**General. This ARM3 upgrade is suitable for the A305, A310, A440, 410/1, 420/1, and 440/1. Some versions may also be fitted to the A3000. The 300 series and A440 also require the MEMC1a upgrade, available from IFEL. In any event, because fitting is beyond the control of IFEL, no responsibility can be accepted for any loss or damage arising from the fitting or use of this upgrade. Both the ARM3 upgrade and the main computer use components which can be damaged by static electricity, and appropriate handling precautions should be taken.**

Some versions of the ARM3 boards use a slightly different "header" which fits the 84-way ARM2 socket. These consist of a set of gold-plated pins arranged in a square. They are perfectly strong enough in normal use and have proven reliable over extended periods of time, but are susceptible to damage if abused. Forcing the header into a socket when it is not aligned properly will probably bend the pins. **Be careful - the headers are expensive and difficult to replace!**

A305, A310 and 400/1 series computers.

1) Unplug the cables connecting the machine to its various peripherals, in particular making sure that the computer is not connected to the mains supply.

2) Remove the lid from the computer by first of all undoing the five screws, (three along the top of the rear edge and one at each side), then sliding the lid off rearwards. Sometimes the sides of the lid grip the rest of the casing and prevent it from sliding off smoothly. If this happens, springing the sides of the lid outwards slightly will help.

3) Unplug the 34-way ribbon cable from the back of the floppy drive. Also disconnect the 4-way power cable, the one containing red, black and yellow wires. There is a certain knack required for the power cable - you need to pull it not only rearwards but upwards slightly too.

4) Undo the two cross-head screws which secure the floppy drive to the metal support bar. Then remove the drive completely by manoeuvring it out of the casing.

5) Use the diagram opposite to locate the ARM chip on the main board. (It was partially obscured by the floppy drive but should now be accessible)
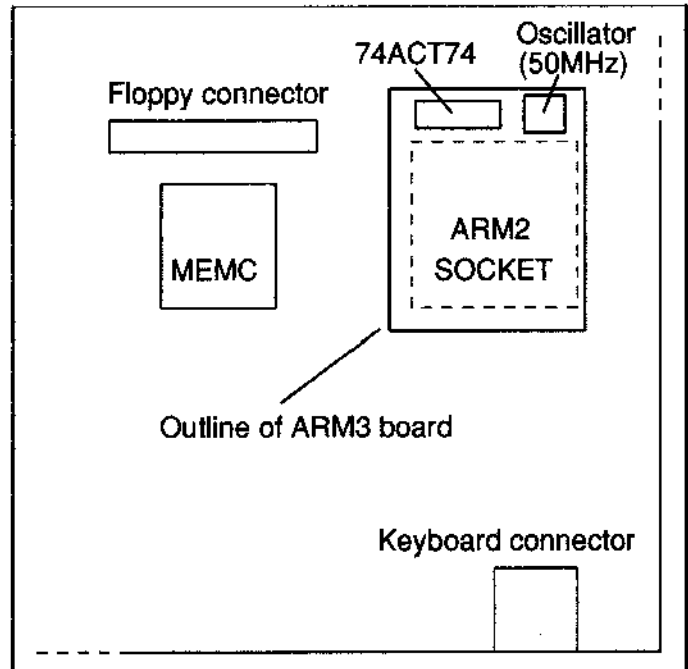
6) Use an extractor tool to remove the ARM2 chip from its socket. The metal hooks of the tool are inserted into the slots in the corners of the socket, and squeezing the sides will then draw the chip out completely.

7) In the case of the A305, A310 and A440 (but **not** the 44011), the memory controller must be upgraded to the MEMC1a. The old MEMC (see above diagram) is normally marked "ANNA". Details of this upgrade are supplied with the MEMC la kit itself.

8) Carefully align the header on the bottom of the ARM3 board with the empty ARM2 socket, making sure that the orientation is correct. Again, use the previous diagram to check this. (It may help to remove the backplane in order to improve access).

9) Put the floppy drive back in position, the old " blu-tack" trick or a magnetic screwdriver being useful for the rather inaccessible securing screw. Reconnect the power and ribbon cables, then proceed to reassemble the machine (this simply being the reverse of step 1-4 opposite. Proceed to the section headed "Using the ARM3 upgrade".

Fitting to the A3000

1) The specialised nature of part of the fitting process is such that no more than a very brief description of the procedure is given.

2) Remove the lid and the keyboard from the computer, and locate IC37 (the ARM2 chip).

Remove this component and install the 84-way surface mount socket in its place, noting that the socket is polarised and that the position of pin 1 is normally marked on the PCB.

3) The ARM3 chip pushes into this socket with the oscillator module at the left when viewed from the front.

4) Reassemble the machine and test.

Using the ARM3 upgrade - RISC OS 2

When the machine is first switched on under RISC OS 2, or after pressing the reset button, it will run at the same speed as the original ARM2 chip. The ARM3's "cache" therefore needs to be initialised. In order to do this, put the floppy disc supplied into the drive, click on the appropriate drive icon, and then double-click on the !ARM3 application. An appropriate message indicates that the ARM3 has been initialised. For 99.9% of the time that is all you really need to do. You can of course always include this as part of the boot-up sequence from a hard disc.

A relocatable module ("CacheMod") supplied on the disc provides two star commands, *CacheOn and *CacheOff. You don't have to worry about the case of the letters (eg *cacheon is acceptable), but make sure that there are no spaces anywhere. These commands respectively enable and disable the cache. Disabling the cache causes the machine to run at the old ARM2 speed, and might be useful in some instances, games for example. With the cache enabled however, the computer will typically run three or four times faster.

Double-clicking on !ARM3 while holding down the SHIFT key will reveal the files inside. "CacheMod" is the relocatable module mentioned above, and is automatically loaded when you double-click on !ARM3. You can look at the !Run file in !Edit to see how it works. Double-clicking on "C_On" and "C_Off' respectively turns the cache on and off.

From the desktop environment, a command line prompt can be obtained by pressing <f 12>. Any "star" commands (such as *CacheOff and *CacheOn mentioned above), can then be typed in.

Notes for RISC OS 3 users

RISC OS 3.10 or later will automatically detect the presence of an ARM3 processor, and enable the cache for you. Therefore the various commands mentioned above do not usually apply. RISC OS 3 does however provide two commands of its own for cache control, namely

*Cache On and

*Cache Of f

Note the presence of the space this time after the word "Cache", although as before, the case of the letters is not important. For additional information see pages 164 and 167 of the RISC OS 3 guide.

2Mb 4Mb, 8Mb Upgrades....

IFEL can provide RAM upgrades for most of Acorn's early RISC computers. These include the A305, A310, A440, 410/1, 420/1, 440/1, A5000 and even the A3000. Some upgrades are straightforward to install, others require some specialist equipment. Please ask for further details.

Users should note that VLSI have now ceased production of the MEMC1a chip, therefore 8Mb upgrades will be discontinued when our stocks of the MEMC1a are exhausted.

Hard discs

We can supply a range of hard discs (both SCSI and IDE) for Acorn's early RISC computers. Please telephone to discuss your requirements.