



# Release Notes

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<b>Product</b>	LTO-5HH Serial Attached SCSI H971
<b>Date</b>	January 2018

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# Introduction

These release notes apply to the Quantum LTO-5 Half Height Model C distribution product.

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# Terms

Types of changes:

- **Enhancements** - A given feature or algorithm of the product has been enhanced, to allow wider usability and/or to provide greater robustness
- **New Functionality** - A new piece of functionality is added.
- **Bug Fix** - Fixes a bug in the software.

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# Firmware Version Identification

These drives will have similar inquiry string as previous Quantum models and presented on the Standard Inquiry Page and Inquiry Device Identification Page 83h as:

- Vendor Identification = 8 bytes of ASCII data: "Quantum" followed by a space
- Product Identification = 16 bytes of ASCII data "ULTRIUM-HH5" followed by 5 spaces
- Product Revision Level =4 bytes of ASCII data "YMDV"

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# Compatibility

LTO-5HH compatibility requirements:

- The LTO-5 HH drive has a dual port SAS-2 6 Gbps interface
- Please use the Drive Compatibility Guide tool found on [Quantum.com](http://Quantum.com) for software and hardware compatibility

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## New Features and Enhancements

This is a second FW release for LTO-5 HH SAS drives. Changes described below are between G9N5 and H971 FW versions.

This update is intended, among other things, to increase overall reliability, improve tape handling, further reduce any possibility of error, and provide continued enhancements to diagnostic capabilities.

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## Description of Changes

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### Fixes Affecting All Drives

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Type:	Bug fix
Description:	<b>Fix task contention w/turbo counts during TLWR:</b> Prevent race condition during initialization, where TLWR could conflict with host activity and cause an incorrect mode setup.
Type:	Bug Fix
Description:	<b>Panic due to abandoned seg status begin cleared on load:</b> Fixes another case for error handling which involves a FM and EOD at end of wrap. In this scenario, the tape was unloaded right after a recovered error, and the panic occurred on the next load.
Type:	Bug Fix
Description:	<b>Correct data for drive id in MAM parm:</b> Fixes a bug caused by CMVC 34860, where a cleaning cart could appear as a data cart in MAM data.
Type:	Enhancement
Description:	<b>Add drive behaviors to report a drive panic:</b> To better identify when a drive panic occurs the follow behaviors were added to the drive for a library to monitor. Set TA=3Ah and assert new recovery procedure 10h - "Device initiated reboot. Retrieve device error log".
Type:	Bug Fix
Description:	<b>Diagnostic callback cannot handle concurrent requests:</b> Fix was added to help the drive better handle concurrent requests with LTFS.
Type:	Bug fix
Description:	<b>Fix error reporting on erase:</b> When a FID write error occurs during an erase sequence, correctly report a media error rather than a code internal error (FSC 6000).
Type:	Bug fix
Description:	<b>Drive Panic due to side effect of previous change:</b> Fix panic caused by previous code change for FSC 78B5 errors.

Type:	Bug fix
Description:	<b>Check existence of Cart Content page before updating:</b> Fixes a code panic which occurred when a Set Capacity command was issued with an uninitialized Gen4 WORM cartridge. This problem only existed in LTO5 code.
Type:	Enhancement
Description:	<b>Motor stall at the beginning of Carlnit caused 2E12:</b> Prevents a temporary motor stall during the servo initialization sequence, from causing an FSC 2E12 load error.
Type:	Bug fix
Description:	<b>Correct supported media type list of log page 14h:</b> Fixes a code problem which caused incorrect values for the supported media types in Log Page 14h.
Type:	Enhancement
Description:	<b>Better handle issues with buffer corruption recovery:</b> Drive would panic if a data buffer corruption was detected. In some cases this can be handled with a simple read retry from the media
Type:	Bug fix
Description:	<b>Fix reservation conflict checking:</b> This change fixes reservation conflict checking to match the SCSI spec, and resolves inconsistencies between SPC2 reserve and Persistent Reservations.
Type:	Bug fix
Description:	<b>Activity duty cycle of log sense 0x14:</b> Fixes a problem with LP 14h, parm 13h, where the activity duty cycle could be incorrectly reported as exceeding 100%.
Type:	Bug fix
Description:	<b>Race in task management can hang frame processing:</b> Fixes a code race condition at the end of a task management response, which result in an interface hang when processing the next incoming frame.
Type:	Enhancement
Description:	<b>Improve Log Sense handling:</b> Process a Log Sense command out-of-order when the command is going to fail immediately due to an invalid request.
Type:	Bug fix
Description:	<b>Thread failure after wake up from power saving:</b> Fixes a problem where the “wake up” sequence from power saving mode could cause a thread failure or a false 12v power error.
Type:	Bug fix
Description:	<b>Motor stall during unspool caused tape damage:</b> Fixes a code problem where a stall during the tape unspool sequence (possibly due to stiction), resulted in incorrect motor movement and possible tape damage.
Type:	Bug fix
Description:	<b>Mode Sense page 10h missing PS bit:</b> The page savable (PS) bit was in error when pc=changeable.

## Functional Change Request

Type:	Bug Fix
Description:	<b>FCR3327: LTO5 LP11 Parm 8001 Medium Encryption Status:</b> The LTO-5 drive needs to change to conform to this behavior to better report the encryption status on the HH LED encryption light.
Type:	Bug Fix
Description:	<b>FCR3329: ADC Service Mode (condensate abatement):</b> Implement new support for ADC Service Mode, which allows a library to tell the drive to go into service mode to reduce condensation.
Type:	Bug Fix
Description:	<b>FCR3333: Support DRA using standards based op-codes:</b> Implement new support for the "standards" based op-codes for Dynamic Runtime Attributes, while still maintaining the legacy based vendor unique op-codes.

## SAS Drives

Type:	Bug Fix
Description:	<b>SAS wrap test sometimes fails:</b> Interrupts were not masked during the loopback test, which could result a frame miscompare and a false wrap test failure.
Type:	Bug Fix
Description:	<b>SAS: Internal CRC failures send wrong data to host:</b> With some HBA suppliers, the drive would send bad data on a CRC error while performing TLR. Also changed the code to not attempt TLR - instead, a check condition with sense key B (aborted command) and ASC/Q of 110A (Miscorrected Data) is sent which should inform the host that the data that was sent was bad.
Type:	Bug Fix
Description:	<b>Handle link stopped in more cases:</b> Code improvement to better handle link stopped scenarios.
Type:	Bug Fix
Description:	<b>Panic due to interrupt being handled in two places:</b> Fix a code panic from a race condition created by a previous change.