

MATOR SHARK / 22 MEGABYTE

SYSTEM DESCRIPTION

COMMODORE VERSION

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GENERAL USE

The Mator SHARK is fully compatible with the Commodore 8050 / 8250 Floppy Disc Unit (DOS 2.5 / 2.7) for use with Commodore PET microcomputers using BASIC 4.0. The Commodore Floppy Disk User's Manual may be used as a guide to the functions available. Differences in Directory and BAM layouts (made necessary by the vastly increased capacity of the disc) are shown in the System Description.

Note that in addition to the red error LED on the front panel, there are two green LEDs indicating activity on each of the two logical drives within the unit and an orange LED which is to indicate activity in the sharkive when in use.

THE MATOR SHARK

INTELLIGENT WINCHESTER DISC SUB-SYSTEM

The MATOR SHARK Intelligent Winchester Disc Subsystem consists of a "Winchester" technology hard disc drive providing 24 Megabytes of data storage (21 megabytes when formatted), a power supply and intelligent INTEL 8085A-based controller housed in a metal cabinet, complete with cooling fan, looms and IEEE-488 socket.

To the COMMODORE PET the sub-system appears identical to the CBM 8050 floppy disc unit in the way it handles its IEEE-488 interface and in the command set it supports. It may be used in any PET configuration since its IEEE device address is switch selectable. If desired, by selecting different device addresses, more than one sub-system may be used in a single configuration.

In one major respect, however, it is very different - it provides the PET with two logical discs, each with a full 10.5 Megabyte capacity. This opens up entirely new application areas for the PET, where vast amounts of data storage are required on-line e.g Stock Control, Mailing Lists etc.

The two logical discs are in fact the two halves of the Winchester disc set out in the following manner -

	Sector	0.....137	

Track 0		-----	Volume Header
	1		
		PET DISC 0	
		Direction of sector allocation	

	299	BAM & Directory Disc 0	

	299	BAM & Directory Disc 1	

		Direction of Sector allocation	
		PET DISC 1	
	1		

Track 599		-----	Defective Sector Re-allocation

It can be seen that the two PET discs, each with 299 tracks and 138 sectors per track, are held as mirror images of one another so that their BAM and Directory tracks (Track 299) are physically adjacent. Setting out the Winchester disc in this way ensures minimum head movement when accessing first one disc then the other. Sectors are allocated to files starting from track 298 working downwards on both discs, again ensuring that head movement is minimised.

Transfer of data between the Winchester disc and the controller uses Direct Memory Access (DMA), providing a transfer rate of 0.8 Megabytes per second.

A linear head positioner gives an average random track access time of 34 milliseconds. The Mean Time Between Failure (MTBF) is reckoned by the drive manufacturers to be 25,000 hours and the drive itself has no scheduled maintenance.

DIRECTORY HEADER BLOCK

Track 299 Sector 23

BYTE	CONTENT	DEFINITION
0,1	299	Track pointer to 1st BAM block
2	0	Sector pointer to 1st BAM block
3	"W"	Disc format code (Winchester)
4	0	Null flag
5-8	0	Unused
9-24		Disc Name
25,26	\$A0	Shifted spaces
27,28		Disc ID
29	\$A0	Shifted space
30,31	"1W"	DOS Version & Format
32-35	\$A0	Shifted spaces
36-255	0	Unused

DIRECTORY BLOCK FORMAT

First Directory Block: Track 299 Sector 24
Subsequent Directory Blocks: Track 299
Sectors 25-137

BYTE	CONTENT	DEFINITION
0,1	299	Track pointer to next Directory sector
2		Sector pointer to next Directory sector
3-33		File entry 1
34-64		File entry 2
65-95		File entry 3
96-126		File entry 4
127-157		File entry 5
158-188		File entry 6
189-219		File entry 7
220-250		File entry 8
251-255		Unused

See detailed File Entry description on next page.

DIRECTORY FILE ENTRY

BYTE	CONTENT	DESCRIPTION
0	128+Type	File Type OR'd with \$80 to indicate closed file Types: 0 DELETED 1 SEQUENTIAL 2 PROGRAM 3 USER 4 RELATIVE
1,2		Track pointer to 1st data block
3		Sector pointer to 1st data block
4-19		File name
20,21	Relative	Track pointer to side sector header
22	file	Sector pointer to side sector header
23	only	Record length
24,25	0	Unused
26,27		Track pointer to 1st replacement data block
28		Sector pointer to 1st replacement data block
29,30		File size (no. of data blocks used)

FILE FORMATS

SEQUENTIAL FORMAT

BYTE	CONTENT	DEFINITION
0-2		Track & sector pointer to next data block
3-255		Up to 253 data bytes with CR's as record terminators

When the block is the last used in a file, the track pointer is set to zero and the sector pointer points to the next free byte in the block.

PROGRAM FILE FORMAT

BYTE	CONTENT	DEFINITION
0-2		Track & sector pointer to next block in program file
3-255		Up to 253 bytes of program stored in CBM memory format (with key words tokenised). End-of-file is indicated by 3 zero bytes.

RELATIVE FILE FORMAT

BYTE	CONTENT	DEFINITION
0,2		Track & sector pointer to next data block.
3-255		Up to 253 bytes of data.

Empty records contain \$FF in their first byte position. Partially filled and empty blocks are padded with null bytes.

BAM FORMAT

First BAM block: Track 299 Sector 0

Subsequent BAM blocks: Track 299 Sectors 1-22

BYTE	CONTENT	DEFINITION
0,1	299	Track pointer to next BAM block
2		Sector pointer to next BAM block
3	"w"	Disc Format (Winchester)
4	0	Null Flag
5,6		Lowest track in this BAM block
7,8		Highest track+1 in this BAM block
9-255		13 19-byte BAM entries (one for each track)

The last BAM block (Track 299 Sector 22) points on to the first Directory block (Track 299 Sector 24).

See detailed description of BAM entry on next page.

BAM ENTRY

BYTE	CONTENT	DEFINITION
0	0-138	No. of available sectors on this track
1		Bit Map for sectors 7-0
2		Bit Map for sectors 15-8

18 Bit Map for sectors 138-136

Within a Bit Map

Bit = 1 means Available
Bit = 0 means Not Available (in use)

SIDE SECTOR HEADER

BYTE	CONTENT	DEFINITION
0,1		Track pointer to 1st side sector
2		Sector pointer to 1st side sector
3	0	Side sector no.
4		Record Length
5-253		Track and sector pointers to up to 83 side sectors
254,255		Unused

SIDE SECTOR

BYTE	CONTENT	DEFINITION
0,1		Back pointer to next side sector
2		Back pointer to next side sector
3	1-83	Side sector no.
4		Word length
5-7		Back and sector pointer side sector header
8-253		Back and sector pointers up to 82 data blocks
254,255		Used

The maximum file size of a relative file (max. no. of data bytes) is $83 \times 82 \times 253 = 1,721,918$ bytes (approximately 1.7 megabytes).