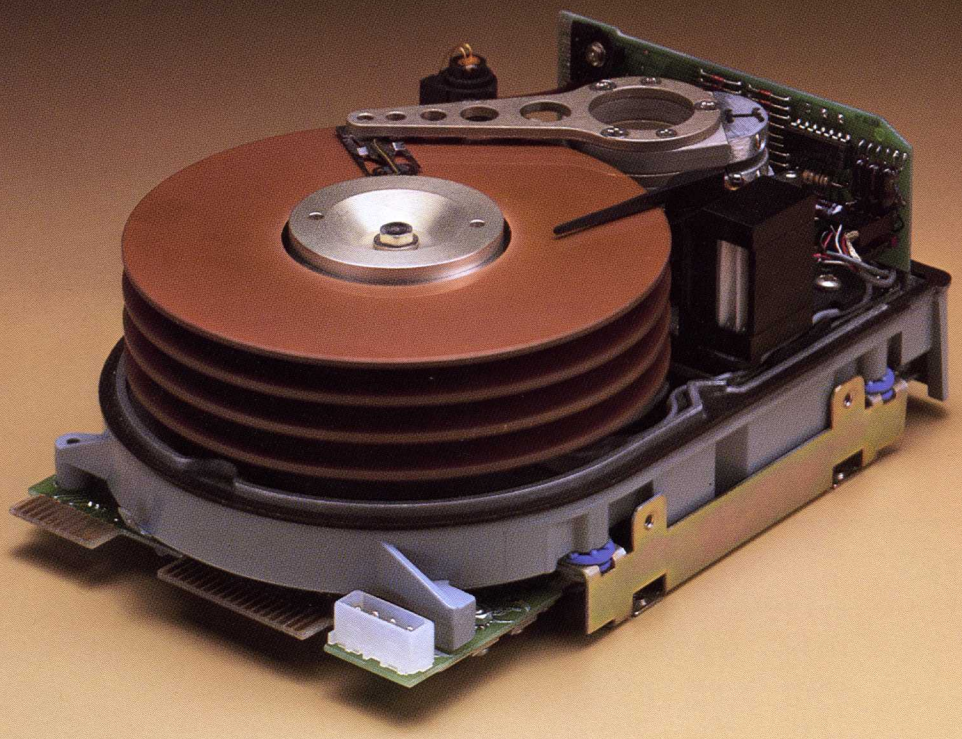
Quantum Q500 Series® 5¼″ Fixed Disk Drives



Quantum's Q500 Series 20-, 30-, and 40-megabyte Winchester disk drives are the cost-effective way to upgrade from 5¼″ floppy drives or lower-capacity Winchesters. Competitively priced, the Q500 offers a mass storage upgrade with sufficient capacity to satisfy most commercial applications. They fit within the standard 5¼″ disk drive envelope, and are fully compatible with industry standards for electrical interface, power requirements and mounting.

Like all Quantum disk drives, the Q500 Series offers the economy inherent in simple, clean, highly manufacturable designs based on proven technology. Because the Q500 is compatible with the industry-standard ST506/412 interface, it can be integrated with any number of low-cost controllers. Drive control and data signals use the same pin assignments as compatible floppy drives, allowing daisy-chaining of fixed and floppy drives.

Quantum's proprietary head positioning system, evolved from the rotary torque actuator used in our Q2000 Series® 8″ drives, enables the Q500 to achieve higher capacity and faster access times than stepper motor drives.

Key Features

- 21.33, 31.99, and 42.66 megabytes (unformatted) storage capacities
- Manufactured with the same quality and reliability procedures as Quantum's 8″ disk drives

QUANTUM

- Full interface, format and power supply compatibility with ST506/412 standards
- Physical dimensions and mounting holes identical to industry-standard 5¼″ form factor
- 5.0 megabits per second transfer rate
- Proven Winchester head and media technology
- Rotary moving coil actuator with patented temperature compensation servo
- Field-proven optical encoder positioning system
- Faster access time than stepper motor drives
- Fail-safe landing and shipping zone
- AIRLOCK™ automatic mechanical shipping lock (patent pending)
- Single external PCB

Q500 Series® 5¼" Fixed Disk Drives

Recording Media
- Standard Winchester lubricated magnetic iron oxide coating on a 130 mm diameter aluminum substrate

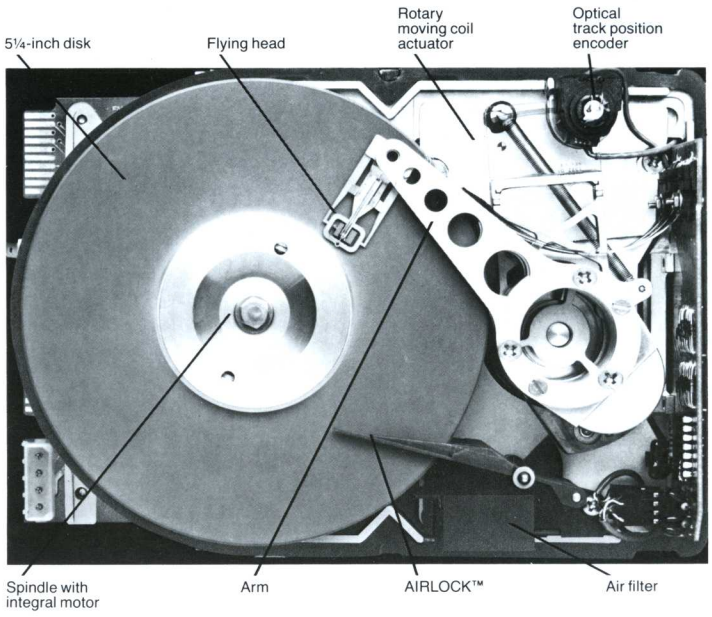
Read/Write Heads
- Monolithic manganese zinc Winchester (IBM 3350) heads
- Low mass/low load force design
- Reliable contact start/stop operation

AIRLOCK
- Heads automatically return to a "fail-safe" landing zone at power-off. No need for software "park" routine
- Actuator is automatically locked in the landing zone position during power-off and shipping

Air Filtration System
- Disks and read/write heads fully sealed in clean air chamber
- Recirculating air system with internal filter
- Absolute breather filter permits pressure equalization without contamination

Rotary Moving Coil Actuator
- Pure torque motor with balanced forces to maximize bearing life
- Simple construction
  - —Two flat-plate magnetic structure
  - —Single-plane moving coils
  - —Two-bearing structure
- Statically-balanced structure for high mechanical stability and maximum vibration resistance
- Low power consumption
- Average access time less than half that of typical stepper motors

Optical Track Position Encoder
- Provides lowest cost, reliable servo system
- Reliable glass reticle/LED/photodiode technology



Temperature Compensation Servo
- Patented servo "wedge" technique provides position feedback from disk without loss of a data surface
- Transparent to controller and host system
- Track location coding embedded between last inter-record gap and index pulse
  - —Data rate, track capacity and unrestricted format the same as ST506/412
  - —ST506/412 compatibility retained by increasing flux reversal density and reducing rotational speed
- Microprocessor-controlled optical servo system is updated once per revolution from the disk

Specifications

Functional/Performance

	Q520	Q530	Q540
Storage Capacity			
Unformatted	21.33 Mb	31.99 Mb	42.66 Mb
Formatted	16.80 Mb	25.20 Mb	33.60 Mb
Data Tracks	2048	3072	4096
Disks	2	3	4
Data Surfaces	4	6	8
Read/Write Heads	4	6	8
Capacity per Surface			
Unformatted	5.33 Megabytes		
Formatted	4.20 Megabytes		
Capacity per Track			
Unformatted	10,416 Bytes		
Formatted	8,192 Bytes		
Capacity per Sector	256 Bytes		
Sectors per Track	32		
Transfer Rate	5.0 Megabits/second		
Rotational Speed	3529 rpm, ±1%		
Recording Density	9200 bpi		
Flux Density	9200 fci		
Track Density	591 tpi		
Cylinders	512		
Index	1		
Access Time	Typical Values (msec)		
Track-to-Track	10		
Average	45		
Full Stroke	80		

Access times specified at the minimum buffered step time of 3 μsec per step pulse. Typical values are measured at nominal steady state temperatures and voltages.

Reliability

MTBF: 12,000 POH, typical usage
Preventive Maintenance: Not required
MTTR: 30 minutes
Component design life: 5 years

Error rates:
Soft read errors: 1 per 10^{10} bits read
Hard errors: 1 per 10^{12} bits read
Seek errors: 1 per 10^{6} seeks

Physical

	Operating	Non-Operating
Environmental Limits		
Ambient Temperature	10°C to 50°C (50°F to 122°F)	–40°C to 62°C (–40°F to 144°F)
Relative Humidity*	8% to 80%	
Maximum Wet Bulb*	26°C (78°F)	46°C (115°F)
Altitude	3.0 km (10,000 ft.)	9.1 km (30,000 ft.)
Temp. Gradient	11°C/hr (20°F/hr)	20°C/hr (36°F/hr)

Nominal Mechanical Dimensions
Height 3.25 inches (82.55mm)
Width 5.75 inches (146.05mm)
Depth 8.05 inches (204.47mm)
Weight 7 pounds (3.18kg)

Power Requirements
+12VDC ± 10%
Typical Currents: 1.2A not seeking; 2.0A seeking.
Maximum Running Currents: 1.5A not seeking; 2.4A seeking.
Maximum Motor Starting Current: 4.5A not to exceed 14 seconds.
+5VDC ± 5%, 0.7A typical, 1.0A maximum

Ripple
5V: 50mV peak-to-peak
12V: 100mV peak-to-peak
Power Sequencing: None required.

Heat Dissipation
Typical: 23W (79 BTU/hr)
Determined using nominal voltages and currents and with a 50 percent seek duty cycle.
Maximum: 31W (106 BTU/hr)
Determined using a 50 percent seek duty cycle and maximum voltages and worst case currents
Worst Case: 37W (126 BTU/hr)
Determined using maximum voltages, worst case currents and continuous seeking.

*Without condensation

Specifications subject to change without notice.

QUANTUM

Quantum Corporation
Corporate Headquarters: 1804 McCarthy Blvd., Milpitas, CA 95035
(408) 262-1100 TWX 910-338-2203
Eastern Regional Sales Office: (603) 893-2672
Western Regional Sales Office: (408) 980-8555
European Sales Office: (49) 611-6666197 Telex 841 417166

Quantum products are distributed in the United States by Arrow Electronics.