IBM TS1160 tape drive model for IBM TS3500 tape libraries deliver up to 20 TB native capacity on new JE media and enable reuse of existing JD media

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At a glance

IBM**(R)** TS1160 tape drives offer organizations an easy way to improve capacity while delivering fast access to data and secure long-term retention for less than the cost of disk or flash solutions. They also help protect investments in tape automation by offering compatibility with existing automation and reuse of existing media. TS1160 Model 60G is designed for the TS3500 tape library.

Features of the TS1160 include:

- Dual-port 16 Gb Fibre Channel host attachment interface for hyperscale environments
- Native data rate of 400 MBps
- Effective reuse of existing JD/JZ/JL media types with the capability to read and write TS1150 and TS1155 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

To help optimize drive utilization and reduce infrastructure requirements, TS1160 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.

Overview

TS1160 Tape Drive Model 60G is designed for the TS3500 tape library and delivers a 100% increase in capacity on JE media types when compared to its predecessor, the TS1150 tape drive. TS1160 Model 60G delivers a native data rate of 400 MBps, the same load/ready, locate speeds, and access times as the TS1150, and includes dual-port 16 Gb Fibre Channel support.

TS1160 tape drives are capable to read and write 20 TB capacities on new JE media types compared to 10 TB for TS1150. TS1160 tape drives also support JD 15 TB format (read/write) and JC 7 TB format (read/write). Media written in TS1160 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 E08 to TS1160 Model 60G.

TS1160 tape drives are not currently supported by IBM TS7700 environments.

TS1160 also supports drive-based data encryption to help protect data. TS1160-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(R), IBM System p, IBM System x, and other servers running AIX(R), Linux(R), Oracle Solaris, and Microsoft(R) Windows™ operating systems.

**Note:** For the latest version of the IBM Security Key Lifecycle Manager, go to the IBM Security Key Lifecycle Manager website.

**Note:** Model conversions are only supported once in the life of the tape drive. A second conversion would have more than 80% of new components.

**Product Preview**

In order to help customers backup and restore data on IBM and other open systems platforms, IBM intends to enable the TS1160 Tape Drive Model 60G to support IBM Spectrum Protect™ between announcement and before the end of first quarter of 2019.

In addition, availability of Type E media for this Tape Drive TS1160 Model 60G delivering up to 20 TB storage capacity is planned to be announced before end of first half of 2019.

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**Key prerequisites**

TS1160 Tape Drive Model 60G 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.

See the Software requirements section for details.

**Planned availability date**

December 7, 2018

**Description**

TS1160 tape drives offer an 100% increase in capacity on JE media types as 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
• Hyperscale, automated tape environments where performance and reliability are required
• Hyperscale, 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, cloud service providers, record management applications, and within the seismic industry

TS1160 consists of Fibre Channel Model 60G that is designed for the TS3500 tape library. Model 60G delivers a native data rate of 400 MBps, the same load/ready, locate speeds and access times as the TS1150, and includes dual-port 16 Gb Fibre Channel.

TS1160 communicates with the TS3500 tape library through an internal Ethernet interface and uses the Statistical Analysis and Reporting System to isolate failures between media and hardware.

TS1160 tape drives deliver the following performance, capacity, availability, and durability 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**

TS1160 tape drives are capable to read and write 20 TB capacity on new JE media types compared to 10 TB for TS1150.

The following table compares the cartridge capacity (native and with 3:1 compression) of the TS1160, TS1155, TS1150, and TS1140:

<table>
<thead>
<tr>
<th>IBM Tape Cartridge 3592 Type E</th>
<th>TS1160 Model 60F/60G native cartridge capacity (native/compressed)</th>
<th>TS1155 Model 55E/55F/55G native cartridge capacity (native/compressed)</th>
<th>TS1150 Model E08/ EH8 native cartridge capacity (native/compressed)</th>
<th>TS1140 Model E07/ EH7 native cartridge capacity (native/compressed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Tape Cartridge 3592 Type E</td>
<td>20TB / 60.0TB</td>
<td>NA / NA</td>
<td>NA / NA</td>
<td>NA / NA</td>
</tr>
<tr>
<td>IBM Tape Cartridge 3592 Type E (Economy)</td>
<td>5.0TB / 15.0TB</td>
<td>NA / NA</td>
<td>NA / NA</td>
<td>NA / NA</td>
</tr>
<tr>
<td>IBM Tape Cartridge 3592 Type D</td>
<td>15.0TB / 45.0TB</td>
<td>15.0TB / 45.0TB</td>
<td>10.0TB / 30.0TB</td>
<td>NA / NA</td>
</tr>
</tbody>
</table>
TS1160 tape drives are designed to provide a native data rate to up to 400 MBps along with other enhancements to help aid small file and hierarchical storage management 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 400 MBps native data rate, other components may limit the actual effective data rate.

**Capacity scaling**

TS1160 tape drives are designed to support capacity scaling of an individual tape cartridge to various percentages of the maximum capacity. Capacity scaling enables 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.

TS1160 tape drives enable an application to issue a command to scale IBM Tape Data 3592 cartridges, exploiting capacity scaling by an application that permits media pools to be defined by the VOLSER range. You can exploit the capacity scaling capability of the TS1160 Model 60G. For more information about using capacity scaling, go to the [IBM 3592 Model 60G Tape Drive Knowledge Center](https://www.ibm.com) website.

**Media and cartridge capacity**

TS1160 tape drives deliver capacity leadership with media reuse and use Type E tape cartridges with tape specifically optimized for the enterprise tape environment. These models provide a native cartridge capacity of 20 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**
TS1160 Tape Drive Model 60G can be directly attached to open systems servers with Fibre Channel. Model 60G is supported in a wide range of environments, including select IBM Power®, System i, System p, and System x systems, Oracle servers, and Intel®-compatible servers running Linux and Microsoft Windows operating system environments.

**Security**

The TS1160 also supports drive-based data encryption to help protect data. The TS1160-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, go to the [IBM Security Key Lifecycle Manager](https://www.ibm.com) website.

**Tape usage and performance monitoring**

TS1160 tape drives will be supported on IBM Spectrum Archive by providing tape usage and performance monitoring with open source monitoring tool 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**

TS1160 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 the 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 TS1160 Tape Drive Model 60G 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 TS1160. 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 TS1160 Model 60G 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 characteristics**
TS1160 tape drives incorporate the following tape characteristics that were introduced with the 3592 Tape Drive and are designed to help improve performance, capacity, availability, and durability:

- 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 that extends virtual backhitch effectiveness for large files.
- N+1 power supply when TS1160 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 TS1160 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. TS1160 tape drives are designed to automatically perform recalibration in the field if they detect degraded performance.
- High-resolution tape directory plus enhanced search speeds enable TS1160 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 TS1160 to deliver 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. TS1160 uses the same larger history buffer to find compression matches, delivering an improved compression ratio over TS1150 when tested against benchmark data files.

TS1160 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 deliver 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 (400 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. TS1160 Tape Drive Model 60G 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 enables tape copies to complete without overflow a much higher percentage of the time.

Product positioning
Storing data on tape in an age of easy-access, flash and cloud computing is still very popular and but that is because of the reliability, durability and low TCO that this technology delivers to its clients. Also, IBM Tape offers the most powerful data protection of all because unlike other storage media, you can easily pull a tape cartridge offline and simply store it on a shelf -- creating a physical barrier or "air gap" that hackers can't penetrate. The upsurge in tape usage demonstrates that ransomware and other cybersecurity concerns are prompting many organizations to put tape technology back in service as the ultimate line of defense for sensitive corporate data.

Massive data growth has led to new ways of handling and securing all that information, modern use cases like big data, cloud or analytics sometimes require a hyperscale approach be able to meet the business goals in a cost-effective manner. The TS1160 is a perfect fit for this environments that achieve massive scale in computing and delivers the lowest TCO.

Innovation keeps the highly successful 3592 Enterprise Drives always ahead of other drive formats, as for example now, the new TS1160 provides a significant capacity and throughput increase over the IBM TS1150 with the introduction of the new JE media. Plus, it offers complete integration with IBM Spectrum™ software-defined storage to help improve data management and reduce storage costs.

The new TS1160 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 TS3500 environments where:
  - Cloud-based and large open computing environments 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. The new TS1160 now supports twice the capacity than the TS1150 to help improve storage space efficiency.
  - A Fibre Channel-attached drive where native switched fabric capability is required. TS1160 offers 16 Gb FC support versus 8 Gb FC in the TS1155/TS1150.

- Other hyperscale 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, reliability, and durability are requirements.
  - Hyperscale 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, banking, cloud service providers, and record management applications.
  - Environments where both streaming and start/stop (access), large and small file workloads are required

- Other customers looking for enhanced security and compliance, and 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, theft, or ransomware.

Reference information

For more information about the following products, see:

- Hardware Announcement 118-103, dated November 20, 2018, for IBM TS1160 Tape drive model 60F
• 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 models

Product number

The following are newly announced features and model on the specified model of the IBM System Storage® 3592 machine type:

<table>
<thead>
<tr>
<th>Description</th>
<th>Machine type</th>
<th>Model</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS1160 Tape Drive Model 60G</td>
<td>3592</td>
<td>60G</td>
<td></td>
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<tr>
<td>TAA Compliance</td>
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<td>60G</td>
<td>0983</td>
</tr>
<tr>
<td>Plant Install 3592 in a 3584 Frame</td>
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<td>60G</td>
<td>9677</td>
</tr>
<tr>
<td>3592 Field Install in 3584</td>
<td>3592</td>
<td>60G</td>
<td>9689</td>
</tr>
<tr>
<td>IBM Systems Lab Services Post-Sale Services: 1 Day</td>
<td>3592</td>
<td>60G</td>
<td>SVCS</td>
</tr>
<tr>
<td>BP Post-Sale Services: 1 Day</td>
<td>3592</td>
<td>60G</td>
<td>SVBP</td>
</tr>
<tr>
<td>Other IBM Post-Sale Services: 1 Day</td>
<td>3592</td>
<td>60G</td>
<td>SVNN</td>
</tr>
</tbody>
</table>

The following are newly announced features of the IBM System Storage 3584 machine type:

<table>
<thead>
<tr>
<th>Description</th>
<th>Machine type</th>
<th>Model</th>
<th>Feature</th>
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<tbody>
<tr>
<td>3592 Fibre Drive Mounting Kit</td>
<td>3584</td>
<td>D23</td>
<td>1535</td>
</tr>
<tr>
<td>3592 60G Tape Drive Field Install</td>
<td>3584</td>
<td>D23</td>
<td>1676</td>
</tr>
<tr>
<td>3592 60F/60G Plant Install in 3584</td>
<td>3584</td>
<td>D23</td>
<td>9706</td>
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<tr>
<td>3592 Fibre Drive Mounting Kit</td>
<td>3584</td>
<td>L23</td>
<td>1535</td>
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<td>3592 60G Tape Drive Field Install</td>
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<td>L23</td>
<td>1676</td>
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</table>

Model conversions

<table>
<thead>
<tr>
<th>From machine type</th>
<th>From model</th>
<th>To machine type</th>
<th>To model</th>
<th>Conversion requirements</th>
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<tbody>
<tr>
<td>3592</td>
<td>E08</td>
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<td>3592</td>
<td>60G</td>
<td>3592</td>
<td>60F</td>
<td>-</td>
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</tbody>
</table>

Notes:
• Parts removed as a result of a model conversion become the property of IBM.
• Model conversions are only supported once in the life of the tape drive. A second conversion would have more than 80% of new components.

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 IBMid).

BP Attachment for Announcement Letter 118-102

Publications

The following publications are shipped with the product:

- TS3500 Tape Library Drives: None
- Model Conversions:
  - Installation instructions for 3592 tape drive model conversion
  - TS11xx Tape Drive Maintenance Manual CD

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.

Services

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For details on available services, contact your IBM representative or go to the IBM Global Technology Services® 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.

## Technical information

### Specified operating environment

#### Physical specifications

**TS1160 Tape Drive Model 60G**

- Width: 186 mm (7.3 in.)
- Depth, front of bezel to rear handle: 467 mm (18.4 in.)
- Height: 93 mm (3.7 in.)
- Weight: 5.57 kg (12.25 lbs)

#### Operating environment

- Temperature: 16°C to 32°C (60.8°F to 89.6°F) in operation (media in use)
- Relative humidity: 20% - 80% noncondensing
- Maximum dew point temperature: 22°C (72°F)
- Drive Electrical power (in canister):
  - Model 60G: 57 W maximum and occurs during write operations at maximum velocity
- Noise level: 5.8 Bels operating

For more information and documentation, go to the **TS3500 IBM Knowledge Center** website.

### Hardware requirements

#### TS1160 tape drives

TS1160 tape drives feature tunnel magnetoresistance (TMR) read sensor head technology. The Fibre Channel version includes a dual-ported, switched fabric with 16 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.

For the latest details on specific hardware, software, and Fibre Channel support for TS1160 Tape Drive Model 60G, go to the **IBM SSIC** website.

The TS1160 Tape Drive is for installation in a TS3500 frame. For all installations, the tape drive comes enclosed in a canister.

Up to twelve TS1160 drives can be installed in a TS3500 model L23, D23, L22, or D22 frame.

New Quad Drive Mounting Kit feature, number 1535 - 3592 Fibre Drive Mounting Kit, is required for installing TS1160 tape drives in a TS3500.

**Note:** Each TS1160, TS1150, or TS1140 tape drive must be ordered separately, and is installed in a TS3500 frame with one of the following feature numbers:
• #1675 - 3592 E07/E08/55G Tape Drive Field Install
• #1676 -- 3592 60G Tape Drive Field Install
• #9692 - 3592 E07/EH7 Plant Install
• #9699 - 3592 E08/EH8 Plant Install
• #9705 - 3592 55G Plant Install
• #9706 - 3592 60F/60G Plant Install

Appropriate cables should be ordered for each tape drive. See the Cables section for a list of available cables.

Labeled or initialized cartridges for TS1160 tape drives can be ordered using machine type 3599. See the Supplies information section.

Cables

A fiber optic cable is required for attaching a TS1160 tape drive to host adapters or other storage area network components. The cable can be customer-supplied or ordered with the tape library, in the lengths available. The attaching fiber cable must be either 50.0/125 micrometers (distances up to 100 meters with OM3) with Multi-Mode Fiber or 9/125 micrometers (distances between 2 meters and 10 kilometers) with Single Mode Fiber. The connector on the TS1160 tape drive is a Lucent Connector (LC) connector type. The cables with LC duplex connectors can be ordered on the TS3500 tape library 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)

See the Special Features section of the TS3500 or 3584 tape library Sales Manual for detailed descriptions of these features.

Fibre Channel switch attachment

The TS1160 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 TS1160, go to the IBM SSIC website.

IBM Spectrum Archive and other compatible software offerings can provide storage and tape management software for the TS1160. 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 TS1160 tape drives. 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

**Limitations**

Although multiple systems may be attached to a TS1160 tape drive, the systems cannot use the drive simultaneously. The TS1160 can only be varied online to one system at a time.

TS1160 tape drives are not currently supported for attachment to an IBM TS7700 or an Enterprise Tape Control Unit.

**Planning information**

**Client 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. See the **Cables** section for a list of available cables.

**Packaging**

<table>
<thead>
<tr>
<th>Product</th>
<th>Shipment group</th>
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</thead>
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<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

**Security, auditability, and control**

This product uses the security and auditability features of the host hardware, host software, and application software to which it is attached.

The client is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

**IBM Systems Lab Services**

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

IBM Global Financing

Yes

Products - terms and conditions

Warranty period

<table>
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<th>Warranty and additional coverage options</th>
<th>Coverage summary(1)</th>
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<tbody>
<tr>
<td>Warranty period:</td>
<td>1 year(2)</td>
</tr>
<tr>
<td>Service level:</td>
<td>IBM On-Site, 24x7 Same Day</td>
</tr>
</tbody>
</table>

Service upgrade options

<table>
<thead>
<tr>
<th>Warranty Service Upgrade</th>
<th>IBM On-Site, 24x7 Same Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance Services (Post-Warranty):</td>
<td>IBM On-Site Repair, 24x7 Same Day</td>
</tr>
<tr>
<td>IBM Hardware Maintenance Services - committed maintenance(3):</td>
<td>Yes</td>
</tr>
</tbody>
</table>

(1) See complete coverage details below

(2) Known exception: Turkey (Warranty period: 2 years)

(3) Not offered in the US

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.

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 through 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-specific 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**
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.

Prices

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

The following are newly announced features and model on the specified model of the IBM System Storage 3592 machine type:

<table>
<thead>
<tr>
<th>Description</th>
<th>Model number</th>
<th>Feature numbers</th>
<th>Initial / MES / Both / Support</th>
<th>CSU</th>
<th>RP MES</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS1160 Tape Drive</td>
<td>60G</td>
<td></td>
<td>Both</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>TAA Compliance</td>
<td>60G</td>
<td>0983</td>
<td>Initial</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Plant Install 3592 in a 3584 Frame</td>
<td>60G</td>
<td>9677</td>
<td>Initial</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3592 Field Install in 3584</td>
<td>60G</td>
<td>9689</td>
<td>Initial</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Post-Sale Services: 1 Day</td>
<td>60G</td>
<td>SVCS</td>
<td>Both</td>
<td>Yes</td>
<td>N</td>
</tr>
<tr>
<td>BP Post-Sale Services: 1 Day</td>
<td>60G</td>
<td>SVBP</td>
<td>Both</td>
<td>Yes</td>
<td>N</td>
</tr>
<tr>
<td>Other Post-Sale SVCS: 1 Day</td>
<td>60G</td>
<td>SVNN</td>
<td>Both</td>
<td>Yes</td>
<td>N</td>
</tr>
</tbody>
</table>
The following are newly announced features of the IBM System Storage 3584 machine type:

<table>
<thead>
<tr>
<th>Description</th>
<th>Model number</th>
<th>Feature numbers</th>
<th>Initial / MES / Both / Support</th>
<th>CSU</th>
<th>RP MES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3592 Fibre Drive Mounting Kit</td>
<td>D23</td>
<td>1535</td>
<td>MES</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3592 60G Tape Drive Field Install</td>
<td>D23</td>
<td>1676</td>
<td>Both</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3592 60F/60G Plant Install in 3584</td>
<td>D23</td>
<td>9706</td>
<td>Initial</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3592 Fibre Drive Mounting Kit</td>
<td>L23</td>
<td>1535</td>
<td>MES</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3592 60G Tape Drive Field Install</td>
<td>L23</td>
<td>1676</td>
<td>Both</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

CSU = Customer setup  
RP MES = Returnable parts MES

**Alternative service**

<table>
<thead>
<tr>
<th>Machine type-model</th>
<th>IOR IBM Same Day On-site Repair (IOR, 24 x 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3592-60G</td>
<td></td>
</tr>
</tbody>
</table>

**ServiceElect (ESA) charges**

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</th>
<th>From</th>
<th>To</th>
<th>Model conversion purchase price*</th>
</tr>
</thead>
<tbody>
<tr>
<td>3592-E08</td>
<td>3592-60G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3592-55G</td>
<td>3592-60G</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Parts removed as a result of a model conversion become the property of IBM.
- Model conversions are only supported once in the life of the tape drive. A second conversion would have more than 80% of new components.

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