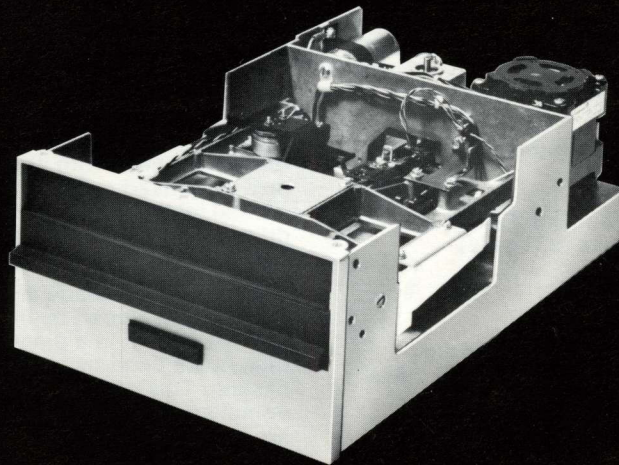


 Shugart Associates

SA850/851 SA850R/851R

Double-Sided Diskette Storage Drives



The SA850/851 diskette storage drives are enhanced double-headed versions of the standard Shugart SA800/801 drives. SA850/851 drives provide up to four times the on-line storage capacity, faster access time, and lower heat dissipation along with improved reliability and maintainability.

SA850/851 drives read and write in single or double density on standard diskettes and on both sides of two-sided diskettes. The new drives are exactly the same size as Shugart SA800/801 drives and are plug compatible. The SA850/851 drives are also media compatible with IBM 3740 and S/32 single-sided drives, the IBM 4964 and 3600 series two-sided units, as well as the new S/34 two-sided double density unit.

The new proprietary Fasflex™ actuator utilizes a flexible metal band for sure low friction head movement and a fast 3 ms track-to-track access time. The read/write heads are also proprietary and are mounted on a newly developed head carriage assembly which allows the heads to be loaded simultaneously on both sides of the diskette. This flexured mounting arrangement provides excellent compliance and minimum wear.

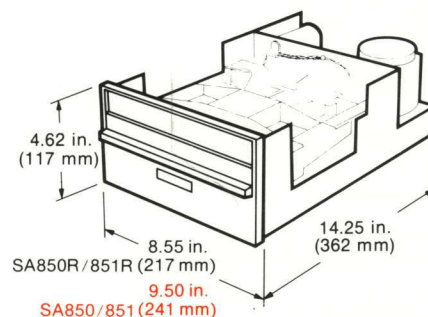
Other valuable features include: new programmable door lock and write protect plus dual index sensor to differentiate between single and two-sided diskettes.

With the elimination of the head load pad and the simplification of actuator and head carriage assemblies, maintenance is greatly reduced and serviceability enhanced.

The new SA850/851 will prove highly cost-effective in applications such as: intelligent terminals, mini-computer/microcomputer systems, program storage, point-of-sale systems, small business systems as well as word processing systems and intelligent calculators.

Key Features

- Storage capacity of up to four times that of SA800 and other standard floppy drives.
- Single or double density (standard).
- Same physical size as standard SA800/801 product family.
- SA800/801 I/O compatibility.
- Reads and writes data on any standard diskette (single-sided) as well as the IBM Diskette 2, 2D or equivalent.
- Improved access time over standard drives—3 ms track-to-track.
- New proprietary Fasflex™ actuator.
- New improved head carriage assembly loads heads on both sides of diskette simultaneously, eliminating head load pad.
- Same proprietary R/W head technology as standard Shugart drives.
- Write protect and programmable door lock are standard for improved data security.



Specifications

Functional Characteristics

SA850/851 Diskette Storage Drives consist of read/write and control electronics, drive mechanism, two read/write heads and a track positioning mechanism. These components perform the following functions:

- Interpret and generate control signals.
- Move read/write head to the selected track.
- Read and write data.

The Fasflex™ Head Positioning Actuator positions the read/write head to the desired track on the diskette. The Head Load Solenoid loads the read/write heads against the diskette and data may then be recorded on or read from the diskette.

The electronics are packaged on one PCB which contains:

1. Index Detector Circuits (Sector/Index for 851)
2. Head Position Actuator Driver
3. Head Load Solenoid Driver
4. Read/Write Amplifier and Transition Detector
5. Data/Clock Separation Circuits (851 only)
6. Write Protect and Door Lock
7. Drive Ready Detector Circuit
8. Drive Select Circuits

The SA851 is designed for ease of use in hard sector applications. Two Model SA850R/851R units mount side-by-side in standard 19" RETMA rack.

Drive Mechanism

The Diskette drive motor rotates the spindle at 360 rpm through a belt-drive system. 50 or 60 Hz power is accommodated by changing the drive pulley and belt. A registration hub, centered on the face of the

spindle, positions the diskette. A clamp that moves in conjunction with the cartridge guide fixes the diskette to the registration hub.

Positioning Mechanism

The read/write heads are accurately positioned by Fasflex™ metal band/stepping motor actuator system. A precision stepping motor is used to precisely position the head/carriage assembly through the use of a unique metal band/capstan concept. Each 3.6° rotation of the stepping motor moves the read/write head one track in discrete increments.

Read/Write Heads

The proprietary heads are a single element ceramic read/write head with straddle erase elements to provide erased areas between data tracks. Thus normal interchange tolerances between media and drives will not degrade the signal to noise ratio and insures diskette interchangeability.

The read/write heads are mounted on a carriage which is positioned by the Fasflex™ actuator. The diskette is held in a plane perpendicular to the read/write head by a platen located on the base casting. This precise registration assures perfect compliance with the read/write heads. Both heads are loaded against the diskette by the head load solenoid. The read/write heads are in direct contact with the diskette. The head surface has been designed to obtain maximum signal transfer to and from the magnetic surface of the diskette with minimum head/diskette wear.

Performance Specifications

	Single Density	Double Density
Capacity		
Unformatted		
Per Disk	800 kilobytes	1600 kilobytes
Per Surface	400 kilobytes	800 kilobytes
Per Track	5.2 kilobytes	10.4 kilobytes
IBM Extended Format (max)		
Per Disk	606 kilobytes	1212 kilobytes
Per Surface	303 kilobytes	606 kilobytes
Per Track	4.1 kilobytes	8.2 kilobytes
Transfer Rate	250 kilobits/sec.	500 kilobits/sec.
Latency (Avg.)	83 ms	83 ms
Access Time		
Track to track	3 ms	3 ms
Average (including settling)	91 ms	91 ms
Settling Time	15 ms	15 ms
Head Load Time	35 ms	35 ms

Functional Specifications

	Single Density	Double Density
Rotational Speed	360 rpm	360 rpm
Recording Density (inside track)	3408 bpi	6816 bpi
Flux Density	6816 fci	6816 fci
Track Density	48 tpi	48 tpi
Cylinders	77	77
Tracks	154	154
Heads	2	2
Physical Sectors		
SA850/R	0	0
SA851/R	32/16/8	32/16/8
Index	1	1
Encoding Method	FM	MFM/M ² FM
Media Requirements		
SA850	SA150/IBM Diskette 2	SA150/IBM Diskette 2D
SA851	SA151	SA151
Alignment Diskette	SA120	SA120

Physical Specifications

Environmental Limits

Ambient Temperature	= 40° to 115° F (4.4° C to 46.1° C)
Relative Humidity	= 20% to 80%
Maximum Wet Bulb	= 78° F (25.6° C)

AC Power Requirements

50/60 Hz ± 0.5 Hz	
100/115 VAC Installations	= 85-127V at .4A typical
200/230 VAC Installations	= 170-253V at .2A typical

DC Voltage Requirements

+ 24VDC ± 10% 0.6A typical	
+ 5VDC ± 5% 0.8A typical	
- 7 to -16VDC .07A typical (option -5VDC ± 5% .05A typical)	

Mechanical Dimensions (exclusive of front panel)

	SA850R/851R	SA850/851
Height	= 4.62 in. (117 mm)	4.62 in. (117 mm)
Width	= 8.55 in. (217 mm)	9.50 in. (241 mm)
Depth	= 14.25 in. (362 mm)	14.25 in. (362 mm)
Weight	= 13.0 lbs. (5.91 kg)	13.0 lbs. (5.91 kg)

Heat Dissipation 195 BTU/hr. typical (57 watts)

Reliability Specifications

MTBF: 5000 POH under heavy usage
8000 POH under typical usage

MTRR: 30 minutes

Component Life: 15,000 POH

Error Rates:

Soft Read Errors:	1 per 10 ⁹ bits read
Hard Read Errors:	1 per 10 ¹² bits read
Seek Errors:	1 per 10 ⁶ seeks
Media Life:	Passes per Track: 3.5 x 10 ⁶
	Insertions: 30,000 +



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