

ZX Spectrum Lower RAM Replacement Module

For Issue 2 - 6 PCBs

Suggested tools:

- Philips head screwdriver
- 25 Watt soldering iron
- 60/40 tin-lead solder 0.7mm
- Fine-point cutters
- Solder wick
- Isopropyl alcohol
- Flux pen
- Cotton buds

Dismantling the Spectrum:

Remove the screws from the underside of the machine, hold the two parts of the case together and flip it over. Lift off the top part, taking care to disconnect the two keyboard membrane cables from their sockets as they become accessible (they just pull out). Remove the screw(s) holding the PCB to the lower part of the case (there's a single central screw in original rubber-key Spectrum, and 2 (or more) at the sides in the Spectrum+) The reset switch of a Spectrum+ just lifts out of its holding bracket.

Usually the Spectrum's lower RAM chips are soldered onto its PCB (IC6-IC13) All eight will need to be removed to fit the RAM board. The easiest way to do this is it to clip their legs near the chips' bodies with some fine-point cutters. The leg stubs can then be plucked out using soldering iron and tweezers. The area and pads should be tidied up with a flux pen and solder wick, and finally cleaned with isopropyl alcohol. Inspect both sides under a magnifying glass for shorts due to solder splashes etc.

At this point you can either solder some DIL sockets (not "turned pin" types) where the chips were and press the RAM board into them, or the module can be soldered directly onto the Spectrum PCB. If opting for the latter approach you may find the legs of the module do not protrude far enough through the Spectrum's PCB unless the capacitors C1-C8 are also removed - it's fine to do so as they are not needed when the old chips have been removed). Take care when soldering that the module's pins do not drop through should the solder melt on the top side.

When installing the board make sure Pin 1 of the PCB is aligned with Pin 1 of IC13 (the top left pin) and that the board is mounted squarely so that all the other pins are aligned correctly. The black mark on the right of the RAM board should be in line with (and left of) the lower right pin of the IC6.

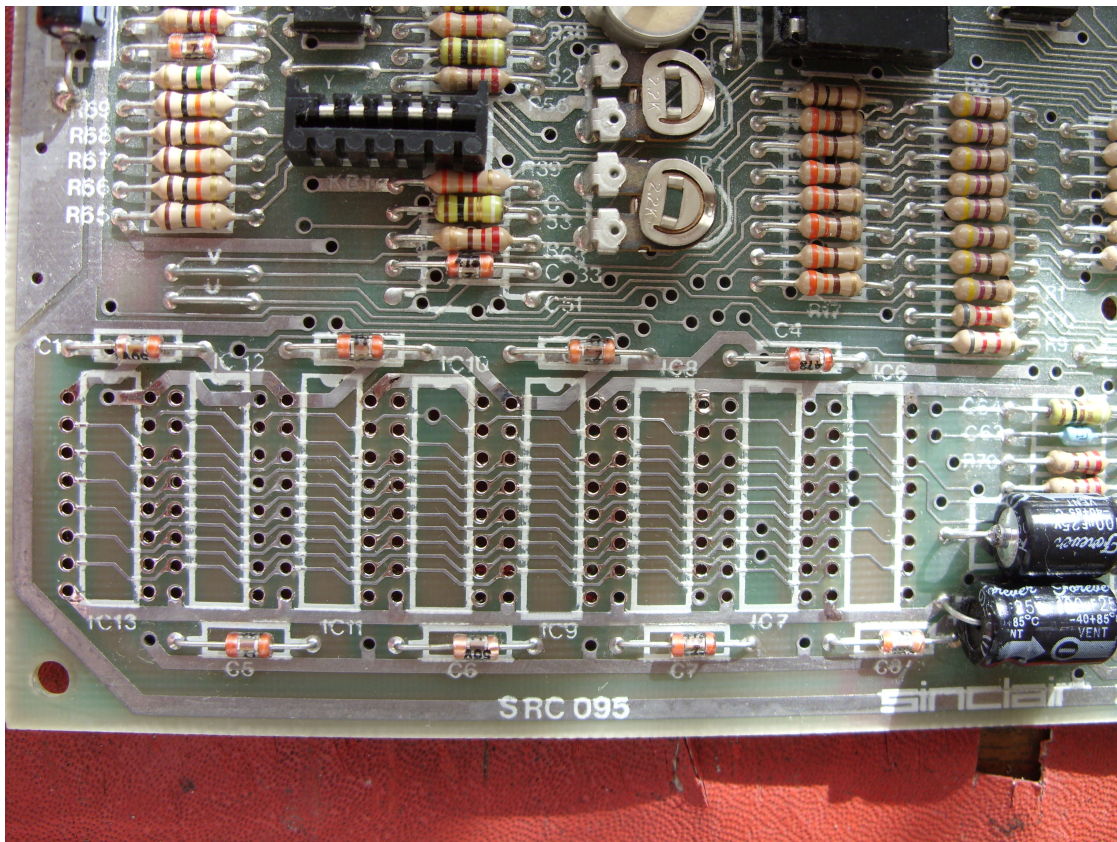
Reassembling:

Place the Spectrum PCB back into the lower case and replace the screw(s). At this point you can test the Spectrum (without the keyboard membrane attached). If it boots to the copyright screen as normal, disconnect the power and proceed with reassembly: Push the membrane tails back into their sockets, replace the top section of the case (try to ensure the cables don't become too pinched). Finally, replace the outer case screws.

Troubleshooting:

If the Spectrum does not display a correct start screen then power off, remove the board and check pin alignment (and solder points where applicable). The module does not need the 12v and -5v supplies generated by the Spectrum motherboard but there are still other components that do so ensure the voltage generator circuitry is working correctly (there are many general Spectrum troubleshooting guides on youtube.)

Spectrum PCB with lower RAM chips removed and cleaned.



**Module correctly located (pressed into DIL sockets in this case.)
Note the black mark on module aligns with bottom/right pin of last chip socket.**

