

# FUJITSU

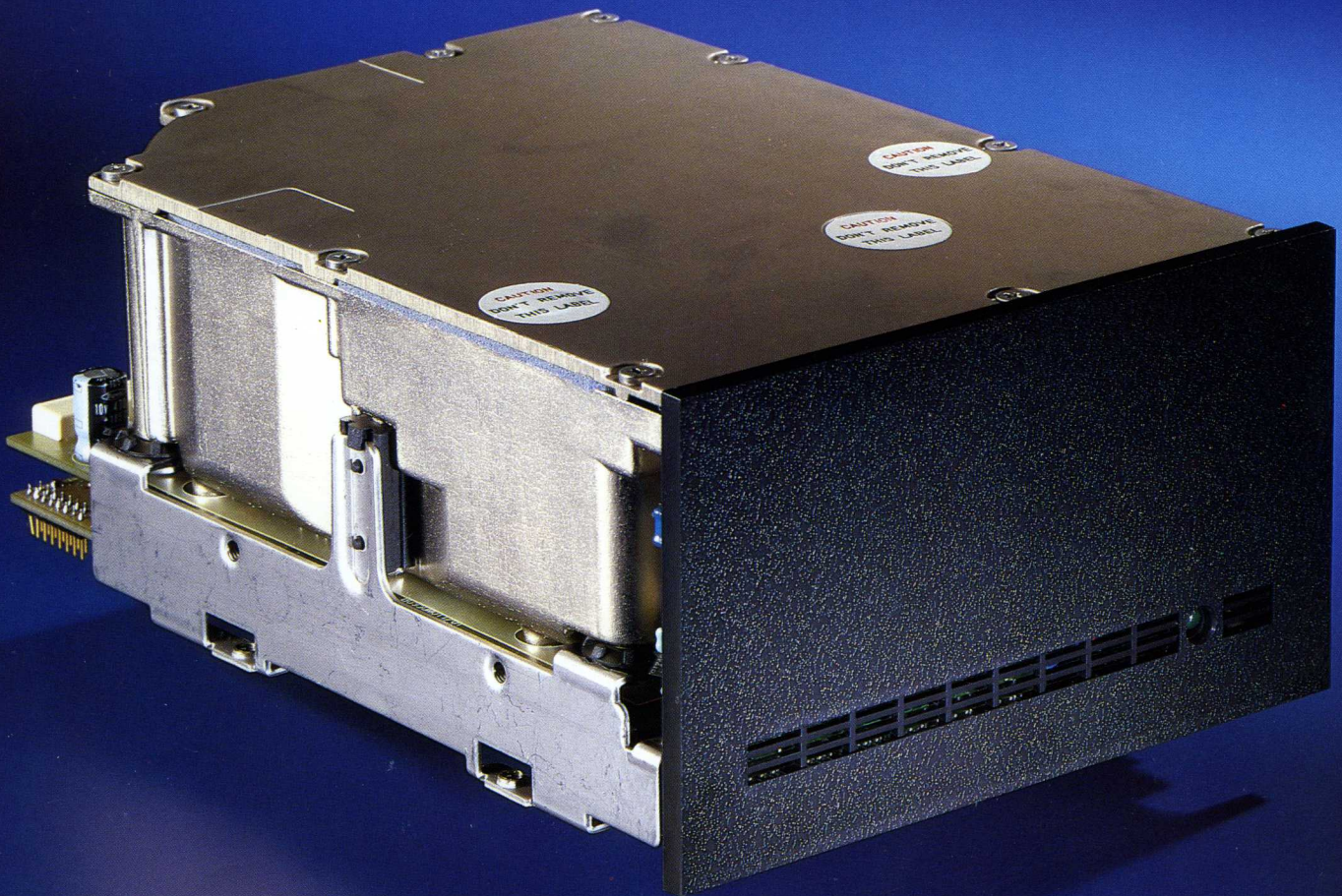
Quality OEM Products

MAR 6 1987

## 5¼-inch disk drives

MAR 17 1987

**M2244E/S/SA/SB**  
**M2245E/S/SA/SB**  
**M2246E/S/SA/SB**



Fujitsu M2244, M2245, and M2246 are high-performance 5¼-inch disk drives providing storage capacities of 85.8 megabytes to 171.7 megabytes. Each model is available in four types – E, S, SA, and SB. The E type has an Enhanced Small Disk Interface (ESDI) and variable sectors from 6 to 65. The S, SA, and SB types each have an embedded SCSI controller and fixed sectors of 19, 35, and 65, respectively. The media, however, can be reformatted in the field to have either one of 19, 35, and 65 sectors. Each model's disk enclosure is completely sealed, integrating three to six disks, six to eleven Whitney heads, a rotary voice coil motor (VCM), and a DC spindle motor. They are ideal for intelligent office systems which can handle even images, voices, and video data. An optional front panel is available.

The cover photo shows the M2246S with optional front panel attached.

### **85.8 to 171.7 megabytes of storage**

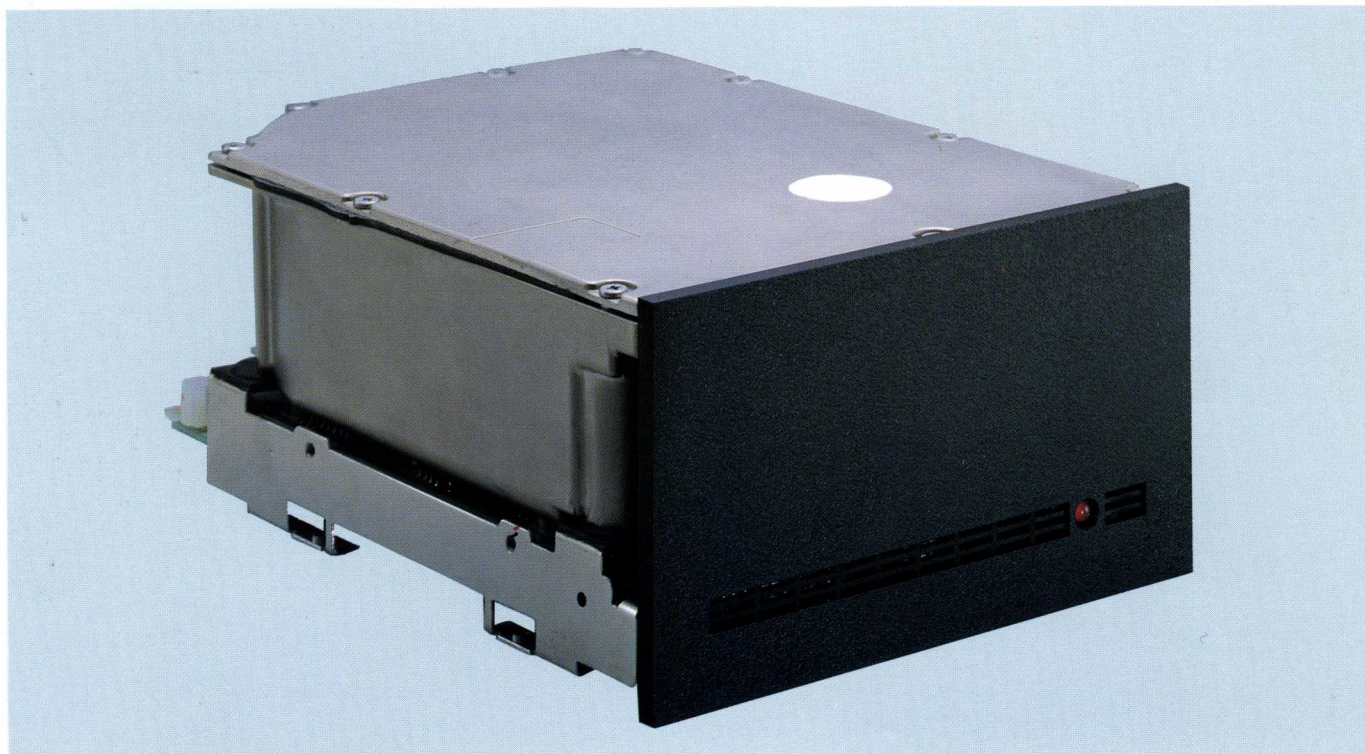
The M2244, M2245, and M2246 disk drives have new large capacities which were available only with conventional 8-inch disk drives. The M2244 is provided with 85.8 megabytes, the M2245 with 120.2 megabytes, and the M2246 with 171.7 megabytes – all unformatted.

### **High performance**

The M2244, M2245, and M2246 have achieved fast positioning times – 5 milliseconds track-to-track, 25 milliseconds average, and 50 milliseconds maximum, including the settling time. The data transfer rate is 1,250 kilobytes per second. With the S, SA, and SB types, which have a large data buffer of 16 kilobytes, total transfer rate is further improved: 2.5 megabytes per second (synchronous mode) and 1.5 megabytes (asynchronous mode).

### **Microprocessor controlled**

The voice coil motor of these drives is controlled by a microprocessor. As a result, the seek control circuit is greatly simplified and reliability is further increased.



M2246E (with optional front panel attached)

## Reliable, maintenance free

The completely sealed disk enclosure contains a breathing filter and a recirculation filter to provide a contamination-free environment. Whitney heads eliminate moving parts for head loading and unloading. All models use LSI drive logic, and the Head IC prevents read errors caused by external electrical noise. With these features, the drives' mean time between failures (MTBF) is more than 30,000 power-on hours, and their mean time to repair (MTTR) is less than 30 minutes.

## Compact, economical

The new drives' large capacities and high performances have not been achieved at the expense of their compactness. Their physical size is the same as that of a minifloppy disk drive, and can be installed in minifloppy disk drive cabinets to increase storage capacity. They can be mounted horizontally or vertically. Each disk drive consumes only 30 watts. Noise and vibration have also been minimized. These features make the drives ideal choice for office applications.

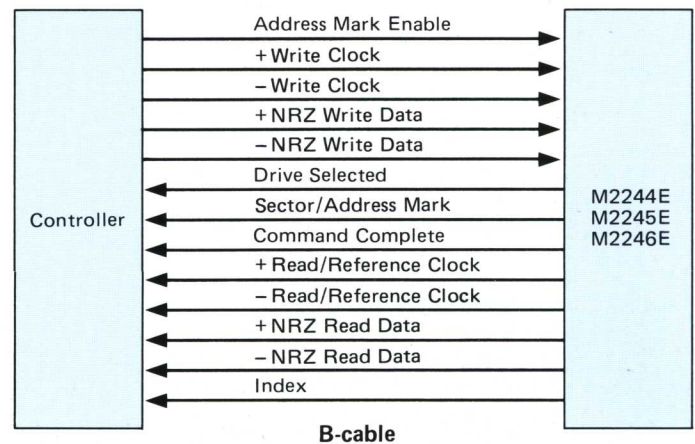
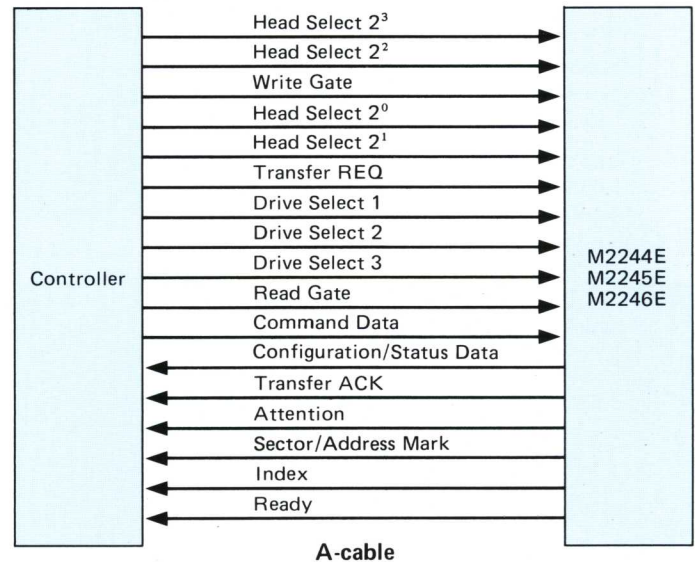
## Interfaces

The E type offers the Enhanced Small Disk Interface (ESDI). The S, SA, and SB types each integrate an SCSI controller for easy host computer connection. The controller's commands meet the SCSI CCS (Common Command Set for Direct Access Device).

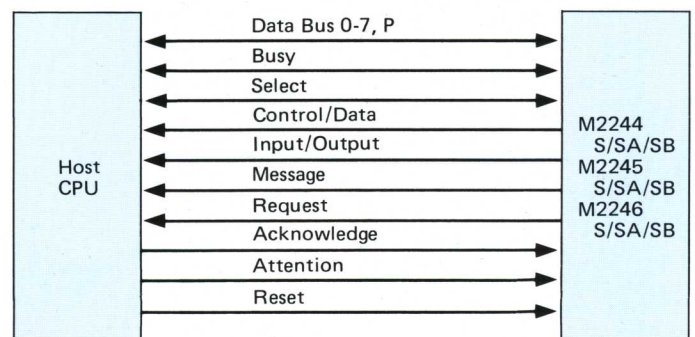
## Internationally compatible

The M2244, M2245, and M2246 disk drives use low-voltage DC power of +12V and +5V, permitting international applications and freedom from the effects of power line fluctuations.

### ESDI interface



### SCSI interface



## FUNCTIONAL SPECIFICATIONS

		M2244E	M2244S/SA/SB	M2245E	M2245S/SA/SB	M2246E	M2246S/SA/SB
Storage capacity	Unformatted	85.8 MB		120.2 MB		171.7 MB	
	Formatted	67.4 MB	80.1 MB*1	94.4 MB	112.1 MB*1	134.8 MB	160.1 MB*1
Disks (5¼-inch)		3		5		6	
Heads	Read/write	5		7		10	
	Servo			1			
Track capacity	Unformatted	20,864 bytes					
	Formatted	16,384 bytes (64 sectors: E type), 16,640 (S type), 17,920 (SA type), 19,456 (SB type)					
Tracks per cylinder		5		7		10	
Cylinders		823					
Sectors		Variable, 6 to 65 (E type), 19*2 (S type), 35*2 (SA type), 65*2 (SB type)					
Positioning time (including settling time)	Track-to-track	5 milliseconds					
	Average	25 milliseconds					
	Maximum	50 milliseconds					
Average latency time		8.3 milliseconds					
Rotational speed		3,600 rotations/minute					
Recording density		20,400 bits/inch					
Track density		850 tracks/inch					
Data transfer rate		1.25 MB/s (ESDI), 1.5 MB/s (SCSI, asynchronous mode), 2.5 MB/s (SCSI, synchronous mode)					
Recording code		RLL (2/7)					
Interface code		NRZ					
Interface		ESDI (E type), SCSI (S, SA, SB types)					
Start time		Less than 20 seconds					
Stop time		Less than 15 seconds					
Option		Front Panel					

\*1 19 sectors/track, 1,024B/sector \*2 Can be reformatted in the field (16, 35, or 65 sectors).

## RELIABILITY SPECIFICATIONS

		M2244E/S/SA/SB M2245E/S/SA/SB M2246E/S/SA/SB
Mean time between failure (MTBF)		More than 30,000 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

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

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## PHYSICAL SPECIFICATIONS

		M2244E/S/SA/SB M2245E/S/SA/SB M2246E/S/SA/SB
Power requirements		12VDC±5%, 1.8 A (max. 4.8 A); 5VDC±5%, 1.6 A (E type), 2.4 A (S, SA, SB types)
Dimensions	Height	83 mm (3.3 in)
	Width	146 mm (5.7 in)
	Depth	203 mm (8.0 in)
Weight		3 kg (6.6 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%, no condensing
	Not operating	5% to 95%, no condensing
Vibration	Operating	Max. 0.2 G (3Hz to 100Hz)
	Not operating	Max. 0.4 G (3Hz to 100Hz)
Shock resistance	Operating	Max. 2 G (max. 10 ms)
	Not operating	Max. 20 G (max. 10 ms)
Altitude	Operating	3,000 m (10,000 ft)
	Not operating	12,000 m (40,000 ft)

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