512 kB RAM for the Philips NMS 8250/55/80

Original by: Bas Kornalijnslijper
Translated by: Bart Hamer

⚠️ **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.
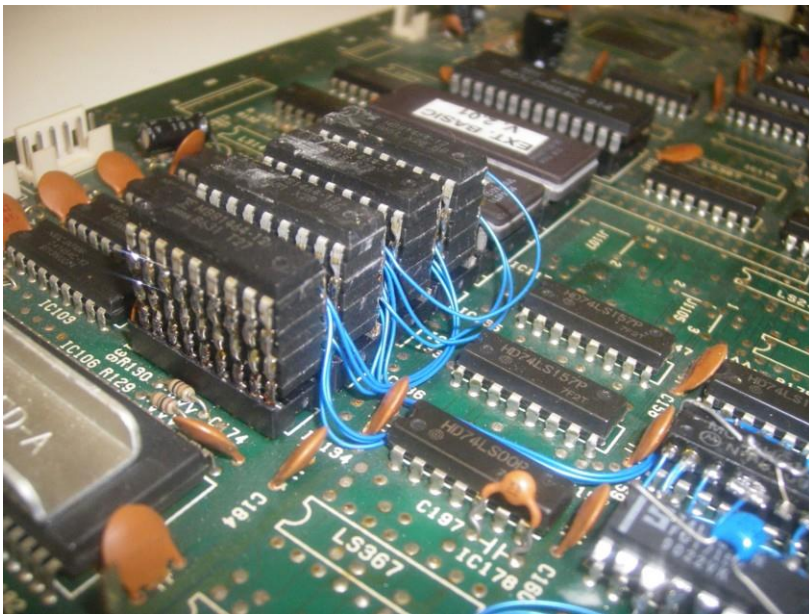
Requisites:

- 74LS125
- 74LS138
- 74LS670
- 81464 or equivalent (12 pieces when reusing the existing memory chips / 16 pieces when the existing memory chips are cut loose)
- 18-pins IC socket (4 pieces)
- 100 nF capacitor (3 pieces)

Preparation:

- 74LS138, shorten pins 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14 and 15.
- 74LS138, connect pin 4 to pin 5 and add a piece of wire of about 5 cm.
- 74LS138, connect pin 6 to pin 16.
- 74LS138, place a 100 nF capacitor between pin 8 and pin 16.
- 74LS125, shorten pins 2, 3, 5, 6, 8, 9, 11 and 12.
- 74LS125, place a 100 nF capacitor between pin 7 and pin 14.
- 74LS670, shorten pins 1, 2, 3, 6, 7, 9, 10 and 15.
- 74LS670, place a 100 nF capacitor between pin 8 and pin 16.
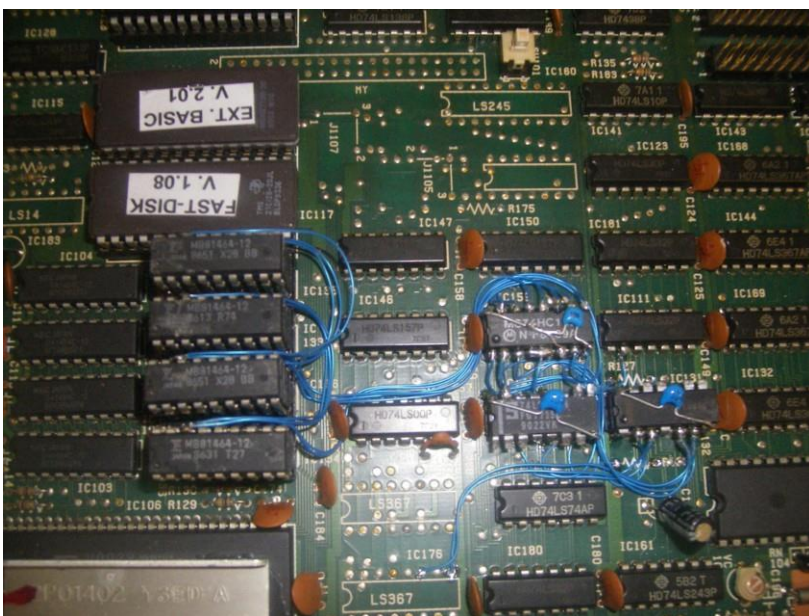- 81464, shorten pin 16 of 12 pieces.

Conversion (mapper circuit):

- Remove R127.
- Remove R128.
- Solder a wire of about 7 cm to the left print spot of R127.
- Solder a wire of about 7 cm to the left print spot of R128.
- Solder the remaining pins of the 74LS125 to the same pins of IC131 (74LS125).
- Solder the remaining pins of the 74LS138 to the same pins of IC159 (74LS139).
- Solder the remaining pins of the 74LS670 to the same pins of IC149 (74LS670).
- Connect pin 1 of the 74LS138 to pin 7 of IC149.
- Connect pin 2 of the 74LS138 to pin 6 of IC149 and pin 2 of the 74LS125.
- Connect pin 3 of the 74LS125 to pin 3 of IC149 and pin 9 of IC176.
- Connect pin 15 of the 74LS670 to pin 6 of the 74LS125 and pin 11 of IC176.
- Connect pin 3 of the 74LS138 to pin 10 of the 74LS670 and pin 5 of the 74LS125.
- Connect pins 4/5 of the 74LS138 to pin 2 of IC111.
- Connect pin 14 of the 74LS138 to R128 (left print spot).
- Connect pin 15 of the 74LS138 to R127 (left print spot).

➔ **Now the computer is working again and 512 kB can be addressed. There is still 128 kB available, but the mapper circuit should be working now.**

The mapper circuit.

Conversion (memory):

- Remove IC133, IC134, IC135 and IC136. Cut out or unsolder.
- Place 4 18-pin IC sockets on the free places of IC133, IC134, IC135 and IC136.
- Make 4 turrets of 4 ICs each (81464). The top three are the ICs with pin 16 shortened.
- Take 2 turrets of 4 ICs and connect pin 16 of the second layer of one turret to pin 16 of the second layer of the other turret and add a piece of wire of about 7 cm.
- Do the same for the third and fourth layer.
- Repeat the two steps above for the other two turrets.
- Place a set of 2 turrets in the 18-pin IC sockets of IC133 and IC134.
- Place the second set of 2 turrets in the 18-pin IC sockets of IC135 and IC136.
- Now there are 6 wires left, which are only attached to the turrets. These can be soldered in any order to pins 7, 9, 10, 11, 12 and 13 of the 74LS138.

512 kB memory.

If everything is properly connected then a 512 kB Memory-Mapper will be present.

The start-up screen will still show 128 kB, but after replacing IC118 with an EPROM with Memory-Counter the full amount of memory is shown.

The completed conversion.