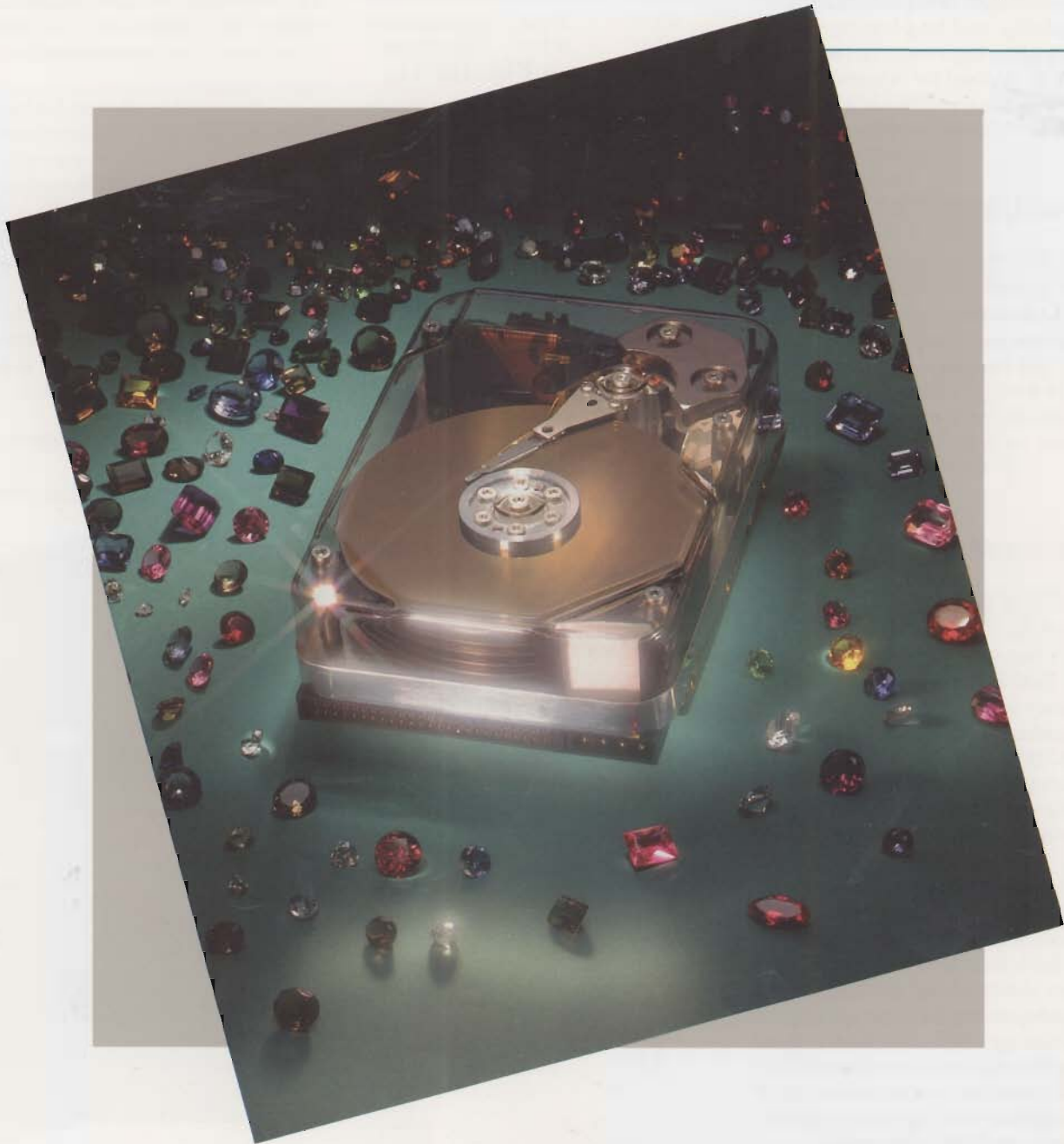

HP C2247 3.5-inch Disk Drive

Product Brief

- 1.05 Gbytes
- SCSI-2 Interface
- 5400 RPM
- 300,000 Hours MTBF
- 5-Year Warranty



Hewlett-Packard: Premier Choice for 3.5-inch Disk Drives

Everything you've come to expect and appreciate from Hewlett-Packard 3.5-inch disk drives is now available in the one gigabyte capacity. The HP C2247 disk drive features 1.05 Gbytes, and is equipped with either single-ended or differential SCSI-2 interfaces. The inherent first-rate performance, reliability, and long-lasting value makes this high-capacity, compact disk drive ideal for integration into workstations, multiuser systems, high-end PCs and arrays.

Leading Performance

The HP C2247 disk drive features one of the swiftest data burst rates in the industry — up to 42 Mbits/s. Average seek time is a mere 10.5 ms, and the fast 5,400 rpm results in an average latency of only 5.6 ms. In synchronous mode, data is transferred up to 20 Mbytes/s.

Fast and Wide SCSI-2

Attaining the 20-Mbyte/s synchronous transfer rate is simple with HP's fast--and wide--SCSI-2 controller. Fast SCSI refers to the frequency in which 8 bits of data are transferred through the SCSI channel. HP's new wide SCSI transfers information 16 bits at a time. In addition, it accommodates up to 16 devices on the same SCSI channel.

The drive's SCSI-2 controller is among industry leaders in performance and available options. A prefetch function enhances disk drive performance, and tagged command queuing (with an advanced reordering scheme) maximizes system throughput. A precise synchronized spindle function allows easy integration into high-performance arrays. And the configurable

segmented-buffer scheme allows the host to manage the buffer for maximum throughput. In addition, the SCSI-2 controller implementation is identical to that of the HP C3010, C3009, and C3007 Series of 5.25-inch disk drives which offers capacity up to 2.0 Gbytes (formatted). Using the same SCSI-2 chip set minimizes required evaluation time for customers who purchase both of these 3.5-inch and 5.25-inch disk drives.

Formatting Flexibility

A hybrid-servo design enables the HP C2247 disk drive to meet the same rugged environmental conditions as HP's previous embedded servo products while enhancing formatting flexibility. This design increases the total user data per track and boosts performance.

300,000 Hours Mean-Time-Between Failure

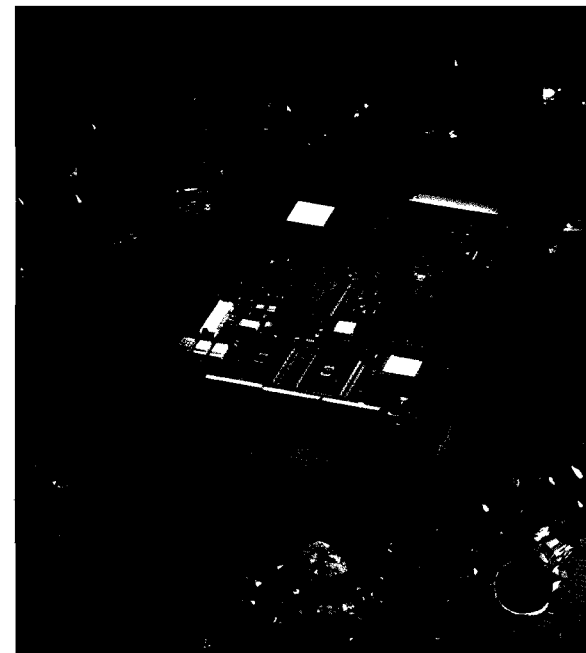
The 300,000-hour MTBF on this 3.5-inch product can contribute to improvements in your daily operations, integration, and field support structures. But HP's commitment to quality goes beyond MTBF numbers. Backing up the 300,000-hour MTBF is the extensive knowledge and experience acquired by designing and manufacturing disk drive products for over 20 years. Plus, a "design-for-reliability" approach to development and production means potential failures have been significantly reduced.

Five-year Warranty and Long-term Support

HP offers a standard five-year warranty on this product — at no price premium. The warranty guarantees low cost of ownership and long-lasting value, and is proof of HP's firm belief in the 300,000-hour MTBF it specifies. In addition, an experienced team of system integration engineers is available to assist. As always, HP will provide parts support for a minimum of five years after date of last manufacture.

Features

- 1.05 Gbytes (formatted)
- SCSI-2 interface
- Single-ended, differential or wide differential
- 300,000 hours MTBF
- Five-year warranty
- 5,400 rpm
- 10.5 ms average seek
- Up to 42 Mbits/s transfer rate
- Multiple recording zones
- Up to 20 Mbytes/s synchronous data rate



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Technical Information

Characteristics

Capacity (formatted)*: 1.05 Gbytes
 Disks: 7
 Data heads: 13
 Rotational speed: 5,400 RPM
 Recording density:
 Bits per inch: 52,000
 Tracks per inch: 2,250
 Cylinders*: 1,984
 Sectors per track*: 56-96

Performance

Channel transfer rate:
 Asynchronous**: 2.5 Mbytes/s to
 5 Mbytes/s
 Synchronous**: up to 20 Mbytes/s

Burst data rate: 24-42 Mbits/s
 Head switch time: <1 ms

Seek time (includes settling):
 Average seek: 10.5 ms
 Track-to-track: 2.5 ms
 Maximum: 25 ms

Average latency: 5.6 ms

Reliability

MTBF: 300,000 hours
 Service life: greater than 5 years

Error rates (per bits transferred):
 Recoverable:
 <10 errors in 10¹³ bits transferred
 Unrecoverable:
 <10 errors in 10¹⁵ bits transferred
 Seek error rate:
 <10 errors in 10⁷ seeks

Power Requirements

	Single-ended	Differential
+5 Vdc (A)		
Typical:	1.0A	1.15A
+12 Vdc (A)		
Typical (seeking):	.8A	.8A
Typical (running):	.45A	.45A
Maximum (starting):	2.6A	2.6A
Power (W)		
Typical (seeking):	14.5 W	15.3 W
Typical (running):	10.5 W	11.2 W

Environmental Conditions

Shock
 (maximum at 11 ms half-sine):
 Operating: 10 G
 Nonoperating: 50 G

Vibration (5 to 500 Hz):
 Operating: 0.5 G
 Nonoperating: 2 G

Temperature range:
 Operating: 5° to 50° C
 Nonoperating: -40° to 65° C

Relative humidity:
 Operating: 8 to 80%
 (noncondensing)
 Nonoperating: 5 to 90%
 (noncondensing)
 Maximum wetbulb: 28° C

Altitude:
 Operating: -30.5 to 3,048 m
 (-100 to 10,000 ft)
 Nonoperating: -305 to 15,240 m
 (-1,000 to 50,000 ft)

Acoustic noise (while seeking):
 37 dB(A)

Physical Specifications

Height: 41.3 mm (1.625 in.)
 Width: 101.6 mm (4.0 in.)
 Depth: 146.1 mm (5.75 in.)
 Weight:
 Unit: 1.0 kg (2.2 lbs)

* Assumes 512 byte sectors. Sectors and tracks reserved for spares have been removed. Other configurations are available.

** Maximum rates available using wide SCSI only.

SCSI Interface

Controller overhead:
 500 microseconds
 Buffer size: 256 kilobytes
 Sector interleave: 1:1
 Sector size: Variable up to 744
 Logical block size: 512, 1024, 2048
 and 4096 bytes

Advanced Controller Features

SCSI-2 command interface:
 Reed-Solomon Error
 Correction Code (ECC)
 256 kilobyte micro-cache
 Look ahead reads
 Programmable look-ahead seeks
 Glitch free power on and power
 down operation
 Command queuing (depth 64)
 Downloadable firmware

SCSI-2 Commands Supported

Log sense
 Log select
 Mode pages (1,2,3,4,8,9,A,C)
 Read data buffer
 Read long
 Search data high, low, equal
 Synchronize cache
 Write data buffer
 Write long
 Write same

SCSI-1 Messages Supported

Abort
 Abort tag
 Bus device reset
 Clear queue
 Command complete
 Disconnect
 Head of queue tag
 Identify
 Initiator detected error
 Link command complete
 Link with flag
 Message parity error
 Message reject
 No operation
 Ordered queue tag
 Save data pointers
 Simple queue tag
 Synchronous data transfer request

SCSI-1 Commands Supported

Format unit
 Inquiry
 Mode select (6) and (10) byte
 Mode sense (6) and (10) byte
 Read (6) and (10) byte
 Read capacity
 Receive diagnostic results
 Reassign block
 Release
 Reserve
 Request sense
 Rezero unit
 Seek (6) and (10) byte
 Send diagnostics
 Start/stop unit
 Test unit ready
 Verify
 Write and verify
 Write (6) and (10) byte

Note: Customer unique requirements accommodated.

Ordering Information

Product Number

C2247 - 1.05 Gbyte disk drive
(formatted)

Option Numbers

Option 001 - specifies SCSI-2 interface (single-ended)
 Option 002 - specifies SCSI-2 interface (differential)
 Option 012 - specifies wide SCSI-2 interface (differential)

Hewlett-Packard Company has been an international manufacturer of highly reliable, high performance disk drives for 20 years. Other 3.5-inch products available to OEMs and System Integrators include:

- HP C2233, C2234 and C2235 Series
 - 234, 328 and 422 megabytes (formatted)
 - SCSI-2 or ATA interfaces
 - Single-ended or differential SCSI

Other 5.25-inch products available include:

- HP C3007, C3009, C3010 Series
 - 1.6, 2.0, and 2.35 gigabytes (unformatted)
 - SCSI-2 interface
 - Single-ended, wide differential and dual-port differential
- HP 97556, 97558 and 97560 Series
 - 804 megabytes, 1.26 and 1.60 gigabytes (unformatted)
 - SCSI-2 or ESDI interfaces
 - Single-ended or differential SCSI
- HP 97549 T/P Series
 - 1.18 gigabytes (unformatted)
 - SCSI-2 interface
 - Single-ended or differential
- HP 9754X Series
 - 397-795 megabytes (unformatted)
 - SCSI-1, SCSI-2 or ESDI interfaces
 - Single-ended or differential SCSI

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