

Memorex 510 Series High-Performance 5.25-inch Disc Drives

- 30, 50, or 70 Mbytes capacity
- Access time of 25 msec average, 45 msec maximum, and 3 msec track-to-track
- Built-in diagnostics and self-test capability
- Diagnostic port
- HDA protection features
- Adaptive controls to compensate for component aging
- Industry-standard 5.25-inch drive interface with SECA option

The Memorex 510 Series disc drives are the first members of the 500 Family of 5.25-inch high-performance Winchester products. Offering a choice of 30, 50, or 70 megabytes of data storage capacity and an average access time of 25 milliseconds, these drives combine high capacity with fast access times.

Mechanical

A vented hub, mounted on a precision spindle, holds up to four 5.25-inch plated discs and is directly driven by a brushless dc motor. Manganese-zinc magnetic heads are used and are mounted one per surface

on Watrous-type flexures. The head assemblies can be accurately positioned to any one of 961 unique radial cylinder positions by means of a linear voice coil actuator. Heads and media are contained within a factory-sealed clean-air enclosure. During operation, air is continuously recirculated and filtered within the enclosure via the holes in the vented disc hub. Circuit board cooling is aided by a fan mounted on the spindle, external to the sealed area. All drives have standard 5.25-inch bezel size and mounting holes.

Electrical

The electronic architecture employs five directly interconnected, autonomous microprocessors. Each microprocessor is dedicated to a specific task but is coupled loosely to each of the other microprocessors via a common communications protocol. These microprocessors directly control all major drive functions. Additionally, they continually monitor critical circuit areas via analog-to-digital converters, thus facilitating diagnostic, test, and adaptive control capabilities. Servo and read channel activities are

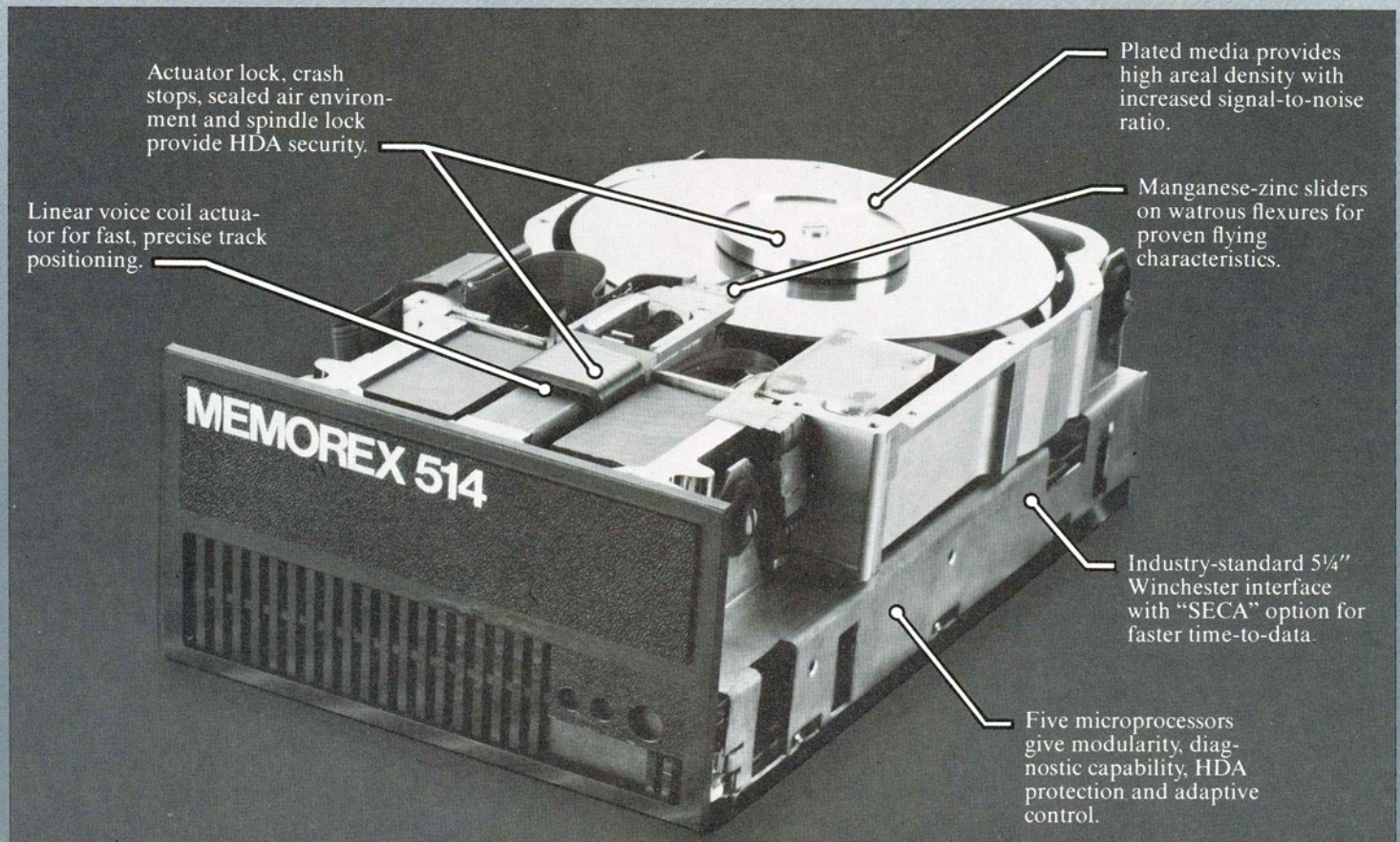
also tightly controlled by the microprocessors via digital-to-analog converters. Online diagnostic and fault warning information is continuously monitored, stored, and made available to the host system via a serial I/O port on the drive. Additionally, the drive can be instructed to perform self-test and confidence tests.

Interface

The industry-standard 5.25-inch disc drive interface is fully supported in regular, buffered, and SECA step modes. SECA is a switch-selectable operational mode which allows full-track address information to be transferred from the controller to the drive in 40 microseconds, thus removing the overhead otherwise associated with interface pulse transfers. This mode also allows transfer of track offset information for improved data recovery capability.

Quality and Reliability

All drives are designed, built, and tested to the highest standards of quality and reliability. It is Memorex policy to constantly strive to further improve these high standards.



Specifications

Functional		512	513	514
Unformatted Capacity	Mbytes per Drive	30.03	50.05	70.07
	Bytes-per-Track	10,416	10,416	10,416
	Heads per Surface	1	1	1
	Data Surfaces	3	5	7
	Bytes per Cylinder	31,248	52,080	72,912
	Cylinders per Drive	961	961	961
Positioning Time (including settling)	Track-to-Track (ms)	3	3	3
	Average (ms)	25	25	25
	Maximum (ms)	45	45	45
Rotational Characteristics	RPM	3600	3600	3600
	Average Latency (ms)	8.33	8.33	8.33
	Transfer Rate (Mbits/sec)	5	5	5
	Maximum Start Time (sec)	<30	<30	<30
	Maximum Stop Time (sec)	<30	<30	<30
Interface	Type	5¼" STD	5¼" STD	5¼" STD
	Data Code	MFM	MFM	MFM
Recording Characteristics	Flux Density (FRI)	9912	9912	9912
	Bit Density (BPI)	9912	9912	9912
	Track Density (TPI)	970	970	970
	Areal Density (Mbits/inch ²)	9.6	9.6	9.6
	Recording Mode	MFM	MFM	MFM

Physical	All Models		
Power Requirements	Start-Up (7 secs)	Nominal	Peak (20 ms)
+ 5 volts ± 5%	2.0 Amps	2.0 Amps	2.0 Amps
+ 12 volts ± 10%	5.0 Amps	1.0 Amps	2.5 Amps
-12 volts ± 10%	0.5 Amps	0.5 Amps	1.5 Amps
Dimensions—inches (mm)			
Height	3.25 (82.6)		
Width	5.75 (146)		
Depth	10.5 (267)		
Weight (approx.)	9 lbs, (4 kg)		
Ambient Temperature			
Operating	40 to 113°F (4 to 45°C)		
Nonoperating	-40 to 122°F (-40 to 50°C)		
Gradient	10°F (5.5°C) per hour		
Relative Humidity			
Operating	10 to 90% non-condensing		
Nonoperating	10 to 90% non-condensing		
Vibration and Shock			
Operating	0.5 G maximum, 5 to 500 Hz		
Packaged for Shipping	20 G shock		
Altitude			
Operating	-1000 to 10,000 feet (-300 to 3,000 meters)		
Nonoperating	-1000 to 40,000 feet (-300 to 12,000 meters)		

Reliability	All Models
Mean-Time-Between-Failures (MTBF)	> 11,000 power-on hours
Mean-Time-To-Repair (MTTR)	< 30 minutes
Component Life	5 years
Error Rates	
Recoverable	< 1 in 10 ¹⁰
Unrecoverable	< 1 in 10 ¹²
Seek	< 1 in 10 ⁶

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