ZX Spectrum Lower RAM Replacement Module V1.3 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

Please take anti-static precautions when handling the RAM board as it uses modern CMOS type components that are easily damaged by static electricity. Hold the board by its edges and avoid touching the pins.

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. The v1.3 module fits between the first and last columns of holes (ie: the holes for pins 1-8 of IC13 and pins 9-16 of IC6 should still be visible when the module is located - see photo on the following page). If you need to, you can remove capacitors C1-C8 as they are not needed when the old chips have been removed. Take care if soldering the board in place that the module's pins do not drop through should the solder melt on the top side.

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 circuity is working correctly (there are many general Spectrum troubleshooting guides on youtube.)



Spectrum PCB with lower RAM chips removed and cleaned.

Module correctly located between first and last columns of socket holes. (Note the "-" marks on the module aligning with top/bottom pins)

