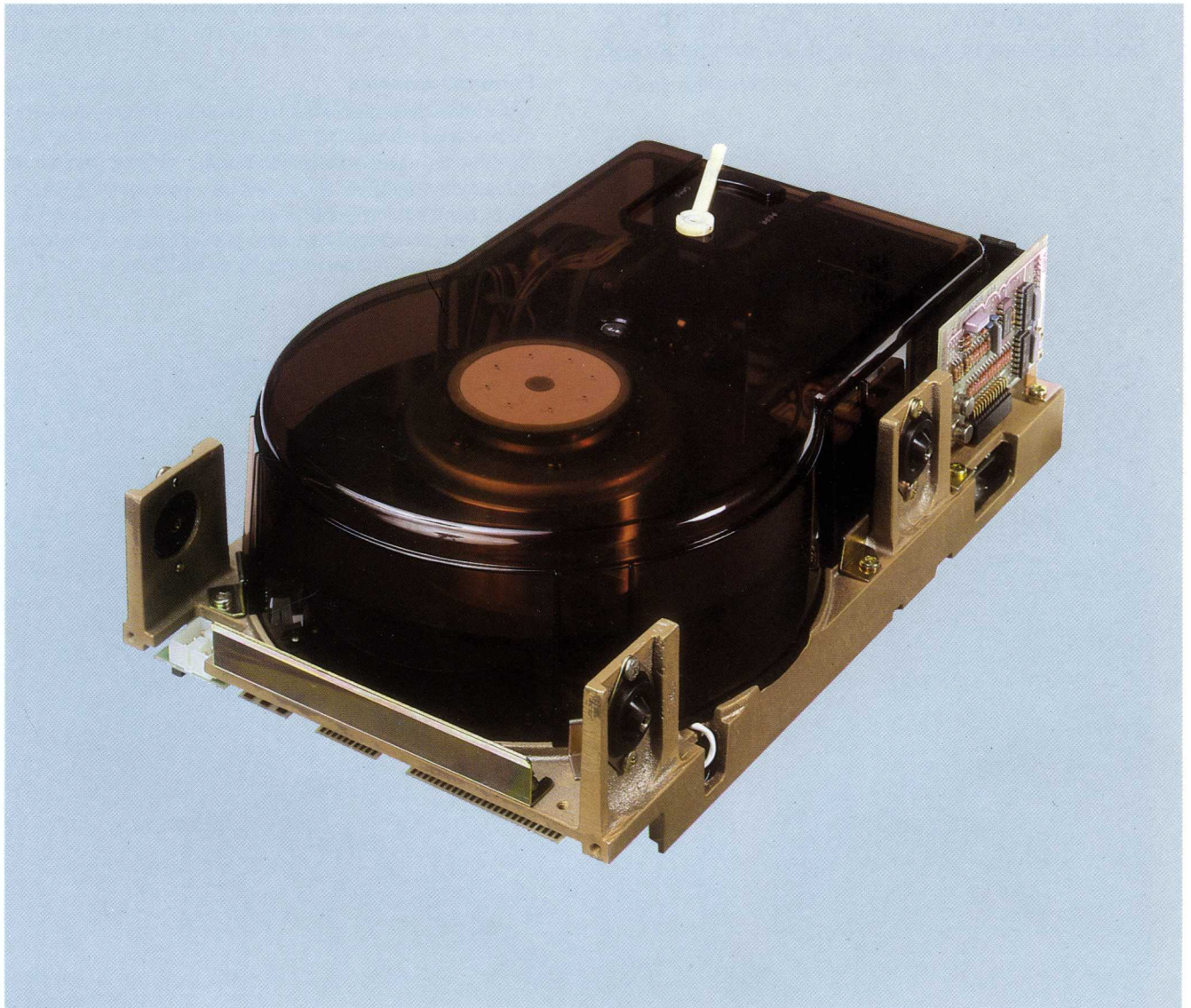


OEM MICRODISK DRIVES

# M2301B/K M2302B/K

*Low-cost 8-inch Winchester-type fixed disk drives ensuring compactness and reliability*

APR 7 1983



M2301B





# OEM MICRODISK DRIVES

The M2301 and M2302 microdisk drives are 8-inch Winchester-type fixed disk drives providing storage capacities ranging from 9.83 megabytes to 23.42 megabytes. They all feature outstanding compactness, economy and reliability, and are suitable for random access storages for micro-computers, intelligent terminals, word processing systems, etc. Each model is available in two types: B-type and K-type. The B-type (M2301B/M2302B) has a modified floppy interface, while the K-type (M2301K/M2302K) is equipped with LSI controller for a bidirectional data bus interface for connecting the drive with the host CPU. Both types adopt LSI drive logic. Each drive consists mainly of a disk enclosure and two printed circuit boards. The disk enclosure integrates Winchester-type contact start/stop heads and two disks (M2301B/K) or four disks (M2302B/K), head positioning actuator, and DC spindle motor.

## Medium-capacity storage models

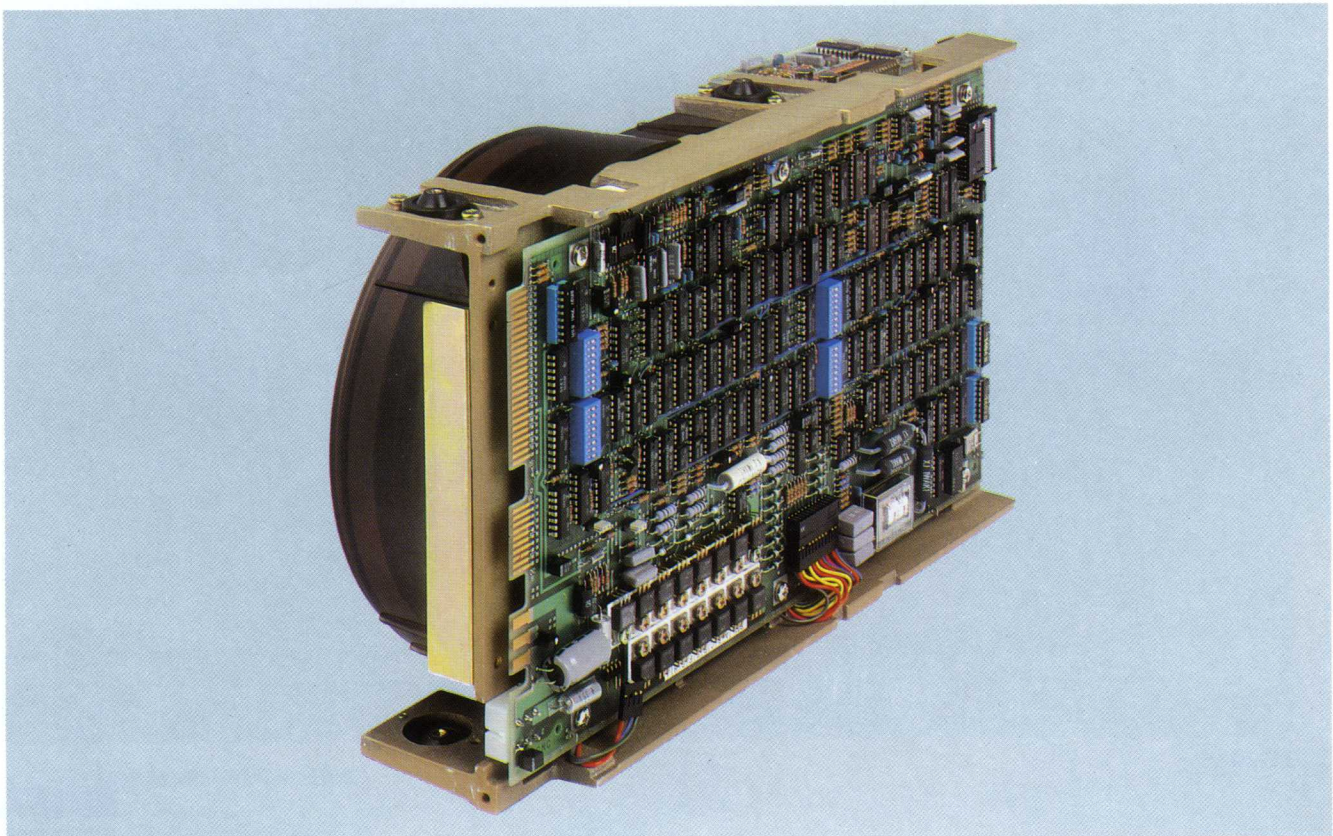
The M2301B and M2302B offer 11.71 megabytes and 23.42 megabytes, respectively, while the M2301K and M2302K provide 9.83 megabytes and 19.66 megabytes, respectively. Thus they are especially suitable for medium-capacity storage requirements.

## Extremely compact design

With adoption of small 8-inch disks and a DC motor directly connected to the spindle, the M2301 and M2302 microdisk drives realize an extremely compact design — 111mm (4.37 inches) in height, 217mm (8.54 inches) in width and 356mm (14.0 inches) in depth. They can be mounted either horizontally or vertically in a standard 19-inch rack or in system cabinets. Since their physical size is the same as that of floppy disk drives, they can serve as replacements in floppy disk cabinets for increased storage capacity. The M2301 and M2302 microdisk drives' compactness also contributes to noise reduction and lowered vibration. These mean that they are ideal for office use.

## Enhanced economy

The M2301 and M2302 microdisk drives' positioning mechanisms are substantially simplified because of a stepping motor using a steel band and a viscous damper, thus enhancing reliability and economy. Their power consumptions are each only 60 watts when seeking and 50 watts when not seeking. They can operate in a wide range of environmental temperatures (5 to 45°C, or 41 to 113°F) without cooling fan.



M2301B



### High performance

The M2301 and M2302 achieve high performance for compact and economical models. Contact start/stop heads and disks substantially reduce the start and stop times to 25 seconds each. The head positioner with stepping motor allows 70 milliseconds average positioning time, and the direct drive DC spindle motor with 2,964 rpm rotational speed provides a high data transfer rate of 593 kilobytes per second.

### Superb reliability

The M2301 and M2302 offer superb reliability thanks to Winchester technology. In the completely sealed disk enclosure, an absolute air filtration system including breathing filter and recirculation filter assures a contamination-free environment. Winchester-type contact start/stop heads eliminate moving parts for loading and unloading. These features guarantee the M2301 and M2302 a mean-time-between-failures (MTBF) of more than 10,000 power-on hours.

### Maintenance-free

With adoption of their completely sealed disk enclosure as well as belt-eliminating built-in DC spindle motor and other highly reliable printed circuit boards, the M2301 and M2302 microdisk drives result in greatly reduced maintenance: no preventive maintenance is needed, and mean-time-to-repair (MTTR) is under one-half hour.

### Simplified interface with powerful commands (M2301K/M2302K)

The M2301K and M2302K each have an LSI controller providing for a bidirectional data bus interface, which permits simplified host interface by its powerful commands, thus facilitating system design. In other words, the M2301K and M2302K can be easily incorporated into a host system. They also have alternate record processing capability for allowing all sectors to be used as non-defect sectors, and self-diagnostic functions for easy troubleshooting.

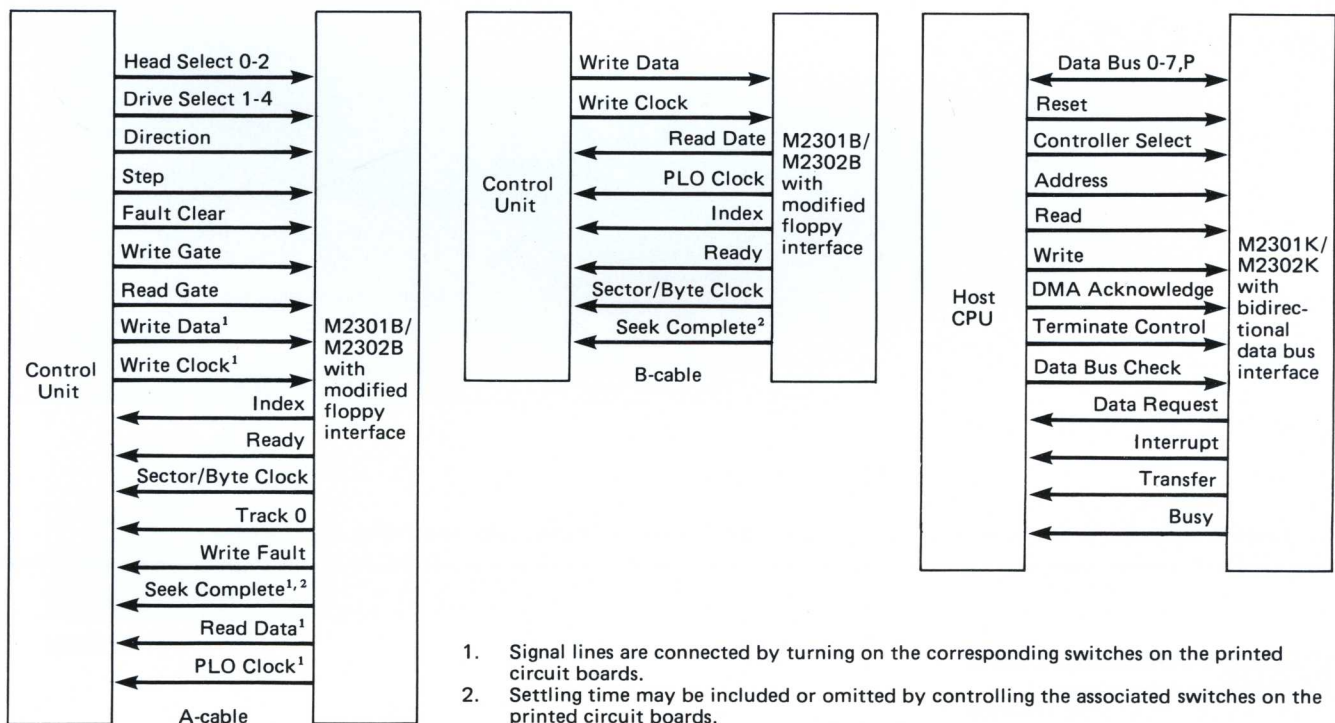
### Industry standard interface (M2301B/M2302B)

The M2301B and M2302B have an industry standard modified floppy interface (Shugart SA4000, Memorex C101/102, etc.).

### International versatility

The standard DC power requirements permit international versatility and independence of power line fluctuations. Also, the industry standard interface adds further to international compatibility.

### Interfaces





# OEM MICRODISK DRIVES

## FUNCTIONAL SPECIFICATIONS

	M2301B	M2302B	M2301K	M2302K
Storage capacity	11,712,000 bytes (unformatted)	23,424,000 bytes (unformatted)	9,830,400 bytes (formatted)	19,660,800 bytes (formatted)
Disks	2	4	2	4
Heads				
Read/write	4	8	4	8
Clock	1	1	1	1
Bytes per track	12,000 (unformatted)		10,240 (formatted)	
Tracks per cylinder	4	8	4	8
Cylinders	244		240 + 3 (alternate) + 1 (diagnostic)	
Sectors	2 or more		40	
Positioning time				
Track-to-track	30 ms			
Average	70 ms			
Maximum	140 ms			
Average latency time	10.1 ms			
Rotational speed	2,964 rotations/minute ± 2%			
Recording density	6,100 bits/inch			
Track density	195 tracks/inch			
Data transfer rate	593 kilobytes/second			
Recording code	MFM (Modified Frequency Modulation)			
Interface code	NRZ (Non-Return-to-Zero)		8-bit parallel	
Interface	Modified floppy		Bidirectional data bus	
Start time	25 seconds			
Stop time	25 seconds			

## RELIABILITY SPECIFICATIONS

	M2301B/K M2302B/K
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 <sup>11</sup> bits read
Unrecoverable errors	10 per 10 <sup>13</sup> bits read
Seek errors	10 per 10 <sup>7</sup> seeks

## PHYSICAL SPECIFICATIONS

	M2301B/M2302B	M2301K/M2302K
Power requirements	24VDC±10%, 1.6A (max. 6A) 5VDC±5%, 4.1A (max. 6A) -5VDC±5%, 0.5A (-16V to -7V can be accommodated)	24VDC±10%, 1.6A (max. 6A) 5VDC±5%, 5.6A (max. 7.5A) -5VDC±5%, 0.5A (-16V to -7V can be accommodated)
Dimensions and weight	Height 111 mm ( 4.4 inches) Width 217 mm ( 8.5 inches) Depth 356 mm (14.0 inches) Weight 6.3 kg (13.9 pounds)	
Ambient temperature	Operating 5 to 45°C ( 41 to 113°F) Non-operating -40 to 60°C (-40 to 140°F) Gradient Less than 15°C (27°F)/hour	
Relative humidity	Operating 20 to 80% (non-condensation) Non-operating 5 to 95%	
Vibration	Operating Max. 0.2G (3 to 60Hz), shock: max. 2G (max. 10 ms) Non-operating Max. 0.4G (3 to 60Hz), shock: max. 3G (max. 10 ms) In storage or during transportation Max. 3G, shock: max. 5G (max. 30 ms)	
Altitude	Operating 3,000 m (10,000 feet) Non-operating 12,000 m (40,000 feet)	

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

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