

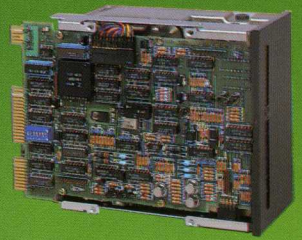
OEM MICRODISK DRIVES

APR

1984

M2230AS/B
M2233AS/B
M2234AS/B
M2235AS/B

*5 1/4-inch Winchester-type fixed disk drives with
6.6- to 26.66-megabyte storage capacities*



M2234B

FUJITSU

Fujitsu's 5¹/₄-inch Winchester-type disk drive line provides small to large storage capacities. The M2230, M2233, M2234, and M2235, with 6.6- to 26.66-megabyte capacities, cover small to medium ranges. Each model is available in two types. Type AS has the Seagate interface, and type B has the SA4000 interface. Each model's disk enclosure is completely sealed, integrating one to four disks, two to eight Winchester-type contact start/stop heads, a rotary actuator, and a DC spindle motor. These compact yet large-capacity disk drives are ideal for offices, particularly with small business computers, word processors, and terminal systems.

Up to 26.66 megabytes of storage

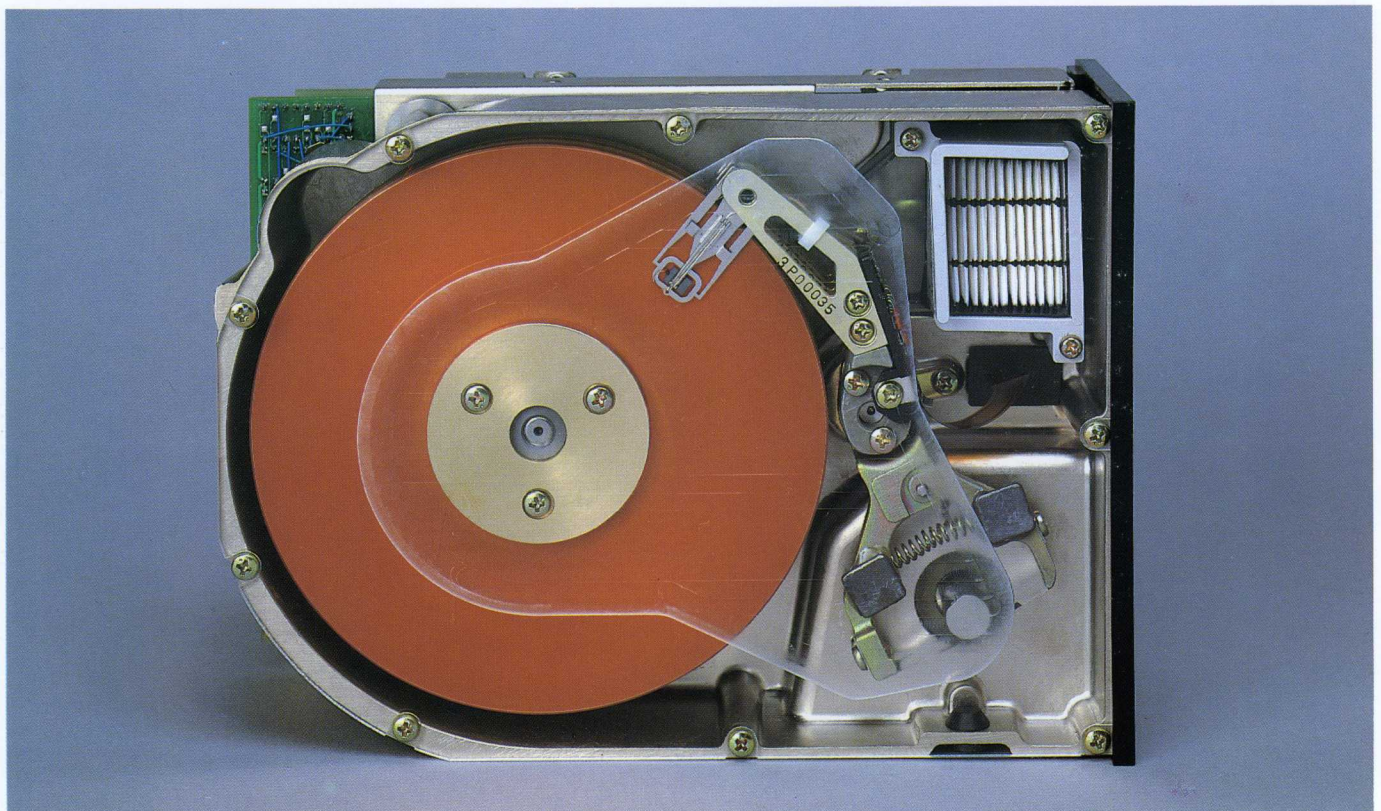
The M2230, M2233, M2234, and M2235 provide a variety of storage capacities in compact, inexpensive packages. Their capacities are 6.66 megabytes (M2230), 13.33 megabytes (M2233), 20 megabytes (M2234), and 26.66 megabytes (M2235) — all unformatted. These larger capacities were made possible by using 320 cylinders with 10,200-bit-per-inch recording density.

High performance

The M2230, M2233, M2234, and M2235 combine compactness and high performance. The average positioning time, including the settling time, is 83 milliseconds, and the data transfer rate is 625 kilobytes per second. The start time is less than 20 seconds, and a dynamic brake reduces the stop time to less than 15 seconds.

Reliable, maintenance free

The completely sealed disk enclosure contains a breathing filter and an absolute recirculation filter to provide a contamination-free environment. Winchester-type contact start/stop heads eliminate moving parts for head loading and unloading.



M2234AS

All models use LSI drive logic, and the Head IC (HIC) prevents read errors caused by external electrical noise. No wonder then that the mean-time-between-failures (MTBF) of the M2230, M2233, M2234, and M2235 is more than 10,000 power-on hours. Also no preventive maintenance is required, and mean-time-to-repair (MTTR) is less than 30 minutes.

Compact, economical

The M2230, M2233, M2234, and M2235 use 5¼-inch (130 mm) disks and a direct DC spindle motor. Since their physical size is the same as that of a minifloppy disk drive, these disk drives can be installed in minifloppy disk drive cabinets to increase storage capacity. They can be mounted horizontally or vertically. Noise and vibration have been significantly reduced. Each disk drive consumes only 30 watts. A stepping motor simplifies the head positioning mechanism and enhances reliability and economy. These features make the drives ideal for office use.

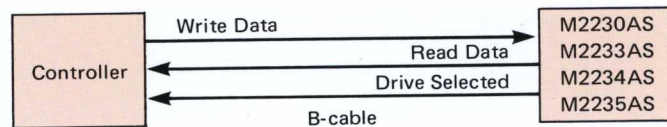
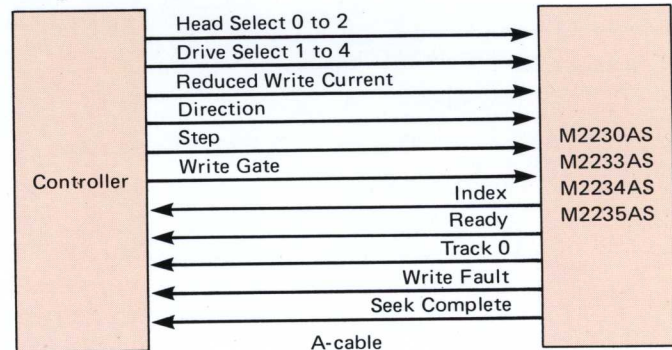
Seagate and SA4000 interfaces

The type AS models have the Seagate interface, an internationally used modified floppy interface for 5¼-inch disks. The type B models are provided with the SA4000 interface, a widely used modified floppy interface for 8-inch disks. The SA4000 interface has Variable Frequency Oscillator (VFO) and Modified Frequency Modulation (MFM) circuits, making the job of designing controllers for the type B models an easy one. The type B models also offer an optional control board for a bidirectional data bus interface and a simplified host interface. Since the control board is the same size as the main printed circuit board, it can be mounted over the main board, making system design much easier.

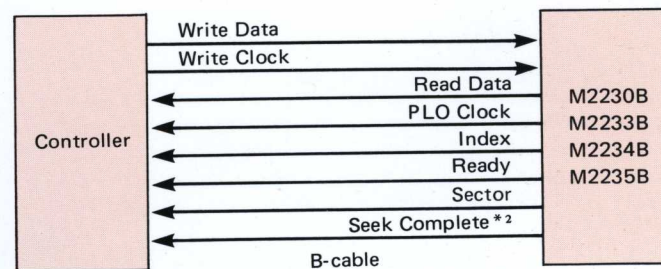
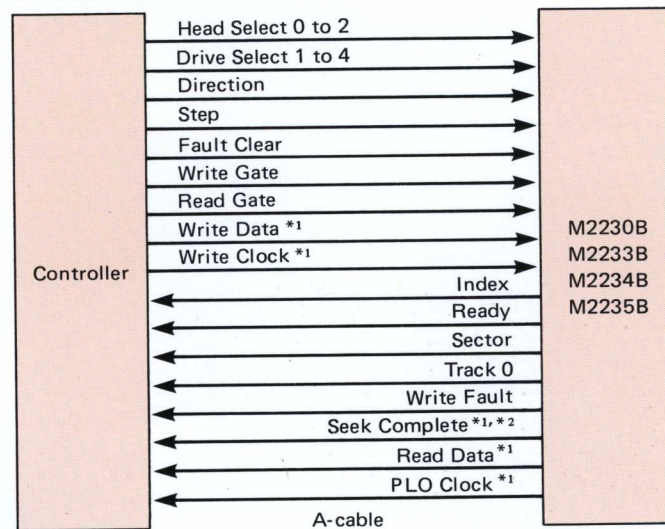
Internationally compatible

These 5¼-inch disk drives use low-voltage DC power of +12V and +5V, permitting international application and freedom from the effects of power line fluctuations.

Seagate interface



SA4000 interface



*1. Signal lines are connected by turning on the corresponding switches on the printed circuit boards.

*2. Settling time may be included or omitted by setting relevant switches on the printed circuit boards.

FUNCTIONAL SPECIFICATIONS

		M2230AS	M2233AS	M2234AS	M2235AS	M2230B	M2233B	M2234B	M2235B
Storage capacity	Unformatted	6.66 megabytes	13.33 megabytes	20 megabytes	26.66 megabytes	6.66 megabytes	13.33 megabytes	20 megabytes	26.66 megabytes
	Formatted	5.24 megabytes	10.48 megabytes	15.72 megabytes	20.97 megabytes	5.24 megabytes	10.48 megabytes	15.72 megabytes	20.97 megabytes
Disks (5¼-inch)		1	2	3	4	1	2	3	4
Heads (read/write)		2	4	6	8	2	4	6	8
Track capacity	Unformatted	10,416 bytes							
	Formatted	8,192 bytes (32 sectors)							
Tracks per cylinder		2	4	6	8	2	4	6	8
Cylinders		320							
Sectors		32				16 or 32			
Positioning time*	Track-to-track	18 milliseconds							
	Average	83 milliseconds							
	Maximum	185 milliseconds (306 cylinders), 192 milliseconds (320 cylinders)							
Average latency time		8.3 milliseconds							
Rotational speed		3,600 rotations/minute							
Recording density		10,200 bits/inch							
Track density		300 tracks/inch							
Data transfer rate		625 kilobytes/second							
Recording code		MFM (Modified Frequency Modulation)							
Interface code		MFM (Modified Frequency Modulation)				NRZ (Non-Return-to-Zero)			
Interface		Modified Floppy (Seagate interface)				Modified Floppy (SA4000 interface) Option: control board			
Start time		Less than 20 seconds							
Stop time		Less than 15 seconds							

* Including settling time

RELIABILITY SPECIFICATIONS

		M2230AS/B M2233AS/B M2234AS/B M2235AS/B
Mean-time-between-failures (MTBF)		More than 10,000 power-on hours
Mean-time-to-repair (MTTR)		Less than 30 minutes
Component life		5 years
Error rates	Recoverable errors	10 per 10 ¹¹ bits read
	Unrecoverable errors	10 per 10 ¹³ bits read
	Seek errors	10 per 10 ⁷ seeks

PHYSICAL SPECIFICATIONS

		M2230AS M2233AS M2234AS M2235AS	M2230B M2233B M2234B M2235B
Power requirements		12VDC±10%, 1.8A (max. 4.0A) 5VDC±5%, 1A	12VDC±10%, 1.8A (max. 4.0A) 5VDC±5%, 1.6A
Dimensions	Height	83 mm (3.3 in)	
	Width	146 mm (5.7 in)	
	Depth	203 mm (8.0 in)	
Weight		2.5 kg (5.5 lb)	
Ambient temperature	Operating	5°C to 45°C (41°F to 113°F)	
	Not operating	-40°C to 60°C (-40°F to 140°F)	
	Gradient	Less than 15°C (27°F)/hour	
Relative humidity	Operating	20% to 80% (non condensing)	
	Not operating	5% to 95% (non condensing)	
Vibration and shock resistance	Operating	Max. 0.2G (3Hz to 60Hz) Shock: max. 2G (max. 10 ms)	
	Not operating	Max. 0.4G (3Hz to 60Hz) Shock: max. 3G (max. 10 ms)	
	In storage or transport	Shock: max. 5G (max. 30 ms)	
Altitude	Operating	3,000 m (10,000 ft)	
	Not operating	12,000 m (40,000 ft)	

Specifications are subject to change without notice.
For the latest information, contact your local Fujitsu representative.
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