

# 1. SONY floppy disk drive (e.g. in HP 9153B)

3.5 inch floppy disk drive with 34 pin connector. Rectangular eject button. HP number 9123-69101. Has 4 position switch for drive select 0...3, but this is not used by HP equipment (factory setting is 3).

SONY MFD-52-W10, MFM, 600 rpm, max transfer rate 17 KBytes/second, 80 tracks, 16 sectors, sector size 256 bytes.

HxC	SONY Connector				HxC
	Signal	pin	pin	Signal	
n.c.	Disk Change Reset (in)	1	2	Disk Change Indicator (out)	to 2
to VCC	5V	3	4	Drive LED (In Use)	n.c.
n.c.	5V	5	6	Drive Select 3 (in)	n.c.
n.c.	5V	7	8	Index Pulse (out)	to 8
n.c.	5V	9	10	Drive Select 0 (in)	to 10
n.c.	5V	11	12	Drive Select 1 (in)	to 12
n.c.	GND	13	14	Drive Select 2 (in)	to 14
to GND	GND	15	16	Motor On (in)	to 16
n.c.	GND	17	18	Direction Select (in)	to 18
n.c.	GND	19	20	Step (in)	to 20
n.c.	GND	21	22	Write Data (in)	to 22
n.c.	GND	23	24	Write Enable (in)	to 24
n.c.	GND	25	26	Track 0 Indicator (out)	to 26
n.c.	GND	27	28	Write Protect Indicator (out)	to 28
n.c.	12V	29	30	Read Data (out)	to 30
n.c.	12V	31	32	Head Select (in)	to 32
n.c.	12V	33	34	Drive Ready(out)	to 34

Notes:

- 1) pinout according to HP 9153B Service Manual.
- 2) the two wires from pins 3 and 15 are routed to the separate power connector of HxC.

HxC Connector			
Signal	pin	pin	Signal
5V	1	2	Disk Change Indicator
5V	3	4	-
5V	5	6	-
5V	7	8	Index Pulse
5V	9	10	Drive Select 0
5V	11	12	Drive Select 1
5V	13	14	Drive Select 2
5V	15	16	Motor On
5V	17	18	Direction Select
5V	19	20	Step
5V	21	22	Write Data
5V	23	24	Write Enable
5V	25	26	Track 0 Indicator
5V	27	28	Write Protect Indicator
5V	29	30	Read Data
5V	31	32	Head Select
5V	33	34	Drive Ready

## Power on

Sounds “— — — —” (3 x beep, pause, 1x short)

## Trying to initialize a disk

Sounds “—” (one beep)

Red LED goes on and stays on for about 10 seconds, computer indicates error message and about 8 seconds later the LED switches off (probably by firmware timeout).

SW1: no effect

SW2 or SW3 or SW4 “on”: DISC Error (probably tries to access the disk image)

SW5: no effect

SW6 or SW7 or SW8 “on”: Mass Storage Unit Failure (probably the whole system is not recognized)

## Trying to display disk directory (CAT)

Red LED goes on and stays on for about 10 seconds, computer indicates error message and about 8 seconds later the LED switches off (probably by firmware timeout).

No Sound.

Header of HFE file, created by reading a HP formatted diskette.

0-7	signature	'HXCPICFE'
8	revision	0
9	tracks	80
10	sides	2
11	encoding	0
12-13	bit rate	250 (=0x00FA, also tried 500 (0x01F4))
14-15	RPM	0
16	interface mode	7 (Generic Shugart)
17	unused	
18-19	tracklist offset	1 x 512 bytes
20	write enabled	255
21	single step	255
22	track 0 side 0 alt	none
23	encoding	0
24	track 0 side 1 alt	none
25	encoding	0
[26 bytes in header]		

## 2. Other SONY Floppy Disk Drives

Used in older HP gear, e.g. 9153A, 9114A, 9114B. These have 26 pin connectors and a separate power connector with +5V, +12V and GND. Square eject button.

SONY OA-D32W, OA-D32V, MFM, 600 rpm, max transfer rate 17 KBytes/second, tracks 0-69, sector IDs 1-16. Sector size 256 bytes. 270 KBytes (SS,DD).

### Specifications

	OA-D32W		OA-D32V		PIN NO	Description	Mnemonic
	SINGLE DENSITY	DOUBLE DENSITY	SINGLE DENSITY	DOUBLE DENSITY			
<b>Capacity</b>					1	Motor On	MTON
Unformatted Per Disk	500 Kbytes	1.0 Mbytes	250 Kbytes	500 Kbytes	2	Drive Select 0	SELECT 0
Unformatted Per Track	3.125 Kbytes	6.25 Kbytes	3.125 Kbytes	6.25 Kbytes	3	Disk Change	DSKCHG
Burst TRANSFER RATE	250 Kbits/sec	500 Kbits/sec	250 Kbits/sec	500 Kbits/sec	4	Drive Select 1	SELECT 1
<b>Access Time</b>					5	Disk Change Reset	CHGRST
Track to Track	12 msec.		12 msec.		6	Direction Select	DIRTN
Average*	350 msec.		350 msec.		7	Return	RETURN
Settling Time	30 msec.		30 msec.		8	Step	STEP
Head Load Time	60 msec.		60 msec.		9	Return	RETURN
Average Latency	50 msec.		50 msec.		10	Write Data	WRDData
<b>Functional</b>					11	Return	RETURN
Rotational Speed	600 RPM		600 RPM		12	Write Gate	WRTGATE
Recording Density (inside track)	4359 bpi   8717 bpi		4094 bpi   8187 bpi		13	Return	RETURN
Track density	approx. 135 TPI		approx. 135 TPI		14	Head Load	HDLOAD
Cylinders	80		80		15	Return	RETURN
Tracks	160		80		16	Head Select	HDSEL
R/W Heads	2		1		17	Return	RETURN
Encoding Method	FM, MFM		FM, MFM		18	Index	INDEX
<b>Heat Dissipation</b>					19	Return	RETURN
Operating Mode (Head Load)	6.0 W		6.0 W		20	Track00	TRK00
Standby mode (Head Unload)	3.9 W		3.9 W		21	Return	RETURN
<b>Media Requirements</b>					22	Write Protect	WRTPR
3.5" x 3.7" (90 mm x 94 mm)	SONY OM-D4440		SONY OM-D3440		23	Return	RETURN
					24	Read Data	RDDATA
					25	Return	RETURN
					26	Ready	READY

\* Average access time = 1/3 x (Track Nos.) x (Track to track time) + (Settling Time)

HxC	SONY Connector				HxC
	Signal	pin	pin	Signal	
to 16	Motor On (in)	1	2	Drive Select 0 (in)	to 10?
to 2	Disk Change Indicator (out)	3	4	Drive Select 1 (in)	n.c.?
n.c.	Disk Change Reset (in)	5	6	Direction Select (in)	to 18
	GND	7	8	Step (in)	to 20
	GND	9	10	Write Data (in)	to 22
	GND	11	12	Write Enable (in)	to 24
	GND	13	14	Head Load (in)	to ?
	GND	15	16	Head Select (in)	to 32
	GND	17	18	Index Pulse (out)	to 8
	GND	19	20	Track 0 Indicator (out)	to 26
	GND	21	22	Write Protect Indicator (out)	to 28
	GND	23	24	Read Data (out)	to 30
	GND	25	26	Drive Ready (out)	to 34

Has switch with 4 positions for drive select. Select lines 0 and 1 work in binary (11=1, 01=2, 10=3, 00=4). The head load signal lowers the head to the surface.

Power connector

- 1 +5V
- 2 GND (5V)
- 3 GND (12V)
- 4 12V