BeebMaster Econet Upgrade Kit Contents

Integrated Circuits

1 x 74LS123 (Not required if disc interface already fitted)
1 x 68B54 Advanced Data Link Controller
1 x 74LS132
1 x 75159
2 x LM319
1 x 74LS244
1 x 74LS74
1 x DNFS ROM (containing Acorn DFS 1.20 and NFS 3.60)
Optional: ANFS 4.18 ROM (available separately)

Other Components

Econet Station lead (5 pin DIN to 5 pin DIN)

5 x 14-pin DIL IC socket
1 x 20-pin DIL IC socket
1 x 28-pin DIL IC socket

1 x 10uF 10V Capacitor
1 x 8x22K SIL resistor pack (9-pin)

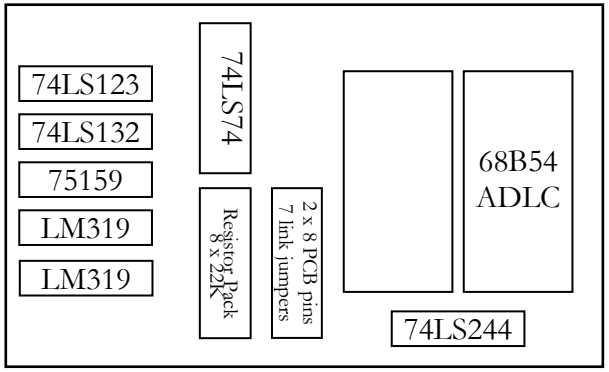
4 x 10kΩ resistor
4 x 56kΩ resistor
4 x 100kΩ resistor

1 x 5-pin DIN socket
1 bank of 16 PCB link pins
7 x link jumpers

1 x 10nF Ceramic Capacitor
1 x 2.2nF Ceramic Capacitor (only for issues 1, 2 & 3)

4 x 1kΩ resistor
3 x 1M5Ω resistor
1 x 1k5Ω resistor

Component Location inside the BeebMaster Econet Upgrade Kit Component Box



Please visit the BeebShop for more Econet products including:

- **BeebMaster Econet Clock**
- **Econet Module for Master Series and Later**
- **Econet Leads**
- **Econet Socket Hubs and Terminators**

BBC Model B Econet Interface Fitting Instructions

Important Note

The integrated circuits in the BeebMaster Econet Upgrade Kit are electrostatic sensitive. Please observe the appropriate precautions for handling such devices when fitting this upgrade.

Please refer to the PCB Links Diagram and Component Location Diagram insert for the approximate locations of the components and links referred to in these instructions.

Please plan your work in advance and ensure that similar components of different values are kept separate. The instructions overleaf set out the steps required to fit the components to a BBC Model B computer but you may wish to vary the fitting order to suit your own requirements or the board layout of the particular machine being upgraded.

If you are in any doubt as to the fitting of the Econet Upgrade Kit to the BBC microcomputer, please contact BeebMaster for advice. DO NOT risk damage to your BBC or this upgrade kit if you are unsure how to proceed!

This kit is only intended for a BBC Model B computer. BeebMaster can supply a conversion kit for use with this kit and a BBC Model B+ on request for a small additional charge.

ANFS Option

For a small additional charge, the BeebMaster Econet upgrade kit can be supplied with version 4.18 of the Advanced Network Filing System in an additional ROM chip. This incorporates a number of improvements over the BBC B NFS ROM, including many more utility * commands in ROM and much faster BGET/BPUT routines to speed up loading of exec files, dumping files etc.

In some cases, it will be necessary to install the supplied DNFS ROM as well as ANFS since the Tube host code and Disc filing system code are only contained in DNFS. The ANFS ROM should be installed in a higher priority ROM socket than DNFS to ensure it is recognised in preference to the standard NFS contained within DNFS.

www.BeebMaster.co.uk/BeebShop
Enquiries@BeebMaster.co.uk

Fitting the BeebMaster Econet Upgrade to a BBC Model B Microcomputer

Note: References to points of the compass in these instructions should be interpreted as looking towards the rear of the computer from the keyboard, e.g. "North" refers to the back of the computer.

1. Switch off the computer and unplug it from the mains. Switch off and unplug any peripherals connected to the computer.

2. Remove the computer's lid by unscrewing the four screws marked "FIX" - two at the rear of the computer and two underneath.

3. Remove the fixing bolts holding the keyboard in position.

4. Unplug the keyboard connector and speaker connector from the main PCB and remove the keyboard.

5. Unplug the power supply connectors from the circuit board. Remember to keep a note of where each connector goes.

6. Remove the screws holding the PCB to the case. On some machines, the analogue port connector may have screws holding it to the case.

7. Disconnect the video out socket from the casing. This can be done by unscrewing the socket from the case which will release the socket assembly or by desoldering the two connecting wires from the socket.

8. Gently remove the circuit board from the computer casing.

9. Solder the 20 resistors to the circuit board. The values and positions are as follows:

R34-10k	***R35-10k***	***R36-1M5***	***R38-100k***	***R39-100k***
R40-100k	***R41-100k***	***R44-1M5***	***R45-10k***	***R46-1k***
R47-1k5	***R48-1k***	***R51-10k***	***R52-1k***	***R59-56k***
R60-56k	***R61-1k***	***R62-56k***	***R63-56k***	***R64-1M5***

10. Solder the 2 capacitors to the circuit board as follows:

C18-10uF 10V Capacitor ***C23-10nF Ceramic Capacitor***

Please note that capacitor C18 is polarised. The positive terminal is marked on the component and on the motherboard. Please ensure that it is fitted observing the correct polarity.

11. Solder the 8 sockets to the circuit board in the following positions:

14-pin:	***IC 91, IC 93, IC 94, IC 95, 1C 97***
20-pin:	***IC 96***
28-pin:	***IC 89***
5-pin DIN:	***SK7***

12. Solder the Resistor Pack at RP2. Please note that RP2 is polarised and the pin 1 marking on the Resistor Pack should be fitted at pin 1 on the BBC motherboard.

13. Remove the link jumpers from the bank of pins and solder the pins at S11.

14. Insert the DNFS ROM (or ANFS ROM if supplied) into a spare sideways ROM socket.

15. Insert the integrated circuits as follows:

1 x 74LS123	***IC87 (Already present if disc already fitted)***
1 x 68B54	***IC89***
1 x 74LS132	***IC91***
1 x 75159	***IC93***
2 x LM319	***ICs 94,95***
1 x 74LS244	***IC96***
1 x 74LS74	***IC97***

16. Cut the wire links at link positions S2, S12 and S13. (S12 and S13 should already have been cut on a Model B).

17. If the BBC Micro does not have a disc interface, link S9 ***must be closed.***

18. Set the following link positions using link jumpers which should already be present on the motherboard:

S18-North	***S19-East***	***S20-North***	***S21-2 x East/West***
S22-North	***S32-West***	***S33-West***	

19. ***On issue 1, 2 or 3 boards only***, the following additional modifications are required:
    a) Remove the capacitor C17 and replace it with a 2.2nF capacitor.
    b) Cut the PCB track from IC26 pin 6 to IC96 pins 1 and 19 leaving the track from IC26 pin 6 to IC97 pin 2 intact.
    c) Cut the track from IC89 pin 26 to IC97 pin 4 and link IC26 pin 9 to IC96 pins 1 and 19 and also to IC97 pin 4.

    Official Acorn Econet Service Centre upgrade instructions, with more information on upgrading boards earlier than issue 4, can be found here:
    http://www.beebmaster.co.uk/BeebShop/Downloads/Econet%20Upgrade%20Instructions%20for%20Approved%20Econet%20Service%20Centres.zip
    A detailed picture set showing some of these modifications is here:
    http://www.beebmaster.co.uk/BeebShop/Downloads/Issue2NetMods/

20. Set the Econet station number by adding one or more link jumpers to the bank of links at S11. Counting from North to South, the links are numbered 0 to 7, with each link representing one bit in an 8-bit number. Installing a jumper sets the corresponding bit to zero.
    Seven jumpers are supplied so that the station number cannot accidentally be set to zero, which is an invalid number. 255 is also an invalid number and should be avoided. 254 and 235 are usually reserved for file and printer server stations so should not be used unless the station being set is to have this function. 1 is the default number allocated to Econet stations from the Master Series onwards and should again be avoided.
    The table below shows the value assigned to each link when there is NO jumper present:

Link	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Value When No Jumper Present	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**

21. Reassemble the computer by repeating steps 1 to 8 in reverse.

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