QuickSpecs

Overview

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HP DAT Tape Drives

HP DAT drives are based on the Digital Data Storage (DDS) format. In fact, DAT is the most successful tape backup technology of all time with more than 18 million DAT drives shipped since its introduction in 1989, and with a current world-wide installed base of over 6 million drives. HP has long been the market leader in DAT technology.

This remarkable tape technology continues to flourish because of its ability to meet the needs of the Small and Medium Business (SMB) market for reliable, cost-effective backup better than any other tape technology available.

The HP family of DAT drives is the first choice for data protection for many small and medium businesses with low-end and mid-range servers and workstations. HP DAT drives are also frequently used for operating system backup and software loading on mission-critical servers in many large enterprises.

HP DAT family offers a complete backup solution including HP's unique One-Button-Disaster-Recovery (OBDR) feature providing customers with the ability to restore their systems quickly and effortlessly with the touch of a single button. The included option to download Yosemite Server Backup Basic backup and recovery software provides an easy and robust data protection application for single servers. HP's unique Library and Tape Tools (L&TT) utilities provide HP DAT customers with a comprehensive suite of tape drive management utilities and HP's extensive testing program ensures that customers benefit from the broadest connectivity and compatibility with HP and third-party servers, operating systems and software in the industry.
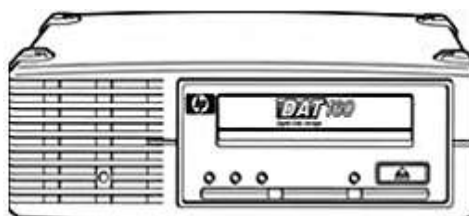
What's New

Yosemite Server Backup Basic has replaced Data Protector Express Basic as the software (downloadable) included with the HP DAT tape drives.

HP DAT 160 SCSI Tape Drive

Protecting the needs of small or medium business, delivering up to 160GB compressed data per cartridge and speeds of around 50GB/hr (assuming 2:1 data compression)

The HP DAT 160 SCSI drive is available with a native SCSI interface in a range of models including internal to fit servers, workstations and rack-mount kits, external modules.
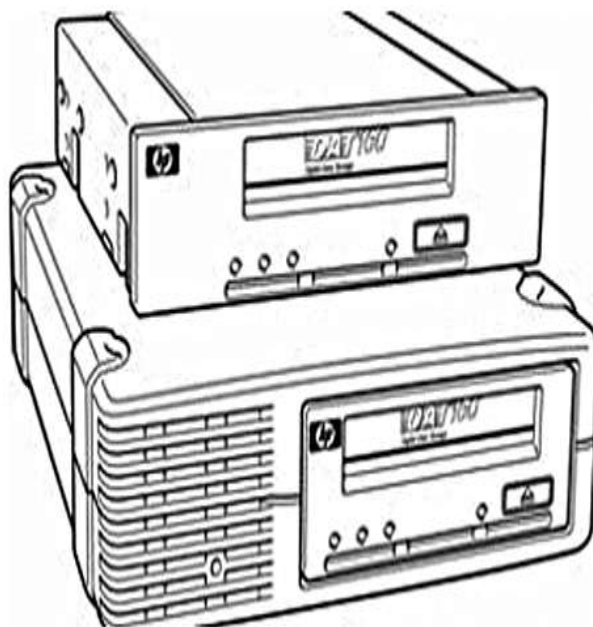

DAT 160 SCSI External Tape Drive

QuickSpecs

Overview

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HP DAT 160 USB Tape Drive

Protecting the needs of small or medium business, delivering up to 160GB compressed data per cartridge and speeds of around 50GB/hr (assuming 2:1 data compression)

The USB 2.0 interface provides plug-and-play connectivity, enabling backup to be initiated from straight out-of-the-box in less than 60 seconds.

DAT 160 USB Internal Tape Drive
DAT 160 USB External Tape Drive

QuickSpecs

Features

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Key Features

- Based on industry-standard DDS technology -- the most popular server backup technology of all time, providing customers with all the benefits of an open standard including better pricing, wider availability and faster development cycles
- Proven reliability -- HP has increased reliability specifications for HP DAT drives based on real field data. Mean-Time-Between-Failure rates (MTBF) are now more than 1 million hours at a typical duty cycle of 12%
- Low-cost of ownership - Lowest media price (in $/GB) of any tape backup technology
- Up to 80GB native capacity on a single tape -- 160GB at 2:1 compression -- with DAT 160 tape drives
- Up to 6.9 MB/s* native data transfer rate -- 13.8 MB/s* with 2:1 compression -- with DAT 160 tape drives * Where 1KB = 1,000 Bytes
- Plug and play -- USB 2.0 interface available for on all drives provides universal native plug-and-play capability and enabling customers to be ready for backup in less than 60 seconds straight out of the box
- Includes the option to download Yosemite Server Backup Basic backup and recovery software. SAS interface also available for the latest server connectivity
- Flexibility of solutions through a wide choice of models - internal, external, and rack-mount configurations
- Small size drives and media for easy physical storage - small, 5.25-inch form-factor internal drives.
- Low ongoing maintenance -- automatic head cleaning minimizes the need for cleaning. Intelligent cleaning monitors the performance of the drive and cleans accordingly when a cleaning tape is loaded
- Dependable disaster recovery -- HP One-Button Disaster Recovery (OBDR) for Proliant Systems restores your entire system at the touch of a button
- Supporting tools -- HP Library and Tape Tools available as a download with the drive to make installation, performance tuning and trouble-shooting even easier
- Broad compatibility with a wide range of servers, operating systems, and backup software
- Includes the option to download Yosemite Server Backup Basic see: www.barracudaware.com/ysbbasic.

Customer Benefits

- **Dependable**: a long track record of proven reliability
- **Easy**: supports One-Button Disaster Recovery, simply the easiest way to restore data in the event of a disaster
- **Affordable:** inexpensive media contributes to an exceptionally low cost of ownership
- **Manageable**: includes superior management capabilities that makes it easy to install, use and support
- **Low-maintenance**: automatic head cleaning system reduces the need for cleaning
- **Well-connected**: compatible with leading operating systems, backup software and servers
- **Future-proof**: the tape technology with an illustrious past also has a solid roadmap for the future
- **Value**: includes the option to download Yosemite Server Backup Basic backup and recovery software which enables robust backup of a single server.
- **Complete**: comes with an easy-to-use backup solution that includes disaster recovery capabilities

QuickSpecs

Product Highlights

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DDS Technology

DDS/DAT continues to be the unit volume leader in the tape drive market for small and medium businesses with a current installed base of over 6 million units and over 18 million DAT drives shipped since its introduction in 1989. This remarkable tape technology continues to flourish because it meets the needs of the SMB market for cost-effective, reliable backup better than any other low end tape technology available.

DDS/DAT is based on an open standard format for data interchange. The influential DAT manufacturers group presides over this open standard with verification processes that ensure compliance. With multiple manufacturers developing and shipping DDS/DAT products, customers benefit from increased competition, which leads to better prices, faster development and more choice.

DDS format for DAT is a helical scan format where data is written diagonally across the width of the tape. The advantage is that, by allowing subsequent tracks to have different writing angles and to overlap, a much greater capacity can be achieved for a given length of tape because no guard bands are necessary. The data format also allows for fast location of tracks and data. To achieve this, the rotating drum is tilted at a slight angle (6°) from the vertical. The drum has four heads (two write heads and two read heads), located at 90° intervals. For each rotation of the drum, two tracks are written. The read heads verify the data that has been written (recorded) and the drive rewrites if necessary. The open format ensures interchangeability between different DDS format drives.

HP has been involved in the design and development of DAT drives since the beginning and applies these many years of experience to its current line of DAT products. Not only does an investment in DAT technology provide the security of a format with a history of outstanding reliability, the legacy of backward compatibility also provides the potential for future expansion without compromising your investment in the technology.

The target market for DAT continues to be direct-attach backup. In small and medium sized businesses cost of ownership, ease of use and a proven history (i.e. low risk) are paramount. DAT technology provides the capacity and performance needed in a tape backup solution for workstations and entry-level servers.

Specific Note on DAT 160
The DAT 160 drive employs the same technology as previous DAT products, and uses DAT 160 wide media in order to achieve higher capacities. However, it maintains 2 generation backward compatibility and can still read and write data to DAT 72 and DAT 40 (DDS-4) cartridges. It does this by recognizing the different tapes (wider DAT 160 and the narrower DAT 72/DDS-4).

Backwards Compatibility

HP DAT tape drives are backward read-write compatible with previous generations, thus:

- DAT 160 also reads and writes DAT 72 and DDS-4

Proven Reliability

HP DAT drives have proven to be exceptionally reliable. The drives have demonstrated exceptional performance with customers over many years and across different generations and this has under pinned their popularity.

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Product Highlights

The drives are designed with reliability in mind and with the security of customer's data as a priority. Hardware reliability is typically measured as MTBF (Mean Time Between Failures) associated with duty cycles which suggests the amount the drive is typically used e.g. 100% duty cycle means the drive is used for 24 hours per day. As a result of field data, the specification for HP DDS products is stated as 125,000 hours at 100% duty cycle, or 1 million hours at a more typical 12% duty cycle (drive used on average for 3 hours per day).

Unlike other manufactures' DAT drives, this specification is not generated in the laboratory with limited numbers of prototype drives and assumptions on customer use; it is generated from real customer data for the products concerned.

Automated Head Cleaning/Intelligent cleaning	HP DDS derives benefit from an automatic head cleaning "sweeper" that can be used during the write or read recovery procedure to dislodge debris from the tape path and recording heads and drive. This feature reduces the need to use a DDS cleaning cartridge for manual cleaning.
	Intelligent cleaning determines the cleaning provided by a cleaning cartridge when loaded by monitoring the drive performance when in use. If the drive is performing well, a routine maintenance clean is performed. If the drive has degraded performance the cleaning is automatically made more robust to recover the drive to optimum performance.
Interfaces	HP offers a range of interface options with our DAT Tape Drives in order to meet the varying needs of our customers. HP DAT drives are available with a choice of: the standard SCSI interface where legacy SCSI connectivity is required, and USB 2.0 interface for universal plug and play connectivity.

Native USB

The USB (Universal Systems Bus) interface was conceived out of a need to simplify computer peripheral device connection. It has been so successful that the majority of computer systems and servers shipped today offer multiple native USB 2.0 ports.

HP is the first company to develop a native USB DDS/DAT tape drive. Where other "USB tape drives" rely on a USB converter, HP's USB interface is fully integrated with the drive and uses the SCSI command set within the USB payload. The benefit of this implementation is that it gives the drive full SCSI functionality and the flexibility of USB without the additional cost of a converter.

By offering native USB 2.0 DAT drives, HP aims to provide customers with a number of benefits:

- Greater usability
- Plug-and-play connectivity - the system automatically detects and configures the tape drive.
- The DAT drive is installed and ready to backup in less than 60 seconds.
- Microsoft fully supports USB devices natively in their operating systems providing robust, secure configuration and installation wizards.
- Cables are easily identifiable, easy to attach without the need for thumb-screw and robust enough to ensure reliable retention.
- Resource abundance
- Native USB ports are universally available in systems and servers
- Multiple ports ensure that port resources are widely available, reducing the conflict between devices over scarce connectors.

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Product Highlights

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- Port expansion is easy, USB hubs can be installed to add additional ports supporting up to 127 devices on a system
- Low cost, reliable connectivity
- By providing native USB DDS/DAT drives there is no need for customers to purchase additional host-bus adapters
- HP's USB 2.0 implementation benefits from the built-in reliability and failure recovery inherent in the underlying SCSI protocol
- USB 2.0 has multiple levels of physical error detection and recovery which ensure reliability on a par with SCSI and Fibre-channel interfaces.
- USB 2.0 compliance certification provides thorough, ongoing reliability and quality control. A well implemented USB network should use only USB 2.0 compliant components, including USB 2.0 certified cables.
- Sustainable performance

Compression

DDS uses built-in hardware compression using the 'DCLZ' data compression algorithm. Data compression is host-selectable with the default that compression is turned on. Typical data compression is 2:1, but actual compression depends on the type of data being compressed and can be more or less than 2:1.

Rack-Mount Tape Options

HP DAT SCSI and USB drives are supported on the HP 1U and 3U Rack-Mount Kits . The 3U Rack-Mount Kit allows up to four internal DAT drives to be installed in 3U of rack space, while the 1U Rack-Mount Kit holds two DAT drives in 1U of space. 1U rack-mount kits use standard internal DAT USB and SCSI drives for a low-cost solution. 3U rack-mount kits use standard internal DAT SCSI drives.
Either of these rack enclosures can be configured with separate SCSI buses (channels) for each drive or two or more drives per bus using the optional cable kits.

NOTE: Please refer to the QuickSpecs for HP Rack-Mount Kits at: http://h18000.www1.hp.com/products/quickspecs/10854_div/10854_div.html for further information.

HP OBDR (One-Button Disaster Recovery)

With HP One-Button Disaster Recovery, you can quickly, reliably and simply restore your entire ProLiant system just by inserting the most recent backup tape and pushing one button on the tape drive. Your HP DAT drive will restore your operating system, configuration, applications, drivers and data files. There's no longer a need to search for software disks and manuals. And with downtime reduced, the costs of recovery are minimized too. There's no need to make a new set of disaster recovery disks each time the network configuration is altered or a peripheral is added. Recovering from a disaster manually at a stressful time makes for an error-prone process. The sheer simplicity of HP One-Button Disaster Recovery means less human error. Backup and disaster recovery preparation -- previously two separate tasks -- become one process. OBDR is simply the best disaster recovery product for small to medium systems. For a current list of servers, workstations, and software that support OBDR, check the tape backup compatibility pages at: http://www.hp.com/go/obdr

Included software

The HP DAT tape drives include the option to download Yosemite Server Backup Basic backup and recovery software. It is an easy-to-use backup and recovery application that is installed in minutes and includes all the features needed to protect a single machine by backup to a HP Storage tape drive. Yosemite Server Backup Basic includes pre-defined and customizable media rotation schemes so you can define when you backup and how long your backups are retained, while easily managing your DAT

QuickSpecs

Product Highlights

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data cartridges. Yosemite Server Backup Basic supports all the features of the DAT tape drives. The Data Protector Express Basic Bare Metal Disaster Recovery (BMDR) feature supports the One Button Disaster Recovery capability of the DAT tape drives for fast and automated recovery of a ProLiant server after a major disaster. Backup data compression can be turned on or off as part of the backup job specifications.

For more information please visit: www.barracudaware.com/ysbbasic

NOTE: Yosemite Server Backup Basic replaces Data Protector Express Basic as the software (downloadable) included with the HP DAT tape drives.

Data Protector backup and recovery software	If the HP DAT tape drive is for a large environment that requires UNIX support and/or enterprise class application and feature support then HP Data Protector is the recommended backup and recovery software. There is no upgrade path from Data Protector Express Basic or Data Protector Express to Data Protector. If current or future requirements will require Data Protector, this software should be installed from day 1. For more information and evaluation software please visit: http://www.hp.com/go/dataprotector.
HP Library and Tape Tools (L&TT)	HP DAT drives are supported on HP's industry-leading diagnostic tool -- HP Library and Tape Tools (L&TT). L&TT is a single, convenient program that's a snap to install and simple to operate. L&TT's intuitive user interface eliminates the need for training and deploys in less than five minutes. This robust diagnostic tool is designed for both the experienced professional and the untrained administrator. It ensures product integrity through self-diagnostics and fast resolution to device concerns. To download and obtain additional information on L&TT go to http://www.hp.com/support/tapetools
HP DDS Media	HP's test program for HP DAT media is probably the most thorough and comprehensive in the industry. HP data cartridges must satisfy an exhaustive battery of additional tests that relate directly to real life situations, where real data and real businesses are at stake. Over 1 million test hours on media and drives per year ensure that HP data cartridges will always offer maximum reliability even in the most extreme conditions. HP recommends that customers always use HP branded media to ensure stress-free backup and complete peace of mind.

QuickSpecs

Compatibility

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HP's extensive compatibility testing program assures that HP DAT drives work with leading servers, operating systems, and backup applications -- and not just those sold by HP. HP DAT drives work seamlessly in many environments, making them especially suitable if you have a mixed system environment. For the latest list of servers, workstations, operating systems, and backup software that support HP DAT drives, check the tape backup compatibility pages at: http://www.hp.com/storage/SPOCK.

HP Server and Workstation Compatibility with SCSI drives	HP DAT SCSI drives are compatible with HP ProLiant servers, HP 9000 servers, Integrity Servers, Alpha Servers and HP Workstations, as well as many third-party servers. HP DAT SCSI drives are supported on the following classes of HP systems: • HP ProLiant DL servers* • HP ProLiant ML servers • HP Alpha Servers • HP 9000 servers • HP Integrity servers • HP Personal and RISC Workstations For details of which tape drive models work with which systems, including third-party systems, visit http://www.hp.com/storage/SPOCK for the latest hardware compatibility information.
HP Server Compatibility with USB drives	HP DAT USB drives are compatible with HP ProLiant servers and HP workstations, as well as many third-party servers. HP DAT USB drives are supported on the following classes of HP systems: • HP ProLiant DL servers* • HP ProLiant ML servers • HP Personal Workstations For details of which tape drive models work with which systems, including third-party systems, visit http://www.hp.com/storage/SPOCK for the latest hardware compatibility information. **NOTE:** HP recommends that no more than one DAT USB tape drive be connected to a system at a time. * HP ProLiant DL family G6 servers do not support internal tape devices
OS Support for SCSI DAT drives	Microsoft® Windows®, Novell NetWare, HP-UX, Linux (various distributions), HP Tru64, HP OVMS, IBM AIX, Sun Solaris, and other operating systems **NOTE:** Please visit http://www.hp.com/storage/SPOCK for the latest compatibility information.
OS Support for USB DAT drives	Microsoft® Windows®, Linux (various distributions) **NOTE:** Please visit http://www.hp.com/storage/SPOCK for the latest compatibility information.
Backup Software Support for SCSI drives	HP Data Protector Software, Yosemite Server Backup Basic (option to download), HP Data Protector Express Basic HP Data Protector Express Software, Symantec Backup Exec, CA BrightStor ARCServe Backup and other backup applications

QuickSpecs

Compatibility

RETIRED

NOTE: Please visit: http://www.hp.com/storage/SPOCK for the latest compatibility information.

Backup Software Support for USB drives

Yosemite Server Backup Basic (option to download), HP Data Protector Express Basic , HP Data Protector Express, CA BrightStor ARCServe Backup, Symantec Backup Exec, and other backup applications

NOTE: Please visit: http://www.hp.com/storage/SPOCK for the latest compatibility information.

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Service and Support, HP Care Pack, and Warranty Information

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Warranty and Services Included with the HP DAT Products	Hewlett-Packard provides a 3-year, next-day, product exchange, limited warranty, for all DAT Tape Drives (excluding the DAT24 USB Tape Drive), plus 9x5 phone--support for the duration of the warranty. For more information about HP's Global Limited Warranty and Technical Support, visit: www.hp.com/storage/warranty
HP Care Pack Information	HP Care Pack Services: Packaged server and storage services for increased uptime, productivity and ROI When you buy HP server and storage products and solutions, it's also a good time to think about what levels of support you may need. Our portfolio of service options reduce deployment and management worries while helping you get the most out of your server and storage investments. We take a holistic approach to your environment, bridging servers, blades, storage, software and network infrastructures with our packaged HP Care Pack Services for servers and storage. Protect your business beyond warranty When it comes to robustness and reliability, standard computing equipment warranties have matured along with technology. Good news that can also create problems stemming from depending on standard warranties designed to only protect against product defects and some downtime causes. Using a standard approach to warranty uplifts, such as HP Care Pack Services, helps reduce downtime risks and provides operational consistency for mission-critical and standard business computing. HP Care Pack Services: Upgrading or extending standard server and storage warranties cost effectively HP Care Pack Services offer a standard reactive hardware and software support services suite sold separately, or combined with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of integrated proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition with HP Proactive Select, you can acquire the specific proactive constancy and technical services. HP Proactive Select menu offers a broad set of service options that you can mix and match depending on your specific requirements. Proactive service options include offers for server, storage, network, SAN device, software, environment and education services. HP server and storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education Services offer flexible, comprehensive training on to help your IT staff get the most out of your server and storage investments. HP Financial solutions extend innovative financing and cost-effective asset management programs-from purchase to equipment retirement. Learn more: www.hp.com/services/servers and www.hp.com/services/storage **NOTE:** Care Pack Services availability may vary by product and country. HP Care Pack Services are sold by HP and HP Authorized Service Partners: • Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools. • Customers purchasing from a commercial reseller can find HP Care Pack Services at http://www.hp.com/go/lookuptool

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HP DAT Tape Drives

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Service and Support, HP Care Pack, and Warranty Information

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Recommended HP Care Pack Services for optimal satisfaction with your HP product	**3 years HP Support Plus 24** For a higher return on your storage investment, HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year combined reactive support option delivers onsite hardware support and over-the-phone software support around-the-clock. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure. • Improve uptime with responsive hardware and software services • Enjoy consistent service coverage across geographically dispersed sites • Update HP software at a predictable cost • Increase customer satisfaction-with no interoperability gaps http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EEE
Recommended Deployment	**HP Installation Service.** For smooth startup and better business outcomes, HP Hardware Installation - this service provides initial hardware installation of your product into your technology environment (system configuration is not included). In today's new era of business technology- customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure. Service Features: • Installation in accordance with your business's configuration requirements • The ability to achieve more effective data management http://h71028.www7.hp.com/ERC/downloads/5981-9356EN.pdf
Important Notice for Tape Drives Installed in a 1U or 3U Rack Mount Kit	**NOTE:** These Care Packs do not apply to Tape Drives mounted in a 1U or 3U Rack Mount Kit. The HP Rack Mount Kit Care Pack covers all possible configurations of Tape Drives. Hence the Care Packs for 1U & 3U Rack Mount Kit covers all drives purchased with the Rack Mount Kit. Please follow the following URL for the correct Care Pack Services and descriptions. http://h18000.www1.hp.com/products/quickspecs/10854_div/10854_div.PDF
Important Notice for Internal Tape Drives Installed in an HP Server	**NOTE:** These Care Packs do not apply to Internal Tape Drives because they do not have Care Packs associated with them if they are mounted in an HP Server. Hence the Care Packs for the HP Server covers all drives purchased with the Rack Mount Kit. Please follow the following URL for the correct Care Pack Services and descriptions. For Proliant use - http://h18000.www1.hp.com/products/quickspecs/ProductBulletin.html For BCS use - http://h18000.www1.hp.com/products/quickspecs/ProductBulletin.html

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HP DAT Tape Drives

Service and Support, HP Care Pack, and Warranty Information

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Optional HP Care Pack Services that will enhance your HP product experience.

5-Year HP Support Plus 24

As an alternative to our recommended support level, for customers who need to improve uptime with responsive 24x7 product support:

HP Support Plus 24 helps you increase performance and availability with comprehensive, consistent hardware and software services. Working with your IT team, HP Services engineers deliver onsite hardware support and over-the-phone software support around-the-clock 365 days per year. Service coverage encompasses HP products and selected multivendor hardware and software.

In addition, this convenient HP Care Pack packaged service makes software updates available to you at substantial savings.

Choose Support Plus 24 when you need to:

- Improve uptime with responsive hardware and software services available anytime
- Cost-effectively obtain expert 24x7 multivendor hardware and software support
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP and selected third-party software at a predictable cost
- Take advantage of subscription savings on software updates

http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EN.pdf

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal
The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit http://www.hp.com/support.

Customer Technical Training

HP Education Services
In today's cost-conscious business environment, IT professionals, developers, consultants and users face an interesting challenge: how to keep up with the latest technologies and expand important skills while delivering profitable results on current projects. To help address this challenge, HP offers

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Service and Support, HP Care Pack, and Warranty Information

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innovative training solutions that help keep you up-to-date on virtualization, server, storage, Insight Control, Citrix, Microsoft® and open source/Linux-related topics-while spending less time away from business-critical activities.

HP Services Awards   HP Technology Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction.

Additional Services Information   To learn more on HP ProLiant servers, HP BladeSystem servers and HP storage products, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: www.hp.com/services/proliant or www.hp.com/services/bladesystem or http://www.hp.com/services/storage

QuickSpecs

Kit Contents

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HP StorageWorks DAT 160 Tape Drives

Model	Part Number

HP StoreEver DAT 160 SCSI Internal Tape Drive — Q1573B

DAT 160 SCSI Internal Tape Drive, installation poster, HP StorageWorks CD (containing electronic user's guide and drivers), Yosemite Server Backup Basic (option to download), SCSI ribbon cable (68-pin wide HD LVD), HP DAT 160 data cartridge, HP DAT 160 cleaning cartridge.
NOTE: 0D1 will appear after this part number on your sales order if factory integration is indicated.

HP StoreEver DAT 160 SCSI External Tape Drive — Q1574B

DAT 160 SCSI External Tape Drive, installation poster, HP StorageWorks CD (containing electronic user's guide and drivers), Yosemite Server Backup Basic (option to download), SCSI cable (68-pin Wide VHD-HD LVD), LVD/SE SCSI multi-mode terminator, power cord, HP DAT 160 data cartridge, HP DAT 160 cleaning cartridge.

HP StoreEver DAT 160 USB Internal Tape Drive — Q1580B

DAT 160 USB Internal Tape Drive, installation poster, HP StorageWorks CD (containing electronic user's guide and drivers), Yosemite Server Backup Basic (option to download), standard USB cable, USB cable for internal ProLiant connect, USB cable for internal connect to an Intel motherboard header, screws, HP DAT 160 data cartridge, HP DAT 160 cleaning cartridge.
NOTE: 0D1 will appear after this part number on your sales order if factory integration is indicated.

HP StoreEver DAT 160 USB External Tape Drive — Q1581B

DAT 160 USB External Tape Drive, installation poster, HP StorageWorks CD (containing electronic user's guide and drivers), Yosemite Server Backup Basic (option to download), integral USB cable, power cord, HP DAT 160 data cartridge, HP DAT 160 cleaning cartridge.

HP StoreEver DAT 160 USB in 1U Rack-mount Kit — AG703C

Single DAT 160 integrated in a 1U USB Rack-Mount enclosure with power supply and fan (up to 2 half-height tape drives supported), installation poster, HP StorageWorks CD (containing electronic user's guide and drivers), Yosemite Server Backup Basic (option to download), integral USB cable, power cord, rail kit, HP DAT 160 data cartridge, HP DAT 160 cleaning cartridge.
NOTE: Single drive installed in a 1U Rack-mount kit
NOTE: 0D1 will appear after this part number on your sales order if factory integration into a rack is indicated.

QuickSpecs

HP DAT Tape Drives

Options

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NOTE: This is a list of related options. Some may be discontinued.

Host Bus Adapters, Controllers, and Accessories for ProLiant Servers	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter **NOTE:** Recommended SCSI HBA for connecting DAT tape drives to G6/G7/Gen8 ProLiant servers.	412911-B21
	HP H222 Host Bus Adapter **NOTE:** Recommended SAS HBA for connecting DAT tape drives to Gen8 ProLiant servers.	650926-B21
	HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller **NOTE:** SAS HBA for connecting DAT tape drives to Gen8 ProLiant servers.	631667-B21
	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller **NOTE:** Recommended SAS HBA for connecting DAT tape drives to G6/G7 ProLiant servers.	462828-B21
	Please visit: http://www.hp.com/storage/SPOCK for a complete list of DAT tape drive compatibility with ProLiant servers and other industry standard servers.	
Controllers for Third-Party Servers	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
	NOTE: Please refer to the following web page for further information: http://www.hp.com/storage/SPOCK	
Media	HP DDS-2 8 GB Data Cartridge (120m)	C5707A
	HP DDS-3 24 GB Data Cartridge (125m)	C5708A
	HP DDS-4 40 GB Data Cartridge (150m)	C5718A
	HP DAT 72 Data Cartridge (170m)	C8010A
	HP DAT 160 160GB Data Cartridge	C8011A
	HP DAT 320 320GB Data Cartridge	Q2032A
	HP DDS/DAT Cleaning Cartridge	C5709A
	HP DAT 320 Cleaning Cartridge	Q2039A
	HP DDS/DAT Cleaning Cartridge II	C8015A
Rack-Mount Options	HP StoreEver 1U SAS Rack-mount Kit **NOTE:** 1U SAS Rack-Mount Kit holds up to two internal DAT SAS drives (and other SAS tape technologies). **NOTE:** Please refer to the following web page for further information: http://h18006.www1.hp.com/storage/tapestorage/rackmount.html	AE459B
	HP StoreEver 3U SAS Rack-mount Kit **NOTE:** 3U SAS Rack-Mount Kit holds up to four internal DAT SAS drives (and other SAS tape technologies). **NOTE:** Please refer to the following web page for further information: http://h18006.www1.hp.com/storage/tapestorage/rackmount.html	AG576B

QuickSpecs

Options

RETIRED

	HP StoreEver 1U SCSI Rack-mount Kit **NOTE:** 1U SCSI Rack-Mount Kit holds up to two internal DAT SCSI drives (and other SCSI tape technologies). **NOTE:** Please refer to the following web page for further information: http://h18006.www1.hp.com/products/storageworks/1urackmount/index.html	A7445C
	HP StoreEver 1U USB Rack-mount Kit **NOTE:** 1U USB Rack-Mount Kit holds up to two internal DAT USB drives **NOTE:** Please refer to the following web page for further information: http://h18006.www1.hp.com/products/storageworks/1urackmount/index.html	A8007B
	HP USB Cable/Panel Option Kit ALL **NOTE:** This cable kit can be purchased to convert a 1U SCSI rack-mount kit to a USB interface to support the DAT USB drives. It includes 1 - 5 meter USB cable, 1- plastic grommet, 1- metallic panel, and documentation. All pieces are pre-assembled for easy implementation.	396114-B21
	HP StoreEver 3U SCSI Rack-mount Kit **NOTE:** 3U Rack-Mount Kit holds up to four internal SCSI DAT drives (and other SCSI tape technologies). **NOTE:** Please refer to the following web page for further information: http://h18006.www1.hp.com/products/storageworks/3urackmount/index.html	274338-B22
SCSI Cable Kits	VHDCI/Wide 12 Ft. Cable	341177-B21
	HP 0.5m HDTS68 M/M Multimd SCSI Cable	C2978B
	HP 1m HDTS68 M/M Multimd SCSI Cable	C2911C
	HP 2.5m HDTS68 M/M Multimd SCSI Cable	C2924C
	HP 1m VHDTS68/HDTS68 M/M Multimd SCSI Cable	C2361B
	HP 2.5m VHDTS68/HDTS68 M/M Multi SCSI Cable	C2362B
	HP 5m VHDTS68/HDTS68 M/M Multimd SCSI Cable	C2365B
	HP 10m VHDTS68/HDTS68 M/M Multim SCSI Cable	C2363B
SAS Cable Kits	HP Mini-SAS Cable for DAT Internal Tape Drive **NOTE:** Use this cable to connect HP DAT internal tape drives to Mini-SAS (SFF8087) ports.	AP747A
	HP SAS External-Min 1x-2M Cable Assembly Kit **NOTE:** Use this cable to connect HP SAS external tape devices to HP SAS controllers with Infiniband (SFF8470) connectors.	AE466A
	HP 1U SAS Ext-Min 1x-4M Cable Assembly Kit **NOTE:** Use this cable to connect HP SAS external tape devices to HP SAS controllers with Infiniband (SFF8470) connectors.	AE468A
	HP SAS Min-Min 1x-2M Cable Assembly Kit **NOTE:** Use this cable to connect HP SAS external tape devices to HP SAS controllers with external Mini-SAS (SFF8088) connectors.	AE470A
	HP SAS MIN-MIN 1X-4M Cable Assembly Kit **NOTE:** Use this cable to connect HP SAS external tape devices to HP SAS controllers with external Mini-SAS (SFF8088) connectors.	AE465A
	HP 1U SAS TP I-E 3HDDs X 1Tape Drive X4M Server Cable Assembly Kit	AE464A

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Options

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NOTE: This split cable connects internally to SAS Hard Drive Cage (3x) and externally to the tape device (1x) with other connector attaching to HP SAS controllers with SAS 4i (SFF8484) connectors. The 1x cable occupies additional PCI slot on the server.

HP SAS MIN-MIN 3X1X-5M Cable Assembly Kit   AG452A

NOTE: This split cable connects internally to SAS Hard Drive Cage (3x) and externally to the tape device (1x) with other connector attaching to the Smart Array P400i controller inside a DL360 G5 or DL365 G5 server. The 1x cable occupies additional PCI slot on the server.

QuickSpecs

Technical Specifications

Dimensions		DAT 160
	Form Factor	Half-height, 5¼ inches (internal and array module)
	Physical (HxWxD) **SCSI Internal**	1.6 x 5.7 x 7 in (4.0 x 14.5 x 17.7 cm)
	Physical (HxWxD) **USB Internal**	1.6 x 5.7 x 7.2 in (4.0 x 14.5 x 18.3 cm)
	Physical (HxWxD) **SCSI/USB External**	2.6 x 7.1 x 9.3 in (6.7 x 18.1 x 23.6 cm)
	Shipping (HxWxD) **SCSI Internal**	6.3 x 9.25 x 9.05 in (16.0 x 23.5 x 23.0 cm)
	Shipping (HxWxD) **USB Internal**	6.3 x 9.25 x 9.05 in (16.0 x 23.5 x 23.0 cm)
	Shipping (HxWxD) **SCSI External**	8.85 x 12.6 x 11.02 in (22.5 x 32.0 x 28.0 cm)
	Shipping (HxWxD) **USB External**	8.85 x 12.6 x 11.02 in (22.5 x 32.0 x 28.0 cm)

Weight		DAT 160
	Out of box SCSI/USB Internal	2.1 lb (.95 kg)
	Out of box SCSI/ USB External	4.2 lb (1.90 kg)
	Shipping USB/SCSI Internal	3.2 lb (1.44 kg)
	Shipping USB/SCSI External	6.4 lb (2.9 kg)

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HP DAT Tape Drives

Technical Specifications

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Capacity		DAT 160
	Native	80GB
	Compressed (assumes 2:1data compression)	160GB
	Buffer Size	16 MB

Performance		DAT 160
	Sustained Transfer Rate (native) Where 1KB = 1,000 Bytes	6.9 MB/s*
	Sustained Transfer Rate (with 2:1 data compression) Where 1KB = 1,000 Bytes	13.8 MB/s*
	Burst Transfer Rate (SAS interface) Where 1KB = 1,000 Bytes	3 Gb/s
	Burst Transfer Rate (SCSI interface) Where 1KB = 1,000 Bytes	6.9 MB/s (asynchronous) 160 MB/s (synchronous)
	Burst Transfer Rate (USB interface)Where 1KB = 1,000 Bytes	40 MB/s
	Data Access Time	50 s
	Average Load Time	35 s
	Average Unload Time	35 s
	Rewind Time	92 s (end to end)

Reliability		DAT 160
	MTBF	125,000 hours at 100% duty cycle
	Uncorrected Error Rate	1×10^{-17} bits read

Media		DAT 160
	Recommended media	DAT 160 (150m, wide tape)
	Backward read-write compatibility	DAT 72 (170m) DDS-4 (155m)

Tape Format		DAT 160
	Recording Method	8 mm helical scan
	Recording Format	DAT 160, DAT 72, DDS-4

QuickSpecs

HP DAT Tape Drives

Technical Specifications

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Data Compression	Lempel-Ziv (DCLZ)
Error Detection/Correction	Reed-Solomon
Data Encoding Method	Partial Response Maximum Likelihood (PRML)

Interface	**DAT 160**
SCSI Interface	SCSI-3 Ultra 160 LVD
SCSI Connector	Internal: 68-pin wide HD LVD External: 68-pin wide LVDS, thumbscrew Array module: 80-pin EBBI
USB Interface	USB 2.0
USB Connector	USB standard series B receptacle
Termination - is only required for the SCSI product	No terminator is required for internal model (assumes use of terminated cable). External model requires termination with multimode terminator (included with product). SCSI Array module requires termination with multimode terminator (ordered separately - p/n C2364A).

Power Specifications		**DAT 160**
Power Requirements (SCSI-2 internal, hot-plug, and array module)		n/a
Power Requirements (USB, SCSI-3 internal and SAS and array module)		+5V ± 5% (100mV Max ripple) @1.1A +12V ± 10% (150mV Max ripple) @0.4A
Power Requirements (external)		100 to 240 VAC, 50-60 Hz, auto-ranging
Power consumption (SAS) (average)		10.3 Watts
Power consumption (SCSI) (average)		10.3 Watts
Power consumption (USB) (average)		10.3 Watts

Environmental Specifications (all models)	**Relative Humidity**	**Storage**	5% to 95%
		Operating	20% to 80%
	Temperature Range	**Storage**	-40° to 158° F/(-40° to 70° C)
		Operating	41° to 104° F/(5° to 40° C)

Standards Compliance cCSAus Certification to C22.2, No. 60950, TÜV EN60950 (IEC 60950), FCC and CE Declaration of

QuickSpecs

Technical Specifications

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Conformity, C-TICK Approved (AS/NZS CISPR22), VCCI Approved, RRL Approved, BSMI Approved, GOSH Approved

DAT 72 drive LED Indicators (with 2 LED indicators)		Tape LED	Clean LED	Meaning
	Tape Ready Signal	On steady	Off	The data cartridge is loaded and the drive is ready.
	Tape Loading Signal	Flashing slowly	Off	The cartridge is loading or unloading, or power-on self-test is in progress
	Tape Activity Signal	Flashing rapidly	Off	The cartridge is loaded, activity is occurring.
	Media Caution Signal	Off or flashing	Flashing slowly	If the media caution signal is displayed: • The drive has detected that cleaning is required to maintain good performance. • Wait for the current operation to finish and clean the drive with an appropriate cleaning media, ensuring it has not expired. • Continue to use the drive as before. If the signal repeats, consider changing the data media for new media when convenient. • Regular cleaning (every 24 hours of tape pulling or weekly) can prevent this signal being shown.
	Error Condition Signal	Off	On steady	HP DAT drives perform a comprehensive self-test during power-up. If a hard error causes the self-test to fail, the clean light changes to steady amber. Run HP Library & Tape Tools to help diagnose the problem.
	OBDR Signal	Both flashing slowly in an alternating pattern		The tape drive is in disaster recovery mode, restoring the operating system.

DAT 160 drive LED Indicators (with 4 LED indicators)		Ready LED	Clean LED	Tape LED	Drive LED	Meaning
	Tape Ready Signal	On steady	Off	Off	Off	The data cartridge is loaded and the drive is ready.
	Tape Loading Signal	Flashing slowly	Off	Off	Off	The cartridge is loading or unloading, or power-on self-test is in progress
	Tape Activity	Flashing	Off	Off	Off	The cartridge is loaded, activity is

RETIRED: Retired products sold prior to the November 1, 2015 separation of Hewlett-Packard Company into Hewlett Packard Enterprise Company and HP Inc. may have older product names and model numbers that differ from current models.

Technical Specifications

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Signal					
Signal	rapidly				occurring.
Cleaning Advisory Signal	Off or flashing	Flashing slowly	Off	Off	If the cleaning advisory signal is displayed:

If the cleaning advisory signal is displayed:

- The drive has detected that cleaning is required to maintain good performance.
- Wait for the current operation to finish and clean the drive with an appropriate cleaning media, ensuring it has not expired.
- Continue to use the drive as before. If the signal repeats, consider changing the data media for new media when convenient.
- Regular cleaning (every 24 hours of tape pulling or weekly) can prevent this signal being shown.

Media Caution Signal	Off or flashing	Off	Flashing slowly	Off	If the media caution signal is displayed:

If the media caution signal is displayed:

- The drive has detected that the data media being used is likely to be nearing the end of its life, damaged or degraded.
- It is recommended that once the current operation is complete, the drive is cleaned with appropriate media and the data media changed.
- If required, the data from the media flagged as suspect should be transferred to a new media cartridge.

Drive Caution Signal	Off or flashing	Off	Off	Flashing slowly	If the drive caution signal is displayed:

If the drive caution signal is displayed:

- The drive has detected that the performance of the drive has become degraded.
- There is an unusual state which is only triggered when there have been issues with multiple data media and the drive has been cleaned

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HP DAT Tape Drives

Technical Specifications

RETIRED

			regularly.
			• If this occurs, please use Library and Tape Tools to perform further diagnosis or contact HP support for further advice.
Error Condition Signal	Off	On steady	HP DAT drives perform a comprehensive self-test during power-up. If a hard error causes the self-test to fail, the clean light changes to steady amber. Run HP Library & Tape Tools to help diagnose the problem.
OBDR Signal	Pulsing (2 flashes followed by a pause)		The tape drive is in disaster recovery mode, restoring the operating system.

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Summary of Changes

RETIRED

Date	Version History	Action	Description of Change:
13-Feb-2015	From Version 41 to 42	Retire	QS was Obsolete, PM Laura Loredo asked to retire.
29-Aug-2013	From Version 40 to 41	Changed	Changes were made throughout the QuickSpec
29-Mar-2013	From Version 39 to 40	Removed	Removed HP DAT 40 and DAT 320 Tape Drive information from entire QS.
		Changed	Overview:Updated What's New with: Yosemite Server Backup Basic has replaced Data Protector Express Basic as the software (downloadable) included with the HP DAT tape drives. Features: Updated Key Features section. Product Highlights: Updated DDS Technology section.
05-Oct-2012	From Version 38 to 39	Changed	Change made to URL in Service and Support, HP Care Pack and Warranty Information section.
21-Sep-2012	From Version 37 to 38	Changed	Change made to URL in Service and Support, HP Care Pack and Warranty Information section.
13-Aug-2012	From Version 36 to 37	Changed	Changes made throughout the QuickSpec.
08-Jun-2011	From Version 35 to 36	Removed	Removed StorageWorks throughout the document.
29-Apr-2011	From Version 34 to 35	Changed	Updated the following: Product Highlights, changed SKM to ESKM and updated the url.
15-Apr-2011	From Version 33 to 34	Changed	HP StorageWorks DAT 160 and 320 Tape Drive descriptions were revised.
12-Nov-2010	From Version 32 to 33	Changed	Rack-Mount Tape Options was modified URL was added to Easy and economical upgrade of the included software to Data Protector Express SCSI Offline Hot-Swap Technology was removed from Product Highlights HP StorageWorks Tape Array 5300 Field Rack was removed from Rack-Mount Options
27-Sep-2010	From Version 31 to 32	Changed	Key Features and Customer Benefits were moved into Features Software in the Box was changed to Included software and Easy and economical upgrade of the included software to Data Protector Express and Data Protector backup and recovery software were added in Product Highlights Revisions were made throughout Service and Support, HP Care Pack, and Warranty Information

QuickSpecs

Summary of Changes

RETIRED

			Kit Contents was completely revised
			Part numbers for IU Rack-Mount, 1U SCSI Rack-Mount, 1U USB Rack-Mount and 3U SAS Rack-Mount Kits were changed
			HP Data Protector Express Basic was added to Backup Software Support for SAS, SCSI and USB Drives in Compatibility
			Models were removed from the Overview
			Host Bus Adapters and Controllers for AlphaServers was removed from Options
			SCSI Cable LVD, HVD or SE (Multimd) HDTS68 Controller 5m and 10m were removed from SCSI Cable Kits
16-Nov-2009	From Version 30 to 31	Changed	Changes made throughout the entire document.
21-Apr-2009	From Version 29 to 30	Changed	Changed the title to included "DAT".
30-Mar-2009	From Version 28 to 29	Changed	Completely revised SAS Cable Kits in the Options section.
26-Jan-2008	From Version 27 to 28	Changed	Change made to the first Overview image.
25-Jan-2008	From Version 26 to 27	Added	"For tape drives and media, 1 GB = 1 billion bytes. Actual formatted capacity is less." was added as the last line in the Copy Right information.
12-Nov-2007	From Version 25 to 26	Changed	Changes made throughout the entire document.
06-Aug-2007	From Version 24 to 25	Changed	Changes made to the North America and Canada QuickSpecs only.
20-Jul-2007	From Version 23 to 24	Changed	The Key Features object in the Overview section, Software in Box object in the Product Highlights section, and the Kit Contents section received sections focusing on the Title change of the document.
19-Jun-2007	From Version 22 to 23	Changed	Changes made throughout the entire document.
07-Jun-2007	From Version 21 to 22	Added	Added EMEA version.
09-Feb-2007	From Version 20 to 21	Removed	Removed DAT 24 from throughout the entire QuickSpec.
26-Jan-2007	From Version 19 to 20	Changed	Changes made throughout the entire QuickSpec except for the Compatibility and Service and Support sections. Most changes included the Removal of all references to "Hot-Plug".
08-Dec-2006	From Version 18 to 19	Changed	Changes made throughout the Service and Support section only.
13-Oct-2006	From Version 17 to 18	Changed	The information for the DAT24 SCSI related to the Interface Object in the Technical Specifications Section was changed to N/A.
01-Sep-2006	From Version 16 to 17	Changed	Updated the following sections: Overview, Product Highlights, Kit Contents and Technical Specifications.
26-May-2006	From Version 15 to 16	Changed	Changed the Images for the External Models.
20-Mar-2006	From Version 14 to 15	Changed	Changes made throughout the entire document.
17-Mar-2006	From Version 13 to 14	Changed	Changes made throughout the entire document, including

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HP DAT Tape Drives

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			the removal of DAT 24 SCSI.
26-Sep-2005	From Version 12 to 13	Changed	Changes made throughout the entire document.
12-Sep-2005	From Version 11 to 12	Changed	Changes made throughout the entire document.
27-Jun-2005	From Version 10 to 11	Changed	This QuickSpec was completely rewritten for this announcement.
19-Apr-2005	From Version 9 to 10	Changed	Fixed PDF Print Problem
08-Apr-2005	From Version 8 to 9	Changed	Minor changes made in Product Highlights, Compatibility and Options.
28-Feb-2005	From Version 7 to 8	Changed	Minor changes made throughout the entire document.
15-Oct-2004	From Version 6 to 7	Added	DAT 72 Tape Drive DAT 72 Rack-mount NOTE: Single drive installed in a 1U Rack-mount kit. A7443A
			DAT 72 Tape Drive DAT 72 Rack-mount NOTE: Single drive installed in a 1U Rack-mount kit. A7443A
04-Aug-2004	From Version 5 to 6	Changed	Changes made throughout the entire document.
26-May-2004	From Version 4 to 5	Removed	Backwards CompatibilityHP DDS tape drives are backward read-write compatible with previous DDS generations, thus: DAT 72 also reads and writes DDS-3 and DDS-4 (and reads DDS-2) DAT 40 also reads and writes DDS-3 and DDS-2 (and reads DDS-1 90m tapes)* DAT 24 also reads and writes DDS-1 and DDS-2 NOTE: The DAT 40 hot-plug drive is an exception. This drive is read-write compatible with DDS-3 and read compatible with DDS-2.
			Backwards CompatibilityHP DDS tape drives are backward read-write compatible with previous DDS generations, thus: DAT 72 also reads and writes DDS-3 and DDS-4 (and reads DDS-2) DAT 40 also reads and writes DDS-3 and DDS-2 (and reads DDS-1 90m tapes)* DAT 24 also reads and writes DDS-1 and DDS-2 NOTE: The DAT 40 hot-plug drive is an exception. This drive is read-write compatible with DDS-3 and read compatible with DDS-2.

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Summary of Changes

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24-May-2004	From Version 3 to 4	Added	The following Note has been added to several available models: *NOTE: 0D1 will appear after this part number on your sales order if factory integration is indicated.
17-May-2004	From Version 2 to 3	Changed	Changes made to the Models, Product Highlights, Compatibility, and Kit Contents sections.
24-Mar-2004	From Version 1 to 2	Changed	Changes made throughout the entire QuickSpec.

For tape drives and media, 1 GB = 1 billion bytes. Actual formatted capacity is less.