



VeriTape®

Tape Cartridge Memory Analyzer

User Manual



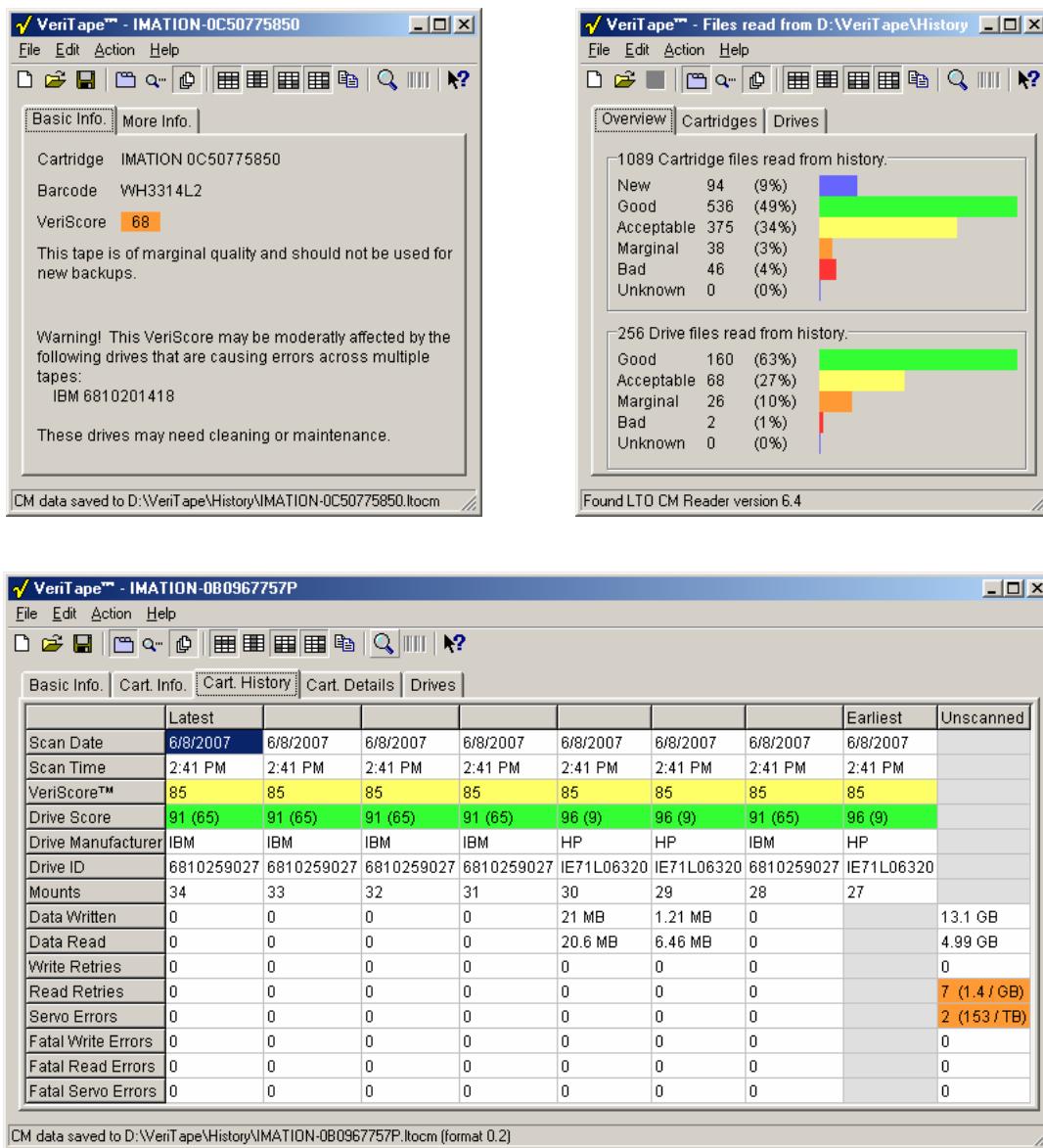
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Overview

All LTO Cartridges have an internal memory chip called Cartridge Memory (CM). This chip contains vital information about the cartridge. VeriTape™ extracts the information from the CM and displays it in a concise way. VeriTape also calculates the VeriScore,™ a single quality number based on all available information.

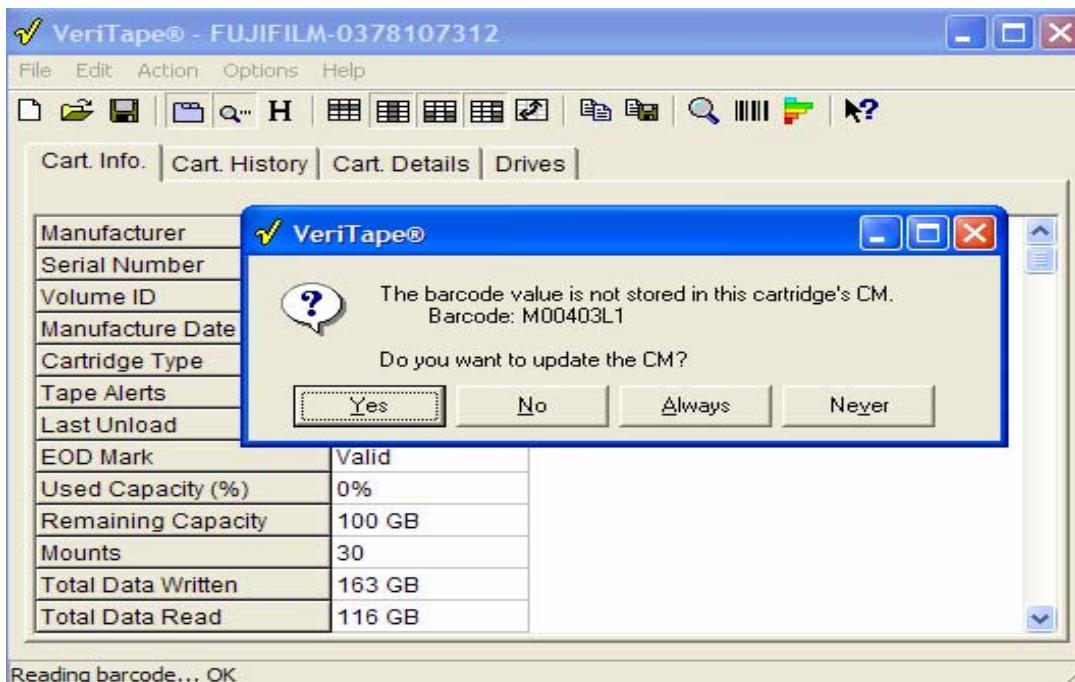
The CM data for all scanned cartridges is saved in a history database, as is information for all drives mentioned in the CM. This allows VeriTape to analyze both cartridge and tape drive quality.



Typical VeriTape Displays

Barcode Reader option

The Tape CM Analyzer comes with an optional barcode reader.



VeriTape Display with barcode reader

Quick Start

Get the Latest Software and Documentation

The latest version of the VeriTape software and documentation is available on the MP Tapes web site at <http://www.mptapes.com/veritape>.

Connecting and Configuring the VeriTape Reader

The VeriTape Reader is connected to the PC using the USB/Serial converter included with the product. The first time the USB/Serial converter is plugged into your PC Windows will identify it as new device. Use the supplied CD-ROM to install the driver.

Run the VeriTape.exe program. The first time you run the program you may get an error message, "Error accessing serial port". This is OK, it just means that the default configuration is trying to use a serial port that does not exist on your computer. Hit OK and the "Configure Serial

Port" dialog will open. Select the serial port connected to the VeriTape Reader. If you don't know which serial port is connected to the VeriTape Reader, select the first one.

The VeriTape program will start looking for the VeriTape Reader. The status bar will show "LTO CM Reader not found -- still looking...". When the program successfully communicates with the reader the status message will change to "Found LTO CM Reader version 5.0". If the "found" message never occurs, there is a cabling or configuration problem. Use the "File | Configure Serial Port" menu command and choose different serial ports until the VeriTape Reader is found. (You must close the "Configure Serial Port" dialog each time you change the settings.)

Reading the CM

To read the CM from a cartridge, place the cartridge on the VeriTape Reader and press the  button or use the "Action | Read CM" menu command. The VeriTape program will read and display the cartridge data.

The serial number recorded in the CM does not in general match any markings on the cartridge case. It is a good idea at this point to write the serial number on the cartridge for later identification.

Basic information about a cartridge and its usage are displayed under the "Cartridge" tab. More detailed information can be seen under the "Usage" and "Details" tabs.

Saving the CM to a File

The CM from a cartridge can be saved to a file for later analysis and comparison with other cartridges. Press the  button or use the "File | Save" menu command. The suggested file name is the cartridge's manufacturer and serial number. The "Save" command takes about 20 seconds since it saves the entire CM memory¹. (Only about 15% was read to get the information displayed by the "Read" command.)

Reading a Saved CM File

Press the  button or use the "File | Open" menu command and select a single CM file to display its contents.

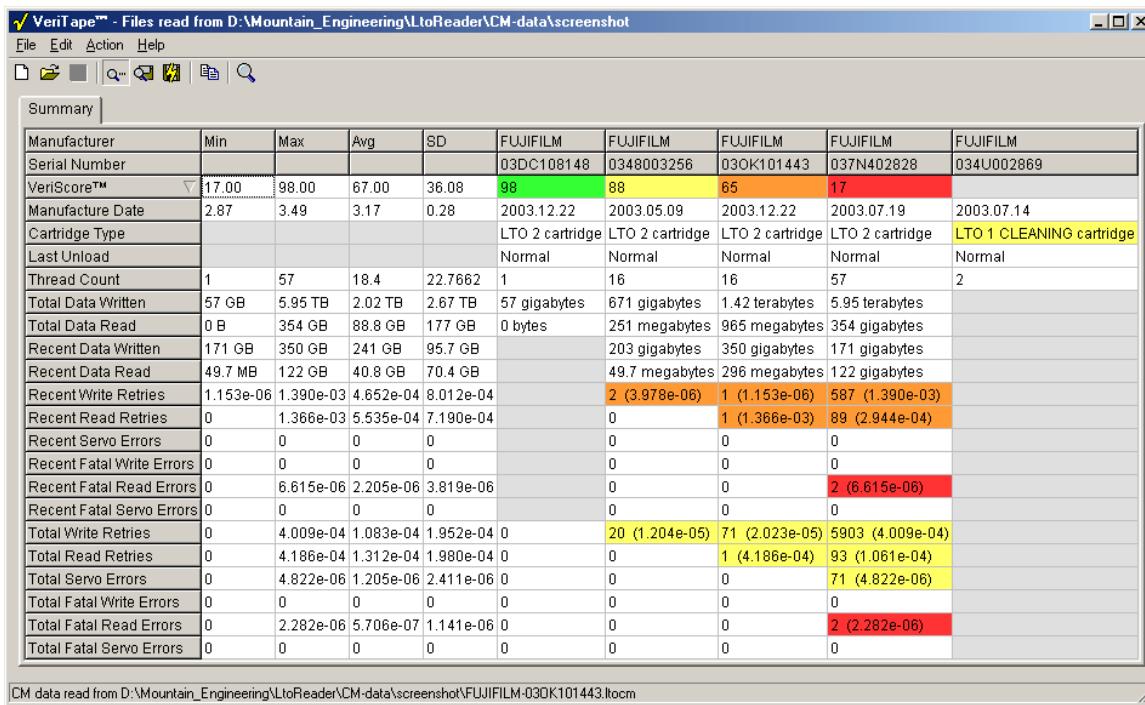
Comparing Multiple Saved CM Files

Press the  button or use the "File | Open" menu command and select multiple CM files to simultaneously display their contents. The CM files' basic information will be displayed in a table under the "Summary" tab. Cartridges may not all have the same data fields present. Missing data fields are indicated by an empty gray cell. A data field that is present but whose value is empty will be an empty white cell.

Clicking on a row header will sort the columns by that rows' values in ascending order. Clicking again on the same row header will sort by descending values.

¹ The VeriTape program saves the entire CM contents so that future versions of the program will be able to examine other data in the CM that may be of use.

Clicking on a column header will reread the file so that it's "Cartridge," "Usage" and "Details" pages can be seen.



The screenshot shows a software window titled "VeriTape™ - Files read from D:\Mountain_Engineering\LtoReader\CM-data\screenshot". The window has a menu bar with File, Edit, Action, and Help. Below the menu is a toolbar with icons for file operations and search. The main area is a table titled "Summary". The table has columns for Manufacturer, Min, Max, Avg, SD, and five Fujifilm models. The "Manufacturer" column is sorted, showing "FUJIFILM" repeated five times. The "Min" column shows values like 17.00, 2.87, etc. The "Max" column shows values like 98.00, 3.49, etc. The "Avg" column shows values like 67.00, 3.17, etc. The "SD" column shows values like 36.08, 0.28, etc. The "FUJIFILM" columns show various cartridge details like model numbers and dates. The bottom of the window shows a status bar with "CM data read from D:\Mountain_Engineering\LtoReader\CM-data\screenshot\FUJIFILM-030K101443.ltocm".

VeriTape Summary Display

Click on a row header to sort the columns by that row's values.

Click on a column header to display the "Cartridge," "Usage" and "Details" tabs for the selected cartridge.

Options

Automatic Cartridge Detection

 button or "File | Options > Autodetect Cartridge" menu item:

Setting the Autodetect option will cause the VeriTape program to continuously poll the VeriTape Reader to detect the presence of a cartridge.

When a new cartridge is detected it is automatically read and displayed.

Automatic Cartridge Detection is temporarily disabled when a CM file is read. Use the  button or the "File | New" menu command to re-enable automatic detection.

Automatic File Save

 button or "File | Options > Autosave" menu item:

Setting the Autosave option will cause the VeriTape program to automatically save the CM data after it is read. When this option is turned on you need to select a directory into which the files will be saved. *Autosave does not overwrite files; if a file exists with the same name the File Save as dialog is displayed.*

QuickSave

 button or “File | Options > QuickSave” menu item:

Setting the QuickSave option will cause the VeriTape program to only save that portion of the CM data that was needed to be read to decode the information that is currently displayed. This makes save nearly instantaneous at the cost of future compatibility; future versions of VeriTape may be limited in what additional information they can display.

Exporting data

VeriTape can export data to the Windows Clipboard so that it may be pasted into a word processor or spreadsheet program. The data can then be formatted as desired and printed.

Table Tabs

Select the cells in the table that you want to export. If no cells are selected the entire table will be exported.

To automatically extend selection to include entire rows or columns, select *Edit / Select by Rows* or *Edit / Select by Columns*. The program default is to select by columns.

Normally the row and column headers are copied as well as the selected cells. This can be controlled by checking/unchecking the *Edit / Include Row Headers* and *Edit / Include Column Headers* menu items.

Click the  button or the *Edit / Copy* menu item to copy the selected portion of the table to the Clipboard.

Paste the Clipboard into your word processor or spreadsheet program.

Some word processors have trouble with wide tables; you may want to limit the number of columns you select when copying data to them. You can also use your word processor’s *Paste Special* command and select *Unformatted Text* to paste the data as tab-separated text.

Most spreadsheet programs do not automatically set column widths based on pasted data. You will need to do this after pasting the data. For Excel,² the pasted data remains selected so you can immediately use the *Format / Column > AutoFit Selection* command.

² Excel is a trademark of Microsoft, Inc.

	A	B	C	D	E	F	G	H	I	J
1	Manufacturer	Min	Max	Avg	SD	FUJIFILM	FUJIFILM	FUJIFILM	FUJIFILM	FUJIFILM
2	Serial Number					348003256	034U002869	037N402828	03DC108148	03OK101443
3	VeriScore™	17	98	67	36.08	88		17	98	65
4	Manufacture Date	2.87	3.49	3.17	0.28	2003.05.09	2003.07.14	2003.07.19	2003.12.22	2003.12.22
5	Cartridge Type					LTO 2 cartridge	LTO 1 CLEANING cartridge	LTO 2 cartridge	LTO 2 cartridge	
6	Last Unload					Normal	Normal	Normal	Normal	Normal
7	Thread Count	1	57	18.4	22.7662	16		2	57	16
8	Total Data Written	57 GB	5.95 TB	2.02 TB	2.67 TB	671 gigabytes		5.95 terabytes	57 gigabytes	1.42 terabytes
9	Total Data Read	0 B	354 GB	88.8 GB	177 GB	251 megabytes		354 gigabytes	0 bytes	965 megabytes
10	Recent Data Written	171 GB	350 GB	241 GB	95.7 GB	203 gigabytes		171 gigabytes	350 gigabytes	
11	Recent Data Read	49.7 MB	122 GB	40.8 GB	70.4 GB	49.7 megabytes		122 gigabytes	296 megabytes	
12	Recent Write Retries	1.15E-06	1.39E-03	4.65E-04	8.01E-04	2 (3.978e-06)		587 (1.390e-03)	1 (1.153e-06)	1 (1.366e-03)
13	Recent Read Retries	0	1.37E-03	5.54E-04	7.19E-04	0		89 (2.944e-04)		
14	Recent Servo Errors	0	0	0	0	0		0		0
15	Recent Fatal Write Errors	0	0	0	0	0		0		0
16	Recent Fatal Read Errors	0	6.62E-06	2.21E-06	3.82E-06	0		2 (6.615e-06)		
17	Recent Fatal Serve Errors	0	0	0	0	0		0		0
18	Total Write Retries	0	4.01E-04	1.08E-04	1.95E-04	20 (1.204e-05)		5903 (4.009e-04)	0	71 (2.023e-05)
19	Total Read Retries	0	4.19E-04	1.31E-04	1.98E-04	0		93 (1.061e-04)	0	1 (4.186e-04)
20	Total Servo Errors	0	4.82E-06	1.21E-06	2.41E-06	0		71 (4.822e-06)	0	0
21	Total Fatal Write Errors	0	0	0	0	0		0	0	0
22	Total Fatal Read Errors	0	2.28E-06	5.71E-07	1.14E-06	0		2 (2.282e-06)	0	0
23	Total Fatal Servo Errors	0	0	0	0	0		0	0	0

Sample Data Pasted into Excel™

Text Tabs

Select the text that you want to export.

Click the  button or the *Edit / Copy* menu item to copy the selected portion of the table to the Clipboard.

If no text is selected the *Copy* command will be disabled.

Paste the Clipboard into your word processor.

Details

Cartridge Tab

Manufacturer

Cartridge manufacturer as recorded in CM. This may be different than the label on the cartridge because some vendors OEM their cartridges.

Serial Number

Cartridge serial number as recorded in CM. Some vendors print a different serial number on the cartridge, usually if they OEM their cartridges.

VeriScore

Composite score computed from information stored in CM. The score ranges from 0 to 100 and is interpreted and colored as:

90-100	Good	Green
70-89	Fair	Yellow
50-69	Poor	Orange
0-49	Bad	Red

Cartridge	Last Usage	Details
Manufacturer	FUJIFILM	
Serial Number	030K101443	
VeriScore™	65	
Manufacture Date	2003.12.22	
Cartridge Type	LTO 2 cartridge	
Last Unload	Normal	
Thread Count	16	
Total Data Written	1.42 terabytes	
Total Data Read	965 megabytes	
Recent Data Written	350 gigabytes	
Recent Data Read	296 megabytes	
Recent Write Retries	1 (1.153e-06)	
Recent Read Retries	1 (1.366e-03)	
Recent Servo Errors	0	
Recent Fatal Write Errors	0	
Recent Fatal Read Errors	0	
Recent Fatal Servo Errors	0	
Total Write Retries	71 (2.023e-05)	
Total Read Retries	1 (4.186e-04)	
Total Servo Errors	0	
Total Fatal Write Errors	0	
Total Fatal Read Errors	0	
Total Fatal Servo Errors	0	

Data read OK

Media Manufacturer

Some cartridge manufacturers OEM their tape. If the Cartridge Manufacturer and Media Manufacturer do not match, the Media Manufacturer is also displayed.

Manufacture Date

The date the cartridge was manufactured. Older cartridges are given slightly lower VeriScores.

Cartridge Type

LTO 1, LTO 2, LTO 3 and LTO 4. Cleaning cartridges are also identified here. Cleaning cartridges are not scored but you can see any usage information that may be stored on them.

Last Unload

This indicates how the cartridge was last removed from the tape drive. The possible values are:

Normal

The cartridge was unloaded normally.

Abnormal - not writing

The cartridge was not unloaded normally, but the drive was not writing at the time. This usually indicates a power failure while the cartridge was loaded in the drive.

Abnormal - during write

The cartridge was not unloaded normally and the drive was writing at the time. This usually indicates a power failure while the cartridge was loaded in the drive.

Abnormal - unknown

An out-of-spec value in this field of the CM; assume the worst...

Thread Count

This is the number of times the cartridge has been loaded into a tape drive.

CM Corrected Count (LTO 3 only)

This is the number of times a tape drive has found the CM to contain invalid data and has attempted to correct the bad data.

For all of the following, two values are displayed: Total and Recent. The Total value is exactly that, the total number of the named event that has ever occurred on the cartridge. The Recent value is number of such events that have occurred in the last 3 times the cartridge has been loaded.

Data Written

This is the amount of data that has been written to the tape.

Data Read

This is the amount of data that has been read from the tape.

Write Retries

This is the number of recovered write errors. Write retries occur when a tape drive detects that a dataset³ it just wrote failed read-while-write verification. The dataset will be rewritten further along the tape. A small number of write retries are expected due to media dropouts and dust on the media. The number in parentheses is the error rate in errors per dataset. The rate, not the gross number, is used in computing the VeriScore.

Read Retries

This is the number of recovered read errors. Read retries occur when a tape drive reads a dataset that fails read verification. The tape must be repositioned and the data reread. A small number of read retries are expected due to dust on the media. The number in parentheses is the error rate in errors per dataset. The rate, not the gross number, is used in computing the VeriScore.

Servo Errors

This is the number of servo tracking errors. Servo errors occur when a tape drive loses lock on the tape's servo tracks. This can be caused by media dropouts, but is less likely to be caused by dust on the tape since there are multiple servo tracks that are read simultaneously. The number in parentheses is the error rate in errors per dataset. The rate, not the gross number, is used in computing the VeriScore.

³ A dataset is the smallest unit of data that can be written to the tape. You can think of it as the physical record size. The dataset size is 403,884 bytes for LTO 1 and LTO 2, and 1,616,940 bytes for LTO 3.

Fatal Write Errors

This is the number of fatal write errors. Fatal write errors cause a backup operation to fail. They occur when a tape drive cannot successfully rewrite a dataset after multiple read-while-write verification failures. Fatal write errors can be caused by damaged media, excessive dropouts, and rarely by dust on the media. The number in parentheses is the error rate in errors per dataset. The gross number of fatal errors is used in computing the VeriScore.

Fatal Read Errors

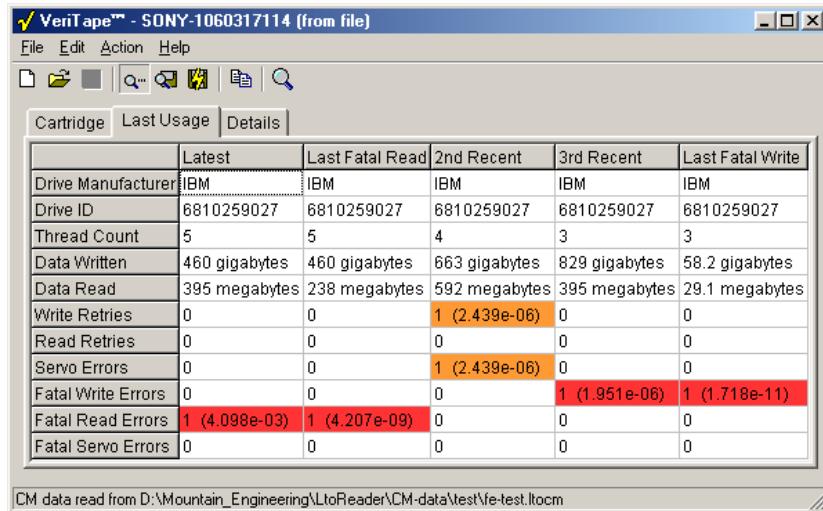
This is the number of fatal read errors. Fatal read errors cause a restore operation to fail. They occur when a tape drive cannot successfully reread a dataset after multiple attempts. Fatal read errors can be caused by damaged media, excessive dropouts, and rarely by dust on the media. The number in parentheses is the error rate in errors per dataset. The gross number of fatal errors is used in computing the VeriScore.

Fatal Servo Errors

This is the number of fatal servo errors. Fatal servo errors cause a backup operation to fail. They occur when a tape drive loses lock on the tape's servo tracks and cannot reacquire lock. Fatal servo errors can be caused by damaged media or excessive dropouts. The number in parentheses is the error rate in errors per dataset. The gross number of fatal errors is used in computing the VeriScore.

Last Usage Tab

The Last Usage Tab shows the usage information for the last three times the cartridge was loaded. For LTO 3 cartridges it also shows the usage information for the last fatal read and write errors.



Cartridge	Latest	Last Fatal Read	2nd Recent	3rd Recent	Last Fatal Write
Drive Manufacturer	IBM	IBM	IBM	IBM	IBM
Drive ID	6810259027	6810259027	6810259027	6810259027	6810259027
Thread Count	5	5	4	3	3
Data Written	460 gigabytes	460 gigabytes	663 gigabytes	829 gigabytes	58.2 gigabytes
Data Read	395 megabytes	238 megabytes	592 megabytes	395 megabytes	29.1 megabytes
Write Retries	0	0	1 (2.439e-06)	0	0
Read Retries	0	0	0	0	0
Servo Errors	0	0	1 (2.439e-06)	0	0
Fatal Write Errors	0	0	0	1 (1.951e-06)	1 (1.718e-11)
Fatal Read Errors	1 (4.098e-03)	1 (4.207e-09)	0	0	0
Fatal Servo Errors	0	0	0	0	0

CM data read from D:\Mountain_Engineering\LtoReader\CM-data\test\fe-test.ltocm

Drive Manufacturer

The manufacturer of the tape drive in which the cartridge was loaded.

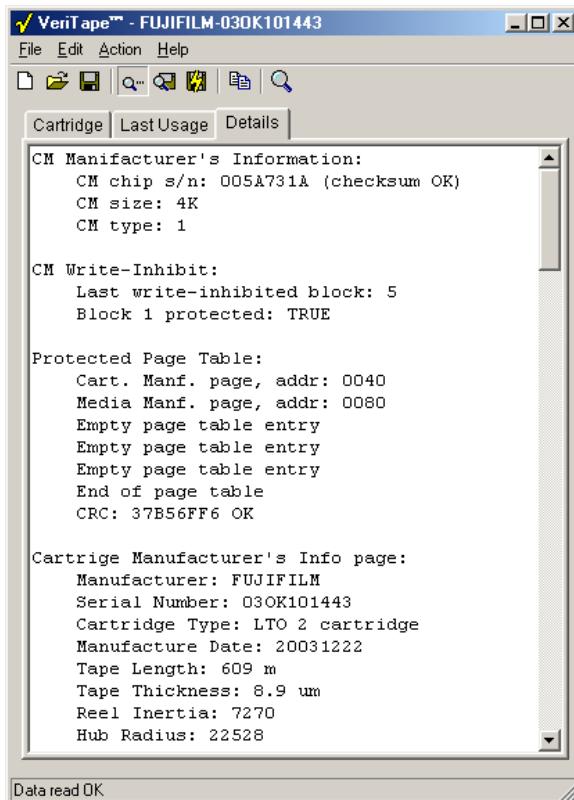
Drive ID

The ID string of the tape drive in which the cartridge was loaded. This may or may not be the drive's serial number.

For other items, see descriptions in the Cartridge Tab section. The values displayed are the numbers of that item that occurred during the indicated threading. The values for fatal errors may be lower than the values for the threading if further activity occurred after the fatal error.

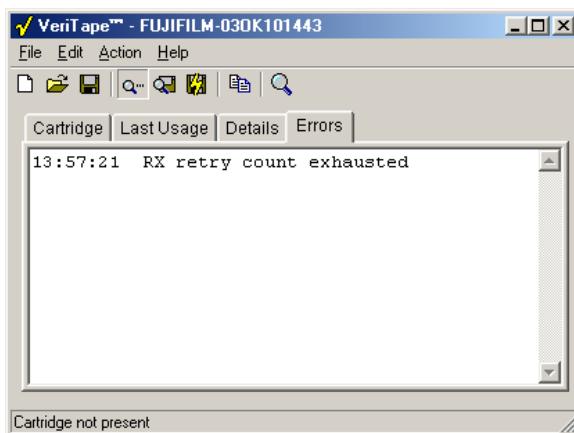
Details Tab

The Details Tab shows all the information that is available in the portion of CM that was read to get the information displayed in the Cartridge and Last Usage Tabs. This may be useful for debugging cartridge interchange problems. The CM is documented in ECMA-319 Standard, Annex D.



Errors Tab

If there are any communications errors between The VeriTape program and the VeriTape Reader The Errors Tab that lists the errors will be displayed.



Summary of Menu Commands

File | New

Clears the currently displayed data. If Automatic Cartridge Detection is enabled, starts looking for a cartridge on the VeriTape Reader.

File | Open

Open a saved CM File and display its contents.

File | Save

Save the currently displayed cartridge to a CM File.

File | Save As

Save the currently displayed cartridge to a CM File with a different name.

File | Options > Autodetect Cartridge

When checked, the VeriTape program periodically polls the VeriTape Reader to see if the cartridge has been changed. If it has, the new cartridge's data is automatically read and displayed.

File | Options > Autosave

When checked, the VeriTape program automatically saves the cartridge's data to a CM File after reading it. When Autosave is first checked, a directory must be selected into which the CM Files will be saved.

File | Options > QuickSave

When checked, the VeriTape program will only save that portion of the CM data that was needed to be read to decode the information that is currently displayed. This makes save nearly instantaneous at the cost of future compatibility; future versions of VeriTape may be limited in what additional information they can display.

File | Configure Serial Port

Opens the “Configure Serial Port” dialog which is used to select the serial port connected to the VeriTape Reader. *The “change settings” checkbox is a debugging relic; do not use it. The settings must be 4800 / none / 8 / 1 / none.*

File | Show Serial Data

Opens a window that displays the serial data sent between the VeriTape Reader and the VeriTape program. This is only useful for debugging connection problems. It slows things down a bit when it is displayed.

File | Exit

Closes the VeriTape program.

Edit | Copy

Copies the currently displayed table to the clipboard so that it can be pasted into another application. If only a portion of the table's cells are selected, only those cells and their row and column headers will be copied.

Edit | Select by Rows

When checked, table cell selection will automatically be extended to include the entire row if any cells in that row are selected.

Edit | Select by Columns

When checked, table cell selection will automatically be extended to include the entire column if any cells in that column are selected.

Edit | Include Row Headers

When checked, row header cells are included in tables copied to the clipboard.

Edit | Include Column Headers

When checked, column header cells are included in tables copied to the clipboard.

Action | Read CM

Reads the information from the cartridge currently on the VeriTape Reader. If there is no cartridge present, displays an error message.

Action | Hex Dump

Technical information used for diagnostic purposes.



Specifications

Operating Conditions

Temperature: 0 - 120 degrees F

Relative Humidity: 0-95%, Non-condensing

Storage Conditions

Temperature: -40 - 140 degrees F

Relative Humidity: 0-95%, Non-condensing

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.