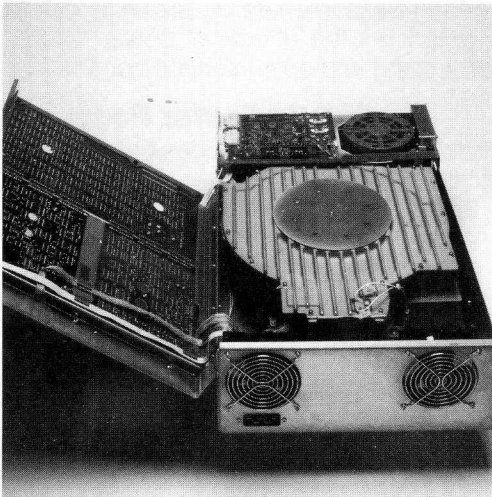


# High speed, large capacity disc storage for small and medium size computer systems.



## Microdata Model 4700 Fixed-Media Disc Drive

Model 4700 fixed-media disc drives provide high storage capacity, very fast access and data transfer, exceptional reliability and immunity to external environments.

- 3350 Technology
- 112 or 158 megabyte capacity
- 30 milliseconds average access time, 6 milliseconds track-to-track
- 9.40 MHz data transfer rate
- 35,000 hours between overhauls
- .5 hour MTTR, no scheduled preventive maintenance
- Error rate less than 1 bit in  $10^{13}$
- Closed air system with continuous refiltration
- Model 4700 drive with all features and options requires just 7 inches of vertical rack space
- Low initial cost per bit, long operational life, low operational cost

### Configurations

Model 4700 comes in two storage capacities: 112 or 158 million bytes, achieved with three or four disc platters.

The basic drive includes the chassis, media, rotational drive system, data and positioning electronics, closed loop air filtration system and slides for rack mounting. Standard interface is CDC Storage Module compatible.

### Model 4700 Configurations

Model Number	Capacity (Unformatted)	Number of Platters
4721	112	3
4722	158	4

### Integral Media Module

The media, recording heads and positioning carriage are packaged in an integral, fixed module. This eliminates the costs and tolerances associated with removability. And it also eliminates the need for head alignments and other periodic maintenance.

### High Data Density

Model 4700 features low mass, high compliance recording heads which fly much closer to the recording surface than previous technologies would permit. Thus, they can read and write at higher data densities on tracks spaced much closer together.

Model 4700 data density is 6427 bits per inch. Track density is 478 tracks per inch. This provides storage of 20,160 bytes of unformatted data on each of 1,122 tracks for a total of 22.6 million bytes per surface.

### Closed Air System

The air system within the media module is closed to the external environment. The inside air is continuously recirculated and refiltered, resulting in a nearly 100% pure air system which is virtually immune to external contamination. A breather with high efficiency absolute filter permits pressure equalization with the ambient air without contamination.

### Fast Access and Data Transfer

Model 4700 uses two read/write heads per surface, effectively halving the average distance the heads must travel to access data and doubling the amount of data accessible by a single head movement. The heads are mounted on a low mass carriage on precision bearings. The positioner

is a voice coil employing radial stroke for maximum positioning speed and stiffness. An electronic velocity transducer controls acceleration, speed and deceleration of the carriage to minimize settling time and wear in the positioning system.

Disc rotation speed is 3530 rpm for an average rotational latency time of only 8.50 milliseconds and a data transfer rate of 9.40 MHz.

### Reliability

Model 4700 is designed for an operating life of more than 35,000 hours between overhauls, with no scheduled preventive maintenance. In the event of malfunction, the Model 4700 is repaired quickly and easily by replacing one of the following modules:

- Disc chamber with linear drive motor and head carriage
- Disc drive motor and/or belt
- Logic/interface circuit card
- Power supply/amplifier circuit card
- Servo electronics circuit card
- Read/write/control electronics circuit card
- DC power supply

Model 4700 has a soft (recoverable) error rate of one bit in  $10^{10}$  with only one bit in  $10^{13}$  nonrecoverable. Design features which make this performance possible include the precise head positioning system, advanced design read/write electronics, clean air system and effective internal ground isolation to protect data from errors caused by heavy power line transients.

To facilitate error recovery from the disc controller, Model 4700 provides servo track offset, data strobe offset, re-write and re-read functions.

### Contact Start/Stop Heads

Model 4700 dual recording heads are similar to those on the IBM 3350. As in the IBM drive, the lightly loaded heads rest on a non-data portion of the disc surface during start and stop. A special coating on the disc surface protects both the heads and the media, extending the useful head and disc life.

### Media Protection

The inherent data safety features of the 4700 closed disc chamber are supplemented by electrical interlocks that protect data from the effects of power failure, internal malfunctions and improper interface commands.

### Switch/Indicator Panel

The switch/indicator panel includes the following controls and indicators:

- WRITE PROTECT switch
- WRITE PROTECT indicator
- READY indicator
- FAULT indicator

### Power Requirements

4700 uses 115 vac line power for rotational drive. DC requirements are +9V, -9V, +18V and -18V. These voltages may be supplied by your system power supplies or by the optional 4700 internal supply. With the internal supply, 4700 required 100 to 240 vac, 50 or 60 Hz.

## Specifications

**Number of Platters:** 3 or 4  
**Number of Data Cylinders:** 561/Head  
**Data Tracks per Surface:** 1,122  
**Data Bytes per Track:** 20,160  
**Data Capacity:** 112 or 158 million bytes  
**Data Bit Density:** 6,427 bits per inch at the inside diameter track  
**Data Bit Cell Time:** 106.40 nanoseconds  
**Disc Rotation Speed:** 3,530 rpm  
**Rotational Latency:** 8.50 milliseconds average  
**Data Bit Transfer Rate:** 9.48 MHz  
**Full Stroke Position Time:** 55 milliseconds  
**Average Stroke Position Time:** 30 milliseconds  
**Single Track Position Time:** 6 milliseconds  
**Head Position Error Rate:** Less than  $0.5 \times 10^{-6}$   
**Mean Time Between Failure (MTBF):** 6000 hours  
**Mean Time to Repair (MTTR):** .5 hour  
**Recoverable Error Rate:** Less than one bit in  $10^{10}$  bits  
**Non-recoverable Error Rate:** Less than one bit in  $10^{13}$  bits

**Air Filters:** 0.3 micron HEPA type

### ELECTRICAL

**DC Power Requirements (normal):**

- +9V ( $\pm 1V$ ) at 1A min, 3A max
- 9V ( $\pm 1V$ ) at 0.5A min, 2A max
- +18V ( $\pm 1.5V$ ) at 1A min, 4A max
- 18V ( $\pm 1.5V$ ) at 1A min, 4A max

**AC Power (for optional DC supply):**

- 100, 115 (std.), 190, 208, 220 or 240 Vac (+10%, -15%), single phase, 60Hz (50Hz optional) at 350 watts max
- Start surge current 20A for 5 sec

### PHYSICAL

**Dimensions:** 19 in. wide, 7 in. high, 28 in. deep  
**Weight:** 100 pounds

### ENVIRONMENTAL

**Operating Temperature:** +15°C to +41°C at front inlet  
**Operating Humidity:** 10% to 80%, without condensation

# Microdata OEM Peripherals

A Significant Difference

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