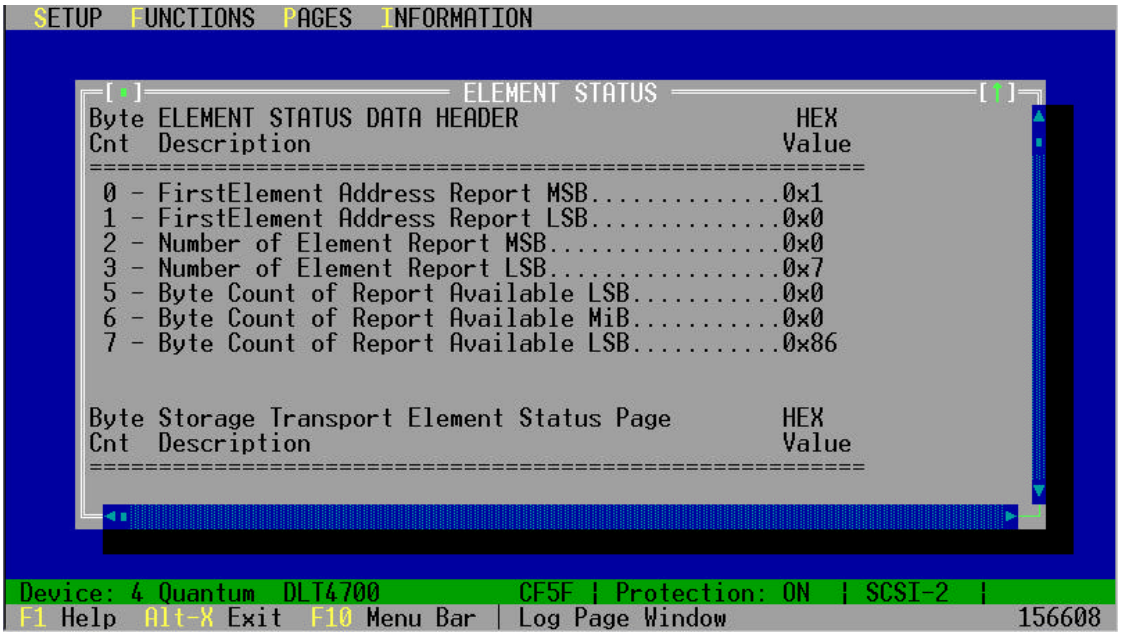
Read Element Status

This menu pick will bring up the Read Element Status window. The User is asked to enter the element status page code. This "code type" is defined as:

Code Type	Code Description
01h	Medium Transport Element (elevator)
02h	Storage Element (magazine)
04h	Data Transfer Element (drive)

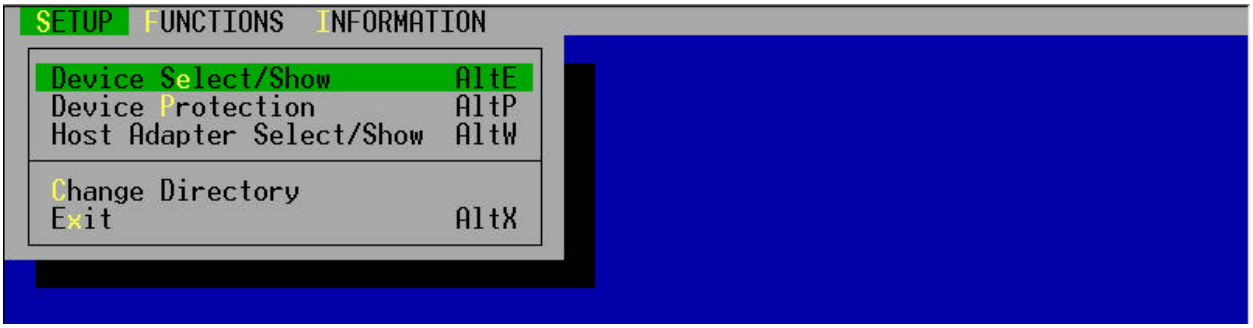


The following is an example when the code type of 2 is entered.



Operations for DLT*diag*

SETUP Menu



Device Select/Show

This selection will display the devices that are found on the selected SCSI adapter bus. The user can select any of the devices or exit the window. Inquiry data can be retrieved in this selection. Once the device is selected all subsequent operations will be performed on that selected device. The user may click the information box to display the inquiry data and vendor unique inquiry data on the selected drive.

The information that is displayed, “Inquiry Response Data” and “Vendor Unique Data” can be found in the DLT tape drive product manual under the “Inquiry” (12H) “Drive Inquiry Response” and “Vendor Unique Inquiry Data” sections**.**

Device Protection

This is a software protection. It is always enabled when the program starts With protection on, operations that write to the device are not allowed. Current protection is always displayed on the INFORMATION LINE.

Host Adapter Select/Show

This selection allows the user to select a different host adapter if more than one are installed. When selecting this option, the number of the host adapters is determined when the system was powered up. The user is allowed to select one adapter at a time . The default is host adapter 0.

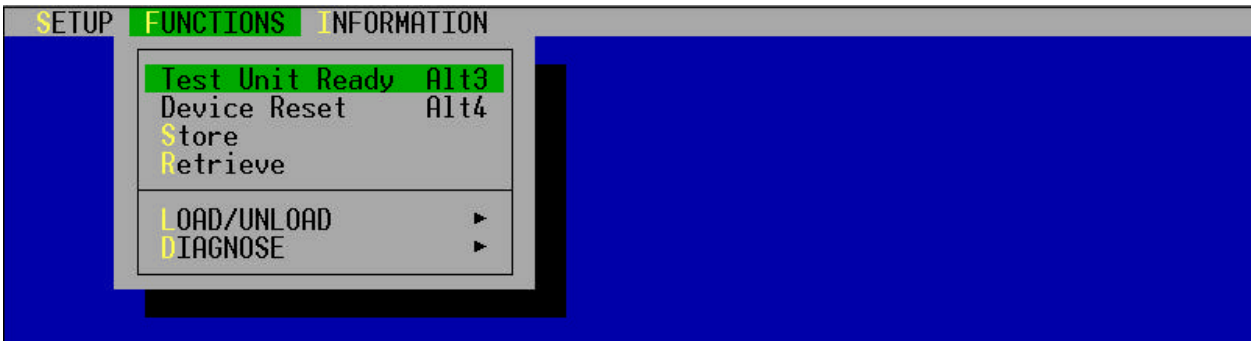
Change Directory

Changes the default directory from which files are listed on the display.

EXIT

This option lets the user end the **DLT*diag*** program.

FUNCTIONS Menu



TEST UNIT READY

The Test Unit Ready Option sends a SCSI Test Unit Ready command to the selected device. This test determines if the device is ready to receive media commands. Good status is returned if the device can accept tape commands. If the device is not ready, CHECK CONDITION is returned with the appropriate sense keys and qualifiers.

DEVICE RESET

The reset option will instruct the selected Host Adapter to reset the device. There is no SCSI command sent to the device; the reset is done through the adapter.

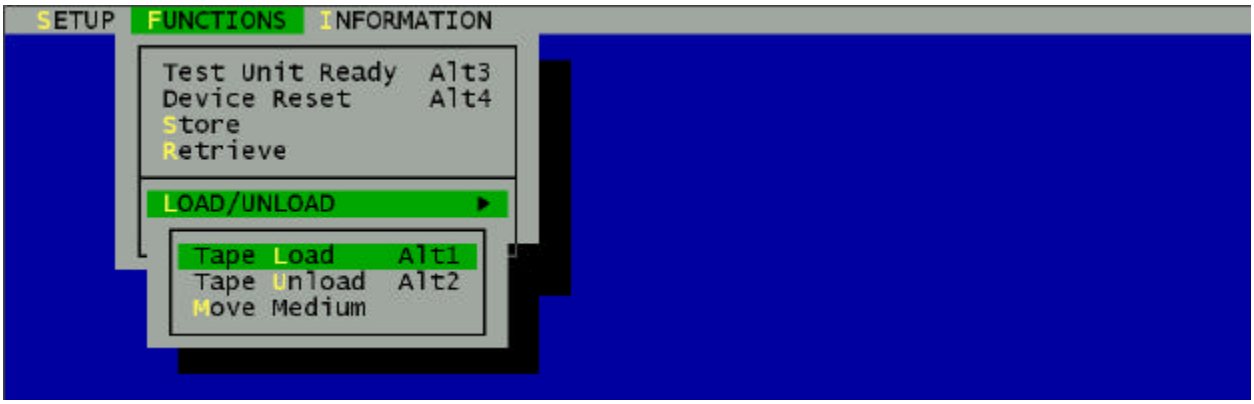
STORE

This function allows the user to store a file to tape. It starts by asking the user to pick a file to store. The program will bring up a window that will display all file and directories in the current directory. The user may move from directory to directory until the one is found that contains the file to use. once the file is chosen, the program will write it to the tape. On success, the final status window is displayed with the file name and the size of the file. This function is not found in the Command Line Interface.

RETRIEVE

This is the counter part to “Store”. The function allows the user to extract data from the tape an store it in a file. The file is placed in the current directory. the user must supply the amount of data that is to be copied from tape to the file. To little and the file is truncated. To much and the size of the file will be larger by a small number of bytes. This function is not found in the Command Line Interface.

LOAD/UNLOAD MENU



TAPE LOAD

The Tape Load sends a SCSI Load command to the selected drive to load the media in the tape cartridge. This command does not support the autoloader units. In this case, the tape load command will fail.

TAPE UNLOAD

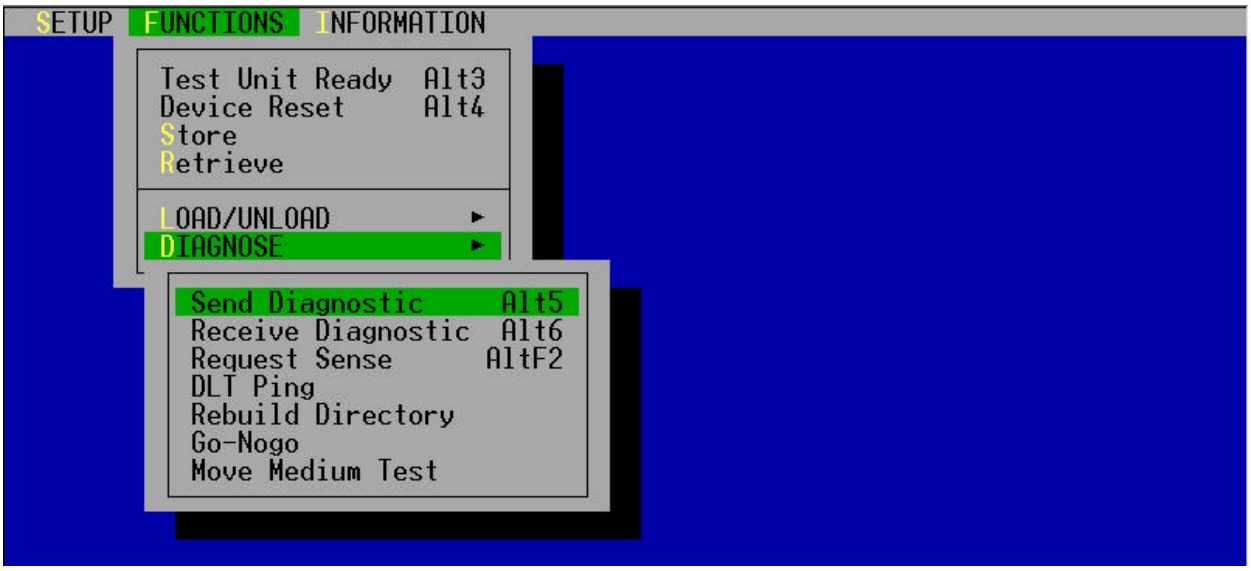
The tape Unload sends a SCSI Unload command to the selected device to unload the media in the tape cartridge. This command does not support the autoloader units. In this case, the tape unload command will unload the tape, the loader part will then take the tape and return it to the magazine. The next tape is then placed in the drive an loaded. This will continue till the last tape in the magazine has been cycled.

MOVE MEDIUM

The selection will bring up the main Move Medium Window. It allows the user to input the source and destination addresses (location) for the drive and cartridge in a loader magazine. Addresses starts at 10 HEX for the drive and 100HEX for the first slot of the magazine. These number increment by one. The address for the magazine will be 100, 101, 102, …. The same is true for the drive (10, 11, …) but this will only happen in a library unit.

Note: *Once the Move Medium command is used the Tape load and unload command will not function and no error are reported.*

DIAGNOSE MENU



SEND DIAGNOSTIC

The Send Diagnostic instruction is sent to the selected device. It will perform a default self test. The program will wait until the self test returns a success or failure on completion.

RECEIVE DIAGNOSTIC

The Receive Diagnostic will retrieve the results of the last self-test performed on the device. The results are in a pass/fail form.

REQUEST SENSE

The **Request Sense** selection will retrieve the request sense information from the selected device. The information returned from the drive is decoded and displayed on the screen.

DLT Ping

The “DLT Ping” function is a tool that can be used to test the integrity of the SCSI bus and the drives front end electronic. This function will read/write and compare data that is moved from the PC to the drive and back. The data is a walking one pattern that at the end of the pattern walk will start a XOR random pattern. This test will continue to run until the user presses the return key of the keyboard or an error occurs.

Rebuild Directory

This function is to rebuild the internal directory that the DLT drive keeps about each tape. This directory is used to locate spots on the tape quickly. There are times this directory becomes invalid or partial. This function has been designed to re-build the directory and update the tape. In short the function will start at Beginning Of Tape (BOT) and a space command is issued to space to End Of Data (EOD) Once the EOD is encountered the tape is unloaded.

Go-Nogo

The Go-Nogo test will test serial function of the drive This is a destructive test. It will write over any data that is on the tape. It is advised that a blank or scratch tape be used. This test will run through the self diagnostic, a bus transfer test, a write and a read test, and a tape unload/load test.

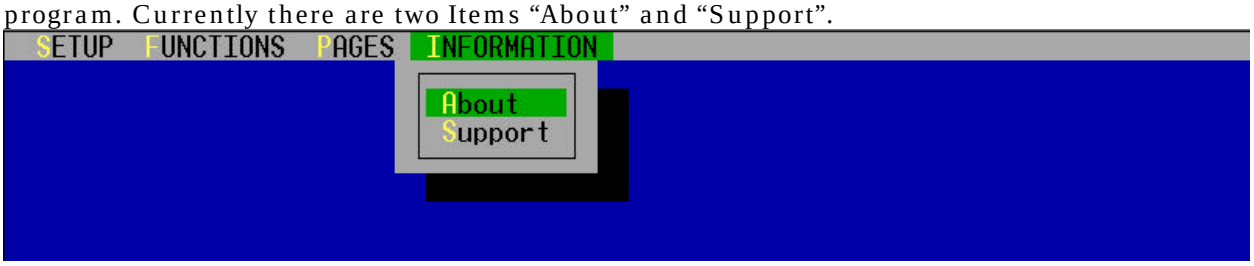
Move Medium Test

Currently there is no test defined.

Operations found in all

Information Menu

The Information menu is setup to inform the user of items that pertain to the current program. Currently there are two Items “About” and “Support”.



About

This screen will display the current revision and build date of the program

Support

This screen displays information about support through Email.

Display at the Bottom of Your Screen

The STATUS LINE is the last line on the display screen. It displays information about hot keys and memory in bytes

The INFORMATION LINE is the line on top of the STATUS LINE. It displays the currently selected device; the state of global protection; current SCSI Specification of the selected device and the execution status of each SCSI commands the user Executes.

Chapter 4

Command Interface Menu

The command line help text has been removed from the DLT utilities and placed in it's own program "CL_help.exe". The user may continue to use the same commands that they have always used because of the links placed in DLTtools and DLTdiag. If the system path is correct, the program "CL_help " will be started when the help flag is found in the command line. All of the command line functions found in these utilities are supported by this program. The /help function will allow the user a quick navigation through a selection of commands for both programs. This is a straightforward command selection system, which allows the user to view needed information to operate the programs in a command line stile.

Help Menu

To execute a Help Command by running CL_help or other utility from the DLTtools package with the "/help" command:

CL_help /help [/(command)]

Note: In order for your COMMAND to work you must leave a space between each command entered.

Once the /help command is entered, the following message will be displayed:

Command		**Description**
		(Common to both DLT*tools* and DLT*diag*)
/win		Invoke a Window-like User Interface.
/sniff	/...	Determine which devices are on the bus.
/scload	/...	Send a SCSI Load to the device.
/scunload	/...	Send a SCSI Unload to the device.
/tur	/...	Send a SCSI Test Unit Ready to the device.
/reset	/...	Reset the device through the adapter.
/get	/…	Retrieves request sense information.
/help		Display this help message.
/help	/<command>	Display specific help for one of the valid commands.
		(Found only in DLT*diag*)
/senddiag	/...	Sends a Self-Test diagnostic command to device.
/rcvdiag	/...	Retrieves diagnostic results of a Self-Test.
/read	/…	read from any supported buffer area.
/write	/…	write to the buffer area zero.
/eod	/…	read the tape from start to finish.
/gng	/…	Go-Nogo test
/wbe	/…	Write from Beginning of tape to End of medium

/rbe	/...	Read from Beginning of tape to End of medium **(Found only in DLT*tools*)**
/make	/...	MAKEs a firmware update tape.
/load	/...	update a device with new code.
/mode	/...	MODE page editor.
/log	/...	display/clear LOG sense data.
/msd	/...	display Mode Sense Data.
/mme	/...	Move MEdium
/els	/...	read ELement Stutus

Note: '/...' indicates more parameters
ex. To display help for the code loader, type: DLTtools /help /load

/Help Command Top Level Qualifier Description

The help engine "CL_HELP.exe" will print help for this command. Commands for **DLT*tools*** and DLTdiag are. SYNTAX: CL_HELP */help /(command)*

/WIN

The /WIN command invokes a Character-cell User Interface (CUI). Default mode when the program is run with out arguments. This window interface has pull down menus that offer easy access to the full set of commands. Dialog boxes make entering command parameters straightforward and intuitive.

SYNTAX:
DLTtools /win
DLTdiag /win

/LOA, (DLTtools only)

The LOAD command will update a device with new code. A binary code file is required as a parameter. If no path information is specified for the file (i.e. just a file name), then the current directory is used to search for the file. If the code file resides in a location other than the current directory, the full path name must be specified (see 2nd SYNTAX example). The device number must also be specified as a parameter. This is the SCSI identification number of the device to be loaded.

OPTIONS:
/ada The host adapter that the device to be updated is on. (0 or 1)
/dev The SCSI Device ID is set to the drive to be updated. (0 through 7)
/fil=8.3 This is the input file name for the load command. It must point to a firmware image file.

SYNTAX:
DLTtools /loa /fil=tzv35oem1.fup /dev=1
DLTtools /loa /fil=c:\code\tzv35oem1.fup /dev=2 /ada=1

/EOD, (DLTdiag only)

The EOD command is a read to end of data function is will rewind the tape to BOT then start reading. This function is to force the drive to re-scan the data on the tape to rebuild the internal directory the drive keeps of the tape. Once EOD is found the tape is unloaded forcing the directory area of the tape to be updated. The

function is setup to fund the EOD by reading till there is no data return on a read. The program will continue to read from the drive until it has tried 64 time. At this point it is assume that this is EOD.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)

SYNTAX:

DLTdiag /eod /dev=4

/MOD, (DLTtools only)

The MODE command is used to read mode page(s) from the device and send mode page(s) to the device. The command qualifiers are described below.

OPTIONS:

/fil=s	In conjunction with the /cmd qualifier, this is the output file name for /cmd=sense and the input file for the /cmd=select. The file contains mode page data in an ASCII readable format.
/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI device ID.
/cmd=s	"sense" is used to read mode page data. "Select" is used to send mode page data to the device.
/typ=s	Sense currents, saved, default, or changeable values. Select only current or saved move page values.
/pag=n	The mode page specified as a hexadecimal number. A page number of 3F can be used to read all supported mode pages. (SENSE only).

SYNTAX:

```
DLTtools  /mod  /fil=pg_out.txt  /dev=1  /cmd=sense  /typ=current  /page=3E
DLTtools  /mod  /fil=pg_out.txt  /dev=3  /ada=1 /cmd=sense  /typ=current  /page=3e
DLTtools  /mod  /fil=pg_out.txt  /dev=1  /cmd=sense  /typ=default  /page=3F
DLTtools  /mod  /fil=pg_out.txt  /dev=1  /cmd=sense  /typ=changeable  /page=1
DLTtools  /mod  /fil=pg_in.txt   /dev=1  /cmd=select  /typ=current
DLTtools  /mod  /fil=pg_in.txt   /dev=1  /cmd=select  /typ=saved
```

/LOG, (DLTtools only)

The LOG command is used to read log page(s) from the device and send log page(s) to the device. The command qualifiers are described below.

OPTIONS:

/fil=s	In conjunction with the /cmd qualifier, this is the output file name for /cmd=sense and the input file for the /cmd=select. The file contains log page data in an ASCII readable format.
/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI device ID.
/cmd=s	"sense" is used to read mode page data. "Select" is used to reinitialize counters in all log pages to their default values.
/pag=n	The log page specified as a hexadecimal number. A page number of 0 can be used to read all supported mode pages. (SENSE only).

SYNTAX:

```
DLTtools    /log  /fil=pg_out.txt /dev=1 /cmd=sense  /page=1
DLTtools    /log  /fil=pg_out.txt /dev=1 /cmd=sense  /page=3e
DLTtools    /log  /dev=1          /cmd=clear
```

/SNI

The SNIFF command interrogates the bus to identify which devices are present. Information gathered from each device is displayed to the user

OPTIONS:

/ada=n The host adapter ID that the tape drive is on. (0 or 1). Default is zero (0).

SYNTAX:

```
DLTtools  /sni   /ada=1
```

/SCL

The SCLOAD command sends a SCSI load to the DLT tape drive. A DLT tape needs to be present in the tape drive. The drive will load and calibrate the tape and tape will then be positioned at logical BOT.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)
/imm	Set is default. Controls the return status. if set, status is returned as soon as the operation is started. If not set status is returned when operation is completed.

SYNTAX:

```
DLTtools  /scl   /dev=1
```

/SCU

The SCUNLOAD command sends a SCSI Unload to the DLT tape drive.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)
/imm	Set is default. Controls the return status. if set, status is returned as soon as the operation is started. If not set status is returned when operation is completed.

SYNTAX:

```
DLTtools  /scu  /dev=1
```

/TUR

The TUR command sends SCSI Test Unit Ready to the device. The user selects the Host Adapter (the default is Host 0). A valid SCSI device number must be also specified.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)

SYNTAX:

```
DLTtools  /tur   /dev=1
DLTtools  /tur   /ada=1 /dev=2
```

/RES

The RESET command will reset the device through the adapter. The user selects the Host Adapter (the default is Host 0). A valid SCSI device number must also be specified.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)

SYNTAX:

```
DLTtools   /res   /dev=1
DLTtools   /res   /ada=1 /dev=2
```

/SEN, (DLTdiag only)

The SENDDIAG command sends a Self Test SCSI Send Diagnostic command to the device. The device will go into a self test and report the results upon completion of the test.

OPTIONS:

/adap=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)

SYNTAX:

```
DLTdiag   /sen  /dev=1
DLTdiag   /sen  /ada=1 /dev=2
```

/RCV, (DLTdiag only)

The RCVDIAG command sends a SCSI Receive Diagnostic Results command to the device. The device will report the results of the last Self Test.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)

SYNTAX:

```
DLTdiag   /rcv  /dev=1
DLTdiag   /rcv  /ada=1 /dev=2
```

/GET

The get command retrieves the request sense data from the selected device and displays the information to screen.

OPTIONS:

/dev=n	SCSI ID of the target device

/ada=n host Adapter ID, defaults to zero

SYNTAX:
DLTtools /get /dev=1 [/ada=n]

/MAK, (DLTtools only)

The MAKE command will write the specified firmware image file to the selected DLT tape drive. If the drive supports the compression then command will disable the compression provided that user has not selected the density from front panel. If user has selected the density from front panel then he must manually select an uncompressed density.
Firmware update tape must be made in uncompressed mode...

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)
/fil=8.3	This is the input file name of the image file. It must point to a valid firmware image file.
/7000	This is to set the format to that of a native DLT7000 (35G uncompressed).
/4000	This is to set the format to that of the native DLT4000 drive (20G uncompressed).
/ibm	A IBM flavor of DLT7000. Information under the IBM drive is different that under the native Quantum drives.

SYNTAX:
DLTtools /mak /fil=tzv35oem1.fup /dev=1
DLTtools /mak /fil=c:\code\tzv35oem1.fup /dev=2

/REA

The READ command will read data from the Buffer zero area in the drive. This area is a block of ram memory set aside for the user. In the case of the DLT drive the normal size is 1096 bytes.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)
/buf=n	Buffer ID to read from (0,1 or 2)
/spl	SPLIT Flag, Tell function to break the output up into 1.4 Megabyte chunks
/fil=s	This is the output file name for the read. Only pertain to the read buffer zero function.
/siz=n	Data transfer size
/loo=n	Loop Counter, read buffer zero only. This is the number of time to read the buffer.

SYNTAX:
DLTtools /rea /dev=2 /fil=datain.dat

/WRI, (DLTdiag only)

The write command is the counter part to the read command. the Buffer zero ram memory area is written using the data from the command line argument /file. The program will only write the size of the buffer zero area. Normally this area is 1096 bytes but may very from time to time.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)

/fil=s	This is the output file name for the read. Only pertain to the write buffer zero function.
/siz=n	Data transfer size
/loo=n	Loop count, Write buffer zero only. This is the number of time to write the buffer.

SYNTAX:

DLTdiag /wri /dev=2 /fil=dataout.dat

/GNG, (DLTdiag only)

The GO-NOGO test allows the user to test specific function of the DLT tape drive. As in the window version this test will run the following: Self Diagnostic, SCSI Bus Data Transfer Test, a Write To Tape Test, a Read From Tape Test, calculate the Soft error of the tape and a Tape Unload/Load Test. If all of these test are successful, the tape is unloaded. If any one of these tests are unsuccessful the tape is not unloaded. In either case the status is display on the screen.

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0 or 1)
/dev=n	The SCSI ID of the tape drive (0 through 7)
/tm	FLAG, will turn off the use of tape marks at the end of the data write.
/nul	FLAG, will not unload tape at the end of a successful pass.
/pgml	FLAG, causes the program to loop until a key on the keyboard is pressed.
/bc=n	Block count, To change the number of blocks that are written/read to/from tape.It should be noted that if this option is used the Soft Error Calculation will not be performed.

SYNTAX:

DLTdiag /gng /dev=2

DLTdiag /gng /dev=4 /bc=25000 /tm /pgml

/MSD, (DLTtools only)

The Mode Sense Data command will read the mode sense data from the selected device and display it on the screen

OPTIONS:

/ada=n	The host adapter ID that the tape drive is on. (0, 1 or 2)
/dev=n	The SCSI ID of the tape drive (0 through 7)

SYNTAX:

DLTtools /msd /dev=1

DLTtools /msd /dev=2 /ada=1

/WBE, (DLTdiag only)

The Write from Beginning-Of-Tape to End-Of-Medium is a command line function only. Its function is to write data to the tape while the drive is being tested in other environments. This function has now found a place in the CLI part of DLTdiag.

This function will pick a data pattern from the patterns listed in the drive manual under self-diagnostic. It will build a 32K buffer area and set it to the pattern chosen. This buffer is then written to tape. On the odd writes to tape the first ten bytes are changed to zeros. This will continue till one gigabyte is written to tape. The data pattern is changed to the next one listed and the process starts over. If the function exhausts the data patterns before reaching the end of media the patterns are repeated. If the "pgml" flag is set, at the EOM mark the tape is rewound and everything is restarted.

OPTIONS:

/ada=n	The Host Adapter ID. Allows the user to pick the host to use. (0 to 2)
/dev=n	Device SCSI ID. Allows the user to pick the SCSI device to use. (0 through 7)
/tm	FLAG, Enable Tape Marks. If set the function will write a tape marks for each photo file that is written to tape. A photo file is one that is 32K time the block count or 1GB by default.
/pgml	FLAG, Enable Looping. If set, this flag will causes the program to repeat the function once EOM is found.
/bc=n	Block Count. It is set to 30518 by default. The block size is set to 32K. This works out to be just over one gigabyte of data to tape. By adjusting the count, you can adjust the number of bytes between tape mark. If no changes are made, the program will write one gigabyte as a photo file. This is repeated till EOM is found.
/verbose	FLAG, Talk to me. If set, this flag will causes the program to become more talkative as the function progresses.
/fil=s	Log File, If given, the program will open this file and send all output to it instead of the standard out of screen.

SYNTAX:

```
DLTdiag  /wbe  /dev=2
DLTdiag  /wbe  /ada=0 /dev=4 /bc=25000 /tm /pgml /verbose
```

/**RBE**, (DLTdiag only)

This function Read from Beginning-Of-Tape to End-Of-Medium, is the counter part to the WBE function. This is also a command line function only. This function is set up to read the data that was written by "WBE" and test it for the expected data pattern. The data is picked from a table that comes from the self-diagnostics section of the drive manual.

OPTIONS:

/ada=n	The Host Adapter ID. Allows the user to pick the host to use. (0 to 2)
/dev=n	Device SCSI ID. Allows the user to pick the SCSI device to use. (0 through 7)
/pgml	FLAG, Enable Looping. If set, this flag will causes the program to repeat the function once EOM is found.
/verbose	FLAG, Talk to me. If set, this flag will causes the program to become more talkative as the function progresses.
/fil=s	Log File, If given, the program will open this file and send all output to it instead of the standard out of screen.

SYNTAX:

```
DLTdiag  /rbe  /dev=2
DLTdiag  /rbe  /ada=0 /dev=4 /pgml /verbose
```

/MME

This function moves a medium cartridge from either the tape drive to the cartridge magazine or viceaver. The command line function is setup to take a target and source destination. Drive numbers must start at 10 and magazine locations must start at 100. Both increment by one. However in a autoloader there is only one drive.

OPTIONS:

/ada=n	The Host Adapter ID. Allows the user to pick the host to use. (0 to 2)
/dev=n	Device SCSI ID. Allows the user to pick the SCSI device to use. (0 through 7)
/sou=n	This is where the cartridge is to be taken from.
/tar=n	This is where the cartridge is to be put.

SYNTAX:

```
DLTtools  /mme  /tar=10  /sou=101  /dev=4
DLTtools  /mme  /ada=1   /dev=4    /sour=104   /tar=10
DLTtools  /mme  /dev=5   /tar=105  /sou=10
```

/ELS

This function will read the element status page and displays the information to the screen or dumps it into a disk file. The data is formatted. The minimum number of arguments is “code type” and “device ID” but the “adapter ID” and “file name” support are also available. Unlike the window-based code, the command line function will not try to second guess the user. This function will not check the device to see if it is a legal command. So the ELS function will work on library units as well as autoloaders.

OPTIONS:

/ada=n	The Host Adapter ID. Allows the user to pick the host to use. (0 to 2)
/dev=n	Device SCSI ID. Allows the user to pick the SCSI device to use. (0 through 7)
/ct=n	Code type.
/fil=s	Std DOS file name

SYNTAX:

```
DLTtools  /els    /dev=4  /ct=1
DLTtools  /els    /ada=1  /dev=4    /ct=2       /fil=mag.txt
```

Interactive Command Examples

Below is a step by step examples on how to change the Vendor ID and Product ID in the command line mode of DLTtools.

The TYPE field = is the firmware personality byte 41 and 42 of the vendor unique inquiry data.

At your system prompt enter the following:

DLTtools.EXE /sniff

or

DLTdiag.EXE /sniff

The program will return:

Device	*Product*	*Vendor*	*Rev*	*Type*
0	*RZ25L (C) DEC*	*DEC*	*0007*	
5	*DLT2000*	*DEC*	*9924*	*4-1*
6	*CD-ROM XM-4101TA*	*TOSHIBA*	*0064*	

To make a change to the Vendor ID or Product ID, you will need create a file that is the ASCII representation of the SCSI CDB and data that will be sent to the drive. Edit the file vid.txt and copy figure 1 into it.

At the system prompt enter the command to change the VID.

Example:

DLTtools.EXE /Mode /dev=5 /file=vid.txt /cmd=select /page=3e /type=currrent


Note:

1) In order for your command to work you must leave a space between each command entered.

2) If there is an syntax error with the command, the program will highlight the error made as follows:

   Error in MODE syntax, no mode types specified. (/type=)

3) If there were any additional errors made, the program will continue to highlight the syntax error until the string is fixed.

The following message will be displayed:

Mode Page successfully set.

You can verify the change by entering the following command,

DLTtools.EXE /sniff

Device	*Product*	*Vendor*	*Rev*	*Type*
0	*RZ25L (C) DEC*	*DEC*		*0007*
5	*DLT2000*	*EEEEFFF*	*9924*	*4-1*
6	*CD-ROM XM-4101TA*	*Toshiba*	*0064*	

If you want to change the Product ID, you need to edit your product ID file (PID.TXT file).

This contains hex values of the Product ID as shown in Figure 2.

Once you edited your Product ID file enter the following command,

DLTtools.EXE /mode /dev=5 /file=pid.txt /cmd=select /type=current

Mode Page successfully set.

You can verify the change by entering the following command:

DLT> C:\DLTtools\DLTtools.EXE /sniff

Device	*Product*	*Vendor*	*Rev*	*Type*
0	*RZ25L (C) DEC*	*DEC*	*0007*	
5	*abcdefghi*	*EEEEFFF*	*9924*	*4-1*
6	*CD-ROM XM-4101TA*	*Toshiba*	*0064*	

Batch File Examples

The following is an example batch file that can be used to change the Vendor ID and Product ID of DLT Tape Drives automatically.

```
echo off
echo
**********************************************************************************
echo        Listing Devices on the bus
DLTtools /sniff
echo
**********************************************************************************
echo        Please make sure DLT tape drive to be configured is ID 2
echo        and the drive is ready (tape in use light is on).
echo        Type Control-C to abort, other key to continue
pause
echo
**********************************************************************************
DLTtools /mode /cmd=select /file=vid.txt /type=current /dev=2
DLTtools /mode /cmd=select /file=pid.txt /type=current /dev=2
echo
**********************************************************************************
echo        Listing devices on the bus again
DLTtools /sniff
```

The VID.TXT and PID.TXT are files that are used to make Vendor ID and Product ID changes.

Figure 1 is an sample of the VID.TXT file. It is the MODE SELECT parameter list along with the EEROM Vendor Unique Page information at byte offset 24, replace the “EEEEFFF” with the real vendor name.

BYTE OFFSET	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
ASCII HEX	76	65	6e	64	6f	72	69	64	20	45	45	45	45	46	46	46	00	00
ASCII CHAR	v	e	n	d	o	r	i	d	_	E	E	E	E	F	F	F	_	_

In Figure 2 is an example of the PID.TXT file. Again it is the MODE SELECT parameter list along with the EEROM Vendor Unique Page information At byte offset 25replace the “abcdefghi” with the real product ID name.

BYTE OFFSET	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
ASCII HEX	70	72	6f	64	75	63	74	69	64	20	61	62	63	64	65	66	67	68	69
ASCII CHAR	p	r	o	d	u	c	t	I	d	_	a	b	c	d	e	f	g	h	i

In both file you will need to use the HEX value of each character with a tab between each. Other formats may work but this format is tested. Both, Figure 1 (VID.TXT) and Figure 2 (PID.TXT) contains 256 Kbytes.

Figure 1 sample VID.TXT File

```
00 00 10 08 00 00 00 00 00 00 00 00 3e 11 76 65
6e 64 6f 72 69 64 20 45 45 45 45 46 46 46 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Figure 2 PID.TXT sample File

```
00 00 10 08 00 00 00 00 00 00 00 00 3e 13 70 72
6f 64 75 63 74 69 64 20 61 62 63 64 65 66 67 68
69 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Product Focus, DLT*diag* GoNogo Function

The following descriptions are an attempt to give some insight to the test criteria of the GoNogo function that in found under the diagnostic program "DLTdiag". This function is designed to give the user a base line test to accept or reject the DLT tape drive on its ability to perform a set of predefined test that deal with the functionality of the drive.

It is assumed that the system has a working SCSI subsystem, the ASPI device manager is installed, the DLTdiag program is at the current release, the DLT tape drive attached and is a resource of the system.

Under this function, each test is setup to stop on any hard errors or failures. However, there are cases where a problem is reported during testing but the program will not stop. These failures are not major enough to stop the testing but are to fail the drive. At the end of testing the function will look at past/fail flags and make a determination on the status of the drive. If the drive has passed, the tape is unloaded and a screen is displayed that tells the user the drive has passed. If the drive has failed, the tape is left in a loaded state and a screen is displayed telling the user the drive has failed. The function will leave the displayed information on the screen till the user acknowledges it. It should also be noted that the log pages 2, 3 and 32 are left in the current directory. These files will be overwritten each time the corresponding drive is tested.

Total test time should be around 17 to 20 minutes. This is depending on the speed of the system and the condition of the drive and tape used.

THIS FUNCTION WILL WRITE ON THE TAPE.
DATA PREVIOUSLY STORED ON THE TAPE WILL BE LOST

There are six parts to this function. These tests touch on the basic functionality of the drive. These tests found under the GoNogo function can not say that under all condition the drive will work but they make a very strong case.

The tests are:

1. Built In Diagnostic
2. SCSI Bus Transfers
3. Write Data Test
4. Read Data Test
5. Soft Error Interpretation
6. Unload / Load Test

Basic Build-In Diagnostic

This function will issue the command for "Send Diagnostic" in default mode only. This will execute a LEVEL-1 and LEVEL-2 test that will take about 290 seconds. This test will write on the tape.

Test description:

- Electronics Self-Test - (Level 1)
  a) The code ROM EDC is verified, Two queues used by much of the controller software is checked by queuing items in and out of the queues.
  b) If a loader is attached, a software reset is done to cause the loader to re-cycle through the cartridge inventory.
- Write/Read Functionality Test - (Level 2)
  This function will test:

a) Write 500 32KB records on track0
b) Rewind the tape
c) Reads the records
d) Positions to beginning of track 1
e) Writes 500 32KB records on track1
f) Rewind the tape
g) Reads the records
h) Rewind tape
i) This function will take about 6minutes to Execute

SCSI Bus Transfers

This function writes/reads and verifies data to the SCSI defined Buffer Zero. The function will retrieve the buffer size from the drive. Once the buffer size is known, the function will set up a write and read buffers inside the program. The write buffer is moved to the Buffer Zero area of the drive then moved back to the program area in the read buffer area. Once this is done, the two buffers are verified that they are the same.

The data pattern starts with 0x01 and is shifted one place for each loop. This causes a walking 1 pattern. Patterns used in this mode are 1,2,4,8,0x10, 0x20, 0x40 and 0x80. Once through these patterns, the process is repeated with the addition of a second data pattern that is XOR into the pattern. This second pattern is shifted for each loop on the first.

This function loops 500 time and takes about 21 seconds to execute.

Write Data Test

Before the following test is started, a bus reset is issued to the DUT (Drive Under Test). This is to clear the three log pages 2,3,32. These pages collect data that will be tested after the write and read test.

The Write test will change the density of the drive to native uncompressed. It allocates a data buffer space of 32K. Data patterns used for testing can be found in the DLT product manual under the table for “Definition of Pattern Numbers” in the “Send Diagnostic” section,. The buffer is built and tested in short integer mode.

This function moves a 32KB buffer to tape until a one-gigabyte of data has been written to tape. The 32KB buffer is set to a base data pattern. Before the buffer is moved to tape the first 10 byte are changed. For even blocks these bytes are the current data pattern. For odd blocks, these bytes are set to zero.

This function will write 0.999 Gigabyte to the tape.
Execute time is around 330 second.

Read Data Test

The read test is based on the write test. The data laid down is retrieved. The function read the data from the tape. Odd blocks are checked to make sure that they are non zero and the even blocks are checked to see if they are not the current data pattern.

The purpose of these write and read functions is to move data to and from that tape make some software attempt to validate the effort and to collect data in the log pages. This function does not do a full buffer verification of the data going on and off the tape. To do a full data verification, the store and retrieve function that is found in the diagnostic menu would do this.

Execute time is around 340 seconds.

Soft Error Interpretation

Although this is not a test, we will treat it as one. This function bases a pass – fail determination on information retrieved from the drive that is based on the Write and Read functions. At the start of the write test, a SCSI bus reset is issued. This under the DOS and Win95 OS will clear the internal log pages.

These pages are log page 2 is the "Write Error Counter Page", log page 3 is the "Read Error Counter Page" and log page 32 is the "Compression Ratio Page". Data from these log pages is retrieved and analyzed in the following manner.

Soft Error Interpretation for Read Error Count are:

>> Exceptional:	0-50	per cartridge
>> Good:	51-100	per cartridge
>> Normal:	101-500	per cartridge
>> High Error:	>500	per cartridge

Soft Error Interpretation for Write Error Count are:

>> Exceptional:	0-500	per cartridge
>> Good:	501-1000	per cartridge
>> Normal:	1001-2000	per cartridge
>> High Error:	>2000	per cartridge

The above numbers are based on the whole tape cartridge. The above specifications apply to all DLT tape cartridges (III, IIIXT and IV)

The time needed to write then read the whole tape would be to long to do in a Test of this type. So under the GoNogo function the Soft Error rate is based on a one-gigabyte data transfer to and from the tape. The Soft Error rate for the cartridge is interpretation as the write and read soft error rate multiple by the total gigabytes the cartridge will support in native mode. This calculation is the total number of error that the function would see if the whole tape were written then read with the current error rate. This is a calculation. In reality, this number would most likely never be reached. This is because the GoNogo function performs the write and read test on the worst case area of the cartridge. This is so there can be no doubt to where or not the numbers are valid for this test.

If the function finds that the Soft Error rate is lest then the "High Error" for write and read logs that this is deemed "Successfully". Numbers that are greater then the "High Error" number are listed as drive failures.

It should be noted here that if the soft error interpretation is high it is unlikely the drive will be able to reach its MAX transfer rate.

By using the data in the log pages and in the request sense data "bytes processed", a user or program can get some idle of how the drive is doing. There should be about 20% difference between the data from the system and the data processed to tape.

This function should take less then a second.

Unload/Load Test

This function tests the drive's ability to unload and reload the tape cartridge. If the GoNogo function is run on a drive that is in an "Autoloader" the Unload/Load sub-function will be disabled. This is do to the default state of the loader. In a normal loader, once the SCSI UNLOAD is issued, the cartridge is removed from the drive but the next cartridge in the magazine will be reload before the program gets acknowledgment back for the UNLOAD command UNLOAD. If this is the case that program can never issues that LOAD command and the function will fail..

Execute time is around 117 second.

Product Focus, DLT*diag* Ping Function

This is a description of the "DLT Ping" function that is found in the program DLTdiag. This function is used to verify the integrity of memory known as buffer zero - mode 2, found in the DLT tape drive. It also verifies data transfers across the SCSI interface to the target devices memory and back.

It should be noted that failures reported by PING can not be pin pointed to a failing component. Under normal conditions it is assumed that the system host adapter and transfers of data have been tested and the only unknown element is the drive. The intention of this function is to test the reliability of data transfers through the drives buffers only.

This function is used in many of the diagnostics found in DLTdiag. This function takes two walking one data pattern (DP1 and DP2) and OR's them together. The second pattern (DP2) will move at a slower pace to the first. This produces a pattern as follows.

	DP1 starts at 01 and is shifted left once for each pass
01 02 04 08 10 20 40 80	DP2 is at zero (0) for the first pass
01 03 05 09 11 21 41 81	DP2 is at one (1) for pass two
03 02 06 0A 12 22 42 82	DP2 is at two (2) for pass three
and so on ...	

This will not repeat until pass 129 and is not a truly random pattern, but it will serve the purpose.
The function will run until the user breaks the loop by pressing any key of the keyboard other then the Esc key.

Pseudo Code is as follows:

start:

```
Retrieve the buffer descriptor for buffer zero (0) from the DLT drive
Convert the ASCI HEX buffer capacity to integer

Allocate memory area the size of the buffer capacity for the write buffer
Allocate memory area the size of the buffer capacity for the read  buffer

Set data pattern one (DP1) to a one (1)
Set data pattern two (DP2) to a zero (0)
Set working data pattern (Ored results from pattern one and two)
Set the drive for buffer mode two (2)

loop:
 Set write buffer with working data pattern
 Write to the selected device data in the write buffer (capacity)
 Read from the selected device to the read buffer (capacity)
 Compare all bytes in write buffer and read buffer

 Shift data pattern one, one bit to the left
 When pattern one is zero                          Set pattern one to one
 When pattern one is one and pattern two is zero    Set pattern two to one
 When pattern one is one (1) and pattern two is not a zero (0)
                                                   Shift pattern two once to the left
 Set the working pattern to the new ORed pattern of pattern one and two
goto loop
```

end:

Product Focus, DLT*diag* Rebuild Directory

This is a description of the "Rebuild Directory" function that is found if the program DLTdiag. This function is used to rebuild or gather the internal directory that is kept on the DLT tape drive This directory is used to allow the drive do the fast access times to locate file and to position to an area of the tape in very short time. Normally this directory is stored on the tape when not loaded in a drive. Once the tape is loaded, the information in the direction is moved to RAM memory. When the tape is unloaded the new, updated or unchanged information is moved back to the tape. If a drive looses power or for some other reason fails to write the information to the directory, this function can be used to gather up the directories that are at the end of each track. Depending on the amount of data on the tape the extent of directory damage the program could take as long as 4 or more hours to complete.

Product Focus, Year 2000 Issues

In an effort to address this issues, DLTtools and DLTdiag has been reviewed and test for problems in the area of the two-digit year. None of the programs supplied in the DLTtools package depended on a two-digit year for decision making. Time and date stamps are used to mark data file but the dates are treated as data string. These strings use a four-digit year and have no meaning to the program or it operations.