IBM System Storage TS2340 Tape Drive 3580 Express Models L43 and S43 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:

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

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

- Includes SCSI Ultra160 LVD attachment for Model L43 and 3 Gbps SAS attachment for Model S43

- Adheres to LTO specifications

- Includes support for encryption capabilities designed to work with Application Managed Encryption

- Includes a 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 L43 and S43** (machine type 3580), external standalone or rack-mountable units, 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 are designed to provide maximum tape drive throughput native data rate performance of up to 120 MB/sec compared to the IBM LTO generation 3 Tape Drive (Ultrium 3) at up to 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 previous Ultrium 3 Tape Drives. 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 serial-attached SCSI (SAS) Tape Drive is encryption capable and designed to support Application Managed Encryption.

The TS2340 Tape Drive Model L43 uses a SCSI Ultra160 LVD attachment, and the Model S43 uses a 3 Gbps dual port SAS interface for connections to a wide spectrum of open system servers. The new

models attach to IBM System i™, IBM System p™, IBM System x™, and PC servers, and support Microsoft™ Windows™, HP-UX, Sun Solaris, and UNIX®.

In summary, the IBM TS2340 Tape Drive 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

- 3 Gbps SAS attachment

- A larger 256 MB internal buffer

- Application Managed Encryption support for Ultrium 4 SAS tape drive

- 8 KB cartridge memory with Ultrium 4 media

- Highly integrated electronics using IBM-engineered copper technology

As 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.

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, UNIX, and PC servers. Refer to the Technical information section for details.

Planned availability date

May 11, 2007

Description

The IBM System Storage TS2340 Tape Drive, an external standalone or rack-mountable unit, contains a Linear Tape-Open (LTO) Ultrium 4 tape drive designed for the heavy demands of backup tape storage. The TS2340 is supported for 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 L43 and S43 incorporate fourth-generation IBM LTO Ultrium technology and offers 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 and 4 data cartridges, and can read LTO Ultrium 2 data cartridges.

  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 doubled over the Ultrium 3 Data Cartridge, 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 Cartridge. 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 and 4 cartridges.

- Encryption supported on Ultrium 4 SAS tape drives — The IBM System Storage TS2340 LTO Ultrium 4 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 a 3 Gbps SAS or Ultra160 LVD SCSI attachment model, 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, Microsoft 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 number 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.

- Better 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, which helps provide for a more reliable drive. The fourth-generation drive electronics are designed to provide error correction of soft errors, and in memory arrays.

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 a 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 comes 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 — To help enhance reliability and prolong the life of the drives, some of the most robust components available are used such as: (1) all metal clutch, (2) steel ball bearings in loader, (3) robust leader block design, (4) single circuit card.

- 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 — Designed to automatically compensate for dynamic changes in readback signal response.

- Dynamic amplitude asymmetry compensation — It is designed to dynamically optimize readback signals 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, and 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 data set 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 feature number 8405, 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 L43 and S43 is an excellent choice if you use tape drives that require larger-capacity or higher-performance tape backup. The TS2340, an entry offering to the family of IBM Ultrium Tape products, is the answer to growing storage requirements and shrinking backup windows.

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, 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 mission-critical data protection needs, optimized for enterprise multimode and host attachment, high-cycle and start/stop intensive tape applications, consider the IBM System Storage TS1120 Tape Drive with the IBM System Storage TS3400 or TS3500 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 107-233

  https://www.ibm.com/partnerworld/mem/sla.jsp?num=107-233

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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 L43/S43 Setup, Operator,
 and Service Guide                GC27-2103
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The preceding 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/

Title	Order number
IBM System Storage LTO Ultrium Tape Drive SCSI Reference (English)	GA32-0450
IBM System Storage TS2340 Tape Drive Models L43/S43 Quick Reference (English)	GC27-2104
IBM Tape Device Driver Installation and User's Guide (English)	GC27-2130
IBM Tape Device Driver Programming Reference (English)	GC32-0566

The IBM Publications Center Portal

- http://www.ibm.com/shop/publications/order

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Services

Global Technology Services

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These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

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

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

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.

IBM xSeries® and BladeCenter® support services

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 (percent)
- 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 Model L43 uses an Ultra160 SCSI Low Voltage Differential (LVD) interface and the Model S43 uses a serial-attached SCSI (SAS) interface. Similar to previous models, the 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 L43, a SCSI cable is required for each server connection to a SCSI bus. A SCSI differential terminator is included with each cable. Cables with a VHDCI connector on one end and an HD68 connector on the other end: The following cable options are available for Ultra160 SCSI LVD attachment:

- Feature number 5602 — 2.5M VHDCI/HD68 SCSI Cable

- Feature number 5604 — 4.5M VHDCI/HD68 SCSI Cable

- Feature number 5610 — 10M VHDCI/HD68 SCSI Cable

For the TS2340 Model S43, a SAS cable is required to attach a TS2340 Tape Drive to a host 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:

- Feature number 5402 — 2.0M SAS/Mini-SAS Cable (from HBA with SFF-8470 to drive with SFF-8088)

- Feature number 5406 — 5.5M SAS/Mini-SAS Cable (from HBA with SFF-8470 to drive with SFF-8088)

- Feature number 5502 — 2.0M Mini-SAS/Mini-SAS Cable (from HBA with SFF-8088 to drive with SFF-8088)

- Feature number 5506 — 5.5M Mini-SAS/Mini-SAS 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 later).

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

- Linux™ distributions: Red Hat Enterprise Linux version 3, SUSE LINUX Enterprise Server 9 (SLES 9), SUSE Linux Enterprise Server 10 (SLES 10), Asianux 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," and view "Interoperability matrix," for 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 new 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 a 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 L43, a SCSI cable is required for each server connection to a SCSI bus. A 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:

- Feature number 5602 — 2.5M VHDCI/HD68 SCSI Cable

- Feature number 5604 — 4.5M VHDCI/HD68 SCSI Cable

- Feature number 5610 — 10M VHDCI/HD68 SCSI Cable

For the TS2340 Model S43, a SAS cable is required to attach a TS2340 Tape Drive to host a 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:

- Feature number 5402 — 2.0M SAS/Mini-SAS Cable (from HBA with SFF-8470 to drive with SFF-8088)

- Feature number 5406 — 5.5M SAS/Mini-SAS Cable (from HBA with SFF-8470 to drive with SFF-8088)

- Feature number 5502 — 2.0M Mini-SAS/Mini-SAS Cable (from HBA with SFF-8088 to drive with SFF-8088)

- Feature number 5506 — 5.5M Mini-SAS/Mini-SAS Cable (from HBA with SFF-8088 to drive with SFF-8088)

Refer to the **Specify or Special Features** section of the 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

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                                          Number of
Product        Shipment group             boxes
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3580            TS2340 with Tape Drive         1
                 (Model L43, LVD SCSI or
                 Model S43, SAS)
                Power cord option
                One cleaning cartridge
                One data cartridge
                Documentation CD that includes:
                 IBM System Storage TS2340 Model
                 L43/S43 Tape Drive 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
                 IBM System Storage TS2340 Model L43/S43
                 Quick Reference
                 CD pointer document
                 Device Driver pointer document
                 Compliance document
                SCSI terminator (Model L43 only)
                SCSI wrap tool (Model L43 only)
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Supplies:

For end users: The LTO Ultrium 800 GB Data Cartridges (feature 8405) and the IBM LTO Cleaning Cartridge (feature 8002), for use in the TS2340 Tape Drive, can be purchased from IBM at the time of purchase, as machine type 3589 media, or 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 Global Financing: Yes

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.

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 delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, (1) return instructions and a container is shipped with the replacement CRU and (2) 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.

• 9 hours per day, Monday through Friday, excluding holidays, next-business-day response

Non-IBM parts support

Warranty service

IBM is now 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.

Warranty service upgrades and maintenance service options: Warranty service upgrades: During the warranty period, warranty service upgrades provide an enhanced level of On-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of On-site Service acquired by the customer. Service levels are response time objectives and are not guaranteed.

IBM will attempt to resolve your problem over the telephone or electronically by access to 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.

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. The following service selections are available as warranty upgrades for your machine type.

CRUs may be provided as part of the machine's standard warranty CRU service except that you may install a CRU yourself or request IBM installation, at no additional charge, under one of the On-site Service levels specified above. For additional information on the CRU service, refer to the warranty information.

Maintenance Services: If required, IBM provides repair or exchange service depending on the types of maintenance 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. Service levels are response time objectives and are not guaranteed. The specified level of maintenance 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. The following service selections are available as maintenance options for your machine type.

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

• 9 hours per day, Monday through Friday, excluding holidays, next-business-day response

CRUs: If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker,

memory, or hard disk drive), and depending upon the maintenance service offerings in your geography, IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request.

Based upon availability, CRUs will be shipped for next business day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, (1) return instructions and a container is shipped with the replacement CRU and (2) 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.

Non-IBM parts support: Under certain conditions, IBM repairs selected non-IBM parts at no additional charge for machines that are covered under warranty service upgrades or maintenance services.

IBM Service provides hardware problem determination on non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, memory) installed within IBM Machines covered under warranty service upgrades or maintenance services and provides the labor to replace the failing parts at no additional charge.

If IBM has a Technical Service Agreement with the manufacturer of the failing part, or if the failing part is an accommodations part (a part with an IBM FRU label), IBM may also source and replace the failing part at no additional charge. For all other non-IBM parts, customers are responsible for sourcing the parts. Installation labor is provided at no additional charge, if the machine is covered under a warranty service upgrade or a maintenance service.

Usage plan machine: No

IBM hourly service rate classification: Two. When a type of service involves the exchange of a machine part, the replacement may not be new, but will be in good working order.

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-L43 or 3580-S43.

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: A reduced charge is available to qualified education customers. The educational allowance may not be added to any other discount or allowance.

The educational allowance is 15% for the products in this announcement.

Prices

Product charges

Description	Machine type	Model	Feature number	Purchase price	Field install only	Plant install only
TS2340 Tape Drive Model L43 with LTO SCSI Tape Drive with enclosure and power supply	3580	L43		$5,170		
TS2340 Tape Drive Model L43 with LTO SAS Tape Drive with enclosure and power supply	3580	S43		5,681		
Options for Model S43						
2.0 M SAS/Mini-SAS 1X Cable	S43		5402	106	N	N
5.5 M SAS/Mini-SAS 1X Cable	S43		5406	128	N	N
2.0 M Mini-SAS/Min-SAS 1x Cable	S43		5502	111	N	N
5.5 M Mini-SAS/Mini-SAS 1x Cable	S43		5506	133	N	N
Ultrium 4 Data Cartridges (5-Pack)	L43, S43		8405	514	N	Y
Options for Model L43						
2.5M VHDCI/HD68 SCSI Cable	L43		5602*	116	N	N
4.5M VHDCI/HD68 SCSI Cable	L43		5604*	138	N	N
10M VHDCI/HD68 SCSI Cable	L43		5610*	176	N	N
Rack Mount Kit, including PDU line cord	L43, S43		7003*	141	N	N
Ultrium Cleaning Cartridge L1 UCC	L43, S43		8002*	65	N	Y
Ultrium 3 Data Cartridge (5-pack)	L43, S43		8305*	295	N	Y
Attached to HP-UX System	L43, S43		9210*	NC	N	Y
Attached to Sun Solaris System	L43, S43		9211*	NC	N	Y
Attached to Windows System	L43, S43		9212*	NC	N	Y
Attached to Linux System	L43, S43		9215*	NC	N	Y
Attach to i5/OS or OS/400 System	L43, S43		9400*	NC	N	Y
Attach to IBM AIX(R) System	L43, S43		9600*	NC	N	Y
Power Cord Options						
2.8 M Power Cord 125V US/CAN	L43, S43		9800*	NC	N	Y
2.8 M Power Cord 250V France/Germany	L43, S43		9820*	NC	N	Y
2.8 M Power Cord 250V Denmark	L43, S43		9821*	NC	N	Y

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2.8 M Power Cord 250V    L43,    9825*    NC    N    Y
  UK/China               S43
2.8 M Power Cord 250V    L43,    9827*    NC    N    Y
  Israel                 S43
2.8 M Power Cord 250V    L43,    9828*    NC    N    Y
  Switzerland            S43
2.8 M Power Cord 250V    L43,    9829*    NC    N    Y
  S. Africa              S43
2.8 M Power Cord 250V    L43,    9830*    NC    N    Y
  Italy                  S43
2.8 M Power Cord 250V    L43,    9831*    NC    N    Y
  Australia              S43
2.8 M Power Cord 250V    L43,    9833*    NC    N    Y
  250V US/Canada         S43
2.8 M Power Cord 250V    L43,    9834*    NC    N    Y
  Uruguay/Argentina      S43
2.8 M Power Cord 125V    L43,    9835*    NC    N    Y
  Taiwan                 S43
2.8 M Power Cord 250V    L43,    9840*    NC    N    Y
  China (PRC)            S43
2.8 M Power Cord 250V    L43,    9841*    NC    N    Y
  Taiwan                 S43
2.8 M Power Cord 125V    L43,    9842*    NC    N    Y
  Japan                  S43
2.8 M Power Cord 250V    L43,    9843*    NC    N    Y
  Japan                  S43
2.8 M Power Cord 250V    L43,    9844*    NC    N    Y
  Korea                  S43
2.8 M Power Cord 250V    L43,    9845*    NC    N    Y
  India                  S43
2.8 M Power Cord 125V    L43,    9846*    NC    N    Y
  Brazil                 S43
2.8 M Power Cord 250V    L43,    9847*    NC    N    Y
  Brazil
1.8 M Power Cord,        L43     9986*    NC    N    Y
  125V Chicago           S43
```

* Previously announced feature

There are no field MES removals for the 3580.

Note: The power cord options are used in the country listed and other countries. Refer to the specific listings below for specific country availability or contact your IBM representative.

Alternative and maintenance service

Alternative service (ICA warranty service upgrades)

```
                                      IE8 IBM         IOE IBM
                                      Next Day        Same Day
                    Machine   Feature On-Site Exch.   On-Site Exch.
Description         type   Model number (IO8, 9 x 5)  (IOE, 24 x 7)

Ultrium 4 Tape  3580   L43          $1,035          $1,380
 Drive
Ultrium 4 Tape  3580   S43          $1,035          $1,380
 Drive
```

Annual minimum maintenance charges

```
                    IOE              IOE
                    IBM              IBM
                    On-site Exchange On-site Exchange
Machine type-model  (IOE 9 x 5)      (IOE 24 x 7)

3580-L43            $1,035            $1,447
3580-S43             1,035            1,447
```

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

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