

IBM LTO-9 Firmware Version Q3F4 (FH) and Q3F5 (HH) Release Announcement

May 2023

Preface

IBM LTO-9 firmware update Q3F4 for full-height (FH) and Q3F5 for half-height (HH) drives. These updates since versions PA60 (FH) and PA61 (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-9 FH and HH drives.

Upgrade Considerations

All prior firmware versions can be upgraded to firmware version Q3F4 for FH and Q3F5 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.
- **FSC 6354 while reading/writing.** The current implementation of User Data Segments (UDS) parsing on a specific task has led to slow performance due to the task being overloaded. The internal UDS parsing logic has been changed to improve performance and efficiency.
- **Improve entropy sampling FSC 1133.** The current entropy sampling rate is causing a higher chance of entropy health test failures for some drives. The sampling rate was changed to a more optimal rate value.
- **Drive failed an UNLOAD posting FSC 78E3.** Due to a code bug, an unload operation fails to complete after a re-chuck ERP failure. Code was changed to correctly handle re-chuck ERP failures during load/unload operations.
- **Drive failed an UNLOAD while entering power saving mode.** Due to invalid logic, when tape is unthreaded for power saving mode and an unload command is requested; this unload command is not executed. Code was changed to properly unload cartridge.

- **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.
- **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 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 make 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 no action defined when a specific failure occurred which caused the drive to hang. A retry action was defined.
- **Modified the life criterion for certain L9 cartridges, manufactured on or before November 25, 2021.**
- **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 callback function if Write Thru Cache (WTC) bit is set for write attribute 1010h.** This change fixes a hang issue in the initial implementation of the FCR.
- **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

- **Disable iADT obfuscation function.** Removed support for an unused iADT/TLS connection type.

FC Drives

- **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-9 Q3F4 (FH) and Q3F5 (HH) is available for download for supported users with active software entitlement agreements.

Go to https://download.overlandtandberg.com/Firmware/Tape_Drives/IBM_LTO9_Drive/.

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