

Mounting a 720 kB disk drive into a Philips VG 8230

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Warning:

The most important part in the computer is the printed circuit board (PCB). Parts can be replaced, but not the PCB. Do not try to unsolder the parts, but cut them loose and then remove the solder pins. The use of IC sockets is recommended.

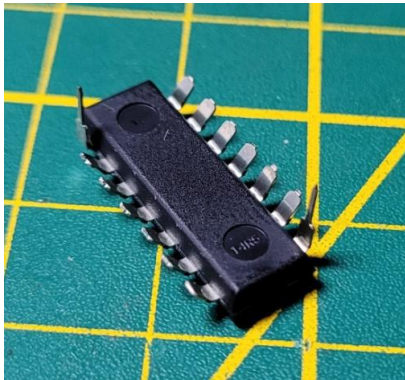
The Philips VG 8230 comes with a single sided disk drive (360 kB).

Requisites:

- 74LS86 (DIP 16)
- Thin wire
- Disk drive suitable for MSX
- Disk-ROM

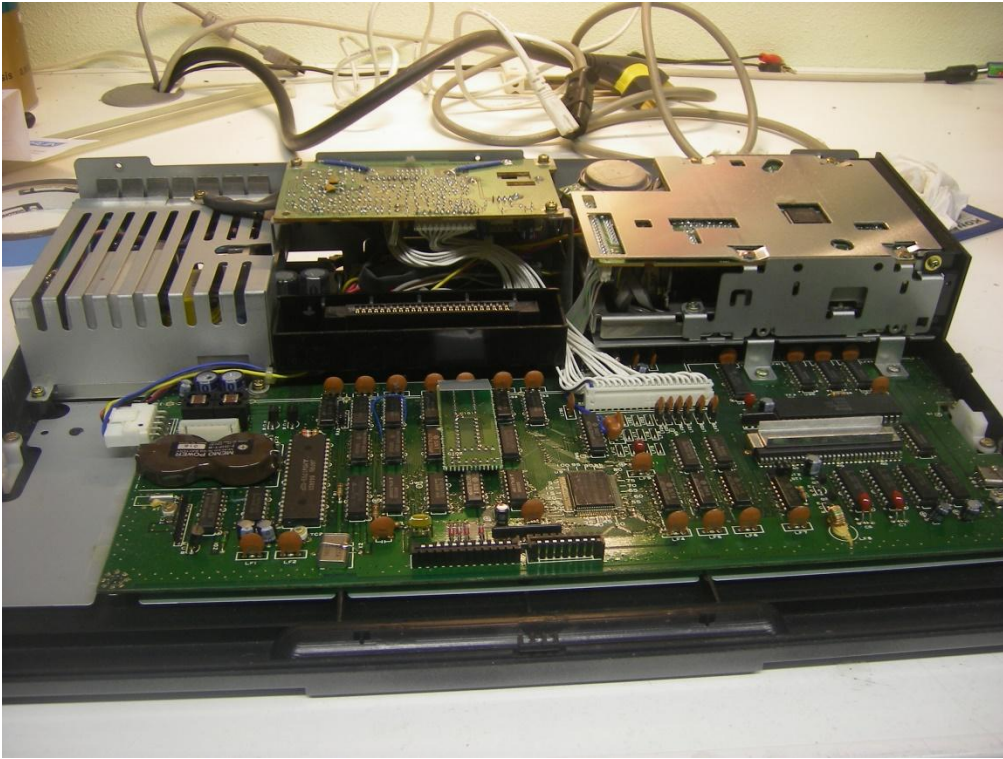
Preparation:

- 74LS86, shorten pins 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12 and 13.

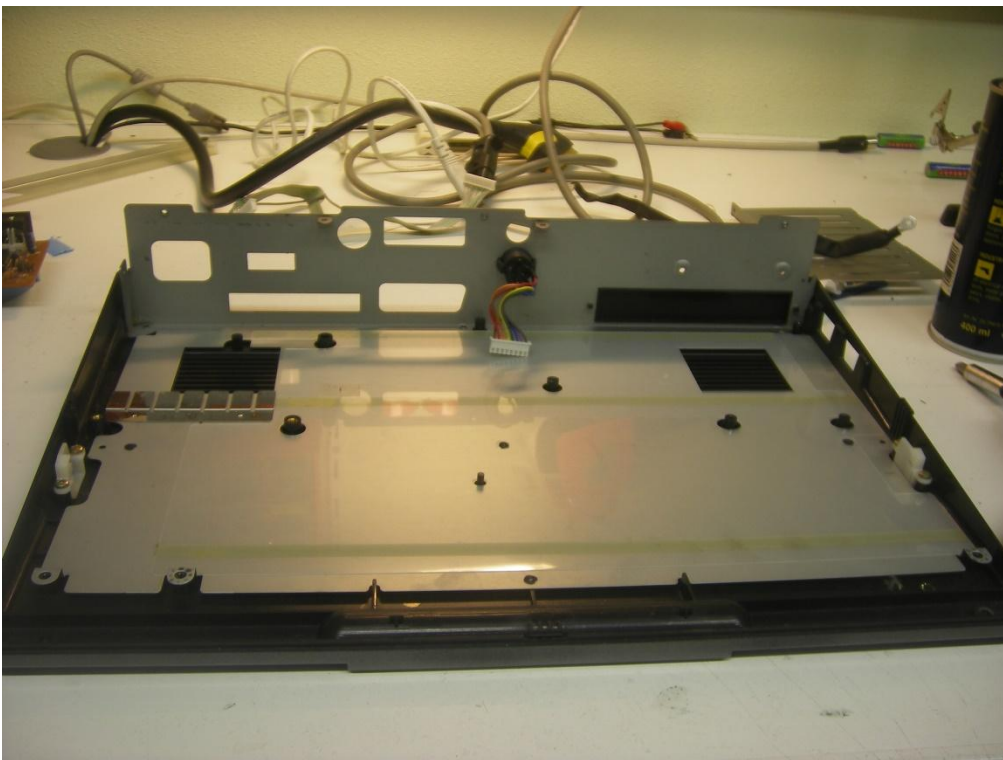


Disassembly:

- Remove the case, there are two clips, one on each side of the outer casing.
- Remove the keyboard, it is attached to a board with a band wire that can be unplugged.
- Remove the AV-PCB.
- Remove the disk drive.
- Remove the power supply PCB.
- Remove the main board.



The single sided disk drive.



After disassembly.

Main board changes:

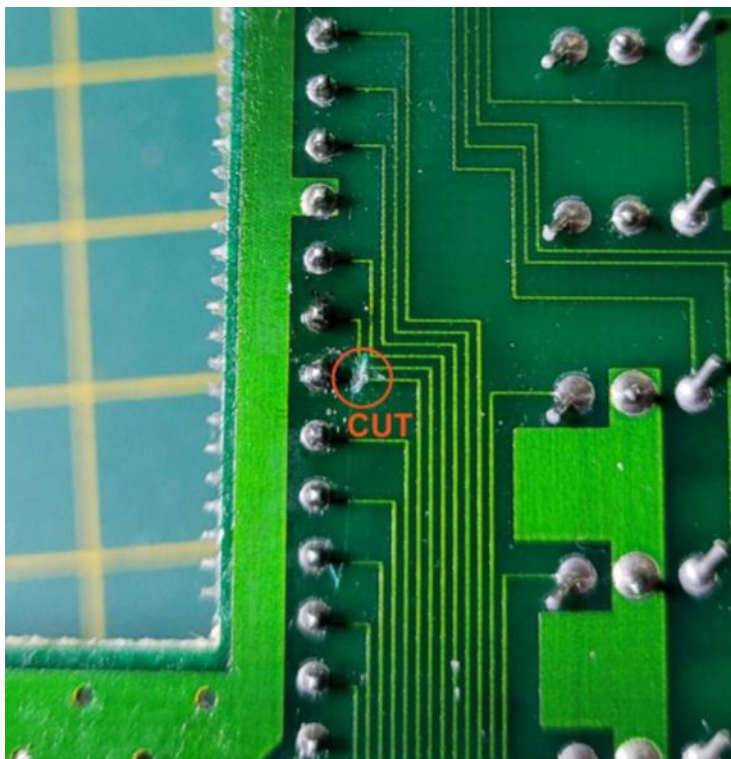
- Remove U13, the disk-ROM (placed in an IC socket).
- Insert the new disk-ROM into the empty socket of U13. This new system-ROM is required for double-sided operation.
- At the bottom side of the main board two print tracks need to be cut. These print tracks are connected to pin 8 and 9 of the connector (located at the disk drive connector side of the main board).
- At the bottom side of the main board two extra connections need to be added (located at the disk drive connector side of the main board).



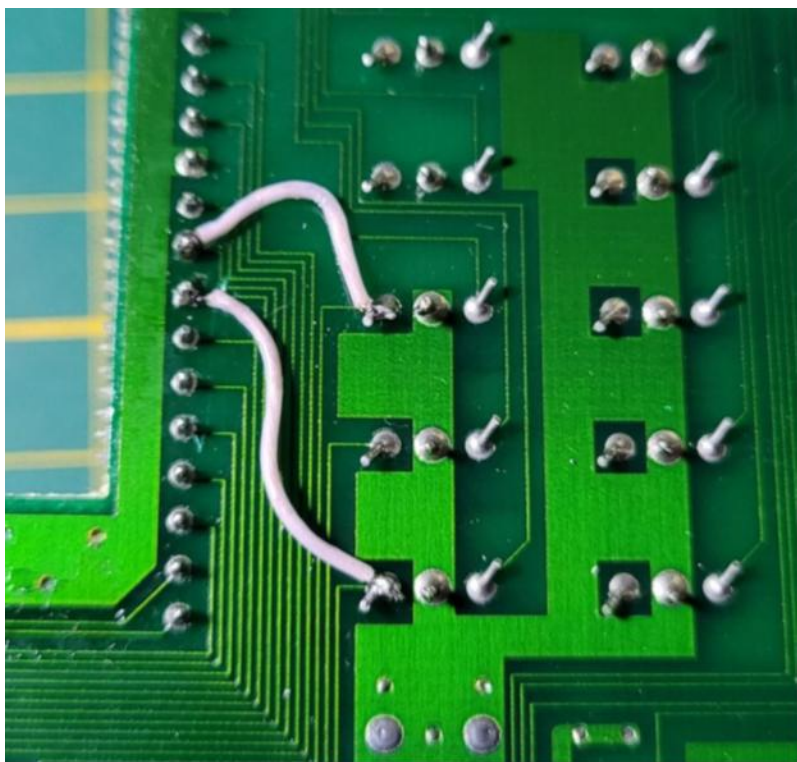
The original disk ROM, U13, in the IC socket.



The new disk ROM is placed in the IC socket of U13.



The interrupted PCB tracks of pins 8 and 9.



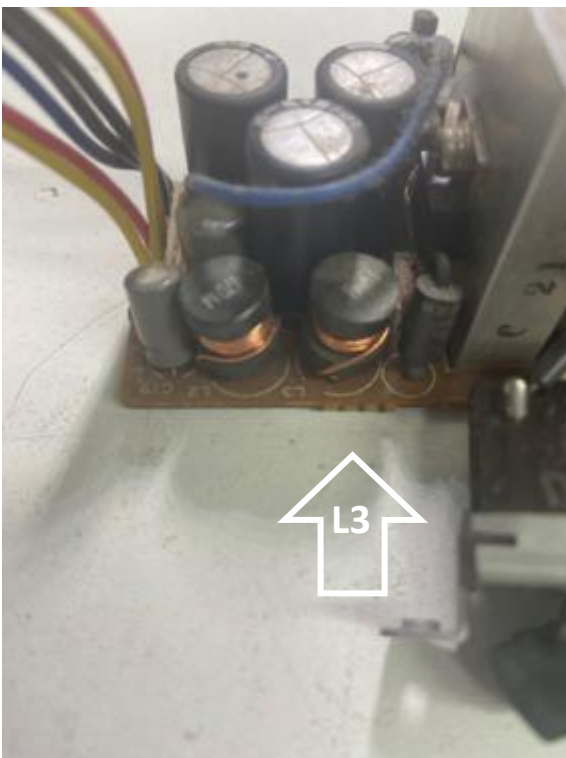
The new connections to pins 8 and 9.

Adjustments to the power supply:

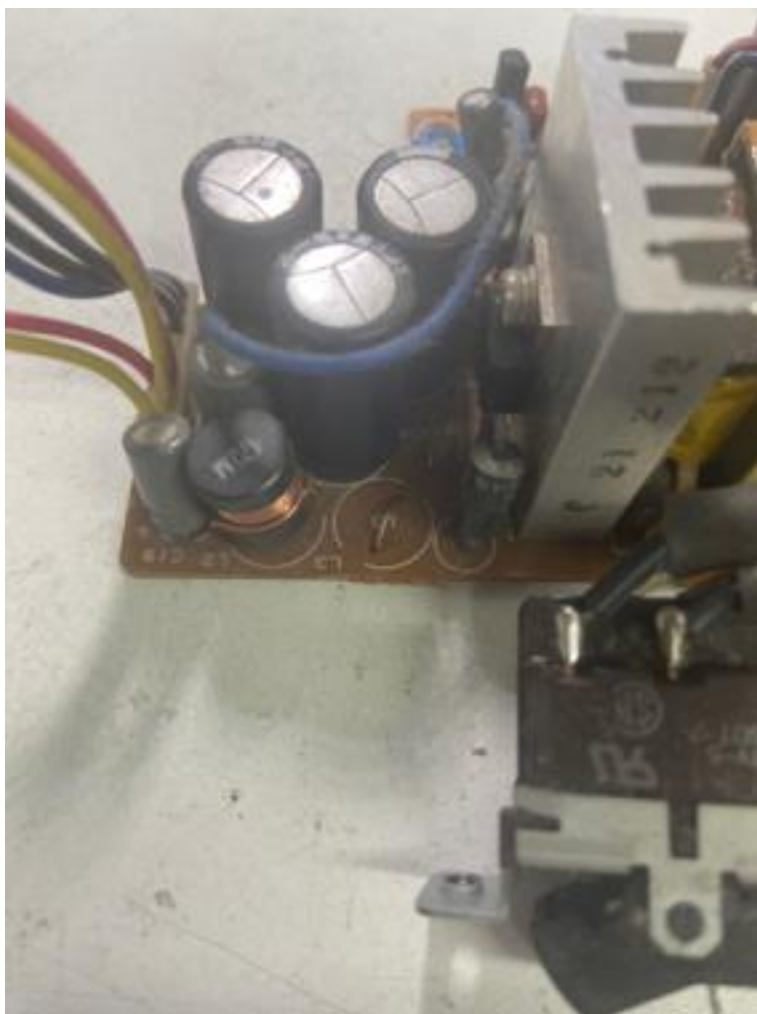
The original disk drive of the Philips VG 8230 uses a 14-pin connector. Also, it requires both +12V DC and +5V DC. The replacement disk drive has a 34-pin connection and requires only +5V DC. Because the new disk drive requires more power from the +5V DC powerline distortions can be seen on the screen during disk activity. This problem can be solved by replacing coil L3 on the power supply PCB with a wire.



The power supply of the VG 8230.



The power supply's PCB before the adjustment.



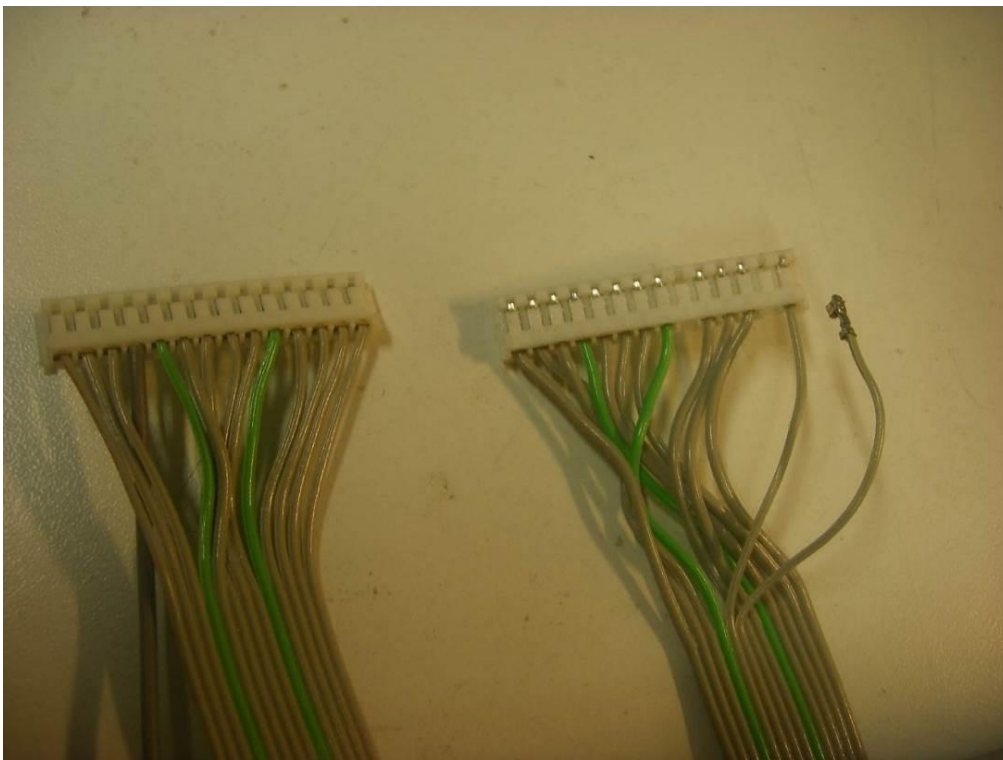
The power supply's PCB after replacing L3 with a wire.

Adapting the 14-pin disk drive cable:

The existing cable can be reused, but it needs to be rewired. This is done by putting several wires to different positions on the 14-pin connector at the disk drive side of the cable. It can then be plugged into the 34-pin disk drive connector. The 'thicker' gray wire (pin 11) is a ground wire, it is connected next to the red wire in the 4-pin power connector of the disk drive.

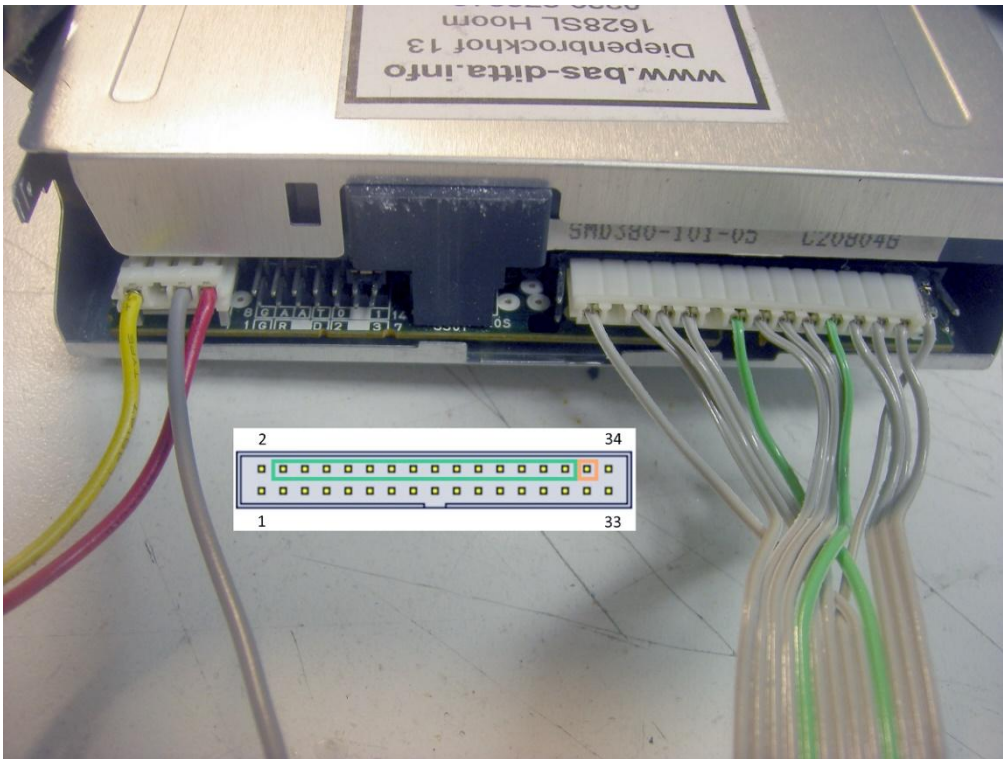
Connections of the 14-pin cable:

Main board side		Disk drive side
1	-----	3
2	-----	8
3	-----	9
4	-----	10
5	-----	11
6	-----	4
7	-----	5
8	-----	Connected right next the 14-pin connector at position '15'.
9	-----	1
10	-----	7
11	-----	Connected to the ground of the power supply of the disk drive.
12	-----	12
13	-----	13
14	-----	14



Left: cable with original wiring.

Right: the rewired cable.

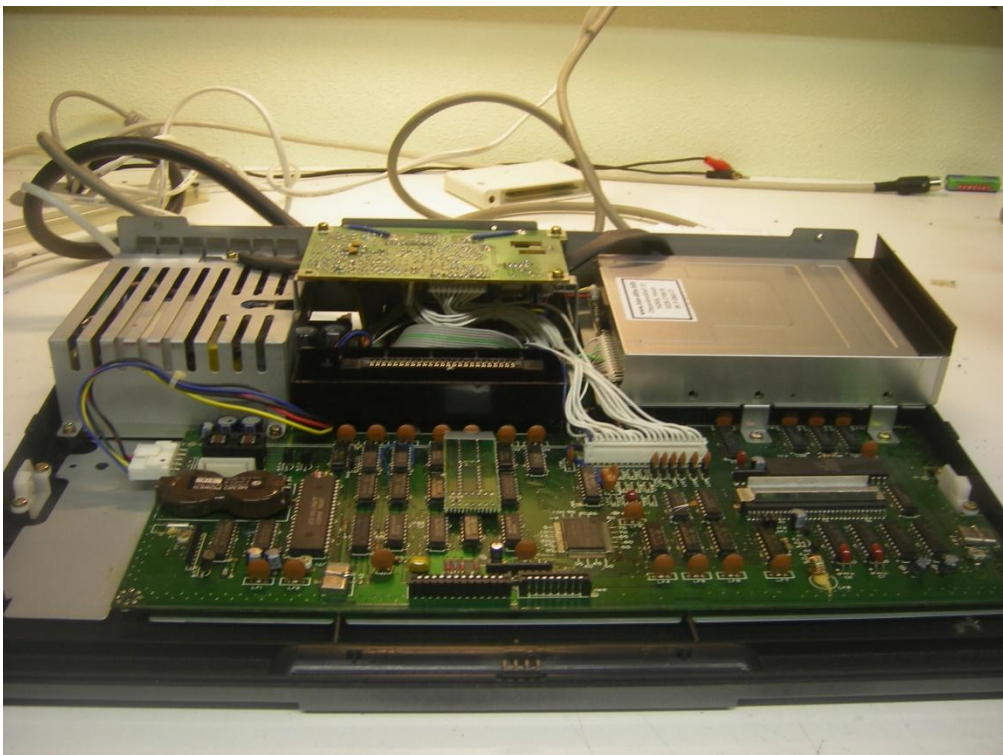


This is the way to connect the rewired cable without the need for a conversion PCB.

Mounting the disk drive:

The 720 kB disk drive has to be compatible for usage in an MSX computer. Also, for using it as an A drive it has to be configured properly. Before mounting the disk drive, a filler piece is mounted on top of it. This is done to give it same height as the original disk drive. A piece of 15x15 mm angle profile can be used for this. It can be glued on using a sealant adhesive or double sided tape. The disk drive fits exactly on the original bottom bracket

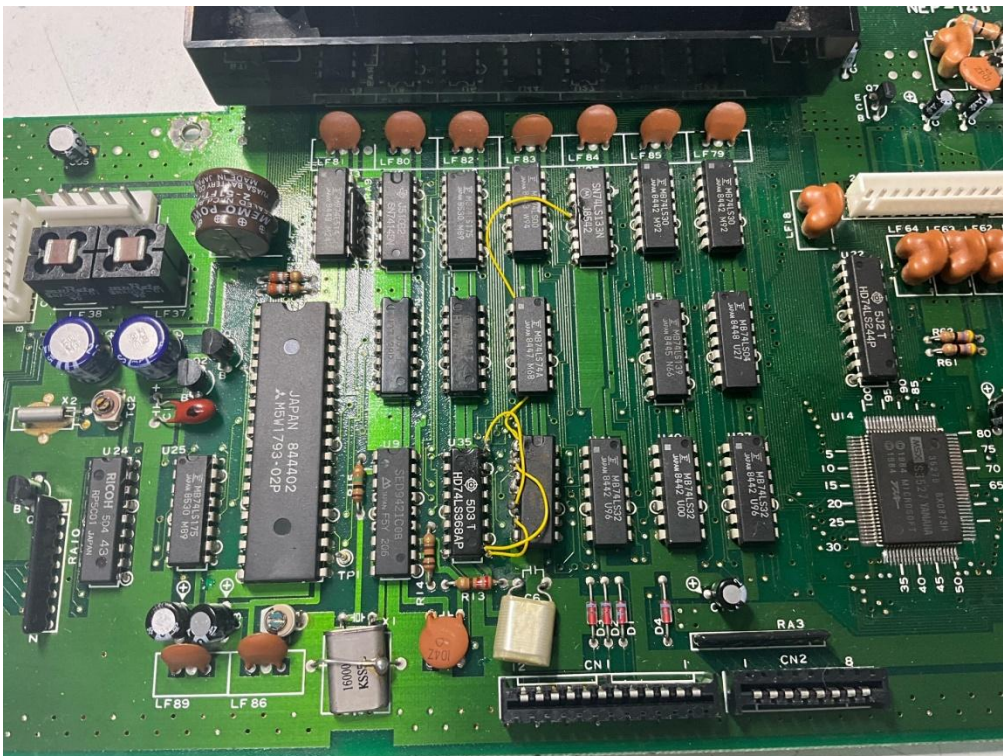
All parts are now ready and everything can be put together.



The Philips VG 8230 with a double sided disk drive mounted.

After the new disk ROM and double-sided disk drive are installed, it is possible to use 720 KB diskettes. Booting with MSX-DOS will not yet be possible. This is because the motherboard of the VG 8230 has a hardware error, which prevents MSX-DOS from booting correctly. This was one of the reasons why Philips introduced the VG 8235/00 shortly after the release of the VG 8230. The problem with the VG 8230 motherboard can be solved with a number of changes:

- Cut pin 4 from U27 (74LS30).
- Cut pin 9 from U35 (74LS368).
- Solder the 74LS86 with the remaining pins to U45 (74LS32).
- Make a connection between U27 (74LS30) pin 4 and pin 5.
- Make a connection between the 74LS86 pin 1 and the print spot of U27 (74LS30) pin 4.
- Make a connection between the 74LS86 pin 2 and U35 (74LS368) pin 9.
- Make a connection between the 74LS86 pin 3 and pin 4.
- Make a connection between the 74LS86 pin 5 and U35 (74LS368) pin 16.
- Make a connection between the 74LS86 pin 6 and the print spot of U35 (74LS368) pin 9.



The wiring at the top of the main PCB.