

Commodore Disk Specifications

Model	D9090	D9060	8250	8050	4040	2031	1541
Drives per Head	1	1	2	2	2	1	1
Heads per Drive	6	4	2	1	1	1	1
Formatted Storage							
Capacity per Unit	7.47 MB	4.98 MB	2.12 MB	1.05 MB	340 KB	170KB	170KB
Max Sequential Files/Drive	7.41 MB	4.94 MB	1.05 MB	521 KB	168 KB	168 KB	168KB
Max Relative Files/Drive	7.35 MB	4.90 MB	1.04 MB	183 KB	167 KB	167 KB	167KB
Disk System Buffer	4 KB	4 KB	4 KB	4 KB	4 KB	2 KB	2KB
Disk Formats							
Cylinders (Tracks)	153	153	77	77	35	35	35
Sectors per Cylinder	128	192	-	-	-	-	-
Sectors per Track	32	32	23-29	23-29	17-21	17-21	17-21
Bytes per Sector	256	256	256	256	256	256	256
Blocks Free	29162	19442	8266	4104	1328	664	664
Transfer Rates (bytes per second)							
Internal to Unit	5 MB	5 MB	40 KB	40 KB	40 KB	40 KB	-
IEEE-488 Bus	1.2 KB	1.2 KB	1.2 KB	1.2 KB	1.2 KB	1.2 KB	-
Access Times (milli-seconds)							
Track-To-Track	3	3	5	*	30	30	30
Average Track	153	153	125	**	360	360	360
Head Settling Time	15	15	-	-	-	-	-
Average Latency	8.34	8.34	100	100	100	100	100
RPM	3600	3600	300	300	300	300	300
* Track-To-Track: Micropolis 8050 = 30 ms. Tandon 8050 = 5 ms.							
** Average Track: Micropolis 8050 = 750 ms. Tandon 8050 = 125 ms.							
Physical Dimensions							
Height (inches)	5.75	5.75	7.0	7.0	7.0	5.5	3.0
Width (inches)	8.25	8.25	15.0	15.0	15.0	8.0	7.0
Depth (inches)	15.25	15.25	13.75	13.75	13.75	14.25	13.0
Weight (pounds)	21	21	28	28	28	20	10
Electrical							
Power (Watts)	200	200	60	50	50	40	35
Voltage (all models)	110 - 120 VAC. 60 Hz						

Disk Utility-Command Set

Command	Abbreviation	Format
Block-Read	B-R	"B-R: " ch;dr;t;s
Block-Write	B-W	"B-W: " ch;dr;t;s
Block-Execute	B-E	"B-E: " ch;dr;t;s
Buffer-Pointer	B-P	"B-P: " ch;p
Block-Allocate	B-A	"B-A: " dr;t;s
Block-Free	B-F	"B-F: " dr;t;s
Memory-Write	M-W	"M-W " adL/adH/nc/data
Memory-Read	M-R	"M-R " adl/adh
Memory-Execute	M-E	"M-E " adl/adh
User Command	U	"ux:ch;dr;t;s

CH	The channel number in DOS: identical to the Secondary Address in the associated OPEN statement
DR	The Drive number: 0 (or 1 floppy dual drives)
T	The Track number: 1 through 154 (depending on the model*)
S	Sector number : 0 through 112 (depending on the model*)
P	The pointer Position for the buffer pointer
ADL	The Low byte of the Address (use CHR\$(ADL))
ADH	The High byte of the Address (use CHR\$(ADL))
NC	The Number of Characters: 1 through 34
DATA	The actual data in hexadecimal. This is transmitted by using the CHR\$(17) would send the decimal equivalent of hexadecimal 11
X	The index to the user table
PARMS	The Parameters associated with the U command (optional)

Sector Distribution By Track

Track Number	Number of Sectors		
	4040	2031	1541
1 - 17	21	21	21
18 - 24	19	19	19
25 - 30	18	18	18
31 - 35	17	17	17

Track Number	8050	8250	
1 - 39	29	29	
40 - 53	27	27	
54 - 64	25	25	
65 - 77	23	23	
78 - 116		29	
117 - 130		27	
131 - 141		25	
142 - 154		23	

D9060/D9090 - 153 tracks per recording surface (4 on D9060 and 6 on the D9090) with 32 sectors per track

User Command Jump Table

Standard Syntax	Alternate Syntax	Function
U1	UA	Block-Read replacement
U2	UB	Block-Write replacement
U3	UC	Jump to \$1300
U4	UD	Jump to \$1303
U5	UE	Jump to \$1306
U6	UF	Jump to \$1309
U7	UG	Jump to \$130C
U8	UH	Jump to \$130F
U9	UI	Jump to \$10F0 (NMI)
U:	UJ	Power-Up vector (reset)

BAM (Block Allocation Map) Formats

4040, 2031, and 1541 BAM Format - Track 18 Sector 00					
Byte#	Description	Data			
0-1	Track-Sector of first Directory block	18-00			
2	ASCII 'a' Identifies DOS 2.6 format	65			
3	Reserved for future DOS use	00			
4-143	Bit map of available blocks	tracks 1-35			
8050 BAM Format					
Byte#	Description	Data			
		BAM 1 Tr38 / Sc00	BAM 2 Tr38 / Sc03		
0-1	Track-Sector of next BAM block	38-03	39-01		
2	ASCII 'c' Identifies DOS 2.5 format	67	67		
3	Reserved for future DOS use	00	00		
4	Lowest track # mapped in this BAM block	01	51		
5	Highest track # (+ 1) mapped in this BAM block	51	78		
6	Number of unused blocks on track:	1	51		
7-10	Bit map of available blocks on track:	1	51		
11-255	(BAM 2: 11-140)Bit map of available blocks on tracks:	2-50	52-77		
8250 BAM Format					
Byte#	Description	Data			
		BAM 1 Tr38 / Sc00	BAM 2 Tr38 / Sc03	BAM 3 Tr38 / Sc06	BAM 4 Tr38 / Sc09
0-1	Track-Sector of next BAM block	38-03	38-06	38-09	38-01 (Dir)
2	ASCII 'c' Identifies DOS 2.7 format	67	67	67	67
3	Reserved for future DOS use	00	00	00	00
4	Lowest track # mapped in first BAM block	01	51	101	151
5	Highest track # (+ 1) mapped in first BAM block	51	101	151	155
6	number of unused blocks on track:	1	51	101	151
7-10	bit map of available blocks on track:	1	51	101	151
11-255	(BAM 4: 11-25)Bit map of available blocks on tracks:	2-50	52-100	102-150	152-154
D9060 / D9090 BAM Format - Track 1 Sector 0 (normal location)					
Byte#	Description	Data			
0-1	Track-Sector pointer to next BAM block	\$FFFF = last			
2-3	Track-Sector pointer to previous BAM block	\$FFFF = first			
4	Lowest track # mapped in this BAM block				
5	Highest track # (+ 1) mapped in this BAM block				
6	Number of blocks unused on this track				
7-10	Bit map of available blocks on this track				
11-255	Bit map of the next 49 tracks				

Directory Format

2031, 4040, 1541 Directory Header - Track 18 Sector 00		
Byte#	Data	Description
1-143		Reserved for 2031 BAM
144-161		Diskette name, padded with shifted spaces
162-163		Diskette ID number
164	160	Shifted space
165-166	50, 65	ASCII '2a' identifies DOS version and format
167-170	160	Shifted spaces
171-255	00	Not used
8050, 8250 Directory Header - Track 39 Sector 00		
Byte#	Data	Description
0-1	38, 00	Track-Sector to first BAM block
2	67	ASCII 'c' identifies DOS 2.5 format
3	00	reserved for future DOS use
4-5		Not used
6-21		Diskette name, padded with shifted spaces
22-23	160	Shifted spaces
24-25		Diskette ID number
26	160	Shifted space
27-28	50, 67	ASCII '2c' identifies DOS version and format
29-32	160	Shifted spaces
33-255	00	Not used
D9060 / D9090 Directory Header - Track 0 Sector 0		
Byte#	Data	Description
0-1		Track-Sector pointer to bad track and sector list
2-3	00, 255	Identifies DOS 3.0 format
4-5	76, 00	Track-Sector of first directory block
6-7	00, 00	Not used
8-9	01, 00	Track-Sector of first BAM block

2031 Directory Blocks - Track 18 Sector 01 through 18
 4040 Directory Blocks - Track 18 Sector 01 through 18
 8050 Directory Blocks - Track 39 Sector 01 through 29
 8250 Directory Blocks - Track 39 Sector 01 through 29
 D9060 / D9090 Directory Blocks - Starting on cylinder 76, uses all Tracks - Sectors 00 through 31, then expands to additional blocks as required, providing 'unlimited' Directory size.

Byte#	Description
0-1	Track-sector pointer to next directory block
2	File type
3-4	Track-sector pointer to first file block
5-20	File name, padded with shifted spaces
21-22	Track-sector of first side sector if RELATIVE file
23	Record length if relative file
24-27	Reserved for future file information
28-29	Track-sector pointer for replacement
30-31	Number of blocks used by the file
32-255	Seven more 32-byte file entries (same as 2-31 above, plus two additional unused bytes)

Additional Notes	
1	32 bytes per file entry, except the first entry is 30 bytes
2	Total of eight (8) file entries per directory block
3	File types are: Scratched Files \$00 Sequential Files \$01 Program Files \$02 User-Defined \$03 Relative Record \$04
4	File type codes are OR'ed with \$80 when file is properly closed
5	Track value of 00 in byte zero indicates the last used block in the directory. Sector value then shows next byte to use