

The AMCOMP 8020 Disc Memory System is a high capacity, fast access storage device for Digital Equipment Corporation PDP-11 Series computers. Memory capacities are available from 131K words to 8,388K words, with average access times of 8.3 or 16.7 milliseconds. Data transfer rates range from 2 microseconds per word to 33 microseconds per word.

Hardware

The 8020 Disc Memory System consists of (1) 8000 Series Disc Memory Unit (2) Model 8021 Controller (3) Optional Model 8022 Chassis/Power Supply Assembly (4) Interconnecting Cables (less UNIBUS™) (5) Function Verification Program.

The 8000 Series Disc units include the 8400 Series (up to 1,048K words) and the 8500 Series (up to 2,097 words) available at either 3600 or 1800 rpm. There are up to 128 data tracks in the 8400 and up to 256 tracks in the 8500. Each track is divided into 256 sectors of 32 data words.

The 8021 controller consists of two printed wire boards mounted in a DEC System unit block. The 8021 can be mounted into the cpu chassis or optionally within a 19 inch slide mountable chassis containing a DC power supply (Model 8022).

The 8021 will interface to the PDP-11 using standard UNIBUS conventions. The UNIBUS is connected to the controller using standard DEC UNIBUS receptacles. Provision is made to loop the UNIBUS cable through the controller or to terminate the UNIBUS on the controller.

Software

The 8020 Disc Memory System is a direct replacement for the DEC RCT1/RS64 Disc and Control and as

such is compatible with DEC developed operating software. To utilize storage capacities greater than those available with the DEC RCT1/RS64 (262K words max), the Disc Address Register (UNIBUS address 777442) has been modified to include bits 13, 14, and 15 and an Address Extension Register (UNIBUS address 777454) has been added. The 8020 does not utilize the DEC Maintenance Register (UNIBUS address 777454) (replaced with Address Extension Register) and Data Buffer (UNIBUS address 777456). An 8020 Function Verification Program is supplied for maintenance purposes.

Operation

Each disc track is divided into 256 sectors, each of which contains 32 words of data plus a 16-bit cyclic check word. The cyclic check word is generated and checked automatically by the controller. Sectors are interspersed across the track depending on the interlace factor wired for the controller. If the interlace factor is N, then there are N-1 sectors located between two consecutively numbered sectors. Sector interlacing is used to change the average data transfer rate of the disc memory. It allows the disc speed to match the transfer speeds desired on the PDP-11 computers. The interlace factors specifiable on the controller are 1:1, 2:1, 4:1, and 8:1.

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The 8021 controller will interface to the PDP-11 using standard UNIBUS conventions. The controller can be strapped to interrupt on any BR level (BR5 standard). The interrupt vector is 210₈. Control and status word transfers use the UNIBUS with the controller as slave. Data transfers to and from the disc use the NPR bus controls.

Controller Instructions

The controller has seven registers that are accessible to the programmer.

REGISTER DESCRIPTION	UNIBUS ADDRESS	COMMENTS
Look Ahead	RCLA 777440	Read Only
Disc Address	RCDA 777442	Read/Write
Disc Error Status	RCER 777444	Read Only
Command & Status	RCCS 777446	Read/Write
Word Count	RCWC 777450	Read/Write
Current Address	RCCA 777452	Read/Write
Address Extension	RCEX 777454	Read/Write
Maintenance	- 777454	Deleted
Data Buffer	- 777456	Not Implemented



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Other literature available from your
local Amcomp sales representative:

8020 Technical Specification

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TWX 910-339-9244

SPECIFICATIONS

Data Format

Word Size	16 bits
Words Per Track	8192
Words Per Sector	32
Sectors Per Track	256

Transfer Characteristics

Transfer characteristics shown at 60Hz input. At 50Hz input without pulley/belt modifications, increase all characteristics by a factor of 1.2.

	At 1800 rpm (Disc Model 8410,8510)	At 3600 rpm (Disc Model 8430, 8530)
Average Data Transfer Rate		
at 1:1 interlace	4.07 μ sec/word	2.03 μ sec/word
at 2:1 interlace	8.14 μ sec/word	4.07 μ sec/word
at 4:1 interlace	16.28 μ sec/word	8.14 μ sec/word
at 8:1 interlace	32.55 μ sec/word	16.28 μ sec/word
Peak Data Transfer Rate	3.71 μ sec/word	1.85 μ sec/word
Average Access Time	16.7 milliseconds	8.3 milliseconds

Storage Capacity per Disc Unit

16 tracks	131,072 data words	(8400/8500-16)
32 tracks	262,144 data words	(8400/8500-32)
64 tracks	524,288 data words	(8400/8500-64)
128 tracks	1,048,576 data words	(8400/8500-128)
256 tracks	2,097,152 data words	(8500-256)

Disc Units per Controller

Up to four 8400 Series Disc Units (4,194,304 data words) or four 8500 Series Disc Units (8,388,608 data words) may be daisy chained to one controller.

Physical Characteristics

8400/8500 Disc Memory Unit	8.72 in. (22.15 cm) H X 16.88 (42.88 cm) W X 22.13 in. (56.21 cm) D. 85 lbs. (39 kg)
8021 Controller	2.25 in. (5.72 cm) H X 16.50 in. (41.91 cm) W X 10.0 in. (25.4 cm) D. 2 lbs (1 kg)
8021 mounted in 8022	3.50 in. (8.89 cm) H X 16.88 in. (42.88 cm) W X 17.0 in. (43.2 cm) D. 10 lbs (4.5 kg)

Power Requirements

AC Power

8400/8500 Disc
Memory Unit 100, 120, 220, 240 VAC + 5%, - 10%
50 or 60 Hz \pm 5%, single phase, 8.3 amps
start, 2.7 amps run.

8021 Controller None required

8021 Controller
mounted in
8022 chassis/power
supply 115, 230 VAC \pm 10% (standard)
100, 200 VAC \pm 10% (special order)
50 or 60 Hz \pm 5%, single phase, 2 amps.

DC Power

8400/8500 Disc
Memory Unit Self contained

8021 Controller + 5 VDC \pm 5%, 6 amps
(from cpu chassis)

8021 Controller
mounted in
8022 chassis/power
supply Self contained

Environmental Characteristics

Same as 8400/8500 Disc Memory Units

Because of our continuing program of product
improvement, all specifications are subject to
change without notice.