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T.E.S. II

"BASIC" MINI ROM/EPROM BOARD

INTRODUCTION

This board was designed primarily for use on the Ohio Superboard and UK101, however there is no reason why it could not be adapted for use on other systems.

Once constructed and installed the board will provide a facility on your main board for the use of three 2716-type EPROMS in the vacant "BASIC" sockets.

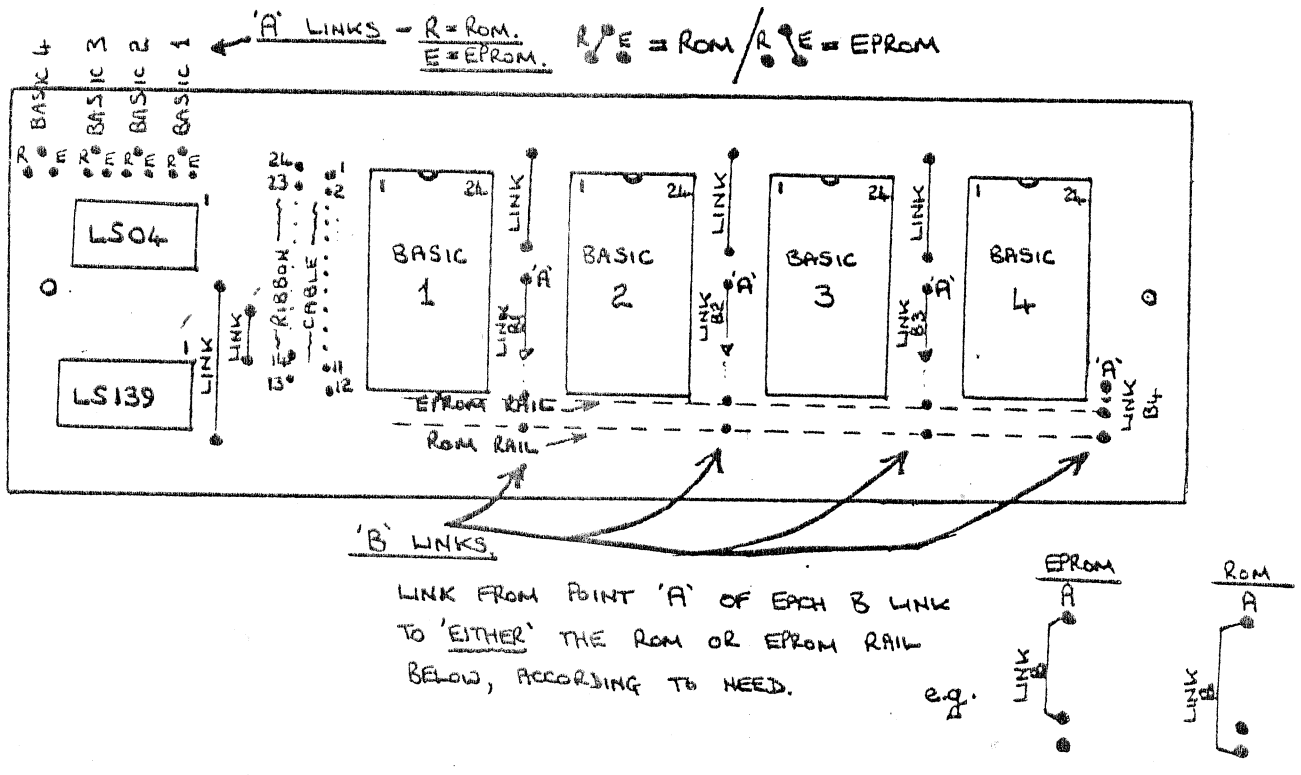
Construction and installation is simplicity itself providing you can use a soldering-iron and have a basic knowledge of your computer or can follow simple instructions.

Your MINI EPROM/ROM board, as its name suggests, will take either ROM or EPROM, therefore those with the new BASIC 1 and 3 EPROMS can mix them with the old BASIC 2 and 4 PROMS on the same board.

COMPONENTS LIST

1 off 74LSØ4
1 off 74LS139
1 off 14 PIN DIL Socket
1 off 16 PIN DIL Socket
4 off 24 PIN DIL Socket
1 off 3 inches of 24 way Ribbon Cable with Header Plug
1 off Length of wire for links (12 inches)
1 off MINI ROM/EPROM Printed Circuit Board

P.C.B. COMPONENT SIDE



CONSTRUCTION

Hints

1) Thoroughly check the P.C.B. before starting work, to ensure there are no shorts between tracks.All boards are inspected before despatch, however you could save yourself time later should a fault develop.

2) Check components against Components List.

3) For soldering use a fine bit 15 WATT (Max) Soldering Iron.

4) For wire stripping use, if possible, wire-strippers.

5) Exercise care when soldering to ensure that you do not damage the fine tracks or short them out.

6) Ensure I.C. sockets have pin 1 in correct position.

PROCEDURE

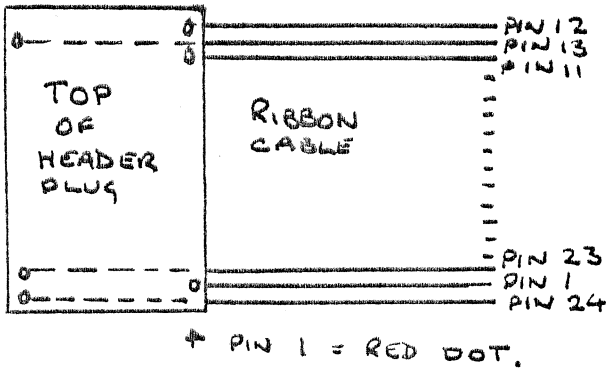
1) Solder the 14 pin DIL Socket into the position shown for the 74LSØ4 on the P.C.B. diagram. Pin 1 is the top right hand pin (from the component side). Pin 1 is marked for each socket on the solder side of the board.

2) Solder the 16 pin DIL Socket into position below the 14 pin Socket, marked on the P.C.B. diagram for the 74LS139. Ensure pin 1 is correctly positioned, as above.

3) Solder the four 24 pin DIL Sockets into position to the right of the previously installed two sockets. Follow the rule for pin 1.

4) Take the 24 way ribbon cable and on the opposite end to the header plug strip back each wire approximately $\frac{1}{8}$th of an inch.
Identify pin 1 on the P.C.B. from the diagram.
Identify pin 1 on the header plug.
Solder the corresponding colour coded wire for pin 1 to the MINI EPROM P.C.B. by inserting it through the P.C.B. from the component side and soldering on the underside of the board. Be very careful not to get any 'solder-runs' that may short out the tracks.

5) See Diagram below before continuing!
Continue the above procedure for each wire in turn, pin 2 to 2, etc. until all 24 wires are soldered to the P.C.B.
If you have a multimeter or continuity tester your could check the connections at this stage to ensure they are correct.



NOTE

The wires on the ribbon cable alternate as shown. DO NOT count from 1 to 24 from one end!

6) Insert and solder the two wire links to the right of the 74LS139 as per the P.C.B. diagram, marked LINK.

7) Insert and solder the three wire links, one between each 24 pin socket. These are located towards the top edge of the board, viewed from the component side, and are marked LINK on the diagram.

8) The remaining links, marked 'A' LINKS and 'B' LINKS on the P.C.B. diagram, select each 24 pin socket (BASIC 1 to 4) for either ROM or EPROM.

   See the attached examples for typical configurations.

   Two examples are given, one for all the 'OLD' BASIC ROMS, and one for the 'NEW' BASIC 1 and 3 in EPROM with BASIC 2 and 4 in ROM.

   You can, however, select any combination you choose by inserting links in the correct positions. This is made quite clear on the diagrams. Complete the links and soldering as appropriate to your computers BASIC configuration. (8 links in all).

9) Insert the 74LSØ4 and 74LS139 into their appropriate sockets, observing pin 1 is correctly positioned.

   You now have to make minor modifications to your main computer board to enable the MINI board to address the 8K for the BASIC ROMS/EPROMS.

MAIN BOARD MODIFICATIONS

1) There are three links to insert on the main board, and three tracks to be cut adjacent to these links. These are the same for both Ohio Superboard and UK101.

   The links, as per your circuit diagrams supplied with your computer are W1, W2 and W4.

   See the attached diagram for details of changes, and complete them as shown.

2) Now remove the four BASIC I.C.s. from your main board and insert them into the MINI board ensuring pin 1 is in the correct position.

   BASIC 1 from socket U9 goes into the socket on the MINI board nearest the ribbon cable.

   BASIC 2 from socket U10 is next.

   BASIC 3 from socket U11 is next.

   BASIC 4 from socket U12 is the last one.

3) Now insert the header plug on the ribbon cable to your MINI board into the BASIC 4 socket on your Main board, (U12), ensuring pin 1 is in the correct position.

   Ensure that you do not short out the solder-side of the MINI board with any components on the Main board (a piece of paper placed between them will suffice to test the board).

4) Switch on, and the display should be as normal. Check all functions until you are satisfied that the computer is functioning correctly.

5) When you are satisfied that all is well, the only remaining step is to secure the MINI board in its permanent position, this is left to the individual, and two mounting holes have been provided to aid you.

NOTE:

Do not increase the length of the ribbon cable otherwise you could encounter timing problems!

FAULT FINDING

As the board is so simple, the only possible faults are most likely to be due to bad solder connections, missing links, incorrectly set links, or incorrectly inserted components.

Check all steps again before calling for assistance.

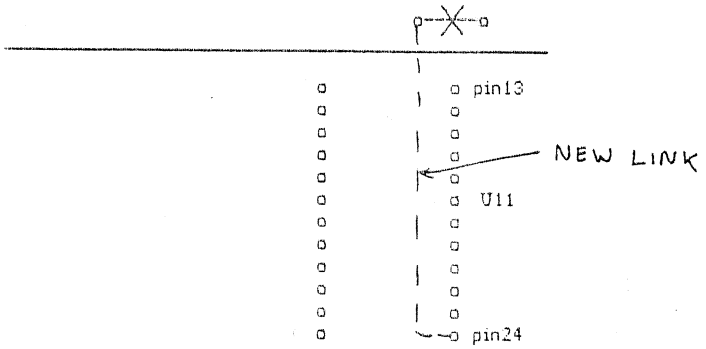
TO USE SPARE SOCKETS (MAIN BOARD).

TO RE-ADDRESS ORIGINAL MAIN BOARD BASIC SOCKETS SEE DIAGRAM (ATTACHED)

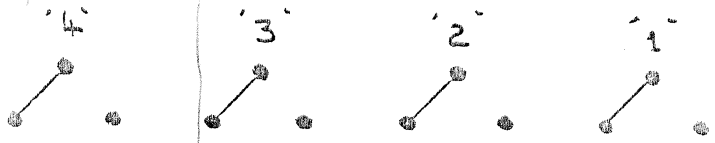
If Eproms are to be used in the vacant sockets on the main board then the following mods should be made.
On the component side of the main board between Basic 3 & 4 sockets, locate the track that joins pin 18 to pin 24 of the Basic 3 socket. Cut this track close to pin 24 of the Basic 3 socket. Connect pin 18 of the Basic 3 socket to pin 12 of Basic 3 socket..

IF you intend using all three vacated sockets for new EPROMS, the following small modification should be carried out to ensure correct timing/enabling of all three EPROMS.

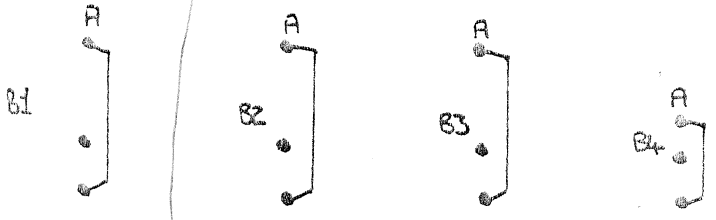
On the underside of the PCB, above pin 13 of U11 (old BASIC 3 socket), there is a short link. It is directly above the 0v rail which runs above U11. This link (it's about 1cm long, with a plated hole at each end) should be cut, and the left hand hole connected to pin 24 of U11.
This completes the modification.



E FOR ALL OLD ROMS

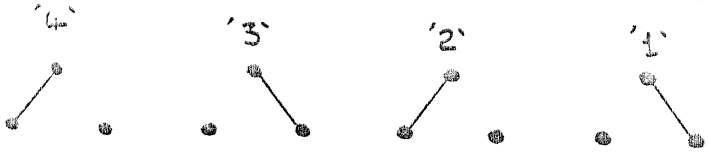


'A' LINKS

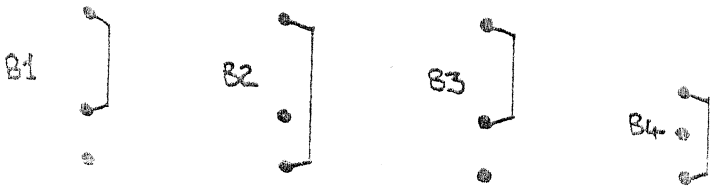


'B' LINKS

EXAMPLE FOR 'NEW' BASIC 1 AND 3, 'OLD' 2 AND 4.

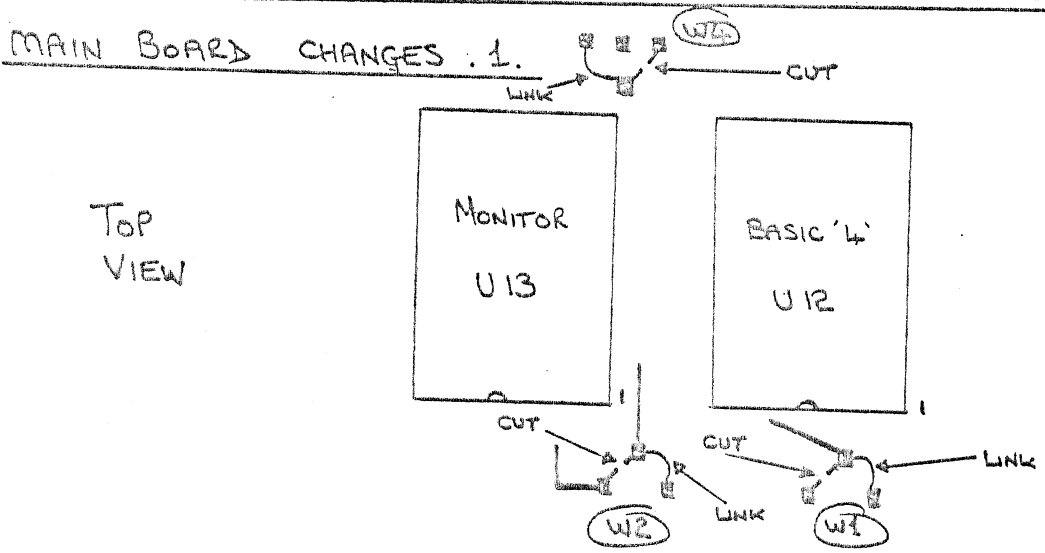


'A' LINKS



'B' LINKS

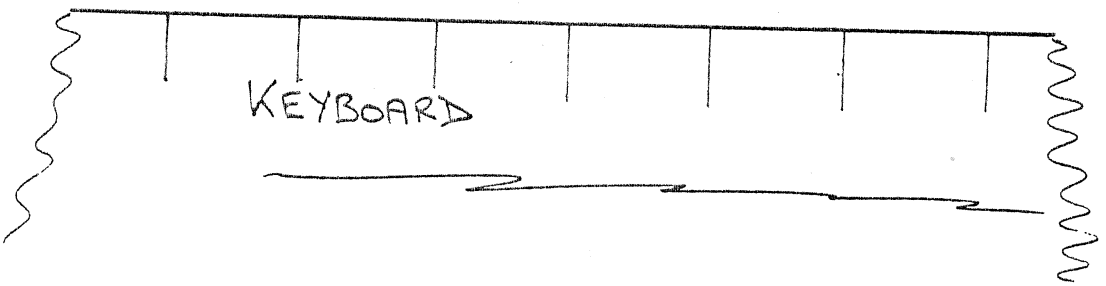
MAIN BOARD CHANGES . 1.



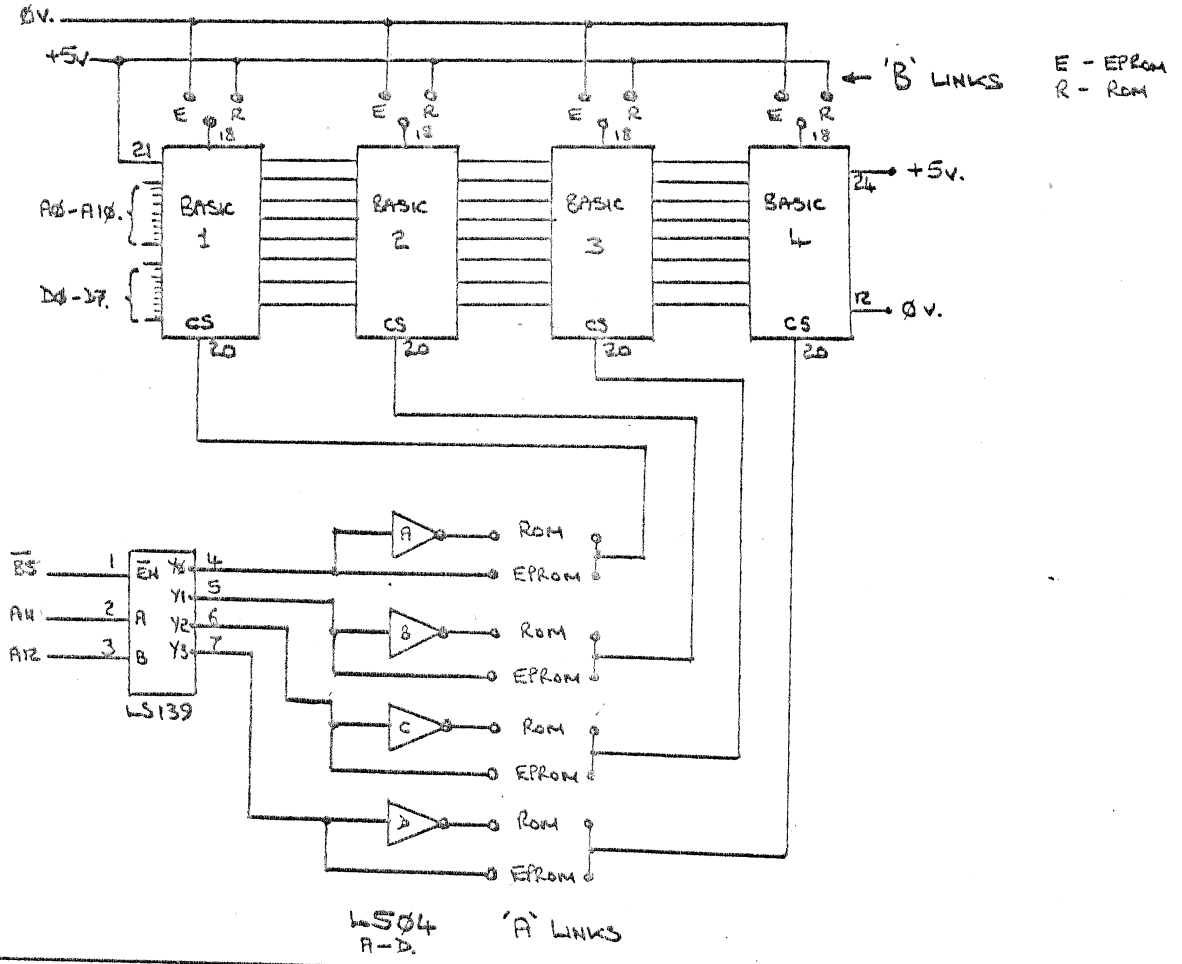
TOP VIEW

CUT THREE TRACKS AS SHOWN.

INSERT THREE LINKS AS SHOWN.



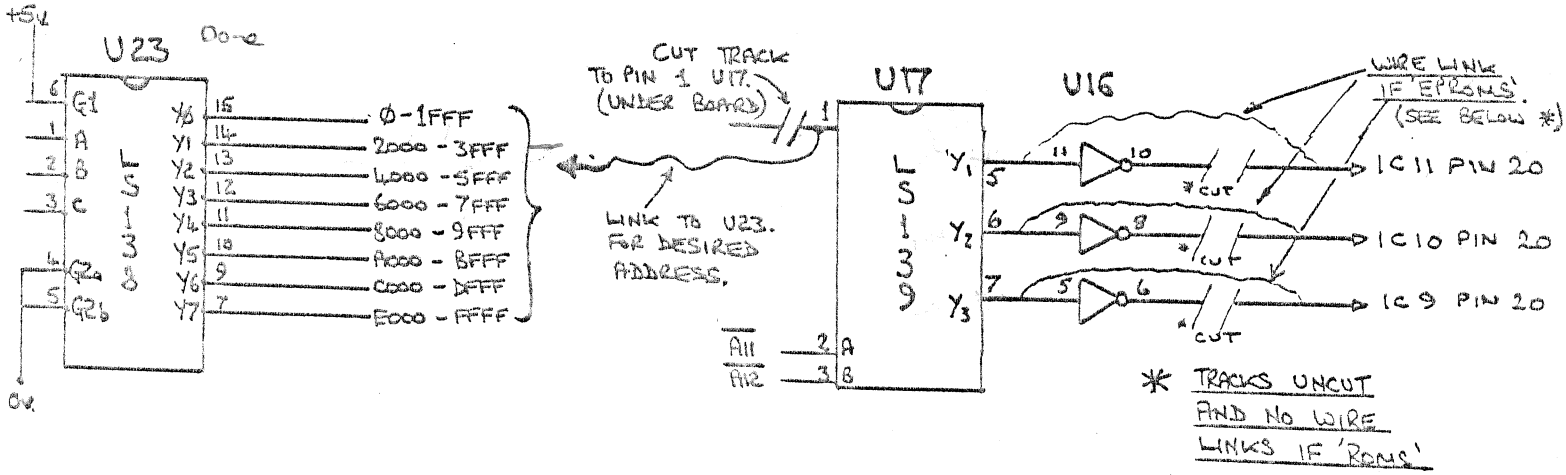
CIRCUIT DIAGRAM.



LS04
A-D.

MAIN BOARD CHANGES .2.

TO RE-ADDRESS ORIGINAL 'BASIC' SOCKETS AND SELECT ROM OR EPROM.



NOTE. INSTEAD OF CUTTING TRACKS ABOVE YOU CAN CAREFULLY BEND I.C. PINS UPWARDS AND SOLDER WIRES TO APPROPRIATE PINS.

e.g. PIN 1 ON U17 (FOR ADDRESS SELECT).
PINS 6, 8, 10, 12 ON U16
PINS 4, 5, 6, 7 ON U17 (FOR EPROMS).

EXAMPLE.

FOR TOOLKIT ETC. AT 8000 CONNECT U17 PIN 1 TO U23 PIN 11 AND TAKE PINS 7, 6, 5 OF U17 TO PINS 20 OF IC's. U9, 10, 11 RESPECTIVELY. (BEND PINS 6, 8, 10, 12 OF U16 UPWARDS AND LEAVE DISCONNECTED.