

IBM LTO-8 Firmware Version Q384 (FH) and Q385 (HH) Release Announcement

May 2023

Preface

IBM LTO-8 firmware update Q384 for full-height (FH) and Q385 for half-height (HH) drives. These updates since versions P380 (FH) and P381 (HH) are intended, among other things, to increase overall reliability, improve tape handling, further reduce any possibility of error, and provide continued enhancements to diagnostic capabilities.

Models Affected

This firmware affects all IBM LTO-8 FH and HH drives.

Upgrade Considerations

All prior firmware versions can be upgraded to firmware version Q384 for FH and Q385 for HH drives.



CAUTION:

To prevent data corruption, verify that all active backup and recovery jobs to the LTO drive are completed prior to performing the upgrade.

Downgrades

Downgrades are not supported.

Fixes That Affect All Drives

- **Panic when attempting invalid behavior ID.** Due to a code bug, when sending a Get or Set Behavior command on LUN2, an invalid behavior ID could cause the drive to panic. Code has been modified to better handling behavior IDs, making sure commands are within the valid range.
- **Fix breakage in contents of read buffer ID 08h.** Due to a code bug, the read buffer 08h WWPN field was returning all zeroes. Code was corrected so the drive will return WWPN of requestor correctly.
- **Incorrect FSC's reported against refurbished tapes.** When a refurbished cartridge gets loaded, the drive posted a FSC 7225 & FSC 7234 which was incorrect.
- **Slow Performance on LOCATE Command.** There was an error in the starting location of the LOCATE which cause it to take longer than it should.
- **Drive failed to send status to a Write command.** Fixed an issue to correctly respond to a Write command while ILEP (Internal Label Encryption Policy) was enabled.
- **Timeout on READ.** The drive attempted some needless ERPs (Error Recovery Procedures) which caused the READ to timeout.

- **Drive fails WRITE with a FSC 6000.** Due to invalid sensor status, the drive incorrectly thought that it needed to LOAD an already loaded cartridge.
- **Drive fails a LOAD from hold position.** Changed logic to clear previous load variables just before threading a cartridge.
- **Time out on a READ Command.** Drive used an invalid LPOS during an ERP.
- **Write Timeout.** Due to a race condition, the WRITE Command was not ready for the return of a CRC failure, so it hung waiting for status that had already provided by a lower level of code.
- **READ failed with FSC 7226 on a partitioned cartridge.** Changed logic so the Drive would refer to the appropriate value while reading partitioned media.
- **Locate failed with FSC 7220.** Drive reports an error incorrectly while locating to different partition.
- **Locate/Space failed with FSC 6017 due to timeout:** The ERPs for an invalid LPOS were changed to avoid continuing the same recovery action which was not working. The ERP progression was changed so when a first retry fails, the drive will then go to rechuck retry to avoid the timeout.
- **Drive fails WRITE with a FSC 7855:** The drive was having trouble getting the current position on tape during a wrap turn, which caused the drive to time out.
- **Drive fails cartridge formatting at EOD with FSC 6402.** Drive failed the FORMAT command due to an error of a previous operation not being cleared.
- **Drive failed to Locate/Space with FSC 6353.** ERP was added so if an invalid LPOS on the skim was detected, the drive would retry the position with a read.
- **Drive failed with FSC 7060. Incorrect was tension was being used during an ERP.** The tension was changed to nominal to improve recovery chances.
- **Correct DHCP settings.** Changed drive DHCP request option from 60 to "tape_drive".
- **Drive did not eject the cartridge after an MTR.** The low-tension rewind failed during the Mid Tape Recovery (MTR) due to in an invalid LPOS, and the drive to failed with a 4105. Corrected the callback when an invalid LPOS is encountered during a retention rewind.
- **Drive failed with FSC 78B5 at EOT.** A change was made to better control the band change at very close to physical EOT.
- **Drive failed a READ posting FSC 7060.** TDS readings taken at or after a wrap turn or mid-wrap location, can result in incorrect readings or permanent errors. Changed the repositioning process, as well as adding a channel state check during read.
- **Read failed with FSC 6017.** When an unexpected BUFFER_FULL occurred, the drive checked too many data segments which caused mis-detects. Limited the number of segments to check if buffer is full.
- **Drive failed with an incorrect FSC 4105.** The drive incorrectly posted an FSC for recovered operation. The drive should post the correct FSC through the call stack within the drive.
- **READ failed with FSC 7175 at EOW:** Changed the ERP behavior to read to the latest data set write pass at the wrap turn.
- **Drive panic while getting Tape directory info.** Fixes a drive hang which could occur when the drive failed to get tape directory information due to referring to an invalid index.
- **Drive failed a READ posting FSC 6354.** Modify the existing code that handles the processing of GRAO segments to include a check for read errors. If an error is detected, the code would cancel any remaining devolved data for read and terminate the segment processing.
- **Drive failed LOCATE/SPACE operation posting FSC 6353.** Fixes isolated cases when a drive could refer to invalid write pass value when it encounters SRV related error.
- **Drive Hang during WRITE.** The drive incorrectly retried writing, on a write completed data set. Code was changed to making sure whether the write operation was successfully completed or not.

- **Excessive skipC2 cause positioning timeout with FSC 706F.** ERPs were enhanced to mitigate position time outs of certain errors.
- **ERP failed on refurbished media posting FSC 7234.** Criterion was changed to properly handle ERP process on refurbished media.
- **FSC 2E0C during THREAD.** Disabled threading of the tape when the bottom head sensor is not working. This keeps the head and threader from interfering with one another and causing the tape to get stuck in the drive.
- **FSC 6720 when logical write append error occurs.** Change criteria to ensure that the drive transitions to write mode only when there isn't logical write append errors.
- **Drive failed a READ posting FSC 6353.** Logic was changed so the drive could successfully determine the read position after an Error Recovery Process.
- **VHF does not update after a LOAD failure.** When a load failure occurred (such as a 2E01) the VHF data would hang and not transition out of the "UNLOADING" state.
- **FSC 7875 at media direction change.** An unexpected velocity spike near zero velocity, caused the drive to lose velocity control and go into tension shutdown. Clamped the PWM velocity to filter any sudden velocity changes near zero velocity.
- **FSC 7836 during a LOCATE.** Fixes a locate problem, which could occur when the drive failed to detect servo signals that lead to PES acquire errors.
- **Drive reported an FSC 6712 on WORM media.** The drive incorrectly appended at last written File Mark (FM) followed by no records on a WORM tape. Criteria was changed to retry the position to the append target, to ensure that the last written FM is properly appended with the subsequent records.
- **Drive hang during mid-tape recovery.** When MTR failed, there was no callback to the originating function to signal the error. A callback function was added so that the drive would not hang.
- **Drive hang:** In internal testing there was not action defined when a specific failure occurred which caused, the drive to hang. A retry action was defined.
- **Drive hang on READ:** When reading, the drive returned the wrong DS which prevented data transfer to the host. Corrected the code to read the correct DS.
- **Panic when Locating to another partition:** When a locate in another partition was attempted, an unexpected wrap from the last partition was used causing the drive to panic.
- **Drive failed with a 6353 During test:** Due to timing related issues, some drives would fail on some cartridges while doing a high speed locate. This cause issues with the drive acquiring LPOS. Servo Improvements were made in acquiring LPOS during high-speed locations.
- **Drive Panic at EOD wrap turn:** Due to a race condition the drive panicked on a recovered servo error at a wrap turn during an EOD write.
- **Drive failed with a FSC 7076:** During a READ ERP, an incorrect tension was used during an ERP which caused the drive fail during the locate.

Functional Change Requests

- **Implement MAM attribute 1100h for LTO.** Added MAM attribute 1100h for LTO which provides the total tape motion meters for that cartridge.
- **Fix breakage in contents in log page 30h[43h].** Due to an incorrect logic, log page Byte 4 bit 2 couldn't be saved. Code changed so that the settings could be saved.
- **Implement new log page 39h[02h].** This FCR adds a method to return the SFP For FC Drive from page A2h to the host and library over LUN 0.
- **Implement MAM attribute 1002h.** Adding parameters to provide MAM attribute User Defined Cartridge ID.

- **Implement FCR 3403:** Data set writing drive information. This FCR creates two new parameters in LP 38 to identify which drive wrote a specific dataset.
- **Implement default/retain disable precise delivery control (EPDC).** This FCR changes the default/retain of the Enable Precise Delivery Control (EPDC) functionality. This needed to be done in order to work around some HBA that unexpectedly started sending non-zero, non-incrementing CRN's.

Fixes That Affect Only Certain Drives

Library Drives

- **An sADT frame may have incorrect data if sent during the 100ms delay after Port Login.** Due to a race condition, the drive may only return 1 byte of the required payload during this time.
- **Disable iADT obfuscation function.** Removed support for an unused iADT/TLS connection type.

FC Drives

- **LP 11h[010?h] may wrongly report PIC1 when FC port offline:** certain offline conditions may report incorrect port status changed to always report PIC=0 when port offline.
- **Improve certain FC class-3 error recovery scenarios.** Some non-compliant FC HBAs use/expect task retry identifiers, but do not advertise support (PRLI word 3 bit 9). Include task retry identifier in outgoing REC parameter field and verify incoming when non-zero.

Downloads

Firmware update code IBM LTO-8 Q384 (FH) and Q385 (HH) is available for download for supported users with active software entitlement agreements.

Go to https://download.overlandtandberg.com/Firmware/Tape_Drives/IBM_LTO8_Drive/.

Additional documentation on how to operate, configure, and support your NEO library is available at our [Knowledge Base](#).