



# IBM TotalStorage 3581 Tape Autoloader Models L38 and F38 support Ultrium 3 Tape Drives

## Overview

The new **IBM TotalStorage® 3581 Tape Autoloader Models L38 and F38** offer high capacity, performance, and technology designed for the midrange open systems environment. These models incorporate a single Linear Tape-Open (LTO) IBM TotalStorage Ultrium 3 Tape Drive which more than doubles tape drive performance over the previous-generation IBM LTO Ultrium 2 Tape Drives (Ultrium 2). It has a native data transfer rate of up to 80 MB/sec native data transfer rate. In addition, with the use of the new IBM TotalStorage LTO Ultrium 400 GB Data Cartridge, the Ultrium 3 Tape Drive has the capability of writing twice as much data, up to 400 GB native capacity (800 GB with 2:1 compression). IBM Ultrium 3 Tape Drives can read and write LTO Ultrium 2 Data Cartridges at original Ultrium 2 capacities. IBM Ultrium 3 Tape Drives can also read LTO Ultrium 1 Data Cartridges with improved data rates of up to 20 MB/sec native data transfer rate (40 MB/sec with 2:1 compression). The Model L38 comes with a Low Voltage Differential (LVD) Ultra160 SCSI attachment, while the Model F38 comes with a native switched fabric 2 Gbps Fibre Channel attachment, for connection to a wide spectrum of open systems servers.

The 3581 Tape Autoloader is an external 2U stand-alone or rack-mountable unit that incorporates a single IBM LTO Ultrium 3 Tape Drive. The 3581 Tape Autoloader capacity is eight tape cartridges, providing a media capacity of up to 3.2 TB (6.4 TB with 2:1 compression) data storage per unit.

Other Ultrium 3 Tape Drive enhancements to help improve performance and reliability include the addition of a new dual-stage 16-head actuator, new independent tape loader and threader motors with

positive pin retention, graceful dynamic braking, a larger 128 MB internal buffer, and highly integrated electronics using IBM-engineered copper technology.

## Product preview

IBM intends to introduce and support Write Once, Read Many (WORM) functionality in products featuring IBM TotalStorage LTO Ultrium 3 Tape Drives. Earlier non-WORM generation 3 drives can be upgraded for WORM support via an update of the firmware to use the new generation 3 WORM Media cartridge as it is made available. Products will be fully compliant to the LTO generation 3 standard for WORM functionality.

Previews provide insight into IBM plans and direction. Specific availability dates, ordering information, and terms and conditions will be provided when the product functionality is announced.

## Key prerequisites

Appropriate levels of host software are required to attach the 3581 Tape Autoloader with IBM LTO Ultrium 3 Tape Drives to selected IBM @server® i5 and iSeries™, AS/400®, IBM @server® p5 and pSeries®, RS/6000®, IBM @server® xSeries®, HP, Sun, UNIX®, and PC servers. Refer to the **Technical information** section for details.

## Planned availability date

March 4, 2005

## At a glance

The 3581 Tape Autoloader combines IBM tape and automation reliability at open systems prices. The new Models L38 and F38 support entry-level unattended backup, open systems attachment flexibility, and enhanced capacity and performance, and include:

- LVD SCSI (Model L38), native switched fabric 2 Gbps Fibre Channel (Model F38)
- Ultrium 3 autoloader native data capacities up to 3.2 TB (up to 6.4 TB using 2:1 compression) with eight cartridge slots
- Use of LTO Ultrium 3 Tape Drive with a native drive data rate of 80 MB/sec
- Optional bar code reader and/or remote management unit
- Sequential or random access
- Stand-alone or rack-mount option

### For ordering, contact:

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

800-IBM-CALL

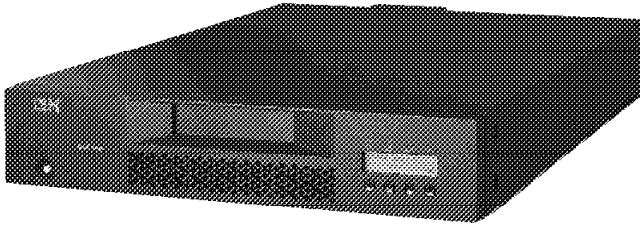
Reference: YE001

*This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: <http://www.ibm.com>.*

---

## Description

---



The 3581 Tape Autoloader is an external stand-alone or rack-mountable unit and contains an LTO Ultrium tape drive designed for the heavy demands of backup tape storage. The 3581 Tape Autoloader capacity is eight tape cartridges, providing a media capacity of up to 3.2 TB (6.4 TB with 2:1 compression) data storage per unit. It is supported for LVD Small Computer Systems Interface (SCSI) for Fibre Channel attachment to IBM *@server*<sup>®</sup> i5 and iSeries, AS/400, IBM *@server*<sup>®</sup> p5 and pSeries, RS/6000, IBM *@server*<sup>®</sup> xSeries, Netfinity<sup>®</sup>, HP, Sun, Linux<sup>™</sup>, UNIX, and PC servers.

The new 3581 Tape Autoloader Models L38 and F38 incorporate the IBM LTO Ultrium 3 Tape Drive. The IBM LTO Ultrium 3 Tape Drive is the third-generation LTO Ultrium Tape Drive in the IBM TotalStorage LTO Ultrium family of products. The Ultrium 3 Tape Drive offers the following significant improvements over the Ultrium 2 Tape Drive:

- Increased performance — Maximum tape drive throughput data rate performance is more than doubled, up to 80 MB/sec native data transfer rate. Data tracks are now written 16 at a time. IBM Ultrium 3 Tape Drives can read and write, at eight data tracks at a time, LTO Ultrium 2 Data Cartridges at Ultrium 2 capacities and rates and read LTO Ultrium 1 Data Cartridges at Ultrium 1 capacities with improved rates.

**Note:** Although the 3581 Tape Autoloader provides the capability for excellent tape performance, other components of the system may limit the actual performance achieved. Also, whereas 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.

- Larger capacity — The tape cartridge capacity is doubled over the Ultrium 2 Data Cartridge up to 400 GB native physical capacity (800 GB with 2:1 compression), with the use of the new IBM TotalStorage LTO Ultrium 400 GB Data Cartridge. This is achieved by increasing the linear density, the number of tape tracks, and the media length. The tape itself is an advanced metal particle tape developed to help provide durability and capacity.
- Ultrium 2 cartridge compatibility — The Ultrium 3 Tape Drive can read and write on Ultrium 2 cartridges.
- SCSI Ultra160 LVD attachment — The Model L38 comes with a SCSI Ultra160 LVD attachment, for connection to a wide spectrum of open system servers. They are supported on AIX<sup>®</sup>, OS/400<sup>®</sup>, i5/OS, Sun Solaris, HP-UX, Microsoft<sup>™</sup> Windows<sup>™</sup> 2000, Windows 2003, Linux, and other open systems.
- Fibre channel attachment — The Model F38 comes with native switched fabric 2 Gbps Fibre Channel attachment. They are supported on AIX, OS/400, Sun Solaris, HP-UX, Microsoft Windows 2000, Windows 2003, Linux, and other open systems.

- New 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.
- New 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. With an independent loader motor coupled with the positive pin retention, the tape threads with a higher level of reliability.
- Dynamic amplitude asymmetry compensation — Readback signals are optimized for linear readback response from magneto resistive read head transducers.
- Larger internal data buffer — There is a 128 MB internal data buffer in the Ultrium 3 Tape Drive as compared to a 64 MB internal data buffer in the Ultrium 2 Tape Drive.
- Highly integrated electronics using IBM-engineered copper technology — This is designed to reduce the total number of components in the drive, lower chip temperatures, and reduce power requirements, helping to provide for a more reliable drive. The third-generation drive electronics are also designed to provide “on-the-fly” error correction capability for soft errors in the memory arrays in data and control paths.
- 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-down.

Proven IBM LTO Ultrium features enhanced in the IBM LTO Ultrium 3 Tape Drive include:

- Servo and track layout technology — There are 704 data tracks in Ultrium 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 vibrate environments.
- Surface Control Guiding Mechanism — IBM’s patented Surface Control Guiding Mechanism is designed to guide the tape along the tape path in the IBM Ultrium 3 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 3 helps minimize contact, debris accumulation, and wear on the tape as it moves over the read/write heads.
- Digital speed matching — The Ultrium 3 Tape Drive is designed to perform dynamic speed matching (at one of five speeds, 40, 50, 60, 70, or 80 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 3 ranges from 40 to 80 MB/sec versus 17.5 to 35 MB/sec on Ultrium 2.
- Robust drive components optimized for automation environments — The drive was designed 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 drive.

- Power management — The Ultrium 3 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 — Readback signals are designed to dynamically optimize for linear readback response from magneto resistive 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 3 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 increased 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 used 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 4,096 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 3 Tape Drive uses SARS to help isolate failures between media and hardware. The 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 more likely cause of failure. SARS can cause the drive to request a cleaner tape, to mark the media as degraded, and to indicate that the hardware has degraded.

With support for LTO Ultrium-format tape data cartridges, the 3581 Tape Autoloader provides an excellent migration path from digital linear tape (DLT or SDLT), 1/4-inch, 4mm, or 8mm tape drives.

---

## Product positioning

---

As you compare competitive tape solutions, consider:

- Capacity and performance requirements
- Data protection, reliability, and availability
- Storage usage and application requirements
- Affordability
- Loyalty to legacy or existing tape formats

The 3581 Tape Autoloader and storage management applications address these requirements and constitute a functionally rich tape storage solution incorporating LTO Ultrium tape technology. You also gain flexibility of tape library management and unattended save and restore operations. The IBM TotalStorage 3581 Tape Autoloader is an excellent solution if you use tape or require a larger-capacity or higher-performance tape backup with or without random access. The 3581 models are an excellent choice for tape automation for IBM @server® p5 and pSeries, RS/6000, IBM @server® i5 and iSeries, AS/400, IBM @server® xSeries, and other popular open systems.

The 3581 Tape Autoloader offers one IBM TotalStorage LTO Ultrium 3 Tape Drive and eight cartridge slots with an autoloader capacity of 6.4 TB (with 2:1 compression) or 3.2 TB native.

The 3581 can be the answer to growing storage requirements and shrinking backup windows, and is part of a family of IBM TotalStorage LTO Ultrium tape products. The 3581 Tape Autoloader constitutes an excellent tape storage solution if you have an existing digital linear tape experience or require high-performance automated tape backup. In addition to reading and writing on IBM LTO Ultrium-format tape cartridges, the 3581 Tape Autoloader provides an excellent functional alternative to DLT/SDLT, 1/4-inch, 4mm, 8mm/AIT, or IBM Magstar® MP 3570 tape drives.

For capacity requirements less than 800 GB (compressed), the external IBM TotalStorage 3580 Tape Drive should be considered.

For capacity requirements greater than 6.4 TB (compressed), the IBM TotalStorage 3582 Tape Library should be considered with its one or two IBM Ultrium Tape Drives and 24 cartridge slots, with a capacity of 9.6 TB native to 19.2 TB (compressed) in an entry-level automation library.

For capacity requirements greater than 9.6 TB and scalable drives and numbers of cartridges, the IBM TotalStorage 3583 Tape Library and IBM TotalStorage 3584 Tape Library should be considered. You can tailor the IBM TotalStorage 3583 Tape Library to address system capacity and performance needs, on 3583 Models L18, L36, and L72 respectively, using up to six IBM LTO Ultrium Tape Drives. The IBM TotalStorage 3584 Tape Library can address system capacity and performance requirement from 25.6 TB to 2.7 PB (51.2 TB to 2.7 PB with 2:1 compression) using up to 192 IBM Ultrium tape drive in up to 16 3584 library frames.

For protection of mission-critical data and hardware needs, optimized for enterprise multi-mode and host attachment, high-cycle and start/stop intensive tape applications, consider the IBM TotalStorage 3592 Tape Drive with the IBM TotalStorage 3584 Tape Library or the IBM TotalStorage 3494 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 105-065

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=105-065>

### ***Trademarks***

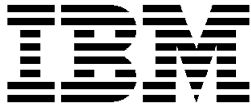
iSeries is a trademark of International Business Machines Corporation in the United States or other countries or both. The e-business logo, TotalStorage, AS/400, pSeries, RS/6000, xSeries, Netfinity, AIX, OS/400, Magstar, and zSeries are registered trademarks of International Business Machines Corporation in the United States or other countries or both.

Microsoft and Windows are trademarks of Microsoft Corporation.

UNIX is a registered trademark of the Open Company in the United States and other countries.

Linux is a trademark of Linus Torvalds in the United States, other countries or both

Other company, product, and service names may be trademarks or service marks of others.



# IBM US Announcement Supplemental Information

February 15, 2005

## Publications

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

Title	Order number
IBM TotalStorage® 3581 Tape Autoloader Models L28/L38/L3H and F28/F38/F3H Setup, Operator, and Service Guide	GA32-0470
IBM TotalStorage 3581 Tape Autoloader Models L28/L38/L3H and F28/F38/F3H Quick Reference	GX35-5071
IBM Ultrium Device Driver Installation and User's Guide	GA32-0430

The publications listed above and the following publications are also available at the following Web site

<http://www.ibm.com/servers/storage/tape/ito>

### Title

IBM TotalStorage 3581 Tape Autoloader Models L28/L38/L3H and F28/F38/F3H SCSI Reference (English)

IBM Ultrium Device Driver Programming Reference (English)

The Publication Notification System (PNS) is available by order number or product number. Customers currently subscribing to PNS will automatically receive notifications by e-mail. Customers who wish to subscribe can visit the PNS Web site location at

<http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>

The publications listed on the notification can be ordered by calling the Pubs Support Group in Raleigh at 800-879-2755, option 1.

The IBM Publications Center Portal

<http://www.ibm.com/shop/publications/order>

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as well as payment options via credit card. Furthermore, a large number of publications are available online in various file formats, which can currently be downloaded free of charge.

Note that PNS subscribers most often order their publications via the Publication Center.

## Services

### Integrated Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure for e-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 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.

## Technical information

### Specified operating environment

#### Physical specifications

##### 3581 Models L38 and F38

- Width: Rack mount 483 mm (19 in), stand-alone 321 mm (16.6 in)
- Depth: Rack mount 864 mm (34 in), stand-alone 665 mm (26.2 in)
- Height: Rack mount 89 mm (3.5 in), stand-alone 86 mm (3.4 in)
- Maximum weight: 5.7 kg (12.5 lb) without rack mount

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

#### Operating environment

##### 3581 Models L38 and F38

- Temperature: 12° to 35°C, 54° to 95°F
- Relative humidity: 20% to 80% (noncondensing)
- Wet bulb: 26°C (79.0°F) maximum

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: <http://www.ibm.com>.

- Voltage: 100-240 V ac, 50-60 Hz auto-ranging
- Electrical power:
  - 1.3 amps at 100 V ac, 0.7 amps at 240 V ac
  - 0.1 kVA
- Maximum acoustical noise sound power levels LwAd in bels: 5.1/5.9
- Heat output: 100 watts (86 kcal/hr)

**Hardware requirements:** The IBM 3581 Tape Autoloader comes with raven black covers. The Model L38 has an Ultra160 SCSI Low Voltage Differential (LVD) interface. The Model F38 has a Fibre Channel interface. The 3581 Tape Autoloader can be attached to the IBM *@server*<sup>®</sup> i5 and *iSeries*<sup>™</sup>, IBM *@server*<sup>®</sup> p5 and *pSeries*<sup>®</sup>, IBM *@server*<sup>®</sup> *xSeries*<sup>®</sup>, *AS/400*<sup>®</sup>, *RS/6000*<sup>®</sup>, *RS/6000 SP*<sup>™</sup> systems, *Netfinity*<sup>®</sup>, and non-IBM servers, workstations, and personal computers 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/servers/storage/tape/lto>

Select “Product Details,” then “LTO Compatibility,” and view “Independent Software Vendor (ISV) matrix for LTO” for the product.

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

**Cables:** A SCSI or Fibre cable is required to attach the 3581 to the server host bus adapter. A SCSI cable and terminator are provided on a Model L38 with the initial plant order. A Fibre cable should be specified on a Model F38 with the initial plant order. An interposer or interposers may be required for attachment to various server adapters. Customers are responsible for selecting and ordering the correct cables and interposers to match the IBM LTO Ultrium SCSI interface and the server SCSI interface.

**SCSI cables:** The following cables are available for SCSI LVD attachment of the 3581.

Cables with a VHDCI connector on one end and an HD68 connector on the other end:

- 5602 — 2.5 meters
- 5604 — 4.5 meters
- 5610 — 10 meters

An interposer is required to connect a SCSI cable with HD68 connectors to a VHDCI connector. The following interposer is available:

- 5099 — VHDCI/HD68 Cable/Interposer

**Fibre Channel cables:** A Fibre Channel cable is required to attach a 3581 Tape Autoloader to host Fibre Channel adapters, Fibre Channel Switches, or other Fibre Channel components. The IBM LTO Ultrium 3 Fibre Tape Drive comes with an LC Duplex connector.

Features available for Fibre Channel cables, and their respective lengths, are as follows:

- 6005 — 5 m LC-LC Fibre Channel cable
- 6013 — 13 m LC-LC Fibre Channel cable
- 6025 — 25 m LC-LC Fibre Channel cable

An interposer may be required to connect a Fibre cable with LC Duplex connectors to another SC Duplex connector. The following interposer is available:

- 5096 — Interposer SC-LC Fibre

Refer to the Special Features section of the *3581 Tape Autoloader Sales Manual* for detailed descriptions of these features.

**Software requirements:** The 3581 Tape Autoloader is supported on the following operating systems at the minimum levels indicated:

- OS/400<sup>®</sup> V5R2, or later.
- AIX<sup>®</sup> 5L V5.1, V5.2, V5.3, or later.
- Sun Solaris 8, 9.
- Microsoft<sup>™</sup> Windows<sup>™</sup> 2000 (build 2195, or greater).
- Microsoft Windows 2003 (build 3790, or greater).
- HP-UX 11.0 and HP-UX 11i (64-bit). HP-UX patches may be required.
- Linux<sup>™</sup> distributions: Red Hat Enterprise Linux Version 3, SUSE LINUX Enterprise Server 8.

For a current list of host software versions and release levels that support the 3581, refer to the following Web site

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

Select “Product Details,” then “LTO Compatibility,” and view “Independent Software Vendor (ISV) matrix for LTO” for the product.

Tivoli<sup>®</sup> Storage Manager and other compatible software offerings can provide storage and tape management software for the 3581. 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/servers/storage/tape/lto>

Select “Product Details,” then “LTO Compatibility,” and view “Independent Software Vendor (ISV) matrix for LTO” for the product.

IBM continues to work together with the ISVs to support the 3581 Tape Autoloader. Individual application vendors should be contacted for specific information and availability dates.

**Compatibility:** The IBM LTO Ultrium 3 Tape Drives can read and write original LTO Ultrium Data Cartridges. The new LTO Ultrium 400 GB Data Cartridges can only be used on the new IBM LTO Ultrium 3 Tape Drives.

**Limitations:** Total LVD SCSI cable length is 12 m (39 ft) due to an internal multi-drop interconnection. Stub length at each device must not exceed 0.1 m (0.33 ft).

Installing more than one 3581 drive on a SCSI bus may impact tape drive or system performance. Intermixing of other SCSI devices on the same SCSI bus as the 3581 may impact performance of those devices.

The 3581 Tape Autoloader operating environment must not conflict with media operating and storage requirements. If media is stored in the 3581 for more than ten hours, the media storage temperature requirements must be met.

### Planning information

**Customer responsibilities:** Physical planning is a customer responsibility. Detailed planning information is in the *IBM TotalStorage 3581 Tape Autoloader*

Models L28/L38/L3H and F28/F38/F3H Setup, Operator, and Service Guide (GA32-0470). The 3581 Tape Autoloader is designated as a customer setup unit (CSU). It is the customer's responsibility to install the unit. Customers are responsible for obtaining the appropriate SCSI 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/servers/storage/tape/lto>

**Cable orders:** A SCSI or Fibre cable is required to attach the 3581 to the server. At least one cable should be specified on the initial plant order. A SCSI terminator is included with each SCSI Ultrium Tape Autoloader (Model L38). An interposer or interposers may be required for attachment to various server adapters. Customers are responsible for selecting and ordering the correct cables and interposers to match the IBM LTO Ultrium Tape Drive interface and the server interface.

Refer to the **Cables** section at the end of **Hardware requirements** for a list of available cables and interposers.

Refer to the Specify or Special Features section of the *3581 Sales Manual* for a detailed description of the cables and interposers available.

**Installability:** Installation time for the IBM TotalStorage 3581 Tape Autoloader when rack-mounted is approximately 3.5 to 4 hours, and when stand-alone installed is approximately 1.5 hours. Refer to the *IBM TotalStorage 3581 Tape Autoloader Models L28/L38/L3H and F28/F38/F3H Setup, Operator, and Service Guide* (GA32-0470).

#### Packaging

Product	Items included	Number of boxes
3581	3581 Tape Autoloader Power cord LVD Terminator (Model L38 only) 2.5 m SCSI Cable included (Model L38 only) SCSI wrap tool (Model L38 only) Fibre wrap tool (Model F38 only) IBM TotalStorage LTO Ultrium 400 GB Data Cartridge IBM TotalStorage LTO Ultrium Cleaning Cartridge (universal) Setup, Operator, and Service Guide Quick Reference Card Warranty Information Open Systems device drivers Device Driver Installation and User's Guide	1

**Supplies:** The IBM TotalStorage LTO Ultrium 400 GB Data Cartridges and the IBM TotalStorage LTO Cleaning Cartridge, for use in the Ultrium 3 Tape Drive, can be purchased from IBM using feature numbers with the initial order. IBM media can also be ordered directly through AAS using machine type 3589. Refer to the *3589 Sales Manual* for further information. Media can also be ordered through 888-IBM-MEDIA (426-6334) in the U.S. or Canada, or refer to the following Web site

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

The part numbers for additional supplies at this Web site are:

IBM part number	Supply item
24R1922	IBM TotalStorage LTO Ultrium 400 GB Data Cartridge
35L2086	IBM TotalStorage LTO Cleaning Cartridge (universal)
08L9129	Leader Pin Attachment Kit

#### 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:** No

**Warranty period:** Three years. IBM TotalStorage Ultrium 400 GB media warranted separately.

#### 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.

**Customer mail-in using rapid replacement service:** If warranty service is required, call IBM Support. IBM Support will assist with problem determination and initiate shipment of a replacement unit, if needed, to the customer's location by express delivery. For calls received by 5:00 p.m. customer's time, in most cases, the replacement unit will arrive within two business days (excluding holidays). The replacement unit becomes the property of the customer in exchange for the failed unit, which becomes the property of IBM. Pack the failed unit into the shipping carton that contained the replacement unit and return to IBM.

Transportation charges, both ways, are paid by IBM.

Failure to use the carton in which the replacement unit was received could result in charges incurred by the customer for damage to the failed unit during shipment.

**ServiceSuite™ and ServiceElect (formerly ESA) maintenance:** For ServiceElect (Z125-5510) and ServiceSuite (Z125-5745) Statements of Work

### *Warranty service upgrades*

On-site service: IBM will exchange 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.

- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average, next-business-day response
- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average, same-business-day response
- 24 hours per day, 7 days a week, 4-hour average response

**Maintenance services:** 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 maintenance 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.

On-site service: IBM will exchange 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 maintenance options for your machine type.

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response
- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average, same-business-day response
- 24 hours per day, 7 days a week, 4-hour average response

### **Maintenance service**

The preferred go-to-market offerings are ServiceElect and ServiceSuite. However, ICA legacy contracts will still be available for current customers until they are withdrawn.

### **Warranty service upgrades**

On-site service: IBM will exchange 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.

- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average, next-business-day response
- 24 hours per day, 7 days a week, 4-hour average response

**Maintenance services:** 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 maintenance 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.

On-site service: IBM will repair or exchange 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 maintenance options for your machine type.

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response
- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average, same-business-day response
- 24 hours per day, 7 days a week, 4-hour average response

**Usage plan machine:** No

**IBM hourly service rate classification:** One

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:** Yes

**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 which the customer has acquired. You can obtain the agreement at

[http://www-1.ibm.com/servers/support/machine\\_warranties/machine\\_code.html](http://www-1.ibm.com/servers/support/machine_warranties/machine_code.html)

or by contacting your IBM representative.

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



**Prices**

**Product charges**

<b>Description</b>	<b>Machine type</b>	<b>Model</b>	<b>Feature number</b>	<b>Purchase price</b>	<b>Field install only</b>	<b>Plant install only</b>
3581 LVD Tape Autoloader	3581	L38		\$ 9,200		
RMU			1660	856	N	N
VHDCI/HD68 Cable/ Interposer			5099	127	N	N
2.5 m VHDCI/HD68 SCSI Cable			5602	116	N	N
4.5 m VHDCI/HD68 SCSI Cable			5604	138	N	N
10 m VHDCI/HD68 SCSI Cable			5610	176	N	N
Rack Mount Kit			7003	399	N	N
Bar Code Reader			7004	635	N	N
1 Cleaning Cartridge			8002	103	N	Y
1-Pack Ultrium 3 Data Cart			8301	116	N	Y
Attached to HP-UX System			9210	NC	N	Y
Attached to Sun System			9211	NC	N	Y
Attached to Windows System			9212	NC	N	Y
Attached to Other Non-IBM System			9213	NC	N	Y
Attached to Linux System			9215	NC	N	Y
Attach to iSeries or AS/400			9400	NC	N	Y
Attach to pSeries or RS/6000			9600	NC	N	Y
2.7 m Power Cords: 125 V, 15A, U.S./ Canada			9800	NC	N	Y
250 V, 16A (AC) France, Germany, and others			9820	NC	N	Y
250 V, 11A, Denmark			9821	NC	N	Y
250 V, 13A, UK, China and others			9825	NC	N	Y
250 V, 6-16A, Israel and others			9827	NC	N	Y
255 V, 10A, Switzerland			9828	NC	N	Y
250 V, 16A, So. Africa and others			9829	NC	N	Y
250 V, 10A and 16A, Italy			9830	NC	N	Y
250 V, 10A, Australia			9831	NC	N	Y
250 V, 15A, U.S./ Canada			9833	NC	N	Y
250 V, 10A, Uruguay and others			9834	NC	N	Y
250 V, 10A, China (PRC)			9840	NC	N	Y
Power Cord, 1.8 m, Chicago			9986	NC	N	Y

Description	Machine type	Model	Feature number	Purchase price	Field install only	Plant install only
3581 Fibre Tape Autoloader	3581	F38		\$12,780		
RMU			1660	856		
SC-LC Fibre Cable Interposer			5096	78	N	N
5 m LC/LC Fibre Channel Cable			6005	155	N	N
13 m LC/LC Fibre Channel Cable			6013	184	N	N
25 m LC/LC Fibre Channel Cable			6025	240	N	N
Rack Mount Kit			7003	399	N	N
Bar Code Reader			7004	635	N	N
1 Cleaning Cartridge			8002	103	N	Y
1-Pack Ultrium 3 Data Cart			8301	116	N	Y
Attached to HP-UX System			9210	NC	N	Y
Attached to Sun System			9211	NC	N	Y
Attached to Windows System			9212	NC	N	Y
Attached to Other Non-IBM System			9213	NC	N	Y
Attached to Linux System			9215	NC	N	Y
Attached to zSeries® Linux			9216	NC	N	Y
Attach to iSeries or AS/400			9400	NC	N	Y
Attach to pSeries or RS/6000			9600	NC	N	Y
2.7 m Power Cords: 125 V, 15A, U.S./Canada			9800	NC	N	Y
250 V, 16A (AC) France, Germany, and others			9820	NC	N	Y
250 V, 11A, Denmark			9821	NC	N	Y
250 V, 13A, UK, China and others			9825	NC	N	Y
250 V, 6-16A, Israel and others			9827	NC	N	Y
255 V, 10A, Switzerland			9828	NC	N	Y
250 V, 16A, So. Africa and others			9829	NC	N	Y
250 V, 10A and 16A, Italy			9830	NC	N	Y
250 V, 10A, Australia			9831	NC	N	Y
250 V, 15A, U.S./Canada			9833	NC	N	Y
250 V, 10A, Uruguay and others			9834	NC	N	Y
250 V, 10A, China (PRC)			9840	NC	N	Y
Power Cord, 1.8 m, Chicago			9986	NC	N	Y

There are no field MES removals for the 3581.

NC = No charge

N = No

Y = Yes

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

**Annual minimum maintenance charges**

**Warranty service upgrade**

<b>Description</b>	<b>Machine type</b>	<b>Model</b>	<b>IE8 IBM On-Site Exch (IO8, 9 x 5)</b>	<b>IOE IBM On-Site Exch (IOE, 24 x 7)</b>
3581 LVD Tape Autoloader	3581	L38	\$600	\$799
3581 Fibre Tape Autoloader	3581	F38	720	959

**Maintenance service**

<b>Description</b>	<b>Machine type</b>	<b>Model</b>	<b>Feature number</b>	<b>Next Day On-Site Exch (IO8, 9 x 5)</b>	<b>Same Day On-Site Exch (IOE, 24 x 7)</b>
3581 LVD Tape Autoloader	3581	L38		\$1,486	\$2,080
RMU			1660	NC	NC
VHDCI/HD68 Cable/ Interposer			5099	NC	NC
2.5 m VHDCI/HD68 SCSI Cable			5602	NC	NC
4.5 m VHDCI/HD68 SCSI Cable			5604	NC	NC
10 m VHDCI/HD68 SCSI Cable			5610	NC	NC
Rack Mount Kit			7003	NC	NC
Bar Code Reader			7004	NC	NC
1 Cleaning Cartridge			8002	NC	NC
1-Pack Ultrium 3 Data Cart			8301	NC	NC
Attached to HP-UX System			9210	NC	NC
Attached to Sun System			9211	NC	NC
Attached to Windows System			9212	NC	NC
Attached to Other Non-IBM System			9213	NC	NC
Attached to Linux System			9215	NC	NC
Attach to iSeries or AS/400			9400	NC	NC
Attach to pSeries or RS/6000			9600	NC	NC
2.7 m Power Cords: 125 V, 15A, U.S./ Canada			9800	NC	NC
250 V, 16A (AC) France, Germany, and others			9820	NC	NC
250 V, 11A, Denmark			9821	NC	NC
250 V, 13A, UK, China and others			9825	NC	NC
250 V, 6-16A, Israel and others			9827	NC	NC
255 V, 10A, Switzerland			9828	NC	NC
250 V, 16A, So. Africa and others			9829	NC	NC
250 V, 10A and 16A, Italy			9830	NC	NC
250 V, 10A, Australia			9831	NC	NC
250 V, 15A, U.S./ Canada			9833	NC	NC

<b>Description</b>	<b>Machine type</b>	<b>Model</b>	<b>Feature number</b>	<b>Next Day On-Site Exch (IO8, 9 x 5)</b>	<b>Same Day On-Site Exch (IOE, 24 x 7)</b>
250 V, 10A, Uruguay and others			9834	NC	NC
250 V, 10A, China (PRC)			9840	NC	NC
Power Cord, 1.8 m, Chicago			9986	NC	NC
3581 Fibre Tape Autoloader	3581	F38		\$1,783	\$2,498
RMU			1660	NC	NC
SC-LC Fibre Cable Interposer			5096	NC	NC
5 m LC/LC Fibre Channel Cable			6005	NC	NC
13 m LC/LC Fibre Channel Cable			6013	NC	NC
25 m LC/LC Fibre Channel Cable			6025	NC	NC
Rack Mount Kit			7003	NC	NC
Bar Code Reader			7004	NC	NC
1 Cleaning Cartridge			8002	NC	NC
1-Pack Ultrium 3 Data Cart			8301	NC	NC
Attached to HP-UX System			9210	NC	NC
Attached to Sun System			9211	NC	NC
Attached to Windows System			9212	NC	NC
Attached to Other Non-IBM System			9213	NC	NC
Attached to Linux System			9215	NC	NC
Attached to zSeries Linux			9216	NC	NC
Attach to iSeries or AS/400			9400	NC	NC
Attach to pSeries or RS/6000			9600	NC	NC
2.7 m Power Cords: 125 V, 15A, U.S./Canada			9800	NC	NC
250 V, 16A (AC) France, Germany, and others			9820	NC	NC
250 V, 11A, Denmark			9821	NC	NC
250 V, 13A, UK, China and others			9825	NC	NC
250 V, 6-16A, Israel and others			9827	NC	NC
255 V, 10A, Switzerland			9828	NC	NC
250 V, 16A, So. Africa and others			9829	NC	NC
250 V, 10A and 16A, Italy			9830	NC	NC
250 V, 10A, Australia			9831	NC	NC
250 V, 15A, U.S./Canada			9833	NC	NC
250 V, 10A, Uruguay and others			9834	NC	NC
250 V, 10A, China (PRC)			9840	NC	NC
Power Cord, 1.8 m, Chicago			9986	NC	NC

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

### ***Specify features***

The following charges apply to features ordered for field installation:

<b>Description</b>	<b>Feature number</b>	<b>Charge</b>
Attached to HP-UX System	9210	\$0
Attached to Sun System	9211	0
Attached to Windows System	9212	0
Attached to Other Non-IBM System	9213	0
Attached to Linux System	9215	0
Attached to zSeries Linux	9216	0
Attached to iSeries, AS/400	9400	0
Attached to pSeries, RS/6000	9600	0

---

### **Order now**

---

To order, contact the Americas Call Centers, your local IBM representative, or your IBM Business Partner.

To identify your local IBM representative or IBM Business Partner, call 800-IBM-4YOU (426-4968).

Phone: 800-IBM-CALL (426-2255)  
Fax: 800-2IBM-FAX (242-6329)  
Internet: [ibm\\_direct@vnet.ibm.com](mailto:ibm_direct@vnet.ibm.com)  
Mail: IBM Americas Call Centers  
Dept: IBM CALL, 11th Floor  
105 Moatfield Drive  
North York, Ontario  
Canada M3B 3R1

Reference: YE001

The Americas Call Centers, our national direct marketing organization, can add your name to the mailing list for catalogs of IBM products.

**Note:** Shipments will begin after the planned availability date.

#### ***Trademarks***

IBMLink, iSeries, SP, and ServiceSuite are trademarks of International Business Machines Corporation in the United States or other countries or both.

The e-business logo, TotalStorage, pSeries, AS/400, RS/6000, xSeries, Netfinity, OS/400, AIX, Tivoli, and zSeries are registered trademarks of International Business Machines Corporation in the United States or other countries or both.

Microsoft and Windows are trademarks of Microsoft Corporation.

Linux is a trademark of Linus Torvalds in the United States, other countries or both.

Other company, product, and service names may be trademarks or service marks of others.