IBM System Storage TS2340 Tape Drive 3580 Express Models for HVEC incorporate IBM LTO Ultrium 4 Tape Drive technology

At a glance

The IBM System Storage TS2340 Tape Drive combines IBM tape reliability and performance at open systems prices. Features of the new Ultrium 4 model include:

- Data transfer rate of up to 120 MB/sec native compared to 80 MB/sec native for LTO Ultrium 3

- Cartridge capacity doubled, providing up to 800 GB native physical capacity per cartridge (1,600 GB with 2:1 compression) compared to Ultrium 3 data cartridges

- SCSI Ultra160 LVD attachment (SEO/part number 3580L4X) and 3 Gbps dual port SAS attachment (SEO/part number 3580S4X)

- Adherence to LTO specifications

- Support for encryption capabilities designed to work with Application Managed Encryption on Ultrium 4 SAS Tape Drives only

- 19-inch rack mount shelf option, which accommodates a single TS2340 Tape Drive

For ordering, contact:

Your IBM representative, an IBM Business Partner, or the Americas Call Centers at

   800-IBM-CALL Reference: YE001

Overview

The new **IBM System Storage™ TS2340 Tape Drive Express Models** (machine type 3580) are designed to offer high capacity and performance for the midrange open systems environment. These models incorporate the new Linear Tape-Open (LTO) **IBM System Storage Ultrium 4 Full-High Tape Drive,** which is designed to provide maximum Tape Drive throughput native data rate performance up to 120 MB/sec, compared to the IBM LTO generation 3 Tape Drive (Ultrium 3) at 80 MB/sec native data transfer rate. In addition, with the use of the new **IBM LTO Ultrium 800 GB Data Cartridge,** the Ultrium 4 Tape Drive provides double the tape cartridge capacity up to 800 GB native physical capacity (1,600 GB with 2:1 compression), compared to Ultrium 3. IBM Ultrium 4 Tape Drives can read and write LTO Ultrium 3 data cartridges and can read LTO Ultrium 2 data cartridges. In addition, the Ultrium 4 SAS tape drive is encryption-capable and designed to support Application Managed Encryption.

The TS2340 Tape Drive Model comes with an SCSI Ultra160 LVD drive interface attachment (SEO/part number 3580L4X) and a 3 Gbps dual port Serial-Attached SCSI (SAS) drive interface attachment (SEO/part number 3580S4X) for a connection to a wide spectrum of open system servers. The new models attach to IBM System p™, IBM System i™,

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IBM System x™, MicroSoft Windows™, HP-UX, Sun Solaris, UNIX®, and PC servers.

The TS2340 Tape Drive is an external stand-alone or rack-mountable unit and is the entry point for the family of IBM Ultrium tape products. The TS2340 Tape Drive provides an excellent migration path from digital linear tape (DLT or SDLT), 1/4-inch, 4mm, or 8mm tape drives. IBM Ultrium 4 enhancements are designed to help improve performance and reliability, and include:

- Native data transfer rate of up to 120 MB/sec

- Ultrium 4 tape cartridge native physical capacity of up to 800 GB

- Improved native data over Ultrium 3

- Application Managed Encryption support for Ultrium 4 SAS Tape Drive

- A larger 256 MB internal buffer

- LTO Ultrium 4 encryption support

- 8 KB cartridge memory with Ultrium 4 media

- Better integrated electronics using IBM-engineered copper technology

Key prerequisites

Appropriate levels of host software are required to attach the IBM System Storage TS2340 Tape Drive to selected IBM System i, IBM System p, IBM System x, HP-UX, Sun Solaris, UNIX, and PC servers. Refer to the Technical information section for details.

Planned availability date

May 25, 2007

Description

The IBM System Storage TS2340 Tape Drive is an external stand-alone or rack-mountable unit and contains a Linear Tape-Open (LTO) Ultrium 4 tape drive designed for the heavy demands of backup tape storage. The TS2340 is supported for Small Computer Systems Interface (SCSI) and serial-attached SCSI (SAS) attachment to IBM System p, IBM System i, IBM System x, HP-UX, Sun Solaris, UNIX, and PC servers.

The TS2340 Tape Drive Models incorporate fourth-generation IBM LTO Ultrium technology. The TS2340 Tape Drive Models offer the following improvements over the Ultrium 3 Tape Drive:

- Increased performance — Maximum tape drive throughput native data rate performance is up to 120 MB/sec. Data tracks are written 16 at a time. IBM Ultrium 4 Tape Drives can read and write LTO Ultrium 3 Data Cartridges at Ultrium 3 capacities and rates, and read LTO Ultrium 2 Data Cartridges at Ultrium 2 capacities with improved rates.

  Note: Although the Ultrium 4 Tape Drive provides the capability for excellent tape performance, other components of the system may limit the actual performance achieved. Also, although the compression technology used in the tape drive can typically double the amount of data that can be stored on the media, the actual degree of compression achieved is highly sensitive to the characteristics of the data being compressed.

- Increased tape cartridge capacity — The tape cartridge physical capacity is up to 800 GB native physical capacity (1,600 GB with 2:1 compression) with the use of the new IBM LTO Ultrium 800 GB Data Cartridge, double that of the Ultrium 3 data cartridges. This is achieved by increasing the linear density and the media length. The tape itself is an advanced metal particle tape developed to help provide durability and capacity.

- Ultrium 3 cartridge compatibility — The Ultrium 4 Tape Drive can read and write Ultrium 3 cartridges at Ultrium 3 capacity and rates.

- Encryption supported on Ultrium 4 SAS Tape Drives. The IBM System Storage TS2340 LTO Ultrium 4 SAS Tape Drive will support data encryption on the base drive with Ultrium 4 media meeting LTO consortium specifications and Application Managed Encryption.

- Attachment options — The TS2340 Tape Drive comes with 3 Gbps SAS, or Ultra160 LVD SCSI attachment models, for connection to a wide spectrum of open system servers. They are supported on IBM System p, IBM System i, IBM System x, Sun Solaris, HP-UX, Windows

2003, Linux™, and other open systems.

- WORM media support — The IBM 3589 Ultrium 4 800 GB WORM Tape Cartridges are designed for applications, such as archiving and data retention, as well as those applications requiring an audit trail. These cartridges work with the IBM LTO Ultrium 4 Tape Drive to help prevent the alteration or deletion of user data. IBM Ultrium 800 GB WORM Tape Cartridges can be ordered as unique 3589 models with the following features:
  - Pre-labeling, with the ability to specify a starting volume serial and color-coding
  - Packaging in individual jewel cases or in bulk
  - Cartridge memory, built into every cartridge, which helps to enhance functionality and media reliability by storing access history and media performance information for use by the tape drive every time the cartridge is accessed
  - Half-inch particle tape with a 800 GB WORM native capacity in a single cartridge

- Larger internal data buffer — There is a 256 MB internal data buffer in the Ultrium 4 Tape Drive as compared to a 128 MB internal data buffer in the Ultrium 3 Tape Drive.

- Highly integrated electronics using IBM engineered copper technology — This technology is designed to reduce the total number of components in the drive, help lower chip temperatures, and reduce power requirements, helping to provide for a more reliable drive. The fourth-generation drive electronics are designed to provide error correction of soft errors in the memory arrays in data and control paths.

Proven IBM LTO Ultrium features enhanced in the IBM LTO Ultrium 4 Tape Drive include:

- Dual-stage 16-channel head actuator — The actuator is designed to provide precision head alignment to help support higher track density and improved data integrity.

- Independent tape loader and threader motors and positive pin retention — These are designed to help improve the reliability of loading and unloading a cartridge, and to retain the pin even if tension is dropped. An independent loader motor coupled with the positive pin retention is designed to cause the tape to thread with a higher level of reliability.

- Graceful dynamic braking — In the event of power failure, reel motors are designed to maintain tension and gradually decelerate instead of stopping abruptly, helping reduce tape breakage, stretching, or loose tape wraps during a sudden power outage.

- Servo and track layout technology — There are 704 data tracks in Ultrium 4 and 3 versus 512 data tracks in Ultrium 2. The high-bandwidth servo system features a low-mass servo to help more effectively track servo bands and improve data throughput with damaged media in less-than-optimal shock and vibration environments.

- Surface Control Guiding Mechanism — IBM's patented Surface Control Guiding Mechanism is designed to guide the tape along the tape path in the Ultrium 4 Tape Drive. This method uses the surface of the tape, rather than the edges, to control tape motion. This helps reduce tape damage (especially to the edges of the tape) and tape debris, which come from the damaged edges and can accumulate in the head area.

- Magneto Resistive (MR) head design — Use of flat lap head technology in MR heads for Ultrium 4 helps minimize contact, debris accumulation, and wear on the tape as it moves over the read/write heads.

- Digital speed matching — The Ultrium 4 Tape Drive is designed to perform dynamic speed matching (at one of six speeds: 30, 48, 66, 84, 103, or 120 MB/sec) to adjust the drive's native data rate as closely as possible to the net host data rate (after data compressibility has been factored out). This helps reduce the number of backhitch repositions and improve throughput performance. Speed matching on Ultrium 4 ranges from 30 to 120 MB/sec versus 30 to 80 MB/sec on Ultrium 3.

- Robust drive components optimized for automation environments — Using some of the most robust components available, such as: (1) all metal clutch, (2) steel ball bearings in loader, (3) robust leader block design, (4) single circuit card, to help enhance reliability and prolong the life of the drives.

- Power management — The Ultrium 4 Tape Drive power management function is designed to control the drive electronics to be either completely turned off or in a low-power mode when the circuit functions are not needed for drive operation.

- Adaptive read equalization — The drive is designed to automatically compensate for dynamic changes in readback signal response.

- Dynamic amplitude asymmetry compensation — It is designed to dynamically optimize for linear readback response from MR read head transducers.

- Separate writing of multiple filemarks — Separate writing of multiple filemarks is designed to cause any write command of two or more filemarks to cause a separate data set to be written containing all filemarks after the first. This feature has two advantages: first, it helps improve performance if a subsequent append overwrites somewhere after the first filemark; second, write of multiple filemarks typically indicates a point where an append operation might occur after the first of these filemarks. This change helps prevent having to rewrite datasets containing customer data and the first filemark if such an append occurs.

- LTO Data Compression (LTO-DC) — The Ultrium 4 uses LTO-DC, which is an implementation of a Lempel-Ziv class 1 (LZ-1) data compression algorithm. LTO-DC is an extension of Adaptive Lossless Data Compression (ALDC) and an improvement over previous IBM lossless compression algorithms. IBM's patented "Scheme-Swapping" compression is designed to look ahead at incoming data, and determine the most efficient storage method (either ALDC or pass-thru mode) to help provide optimal data compression and increase data throughput.

- LTO Cartridge Memory (LTO-CM) — Contained within the LTO Ultrium data cartridge is the LTO-CM, which is a passive, contactless silicon storage device that is physically a part of the cartridge. The LTO-CM is designed to hold information about that specific cartridge, the media in the cartridge, and the data on the media. The storage capacity of the LTO-CM is 8K bytes. Communication between the drive and the LTO-CM is via a low-level RF field transmitted by the drive to the cartridge.

- Statistical Analysis and Reporting System (SARS) — The Ultrium 4 Tape Drive uses SARS to help isolate failures between media and hardware. SARS uses the cartridge performance history saved in the CM module, and the drive performance history kept in the drive flash EEPROM, to help determine the likely cause of failure. SARS is designed to cause the drive to request a cleaner tape, to mark the media as degraded, and to indicate that the hardware has degraded.

Ultrium 800 GB Data Cartridge:

The tape cartridge physical capacity of the IBM Ultrium 800 GB Data Cartridge has doubled over the IBM Ultrium 400 GB Data Cartridge to 800 GB native physical capacity (1600 GB with 2:1 compression). IBM LTO Ultrium 4 Tape Drives can read and write Ultrium 3 data cartridges, and read only Ultrium 2 data cartridges. LTO Ultrium 800 GB data cartridges can be ordered using machine type 3589, LTO Ultrium tape cartridges, or part number 95P4278 at the time of purchase.

These cartridges have been designed to provide several enhancements over previous tape technologies. They are designed to work with tape drives that have increased tape speeds and high-density data recording. The case is specially designed for use in automated libraries, and is designed for repeated, unattended handling. The tape itself is an advanced metal particle tape developed for durability and capacity.

With support for IBM LTO Ultrium-format tape data cartridges, the TS2340 Tape Drive provides an excellent migration path from digital linear tape (DLT or SDLT), 1/4-inch, 4mm, or 8mm tape drives. It can be a cost-effective solution for backup, save-and-restore, and archiving functions as the entry point for the family of IBM Ultrium tape products.

Product positioning

As you compare competitive tape solutions, consider:

- Capacity and performance requirements

- Data integrity, reliability, and availability

- Storage usage and application requirements

- Affordability

- Loyalty to legacy or existing tape formats

- Work environment, where space is limited

The IBM System Storage TS2340 Tape Drive and software applications are designed to address these requirements and constitute a functionally rich tape storage solution incorporating LTO

Ultrium 4 Tape Drive technology.

The TS2340 Tape Drive Models are excellent choices if you use tape drives that require larger-capacity or higher-performance tape backup. The TS2340 is the answer to growing storage requirements and shrinking backup windows, and is the entry offering to the family of IBM Ultrium Tape products.

The TS2340 Tape Drive is an excellent tape storage solution if you use digital linear tape drives or require high-performance tape backup. In addition to reading and writing on IBM LTO Ultrium 3 or 4-format tape cartridges, and reading LTO Ultrium 2-format tape cartridges, the TS2340 Tape Drive provides an excellent functional alternative to DLT/SDLT, 1/4-inch, 4mm, 8mm, or IBM Magstar® MP 3570 Tape Drives.

For capacity requirements greater than 800 GB (native) and incorporating LTO Ultrium technology, the IBM System Storage TS3100 or TS3200 Tape Library, and the IBM System Storage TS3310 and TS3500 Tape Libraries should be considered.

For protection of mission-critical data needs, hardware optimized for enterprise multi-mode and host attachment, high-duty cycle and start/stop intensive tape applications, consider the IBM System Storage TS1120 with the IBM System Storage TS3400 (3577) or IBM System Storage TS3500 (3584) Tape Library.

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBM ID).

BP Attachment for Announcement Letter 107-234

https://www.ibm.com/partnerworld/mem/sla.jsp?num=107-234

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Publications

The following publication is shipped with the product, as appropriate. Additional copies are available. To order, contact your IBM representative:

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                                          Order
Title                                     number

IBM System Storage(TM) TS2340 Tape Drive Models    GC27-2103
 L43/S43 Setup, Operator, and Service Guide
```

The proceeding publication and the following publications are also available at

http://www.ibm.com/storage/lto

The device driver publications are also available at

ftp://ftp.software.ibm.com/storage/devdrvr/Doc/

- IBM System Storage LTO Ultrium Tape Drive SCSI Reference (GA32-0450) (English)

- IBM System Storage TS2340 Tape Drive Models L43/S43 Quick Reference (GC27-2104) (English)

- IBM Tape Device Driver Installation and User's Guide (GC27-2130) (English)

- IBM Tape Device Driver Programming Reference (GA32-0566) (English)

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http://www.ibm.com/services/continuity

For details on education offerings related to specific products, visit

http://www.ibm.com/services/learning/index.html

Select your country, and then select the product as the category.

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Recommended core technical support: When you buy IBM xSeries technology, include the support services you need to help keep both your hardware and software working for you, day after day, at peak performance. It's your first step toward helping to protect your investment and sustain high levels of system availability. We offer service-level and response-time options to fit your business needs, and we'll help you get started with a core support package that includes:

- **Continuous system monitoring**

Exclusive electronic monitoring that helps speed up problem-solving with automated, early detection of potential problems and system errors.

- **Hardware maintenance**

  World-class remote and on-site hardware problem determination and repair services.

- **Software technical support**

  Unlimited help line calls for fast, accurate answers to your questions during installation and throughout ongoing operations.

For more information refer to

http://www.ibm.com/servers/eserver/xseries/services.html

Technical information

Specified operating environment

Physical specifications

- Width: 250.20 mm (9.83 in.)
- Depth: 292.10 mm (11.47 in.)
- Height: 120.60 mm (4.74 in.)
- Maximum Weight: 6.45 kg (14.20 lbs.)

For installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

Operating environment

- Temperature: 10° to 38°C (50° to 100°F)
- Relative Humidity: 20% to 80%
- Wet Bulb: 26°C (78.8°F) maximum
- Voltage: 100-240 V ac, 50-60 Hz auto-ranging
- Electrical Power:
  - 1.0 amps at 100 V ac, 0.5 amps at 240 V ac
  - 0.120 KVA
- Maximum Sound Power Levels: 5.9 bels idle, 6.0 bels operating
- Heat Output: 58 watts (50 calories/hour)

Hardware requirements: The TS2340 Tape Drive comes with raven black covers. The TS2340 Models use an Ultra160 SCSI Low Voltage Differential (LVD) interface or a serial-attached SCSI (SAS) interface. Similar to previous models, the TS2340 (machine type 3580) Tape Drive can be attached to the IBM System i™, IBM System p™, and HP-UX, Sun Solaris, and non-IBM servers that support those interface specifications. A current list of supported open system configurations is available from the following Web site

http://www-1.ibm.com/storage/tape/lto

Select the model, then "Product Details," "LTO Compatibility," to view "Independent Software Vendor Matrix (ISV)" for the product.

A power cord option number, if applicable, should also be specified.

Cables

For the TS2340 Model L4x, an SCSI cable is required for each server connection to an SCSI bus. The following cable options are available for Ultra160 SCSI LVD attachment. Cables with a VHDCI connector on one end and an HD68 connector on the other end:

- 23R7133 — 2.5M VHDCI/HD68 SCSI Cable

- 23R7134 — 4.5M VHDCI/HD68 SCSI Cable

- 23R7135 — 10M VHDCI/HD68 SCSI Cable

For the TS2340 Model S4x, an SAS cable is required to attach a TS2340 Tape Drive to host an SAS adapter. SAS/Min-SAS cables provide attachment from HBA with SFF-8470 to the drive with SFF-8088. Mini-SAS/Mini-SAS cables provide attachment from HBA SFF-8088 to the drive with SFF-8088. At least one SAS cable should be specified on the initial plant order.

The following cable options are available for SAS attachment:

- 95P4711 — 2.0M SAS/Mini-SAS 1x Cable (from HBA with SFF-8470 to drive with SFF-8088)

- 95P4712 — 5.5M SAS/Mini-SAS 1x Cable (from HBA with SFF-8470 to drive with SFF-8088)

- 95P4713 — 2.0M Mini-SAS/Mini-SAS 1x Cable (from HBA with SFF-8088 to drive with SFF-8088)

- 95P4714 — 5.5M Mini-SAS/Mini-SAS 1x Cable (from HBA with SFF-8088 to drive with SFF-8088)

Refer to the **Special Features** section of the TS2340 (3580) Tape Drive Sales Manual for detailed descriptions of these features.

Software requirements: The TS2340 Tape Drive is supported on the following operating systems at the minimum levels indicated:

- OS/400® V5R3

- i5/OS™ V5R3 or later

- AIX 5L™ V5.1, V5.2, or V5.3

- Sun Solaris 8, 9, 10

- Microsoft™ Windows™ 2003 (build 3790, or greater)

- 64-bit HP-UX 11iv1 and 11iv2

- Linux™ distributions: Red Hat Enterprise Linux version 4, SUSE Linux Enterprise Server 9, SUSE Linux Enterprise Server 10 (SLES 10), Asiaux 2.0

For a current list of host software versions and release levels that support the TS2340, refer to the following Web site

http://www-1.ibm.com/storage/tape/lto

Select the model, then "Product Details," "LTO Compatibility," then "Interoperability," to view supported servers and operating systems for the product.

Tivoli® Storage Manager and other compatible software offerings provide storage and tape management software for the 3580 or TS2340 family of products. Supporting software and applications must be obtained separately from IBM, IBM Business Partners, or independent software vendors (ISVs). A list of compatible software is available from your IBM representative or at

http://www-1.ibm.com/storage/tape/lto

Select the model, then "Product Details," and view "Independent Software Vendor (ISV) matrix for LTO" for the product.

IBM continues to work together with the ISVs to support the IBM LTO Ultrium Tape Drives or TS2340 family of products. Individual application vendors should be contacted for specific information and availability dates.

Compatibility: The IBM LTO Ultrium 4 Tape Drives can read and write IBM LTO Ultrium 3 and 4

data cartridges and read IBM LTO Ultrium 2 data cartridges. The new LTO Ultrium 800 GB data cartridges can only be used on the IBM LTO Ultrium 4 Tape Drives.

Limitations: Total LVD SCSI cable length is limited to 25 m (81 ft) using point-to-point interconnection. Total LVD SCSI cable length is 12 m (39 ft) using a multi-drop interconnection. Stub length at each device must not exceed 0.1 m (0.33 ft).

SAS cable lengths are limited to 6 meters (20 ft).

Installing more than one TS2340 Tape Drive on an SCSI bus may impact tape drive or system performance. Intermixing of other SCSI devices on the same SCSI bus as the TS2340 may impact performance of those devices.

Although multiple systems may be attached to a tape drive, the systems cannot use the drive simultaneously.

While the compression technology can increase the amount of data stored on the media, the actual degree of compression achieved is highly sensitive to the characteristics of the data being compressed.

Planning information

Customer responsibilities: Physical planning is a customer responsibility. Detailed planning information is in the IBM System Storage TS2340 Tape Drive Models L43/S43 Setup, Operator, and Service Guide (GC27-2103). The TS2340 Tape Drive is designated as a customer setup unit (CSU). It is the customers' responsibility to install the unit. Customers are responsible for obtaining the appropriate SCSI or SAS adapters, cables, and interposers (if required) for system attachment. Customers are also responsible for ordering media. For optimum performance, the customer must obtain the latest level of firmware prior to installing the unit. Customers can download the latest level of firmware from the LTO Web site

http://www.ibm.com/storage/lto

Cable orders: For the TS2340 Model L4x, an SCSI cable is required for each server connection to an SCSI bus. An SCSI differential terminator is included with each cable. The following cable options are available for Ultra160 SCSI LVD attachment. Cables with a VHDCI connector on one end and an HD68 connector on the other end:

- 23R7133 — 2.5M VHDCI/HD68 SCSI Cable

- 23R7134 — 4.5M VHDCI/HD68 SCSI Cable

- 23R7135 — 10M VHDCI/HD68 SCSI Cable

For the TS2340 Model S4x, an SAS cable is required to attach a TS2340 Tape Drive to host an SAS adapter. The following cable options are available for SAS attachment:

- 95P4711 — 2.0M SAS/Mini-SAS 1x Cable (from HBA with SFF-8470 to drive with SFF-8088)

- 95P4712 — 5.5M SAS/Mini-SAS 1x Cable (from HBA with SFF-8470 to drive with SFF-8088)

- 95P4713 — 2.0M Mini-SAS/Mini-SAS 1x Cable (from HBA with SFF-8088 to drive with SFF-8088)

- 95P4714 — 5.5M Mini-SAS/Mini-SAS 1x Cable (from HBA with SFF-8088 to drive with SFF-8088)

Refer to the **Specify or Special Features** section of the TS2340 3580 Sales Manual for a detailed description of the cables available.

Installability: Installation time for the TS2340 Tape Drive is approximately 0.5 to 0.7 hours.

Packaging

Product	Shipment group	Number of boxes
3580	TS2340 Tape Drive 125V U.S./CAN Power Cord	1

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One cleaning cartridge
One data cartridge
Documentation CD that includes:
 IBM System Storage TS2340 L43/S43
  Setup, Operator, and Service Guide
 IBM System Storage TS2340 Statement of
  Limited Warranty
 IBM Translated Safety Notices
Documentation kit that includes:
 License Agreement
 IBM System Storage TS2340 Statement of
  Limited Warranty
 CD pointer document
 Device Driver pointer document
SCSI terminator (Model L4x)
SCSI wrap tool (Model L4x)
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Supplies: For end users

The IBM LTO Ultrium 800 GB Data Cartridges and the IBM LTO Cleaning Cartridge, for use in the TS2340 Tape Drive, can be ordered as SEO part number 95P4278 or 23R7008 or from IBM through 888-IBM-MEDIA (426-6334) in the U.S. and Canada.

For information about IBM branded media, such as additional IBM LTO Ultrium data or cleaning cartridges, call 888-IBM-MEDIA (426-6334) in the U.S. or Canada, or refer to the following Web site

   http://www.storage.ibm.com/media

Security, auditability, and control

This product uses the security and auditability features of the host hardware, host software, and application software.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

Terms and conditions

IBM credit corporation financing: Yes

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM.

In the United States, call 800-IBM-SERV (426-7378), or write to:

Warranty Information

P.O. Box 12195

Research Triangle Park, NC 27709

Attn: Dept. JDJA/B203

Warranty period: Three years. IBM Ultrium 800 GB media is warranted separately.

IBM options or features initially installed in an IBM system carry the same warranty period as the system. If installed after the initial system installation, they carry the balance of the system warranty.

Optional IBM features initially installed in an IBM system carry the same warranty period as the system. If installed after the initial system installation, they carry the balance of the system warranty or the optional feature warranty, whichever is greater.

Warranty service

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. If applicable to your product, parts considered Customer

Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country and location specific information. This product is covered by the following types of service.

CRU service and on-site for other selected parts.

CRU service: IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request. CRUs are designated as being either a Tier 1 or a Tier 2 CRU.

Tier 1 CRU: Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

Based upon availability, CRUs will be shipped for next business day (NBD) delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, return instructions and a container is shipped with the replacement CRU and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

Tier 1 CRU Part: The CRU is the complete IBM standalone TS2340 Tape Drive.

On-site service: IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose.

Non-IBM Parts Support

Warranty service

IBM is shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their customers, and normal warranty service procedures for the IBM machine apply.

ServicePac® offerings

Warranty and maintenance options: The announced products may be eligible for ServicePacs for warranty and maintenance options, convenient prepackaged offerings for warranty service upgrades and maintenance services.

Installation services: The announced products may be eligible for ServicePacs for installation services, convenient prepackaged offerings for installation services. Refer to the Prices section for information on the availability of ServicePac offerings.

For additional ServicePac information, visit

   http://www-3.ibm.com/services/its/us/servicepac.html

Field-installable features: No

Model conversions: No

Machine installation: Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

Graduated program license charges apply: No

Licensed Machine Code: IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement or by contacting your IBM representative or visiting

   http://www-1.ibm.com/servers/support
   /machine_warranties/machine_code.html

This license machine code pertains to a machine using LMC Type Model 3580.

IBM may release changes to the Machine Code. IBM plans to make the Machine Code changes available for download from the IBM technical support Web site

http://www-304.ibm.com/jct01004c/system s/support/machine_warranties/index.html

If the machine does not function as warranted and your problem can be resolved through your application of downloadable Machine Code, you are responsible for downloading and installing these designated Machine Code changes as IBM specifies. If you would prefer, you may request IBM to install downloadable Machine Code changes; however, you may be charged for that service.

Educational allowance: None

Prices

Description	Machine type	Model	Part number	Purchase price	Field install only	Plant install only
TS2340 Tape Drive with LT04 SCSI Tape Drive, with enclosure and power supply	3580	L43	3580L4X	$5,170		Y
TS2340 Tape Drive with LT04 SAS Tape Drive, with enclosure and power supply	3580	S43	3580S4X	5,681		Y
Ultrium 4 Data Cartridge (5-pack)	3580	L43, S43	95P4278	514	N	Y
Options for Model S43						
2.0M SAS/Mini-SAS Cable	3580	S43	95P4711	106	N	N
5.5M SAS/Mini-SAS Cable	3580	S43	95P4712	128	N	N
2.0M Mini-SAS/Mini-SAS Cable	3580	S43	95P4713	111	N	N
5.5M Mini-SAS/Mini-SAS Cable	3850	S43	95P4714	133	N	N

Single Entity Offerings (SEO)

Description	SEO number	IBM list price
TS2340 Tape Drive with LT04 SCSI Tape Drive, with enclosure and power supply	3580L4X	$5,170
TS2340 Tape Drive with LT04 SAS Tape Drive, with enclosure and power supply	3580S4X	5,681

ServicePacs for warranty upgrades and maintenance

Machine type-Model	Description	ServicePac SE0 part number	ServicePac TMF part number
3580-L43	3-year IOE 9 X 5 NBD average response	44J8922	675600U
3580-L43	3-year IOE 24 X 7 4-hour average response	44J8923	675600V
3580-L43	5-year IOE 24 X 7 4-hour average response	44J8924	675600W
3580-L43	1-year MA IOE 9 x 5 NBD average response	44J8925	6756D2C
3580-L43	1-year MA IOE 24 X 7 4-hour average response	44J8926	6756D2D
3580-L43	2-year MA IOE 9 x 5 NBD average response	44J8927	6756D2F
3580-L43	2-year MA IOE 24 X 7 4-hour average response	44J8928	6756D2G
3580-S43	3-year IOE 9 X 5 NBD average	44J8929	675600X
3580-S43	3-year IOE 24 X 7 4-hour average response response	44J8930	675600Y
3580-S43	5-year IOE 24 X 7 4-hour average response	44J8931	675600Z
3580-S43	1-year MA IOE 9 x 5 NBD average response	44J8932	6756D2H
3580-S43	1-year MA IOE 24 X 7 4-hour average response	44J8933	6756D2J
3580-S43	2-year MA IOE 9 x 5 NBD average response	44J8934	6756D2K
3580-S43	2-year MA IOE 24 X 7 4-hour average response	44J8935	6756D2L

For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

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