LTO-7
High-Density Storage

Enhanced with Spectra Certified Media

SPECTRA
Spectra’s Brand New LTO-7 Drive

Fibre Channel or SAS connectivity

Enhanced servo and data bands

Superior data compression

Double the performance, speed and capacity of LTO-6

12 levels of speed matching

Advanced data encryption options

Longer lasting electronics

State-of-the-art LTO Ultrium Technology

Linear Tape Open (LTO) Ultrium is a high-capacity tape storage solution designed for dependability and cost efficiency. It’s a powerful, scalable and adaptable tape format that helps address the exponential data growth and storage challenges facing organizations today.
Coupled with Spectra Certified LTO-7 Media

Spectra media is vastly superior.

Our commitment is making tape storage pain-free through Spectra® Certified Media. From manufacturer selection to testing and customer shipment, every step of the Spectra Certified Media process is designed to ensure you have the most reliable and automated tape storage available. No other supplier places as much emphasis on continual enhancements and added features that simplify all aspects of the media management process.
LTO-7 Means More...

**More Capacity means...**
- Smaller Libraries
- Simple Expansion
- Lower Cost

**More Speed means...**
- Faster Archives
- Fewer Drives
- Lower Cost

**Backward Compatibility means...**
- Flexibility
- Lower Cost
The Future of Storage - Available Now

<table>
<thead>
<tr>
<th>LTO-6 versus the New LTO-7</th>
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<tbody>
<tr>
<td><strong>LTO-6</strong></td>
</tr>
<tr>
<td>2.5 TB Native 6.25 TB Compressed</td>
</tr>
<tr>
<td>160 Mb/s Native 400 Mb/s Compressed</td>
</tr>
<tr>
<td>Bit Error Rate = $1.0 \times 10^{17}$</td>
</tr>
<tr>
<td>16 Data Track Channels</td>
</tr>
<tr>
<td>2.5 to 1</td>
</tr>
<tr>
<td>Writes back to LTO-5 Reads LTO-5, LTO-4</td>
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<tr>
<td></td>
</tr>
<tr>
<td>6 TB Native 15 TB Compressed</td>
</tr>
<tr>
<td>300 Mb/s Native 750 Mb/s Compressed</td>
</tr>
<tr>
<td>32 Data Track Channels</td>
</tr>
<tr>
<td>2.5 to 1</td>
</tr>
<tr>
<td>Writes back to LTO-6 Reads LTO-6, LTO-5</td>
</tr>
</tbody>
</table>

Key Features
32 Channel Head & improved electronics

Enlarged images of LTO-6 and LTO-7 head surfaces
A new **32 channel head** and 15% more tape length means 240% more capacity than LTO-6 technology.

To reach **6TB per tape** requires using a dense Barium Ferrite (BaFe) particle on highly controlled tape media. LTO-7 is **exclusively BaFe**.

Leveraging the enterprise grade **IBM Jaguar** electronics, LTO-7 can reach speeds of **300 Mb/s**, more than double the previous generation. LTO-7 also has intelligent **speed matching** capability from 100Mb/s up to 300Mb/s compared to 40Mb/s up to 100Mb/s with LTO-6.

**On-the-fly ENCRYPTION** is available at full speed, managed by the Spectra library or with third-party key management software.
Enterprise Grade Speed

Up to 300 Mb/s
Native Transfer Rate

Up to 750 Mb/s
Compressed Transfer Rate

Automatic speed-matching ensures an uninterrupted, serial data stream regardless of the server’s capabilities.
Enterprise grade bit-error-rate 1.0 x 10^{19} bit error rate comparable to that of TS1150 technology and is 100x that of LTO-6.

CarbideClean® Certified Media
Lengthens drive and media life by removing harmful debris.

Media Lifecycle Management
Uses embedded RFID memory chip to track 40 different aspects of media reliability.
## Re-energize existing libraries

<table>
<thead>
<tr>
<th>Library</th>
<th>LTO-4</th>
<th>LTO-5</th>
<th>LTO-6</th>
<th>LTO-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>T50e</td>
<td>39TB</td>
<td>75TB</td>
<td>125TB</td>
<td>300TB</td>
</tr>
<tr>
<td></td>
<td>98TB</td>
<td>187TB</td>
<td>312TB</td>
<td>750TB</td>
</tr>
<tr>
<td>T120</td>
<td>94TB</td>
<td>180TB</td>
<td>300TB</td>
<td>720TB</td>
</tr>
<tr>
<td></td>
<td>234TB</td>
<td>450TB</td>
<td>750TB</td>
<td>1.8PB</td>
</tr>
<tr>
<td>T380</td>
<td>297TB</td>
<td>570TB</td>
<td>950TB</td>
<td>2.3PB</td>
</tr>
<tr>
<td></td>
<td>742TB</td>
<td>1425TB</td>
<td>2.4PB</td>
<td>5.7PB</td>
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<tr>
<td>T680</td>
<td>523TB</td>
<td>1PB</td>
<td>1.7PB</td>
<td>4PB</td>
</tr>
<tr>
<td></td>
<td>1.3PB</td>
<td>2.5PB</td>
<td>4.2PB</td>
<td>10PB</td>
</tr>
<tr>
<td>T950</td>
<td>780TB</td>
<td>1.5PB</td>
<td>2.5PB</td>
<td>6PB</td>
</tr>
<tr>
<td></td>
<td>2PB</td>
<td>3.8PB</td>
<td>6.3PB</td>
<td>15PB</td>
</tr>
<tr>
<td>TFinity (5-frame)</td>
<td>3.5PB</td>
<td>6.8PB</td>
<td>11.3PB</td>
<td>27PB</td>
</tr>
<tr>
<td></td>
<td>8.8PB</td>
<td>17PB</td>
<td>28.3PB</td>
<td>68PB</td>
</tr>
<tr>
<td>TFinity (20-frame)</td>
<td>20PB</td>
<td>38PB</td>
<td>63PB</td>
<td>152PB</td>
</tr>
<tr>
<td></td>
<td>49PB</td>
<td>95PB</td>
<td>158PB</td>
<td>380PB</td>
</tr>
</tbody>
</table>

Chart Above: Non-bolded numbers are Native Capacity and Bolded numbers are Compressed
An existing T50e library with LTO-5 media holds 75 TB of data and up to 187 TB if compression is enabled and data is compressible.

That same T50e, when upgraded to LTO-7, holds four times the data – up to 300 TB uncompressed!

On the high end, a 20-frame TFinity library can now hold up to 152 PB uncompressed, but only 38 PB with LTO-5.
**Phase 1**
The initial rollout is for new libraries and those needing more capacity without having to add media frames or are space constrained. LTO-7 will be a little more expensive in this time frame.

**Phase 2**
As media pricing moves to equivalence with the previous generation as measured in $/GB, upgrades are enabled. Customers enabling smaller libraries and those looking to expand capacity should convert in this time frame.
As media pricing moves to equivalence with the previous generation as measured in $/GB, upgrades are enabled at cost parity. Customers enabling smaller libraries and those looking to expand capacity should convert in this time frame.

**Phase 3**

LTO-7 will offer the best cost/GB during this phase. All new purchases should be LTO-7 at this time and all expansions should also be LTO-7.

Phase 2

Buy the Latest

Phase 3

Cost Leader

LTO-7 Phase-In
Spectra Exclusive Migration Offers*

Migrating your data from LTO-3, 4 and 5

- **Free SLS license** to enable separate library partitions (a $5,000 value)

- **Loaner LTO-5 drive** – to read LTO-3, LTO-4 and LTO-5 for as long as you need to complete your migration process

- **1 Free chamber license** for each TWO LTO-7 drives purchased (a $1,000 value per 2 drives)

- **Discounted LTO-7 drive pricing with trade-in**

* With a minimum LTO-7 drive and media purchase.
Migrating your data from LTO-6

- **Free SLS license** to enable separate library partitions (a $5,000 value)

- **1 Free chamber license** for each TWO LTO-7 drives (a $1,000 value per 2 drives)

- **Discounted LTO-7 drive pricing** with trade-in
More about Spectra’s performance boost...
Spectra Certified Media performs better than competitors’ media. The CarbideClean® process is a unique Spectra enhancement that extends the life of your tape drives and enhances the performance and capacity of your tapes. Spectra Certified LTO Media with CarbideClean® ensures your media is debris-free, allowing your system to run at peak performance.

LTO tape magnified at 1:5000. CarbideClean removes debris, maximizing the potential that every bit is written and read.
More about CarbideClean™

Specialized CarbideClean® Drive: Tape moves across the cleaning head to remove debris.
Tape debris results from even the most careful manufacturing process, administrative media handling and environmental contamination. As new generations of LTO tape reach ever-greater capacities, the distance shrinks both between tracks on the tape, and between the drive head and physical media. This means that debris too tiny to create problems in earlier generations of LTO may now pose a threat.

With traditional tape applications, tapes are reused so that debris is eventually removed through repeated use. With applications like archive, data is consistently written to new media, so reuse does not remove debris. Exclusive use of new tapes with debris can damage the tape drive head, reduce capacity, degrade performance and lead to data integrity issues.

The CarbideClean® process is only available with Spectra Certified LTO Media. Only our media undergoes the CarbideClean® process using specialized drives at our factory prior to shipment. This process removes tape debris to increase your drives’ lifespan and ensures optimal performance and media capacity.

For more technical details about CarbideClean®, please visit spectralogic.com/media.
Spectra programmed chip stored in each tape cartridge tracks over 40 parameters throughout the life of the tape.
Track Spectra tapes throughout their life.

With **Spectra Certified Media**, you’ll never get caught by surprise again. Certified Media combined with Media Lifecycle Management (MLM) reduces the most common media-related failures, and can only be found with Spectra tape libraries. MLM allows you to proactively manage your tape inventory through simple monitoring of over 40 health statistics and automatically identifies at-risk tapes ready for retirement.

**Management Made Simple**

MLM stoplight icons serve as easy visual diagnostics, recommending action based on the health status of a tape.
Data Integrity Assurance
With **Spectra Certified Media**, you’ll be confident that your data is there when you need it. Certified Media assures data integrity using an integrated, intelligent and comprehensive set of Data Integrity Verification (DIV) tools when integrated with Spectra tape libraries. PreScan verifies your tapes are safe prior to usage and QuickScan and FullScan verify your data has been properly written to tape.

DIV tools scan a tape prior to usage to verify writability and confirms all data has been laid down error-free.
Spectra and LTO will stick with you...
LTO (Linear Tape-Open) Ultrium Technology is optimized for high capacity and performance with exceptional reliability. Spectra’s trust in this technology for backup, deep storage and archive applications, is demonstrated in our long-term commitment to LTO’s current and future advancements. LTO technology will meet the needs of the enterprise with a roadmap and migration path that extends far into the future.
No Assembly Required
TeraPacks simplify media handling.

Your Spectra Certified Media arrives on your doorstep, with pre-applied barcode labels and bundled in TeraPack® containers, ready for bulk loading into your Spectra tape library. When it’s time to export them from the library, the TeraPacks can be covered and protected as they are stored onsite or offsite.

For even greater efficiency, our TeraPack Access Port can load up to 10 tapes at a time and our bulk-load option allows you to import and export up to 140 tapes at once.

*For illustrative purposes only. Not actual operation.
Have It Your Way

- TeraPacks
- 10 LTO tapes or 9 TS11XX tapes
- Individual tapes
- Bulk-shipped TeraPacks
- T120 LTO TeraPack
- TeraPacks with 10 LTO tapes or 9 TS11XX tapes
- TS11XX Media
- TeraPack dust cover
Logistics that match your unique needs.

With **Spectra Certified Media** you order it any way you want it. A myriad of choices allow you to specify the exact number of tapes you require with no minimum order, custom or predefined barcode sequences, TeraPacks with or without dust covers or no TeraPack at all. The choice is yours.

Skip unwrapping individual tapes and barcoding them. Spectra Certified Media arrives ready to import into your library right out of the box.
Measurable Cost Savings
Because Spectra Certified Media provides many significant time and management efficiency benefits, it lowers your tape-related operational expenses and allows your staff to focus on high-value tasks.

More than pays for itself.

- Lower risk of data loss ($$$$$)
- Floor space savings ($$$$
- Lower management costs ($$$$
- Reduced staffing costs ($$$$
- Reduced media failure downtime ($$$$
- Faster problem resolution ($$$$
- Fewer drive replacements ($$$$
- Longer useful media lifespan ($$$$
- More efficient tape operations ($$$$
- Higher media capacity ($$$$
- Zero staff time to label media ($$$$
- Efficient bulk-tape loading/unloading ($$$$
- Tape import and export efficiency ($$
- Enhanced offsite tape processing ($$
- Fewer drive failure related service calls ($$
- Higher data transfer rate ($$
- Greater staff efficiency ($$
- Lower write error rates ($$
- Fewer cleaning cartridges consumed ($)$$
- No duplicate barcode labels ($)$$
- Fewer media warranty claims ($)$$
- Encryption moniker tracker ($)$$
- Lower read error rates ($)$$
- Easier ordering ($)$$
- Easier storage ($)$$

Our Guarantee To You
Media Lifecycle Management Tracking Statistics

Only available with Spectra Certified Media and Spectra libraries, Media Lifecycle Management monitors, tracks and reports on all facets of tape usage and health status to reduce tape-related errors, eliminate unscheduled downtime and increase the reliability of your backup and archive operations.

1. Media health
2. Barcode
3. Load count
4. Loaded
5. Born on date
6. Write protected
7. Encryption and moniker
8. Encryption key expiration
9. Media type
10. Cleans remaining
11. First write partition
12. First write library
13. Last write partition
14. Last write library
15. Remaining capacity
16. Maximum capacity
17. Soft write errors
18. Soft read errors
19. Remaining MAM capacity
20. Current drive display
21. Drive efficiency
22. Media efficiency
23. Drive status (last four)
24. Last four load device s/n’s
25. Last four load device efficiency
26. Media s/n
27. Compression ratio
28. Exported
29. Export user
30. Export time
31. Current partition
32. Manufacturer
33. Manufacturer data
34. Tape generation
35. Number of cleans
36. Date of first LTO CarbideClean®
37. Drive s/n of first LTO CarbideClean®
38. Temperature first LTO CarbideClean®
39. Humidity of first LTO CarbideClean®
40. Date of most recent LTO CarbideClean®
41. Drive s/n of most recent LTO CarbideClean®

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