IBM System Storage TS1140 Tape Drive Model E07 delivers higher performance, reliability, and capacity

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At a glance

With its higher performance and greater capacity as compared to TS1130 Tape Drive Model E06, the use of the TS1140 Tape Drive can help save costs as the number of tape drives, cartridges, and associated floor space are all reduced. Enhancements of the TS1140 Tape Drive include:

• Native data rate performance of up to 250 MB/sec (up to 650 MB/sec compressed) versus the 160 MB/sec native data rate of TS1130 Tape Drive Model E06
• Uncompressed cartridge formatting of up to 4.0 TB (12.0 TB with 3:1 compression) with the use of IBM® Tape Cartridge 3592 Advanced Data (Type C)
• Dual Fibre Channel interface at 8 Gbps designed to enhance attachment flexibility
• Effective media reuse with capacity to read and write up to N-1 generation media
• Encryption capabilities designed to work with the IBM Tivoli® Key Lifecycle Manager
• Small form factor to help improve space efficiency of tape infrastructure
• High availability design

The high reliability of the 3592 tape drive and media is maintained and improved with these features:

• Giant Magneto Resistive (GMR) 32-channel head technology
• Media partitioning capability setting the grounds for improved data management on tape
• Virtual backhitch improvements for increased performance avoids the backhitch of the tape

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Overview

IBM System Storage® TS1140 Tape Drive Model E07 (machine type 3592) is the fourth generation of the highly successful IBM 3592 Enterprise Tape Drive. It is supported for integration in the IBM System Storage TS3500 Tape Library or racks that enable stand-alone installations.

The TS1140 Tape Drive is designed to provide higher levels of performance, reliability, and cartridge capacity than the TS1130 Model E06 Tape Drive. It has
a high-technology 32-channel GMR head design and provides a native data rate performance of up to 250 MB/sec versus the 160 MB/sec data rate of the TS1130 Tape Drive Model E06. The TS1140 E07 Tape Drive has a dual-port 8-Gbps Fibre Channel interface for Fibre Channel attachment to host systems or a switched fabric environment.

With the use of the IBM Tape Cartridge 3592 Advanced Data (Type C), TS1140 Model E07 can format a cartridge uncompressed up to 4.0 TB (12.0 TB with 3:1 compression). TS1140 E07 is designed for automation and uses a tape cartridge with a form factor similar to other 3592 tape cartridges, allowing it to be used in the IBM TS3500 Tape Library.

The TS1140 Tape Drive also supports drive-based data encryption to help protect your data. The TS1140-based encryption and associated IBM Tivoli Key Lifecycle Manager component are supported in a wide variety of operating system environments, including IBM Power®, IBM System i®, IBM System p®, HP-UX, Oracle, Linux®, and Microsoft® Windows®. Application, System, or Library Managed encryption management methods are supported. The encryption capability is supported when the TS1140 Tape Drive is integrated or attaches to selected IBM supported tape libraries, subsystems, or controllers.

For the latest version of the IBM Tivoli Key Lifecycle Manager, refer to 


Key prerequisites

The TS1140 Tape Drive Model E07 is supported in a wide range of environments including selected IBM Power Systems™, IBM System i, IBM System p, IBM System x, and other servers running AIX®, HP-UX, Linux, Oracle Solaris, and Microsoft Windows operating system environments. Refer to the Software requirements section for details.

Planned availability date

June 3, 2011

Description

TS1140 Tape Drive (machine type 3592) is the fourth generation for the highly successful 3592 Tape Drive. It is designed for high-performance tape applications, including:

- High-speed data-save operations where backup windows are critical and large amounts of data are archived to tape
- Large-scale automated tape environments where performance and reliability are required
- Large-scale mass data archive applications where massive amounts of data need to be quickly saved to tape for storage and later recalled (examples include the seismic industry, data warehousing, and record management applications)

Capacity

The TS1140 is designed to provide up to 4.0 TB uncompressed capacity with the new IBM Tape Cartridge 3592 Advanced Data (Type C) media. The exact ratio depends on which cartridge is used with the tape drive.

The following table compares the cartridge capacity (native and with 3:1 compression) of the TS1140, TS1130, and TS1120:
**TS1120** | **TS1130** | **TS1140**
---|---|---
Model E05 | Model E06 | Model E07
native cartridge capacity (native / compressed) | native cartridge capacity (native / compressed) | native cartridge capacity (native / compressed)

<table>
<thead>
<tr>
<th>IBM Tape Cartridge 3592</th>
<th>800 GB</th>
<th>1 TB</th>
<th>1.6 TB</th>
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</thead>
<tbody>
<tr>
<td>(Extended)</td>
<td>2.1 TB</td>
<td>3 TB</td>
<td>4.8 TB</td>
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<table>
<thead>
<tr>
<th>IBM Tape Cartridge 3592</th>
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<th>NA</th>
<th>4.0 TB</th>
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<tbody>
<tr>
<td>Type C (Advanced Data)</td>
<td>NA</td>
<td>NA</td>
<td>12.0 TB</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>IBM Tape Cartridge 3592</th>
<th>NA</th>
<th>NA</th>
<th>500 GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type K (Advanced Economy)</td>
<td>NA</td>
<td>NA</td>
<td>1.5 TB</td>
</tr>
</tbody>
</table>

NA = Not Applicable

**Performance**

TS1140 E07 uses a design that increases the native data rate up to 250 MB/sec (up to 650 MB/sec compressed) versus the 160 MB/sec data rate of TS1130 Tape Drive Model E06. It is designed to offer improved access characteristics in search velocity and rewind time versus the TS1130 E06, with other enhancements designed to help aid small file and Hierarchical Storage Manager performance.

**Note:** The actual throughput achieved is a function of many components, such as system processor, disk data rate, data block size, data compressibility, I/O attachments, SAN, and the system or application software used. Although the drive is capable of a 250 MB/sec native data rate, other components may limit the actual effective data rate.

**Capacity scaling**

TS1140 Model E07 is designed to support capacity scaling of an individual tape cartridge to 20% of maximum capacity (800 GB for advanced tape cartridges). Capacity scaling lets the utilized length of tape to be logically shortened, allowing improved data access times in trade off for reduced capacity. The tapes can subsequently be scaled back to full capacity as needed.

The TS1140 Model E07 Tape Drive allows an application to issue a command to scale the IBM Tape Data 3592 cartridge. This allows capacity scaling to be exploited by an application that permits media pools to be defined by VOLSER range. You can exploit the capacity scaling capability of the TS1140 E07. For more information on using capacity scaling, refer to **IBM 3592 Model E07 Tape Drive Customer Information Center**.

**Media and cartridge capacity**

The TS1140 E07 provides capacity leadership with media reuse and uses Type C tape cartridge with tape specifically optimized for the enterprise tape environment. This provides a native cartridge capacity of 4.0 TB (or up to 12.0 TB with 3:1 compression) and can be beneficial in space savings and economy of data storage since it can help lower the cost of storage per megabyte. For applications that fill current data cartridges, this can help reduce the number of tape cartridges required. The reduced number of cartridges may also help free up floor space for other requirements and reduce the number of automation slots used.

The robust cartridge shell is designed to sustain a 1 meter drop. IBM Tape Cartridge 3592 contains cartridge memory that is a passive, contactless silicon storage device. It is used to hold information about the specific cartridge, including the VOLSER, the media in the cartridge, and the drive.
Attachment options

The TS1140 E07 has dual-ported 8 Gbps native switched fabric Fibre Channel interfaces to offer attachment flexibility in an open systems environment. The drives can be directly attached to open systems servers with Fibre Channel.

The TS1140 is supported in a wide range of environments, including selected IBM Power, System i, System p, and System x systems, Oracle, and Hewlett Packard servers, as well as Intel® compatible servers running Linux and Microsoft Windows operating system environments.

Statistical Analysis and Recording System

The TS1140 E07 uses Statistical Analysis and Recording System to assist in isolating failures between media and hardware. It is designed to use the cartridge performance history saved in the cartridge and drive performance history kept in the drive to determine the more likely cause of failure. It is designed to cause the drive to mark the media as degraded, and to indicate that the hardware has degraded.

High-availability data path failover

High-availability data path failover is available with the AIX, HP-UX, Linux, Oracle Solaris, and Microsoft Windows IBM tape device drivers. The failover mechanism is designed to enable configuration of multiple redundant paths in a SAN environment that includes the TS1140. In the event of a path or component failure, the failover mechanism is designed to automatically enable error recovery to retry the current operation using an alternate, preconfigured path without aborting the current job in progress. This supports flexibility in SAN configuration, availability, and management.

Dynamic load balancing

Dynamic load balancing is a function in the AIX, HP-UX, Linux, Microsoft Windows, and Oracle Solaris tape device drivers that is also available for TS1140 E07 Tape Drives used in a SAN environment. Dynamic load balancing support is designed to improve resources for devices that have physical connections to multiple Host Bus Adapters (HBA) in the same machine. When an application opens a device that has multiple HBA paths configured, the device driver determines which path has the HBA with the lowest usage, and assigns that path to the application. The device driver is designed to dynamically track the usage on each HBA as applications open and close devices, and balance the number of applications using each HBA in the machine. This can help optimize HBA resources and improve overall performance.

Additional enhancements

The TS1140 E07 incorporates the following tape enhancements that were introduced with the 3592 Tape Drive and are designed to help improve performance, capacity, and availability:

- High reliability of the 3592 drive and media maintained and improved with added features:
  - GMR 32-channel head technology
  - Head overcoat technology into tape offers improved head protection and wear characteristics
  - Standby power management improvements that automatically reduce fan speed when idle to lower power dissipation and reduce the risk of unnecessary airborne debris contamination over extended idle periods
- Enhanced performance: For functions such as Recursive Accumulating Backhitchless Flush (RABF), and the addition of a new Same Wrap Backhitchless Flush (SWBF) function that extends virtual backhitch effectiveness for large files.
- N+1 power supplies: The TS1140 E07 supports n+1 power supplies when it is installed in an automation frame, designed to help increase drive availability in the event of a power supply failure.
Digital speed matching: The TS1140 E07 is designed to dynamically perform digital speed matching in 14 speeds to adjust the drive’s native data rate to the net host data rate (after data compressibility has been factored out) to help allow slower hosts to stream the tape drive.

Channel calibration: The channel calibration feature is designed to allow for customization of each read/write data channel for optimum performance. The customization can enable compensation for variations in the recording channel transfer function, media characteristics, and read/write head characteristics. The TS1140 E07 is designed to automatically perform recalibration in the field if it detects degraded performance.

High resolution tape directory plus enhanced search speed: The TS1140 E07 Tape Drive maintains a tape directory structure with a high granularity of information about the physical position of data blocks on the media. This feature, plus the increased search speed, allows the TS1140 E07 to have improved nominal and average access times for locate operations versus previous IBM tape drives.

Streaming Lossless Data Compression (SLDC) algorithm: SLDC is an implementation of a Lempel-Ziv class 1 (LZ-1) data compression algorithm. It is an extension to Adaptive Lossless Data Compression (ALDC) and is designed to offer an improvement over previous IBM lossless compression algorithms.

In addition, the TS1140 E07 offers the following enhancements over other 3592 Model Tape Drives:

Large internal data buffer: The TS1140 E07 Tape Drive has a 1 GB internal data buffer. Along with enabling higher performance characteristics, the data buffer is designed to use support read ahead of compressed data from tape and provide high performance random skip forward sequential (short hop) locates common in database search and tape software recycle operations.

Offboard data string searching: The TS1140 E07 Tape Drive can search the data content of host records for string matches offboard from the host server. The tape drive can perform this search at maximum data rate (250 MB/sec native) while it would take much longer for a host server to read the data, buffer the data to disk, and then parse the actual data stream with host software routines.

Enhanced logic to report logical end-of-tape (LEOT): LEOT is now reported based on a combination of capacity-based and position-based LEOT indicators. The TS1140 E07 monitors the total accumulated number of physical tape data sets written to the volume and will report LEOT based on this capacity-based LEOT value. This allows tape copies to complete without overflow a much higher percentage of the time.

Product positioning

The TS1140 E07 Tape Drive is the next generation of the highly successful 3592 Enterprise Tape Drive. The TS1140 is supported in a wide range of environments, including IBM Power Systems, IBM System i, IBM System p, IBM System x, and other servers running AIX, HP-UX, Linux, Oracle Solaris, and Microsoft Windows operating system environments. It has significant performance and capacity benefits over the IBM TS1130, as well as other half-inch tape drives.

The TS1140 is designed for high-performance computing environments where high reliability, capacity, and performance are mandated. It should be considered in the following environments:

- Current enterprise tape drive applications in TS3500 or stand-alone environments where:
  - Space allocated to tape cartridges needs to be reduced within automation solutions or offline storage.
  - Backup windows are growing and there is a need for higher performance tape drives to back up larger amounts of data in less time.
  - A Fibre Channel-attached drive with native switched fabric capability is required.
- Other large scale tape environments, such as:
  - High-speed data-save operations where backup windows are critical and large amounts of data are archived to tape.
  - Large-scale automated tape installations where performance, capacity, and reliability are requirements.
  - Large-scale mass data archive applications where massive amounts of data need to be quickly saved to tape for storage and later recalled (examples include the seismic industry, data warehousing, and record management applications).
  - Environments where both streaming and start/stop (access), large and small file workloads are required.

Other target customers for the TS1140 Tape Drive are encryption opportunities in medium to large enterprises in the financial sector, government and public sector, and other industries that must protect their customer tape data from loss or theft.

**Reference information**

For more information on the following products, refer to:

- Hardware Announcement **111-086**, dated May 09, 2011, for IBM System Storage TS3500 Tape Library Connector Model SC1 and TS1140 Tape Drive support
- Hardware Announcement **111-087**, dated May 09, 2011, for IBM System Storage TS1140 Tape Drive Model E07
- Hardware Announcement **111-095**, dated May 09, 2011, for IBM System Storage 3599 Tape Media New Models

**Product number**

<table>
<thead>
<tr>
<th>Description</th>
<th>Machine type</th>
<th>Model</th>
<th>Feature</th>
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<tr>
<td>TS1140 Tape Drive</td>
<td>3592</td>
<td>E07</td>
<td></td>
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<tr>
<td>Drive Microcode Update</td>
<td>3592</td>
<td>E07</td>
<td>0500*</td>
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<td>Install 3592 in rack</td>
<td>3592</td>
<td>E07</td>
<td>4674**</td>
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<td>3592 E07 Additional</td>
<td>3592</td>
<td>E07</td>
<td>4684</td>
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<td>Rackmount Hardware</td>
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<td>E07</td>
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<td>Remove 3592 From rack</td>
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<td>E07</td>
<td>4802**</td>
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<td>E07</td>
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<td>Rack Right Cradle</td>
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<td>5596**</td>
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<td>13 M LC/SC Fibre Cable</td>
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<td>E07</td>
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<td>22 M LC/SC Fibre Cable</td>
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<td>E07</td>
<td>6061*</td>
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<td>Attached to HP-UX System</td>
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<td>E07</td>
<td>9210*</td>
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<td>Attached to Solaris System</td>
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<td>E07</td>
<td>9211*</td>
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<td>Attached to windows System</td>
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<td>E07</td>
<td>9212*</td>
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<td>Attached to Other Non-IBM</td>
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<td>E07</td>
<td>9213*</td>
</tr>
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<td>Attached to Linux System</td>
<td>3592</td>
<td>E07</td>
<td>9215*</td>
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<tr>
<td>Attached to i5/OS® or OS/400® System</td>
<td>3592</td>
<td>E07</td>
<td>9400*</td>
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<tr>
<td>Encryption</td>
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<td>Attached to IBM AIX System</td>
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<td>E07</td>
<td>9600*</td>
</tr>
<tr>
<td>Plant Install 3592 in 3584</td>
<td>3592</td>
<td>E07</td>
<td>9677**</td>
</tr>
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</table>
Field Merge 3592 in 3584 3592 E07 9689**

* This feature has been previously announced on other models.

** This feature has been previously announced on other models, but the description has changed.

Model conversions

<table>
<thead>
<tr>
<th>From model</th>
<th>To model</th>
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<tbody>
<tr>
<td>3592-E06</td>
<td>3592-E07</td>
</tr>
</tbody>
</table>

Parts removed as a result of a model conversion become the property of IBM.

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).


Publications

The following publications are shipped with the product:

Title

README - One-page pointer to the Customer Information Center
Installation Instructions converting an E06 to an E07
Installation Instructions for Installing an E07 in a Rack
TS1120, TS1130, TS1140 Maintenance Information Manual
TS11x0 Product Information CD

The IBM Systems Information Center provides you with a single information center where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access. The IBM Systems Information Center is at


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For details on education offerings related to specific products, visit


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

Technical information

Specified operating environment

Physical specifications

TS1140 E07 Tape Drive canister:

- Width
  - Front of drive: 150 mm (5.9 in)
  - Overall: 195 mm (7.5 in)
- Depth, front of bezel to rear of closed retention latch: 467 mm (18.4 in)
- Height: 95 mm (3.8 in)
- Weight: 5.7 Kg (12 lbs 7 oz)

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

Operating environment

- Temperature: 16° to 32° C (60° to 90° F) in operation (media in use)
- Relative humidity: 20% to 80% non-condensing (limited by media)
- Wet bulb (caloric value): 26° C (78.8° F)
- Electrical power:
  - 23 watts*, idle, no tape loaded
  - 50 watts* - maximum continuous (not peak), reading and writing
- Heat output: 170 Btu/ Hour* - maximum continuous
- Capacity of exhaust: 0.34 Cubic meter/minute (12 CFM) per drive
- Noise level: 4.3 Bels idle; 6.3 Bels operating

Note: * External AC/DC power supply losses and heat output not included.

Hardware requirements

TS1140 E07 Tape Drive

Each TS1140 E07 Tape Drive comes with GMR head technology and dual-ported switched fabric 8 Gbps Fibre Channel attachments, for attachment to multiple servers or a single server with redundancy. It can be attached to IBM Power Systems, IBM System i, IBM System p, IBM System x and other servers running
AIX, HP-UX, Linux, Oracle Solaris, and Microsoft Windows operating system environments.

For the latest details on specific hardware, software, and Fibre Channel support for the TS1140 E07, refer to

http://www-03.ibm.com/systems/support/storage/config/ssic/index.jsp

The TS1140 E07 Tape Drive is for installation in a TS3500 or racks that enable stand-alone installations. For all installations, the tape drive comes enclosed in a canister. For rack installation, a left drive cradle with a shelf must be installed before the right drive cradle can be installed. For both installations, cradles include redundant hot-swappable power supplies for both tape drives, as well as logic cards for management of power, serial numbers, and ID identifiers, and must be installed before the tape drive canisters can be installed.

For installation in a rack, feature #4674, up to two TS1140 E07 Tape Drives can be installed in each cradle feature (#4802 or #4812). The cradle requires 10 EIA units of rack space. Two cradles can be mounted on a shelf, for a total of 4 tape drives on a shelf. A 2.0 meter rack, without a tape controller, can thus contain up to 16 tape drives. A 2.0 meter rack with a tape controller, or a 1.6 meter to 1.8 meter rack without a tape controller can contain up to 12 tape drives. A 1.6 meter to 1.8 meter rack with a tape controller can contain up to 8 tape drives. If space is available, an existing customer rack may be used. Refer to 3592 Sales Manuals for further information.

Up to twelve TS1140 drives can be installed in a 3584 Model L22, L23, D22, or D23 frame. The 3584 Model L22 or L23 Base Frame and Model D22 or D23 Expansion Frame are designed for TS1140 Model E07, TS1130 Model E06, TS1120 Model E05, and 3592 Model J1A Tape Drives and 3592 cartridges. Each frame supports up to twelve tape drives with an incremental reduction of storage slots for each set of four drives installed.

A 3592 Fibre Drive Mounting Kit feature is required for installing a TS1140, TS1130, TS1120, or 3592 Tape Drive in a TS3500:

- 1503 - 3592 J1A, E05, E06 Fibre Drive Mounting Kit for Models L22 and D22
- 1513 - 3592 J1A, E05 Fibre Drive Mounting Kit for Models L23 and D23
- 1515 - 3592 J1A, E05, E06, E07 Fibre Drive Mounting Kit for Models L23 and D23

**Note:** For Models L23 and D23, the previous version of 3592 Fibre Drive Mounting Kit feature (#1513) is not compatible with TS1130 and TS1140.

Each TS1140, TS1130, TS1120, or 3592 Tape Drive must be ordered separately, and is installed in a 3584 frame with one of the following feature numbers:

- 1674 - 3592 Drive Field Install
- 1675 - 3592 E07 Drive Field Install
- 9677 - Plant Install 3592 J1A in 3584
- 9680 - Plant Install 3592 E05 in 3584
- 9683 - Plant Install 3592 E06 in 3584
- 9692 - Plant Install 3592 E07 in 3584

Appropriate Fibre Channel cables should be ordered for each tape drive. Refer to the **Cables** section for a list of available cables. Also, refer to the Fibre Channel Cables section of the Special Feature Codes in the 3592 Model E07 Sales Manual for Fibre Channel cable information.

Labeled or initialized cartridges for TS1140 E07 or TS1130 E06 Tape Drives can be ordered using machine type 3599. Refer to the **Supplies** information section.
Cables

A fiber optic cable is required for attaching a TS1140 E07 Tape Drive to host Fibre Channel adapters or other storage area Fibre Channel components. The cable can be customer supplied, or ordered with the TS1140 E07 Tape Drive in the lengths available. The attaching fiber cable must be 50.0/125 micrometers for distances up to 150 meters at 8 Gbps. The connector on the TS1140 E07 Tape Drive is a LC duplex connector type. The Fibre Channel cables with LC or SC duplex connectors can be ordered on the TS1140 E07 Tape Drive in the lengths indicated with the following feature numbers:

- 5913 - 13-meter Fibre Channel cable with an LC connector on one end and an SC connector on the other end
- 5922 - 22-meter Fibre Channel cable with an LC connector on one end and an SC connector on the other end
- 5961 - 61-meter Fibre Channel cable with an LC connector on one end and an SC connector on the other end
- 6013 - 13-meter Fibre Channel cable with LC connectors on both ends
- 6025 - 25-meter Fibre Channel cable with LC connectors on both ends
- 6061 - 61-meter Fibre Channel cable with LC connectors on both ends

IBM Networking Services are designed to deliver convenient, packaged services to help reduce the complexity of planning, ordering, and installing fiber optic cables. The appropriate fiber cabling is selected based upon the product requirements and the installed fiber plant. IBM Networking Services has a comprehensive set of scalable solutions to address IBM cabling requirements, from product level to enterprise level. IBM Network Integration and Deployment Services for enterprise fiber cabling provides planning, IBM Fiber Transport System trunking components, and installation services for small, medium, and large enterprises.

IBM Global Services has the expertise and personnel available to effectively plan and deploy the appropriate cabling with the future in mind. These services may include planning, consultation, cable selection, installation, and documentation, depending upon the services selected. These services are designed to be right-sized for your products or the end-to-end enterprise, and to take into consideration the requirements for all of the protocols and media types whether the focus is the data center, the SAN, the LAN, or the end-to-end enterprise. Contact your IBM representative for additional information on these services.

TS1140 Tape Drive

Each TS1140 Tape Drive comes with dual-ported switched fabric 8 Gbps Fibre Channel attachments, for attachment to multiple servers or a single server with redundancy. It can be attached to IBM System i, System p, System x, and non-IBM servers, workstations, and personal computers that support Fibre Channel interfaces. For the latest details on specific hardware, software, and Fibre Channel support for the TS1140 Tape Drive, refer to

http://www-03.ibm.com/systems/support/storage/config/ssic/index.jsp

TS3500 or 3584 Tape Library encryption installations

The TS1140 Tape Drive may be installed and is supported in the IBM System Storage TS3500 Tape Library Models L22, L23, D22, and D23. The TS1130 encryption function requires a minimum level of microcode firmware level and is a customer's responsibility to load, configure, and maintain on the TS3500 Tape Library.

Non-IBM 3584 encryption open systems installations

Support for the TS1140 encryption function installed in a 19-inch Rack open-systems attached requires a minimum level of microcode firmware for any 3592 J1A Enterprise Tape Drive, TS1120 Tape Drive, TS1130, or TS1140 Tape Drive where you intend to use tape cartridges from a common tape cartridge scratch pool.
A minimum level of microcode firmware is required and may be ordered as follows for service assisted installation:

- 3592 J1A Enterprise Tape Drive support: Feature #0500 Drive Microcode Update
- TS1120 Tape Drive (3592 E05) support: Feature #0500 Drive Microcode Update
- TS1130 Tape Drive (3592 E06) support: Feature #0500 Drive Microcode Update
- TS1140 Tape Drive (3592 E07) support: Feature #0500 Drive Microcode Update

### Fibre Channel Switch attachment

The TS1140 E06 Tape Drive is supported by a variety of Fibre Channel Switches and Fibre Channel Directors. The support is dependent on server, operating system, and host bus adapter that is being used.

### Software requirements

For a current list of host software versions and release levels that support the TS1140, refer to the following website

http://www-03.ibm.com/systems/support/storage/config/ssic/index.jsp

IBM Tivoli Storage Manager and other compatible software offerings can provide storage and tape management software for the TS1140. 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-03.ibm.com/systems/storage/tape/library.html#compatibility

Select "Compatibility Information", then "Independent Software Vendor Matrix (ISV) for 3592 Tape Drive" for the product.

IBM continues to work together with the ISVs to support the TS1140 Tape Drive. Individual application vendors should be contacted for specific information and availability dates.

IBM maintains the latest levels of System Storage tape drive and library device drivers and documentation on the Internet. Utilize the Fix Central download portal by accessing the following website

http://www.ibm.com/support/fixcentral

There are a few pull down menus to navigate to the correct download as follows:

- In the first pull down menu labeled "Product Group" select "Storage Systems".
- In the next pull down menu that appears which is labeled "Product Family" select "Tape Systems".
- With the next pull down menu, "Product Type", select "Tape Device Drivers and Software".
- This will in turn bring up the "Product" menu, which provides selections for "Platform drivers, Tools, or Software".
- Under "Platform drivers", in order to download your driver, select the correct operating system.
- Two more pull down menus will appear with information. Click "Continue".
- The next screen can be used to narrow the search, however just click "Continue" to view what is available.

The IBM Tape Device Drivers Installation and User's Guide can be found at the following website

http://www-01.ibm.com/support/docview.wss?rs=577&uid=ssg1S7002972
Encryption

Encryption support for the TS1140 Tape Drive in the TS3500 Tape Library, with Fibre Channel, is provided in i5/OS, AIX, HP-UX, Linux, Oracle Solaris, and Microsoft Windows operating system environments.

Three modes of encryption management are supported:

- System Managed (available for AIX, Linux, Oracle Solaris, and Microsoft Windows)
- Library Managed (available for OS/400, i5/OS, AIX, Linux, HP-UX, Oracle Solaris, and Microsoft Windows)
- Application Managed (IBM Tivoli Storage Manager)

The installation of a TS1140 Tape Drive with encryption may require code updates for System i, System p and supported open systems device drivers or storage management software.

IBM maintains the latest levels of System Storage tape drive and library device drivers and documentation on the Internet. Obtain them by accessing the IBM Fix Central website

http://www.ibm.com/support/fixcentral

For details on supported software versions and release levels for the TS1140 Tape Drive, as well as hardware support information, refer to the following website

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

Limitations

- Although multiple systems may be attached to a TS1140 E07 Tape Drive, the systems cannot use the drive simultaneously. The TS1140 E07 can only be varied on-line to one system at a time.
- TS1140 E07 Tape Drives are not supported for attachment to a 3590 Controller Models A60, A50, A00, or 3592 Model J70 Controller.

Planning information

Customer responsibilities

Physical planning is a customer responsibility. Current levels of the open systems device drivers should be obtained to ensure the TS1140 E07 is supported. For information on these requirements, refer to IBM System Storage 3592 Tape Drive and Controller Introduction and Planning Guide 3592 Models J1A, E05, E06, EU6, E07, J70 and C06, GA32-0555.

You are responsible for downloading or obtaining from IBM, and installing designated Machine Code (microcode, basic input/output system code (called BIOS), utility programs, device drivers, and diagnostics delivered with an IBM machine) and other software updates in a timely manner from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides. You may request IBM to install Machine Code changes; however, you may be charged for that service.

Cable orders

Appropriate Fibre Channel cables should be ordered for each tape drive. Refer to the Cables section for a list of available cables. Also refer to the Fibre Channel Cables section of the Special Feature Codes in the 3592 Model E07 Sales Manual for Fibre Channel cable information.
Packaging

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<thead>
<tr>
<th>Product</th>
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<tbody>
<tr>
<td>TS1140 E07</td>
<td>TS1140 Tape Drive Model E07</td>
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<td></td>
<td>Power cord (for rack or frame attachment)</td>
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<td></td>
<td>Fibre Channel cables as ordered</td>
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<td></td>
<td>IBM System Storage TS1120, TS1130,</td>
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<tr>
<td></td>
<td>and TS1140 Tape Drives</td>
<td></td>
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<td></td>
<td>(3592 Models J1A, E05,</td>
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</tr>
<tr>
<td></td>
<td>E06, E07, and EU6)</td>
<td></td>
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<tr>
<td></td>
<td>Maintenance Information -</td>
<td></td>
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<tr>
<td></td>
<td>Edition (May 2011)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Device Driver README sheet</td>
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</tr>
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</table>

Supplies

**For users and remarketers:** IBM TS1140 media supplies can be ordered directly through AAS using machine type 3599.

IBM TS1140 media supplies can be also purchased through Priority Fulfillment Services and its distribution channel in North America, Latin America, and Asia Pacific. These TS1140 media supplies can be purchased through Forex Telegistics BV and its distribution channel in Europe, the Middle East, and Africa.

For information about Priority Fulfillment Services distribution channels, call 1-888-IBM Media in the U.S. and Canada or visit

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

Security, auditability, and control

This product uses the security and auditability features of 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

**Volume orders:** Contact your IBM representative.

**IBM Global Financing**

Yes

**Warranty period**

One year

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. An IBM part or feature which replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty effective on its date of installation. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature is the same as the machine it is installed.
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 website. Certain Machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. 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.

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.

Service level is:

- 24 hours per day, 7 days a week, 4 hour average, same day response.

Warranty service upgrades

During the warranty period, warranty service upgrades provide an enhanced level of On-site Service for an additional charge. Service levels are response-time objectives and are not guaranteed. See the Warranty services section for additional details.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. Certain Machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

Maintenance service options

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.

Service levels are:

- 24 hours per day, 7 days a week, 4 hour average response, same day
- 24 hours per day, 7 days a week, 2 hour average response, same day

Warranty service upgrades

Usage plan machine

No

IBM hourly service rate classification

Three
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**
Yes

**Machine installation**
Installation is performed by IBM. IBM will install the machine in accordance with the IBM installation procedures for the machine. In the United States, contact IBM at 1-800-IBM-SERV (426-7378). In other countries, contact the local IBM office.

For planning information, see *3592 Introduction and Planning Guide*, GA32-0555.

**Graduated program license charges apply**
No

**Licensed internal code and licensed machine code**
This product does not contain Licensed Internal Code or Licensed Machine Code.

**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.

### Pricing

#### Product charges

<table>
<thead>
<tr>
<th>Description</th>
<th>Machine type</th>
<th>Model</th>
<th>Feature number</th>
<th>Field install only</th>
<th>Plant install only</th>
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</thead>
<tbody>
<tr>
<td>TS1140 Tape Drive</td>
<td>3592</td>
<td>E07</td>
<td></td>
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<tr>
<td>Drive Microcode update</td>
<td>3592</td>
<td>E07</td>
<td>0500</td>
<td>Y</td>
<td>N</td>
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<tr>
<td>Install 3592 in rack</td>
<td>3592</td>
<td>E07</td>
<td>4674</td>
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<tr>
<td>3592 E07 Additional Rackmount Hardware</td>
<td>3592</td>
<td>E07</td>
<td>4684</td>
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<tr>
<td>Remove 3592 from rack</td>
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<td>E07</td>
<td>4772</td>
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<td>E07</td>
<td>4802</td>
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<tr>
<td>Rack Right Cradle</td>
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<td>E07</td>
<td>4812</td>
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<td>Encryption</td>
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<td>E07</td>
<td>5596</td>
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<td>N</td>
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<td>13 M LC/SC Fibre Cable</td>
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<td>E07</td>
<td>5913</td>
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<td>22 M LC/SC Fibre Cable</td>
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<td>E07</td>
<td>5922</td>
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<td>61 M LC/SC Fibre Cable</td>
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<td>E07</td>
<td>5961</td>
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<td>E07</td>
<td>6013</td>
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<td>61 M LC/LC Fibre Cable</td>
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<td>Attached to HP-UX System</td>
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<td>N</td>
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<tr>
<td>Attached to Solaris System</td>
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<tr>
<td>Attached to Windows System</td>
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<td>N</td>
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<tr>
<td>Attached to Other Non-IBM</td>
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<tr>
<td>Attached to Linux System</td>
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<td>Attached to IBM AIX System</td>
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<tr>
<td>Plant Install 3592 in 3584</td>
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<td></td>
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<tr>
<td>Field Merge 3592 in 3584</td>
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<td>Y</td>
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</table>

* = No charge

** If field installed on a purchased machine, parts removed or replaced become the property of IBM and must be returned.

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Prices in the following PDF prices link are suggested list prices on day of announcement for the U.S. only. They are provided for your information only. Dealer prices may vary, and prices may also vary by country. IBM list price does not include tax or shipping and is subject to change without notice.

ENUS-111-087-List_prices_2011_05_09.PDF
**ServicePac prices**

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

**Model conversion purchase price**

<table>
<thead>
<tr>
<th>Model from</th>
<th>Model to</th>
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<tbody>
<tr>
<td>E06</td>
<td>E07</td>
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</table>

Parts removed or replaced become the property of IBM and must be returned.

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