

**SIDEWAYS ROM
EXTENSION BOARD
FOR THE
BBC MICROCOMPUTER**

USERS GUIDE

ROMEX 13

Your sideways ROM-sockets extension for the BBC Microcomputer.

What are sideways ROMs

Sideways ROMs (or Paged ROMs) are ROMs containing languages (such as BASIC, PASCAL), Spreadsheets, Wordprocessors, Financial and accounting packages and other utilities. Up to sixteen such firmware (software in ROMs) packages can be used with the BBC. These ROMs fit in the four rightmost sockets (identified as IC52, IC88, IC100 and IC101) on the BBC circuit board.

Since only four ROM sockets are provided on the BBC circuit board although the BBC has the software to support up to 16 sideways ROMs, your ROM board will enable you to fully utilise the firmware now available by giving you twelve more ROM sockets.

How to connect the ROM board to the BBC

The ROM board is connected to the BBC circuit board by means of two ribbon cables supplied with it.

Switch off the BBC micro and proceed as follows.

1. Undo the four fixing screws. Two of these are on the underside of the computer and the remaining two are on the rear.
2. Remove the lid and release the keyboard by undoing the two bolts located on either side of the keyboard.
3. It is not necessary to disconnect the keyboard completely from the multiway connector. Carefully displace the keyboard to the right to access IC76 (see Figure 2 for the location of IC76). Alternatively lift the keyboard up and carefully turn it over to place it on the rear of the circuit board with keys downward (see Figure 2).
4. Remove IC76 (74LS163) from the main board and insert, in its place, the 16 way dual-in-line plug (attached to 16 way ribbon cable) such that pins 1 to 16 of the plug correspond to pins 1 to 16 of the socket. Pin 1 on some plugs is identified by a white dot. See Figure 2 to identify pin 1 of the socket.

Note: If IC76 is found to be soldered to the circuit board then please contact us either by writing or telephoning. We will advise you of the best possible alternative to suit your requirements.

5. Locate the row of five large (28 way) sockets. The four right hand sockets are for sideways ROMs (see Figure 2). Insert 28 way dual-in-line plug (of 28 way ribbon cable) into any spare sideways ROM socket taking care that pins 1 to 28 of the plug correspond with that of the ROM socket.

While the keyboard is released the ROM containing BASIC language (printed B05) may be removed and plugged into the ROM board. Before doing so do read the section headed 'Operating priorities'. Secure back the keyboard.

6. Take the four P.C. board spacers and insert them, one by one, into four fixing holes on the ROM board from the solderside. Place the lid of the micro on a flat surface to expose the inside of the lid as shown in Figure 1. Peel off the tape from the bottom of the spacers (careful, as these are sticky now). Position the board approximately 110 mm from the left hand edge of the lid and approximately 25 mm from the back edge and firmly press against the lid. This will fix the board to the lid. See Figure 1.

Remove the board by pressing in tiny latches on the spacers. Fit the fifth (half size) spacer roughly in the centre of four spacers. This would support the ROM board in the middle. The ROM board may be fitted back to the lid.

When fitted to the lid, the orientation of the board is to be such that the inscription "Romex 13 (GCC CAMBRIDGE) LTD" is nearer to the keyboard aperture. See Figure 1.

- 7 Insert IC76 (74LS163) removed in section 4 (remember!) into socket identified as IC1 on the ROM board. See Figure 1 to identify pin 1 of sockets on ROM board. Fit 28 and 16 way ribbon cables to socket 1 and 2 respectively. Always remember to line up pin 1 of the plugs (on ribbon cables) to pin 1 of sockets.
8. Remove link S21 (shown in Figure 2) and replace it with the two way ribbon cable. The brown (or orange) lead should be closer to IC22. IC22 is indicated in Figure 2.

This completes the installation of the ROM board.

Operating priorities

When the ROM board is installed in the BBC microcomputer the sixteen sideways ROMs have an operating priority. On a hard reset or on power

up the highest priority is given to IC14 decreasing to IC3 on ROM board and then to IC101, IC100, IC88 and IC52 on the BBC board. Thus the lowest priority is assigned to IC52. See Figure 1. Firmware fitted in ICR on ROM board has the same priority as of the one in which 28 way ribbon cable is plugged in on the BBC board. For example if the 28 way ribbon cable is connected to socket labelled IC52 then ICR has the same priority as of IC52 i.e. the lowest.

What it really means is this:

ROM socket IC14 should contain the firmware with which the computer is desired to start up on power up or on hard reset. Most people like to start up in BASIC therefore it is a good idea to remove BASIC ROM from the BBC and insert it in socket labelled IC14.

Once the ROM board is installed a quick way to check the priority (or indeed the presence) of firmware is to type *HELP followed by <RETURN>. A list of firmware in the decreasing order of priority should be seen.

Types of ROMs/EPROMs

ROMs containing software for the BBC does not require any changes to links on ROM board. Software in EPROMs should be in **27XX** series EPROMs.

EPROM-27128 (16K)

can be plugged straight in. No changes to links required.

EPROM-2764 (8K)

can be plugged straight in. No changes to the links required.

EPROM-2732 (4K)

To use software contained in 4K EPROMs in any socket, say IC9, bridge the two half moons adjacent to pin 26 of this IC socket on the solder side of the board by soldering them. Adjoining the half moons are two more pads — a triangular pad and a circular pad. Make a cut with a sharp implement (knife/scalpel) where the triangular pad joins the circular pad to isolate the two. See Figure 3.

Since the 4K EPROM is a 24 pin IC and the sockets are 28 pin, plug the EPROM in socket IC9 leaving positions 1, 2, 27, 28 vacant. See Figure 1.

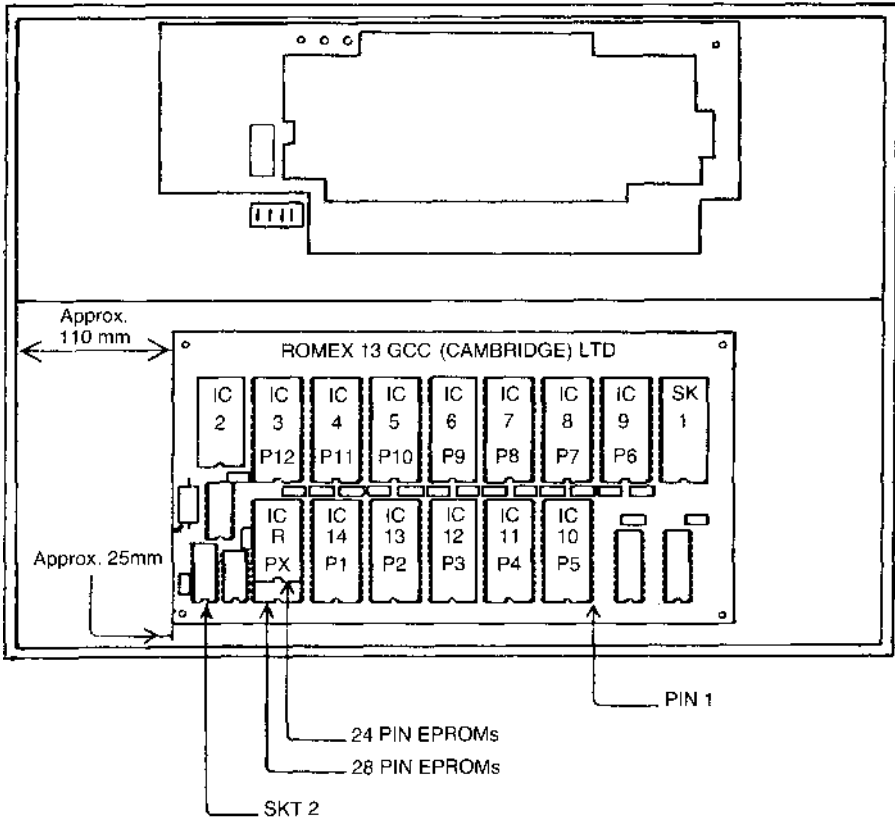
To convert socket IC9 back for use with 8K and 16K ICs connect the circular pad to the triangular pad and disconnect the two half moon pads.

EPROM-2716 (2K)

These EPROMs can only be used in socket 14. Link connections are shown in Figure 3.

FIGURE 1

Board fitted to the inside of the lid



P1 Denotes priority one (top priority) socket then P2 etc.

PX Assumes the priority of the socket in which 28 way ribbon cable is plugged in on the BBC Circuit Board

FIGURE 2

View of the BBC Microcomputer with the lid removed.

Note the pin-identification of ICs

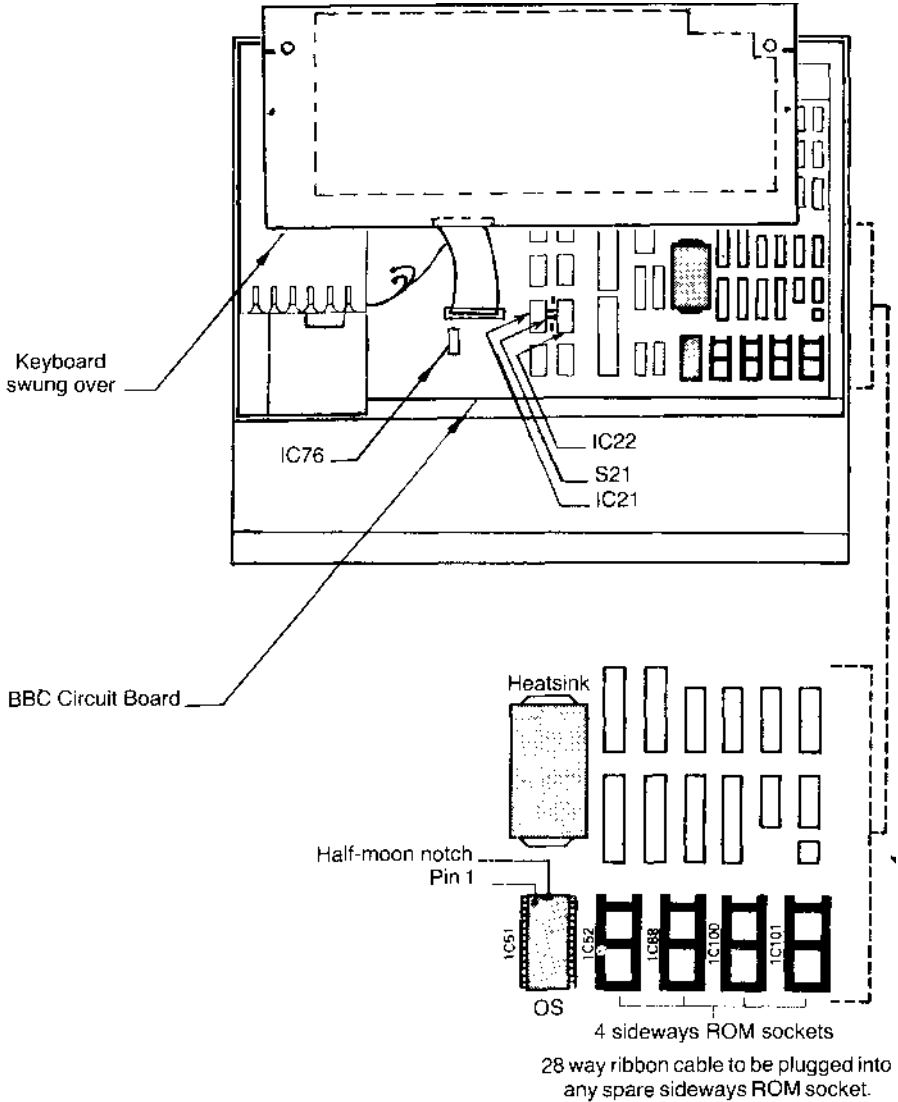
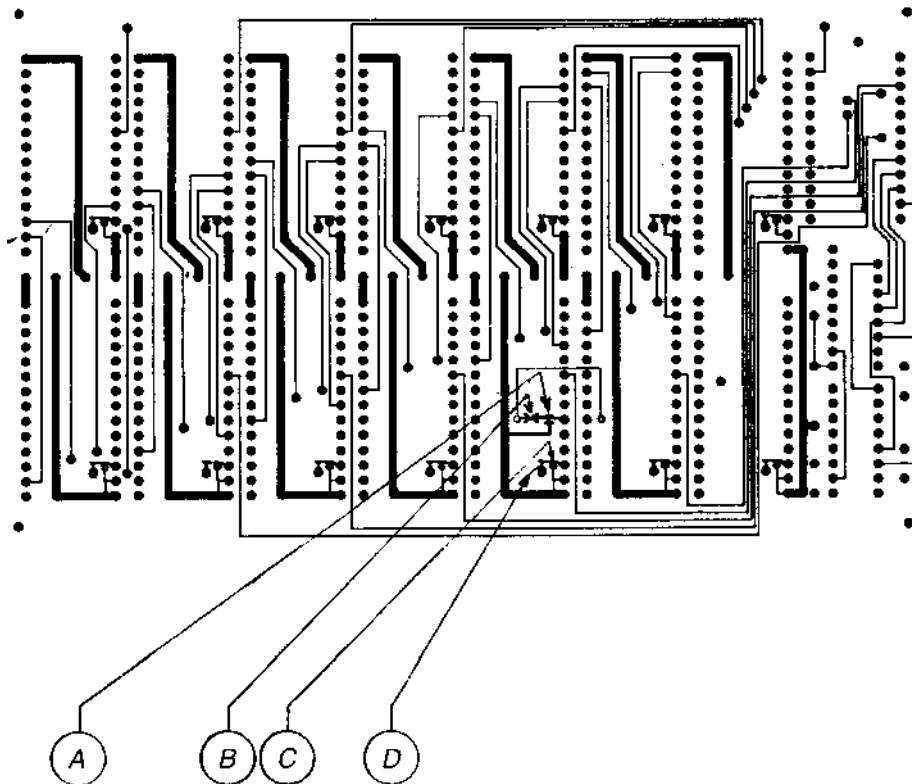


FIGURE 3

Changes to links for 2732 & 2716 EPROMs



2732 — (4K)

Bridge with solder at C

Cut at D

2716 — (2K)

Bridge with solder at A & C

Cut at B & D

FIRMWARE & EPROMS AVAILABLE FROM GCC

F i r m w a r e

Wordprocessors

V I E W

W O R D W I S E

Spreadsheets

B E E B C A L C

Database Management

B e e B A S E

EPROMS

27128

2764

2732

2716

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