

# Cambridge Electronic Design Limited

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## Changing the Monitor ROM in a micro1401 mk 1 with top boxes

### *Introduction*

The micro1401 is designed so that it can be fitted with a variety of add-on units available from CED. The add-on units are called 'Top Boxes' and are mechanically similar to the main unit. Each micro1401 may have up to two top boxes fitted to it. This leaflet describes how to dismantle micro1401s with one or more expansion units, for the purpose of upgrading the monitor ROM.

Before commencing the work, please read the instructions carefully and arrange a clear working space onto which you can lay out the pieces. Ensure that both you and the micro1401 are earthed, to prevent the risk of electrostatic discharge. Ideally, the micro1401 should be connected to mains earth and you should be connected to the micro1401 by a wrist strap. If you are in any doubt about being able to carry out the dismantling and ROM exchange, please ask a qualified engineer or send the micro1401 to the CED Service Department. CED will make a small charge for this service.

### *What you will need*

It is essential to take precautions against electrostatic discharge. Before handling the ROMs or opening your micro1401 you should earth yourself to the micro1401, preferably with a wrist strap also connected to mains earth. You will need:

- A small cross-head screwdriver (earlier models) or a 2mm Allen key (later models)
- A chip extractor (a flat-bladed screwdriver will do)
- A piece of conductive foam or conductive tube

### *Dismantling the micro1401*

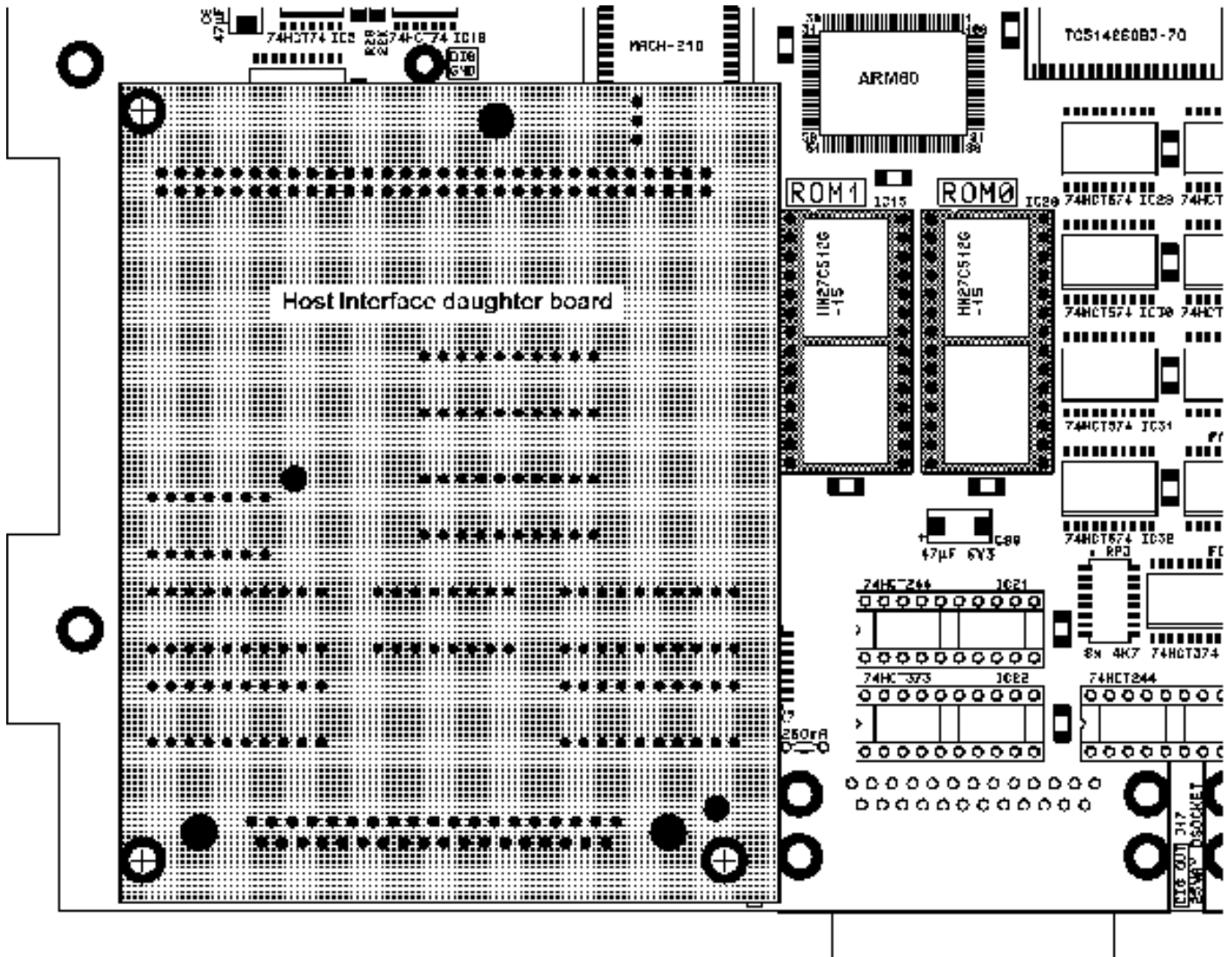
1. Switch off the Micro1401 and remove all cables connected to it.
  2. Unscrew the four black countersunk screws that secure the top rear panel. Earlier models will use 1-pt cross-head fixings, later ones 2mm hex fixings. Remove the top rear panel. Note the recess on the inside of the panel, this goes on the left-hand side.
  3. Slide the black top plate out of its slot in the outer case of the top box.
  4. The inner, bright-metal can is now exposed. Note the green-and-yellow earthing strap, which links all the cans to the metalwork of the outer case. Unscrew the strap from the can. Note the order of the eyelet and shakeproof washer on the M3 x 5mm pan-head screw; this is important for EMC reasons. Reserve the fixings.
  5. You will see six cross-head screws, three on each side, securing the inner-can cover. Unscrew these M3 x 10mm pan-head screws and reserve them. Lift off the inner-can cover. Remove the two graphite-impregnated gasket strips from either side. Be careful, they are delicate. Also, note that they are asymmetric: the holes are closer to the outside edge.
  6. The expansion board circuitry is now exposed. Identify the two riser cards. These are vertical printed circuit boards that pass through slots in the top box main board. There is a flying cable on each riser card that plugs into an adjacent connector.
  7. Disconnect the flying cables from their connectors. Carefully pull the riser cards out of their slots.
  8. Note how the top box main board is mounted in a pair of slots in the black outer case. Push the earthing strap out of the way so that the board, together with the inner-can base, can slide past. Carefully slide them out. As you do so, you will observe the conductive-foam strips that are sandwiched between the inner cans of the main and expansion units.
  9. If your micro1401 has two expansion units, remove the remaining one by repeating steps 2 to 8 (missing step 3).
  10. Unscrew the rear panel of the bottom (main) unit, as detailed in step 2. There is no need to unscrew the earth strap that is bolted to it. Swing the panel to one side.
  11. Slide the main-board inner can about halfway out of the outer case, and unscrew the earth strap from the side of the can. Note the order of the washers. Reserve the fixings.
  12. Remove the main-board inner can. Try not to splay the side extrusions of the outer case. (Once all the rear panels are removed, the rigidity of the outer case is compromised.)
  13. Remove the lid from the bottom inner can, as detailed in step 5. You are now ready to exchange the Monitor ROM.
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### Identifying the old ROM

The ROM sockets are positioned next to the Host Interface daughter board. Identify the ROM to be changed. Monitor ROMs plug into the socket furthest from the Host Interface, labelled "ROM 0". The ROMs themselves are clearly labelled "CED Micro1401 Mon ROM", and "IC20" together with the version number.

### Removing the old ROM

Ensure that you are properly earthed. Slide a chip extractor or a narrow screwdriver blade between the chip and the socket, and pull the chip upward with a gentle rocking motion. Try to avoid touching the chip's legs; hold it by its short edges. Also try to avoid bending the legs as the chip comes out. Push the old chip into a piece of conductive foam or tubing for safe storage and return to CED. Alternatively wrap it in aluminium foil.



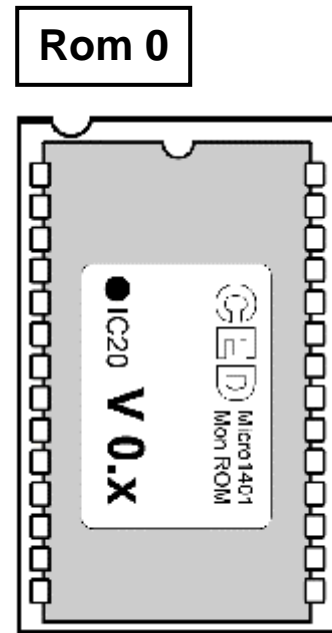
ROM sockets (dark grey). Note position relative to Host Interface daughter board.

### ***Inserting the new ROM***

It is essential that the chip is inserted the right way round. The chip is marked with a notch at one end; this identifies pin 1. The socket also is marked with a notch to identify pin 1 (see figure 1). Pin 1 is nearest the front of the micro1401. While still properly earthed, remove the new ROM from its antistatic tube or conductive foam. Offer the chip to the socket, making sure that all the pins enter the holes in the socket. If the legs are sprung outward, insert one row and gently push the other row into alignment using a small steel ruler or similar tool. Press the chip firmly down until it is seated.

### ***Problems to avoid when inserting chips***

It is possible for a pin to miss its hole and get bent over as the chip is pressed down. This is the most commonly encountered problem; it may cause complete or intermittent failure. The pin can usually be carefully bent back into position and the chip re-inserted. Also avoid mis-positioning the chip while inserting, so that two socket holes are unoccupied and two pins are hanging over the other end. This will result in total failure and may damage the chip.



*Monitor ROM in socket;  
note the orientation notches*

### ***Power-up test***

Before closing the micro1401, reconnect the lead from the power supply and power it up briefly, to make sure that it passes its power-up self test: the red "TEST" light should come on for about 5 seconds then turn off. If it flashes continuously, the self-test has failed; switch the micro1401 off and check that the ROM is installed properly. In particular, make sure that none of the pins has been bent. If it still does not pass the test, contact the CED hardware help desk on (+44) 1223 420186.

### ***Closing the micro1401***

Close the micro1401 by reversing the opening procedure detailed above. Bear in mind the conductive strips are a close fit. Make sure that they are properly tucked under the base plate when sliding the expansion unit over them. Also be careful, when re-inserting the riser cards, that they mate fully with the sockets below. It is a good idea to insert them experimentally while the main board is exposed, to get a feel for the task.