

WATFORD ELECTRONICS
SOLDERLESS SIDEWAYS ROM BOARD
FOR THE BBC MICRO

The Solderless Sideways ROM board for the BBC micro enables the user to increase the sideways ROM capacity from the basic 4 sockets to the full 16 supported by current operating systems.

FITTING INSTRUCTIONS

First open the case of the BBC Micro by removing the four main case screws. Two of these are at the back, and the other two under the keyboard. They may be marked FIX. Remove the keyboard by undoing the two bolts at either end. Next remove IC51; this is the OS ROM and is the fifth chip from the right under the keyboard. It should be labelled "PB04" for OS 1.20. Plug this into the ROM board bottom right hand socket on the ROM board labelled "OS ROM".

Now remove IC73; this is the ADC chip which is at the rear of the computer just below the joystick port. It should be labelled "D7002C". Plug this into the ROM top left board socket labelled "ADC". Next locate link S21, which is to the right of the keyboard cable. S21 consists of four posts - two sets of two running East/West (or right/left). Remove and keep the link from the front most of these two links. Then plug the flying wire labelled S21 from the 12 ROM board on to the newly vacated posts of S21. The same orientation must be retained as on the 12 ROM board ie. the wire from "S21 e" goes to the east (or right hand) part of S21.

Finally plug the whole board in. The OS ROM should be over its former socket as should the ADC. Part of the board will go under the keyboard ribbon so make sure this does not get in the way. Press the board firmly in place so it is stable. Having done this, switch on the computer. If a continuous buzz is heard, make sure the board is pressed firmly in place. If "Language?" appears on the screen, you have probably plugged the flying wire the wrong way round on S21.

OPERATION

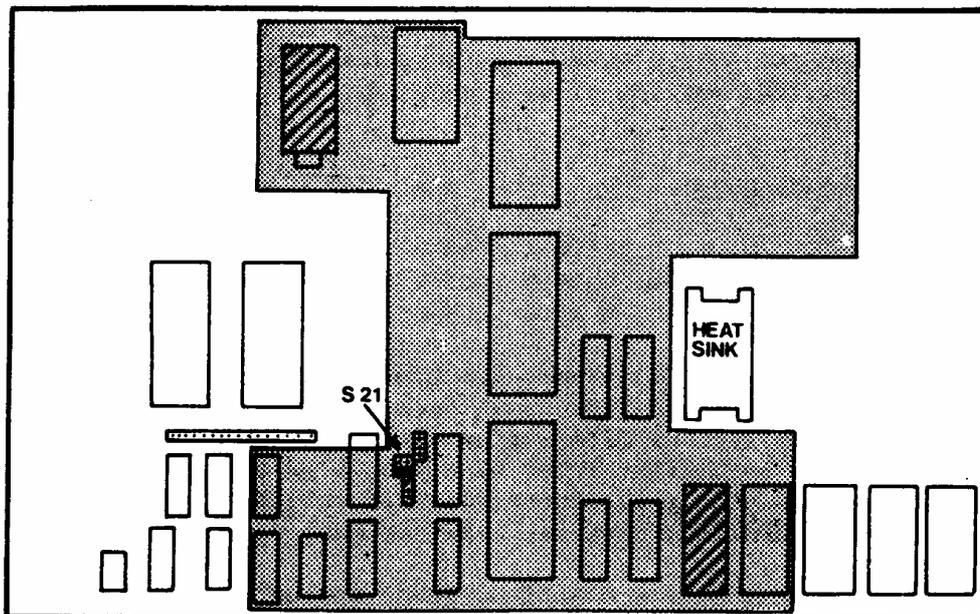
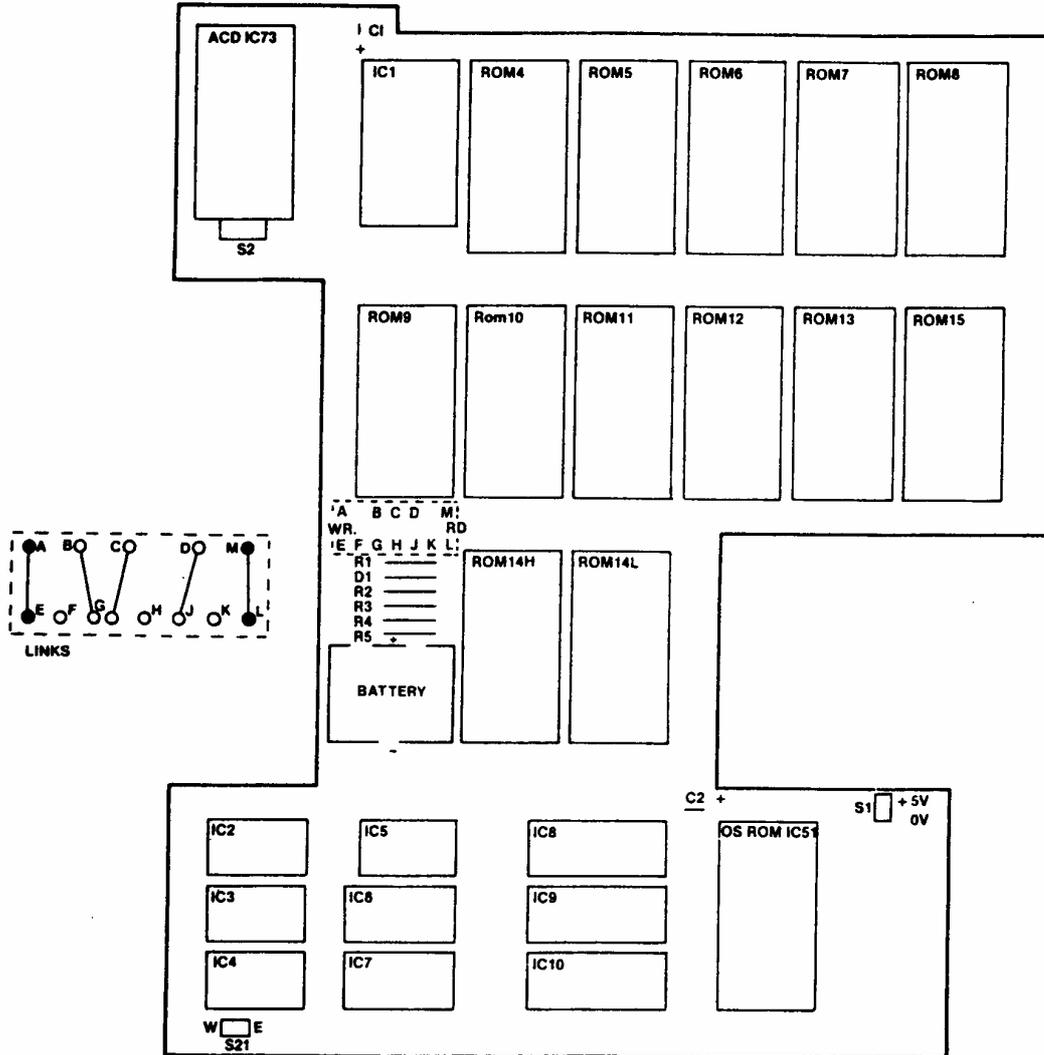
The ROM you want enter the machine is switched on (normally BASIC) should go in the highest priority socket, which is socket 15. The BASIC ROM is labelled "PB01" or "PB05". If you have a disk system, the DFS ROM should go in a low priority socket. Sockets 14L and 14H are different from the other remaining sockets; they can take a variety of different chip types, with links specifying what type is fitted. Two low capacity chips can be 'linked' together to behave as if they were one. The main use of this is for sideways RAM, type 6264. The setting links are defined as follows (the links are factory set for 2764/6462 chips):

14H 14L	Links to be made	14H 14L	Links to be made
27128-2764	J to D, G to B	2764-2764	J to D, G to C, G to B, E to A
6264-2764	J to D, G to C, G to B, E to A	6264-6264	J to D, G to C, G to B, E to A
6116-6116	K to D, J to C, F to B, E to A	6116-2716	K to D, J to C, F to B, E to A
2716-2716	K to D, J to C, F to B, E to A	2732-2732	H to C, F to B

Whenever a write is made to a sideways ROM (in the region &8000 to &BFFF), it is automatically directed to socket 14 which can take RAM. This means you can "LOAD" ROMs which you do not have room for, or directly assemble machine code into this RAM. However it is sometimes desirable to disable this. Link E to A is a push-on terminal which, when removed, protects the RAM from write operations; ie it controls write protect. This can have a switch coupled up to it instead for ease of use.

Link L to M is a push-on terminal which, when removed, protects the RAM in socket 14 from being read. This is useful if an error occurs when developing a ROM in the sideways RAM. The RAM can still be written to, so it can be altered safely.

Provision is allowed for the installation (via soldering) for a PCB mounting type Ni-Cad battery to be fitted to maintain the contents of static RAM in sockets 14L AND 14H, even when the BBC itself is turned off.





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Watford 12 Socket Solderless ROM Board

A number of users have encountered problems when fitting this board to their computer's. To help you, we have distilled the problems and cures into a few paragraphs..

The main problem encountered is that of components on the main board snagging with the ROM board. The S21 and power leads may all need to be bent (very carefully) to allow the board to rest comfortably in its two sockets. Towards the rear right of IC2 is a crystal. On some BBCs this crystal is very prominent from the surface of the board and may require some insulation tape placing over it to prevent potential shorts across the casing when the ROM board is installed.

When you are finally ready to push the ROM board home into the OS and ADC sockets, ensure that ALL the pins are lined up BEFORE you start applying pressure. When you do apply pressure, do so equally on the two sockets and push vertically down. DO NOT apply any sideways pressure as this may result in you snapping some or all of the pins due to excess force.

In use, the two RAM sockets (14L and 14H - logical socket 14/&E) are only active when accesses come from on the ROM board. This drastically cuts down on the power consumption of the board, but has the implication that you cannot, for example, *LOAD filename 8000 with the DFS ROM located in one of the four original sockets. The DFS ROM (and any other ROM that is going to perform writes to the sideways RAM) needs to be located on the ROM board itself for these writes to actually perform anything.

On some BBCs we have encountered small surges that corrupt the sideways RAM on power down and switch on. If you are using battery backed RAM, then it is advisable to remove the Write protect link from the board before power down to prevent any writes to the sideways RAM. Should corruption occur, you can remove the Read protect link to allow the machine to power up.

Should you be experiencing a problem with any of our products, and the above not provide the solution, please write in with as many details as possible. Writing in allows us to contact external authors, whereas telephone calls do not permit this.

Technical Support.