
Hewlett-Packard's Series 6000 SCSI Mass Storage Systems for HP Computers

Technical Data

- Fast/Wide differential SCSI and Single-ended SCSI
- 1- and 2-Gbyte SCSI disk drives
- Supports DAT, 8mm tape and CD-ROM drives
- Tested and supported on HP Systems

The Complete Mass Storage System with Fast/Wide SCSI performance

Hewlett-Packard, with greater than two decades in the storage business, is among the first in the industry to introduce storage products with a fast/wide differential SCSI interface. The HP Series 6000 mass storage systems, available in rackmount or compact mini-tower enclosures, offer a single-ended interface for HP 9000 Series 700 and Series 800 and HP 3000 Series 900 systems. A fast/wide differential interface is offered for HP 9000 Series 800 and HP 9000 Series 700 workstations. The fast/wide interface offers a 20 Mbyte-per-second transfer rate which make these storage systems the fastest available for HP systems. The channel transfer rate can be four times the transfer rate currently achieved with single-ended SCSI.



Reliable Disk Drive Storage

The mass storage products use 3.5-inch, 1- and 2-gigabyte* disk drives, among the most reliable on the market. The 2-gigabyte drive has a 500,000 hour Mean-Time-Between-Failures (MTBF) rate.

The high reliability of these drives reduces long-term cost of ownership. In addition, these drives have a unique "powerfail" feature which ensures data integrity in the event of a powerfail by preventing incomplete writes to the disk drive if power is lost.**

*Support of the new 2-gigabyte drive on HP 9000 Series 700 is planned.

**Powerfail support available on HP 9000 Series 800 and HP 3000 Series 900 only.

Tailored Mass Storage

The HP Series 6000 SCSI mass storage systems consist of a rackmount or mini-tower cabinet which houses disk drives and, with single-ended systems, CD-ROM, 8mm tape and DAT drives as well.

The rackmount model can hold up to five half-height (or three full-height) devices for a disk capacity of up to 10 gigabytes of storage and is designed to be mounted in 1.1-meter or 1.6-meter high 19-inch EIA cabinets.

The mini-tower model, for desk-side use, can hold up to seven half-height (or three full-height) devices for a disk capacity of up to 14 gigabytes of storage.

Dependable Secondary Devices

While the fast/wide differential SCSI version is for use with hard disks only, the HP single-ended mass storage systems allow users to mix and match CD-ROM, 8mm tape and DAT drives with hard disk storage.

The new high performance CD-ROM has a transfer rate of 376 Kbytes-per-second, more than double that of the previously offered drive. The 5.25-inch, half-height CD-ROM drive, commonly used for software distribution, database libraries, multimedia applications and more, has a capacity of 600 megabytes.

A popular backup choice for Unix workstations and servers is the newly supported 8mm tape drive. With a 5.25-inch, half-height form factor, this drive has a capacity of 5-gigabytes without compression and up to 10-gigabytes with compression.

Convenient for backup and software distribution, the DAT drive's compact 3.5-inch form factor needs only one half-height bay. Storage capacities range from 2-gigabytes without data compression, up to 8-gigabytes with data compression.

The single-ended version of the Series 6000 is designed to be flexible, enabling the system to be tailored to users' specific storage needs.

Hewlett-Packard Quality and System Compatibility

As with all HP products, the disk drives in Series 6000 mass storage systems have been extensively qualified and tested on HP systems and operating systems to ensure complete system and storage compatibility, as well as data integrity.



HP Computer Museum

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Device Support Matrix

	1 gigabyte SE	1 gigabyte FW	2 gigabytes SE	2 gigabytes FW	DAT	CD-ROM	8mm
9000 S/300	9.0 ¹	N/A	N/A	N/A	9.0	N/A	N/A
9000 S/400	9.0	N/A	N/A	N/A	9.0	N/A	N/A
9000 S/700	9.0 ³	9.01 ⁴	Planned	Planned	8.07	9.03 ⁷	N/A
9000 S/800	9.0 ³	9.04	9.04	9.04	9.0 ²	9.04	9.04
3000 S/900	4.0	N/A	4.0 ⁶	5.0 ⁵ Planned	4.0	4.0 ⁶	N/A

1 excluding 310, 318, 320

2 w/8X7 backup only is provided w/8.02

3 8.02/8.07 non-boot non root support available with patch (P/N C3301A)

4 Only on certain S/700 models that support fast/wide

5 Fast/wide support on S/9X7, S/9X8 and corporate business system only

6 Requires patch. Contact your CE for details

7 Support at 9.0 is provided with 9.0 update

SE = single-ended

FW = fast/wide

Ordering Information

(All mini-tower and rackmount products include an enclosure, disk and/or DAT drives, power supply and power cord.)

Product Number Description

Single-ended Mini-tower Mass Storage Systems:

C3020T	1-gigabyte disk/2-gigabyte DAT
C3022T	1-gigabyte disk mini-tower
C3040T	2-gigabyte disk mini-tower
C3041T	4-gigabyte (2 X 2-gigabyte disks) disk mini-tower

Fast/Wide Mini-tower Disk Systems:

C3032T	1-gigabyte fast/wide disk mini-tower
C3550T	2-gigabyte fast/wide disk mini-tower
C3551T	4-gigabyte (2 X 2-gigabyte disks) fast/wide disk mini-tower
C3035T	4-gigabyte (4 X 1-gigabyte disks) fast/wide disk mini-tower
C3036T	7-gigabyte (7 X 1-gigabyte disks) fast/wide disk mini-tower

Single-ended Rackmount Mass Storage Systems:

C3022R	1-gigabyte disk rackmount
C3040R*	2-gigabyte disk rackmount
C3041R*	4-gigabyte (2 X 2-gigabyte disks) disk rackmount
C2466R	2-8 gigabyte DC DAT rackmount
C2467R	2 X 2-8 gigabyte DC DAT rackmount

Fast/Wide Rackmount Disk Systems:

C3032R	1-gigabyte fast/wide disk rackmount
C3550R	2-gigabyte fast/wide disk rackmount
C3551R*	4-gigabyte (2 X 2-gigabyte disks) fast/wide disk rackmount
C3035R	4-gigabyte (4 X 1-gigabyte disks) fast/wide disk rackmount

Expansion Kits:

C3027U	1-gigabyte single-ended disk drive expansion kit
C3044U	2-gigabyte single-ended disk drive expansion kit
C3037U	1-gigabyte fast wide disk drive expansion kit
C3554U	2-gigabyte fast wide disk drive expansion kit
C2478U	2-8 gigabyte DAT drive expansion kit (S/800, S/900)
C2298U	2-8 gigabyte DAT drive expansion kit (S/300, S/400, S/700)
C3560U	600-Mbyte CD-ROM drive expansion kit
A3024A	5-gigabyte 8mm tape drive expansion kit (option 003 - for mini-tower; option 004 - for rackmount)

CD-ROM Drive Specifications

Mode 1	Capacity:	599 megabytes
	User data block:	2,048 bytes
	Error rate:	1 x 10 ⁻¹²
Mode 2	Capacity:	683 megabytes
	User data block:	2,336 bytes
	Error rate:	1 x 10 ⁻⁹
Standard format:	Yellow/red book	
Performance (all mode 2,2X):	CD-ROM XA, Photo-CD, CD-Bridge, CD-1 ready	
Access time (includes latency):		
	Average (ms)	200 ms (max.)
	Maximum (ms)	330 ms (max.)
Data transfer rate: (average)	376 kilobytes/sec	
Channel transfer rate		
Asynchronous/Synchronous:	1.41 to 5.0 megabytes/sec	
Audio:	Front panel	
MTBF (hours):	50,000/20% duty cycle	
AFR (%):	18	



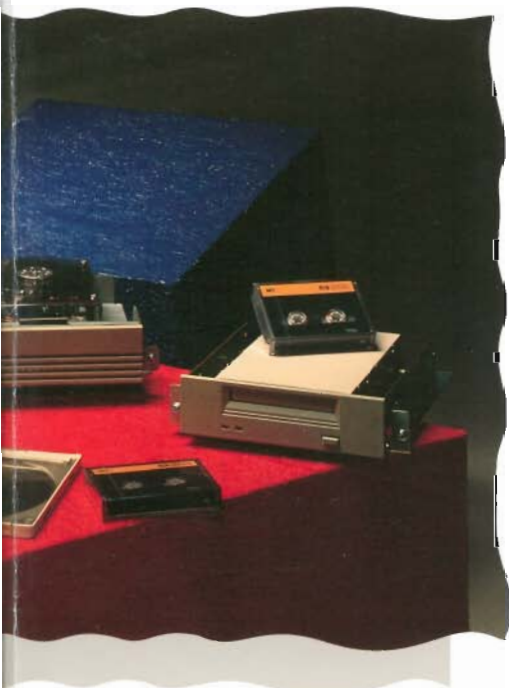
8mm Tape Drive Specifications

Formatted capacity (gigabyte):	5.0 to 10.0
Data Transfer Rate (sustained):	500 kilobytes/sec to 1 megabyte/sec
Channel Transfer Rate Asynchronous/Synchronous:	2.5 up to 5 megabytes/sec
Average Search:	
Speed	67 seconds
Format	EXB-8500, EXB-8500C
Error Rate	1×10^{-17}
MTBF (hours):	50,000/12% duty cycle
AFR (%):	16

Digital Audio Tape Drive Specifications

Formatted capacity (gigabyte):	2.0 to 8.0
Max. Tape Length (meters):	90
Data Transfer Rate (sustained):	183 to 732 kilobytes/sec
Channel Transfer Rate Asynchronous/Synchronous:	1.5/up to 5.0 megabytes/sec
Average Search:	
Speed	30 seconds
Format	DDS-DC*
Error Rate	1×10^{-15}
MTBF (hours):	50,000/12% duty cycle
AFR (%):	16

* DDS extended to support DCLZ



Ordering information (continued)

Ordering Options:

All disk only storage systems and disk drive expansion kits must be ordered with either option 001 (for HP 9000 S/300, 400, and 700) or option 002 (for HP 9000 S/800; HP 3000 S/900). Firmware on drives developed and tuned specifically for each system. Powerfail support is provided as well on the option 002 drives.

001	for HP 9000 Series 300, 400, 700 (only the 1-gigabyte drive is supported on the Series 300 and 400)
002	for HP 9000 Series 800 and 3000 Series 900
ABA	English manuals
ABF	French manuals
ABD	German manuals
ABJ	Japanese manuals
OSX	Field installation/service options

* Similar products may be ordered integrated with systems into a 19" EIA cabinet. The products have the suffix "RZ" instead of "R". A C3042RZ (3 x 2-gigabyte disks) and a C3552RZ (4 x 2-gigabyte fast/wide disks) are also available.

Accessories:

Single-ended SCSI:

K2296	.9-meter system to peripheral cable
K2297	1.5-meter system to peripheral cable
92222A	.5-meter peripheral to peripheral cable
92222B	1-meter peripheral to peripheral cable
92222C	2-meter peripheral to peripheral cable
92222D	1-meter (male to female) extender cable
K2291	terminator

Fast/Wide SCSI:

C2911A	.9-meter system/peripheral to peripheral cable
C2924A	2.5-meter system/peripheral to peripheral cable
C2925A	10-meter system/peripheral to peripheral cable
C2926A	20-meter system/peripheral to peripheral cable
C2905A	terminator

Other:

92283A	Box of five 60-meter (1.3-gigabyte) DDS cassettes
92283B	Box of five 90-meter (2-gigabyte) DDS cassettes (2-8 gigabytes with data compression)
92283Z	Master carton (20 of 92283A) 60-meter DDS cassettes
92283M	Master carton (20 of 92283B) 90-meter DDS cassettes
C2785A	1.1-meter 19-inch EIA cabinet
C2786A	1.6-meter 19-inch EIA cabinet
C3301A	patch tape for HP-UX 8.02/8.07 support of 1-gigabyte drive

Safety

IEC 950: 1986 +A1,A2 / EN 60950 (1988) +A1,A2
IEC 825: 1984 Laser Class 1 (where applicable)
UL 1950
CSA 950

Warranty

All products come with a one year on-site warranty.



Disk Specifications

Capacity/Recording Specifications		1 gigabyte	2 gigabytes		
Form factor/height		3.5"/half height	3.5"/half height		
Formatted capacity (megabytes)		1052	2132		
Bytes/sector (formatted)		512	512		
Megabytes/surface (formatted)		80.9	118.4		
Performance Specifications		1 gigabyte	2 gigabytes		
Channel transfer rate (megabytes/sec)					
Asynchronous/Synchronous (single-ended):		2.5/up to 10**	2.5/up to 10**		
Asynchronous/Synchronous (fast/wide):		5.0/up to 20	5.0/up to 20		
Drive (burst) transfer rate (megabytes/sec):		3.1 to 5.3	4.5 to 7.1		
Drive (sustained) transfer rate (megabytes/sec):		2.2 to 3.8	3.1 to 5.4		
Seek time (includes settling; ms):					
Average random (reads/writes)		10.2/11.2	9.0/10.5		
Maximum		22	18		
Average latency		5.6	5.6		
Rotational speed (RPM):		5400	5400		
Controller overhead (microseconds):		500	<500		
MTBF (hours):		300,000	500,000		
AFR (%)*:		3	2		
Power Requirements		With Enclosure		Each Additional Disk	
		1 gigabyte	2 gigabytes	1 gigabyte	2 gigabytes
Voltage (V):		88-268	88-268	NA	NA
Frequency (Hz):		47.5-63	47.5-63	NA	NA
Phase:		single	single	NA	NA
Power (watts; 120V/230V):					
Maximum		64/64	69/69	19/19	31/24
Typical		46/47	51/51	15/15	24/19
Current (amps; 120V/230V):					
Maximum		.96/.66	1.08/.70	.33/.15	.44/.24
Typical		.73/.49	.79/.53	.12/.1	.25/.12
Heat dissipation (typical) BTU/hr.:		161	175	51	82/65
Reliability (MTBF; hours):		>120K	>140K	***	***
Environmental Requirements		Operating		Non-operating	
(including enclosure)					
Temperature: Disk		5° to 45° C		-40° to 65° C	
DAT		5° to 40° C		-40° to 70° C	
CD-ROM		5° to 50° C		-10° to 65° C	
8mm		5° to 40° C		-40° to 60° C	
Humidity: Disk, CD-ROM		8° to 80% RH		5° to 80% RH	
DAT		20° to 80% RH		5° to 95% RH	
8mm		20° to 80% RH		10° to 90% RH	
Shock:		4 g max at 11 ms half sine wave form (no data loss)		20 g max at 11 ms half sine wave form (no data loss)	
Vibration:		0.2 g RMS / 5 to 500 Hz		2 g RMS / 5 to 500 Hz	
Altitude: Disk		-61 to 3,048 meters		-305 to 15,240 meters	
DAT		0 to 4,600 meters		0 to 15,240 meters	
CD-ROM		-305 to 3,048 meters		-305 to 12,500 meters	
8mm		-305 to 3,048 meters		-305 to 3,048 meters	
Acoustic Emissions					
Average sound power:		5.7 bels (per ISO 9296)			
		3 drives seeking			

* Annualized Failure Rate.

** Per the SCSI Standard 10 megabytes/sec is supported with cable lengths of five meters or less only.

*** Reliability with two 1 gigabyte disks is >85K hours MTBF; with two 2 gigabyte disks is >100K hours MTBF.

Product Physical Characteristics

Mini-tower	w/1 disk drive
Net weight (kg/lbs):	16/35
Shipping weight (kg/lbs):	20/44
Height (mm/inches):	370/14.6
Width (mm/inches):	191/7.5
Depth (mm/inches):	387/15.25
<hr/>	
Rackmount	w/1 disk drive
Net weight* (kg/lbs):	15/33
Shipping weight** (kg/lbs):	20/43
Height (mm/inches):	130/5.1
Width (mm/inches):	325/12.8
Depth (mm/inches):	571/22.5
Excludes front bezel.	
<hr/>	
Additional devices (kg/lbs):	
Mini-tower/Rackmount Enclosures	
	Net Ship
Disk	2/4 4/9
Digital Audio Tape	2/4 3/6
CD-ROM	2/4 6/13
8mm tape	2/4 3/7

* Excludes weight of racking hardware of 9 kg/20.0 lbs. for 19-inch EIA cabinet.

** Excludes weight of racking hardware.

Electromagnetic Emissions

CISPR 22: 1985 / EN 55022 (1988) Class B
IEC 801-2: 1991 / prEN 55024-2 (1991)
IEC 801-3: 1984 / prEN 55024-3 (1991)
IEC 801-4: 1988 / prEN 55024-4 (1992)
FCC Rules part 15 Class A

The product also complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

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