



# IBM TS1150 tape drives deliver the fastest and largest capacity drive for enterprise archiving and data protection

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## At a glance

With higher performance and greater capacity as compared to the IBM® TS1140 tape drive, the use of the TS1150 can help improve data center economics as the number of tape drives, cartridges, and associated floor space may be reduced. Features of the TS1150 include:

- Native data rate performance of up to 360 MB/sec versus the 250 MB/sec native data rate of the TS1140
- Uncompressed cartridge formatting of up to 10 TB with the use of IBM Tape Cartridge 3592 Advanced Data (Type D)
- Effective reuse of existing JC/JY/JK media type with the capability to read and write TS1140 formatted media, and format the same media up to 7 TB uncompressed capacity with native data rate performance of up to 300 MB/sec in the TS1150 format
- Encryption capabilities work with IBM Security Key Lifecycle Manager
- High-availability design which includes:
  - Single, integrated three-module 32-channel head technology for higher native data rate performance
  - Media partitioning capability for improved data management on tape and IBM Linear Tape File System™ (LTFS) support
  - Virtual backhitch improvements for increased performance to avoid the backhitch of tape
  - Flangeless tape path eliminates tape edge guiding resulting in debris reductions and long media life
  - Highly integrated electronics with lower power dissipation than the TS1140 drive for higher performance levels
  - Improved track following methods for improved track placement while maintaining vibration rejection support equivalent to the TS1140 drive

To help optimize drive utilization and reduce infrastructure requirements, TS1150 can be shared among supported open-system hosts on a storage area network. It also offers multiplatform support and can scale from midrange to enterprise environments, delivering flexible storage for heterogeneous server environments.

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: YE001).

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## Overview

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IBM TS1150 Model E08 (3592-E08) is the fifth generation of the highly successful IBM 3592 enterprise tape drive and is designed to provide higher levels of performance, reliability, and cartridge capacity than the TS1140 Model E07 tape drive. The TS1150 has a high-technology, 32-channel GMR head design to deliver a native data rate performance of up to 360 MB/sec versus the 250 MB/sec data rate of the TS1140. TS1150 tape drives have dual-port 8 Gbps Fibre Channel interfaces for Fibre Channel attachment to host systems or a switched fabric environment.

The IBM TS1150 Model EH8 (3592-EH8) tape drive is the HD2-compatible model of the TS1150 for installation in HD2 frames of the IBM TS4500 tape library.

Model conversions are also supported to allow TS1150 Model E08 to be moved from an IBM TS3500 tape library to the HD2 frames of a TS4500.

With the use of the IBM Tape Cartridge 3592 Advanced Data (Type D), TS1150 can format a cartridge uncompressed up to 10 TB. TS1150 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 TS4500 tape library.

The TS1150 also supports drive-based data encryption to help protect data. The TS1140-based encryption and associated IBM Security Key Lifecycle Manager components are supported in a wide variety of operating system environments, including IBM Power®, IBM System i®, IBM System x®, IBM System p®, Oracle, Linux™, and Microsoft™ Windows™. Application, system, or library managed encryption management methods are supported. The encryption capability is supported when the TS1150 tape drive is integrated with or attached to select IBM supported tape libraries.

**Note:** For the latest version of the IBM Security Key Lifecycle Manager, refer to

<http://www-03.ibm.com/software/products/en/key-lifecycle-manager>

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## Key prerequisites

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The TS1150 tape drive is supported in a wide range of environments including select IBM Power Systems™, IBM System i, IBM System p, IBM System x, and other servers running AIX®, Linux, Oracle Solaris, and Microsoft Windows operating system environments. Refer to the [Software requirements](#) section for details.

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## Planned availability date

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- October 24, 2014:
  - Model E08 and its feature numbers
  - Feature number 9699 and Model conversion for Model E07 to Model E08
- November 21, 2014:
  - Feature numbers 1628, 1629, and Model EH8
  - Model conversions for Model EH7 to EH8 and Model E08 to Model EH8

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## Description

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### 3592 tape drives

The TS1150 tape drive offers a dual-port 8 Gb Fibre Channel host attachment interface to deliver flexibility in open systems environments. All TS1150 tape drives

are encryption capable. The HD2-compatible 3592 tape drive is supported by the HD2 IBM TS1150 Tape Drive (Model 3592 EH8) frames of the TS4500 tape library.

**Note:** Drive model 3592 E08 is not supported by the HD2 frames of the TS4500 tape library.

The 3592 tape drive communicates with the TS4500 tape library through an internal Ethernet interface and uses the Statistical Analysis and Reporting System to isolate failures between media and hardware.

The 3592 tape drives deliver the following performance, capacity, and availability features:

- N+1 power supplies
- Speed matching
- High resolution tape directory
- Channel calibration and dynamic adaptive equalization
- Recursive accumulating backhitchless flush
- Backhitchless backspace
- Capacity scaling
- WORM
- Capacity-based and position-based LEOT reporting
- Enhanced format for recording error-correction codes
- Mechanical and electrical drive reliability
- Data compression
- Data buffer with read ahead feature
- Offboard data string searching
- Encryption

TS1150 Tape Drive (machine type 3592) is the fifth 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, such as data warehousing, record management applications, and within the seismic industry

## Capacity

The TS1150 is designed to provide up to 10 TB uncompressed capacity with the new IBM Tape Cartridge 3592 Advanced Data (Type D) 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 TS1150, TS1140, and TS1130:

	TS1130 Model E06 native cartridge capacity (native / compressed)	TS1140 Model E07/EH7 native cartridge capacity (native / compressed)	TS1150 Model E08/EH8 native cartridge capacity (native / compressed)
IBM Tape Cartridge 3592	NA	4.0 TB	7.0 TB
Type C	NA	12.0 TB	21.0 TB

IBM Tape Cartridge 3592 Type D (Advanced Data)	NA	NA	10.0 TB
	NA	NA	30.0 TB

IBM Tape Cartridge 3592 Type L (Advanced Economy)	NA	NA	2.0 TB
	NA	NA	6.0 TB

NA = Not Applicable

## Performance

TS1150 E08 and EH8 models are designed to increase the native data rate from 250 MB/sec with the TS1140 Tape Drive Model E07 to up to 360 MB/sec. They are designed to offer improved access characteristics such as improved load to ready timings versus the TS1140 E07, 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 360 MB/sec native data rate, other components may limit the actual effective data rate.

## Capacity scaling

TS1150 Model E08 and EH8 are designed to support capacity scaling of an individual tape cartridge to various percentages of the maximum capacity. Capacity scaling allows the utilized length of tape to be logically shortened for improved data access times in exchange for reduced capacity. The tapes can subsequently be scaled back to full capacity as needed.

The TS1150 Model E08 and EH8 Tape Drives allow 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 the VOLSER range. You can exploit the capacity scaling capability of the TS1150 E08. For more information on using capacity scaling, refer to *IBM 3592 Model E08 Tape Drive Knowledge Center*.

## Media and cartridge capacity

TS1150 E08 and EH8 provide capacity leadership with media reuse and use Type D tape cartridges with tape specifically optimized for the enterprise tape environment. These models provide a native cartridge capacity of 10 TB and can be beneficial for space savings and the cost of data storage as they 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 TS1150 E08 and EH8 models have 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 TS1150 is supported in a wide range of environments, including select IBM Power, System i, System p, and System x systems, and Oracle servers, as well as

Intel™ compatible servers running Linux and Microsoft Windows operating system environments.

### **Statistical Analysis and Recording System**

The TS1150 E08 and EH8 use the Statistical Analysis and Recording System to assist in isolating failures between media and hardware. They are 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. They are 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, 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 TS1150. 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, Linux, Microsoft Windows, and Oracle Solaris tape device drivers that is also available for TS1150 E08 and EH8 Tape Drives used in a SAN environment. Dynamic load balancing support is designed to improve resources for devices that have physical connections to multiple HBAs 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**

TS1150 E08 and EH8 incorporate 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 is maintained and improved with added features:
  - 32-channel head technology for increased native data rate performance.
  - Head overcoat technology into tape for 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 with functions such as Recursive Accumulating Backhitchless Flush and the addition of a new Same Wrap Backhitchless Flush function extends virtual backhitch effectiveness for large files.
- N+1 power supply when TS1150 E08 and EH8 are installed in an automation frame help increase drive availability in the event of a power supply failure.
- Digital speed matching in 12 speeds enables the TS1150 E08 and EH8 to dynamically perform digital speed matching to adjust the drive's native data rate to the net host data rate (after data compressibility has been factored out) to enable slower hosts to stream the tape drive.
- Channel calibration 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. TS1150 E08 is designed to automatically perform recalibration in the field if it detects degraded performance.

- High-resolution tape directory plus enhanced search speed enables the TS1150 E08 and EH8 Tape Drives to maintain a tape directory structure with a high granularity of information about the physical position of data blocks on the media. Combined with increased search speed, this feature enables the TS1150 E08 and EH8 to have improved nominal and average access times for locate operations versus previous IBM tape drives when using legacy media.
- Streaming Lossless Data Compression (SLDC) algorithm 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. The TS1150 uses a larger history buffer to find compression matches, delivering an improved compression ratio over the TS1140 when tested against benchmark data files.

TS1150 E08 and EH8 also offer the following enhancements over other 3592 model tape drives:

- Large 2 GB internal data buffer offers higher performance characteristics with automatic read-ahead to provide high-performance, random skip forward sequential (short hop) locate operations that are common in database search and tape software recycle operations.
- Offboard data string searching enables data content searching of host records for string matches offboard from the host server. The tape drives can perform this search at maximum data rate (360 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) is now reported based on a combination of capacity-based and position-based LEOT indicators. TS1150 E08 and EH8 monitor 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.

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## Product positioning

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The TS1150 E08 and EH8 Tape Drives are the next generation of the highly successful 3592 Enterprise Tape Drive. TS1150 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, Linux, Oracle Solaris, and Microsoft Windows operating system environments. It has significant performance and capacity benefits over IBM TS1140 and other half-inch tape drives.

The TS1150 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 TS4500 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 where 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, such as 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 TS1150 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.

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## Statement of general direction

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### Product preview

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IBM intends to introduce IBM Linear Tape File System (LTFS) Library Edition (LE), Storage Manager, and Enterprise Edition (EE) support to IBM TS1150 tape drives in the fourth quarter of 2014.

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

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## Reference information

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For more information on the following products, refer to:

- [114-163](#), dated October 06, 2014, for IBM 3599 Tape Media new Models
- [114-072](#), dated May 19, 2014, for IBM System Storage® TS4500 Tape Library New HD Models
- [111-087](#), dated May 09, 2011, for IBM System Storage TS1140 Tape Drive Model E07
- [111-095](#), dated May 09, 2011, for IBM System Storage 3599 Tape Media New Models

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## Product number

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Description	Machine		Feature
	type	Model	
TS1150 Tape Drive	3592	E08	
Plant Install 3592 in 3584	3592	E08	9677
3592 Field Install in 3584	3592	E08	9689
Drive Microcode Update	3592	E08	0500
Install 3592 in rack	3592	E08	4674
3592 E07/E08 Additional Rackmount Hardware	3592	E08	4684*
Remove 3592 from rack	3592	E08	4772
Rack Left Cradle	3592	E08	4802
Rack Right Cradle	3592	E08	4812
Encryption Configuration/Field	3592	E08	5596
22 M LC/SC Fibre Cable	3592	E08	5922
13 M LC/LC Fibre Cable	3592	E08	6013
25 M LC/LC Fibre Cable	3592	E08	6025
61 M LC/LC Fibre Cable	3592	E08	6061
Encryption Configuration/Plant	3592	E08	9596
TS1150 HD2 Tape Drive	3592	EH8	
Plant Install 3592 in 3584	3592	EH8	9677
3592 Field Install in 3584	3592	EH8	9689

Description	Machine type	Models	Feature
3592 E08/EH8 Plant Install	3584	L25,D25, L23,D23	9699

Description	Machine type	Models	Feature
Additional LTO™ Cartridge Magazine	3584	L55	1628

Description	Machine type	Models	Feature
Additional 3592 Cartridge Magazine	3584	L25	1629

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

### Model conversions

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From model	To model	Conversion requirements
3592-E07	3592-E08	Field only
3592-EH7	3592-EH8	Field only
3592-E08	3592-EH8	Field only

### Business Partner information

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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).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=114-165>

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## Publications

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The following publications are shipped with the product:

Title

README - One-page pointer to the Customer Information Center  
Installation Instructions converting an E08 to an EH8  
TS11x0 Product Information CD

IBM Knowledge 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. IBM Knowledge Center is located at

<http://www.ibm.com/support/knowledgecenter/>

### IBM Publications Center Portal

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<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. A large number of publications are available online in various file formats, which can currently be downloaded.



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## Services

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### **Global Technology Services®**

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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 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/ites.wss/zz/en?pageType=tp\\_search\\_new](http://www.ibm.com/services/learning/ites.wss/zz/en?pageType=tp_search_new)

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## Technical information

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### **Specified operating environment**

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#### ***Physical specifications***

TS1150 E08 model

- 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)

TS1150 EH8 model

- Width: 156 mm (6.1 in)
- Depth, front of bezel to rear handle: 374 mm (14.7 in)
- Height: 86 mm (3.4 in)
- Weight: 3.97 Kg (8.75 lbs)

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: 15°C to 32°C (60°F to 90°F) in operation (media in use)
- Relative humidity: 20% to 80% non-condensing
- Drive Electrical power: 46.5 Watts max continuous operating power
- Noise level: 6.4 Bels operating

For more information and documentation, refer to TS4500/TS3500 Knowledge Center at

<http://www-01.ibm.com/support/knowledgecenter/STQRQ9/>  
[http://www-01.ibm.com/support/knowledgecenter/STCMML8/ts3500\\_kcwelcome.html](http://www-01.ibm.com/support/knowledgecenter/STCMML8/ts3500_kcwelcome.html)

## **Hardware requirements**

### **TS1150 E08 Tape Drive**

Each TS1150 E08 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, Linux, Oracle Solaris, and Microsoft Windows operating system environments.

For the latest details on specific hardware, software, and Fibre Channel support for the TS1150 E08, refer to

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

The TS1150 E08 Tape Drive is for installation in a TS3500 or racks that enable stand-alone installations. 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, and logic cards for management of power, serial numbers, and ID identifiers that must be installed before the tape drive canisters can be installed.

For installation in a rack, feature #4674, up to two TS1150 E08 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 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 TS1150 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 TS1150 Model E08, TS1140 Model E07, TS1130 Model E06, 3592 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 TS1150, TS1140, TS1130, or 3592 Models E05 and J1A Tape Drives in a TS3500:

- 1503 - 3592 J1A, E05, E06, E07, and E08 Fibre Drive Mounting Kit for Models L22 and D22
- 1513 - 3592 J1A, E05, and E06 Fibre Drive Mounting Kit for Models L23 and D23
- 1515 - 3592 J1A, E06, E07, E08 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 TS1140 and TS1150.

Each TS1150, TS1140, TS1130, or 3592 Models E05 and J1A Tape Drive must be ordered separately, and is installed in a TS3500 frame with one of the following feature numbers:

- 1674 - 3592 Drive Field Install
- 1675 - 3592 E07/E08 Drive Field Install
- 9677 - Plant Install 3592 J1A in 3584
- 9680 - 3592 E05 Drive Plant Install
- 9683 - Plant Install 3592 E06 in 3584
- 9692 - Plant Install 3592 E07 in 3584
- 9699 - Plant Install 3592 E08 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 E08 Sales Manual for Fibre Channel cable information.

Labeled or initialized cartridges for TS1150 E08 or TS1140 E07 Tape Drives can be ordered using machine type 3599. Refer to the *Supplies information* section.

### **TS1150 EH8 Tape Drive**

Each TS1150 EH8 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, Linux, Oracle Solaris, and Microsoft Windows operating system environments.

For the latest details on specific hardware, software, and Fibre Channel support for the TS1150 EH8, refer to

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

The TS1150 EH8 Tape Drive is for installation in a TS4500 frame. For all installations, the tape drive comes enclosed in a canister.

Up to sixteen TS1150 drives can be installed in a 3584 TS4500 Model L25 or D25 frame (up to twelve in frame 1).

A Quad Drive Mounting Kit feature is required for installing up to four TS1150 Model EH8 in a TS4500:

- 1521 - 1st Quad Drive Mounting Kit
- 1522 - 2nd Quad Drive Mounting Kit
- 1523 - 3rd Quad Drive Mounting Kit
- 1524 - 4th Quad Drive Mounting Kit

**Note:** Each TS1150 or TS1140 Tape Drive must be ordered separately, and is installed in a 3584 TS4500 frame with one of the following feature numbers:

- 9690 - 3588/3592 Field Install
- 9692 - 3592 E07/EH7 Plant Install in 3584
- 9699 - 3592 E08/EH8 Plant Install 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 EH8 Sales Manual for Fibre Channel cable information.

Labeled or initialized cartridges for TS1150 E08 or EH8 Tape Drives can be ordered using machine type 3599. Refer to the **Supplies** information section.

### **Cables**

A Fibre Channel cable is required to attach a TS1150 Tape Drive in the TS4500 Tape Library Models L25 or D25 to host Fibre Channel adapters, the IBM 2109 SAN Fibre Switch, or other Fibre Channel components. The cable can be customer supplied or ordered with the TS4500 tape library in the lengths shown. The attaching Fibre Channel cable must be a 50.0/125 micrometer short wavelength fiber-optic cable for distances up to 500 meters. These tape drives come with LC Duplex connectors. Eight LC-LC Fibre Channel drive-to-patch panel cables are included with each Quad Drive Mounting Kit (#152x).

The following features are available for Fibre Channel cables in the TS4500 frame, with the following feature numbers:

- #6013 - 13 m LC-LC Fibre Channel Cable
- #6025 - 25 m LC-LC Fibre Channel Cable
- #6061 - 61 m LC-LC Fibre Channel Cable

Refer to the **Special Features** section of the TS4500 or 3584 tape library Sales Manual for detailed descriptions of these features.

### **Fibre Channel Switch attachment**

The TS1150 EH8 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 TS1150, 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 TS1150. 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 several menus to navigate to the correct download as follows:

1. On the first menu item Click **Select Product** > **Product Group** > *System Storage*
2. Expand **Select from System Storage** > *Tape Systems*
3. Expand **Select from Tape systems** > *Tape drivers and software*
4. Expand **Select from Tape drivers and software** > *user product*
5. Expand **Platform** > *user operating system*
6. Click **Continue** to view what drivers are available

The *IBM Tape Device Drivers Installation and User's Guide* can be found at

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

### **Encryption**

Encryption support for the TS1150 Tape Drives in the Tape Library, with Fibre Channel is provided in i5/OS™, AIX, Linux, Oracle Solaris, and Microsoft Windows operating system environments.

Two modes of encryption management are supported:

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

The installation of a TS1150 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 TS1150 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 TS1150 Tape Drive, the systems cannot use the drive simultaneously. The TS1150 can only be varied online to one system at a time.
- TS1150 E08 and EH8 Tape Drives are not supported for attachment to a 3590 Controller Models A60, A50, A00, or 3592 Model J70 Controller.

### **Planning information**

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#### **Customer responsibilities**

Physical planning is a customer responsibility. Current levels of the open systems device drivers should be obtained to ensure the TS1150 Models E08 and EH8 are supported. For information on these requirements, refer to *IBM System Storage 3592 Tape Drive and Controller Introduction and Planning Guide 3592 Models E06, EU6, E07/EH7, E08/EH8, 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 website 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 E08/EH8 Sales Manuals for Fibre Channel cable information.

#### **Packaging**

Product	Shipment group	Number of boxes
TS1150 E08	TS1150 Tape Drive Model E08	1
	Device Driver README sheet	
Product	Shipment group	Number of boxes
TS1150 EH8	TS1150 Tape Drive Model EH8	1

## **Security, auditability, and control**

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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.

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## **Terms and conditions**

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### **Volume Orders**

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Contact your IBM representative.

### **IBM Global Financing**

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Yes

### **Products - terms and conditions**

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#### ***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 on.

#### ***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 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.

### ***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

#### ***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.

### ***General terms and conditions***

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#### ***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.

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## **Prices**

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For additional information and current prices, contact your local IBM representative.

Description	Machine type	Model	Feature number	Field install only	Plant install only
TS1150 Tape Drive	3592	E08			
Plant Install in 3584	3592	E08	9677	N	Y
3592 Field Install in 3584	3592	E08	9689	N	Y
Drive Microcode Update	3592	E08	0500	Y	N
Install 3592 in rack	3592	E08	4674	N	N
3592 E07/E08 Addtnl Rackmount HW	3592	E08	4684	N	N
Remove 3592 from rack	3592	E08	4772	Y	N
Rack Left Cradle	3592	E08	4802	N	N
Rack Right Cradle	3592	E08	4812	N	N
Encryption Configuration/Field	3592	E08	5596	Y	N
22 M LC/SC Fibre Cable	3592	E08	5922	N	N
13 M LC/LC Fibre Cable	3592	E08	6013	N	N
25 M LC/LC Fibre Cable	3592	E08	6025	N	N
61 M LC/LC Fibre Cable	3592	E08	6061	N	N
Encryption Configuration/Plant	3592	E08	9596	N	Y

Description	Feature number	MES removal
TS1150 Model E08 Tape Drive		Y
Drive Microcode Update	0500	Y
Install 3592 in rack	4674	Y
3592 E07/E08 Addtnl Rackmount Hardware	4684	Y
Remove 3592 from rack	4772	Y
Rack Left Cradle	4802	Y
Rack Right Cradle	4812	Y
Encryption Configuration/Field	5596	Y
22 M LC/SC Fibre Cable	5922	Y



13 M LC/LC Fibre Cable	6013	Y
25 M LC/LC Fibre Cable	6025	Y
61 M LC/LC Fibre	6061	Y

Description	Machine type	Model
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TS1150 Tape Drive 3592 E08

Description	Machine type	Model	Feature number	Field install only	Plant install only
TS1150 HD2 Tape Drive	3592	EH8			
Plant Install in 3584	3592	EH8	9677	N	Y
3592 Field Install in 3584	3592	EH8	9689	N	Y

Description	MES removal
-------------	-------------

TS1150 Model EH8 Tape Drive Y

Description	Machine type	Model
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TS1150 HD2 Tape Drive 3592 EH8

Description	Machine type	Models	Feature	Field install only	Plant install only
3592 E08/EH8 Plant Install	3584	L25,D25, L23,D23	9699	N	Y

Description	MES removal
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3592 E08/EH8 Plant Install N

Description	Machine type	Models	Feature	Field install only	Plant install only
Additional LTO Cartridge Magazine	3584	L55	1628	N	N

Description	MES removal
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Additional LTO Cartridge Magazine Y

Description	Machine type	Models	Feature	Field install only	Plant install only
Additional 3592 Cartridge Magazine	3584	L25	1629	N	N

MES

Description	removal
Additional 3592 Cartridge Magazine	Y

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**Alternative service**

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	IOR
	IBM Same Day
	On-site Repair
Machine type-model	(IOR, 24 x 7)

3592-E08  
3592-EH8

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**ServiceElect (ESA) charges**

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

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**Model conversion purchase price**

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Model	
From	To
E07	E08*
EH7	EH8*
E08	EH8

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

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**IBM Global Financing**

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**Order now**

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Fax: 800-2IBM-FAX (242-6329)  
Email: [callserv@ca.ibm.com](mailto:callserv@ca.ibm.com)

Mail: IBM Teleweb Customer Support  
ibm.com® Sales Execution Center, Americas North  
3500 Steeles Ave. East, Tower 3/4  
Markham, Ontario  
Canada  
L3R 2Z1

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