

# IBM LTO-7 Firmware Versions JAYE (FH) and JAYF (HH) Release Announcement

April 2019

## Preface

This Product Information Bulletin announces the release of IBM LTO-7 firmware updates JAYE for full-height (FH) drives and JAYF for half-height (HH) drives. These updates 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

These firmwares affects all IBM LTO-7 drives, both FH and HH.

## Upgrade Considerations

All systems running code IBM LTO-7 J4D0/J4D1 can be upgraded to LTO-7 JAYE/JAYF.



**CAUTION:** To prevent data corruption, verify that all active backup and recovery jobs to the NEO tape library are completed prior to performing the upgrade.

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## Downgrades

Downgrades are not supported.

## Functional Improvements (Reduce Permanent Errors)

Firmware fixes included with the JAYE FH and JAYF HH updates:

- **DCCs / error queue wrongly cleared on 6/2800 reporting:** Fix problem which could cause deferred errors to be incorrectly cleared on other paths when UA 6/2800 was reported.
- **LP 14h duty cycle reporting:** Fix problem with incorrectly reporting the duty cycle parameters in LP 14h.
- **Fix multi-initiator reservation medium access:** The queuing logic incorrectly dequeues reservation commands (RU/PRO) when a medium access command is performing pre-processing (flushing). This can result in overlapped flushes and FSC 6000.
- **Improve/cleanup MAC queue:** Changes and improvements to the drive Medium Access Command queue code, to better handle error scenarios which could previously result in a drive hang.
- **Additional ERP improvements for FSC 706x read error recovery.**
- **ASIC support:** Initial code changes to support a new ASIC (A/D converter for the LTO read channel).
- **Only do one calibration at load:** Fixed a code panic caused by looped up attempts to calibrate when a tape was loaded.

- **Archive Mode Unthread improvements:** Additional servo code changes to support unloading the tape at lower tension for the Archive Mode Unthread.
- **Velocity spike caused motor driver error:** This change prevents a motor driver velocity spike from resulting in an FSC 78A0 accel/decel error.
- **Unexpected End Mark by read after rewind with multi-partition:** Fixed an FSC 6601 error on a read command with a multi-partition tape. This was caused by race condition between the host read and completing an internal BOP cache operation.
- **Accept rechuck ERP req after cart init failure:** ERP improvement by allowing additional cases where a rechuck (head brush) can be done following FSC 2E1x errors.
- **Servo signal detection enhancement for drives with TMR readers.**
- **Timeout by reading corrupted compressed record at BOT:** Fixed a problem where reading a bad record at BOT resulted in a hang and timeout. It should have reported FSC 601D instead.
- **FSC 7076 No EOD detected:** Fix some cases of a false FSC 7076, which were caused by issues with reading or using the LPOS value.
- **Panic due to table index out of range:** Fixed a panic when code was unable correctly handle interrupts for a read error condition.
- **Additional conditions for requesting Clean:** For the set of FSCs where the ERP would normally invoke a head brush, the recovery could sometimes fail before that step was reached. This change checks for that condition and will now invoke a Clean request.
- **Tracing for unspool failure:** Additional tracing to help debug an unspool stall which can result in FSC 2E14/2E15 and a stuck tape.
- **Close timing window on Write Attribute command:** Fixed the SCSI command response to the Write Attribute command when a cartridge is just loaded and the cartridge memory is being read and / or the cartridge memory is being initialized. During this short time period a Write Attribute command cannot write to the cartridge memory. The drive was not responding with appropriate sense data and wrongly reporting the command completed.
- **Avoid invalid trip error during partition change:** Fixed a code problem where read ERPs located to the wrong partition on a multi-partition tape, resulting in an FSC 7220 error.
- **FSC 7420 write error criteria:** Adjust the criteria for setting an FSC 7420 write error, to help improve the margin against subsequent read errors.
- **Add more fields to serial command:** Include additional fields which were previously not cleared.
- **Fix Idle\_C timer usage:** Fixed a code problem which incorrectly changed the Idle\_C Condition parameter value, which is specified in MP 1Ah Power Condition. This parameter effects the length of time the drive remains idle before entering low-power mode.
- **Fix report density DEFLT bit for Gen6 media:** Fixed a problem with the Report Density Support command, where the default density was not correct when some types of Gen6 media were loaded.
- **New ASIC support:** Final bring-up code changes required to support a new ASIC (A/D converter for the LTO read channel).
- **Do not create Init Data CM page in unprot area:** Ensure that the Initialization Data page does not get created in the wrong area on initialization of the cartridge memory.
- **Channel calibration at the beginning of PostB:** Improve the effectiveness of the PostB drive diagnostic, by first completing a Channel calibration sequence before running the diagnostic tape write sequence. This may help reduce some unnecessary drive replacements by ensuring the hardware is correctly set up and by also allowing collection of calibration details which can be useful in problem diagnosis.
- **FSC 2E09 on unload - false detection:** Fixed a code problem which incorrectly detected an FSC 2E09 error during an Unload sequence.
- **Flush before Read Attribute of VWJ attribute:** Fixed a problem which reported an incorrect block position value in the Volume Change Reference attributes.
- **Unload with retension bit on doesn't work:** Perform an Archive Mode Unthread when the Retension bit is set on an Unload command.

- **Cannot unload if retension fails:** Fixed a code bug which blocked subsequent unload attempts with FSC 2C53, after an archive mode unthread operation failed.
- **Fix cart gen check for Alt-UCI validity:** Report the correct value for MAM Attribute 1001h (Alt-UCI) when a cartridge is unloaded to the Hold position.
- **FSC 2E16 false detection:** Fixed a code problem which caused a false detection of an FSC 2E16 error. This occurred while unloading a tape which was loaded and threaded at the time the drive was reset or powered-on.
- **Timeout by LBP error during write operation:** Fixed a rare problem where a write operation with LBP enabled, could get hung resulting in a host timeout error.
- **Improve Mode Sense descriptors:** This change implements some improvements and minor fixes dealing with Mode Sense descriptors. This includes fixing some issues with the density code in the Block Descriptor, when the cart was loaded or unloaded to the Hold position (mounted but unthreaded). In addition, a Mode Select from LUN2 will not update header fields shared with LUN0 (such as speed and buffer mode).
- **SCD 0 in normal operation mode:** Fixed a problem where the drive SCD (Single Character Display) was not always cleared at the end of POST.
- **MTR enhancement for controlling motor spin:** Code improvement for controlling the reel motors, when unspooling a tape which was loaded when the drive was reset or powered-on.
- **Missing check condition when code download fails:** Fixed a problem with specific scenarios where a code download failed, but no check condition was presented. With the fix, the drive correctly presents check condition with `sk/asc/ascq = 5/82/83` and sets TA 22h.

## Functional Change Requests

- **Support TA07h Media Life and update TA13h Near Media Life:** Implements support for setting TA07h indicating the media is at end of life based on usage thresholds. In addition, adjust the thresholds for setting TA13h indicating that the media is near to or approaching end of life.
- **Optical transceiver information:** Implements support for new LP11h parameters to report information about the installed optical transceivers. Specifically, this provides a method to determine if Single-mode or Multi-mode transceivers are installed.
- **Autoload mode (SPC MP0Ah):** Implements support for the AUTOLOAD MODE field in MP0Ah. This provides a method to allow applications to access MAM without threading the tape, in cases such as a library inserting the volume into the drive for a MOVE MEDIUM.
- **Changes to Inquiry page C1h:** Implements support of changes to Inquiry Page C1h. This allows reporting of the Manufacturing Drive Brick serial number, in all configurations, to be available over the SCSI interface.

## Fixes That Affect Only Certain Drives

### Library Drives

- **Fix six-byte value VOLSER in MR page:** Fixed a problem with incorrectly storing MAM attribute 806h, when the CM MR page has a six-byte VOLSER.
- **Fix panic on concurrent dump reads from host and lib:** Prevents a code panic when concurrent Read Buffer requests are received from two initiators.
- **Send correct MP 0Eh[04h] data (multi-page).**
- **LN1: Set VS=0 in both bytes 6,7 in inquiry data.**
- **ADI: Fix IU tracker queuing on timeouts:** Frames that were not ACKed by the library were not handled correctly in the queue when they timed out, so the library interface would hang.
- **Drive panic due to overlapped Mode Select Commands:** The drive and library were both doing the Mode Select with the save bit to the same page which caused a conflict, and the drive panicked.

- **Report the correct node name for port 1 in Log Page 11h.**
- **Library generic command not transferring all data:** Fixed a problem where the drive was not transferring data correctly for a generic command, after the second XFER RDY IU.
- **Correct LN1 sense data after recovery login IU:** The default sense data for the library status was not correctly set prior to the library logging into the drive via ADI on a communication recovery.
- **Use correct length when getting set MAM attributes.**
- **ADI: Change order of checking XMIT and RCV IRQs:** Due to a timing issue in servicing transmit versus receive interrupts on the ADI interface, the drive and library could lose communication which would necessitate an ADI interface recovery.
- **LN0: improve lib/host LOG SENSE reset contention:** Improves contention issues with Log pages which are reset when read by either the host or library.
- **Device Activity stuck at Writing:** This change correctly sets the Device Activity field in VHF back to No Activity, following a Write or Read error. Previously, the field could stay at Writing or Reading and might cause a library to think it should not unload the media.

### SAS Drives

- **Drive panic due to excessive repeating transfer failures:** In an error inject scenario, repeated dropped data frames caused the drive to run out of messages and reboot unexpectedly.

### FC Drives

- **Avoid duplicate PEWZ notification:** A race condition could occur which would cause a duplicate PEWZ (programmable early warning zone) sense data to be sent.
- **FCH: Improve N-Port direct attach:** Additional code improvements for N-Port attach.
- **SRR should read from media, not BOP cache:** Prevents a case of corrupted read data following SRRs on the host interface.
- **Set SCD F (NO\_LIGHT) when no cable is attached at power-on:** There was a race condition between the POST code sequence completing and interface code checking for cable attach. In some cases where no cable was attached, the SCD F did not get set.
- **Queued TM might dispatch twice and panic:** Prevents a code panic in a rare scenario where two Task Management requests are received at the same time.

### HH Drives

- **Tape run off with archive mode unload:** When an archive mode unload was sent to the drive and the tape was near Logical EOT (LP5), the tape could run off the end.
- **Prevent 78B0 (over rotation):** Fix one cause of FSC 78B0 over-rotation error when the tape deceleration and stop completed sooner than expected.
- **Tape break and 12V drop during unspool:** Fixed one case of a tape break during an unspool sequence, where the tape stopped (possibly due to stiction) and the code did not correctly limit the motor current.
- **Change threshold for vibration compensator:** Revert back to pre-J4D0/1 threshold value for the vibration compensator due to elevated stop writes in some environments.

## Downloads

Firmware update codes IBM LTO-7 JAYE (FH) and JAYF (HH) are available for download for supported NEO users with active software entitlement agreements. Go to the Overland-Tandberg Customer Support Portal by navigating to the Manage Products page: <http://support.overlandstorage.com/support/neo-series.htm>.