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Power Macintosh 9500: Quantum Hard Drive Specifications (7/95)

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TOPIC -----

This article lists the specifications of Quantum's Empire 540S/1080S hard drive which ships in the Power Macintosh 9500 series of computers.

DISCUSSION -----

Drive Name	Empire 540S/1080S
Physical Configuration	540/1080
Form Factor	3.5 inch
Interface	Fast SCSI-3
.	Fast Wide SCSI-3*
.	Fast Wide Differential SCSI-3*
Unformatted Capacity(MB)	616 / 1,232
Formatted Capacity(MB)**	540 / 1,080

Disk Drive Configuration

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Disks

. 540	2
. 1080	4

Heads

. 540	4
. 1080	8

Recording Surfaces

. 540	4
. 1080	8

Tracks per Surface 2,874

Sectors per Track 64-107

Bytes per Sector 512***

Track Density (tpi) 3,014

Flux Density (fci) 46,000

Recording Density (bpi) 61,300

Encoding Method RLL 1,7

* Available CY 1994
 ** Quantum defines a megabyte(MB) as 10(6) or 1,000,000 bytes.
 *** Default setting. The drive supports variable sector sizes of 256, 512, 520, 524, and 1024 bytes per sector.

Performance Specifications

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Typical Seek Times(ms)*

Average Seek (read)	9.5
Average Seek (write)	11
Track-to-Track	1.8
Full Stroke	19
Average Rotational Latency (ms)	5.6
Rotational Speed (RPM)	5,400

Command Overhead

Reads/Writes (ms)	150
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Other Commands (ms)	<500
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Data Rate (maximum)

Disk-to-Buffer (Mb/sec)	48
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Data Transfer Rates (Buffer-to-Host)

Fast SCSI-3 (MB/sec)	10
Fast Wide SCSI-3 (MB/sec)	20
Sustained (MB/sec)	4
Buffer Size(KB)**	512
Interleave	1:1

* Seek times are at nominal environmental conditions and includes settling

** Upper 128K used for firmware

Jumper Settings

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Jumper Pin and Terminator Locations

TE	Termination Enable at J13
EP	Enable Parity Jumper
WS	Wait/Spin Jumper
A2,A1,A0	SCSI Bus Identification Jumpers
TP	SCSI Termination Power Jumper at J13
J5	Remote Address Feature for SCSI Bus ID

Jumper	Setting	Description
TE	OFF	Disabled
.	ON*	Enabled
EP	OFF	Disabled
.	ON*	Enabled

WS	OFF*	Disabled
.	ON	Enabled
A2	ON*	Used to determine
A1	ON*	SCSI ID
A0	OFF	
J13	ON*	Term Pwr Supplied by the Drive
.		
.	OFF	Term Pwr Supplied by the Host

Note: An Asterisk(*) indicates the default setting.
. On indicates a jumper is installed.
. Off indicates that no jumper is installed

Termination

In addition to the TE jumper, Empire Drives have two resistor packs. They are located by the TE and J13 jumpers.

There must be no more than two sets of terminating resistors on the SCSI bus. One set on the device at the start of the bus, and one for the device at the end. If the drive is in the middle of the chain, remove the TE, TP jumpers as well as the two resistor packs.

Parity

Parity is enabled at the factory. The EP jumper controls parity checking of data across the SCSI bus.

Wait/Spin Jumper

With the WS jumper disabled, at a power on or reset, the drive motor starts to spin automatically, and the drive prepares itself to perform read or write operations without the need for a start command.

Empire Address Jumpers

	A2	A1	SCSI A0	ID
.	OFF	OFF	OFF	0
.	OFF	OFF	ON	1
.	OFF	ON	OFF	2
.	OFF	ON	ON	3
.	ON	OFF	OFF	4
.	ON	OFF	ON	5
.	ON	ON	OFF	6*
.	ON	ON	ON	7

* Default setting

Environmental Specifications

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Operating

Temperature(C)	0 to 55
Non-condensing Humidity(%)	5 to 95
Maximum Wet Bulb(C)	40
Shock (11ms)	10
Vibration (G, base to peak)	0.5
Altitude(ft.)	-200 to 10,000
Audible noise (dbA @ 1m, any direction, idle)	<35

Reliability Specifications

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Projected Field MTBF (hours)	500,000
Preventive Maintenance	Not Required
Data Errors	
Recoverable (per bits read)	10 per 10(11)
Nonrecoverable	10 per 10(11)
Error Correction Method	Reed Solomon
Warranty* (years)	5

*This warranty is standard when products are purchased directly through authorized Quantum distributors/dealers. End-user warranties provided by computer manufacturers may vary.

Power Requirements

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+5V DC Max (A) Idle	.41
+12V DC Max (A) Idle	.33
Typical Power Draw (W)	
Idle	6.0
Seek (30 percent)	7.5

Mounting Requirements

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Mounting:

For Mounting, #6-32 UNC screws are recommended. To avoid stripping the mounting-hole threads, the maximum torque applied to the screws must not exceed 8-inch pounds.

Mounting Screws

Use of mounting screws longer than the maximum lengths specified voids the warranty on the Empire 540/1080S.

Thread Type	Maximum Penetration(side mounting holes)	Maximum Penetration (Bottom mounting holes)
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returns) are connected on the drive PCB.

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