300/400 Series 4-8MB RAM Fitting Instructions

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 4-8Mb RAM upgrade are static sensitive and excessive handling can damage them. It is recommended that the upgrade boards are left in their protective packaging and only removed immediately prior to fitting them to 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 old 440 machines must have a MEMC1a fitted for the upgrade to work correctly. If your memory controller is labelled VL2304 - ANNA and the PAL (see Fitting the MEMC board - 2) is coded 0276,032 then you have the old MEMC. You do not need to purchase a full MEMC1a kit but only the PAL which is available from SIMTEC at nominal cost.

Compatibility: Your computer must have a full 4Mb of RAM before it can be upgraded to 8Mb. It will be very difficult if not impossible however to fit this or any other 4-8Mb upgrade to machines fitted with 'Plug-in' style 4Mb RAM upgrade boards. It may also be imposible to fit the upgrade if the MEMC socket is covered by an early ARM3 or floppy-drive buffer card. These must be changed/removed to fit the 4-8Mb RAM.
For correct operation, a machine must be fitted with RISC-OS3. For those who still need to use RISC-OS2 then a disc with replacement Windowmanager modules is available from SIMTEC.

Purpose

To install an extra 4Mb of RAM to a 4Mb machine to give a total of 8Mb. The upgrade consists of two parts, a memory board holding the RAM which fits in the ROM sockets, and a Dual MEMC board which plugs into the MEMC socket. The two parts are connected by a length of cable. Any ROM carrier (RiscOS hardware upgrade board) already fitted is redundant and is removed as the new memory board performs the same functions.

Tools Required

A small cross-head screwdriver for removing the case, a PLCC extractor tool to remove the MEMC from its socket and a DIL extractor or 'Bic' pen top to remove the operating system ROMS. M6 nut runner for 400/1 machine.

Fitting

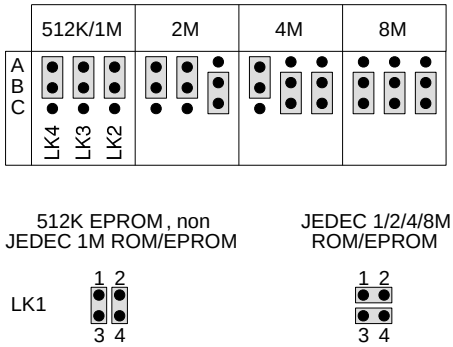
To fit the upgrade, the main printed circuit board (PCB) must be removed to give access to the ROM sockets. This involves the removal of the metal cover, the removal of any podules, the unplugging of the backplane and the disconnection of the cables from the PCB before it can be slid out of the machine. If you have Risc-OS3, it may be useful to save your CMOS RAM settings onto floppy using !Configure before you commence as they may be lost when the machine is disassembled.

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) Remove any podule cover plates from the rear of the machine and if you have any podules fitted then remove them by following the reverse of the manufacturer's fitting instructions, placing them in a safe place.
3) If fitted, the backplane is now removed by unscrewing the two fixing screws at either end of the backplane bar that attach it to the side of the case and the power supply fixing tab. If there is a large hole in the side of the power supply cover to the side of one of the fixing screws then it is advisable to cover it with a small piece of adhesive tape to prevent the screw from falling into the power supply when it is removed. With both screws undone, the backplane can be unplugged from the main PCB with cables still attached, by easing it carefully upwards. Being careful of the three cables still attached rest the backplane on the top of the power supply to keep it out of the way.
4) The flat cable connecting the disk drive to the PCB must now be unplugged from its socket. If you have an internal ST506 hard disk fitted then detach the two flat ribbon cables from the PCB by carefully easing their plugs from the vertical pin connectors and curl them out of the way.
5) Now detach the fan, battery and speaker/LED connectors, and the four power cables from the board (coloured red, black, yellow and purple).
6) For 400/1 machines, remove the black earth strap from the disk drive bridge. The securing stud is located in the gap between the floppy drive and the side of the case.
7) With all connecting cables removed from the PCB, the two small screws securing each end of the rear plate of the board can now be removed allowing the PCB to be slid out

of the rear of the machine on its two plastic runners. (The board must be kept horizontal or the sharp end of one of the case screws may scratch the underneath of the board as it is withdrawn possibly causing damage. It is advisable to unscrew them before withdrawal.) On some of the older machines the PCB is secured using three sprung pillars which require the tops to be squeezed together with pliers while the PCB is lifted before it can be slid out.

Fitting the RAM Board

1) Place the PCB on a compliant, anti-static work surface. If there is a plastic pillar in the middle of the board then this must be removed to allow the PCB to lie flat.
To fit the upgrade, the existing ROM chips have to be removed, using a DIL extractor or plastic pen top to gently leaver up the ends of each chip in turn. If the ROMs are to be refitted then it may be useful to label them before removal. If you have a ROM carrier board, this must be removed before the RAM carrier can be fitted.
2) With the PCB on a flat surface, place the RAM carrier over the four sockets so that the pins of the carrier line up with the holes of the sockets. Make sure that the cable connector and links of the board are pointing away from the backplane connector as shown in the diagram.
3) Push home the RAM carrier with even pressure so that the legs of the carrier penetrate the sockets to a depth of 3-4mm so that only the wide part of the legs are visible. A small block of wood makes the job easier, but be careful not to damage any of the upgrades connector pins.
Check very carefully to make sure that the board is level and not bowed.
4) When refitting the ROMs, make sure that the chips are fitted to the carrier, with the notch at the end of the chip pointing towards the cable connector. If the ROMs are not marked as ROM 1, 2, 3, 4 then the Rom 1 can be identified by the lowest numbered Acorn part number printed on the top of the chip eg 283,022-01 with the other Roms being fitted in ascending order from right to left ie Rom 2 would be 283,023-01 and so on.
If you are re-fitting your original **RISC OS-2 ROMs**, then they should occupy the lower 28 holes of each socket leaving the upper four holes (by the notch) empty. Before pushing home the devices, make sure that the legs of each chip are aligned with the entrance holes of the sockets to prevent damaging them if they miss. Change the jumpers on the carrier from their RISC OS3 setting to the non-JEDEC 1M ROM/EPROM.
If you are fitting new ROMs, it may be necessary to *'set'* the legs as they are usually splayed out when new. This can be done by carefully rolling the side of the chip on a flat surface so that the legs are bent straight.



512K EPROM , non JEDEC 1M ROM/EPROM

JEDEC 1/2/4/8M ROM/EPROM

Fitting the MEMC Board

The square MEMC chip can now be removed from its socket using the PLCC extractor to make room for the MEMC board.

1) 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. (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.
2) **ONLY** if you have an old MEMC then you will need to replace the 20 pin PAL chip which is in the turquoise socket between the ARM and MEMC sockets. This is done by gently levering up each end of the chip using either the DIL extractor or clip of a 'BIC' pen top. Now take the replacement 20 pin PAL chip and plug it into the socket making sure that pin 1 (identified by either a notch at one end or moulded dot on the top left of the body) is towards the rear of the machine. As with new ROMs, you will need to bend the legs of the chip inwards so it will fit the socket by rolling each side on a flat surface. Check that both chips are socketed correctly
3) Take the MEMC board from the packaging and carefully remove the transit ring from around the adaptor on the underneath of the PCB. With the MEMC board orientated from left to right with its cable connector to the front as in the diagram overleaf, place the board in position so that the adaptor of the MEMC board sits squarely in the top the 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.
4) Carefully fold the cable in the fashion of the diagram and plug one end of it onto the RAM carrier and the other to the MEMC board. The cable stripe should be adjacent to the white triangle mark at the end of each board connector. Be careful not to misregister the ribbon cable with its connector as there is no shroud to aid in its alignment. Check that the RAM carrier has not been disturbed and that the MEMC board is still level. **Replace the pillar if one was fitted**.
5) The main PCB can now be returned to the chassis. Be careful not to catch the PCB on the underside of the disk drive bridge or the rear case screws as it is slid home.
The computer can now be reassembled by following the instructions in reverse.
Take great care to reconnect all cables making sure that the multi-way connectors are plugged in the right way round without displacing them sideways.

Note: The four power cables are connected to the spade terminals on the PCB in the following way:-
RED to the +5v terminal, BLACK to the 0v terminal, YELLOW to the +12v terminal and PURPLE to the -5v terminal.

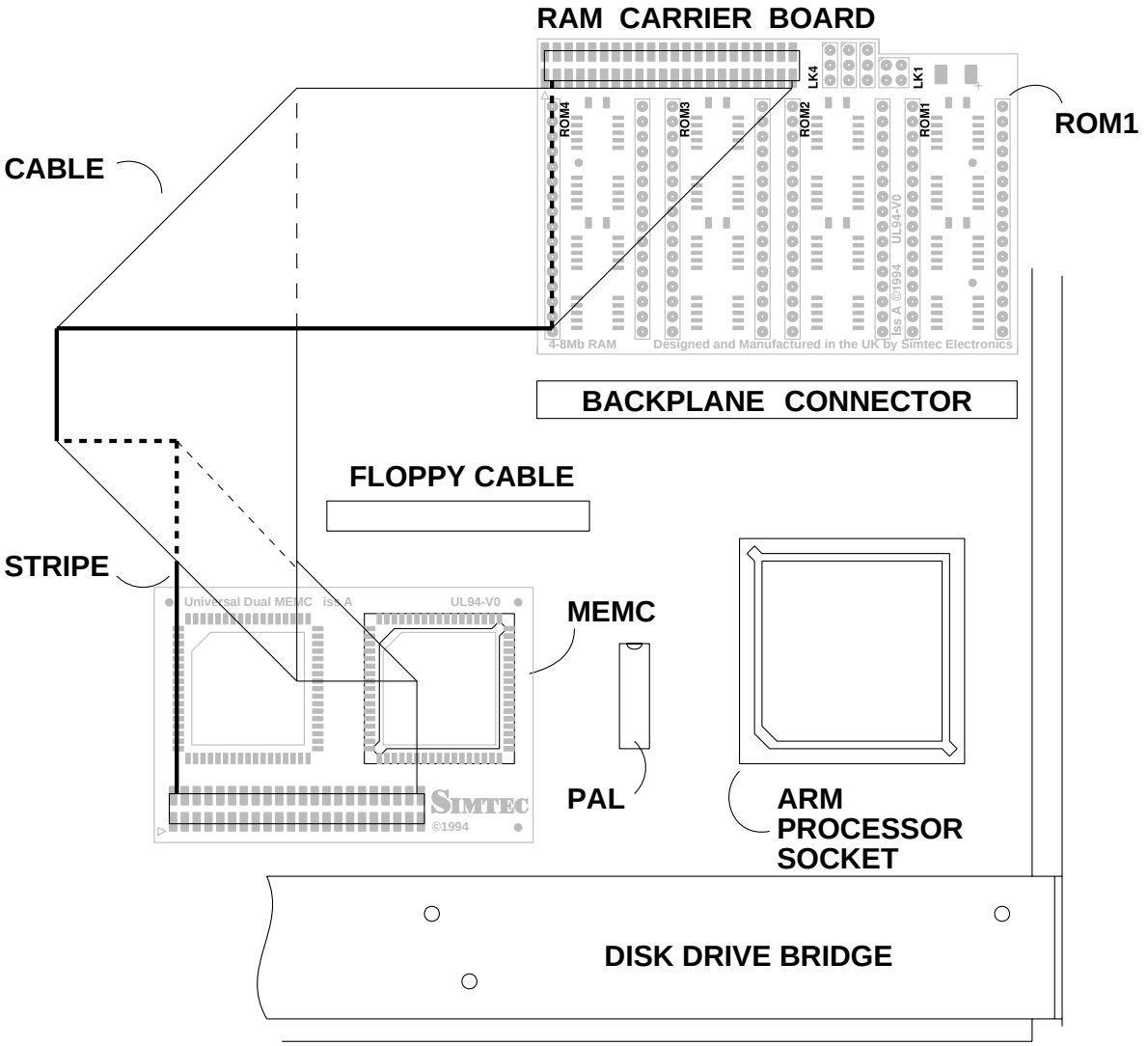
Permanent damage to your computer will occur if these connections are not correct.

Any backplane and podules should also be replaced but you may choose to fit these later, after the machine has been tested. If you have a colour graphics card then you must either fit this or make sure the Genlock links are fitted or no video picture will be output.
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.

With the machine fully assembled, first allow the monitor to warm up for one minute and then switch on with the <*Delete*> key pressed until a few seconds after the power on self test (coloured screens going from Magenta to Cyan to black) has completed.
If the colour of the screen does not change within a few seconds of switch-on then turn off and check the orientation of the ROMs with no legs bent out of the socket. Also check the cable connection and that link settings match the size and type of ROM being used.

Remember to set the 'Real time clock' and change back the CMOS Ram settings as they are forgotten when the battery connector is removed !



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