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# 25MHz ARM3 FPA Upgrade Fitting Instructions

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## WARNING!



Your computer contains hazardous voltages so before removing any cover, switch off and disconnect from the mains supply as failure to do so may cause injury.

## CAUTION!



OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES. Your computer and upgrade can be damaged by careless static discharge. Earth yourself and try to avoid touching any of the electronic circuitry.

**Note: The computer board and ARM3 FPA upgrade are static sensitive and excessive handling can damage them. It is recommended that the ARM3 board is left in its protective packaging and only removed immediately prior to plugging it into the machine. Precautions should be taken to reduce static by wearing an earthed anti-static strap or by occasionally touching an earthed surface. As the fitting of this upgrade is outside our control, no responsibility can be accepted for any consequential loss or damage caused by its incorrect installation. 305/310 or 440 machines must have a MEMC1a fitted for the ARM3 to work correctly.**

## Purpose

To install an ARM3 processor to an ARM2 based machine to give software an average four fold speed increase. A socket has been provided on the ARM3 board to accommodate the forthcoming Floating Point Accelerator chip which will execute simple maths instructions 'on chip' with the more complex instructions being handled by a hardware assist module.

## Tools Required

A small cross-head screwdriver for removing the case, and a PLCC extractor tool to remove the ARM2 from its socket.

## Fitting

The fitting of the ARM3 FPA involves the removal of the metal cover and the floppy drive to give access to the ARM2 processor socket.

1) Disconnect the power cable and all other connecting cables from the the computer, placing the monitor and keyboard in a safe place. The cover can now be removed by using the cross-head screwdriver to unscrew the two side screws and the three rear screws and carefully sliding the cover to the rear until it clears the rest of the machine.

Place the cover in a safe place. (This operation is explained in more detail in appendix B of the Archimedes User Guide : Maintaining the Archimedes computer in the section *Changing the Batteries.*)

2) Carefully detach the ribbon cable and power cable from the rear of the right-hand floppy drive and curl them back out of the way.

3) Now using the cross head screwdriver, undo the two screws securing the drive cradle to the drive bridge and carefully lift clear and place in a safe place.

4) With the processor socket now fully exposed, the ARM2 chip can now be removed from its socket using the PLCC extractor. Holding the tool vertically in one hand, both metal hooks of the tool are pushed into the two extraction slots of the socket at diagonally opposite corners of the chip so that the plastic body of the tool rests upon the upper face of the socket. The slots are shown overleaf. (You should be able to move the hooks of the tool freely up and down slightly in the slots of the socket . If the hooks do not move then they have not cleared the side of the chip and tool must be rocked gently back and fore by a few degrees in line with the slots so that the hooks become free and latch round the underneath of the chip.) Holding the tool upright, gently squeeze the two elbows together. This causes the hooks to pull the chip upwards out of the socket. Under no circumstances should you pull upwards or tilt the tool as this will damage both tool and socket - let the tool do the work!

When the extracting action is complete, the chip will be just clear of the top of the socket, being clamped firmly between the hooks and base of the tool and can be lifted clear.

DO NOT touch the contacts within the socket as the grease on your fingers will cause future connector failure with the socket. Store the ARM2 in the conductive packaging accompanying the upgrade as it can be re-fitted should you wish to remove the ARM3 at a later date.

## Fitting the Upgrade

Take the ARM3 board from the packaging and carefully remove the transit ring from around the adaptor on the underneath of the PCB. With the 68 pin FPA socket towards the rear of the machine as shown in the diagram overleaf, place the board in position so that the adaptor of the ARM3 sits squarely in the top the processor socket. Using your thumbs, gently press downwards on the upgrade board above the adaptor with even pressure, trying to keep the upgrade level with the main PCB until the adaptor bottoms out in the socket. Check that the ARM3 board is still level with the main PCB and then replace and secure floppy disk cradle with its two screws and reconnect the ribbon and power cables. Be careful not to misregister the ribbon cable with its connector as there is no shroud to aid in its alignment.

Before replacing the cover check once more that all cables have been reconnected and that all screws have been replaced. You may wish to take the opportunity of changing your fan-filter and batteries before the computer is fully assembled.

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With the machine fully assembled, reconnect your monitor and switch on. Start up the desktop and load the !Cache application from the ARM3 support disk supplied with the upgrade.

The application will install itself on the left of the icon bar displaying either a 'No restrictions' or '30' sign to indicate whether the ARM3 cache is currently on or off.



The state of the cache can be toggled by clicking on the icon using the select button of the mouse.

When the ARM3 application is started, two relocatable modules are loaded from disk: ArmSupport, an Acorn compliant ARM3 controller, and CacheApp, the desktop control application. If you have RISC OS3 fitted to your machine then you do not need to use this application as there is already an ArmSupport module present in the operating system but you can still use it as a convenient way of turning the cache on or off from the desktop.

From the command line, the cache can be controlled by the following command: \*CACHE On|Off.

The default setting for the cache can be stored in CMOS RAM using the command \*Configure Cache On|Off.

The cache is switched on using \*CACHE On and off using \*CACHE Off. The state of the cache can be determined by typing \*CACHE with no parameters which displays a short status message. Normally the cache would be left on but sometimes it is desirable to turn the cache off as some games run abnormally quickly with the cache enabled.

Advanced programmers may like to load the ArmSupport module contained within the !Cache application as part of their machines !Boot sequence by adding the following lines:

```
| Try to load ArmSupport module
RMEnsure ARM3Support 1.03 RMLoad
<Obey$Dir>.ArmSupport
| Check for successful loading of module
RMEnsure ARM3Support 1.03 ERROR 0 "Can't find
ArmSupport"
```

For Impression II users there is also a !UserGuide document supplied on the support disk which documents the star commands supported by the ARM3Support module in greater detail. The pages of the guide can be printed out and attached to your manual as they are laid out in a similar style.

#### Plan and side view of upgrade fitted to processor socket

