

# HP Flexible Disk Formats

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## Nomenclature

- 0.5 MB media is typically 250...360 KB formatted (SS/DD)
- 1.0 MB media is typically 600...720 KB formatted (DS/DD)
- 2.0 MB media is typically 1.20...1.44 MB formatted (HD)

Product	0.5-Mbyte Media	1.0-Mbyte Media	2.0-Mbyte Media
HP 9122D/S	E	D	N
HP 9122C	E/2	D/2	D
HP 9123D	E/2	D	N
HP 9133D/H/L	E	D	N
HP 9153C	E/2	D/2	D

D = Recommended for daily use.

D/2 = Recommended for daily use; data transferred at one-half the normal rate.

E = Recommended for data exchange only.

E/2 = Recommended for data exchange only; data transferred at one-half the normal rate.

N = Never use; product unable to identify 2-Mbyte media.

**Table 1: Flexible Disk Media Usage as Recommended by HP.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity
HP 98217A*	256	30	67(-6 = 61)	1	2010 (1830)	514'560 (468'480)
HP 98228A**	256	30	67(-2 = 65)	1	2010 (1950)	514'560 (499'200)

\* The HP 98217A format uses the tracks 0 to 4 for the directory and HP 9825 boot code. Track 5 is a copy of track 0. The user files are stored on 61 tracks from track 6 to 66.

\*\* The HP 98228A format uses the first track 0 for the directory. Track 1 is a copy of track 0. The user files are stored on 65 tracks from track 2 to 66.

The values given for Sectors and Capacity are for the complete disk; values in parentheses represent the capacity available for user data.

**Table 2: Format Data, HP 9885M, 9885S, 8-inch SS/DD media. For 9800, 21MX and 9000/200 systems.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity
HP	256	30	77 (-2 = 75)*	2	4620 (4500)	1'182'720 (1'152'000)
IBM	128	26	77(-4 = 73)*	1	2002 (1898)	256'256 (242'944)

\* The HP format uses 2 per side (resp. 4 spare tracks for single sided disks) so that 75 resp. 73 remain (TO BE CONFIRMED). The values given for Sectors and Capacity are for the complete disk; values in parentheses subtract these spare tracks and represent the available capacity.

**Table 3: Format Data, HP 9895A, 8-inch DD media. For Series-80, 9825, 9845 and similar machines.**

Format	Bytes/Sector	Sectors	Tracks/Side	Sides	Sectors	Capacity
HP	256	16	70 (-4 = 66)*	1	1120 (1056)	286'720 (270'336)

\* The HP format uses 4 spare tracks so that 66 remain. The values given for Sectors and Capacity are for the complete disk; values in parentheses subtract these spare tracks and represent the available capacity.

**Table 4: Format Data, HP 85, with 9121S, 9121D, 9133A disk drive, 3½-inch DD media.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity	Typical
0, 1	256	16	77 (-2 = 75)*	2	2464 (2400)	630'784 (614'400)	9000/200
2	512	9	77 (-2 = 75)*	2	1386 (1350)	709'632 (691'200)	HP 150
3	1024	5	77 (-2 = 75)*	2	770 (750)	788'480 (768'000)	
4**	256	16	70 (-4 = 66)*	1	1120 (1056)	286'720 (270'336)	HP 85
16	512	9	80	2	1440	737'280	

\* The HP format uses 2 per side (resp. 4 spare tracks for single sided disks) so that 66 resp. 75 remain. The values given for Sectors and Capacity are for the complete disk; values in parentheses subtract these spare tracks and represent the available capacity.

\*\* Option 4 can be used to format single-sided 0.5-Mbyte media as well as double-sided 1-Mbyte media.

If a 1-Mbyte disk is formatted with Option 4 only one side of the disk will be formatted. Option 4 is also produced by the INITIALIZE command of the HP-85. This format is compatible with the 9121 disk unit.

**Table 5: Format Data: HP 9122C, 9122D/S, 9123D, 9133D/H/L, 9153A/B/C, 3½-inch DD media.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity
format_disc	512	9	80 (-3 = 77)*	2	1440 (1386)	737'280 (709'632)

\* The HP-UX format uses 2 spare tracks per side and one "privileged" track so that 77 tracks remain. The values given for Sectors and Capacity are for the complete disk; values in parentheses subtract these spare tracks and represent the available capacity.

**Table 6: Format Data: HP Integral PC, 3½-inch DD media.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity
0, 1, 4	256	32	77 (-2 = 75)*	2	4928 (4800)	1'261'568 (1'228'800)
2	512	18	77 (-2 = 75)*	2	2000 (2700)	1'419'264 (1'382'400)
3	1024	10	77 (-2 = 75)*	2	1540 (1500)	1'576'960 (1'536'000)
16	512	18	80	2	2880	1'474'560

\* HP format uses 2 spare tracks per side resp. 4 for single sided disks. The values given for Sectors and Capacity are for the complete disk; values in parentheses subtract these spare tracks and represent the available capacity.

**Table 7: Format Data, HP 9122C and 9153C, 3½-inch 2 MB (HD) media.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity
HP	256	16	35 (-2 = 33)*	2	1120 (1056)	286'720 (270'336)

\* HP format uses 2 spare tracks per side so that 33 remain. The values given for Sectors and Capacity are for the complete disk; values in parentheses subtract these spare tracks and represent the available capacity. Sector IDs are from 0 to 15.

**Table 8: Format Data, HP 82901M, 82902M, 9130A, and 9135A, 5¼-inch DD media.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity
0, 1	256	16	35 (-2 = 33)**	2	1120 (1056)	286'720 (270'336)
2*	512	9	40	2	720	368'640
3	1024	5	37	2	370	378'880
4*	512	8	40	1	320	163'840
5*	512	9	40	1	360	184'320
6*	512	8	40	2	640	327'680

\* IBM compatible format.

\*\* HP format uses 2 spare tracks per side so that 33 remain. The values given for Sectors and Capacity are for the complete disk; values in parentheses subtract these spare tracks and represent the available capacity.

**Table 9: Format Data, HP 9125S and 9127A, 5¼-inch DD media.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity	Media Byte
1*	256	16	80	1	1280	327'680	
2*	512	9	80	1	720	368'640	
3*	1024		80	1			
4*	256	16	80	2	2560	655'360	
5*	512	9	80	2	1440	737'280	0xF9
6*	1024		80	2			

\* IBM compatible format.

**Table 10: Format Data, HP 9114, HP-150, MS-DOS, IBM-PC compatibility, 3½-inch DD media.**

Format	Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity	Available	DOS
FORMAT /W	256	16	80 (-3=77)	1	1232 (1056)	315'323	270'336	264'192
FORMAT /X	256	16	80 (-3=77)	2	2560 (2464)	655'360	630'784	618'496
FORMAT /Y*	512	9	80 (-3=77)	2	1440 (1386)	737'280	709'632	700'416
FORMAT /Z	1024	5	80 (-3=77)	2	800 (770)	819'200	788'480	780'288

\* This format can be read by HD floppy drives and is therefore suitable for data exchange. Of course, the media must be DS/DD (720 KB), not HD (1.44 MB). Such DS/DD disks should be formatted on 720 KB drives. All formats have a media byte of 0xFC. The DOS capacity is reduced due to FATs, directory sectors and, rounding down to even multiples of a cluster.

The values given for Sectors and Capacity are for the complete disk; values in parentheses subtract these spare tracks and represent the available capacity.

**Table 11: Format Data, HP 110 and Portable Plus with 9114B disk drive, 3½-inch DD media.**

### Some typical MS-DOS compatible formats

Bytes/Sector	Sectors/Track	Tracks/Side	Sides	Sectors	Capacity
512	9	40	2	720	368'640
512	8	40	1	320	163'840
512	9	40	1	360	184'320
512	8	40	2	640	327'680
512	9	80 (-3 = 77)	2	1440 (1386)	737'280 (709'632)

#### Notes:

- Number of Sectors / Disk = Sectors/Track \* Tracks/Surface \* Surfaces/Disk
- Capacity denotes nominal, unformatted disk capacity in Bytes.
- Depending on the file system, volume and directory entries or file allocation tables reduce the capacity available for actual data.
- Tracks/Side is also called Cylinders

HP Model	Drive Manufacturer	Drive Model	Heads	RPM	Mode	Tracks/Surface	Command Set
9121D, S	SONY	OA-D30V-1 OA-D31V-1 OA-D31V-14	1	600	MFM	70	AMIGO
9122D, S	SONY	OA-D32W-10 OA-D32W-11	2	600	MFM	80	SS/80
9122C	SONY(?)		2	300	MFM	80	SS/80
9133A, B	SONY	OA-D31V-??	1	600	MFM	70	SS/80
9133V, XV	SONY	OA-D31V-1	1	600	MFM	70	AMIGO
9133D, H, L	SONY	OA-D32W-10 OA-D32W-11	2	600	MFM	80	SS/80
9114A, B	SONY	OA-D32W-10 OA-D32W-11	2	600	MFM	80	SS/80
9153A	SONY	OA-D32W-10 OA-D32W-11	2	600	MFM	80	SS/80
HP Integral PC	SONY	OA-D32W-10	2	600	MFM	80	n.a.
9153A	SONY		2	300	MFM	80	SS/80
82901M/S	Tandon	TM-100-2A	2	300	MFM	35	AMIGO
82902M/S	Tandon	TM-100-2A	2	300	MFM	35	AMIGO
9885M/S	Shugart	S-800	1	360	MFM	67	SS/80?
9895A			2	360	MFM	77	AMIGO
13272	Tandon	TM-100-2A(?)	1	300	MFM	35	SS/80
64110A	Tandon	TM-100-2A(?)	1	300	MFM	35	SS/80
64100B	Tandon	TM-100-2A(?)	1	300	MFM	35	SS/80
9130A/K	Tandon	TM-100-2A	2	300	MFM	35	
9135A	Tandon	TM-100-2A	2	300	MFM	35	SS/80
9126	Tandon	TM-100-2A (?) HP 9130	1	300	MFM	35	
9836	Tandon	TM-100-2A (?) HP 9130	1	300	MFM	35	

**Table 12: Floppy Disk Drive Hardware.**

## FAT structure

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<-----VOLUMEName-----> #B/SC SP RESCL
/W      0000 - EB 1C 90 48 50 31 31 30 20 20 20 00 01 04 02 00 ...HP110      ....
          #F #DIRE #TSEC MB #SFAT #SCSI #HEAD #HIDN
/W      0010 - 02 80 00 20 04 FC 03 00 10 00 01 00 00 00 EA 00 ... ..
/W      0020 - 00 FF FF 00 00 00 00 00 00 00 00 00 00 00 00 .....

<-----VOLUMENAME-----> #B/SC SP RESCL
/X      0000 - EB 1C 90 48 50 31 31 30 20 20 20 00 01 04 01 00 ...HP110      ....
          #F #DIRE #TSEC MB #SFAT #SCSI #HEAD #HIDN
/X      0010 - 02 30 01 A0 09 FC 04 00 10 00 02 00 00 00 EA 00 .0.....
/X      0020 - 00 FF FF 00 00 00 00 00 00 00 00 00 00 00 00 .....

<-----VOLUMENAME-----> #B/SC SP RESCL
/Y      0000 - EB 1C 90 48 50 31 31 30 20 20 20 00 02 02 01 00 ...HP110      ....
          #F #DIRE #TSEC MB #SFAT #SCSI #HEAD #HIDN
/Y      0010 - 02 B0 00 6A 05 FC 03 00 09 00 02 00 00 00 EA 00 ...j.....
/Y      0020 - 00 FF FF 00 00 00 00 00 00 00 00 00 00 00 00 .....

<-----VOLUMENAME-----> #B/SC SP RESCL
/Z      0000 - EB 1C 90 48 50 31 31 30 20 20 20 00 04 01 01 00 ...HP110      ....
          #F #DIRE #TSEC MB #SFAT #SCSI #HEAD #HIDN
/Z      0010 - 02 60 00 02 03 FC 02 00 05 00 02 00 00 00 EA 00 .`.....
/Z      0020 - 00 FF FF 00 00 00 00 00 00 00 00 00 00 00 00 .....

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