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SDLT Event Log Troubleshooting Guide

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Quantum Corporation

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How to Use this Document

This manual support SDLT220.

The manual is in numerical order of the EVENT LOGS Documented, followed by the SCSI common SCSI sense keys. The definition of the information is based on the most current version of firmware but are still subject to change for each future version of firmware.

The description of the fields may be defined as a Hex value in which the value is a code. Or the field may be described as bit dependent in which there are multiple definitions for the byte depending on the number of bits set or cleared in that byte field.

If the data field is a Hex value the document will indicated that by documenting the Dex value followed by the description of what the value means.

Example: 1Fh = Power on Self Test Error

If the filed is defined by which bits are set for multiple indications the description of each bit will be defined separately and the reader will need to imply the multiple status indications by developing the sums of the definitions based on which bits are set or cleared.

Example: A field in Event A507 labeled Drive Flags uses multiple bits to indicate the status of the drive when the event occurred. If the field were to have bit 13 set to 1 and all others equal to 0 this field would indicate the drive was in the process of calibration on load success at the time of the event.

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Recommendation for improvement

If there are request for additional data to assist in the use of this document please forward them to your SDLT engineering contacts who will share them with their Quantum account teams for consideration in the next release of this manual. You may also send email to Anthony.Tan@Quantum.com

If there are ways to make this document easier to read please provide those recommendation as we are always looking for ways to improve.

Not all codes for the events have been documented. The ones documented are the ones most valuable in determining if the event is related to drive issues, media issues, or some external concern. If others need to be added make your request as recommended above. The intent was to make this document easy to use and does not contain information that is not useful. We want to save the tree and hours required documenting information that is of little or no value to the user. If we missed items let us know.

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Packet Interpretation

Purpose of the Event log is to record;

- Firmware Resets, labeled as Bugchecks
- Key Events that may impact performance
- PO/ST Failure (Power-On-Self-Test)
- SDLT Drive Diagnostic Results
- Firmware Changes
- Key SCSI Check Conditions (hardware and media related)

Event Log Break Down

Each packet is broken down into several different fields that will aid in understanding what and when it occurred. The following is a description of the common packet information that each Event Packet will contain and must be considered to fully understand the relationship of an event to the possible failure mode experienced by the application. The other fields described in each Event Packet section will color code the fields that will be of value in defining that event. Please use the below example to understand the common information for all Event Packets.

Packet # 7 - Event: A500 [V15-0 19-Jan-2001] 001:04:27.580 POH/PC= 26/5
Temp= 34 (36,50,45)
C5B90B03 0000963E 000187E2 20008000 21382B78 0000341B 0011A351 00000021
00000000 FF14FEEF FF60FF45 001EFCD1 00640300 07800054 00010000 0088002A
00000000 00000000 00000000 00000000

Packet Number is a sequence number to indicate the order in which the event was logged, in the example above this was the 7th event packet recorded in Log Page 7 of the SDLT tape drive. The log page contains only the last few events and prior once will be rotated out of the log and lost. If there are multiple events related to the same conditions the sequence in which they occurred may be reversed in which case you need to use the time stamp to confirm the order of occurrence, where possible.

Event Number is a code to indicate the type of event being logged. In the case of this example it is a hex of “A500” indicating a read error. An Event is just an occurrence of something happening and does not indicate the drive has failed. The Events with system / application information will aid in determining the real cause of the customer concern and aid in defining what was the root cause, media drive, or other external source from the drive.

V Number and Date is the version of firmware the drive was using when the event was logged. The date is reference data for when the firmware was created by Quantum.

The field described as **001:04:27.580** us the total time in which the SDLT tape drive has had power applied to the tape drive, since the last power cycle. This is hours, minutes, seconds, and milliseconds. There is no data associated with the power up time.

POH/PC is tracking information for how many power-on-hours (POH) the drive has had since it was shipped from Quantum. This is how many hours the drive has had power applied regardless of the number of times it is turned on and off. POH is incremented once every 60 minutes the drive has had power applied to the drive with no interruptions. Power cycles (PC) is how many times the drive has experienced a power on cycle. Also note each time a drive logs a Bugcheck it will increment this count as well.

Temp is the temperature of the drive in Celsius when this event occurred.

The remaining information is detailed data that further describes the event and will be covered under the section of the event type.

One other packet type is similar to **Packet 7**, below in which it is a log entry of a SCSI event that may have sent to the host in response to a command not competing successfully. POH, POC are the same for all packet types. These same packet or SCSI check conditions are logged in Log Page 33 if your SDLT drives support that log page. These packets may also be related to the events logged prior to this entry as an indicator that the event created a check condition that the host should know about.

Packet # 8 - SCSI Event: POH/PC/MID/SK/ASC/ASCQ/AddErr=26/5/C5B90B03/3/0C/00/00

MID is Media ID that is an internal identification number, written to the media the first time the media is used, to aid tracking media to the different events. This ID does not correlate to any media ID used by application software.

SK/ASC/ASCQ are the SCSI equivalents of Sense Key (SK), Additional Sense Code (ASC), and the Additional Sense Code Qualifier as defined by the SCSI Standards. See SCSI Events section for a description of some common events that may be logged.

DLT Firmware Changes

Each time the SDLT tape drive is requesting to change the firmware version, either by following the procedure for updating firmware by tape or SCSI there will be three possible entries that may be logged. The below are example of those entries. The first entry is a Event Packet indicating an attempt to enter the code update is a successful code update entry. The last entry is a sample update in which it was successful and being reported to the host system for detailed explanation of these entries.

Packet # 4 - Event: CA02 [V24-0 11-Apr-2001] 000:00:59.011 POH/PC= 857/260
Temp= 25 (26,41,30) Motion (Hr:Min) = 183:40
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

Packet # 5 - CUP Event: POH/PC= 857/261
Temp= 127 (-128,-128,-128) Motion (Hr:Min) = 0:00
Drv CUP status: Complete
Drv Old: 17010000/C01959B6
Drv New: 1E000000/0640F263
Cnt CUP status: Complete
Cnt Old: V024/9759D9BC (11-Apr-2001 21:38:26) Pers: (4-1)
Cnt New: V030/34E7971F (23-May-2001 19:39:52) Pers: (4-1)

Packet # 6 - SCSI Event: POH/PC/MID/SK/ASC/ASCQ/AddErr=857/261/00000000/9/1E/1E/00
Temp= 127 (-128,-128,-128) Motion (Hr:Min) = 0:00

Format of the Packet

Each Event packet will consist of multiple Long words. The Long words are labeled from left to right. Using the example below, Packet # 7, the first Long Word is the top containing the data C5B90B03. The eighth Long Word is on the top line located to the far right side containing the data 00000021. The ninth Long Word will start again on the left at the second line and long words will continue to increment from left to right and back again to the left for the third line for a total of 20 long words. All Packet will have 20 Long Words.

Packet # 7 - Event: A501 [V15-0 19-Jan-2001] 001:04:27.580 POH/PC= 26/5
Temp= 34 (36,50,45)
C5B90B03 0000963E 000187E2 20008000 21382B78 0000341B 0011A351 00000021
00000000 FF14FEEF FF60FF45 001EFCD1 00640300 07800054 00010000 0088002A
00000000 00000000 00000000 00000000

Using Long Word 1 of the above packet as an example of a long word we ca further brak down that word into smaller segments called words, bytes and bits. A bit being the ones or zeros making up each binary location of a long word that consist of 32 bits. A byte is 8 bits, a word being two bytes long, and finally a long word being 2 words or 4 bytes. The difference is that words and bytes are counted from 0 to 3 for bytes or 0 to 1 for words in each Long Word. Long Words as explained earlier count from 1 to 20. An example of a long word broken into bytes is displayed below.

Example of a Long Word

(Long Word may consist of two hex grouped number representing words)

Word 01	Word 00
C5B9	0B03

(Long Words may consist of 4 hex grouped numbers representing bytes)

Byte 03	Byte 02	Byte 01	Byte 00
C5	B9	0B	03

Long Words, Words, and Bytes may also be broken down into bits. Each bit representing a register would have a unique meaning. To fully understand the entire status or information provided by the Long word, Word or Byte the reader will need to know which bits are set and which ones are not to fully understand the information being provided by that register data. All bits are labeled from right to left regardless of the bit being part of a Long Word, Word or Byte. An example of a byte (8 bits) broken into bits is provided below. Long Words and Words would be equivalent to this example expect with the addition of more bits to make up the entire Word (16 bits) or Long Word (32 bits). The below example is from Packet # 7 Long Word 1, Byte 0 with the content of 03 hex.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	0	0	0	0	1	1

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Event A500 – SDLT Read Error

Read Error is a recorded event indicating the tape drive detected a condition in which the drive was not successfully able to read the data from a particular location on the media.

Packet # 7 - Event: A500 [V15-0 19-Jan-2001] 001:04:27.580 POH/PC= 26/5
Temp= 34 (36,50,45)
C5B90B03 **0000963E** **000187E2** 20008000 21382B78 0000341B 0011A351 00000021
00000000 FF14FEEF FF60FF45 001EFCD1 **00640300** 07800054 00010000 0088002A
00000000 00000000 00000000 00000000

Long Word	Byte 03	Byte 02	Byte 01	Byte00
1	Media ID			
2	Physical Bock Number (PBN)			
3	Tape Address			
4-12				
13	Media Type		Tape Format	
14			Track Number	
15	Retry Count	Logical Blk Num (LBN)		
16	Head Wear Hours		BRC Head Wear Hours	

Field Description A500

Media ID = Random number used to identify tapes

Physical Block Number (PBN) = A physical location on the media based on distance from the end-of-track depending on which direction the tape is moving.

Tape Address = Location on tape in inches

Media Type = Type of DLT cartridge

0x0014 – DLTtape III 0x0028 – DLTtape IIIxt

0x0050 – DLTtape IV 0x0064 – SuperDLT1

Tape Format = The value of this filed defines the Format or Density the media is written

0x0210 – DLT 2000 0x0220 – DLT4000 0x0240 – DLT7000

0x0280 – DLT8000 0x0290 – DLT1 0x0300 – SDLT-1

0x0000 - Unknown

Track Number = Track number where error occurred

Retry Count = Retry count used when reading

Logical Block Number = Refers to a user's view of the way block numbers are organized.

Head Wear Hours = Number of Head Wear for the SDLT Head reported by Servo

BBC Head Wear Hours = Number of Head Wear for the

CAUSE

This error could be due to one or more of the following:

- A bad spot on the media
- A failure of the drive to determine the data read from the tape was good due to bad CRC
- Other indicators used by the drive to insure data integrity
- The data originally written was not written correctly.

Suggested Actions

- Verify if multiple events on the same media occur, or multiple events on different media occur. With this information you can determine if the failure is media caused or drive caused.
- Make sure the event is not due to media being written badly by some other drive. To confirm the media was not written incorrectly, look for A501 events with the same media ID on this drive and other drives this media may have been written to.
- Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the drive.

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Event A501 – SDLT Write Error

Write Error is an event in which the tape drive detected a condition that the drive was not successfully able to write data to the media.

Packet # 7 - Event: A501 [V15-0 19-Jan-2001] 001:04:27.580 POH/PC= 26/5
Temp= 34 (36,50,45)
C5B90B03 0000963E 000187E2 20008000 21382B78 0000341B 0011A351 00000021
00000000 FF14FEEF FF60FF45 001EFCD1 **00640300** 07800054 00010000 0088002A
00000000 00000000 00000000 00000000

Long Word	Byte 03	Byte 02	Byte01	Byte 00
1	Media ID			
2	Physical Block Number (PBN)			
3	Tape Address			
4-12				
13	Media Type		Tape Format	
14			Track Number	
15	Retry Count	Logical Blk Num (LBN)		
16	Head Wear Hours		BRC Head Wear Hours	

Field Description A501

Media ID = Random number used to identify tapes

Physical Block Number = A physical location on the media based on distance from the end-of-track depending on which direction the tape is moving.

Tape Address = Location on tape in inches

Media Type = Type of DLT cartridge

0x0014 – DLTtape III 0x0028 – DLTtape IIIxt
0x0050 – DLTtape IV 0x0064 – SuperDLT1

Tape Format = The value of this filed defines the Format or Density the media is written

0x0210 – DLT 2000	0x0220 – DLT4000	0x0240 – DLT7000
0x0280 – DLT8000	0x0290 – DLT1	0x0300 – SDLT-1
0x0000 - Unknown		

Track Number = Track number where error occurred

Retry Count = Retry count used when reading

Logical Block Number = Refers to a user's view of the way block numbers are organized.

Head Wear Hours = Number if head Wear Hours for the SDLT Head reported by Servo

BRC = Number of head Wear Hours for the BRC Head reported by Servo

CAUSE

This error could be due to one or more of the following:

- A bad spot on the media
- A failure of the drive to determine the data written was good during the read after write

Suggested Actions

- Check the Media Ids. Multiple Media Ids may indicate the drive is the problem. Similar media ID may indicate the media is the problem.
- Try different media before indicating the drive as the failure.
- Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the drive.

Event A502 – SDLT Loader Communication Error

This Event log entry is used by the drive loader/library OEM suppliers in which the library/loader supplier should provide additional details.

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1	Loader Communication Status			

Field Description A502

Loader Communication Status – Status of communication problem

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Event A503 – SDLT Drive-Servo Error

The Drive Servo Error occurs when the SDLT tape drive experience servo errors. There errors will result in Tape Drive Read/Write Errors.

Packet # 1 - Event: A503 [V15-0 19-Jan-2001] 097:17:22.912 POH/PC= 97/2
Temp= 29 (31,46,36)
200E0001 000C8000 00820000 00000001 00000000 00000000 EBF8FFFF 00200081
00100000 00000000 00100000 20C00640 00BC0023 108E0000 007B0000 001B000E
00180000 00000000 00000000 00000000

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1	Log Type			
2				
3	Drive Error Code		Drive Status (MSW)	
4	Drive Status (LSW)			
5			Track Number	
6	Physical Block Number (PBN)			
7-11				
12	Power on Hours (LSW)		Power on Hours (MSW)	
13	Head Wear Hours			
14			POST Flags (MSW)	
15	POST Flags (LSW)			
16-36				

Field Description A503

Log Type = Type of Log

Description	Value
Calibration Failure	0x15
Drive Command Time Out	0x09
Controller to Drive Interface	0x0A
Drive Command Time Out	0x21
Drive Event	0x20

Drive Error Code = Error code from Servo Processor

Major Error Code	Description	Possible Action
0000h – 001Fh	Power on Self Test Error	1.Check Power 2.Check Post Flags
0020h – 003Fh	Initialization Errors	1.Check Power 2.If Repeating insure no media loaded 3.No Media and repeat drive replacement
0040h – 004Fh	Cartridge Insertion Errors	Check Cartridge
0050h – 005Fh	Cartridge Load Errors	Check Cartridge/Leaders
0060h – 006Fh	Cartridge Unload Errors	Check Cartridge/Leaders
0070h – 007Fh	Cartridge Extraction Errors	Check Cartridge/Leaders
0080h – 009Fh	Servo Errors	1.Possible Drive 2.Try Multiple Media
00A0h – 00Afh	Miscellaneous Tape Motion Errors	1.Possible Drive 2.Try Multiple Media
00B0h – 00BFh	Hardware Errors	1.Possible Drive
00C0h – 00DFh	Internal Software Errors	1.Possible Drive 2.Try Multiple Media
00E0h – 00EFh	Interrupt Trap Errors	Possible Drive
00F0h – 00FFh	Miscellaneous Errors	Possible Drive

Drive Status (on Error)

MSW Bits	Description
Bit 3	15 undefined
Bit 2	Drive did not buckle the tape when loading
Bit 1	Drive is unloading a tape
Bit 0	Drive is loading a tape
LSW Bits	**Description**
Bit 15	Drive is running a cleaning tape
Bit 14	Drive is ejecting a cartridge
Bit 13	Drive has No Tape Tension
Bit 12	Drive is in the Process of Calibrating after loading a tape cartridge
Bit 11	Drive is in the Process of Rewinding the tape to BOT
Bit 10	Drive is at a End of Track
Bit 9	Drive is on the Correct Track and physical location of the media
Bit 8	Drive is Moving the Tape and Seeking to a Track location
Bit 7	Drive is Stopped on Tape
Bit 6	Drive is at EOT
Bit 5	Drive is at BOT
Bit 4	Drive is in process of loading a tape step 2
Bit 3	Drive is in process of loading a tape step 1
Bit 2	A cartridge has been inserted
Bit 1	No cartridge present in drive
Bit 0	Drive is in the Process of Initializing (typical after power on or a total drive reset)

MSW Bits	Description
Bit 15	Unused
Bit 14	Unused
Bit 13	Unused
Bit 12	Unused
Bit 11	Unused
Bit 10	Unused
Bit 9	Unused
Bit 8	Unused
Bit 7	Unused
Bit 6	Unused
Bit 5	Unused
Bit 4	Unused
Bit 3	Unused
Bit 2	Unused
Bit 1	Unused
Bit 0	EEROM Bad
LSW Bits	**Description**
Bit 15	Unused
Bit 14	BOT LED bad
Bit 13	Unused
Bit 12	A to D test failed
Bit 11	Unused
Bit 10	Unused
Bit 9	EEROM check sum failed
Bit 8	12 volts bad
Bit 7	Unused
Bit 6	Unused
Bit 5	PLL clock check sum failed
Bit 4	EEROM check sum failed
Bit 3	Code check sum failed
Bit 2	RAM test failed
Bit 1	Address Line test failed
Bit 0	RAM test failed

CAUSE

This error could be due to grave failure to track the optical servo or electrical servo.

Suggested Repair

- Run a Tape Drive Write/Read test with two pieces of media. If test fails, replace the drive.

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Event A507/A508 – SDLT Read Failure / Directory Write Failure

These events indicate a possible problem in reading or writing to the tape directly.

Packet # 30 - Event: A507 [V24-0 11-Apr-2001] 004:12:03.342 POH/PC= 2011/11
Temp= 33 (35,49,40) Motion (Hr:Min) = 173:00
0F020F**05** **03000300** **00003020** **02010000** 00000000 **00000000** 00000000 00000000
00000001 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

Long Word	Byte 03	Byte 02	Byte 01	Byte 00
1				Called Mode
2	Save Format		New Format	
3	Flags			
4	Read Fails Status	Status		EEPROM Status
5				
6	Media ID			
7				
8				
9	EOT Status			
10-12				

Field Description

Called Mode = Directory mode called from

Mode	Value
READ on LOAD	0x01
WRITE on UNLOAD	0x02
WRITE from BOT	0x03
READ BOTH REVERSE	0x04
READ BOTH FORWARD	0x05

Save Format = Tape format before reading directory

Format	Value
DLT 2000	0x0210
DLT 4000	0x0220
DLT 7000	0x0240
DLT 8000	0x0280
DLT-1	0x0290
SDLT-1	0x0300

NEW Format = Tape format of the directory. For format values, see the Save Format field.

Flags = Directory Flags

Bits	Description
Bit 14-31	Filler
Bit 13	Calibration On Load Success
Bit 12	Lram directory stale
Bit 11	Tape direction rev
Bit 10	Directory Stale
Bit 9	Retry needed
Bit 8	Directory clobbered
Bit 7	Non-zero first track
Bit 6	Unknown format
Bit 5	Event log
Bit 4	Format mismatch
Bit 3	Directory Write failed
Bit 2	LBN 0 found
Bit 1	Inhibit directory write
Bit 0	Read ON Load complete

Read Fail Status = Status for Directory Read failures

Description	Value
Unknown	0x0
Retry failed	0x1
No Blocks	0x2
Goofy Blocks	0x3
No Block 0	0x4
Bad ECC	0x5
Directory Cell Recovery	0x6
Directory Cell stale	0x7
Directory Cell fail	0x8
Serpentine	0x9
Verify fail	0xA
BOT No Blocks	0xC
BOT Bad ECC	0xD
Indeterminate Blocks	0xE
Could not correct	0XF
System Error	0x10
Calibration failed	0x11
Drive Error	0x12

Status = Media Directory Status

Description	Value
Directory Unknown	0
No Directory	1
Partial Directory	2
Directory Complete	3
Directory Stale	4

EEPROM Status = EEPROM Directory Status

Description	Value
Directory Recovered	1
No LBN 0	10
Media ID Mismatch	11
On Tape Directory not empty	12
Sync Lock Mismatch	13
Directory Unreliable	20

Media ID = Media ID from Tape

EOT Status = Directory Status

Description	Value
Directory Recovered	1
Directory attempt	2
Bad Directory Cell Structure	10
Bad Directory Cell Entry	11
Invalid Track	12
Sync Lock Mismatch	20
Track Zero	21
Directory No Pair	30
Directory Bad Revision	32
Directory Bad Media ID	33
Directory RSTO	34

CAUSE

This error could be due to one of the following:

- Drive may need to rebuild to directory
- Drive is having difficulty writing to directory

Suggested Repair

- Check for other Write Errors
- Performed a Tape Drive Write/Read test with two pieces of media. If test fails, replace the Drive
- Perform a complete Drive Read Only test.

Other Events

Event A50C – This event log is created when a power cycle or a device reset occurs

Packet # 52 - Event: A50C [V15-0 19-Jan-2001] 000:00:00.000 POH/PC= 2993/12

Temp= 127 (-128,-128,-128)

00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

00000000 00000000 00000000 00000000

Firmware Updates

When the SDLT tape drive enters the firmware update mode it will either log an entry to indicate it did try to the firmware upgrade and failed or will indicate it passed. The below entries Packet # 4 is the event packet indicating the SDLT tape drive entered the update process. Packet # 5 shows the results of the upgrade. In this case the firmware went did not happen and it shows what firmware revision (11) it was going from and to (23). It shows the personality type, which is used to indicate what firmware characteristics are being loaded based on that particular OEM customer request. Packet # 5 is the SCSI check condition that would be sent to the host indicating the upgrade. The SCSI sense key is 09 for firmware upgrade and the ASC shows the old firmware version and the ASCQ shows the new firmware version.

Packet # 4 - Event: CA02 [V24-0 11-Apr-2001] 000:00:59.011 POH/PC= 857/260
Temp= 25 (26,41,30) Motion (Hr:Min) = 183:40
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

Packet # 5 - CUP Event: POH/PC= 857/261
Temp= 127 (-128,-128,-128) Motion (Hr:Min) = 0:00
Drv CUP status: Complete
Drv Old: 17010000/C01959B6
Drv New: 1E000000/0640F263
Cnt CUP status: Complete
Cnt Old: V024/9759D9BC (11-Apr-2001 21:38:26) Pers: (4-1)
Cnt New: V030/34E7971F (23-May-2001 19:39:52) Pers: (4-1)

Packet # 6 - SCSI Event: POH/PC/MID/SK/ASC/ASCQ/AddErr=857/261/00000000/9/1E/1E/00
Temp= 127 (-128,-128,-128) Motion (Hr:Min) = 0:00

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Bug Checks

This is a description of Bugchecks Log Entries. A bugcheck is typically an indication that the SDLT firmware has reached a point in the decision process that requires a drive reset. There are many bugchecks and many things that may cause the bugcheck, for example; they may be due to hardware error, media error, power supply problem, something external (shock, vibe, hot, cold. etc), or a firmware problem. Typically firmware problems are not the cause and you should check for other sources. If it is assumed to be a firmware issue contact your SDLT support group or you SDLT Account team for assistance. Some common bugchecks that may be seen are:

BugCheck Code (in hex)	**Description and Possible Cause**
B810	Indicator that there may be Library Port communication problems – Library or Drive Problem
E204	Unexpected Timer 2 interrupt –Drive problem
EE01	Spurious Non-Maskable Interrupt – Drive problem
EE02	Spurious Timer Interrupt – Drive Problem
EE03	Spurious level 5 interrupts – Drive problem
EE04	Spurious drive comm. Interrupt – Drive problem
EE05	Spurious loader comm. Interrupt – Drive problem or Loader problem
EE06	Spurious diagnostics comm. Interrupt – Drive problem
EE08	Watch Dog Timer Expired – SCSI Bus problem, Host controller problem, Drive problem
EE09	Spurious Power Fail – Power supply, power cables
EE0D	Spurious level 6 interrupts – Drive problem
F203	Loader time-out – Loader Failure

The below is an example of a Bugcheck Entry from a SDLT220.

```
Packet # 48 - BugCheck Error: EE01   [V15-0  19-Jan-2001]
 PC= 20020D2E  SR= 270C  Cntxt= Intrp  000:01:06.813  POH/PC= 8/9
  MSP = 212664FC  ISRret = 20036962 (IDLE )
   Temp= 23  (24,27,27)
          00000000 00000008 FFFF7FFF 00071819 0000003B 00000080 80000000 00000004
          14013000 201AFE30 52000000 2120573C 212664AC 21205714 212664A8 21266
```

SCSI Events

Sense Key Definitions

0h – NO SENSE, Check the Filemark / EOM / ILI bits and the Additional Sense Code / Additional Sense Code Qualifier bytes.

1h – RECOVERED ERROR, This can be caused by rounding of Mode Parameters on a MODE SELECT, or may report that READ/WRITE error rates are reaching subsystem specification limits for optimal operation. The device may still be able to continue to functions without any unrecovered errors for a long period of time, however. No CHECK CONDITION is generated unless the PER bit of Mode Page 01 is set.

2h – NOT READY, The tape medium is not ready for tape operation commands. Tape medium might not be present in the drive or may be in the process of loading or calibrating.

3h – MEDIUM ERROR, An unrecoverable WRITE, READ, or positioning error has occurred. Detailed device-specific information may be available.

4h – HARDWARE ERROR, The Additional Sense Code / Additional Sense Code Qualifier fields may present more specific information.

5h – ILLEGAL REQUEST, The Command Descriptor Block or supplied parameter data has an unsupported or illegal operation specified. Check bytes 15, 16, and 17.

6h – UNIT ATTENTION, Unit Attentions are created after advice reset, if the medium asynchronously becomes ready to the initiator, if another initiator changes Mode Parameters, and/or if the firmware is updated.

7h – DATA PROTECTED, The current tape medium is write-protected. This can be because the Write Protect switch on the cartridge is in its enabled position or if the medium is not the appropriate type, or if a software write protect is issued.

8h – BLANK CHECK, An End of Data or LongGap has been encountered.

9h – CODE UPDATE, This sense key is a means to notify the host that the firmware in a drive has been changed. The ASC and ASCQ will indicate what the new revision of the drive firmware has been changed to. This is logged in the drive logs to track any firmware changes that may have occurred.

Bh – COMMAND ABOTED, This key is generated when a command has been aborted by the tape drive for some reason. Check the Additional Sense Code / Additional Sense Code Qualifier bytes.

Dh – VOLUME OVERFLOW, This key indicates that the physical end of tape medium has been reached during writing. The initiator ignored the End of Medium condition and continued to write to tape.

Common ASC/ASCQ

ASC/ ASCQ	Description	Action
0C/00	Write Error, Drive was not able to successfully write the customer data to the tape	Problem may be the tape cartridge or the drive. Check logs to correlate A501 events with the media type and ID system logs
11/00	Unrecoverable Read Error, After exhausting the read recovery algorithms the drive was not able to read the data correctly	Problem may be the tape cartridge or the drive. Check logs to correlate A500 events with media type and ID with system logs. Look for write errors to this media from this drive or others as that may be the result of this read error.
40/8x	POST Error, The drive during power on self test has detected an error	Errors of this type indicate a drive problem. Verify the SCSI bus is terminated correctly and if this continues replace the drive.
14/00	Entity Not Found, a logical block that was written on the tape was not found while trying to read the data.	Problem may be the tape cartridge or the drive. Check drive logs to correlate events that may have led up to this condition.
47/00	SCSI Parity Error, SCSI bus communications problem	Check SCSI Cables, Terminators, all devices attached to SCSI bus.
80/03	Soft Error Exceeds Threshold, The drive has detected that a high soft error rate has occurred which may lead to a hard error	Try another tape if this persists use the drive logs to correlate this condition with other events and replace the drive if this frequent with multiple media. The same media ID with multiple entries indicated a media problem