



# TS1155 Tape Drive models for the TS4500 tape library deliver up to 15 TB native capacity and enable reuse of existing JD media with increased capacity for investment protection

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## At a glance

The IBM<sup>®</sup> TS1155 Tape drive gives organizations an easy way to improve capacity, while keeping a fast access to data and secure long-term retention for less than the cost of disk or flash solutions. It also helps protect investments in tape automation by offering compatibility with existing automation and reuse of existing media.

With greater capacity as compared to the IBM TS1150 tape drive, the TS1155 Tape Drive consists of two new models designed for the TS4500 tape library, as well as stand-alone installation with traditional Fibre Channel or Ethernet host attachment interfaces (RDMA over Converged Ethernet) for cloud-based and open-compute environments.

Features of the TS1155 include:

- 10 Gb Ethernet host attachment interface for hyperscale environments on Model 55E
- Native data rate of 360 MBps
- Dual-port 8 Gb Fibre Channel as well as support for standalone rack-mount applications on Model 55F
- Effective reuse of existing JD/JZ/JL media types with the capability to read and write TS1150 formatted media, and format the same media with up to 15 TB uncompressed capacity
- Support for JC 4 TB format (read only) and JC 7 TB format (read/write)
- Encryption capabilities that work with IBM Security Key Lifecycle Manager
- Support for IBM Spectrum Archive™ (LTFS format) for direct, intuitive, and graphical access to data (refer to the [Limitations](#) section)

To help optimize drive utilization and reduce infrastructure requirements, TS1155 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.

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## Overview

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IBM TS1155 Tape Drive is designed to provide an increased capacity of 50% on JD media types compared to its predecessors and consists of two models designed for the TS4500 tape library:

- 3592 55F (Fibre Channel)
- 3592 55E (Ethernet)

The TS1155 Tape Drive Model 55F delivers a native data rate of 360 MBps, the same load/ready, locate speeds, and access times as the TS1150, and includes dual-port 8 Gb Fibre Channel support. IBM TS1155 Tape Drive Model 55F is supported in IBM TS4500 tape libraries as well as rack-mount installations.

IBM TS1155 Tape Drive Model 55E delivers a 10 Gb Ethernet host attachment interface optimized for cloud-based and hyperscale environments.

The TS1155 Tape drive is capable to read and write 15 TB capacities on existing JD media types (JD/JZ/JL) compared to 10 TB for TS1150. TS1155 tape drives also support JC 4 TB format (read only) and JC 7 TB format (read/write). Media written in TS1155 format is not readable by TS1150, but is back-portable for reformatting the TS1150 format of 10 TB.

Model conversions are also supported to convert TS1150 Model EH8 to TS1155 Model 55F.

The TS1155 Tape drive is not compatible with IBM TS7700 or Enterprise Tape Control Unit environments.

TS1155 also supports drive-based data encryption to help protect data. The TS1155-based encryption and associated IBM Security Key Lifecycle Manager components are supported in a wide range of environments, including select IBM Power Systems™, IBM System i<sup>(R)</sup>, IBM System p, IBM System x, and other servers running AIX<sup>(R)</sup>, Linux™, Oracle Solaris, and Microsoft™ Windows™ operating systems.

**Note:** For the latest version of the IBM Security Key Lifecycle Manager, refer to the [IBM Security Key Lifecycle Manager](#) website.

### Product Preview

IBM plans to extend support for the TS1155 Tape Drive Model 55F to the IBM Spectrum Archive family of products.

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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## Key prerequisites

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TS1155 Tape Drive Model 55F 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.

IBM TS1155 Tape Drive Model 55E is initially limited to be supported through a Microsoft Windows device driver and will require approval of i-RPQ 8B3685.

Refer to the [Software requirements](#) section for details.

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## Planned availability date

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- May 9, 2017: Feature number AGKQ for 3584 models L55 and D55
- June 2, 2017: Model 55F, model conversion, and all other features in all countries except Argentina and Taiwan
- June 23, 2017: Model 55F, model conversion, and all other features in Argentina and Taiwan
- July 28, 2017: Model 55E

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## Description

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### TS1155 tape drives

The IBM TS1155 Tape Drive offers an increased capacity of 50% on JD media types compared to the TS1150 tape drive. It is designed for high-performance and high-capacity 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

IBM TS1155 consists of two models designed for the TS4500 tape library:

- 3592 55F (Fibre Channel)
- 3592 55E (Ethernet)

IBM TS1155 Tape Drive Model 55F delivers a native data rate of 360 MBps, the same load/ready, locate speeds, and access times as the TS1150, and includes dual-port 8 Gb Fibre Channel as well as support for standalone rack-mount applications.

IBM TS1155 Tape Drive Model 55E delivers a 10 Gb Ethernet host attachment interface optimized for cloud-based and large, open-compute environments.

The TS1155 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 TS1155 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 logical end-of-tape (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

## Capacity

The TS1155 tape drive is capable to read and write 15 TB capacity on existing JD media types(JD/JZ/JL) compared to 10 TB for TS1150.

The following table compares the cartridge capacity (native and with 3:1 compression) of the TS1155, TS1150, and TS1140:

	<b>TS1140 Model E07/EH7 native cartridge capacity (native/compressed)</b>	<b>TS1150 Model E08/EH8 native cartridge capacity (native/compressed)</b>	<b>TS1155 Model 55E/55F native cartridge capacity (native/compressed)</b>
IBM Tape Cartridge 3592 Type C	4.0 TB / 12.0 TB	7.0 TB / 21.0 TB	7.0 TB / 21.0 TB
IBM Tape Cartridge 3592 Type D (Advanced Data)	NA / NA	10.0 TB / 30.0 TB	15.0 TB / 45.0 TB
IBM Tape Cartridge 3592 Type L (Advanced Economy)	2.0 TB / 6.0 TB	2.0 TB / 6.0 TB	3.0 TB / 9.0 TB

NA = Not Applicable

## Performance

TS1155 Tape Drive Model 55E is designed to deliver 10 Gb Ethernet host attachment interface for cloud environments.

TS1155 Tape Drive is designed to provide a native data rate to up to 360 MBps 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 MBps native data rate, other components may limit the actual effective data rate.

## Capacity scaling

The TS1155 tape drive is 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 TS1155 tape drive allows an application to issue a command to scale the IBM Tape Data 3592 cartridge, enabling 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 TS1155 Model 55F. For more information on using capacity scaling, refer to [IBM 3592 Model 55F Tape Drive Knowledge Center](#) website.

## Media and cartridge capacity

The TS1155 tape drive delivers 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 15 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**

TS1155 Tape drive Model 55E is designed to deliver a 10 Gb Ethernet host attachment interface for cloud environments.

TS1155 Tape drive Model 55F has a dual-ported 8 Gbps native switched fabric Fibre Channel interface to offer attachment flexibility in an open systems environment. These drives can be directly attached to open systems servers with Fibre Channel.

TS1155 Tape drive Model 55F is supported in a wide range of environments, including select IBM Power<sup>(R)</sup>, System i, System p, and System x systems, and Oracle servers, as well as Intel<sup>TM</sup> compatible servers running Linux and Microsoft Windows operating system environments.

### **Security**

The TS1155 also supports drive-based data encryption to help protect data. The TS1155-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.

**Note:** For the latest version of the IBM Security Key Lifecycle Manager, refer to [IBM Security Key Lifecycle Manager](#) website.

### **Tape usage and performance monitoring**

The TS1155 Tape Drive will be supported on IBM Spectrum Archive by providing tape usage and performance monitoring with ELK and alerts through Simple Network Management Protocol (SNMP):

- Historical performance statistics and resource usage
- Visualized data to understand trends and outlook of the system
- Alerts to notify users to take immediate action

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

TS1155 Tape drive uses 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. These drives 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 for TS1155 Tape Drive Model 55F with the AIX, Linux, Oracle Solaris, IBM i, 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 TS1155. 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 TS1155 Tape Drive Model 55F 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**

TS1155 tape drives 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 TS1155 tape drives are installed in an automation frame helps increase drive availability in the event of a power supply failure.
- Digital speed matching in 12 speeds enables TS1155 tape drives 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 can enable compensation for variations in the recording channel transfer function, media characteristics, and read/write head characteristics. TS1155 tape drives are designed to automatically perform recalibration in the field if they detect degraded performance.
- High-resolution tape directory plus enhanced search speed enables TS1155 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 TS1155 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. TS1155 uses the same larger history buffer to find compression matches, delivering an improved compression ratio over TS1140 when tested against benchmark data files.

TS1155 tape drives also offer the following enhancements over other 3592 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 MBps 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 LEOT is 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 enables tape copies to complete without overflow a much higher percentage of the time.

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## Product positioning

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The TS1155 Tape Drive is an enhancement of the fifth generation of the highly successful 3592 Enterprise Tape Drive. TS1155 Tape Drive Model 55F 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 provides a significant capacity increase on JD media types over IBM TS1150.

TS1155 is designed for high-capacity 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:
  - Cloud-based and large open computing environments that require innovation for tape
  - 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 TS1155 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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## Reference information

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For more information about the following products, refer to:

- Hardware Announcement [116-041](#), dated May 10, 2016, for IBM TS1150 Tape Drive Rack mount kit
- Hardware Announcement [114-165](#), dated October 6, 2014, for IBM TS1150 Tape Drive
- Hardware Announcement [114-163](#), dated October 6, 2014, for IBM 3599 Tape Media new models

- Hardware Announcement [114-072](#), dated May 19, 2014, for IBM System Storage<sup>®</sup> TS4500 Tape Library New HD Models

## Product number

Description	Machine type	Model	Feature number
TS1155 Tape Drive	3592	55F	
TAA Compliant	3592	55F	0983
Rack Mount Kit	3592	55F	4804
Rack Drive Accessories	3592	55F	4805
Drive Filler Panel	3592	55F	4806
Plant Install 3592 in 3584	3592	55F	9677
3592 Field Install in 3584	3592	55F	9689
Install 1st Drive in a Rack Mnt Kit	3592	55F	9806
Install 2nd Drive in a Rack Mnt Kit	3592	55F	9807
10 meter OM3 fiber Cable(LC)	3592	55F	AGK1
25 meter OM3 fiber Cable(LC)	3592	55F	AGK2
80 meter OM3 fiber Cable(LC)	3592	55F	AGK3

Description	Machine type	Model	Feature number
TS1155 Ethernet Drive	3592	55E	
TAA Compliant	3592	55E	0983
Plant Install 3592 in 3584	3592	55E	9677
3592 Field Install in 3584	3592	55E	9689

Description	Machine type	Model	Feature number
TS1150 and TS1155 tape drive support	3584	L25, L55	1406
3592 55E Plant Install	3584	L25, D25	9704
3592 55F Plant Install	3584	L25, D25	9705
3 Meter OM3 Quad Cables (LC)	3584	L55, D55	AGKQ

## Model conversions

From Model	To Model	Conversion requirements
3592-EH8	3592-55F	Field only

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

## Feature conversions

Not applicable.

## 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 IBMid).

[BP Attachment for Announcement Letter 117-038](#)

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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 Knowledge Center for Installation Instructions converting an EH8 to a 55F
<i>TS11xx Product Doc CD</i>

IBM Knowledge Center provides you with a single point of reference 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 by going to [IBM Knowledge Center](#) for all your product information needs.

To access the IBM Publications Center Portal, go to the [IBM Publications Center](#) website.

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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### IBM Systems Lab Services

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IBM Systems Lab Services offers a wide array of services available for your enterprise. It brings expertise on the latest technologies from the IBM development community and can help with your most difficult technical challenges.

IBM Systems Lab Services exists to help you successfully implement emerging technologies so as to accelerate your return on investment and improve your satisfaction with your IBM systems and solutions. Services examples include initial implementation, integration, migration, and skills transfer on IBM systems solution capabilities and recommended practices. IBM Systems Lab Services is one of the service organizations of IBM's world-renowned IBM Systems Group development labs.

For details on available services, contact your IBM representative or go to the [Lab Services](#) website.

### 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 go to the [IBM Global Technology Services<sup>\(R\)</sup>](#) website.

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or go to the [Resiliency Services](#) website.

Details on education offerings related to specific products can be found on the [IBM authorized training](#) website.

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## Technical information

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### **Specified operating environment**

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

##### **TS1155 Tape Drive Model 55F**

- 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)

##### **TS1155 Tape Drive Model 55E**

- 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: 16°C to 32°C (60.8°F to 89.6°F) in operation (media in use)
- Relative humidity: 20% to 80% noncondensing
- Drive Electrical power (in canister):
  - Model 55F: 46 W maximum and occurs during write operations at maximum velocity
  - Model 55E: 66.5 W maximum and occurs during write operations at maximum velocity and Ethernet chip at max workload
- Noise level: 5.8 Bels operating

For more information and documentation, go to the [TS4500 Knowledge Center](#) website.

#### ***Hardware requirements***

##### **TS1155 Tape Drive**

TS1155 tape drives feature new TMR read sensor head technology. The Fibre Channel version includes a dual-ported, switched fabric 8 Gbps Fibre Channel 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, whereas the Ethernet based version supports two 10 Gb Ethernet ports, similar to the two Fibre ports on the Fibre Channel drives.

For the latest details on specific hardware, software, and Fibre Channel support for TS1155 Tape drive Model 55F, go to the [IBM SSIC](#) website.

The TS1155 Tape Drive is for installation in a TS4500 frame. For all installations, the tape drive comes enclosed in a canister.

Up to sixteen TS1155 drives can be installed in a 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 TS1155 Tape drives 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 TS1155, TS1150, or TS1140 tape drive must be ordered separately, and is installed in a TS4500 frame with one of the following feature numbers:

- #9690 - 3588/3592 Field Install
- #9692 - 3592 E07/EH7 Plant Install
- #9699 - 3592 E08/EH8 Plant Install
- #9704 - 3592 55E Plant Install
- #9705 - 3592 55F Plant Install

Appropriate cables should be ordered for each tape drive. Refer to the [Cables](#) section for a list of available cables.

Labeled or initialized cartridges for TS1155 Tape drives can be ordered using machine type 3599.

### **Cables**

A fiber optic cable is required for attaching a TS1155 tape drive to host adapters or other storage area network components. The cable can be customer-supplied, ordered with the tape library, or ordered with the rackmount TS1155 tape drive in the lengths available. The attaching fiber cable must be 50.0/125 micrometers for distances up to 300 meters. The connector on the TS1155 tape drive is a Lucent Connector (LC) duplex connector type. The cables with LC duplex connectors can be ordered on the TS4500 tape library, or rackmount TS1155 tape drive in the lengths indicated with the following feature numbers:

- #AGK1 - 10-meter OM3 fiber cable (LC)
- #AGK2 - 25-meter OM3 fiber cable (LC)
- #AGK3 - 80-meter OM3 fiber cable (LC)

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 TS1155 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 TS1155, go to the [IBM SSIC](#) website.

IBM Spectrum Protect™ and other compatible software offerings can provide storage and tape management software for the TS1155. 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 the [Independent Software Vendor Matrix \(ISV\) for IBM TotalStorage 3592 tape drives and LTO™](#) website.

IBM continues to work together with the ISVs to support the TS1155 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 [IBM Fix Central](#) download website.

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

See the [IBM Tape Device Drivers Installation and User's Guide](#) for more information.

### **Encryption**

Two modes of encryption management are supported:

- Library managed
- Application managed (for example, IBM Spectrum Protect)

### **Limitations**

- Although multiple systems may be attached to a TS1155 Tape Drive, the systems cannot use the drive simultaneously. The TS1155 can only be varied online to one system at a time.
- TS1155 Tape Drive is not supported for attachment to an IBM TS7700 or an Enterprise Tape Control Unit.
- TS1155 Tape Drive Model 55E is not supported by IBM Spectrum Archive.
- Approval of i-RPQ 8B3685 will be required for ordering a TS1155 Tape Drive Model 55E.
- RoCE (RDMA over Converged Ethernet) is a temporary interoperability limitation.

### **Planning information**

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#### **Customer responsibilities**

Physical planning is a customer responsibility.

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 cables should be ordered for each tape drive. Refer to the [Cables](#) section for a list of available cables.

#### **Packaging**

<b>Product</b>	<b>Shipment group</b>	<b>Number of boxes</b>
TS1155 Model 55F	TS1155 Tape Drive Model 55F Device Driver README sheet	1
TS1155 Model 55E	TS1155 Ethernet Drive Model 55E Device Driver README sheet	1

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### **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.

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## **Terms and conditions**

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### **IBM Global Financing**

Yes

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

#### ***Warranty period***

One year

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM. An IBM part or feature installed during the initial installation of an IBM machine is subject to the full warranty period specified by IBM. An IBM part or feature that 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. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature are the same as those for the machine in which it is installed.

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.

### ***International Warranty Service***

International Warranty Service allows you to relocate any machine that is eligible for International Warranty Service and receive continued warranty service in any country where the IBM machine is serviced. If you move your machine to a different country, you are required to report the machine information to your Business Partner or IBM representative.

The warranty service type and the service level provided in the servicing country may be different from that provided in the country in which the machine was purchased. Warranty service will be provided with the prevailing warranty service type and service level available for the eligible machine type in the servicing country, and the warranty period observed will be that of the country in which the machine was purchased.

The following types of information can be found on the [International Warranty Service](#) website

- Machine warranty entitlement and eligibility
- Directory of contacts by country with technical support contact information
- Announcement Letters

### ***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**

No

### **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.

<b>Description</b>	<b>Machine type</b>	<b>Model</b>	<b>Feature number</b>	<b>Install type*</b>	<b>MES removal</b>
TS1155 Tape Drive	3592	55F			
TAA Compliant	3592	55F	0983	Plant	Yes
Rack Mount Kit	3592	55F	4804	Both	Yes
Rack Drive Accessories	3592	55F	4805	Both	Yes
Drive Filler Panel	3592	55F	4806	Both	Yes
Plant Install 3592 in 3584	3592	55F	9677	Plant	Yes
3592 Field Install in 3584	3592	55F	9689	Plant	Yes
Install 1st Drive in a Rack Mnt Kit	3592	55F	9806	Both	Yes
Install 2nd Drive in a Rack Mnt Kit	3592	55F	9807	Both	Yes

Description	Machine type	Model	Feature number	Install type*	MES removal
10 meter OM3 fiber Cable(LC)	3592	55F	AGK1	Both	No
25 meter OM3 fiber Cable(LC)	3592	55F	AGK2	Both	No
80 meter OM3 fiber Cable(LC)	3592	55F	AGK3	Both	No

Description	Machine type	Model	Feature number	Install type*	MES removal
TS1155 Ethernet Drive	3592	55E			
TAA Compliant	3592	55E	0983	Plant	Yes
Plant Install 3592 in 3584	3592	55E	9677	Plant	Yes
3592 Field Install in 3584	3592	55E	9689	Plant	Yes

Description	Machine type	Model	Feature number	Install type*	MES removal
TS1150 and TS1155 tape drive support	3584	L25, L55	1406	Both	No
3592 55E Plant Install	3584	L25, D25	9704	Plant	No
3592 55F Plant Install	3584	L25, D25	9705	Plant	No
3 Meter OM3 Quad Cables (LC)	3584	L55, D55	AGKQ	Both	No

\* Install type:

- "Plant" denotes plant installation only
- "Field" denotes field installation only
- "Both" denotes both plant and field installation

### Alternative service

Machine type-model	IOR IBM Same Day On-site Repair (IOR, 24 x 7)
3592-55F	
3592-55E	

### ServiceElect (ESA) charges

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

### Model conversion purchase price



Model		Model conversion purchase price*
From	To	
EH8	55F	

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

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