ACORN TECHNICAL MANUAL

Extension Memory Board ..   200,003

Issue 3   March 1980©

The Acorn Extension Memory board provides an extra 8K bytes of user RAM space and has sockets for two R.O.M.'s which may be 2, 4 or 8K devices providing 4 or 8K bytes of firm ware. The board connects to the Acorn computer bus via a 32 way Euro-connector and bus buffers ensure a low loading on the bus. A full set of integrated circuit sockets are supplied with each board even if the full memory option is not purchased.

The board operates from a single 5v supply on the Acorn bus and consumes not more than 1.6 amperes when a full compliment of 2114's is fitted.

A write protect switch may be fitted by breaking a track and fitting a single pole, single throw switch across the break, wiring to the two holes provided. Refer to P.C.B. layout on page 5.
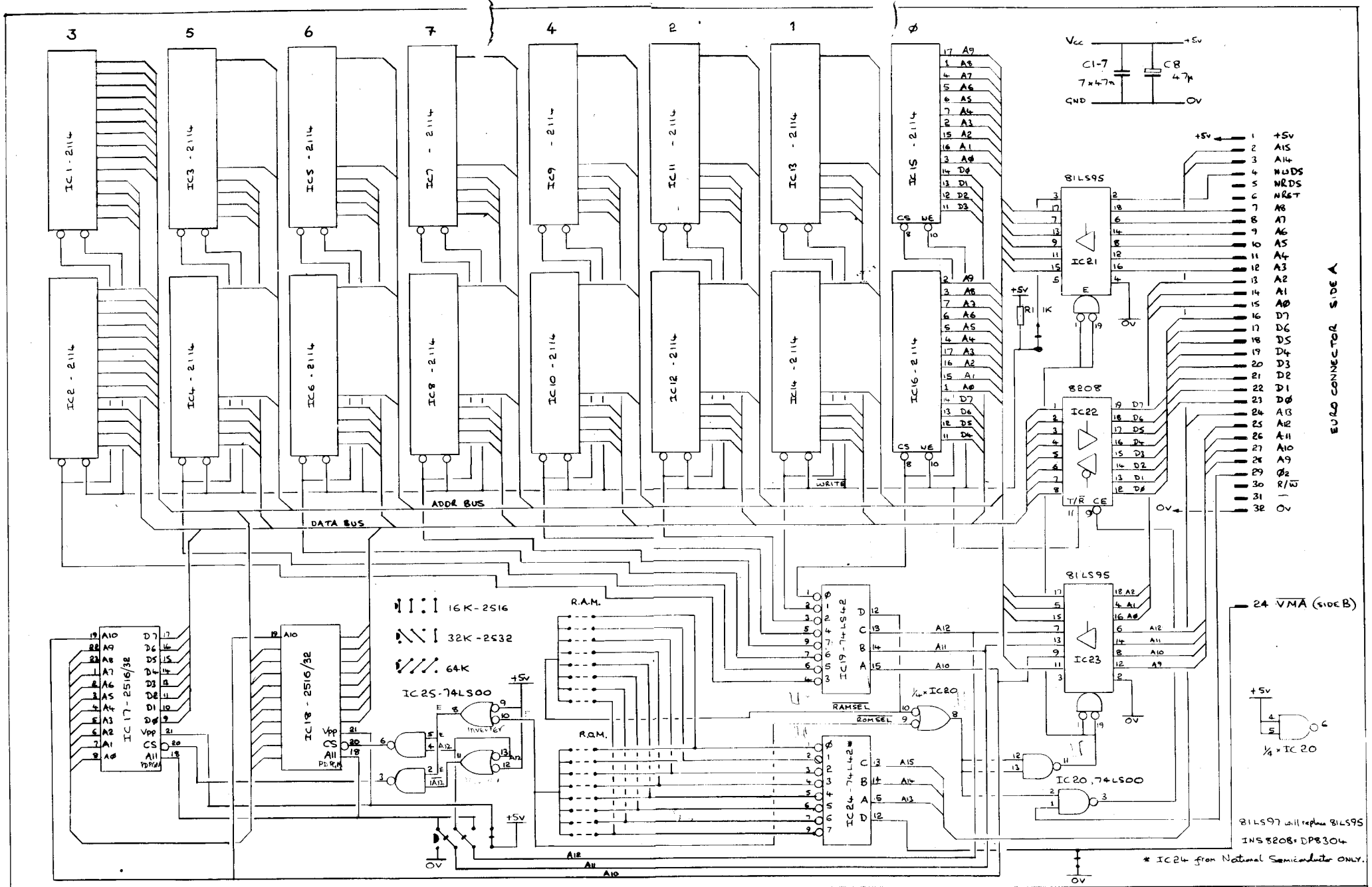

The RAM and ROM may each set to appear in any 2 out of 16 blocks in the address map by fitting wire links, see page 6. If the board is to be used either without any ROM or without any RAM then both the RAM and ROM address links should be fitted in the same positions ensuring that one input to IC 20 pins 9 or 10 is not left open circuit.

In systems with a Valid Memory Address signal on the backplane a 64 way Euro-connector may be fitted and the VMA link on the P.C.B. may be cut allowing the signal to be fed to the board.

<u>PARTS LIST FOR ACORN MEMORY BOARD</u>

P.C.B.   Acorn Computers Ltd Pt. No. 200,003

IC 1-16   2114 Random Access Memory   and 18 pin sockets

IC 17-18   ROM or EPROM of 2516 or 2532 style & 24 pin sockets

             or

IC 17 only ROM or EPROM of 2564 style   and 24 pin socket

IC 19   74LS42 Decoder   and 16 pin socket

IC 20   74LSOO NAND gate   and 14 pin socket

IC 21, 23   81LS95 or 97 Bus buffer   and 20 pin sockets

IC 22   INS 8208 Bus Buffer   and 20 pin socket

IC 24   74LS42 Decoder from National Semiconductor

                                              and 16 pin socket

IC 25   74LS00 NAND gate   and 14 pin socket

CI-7   47 nF or 100 nF Capacitor

C 8   10, 15 or 47 uF Electrolytic Capacitor

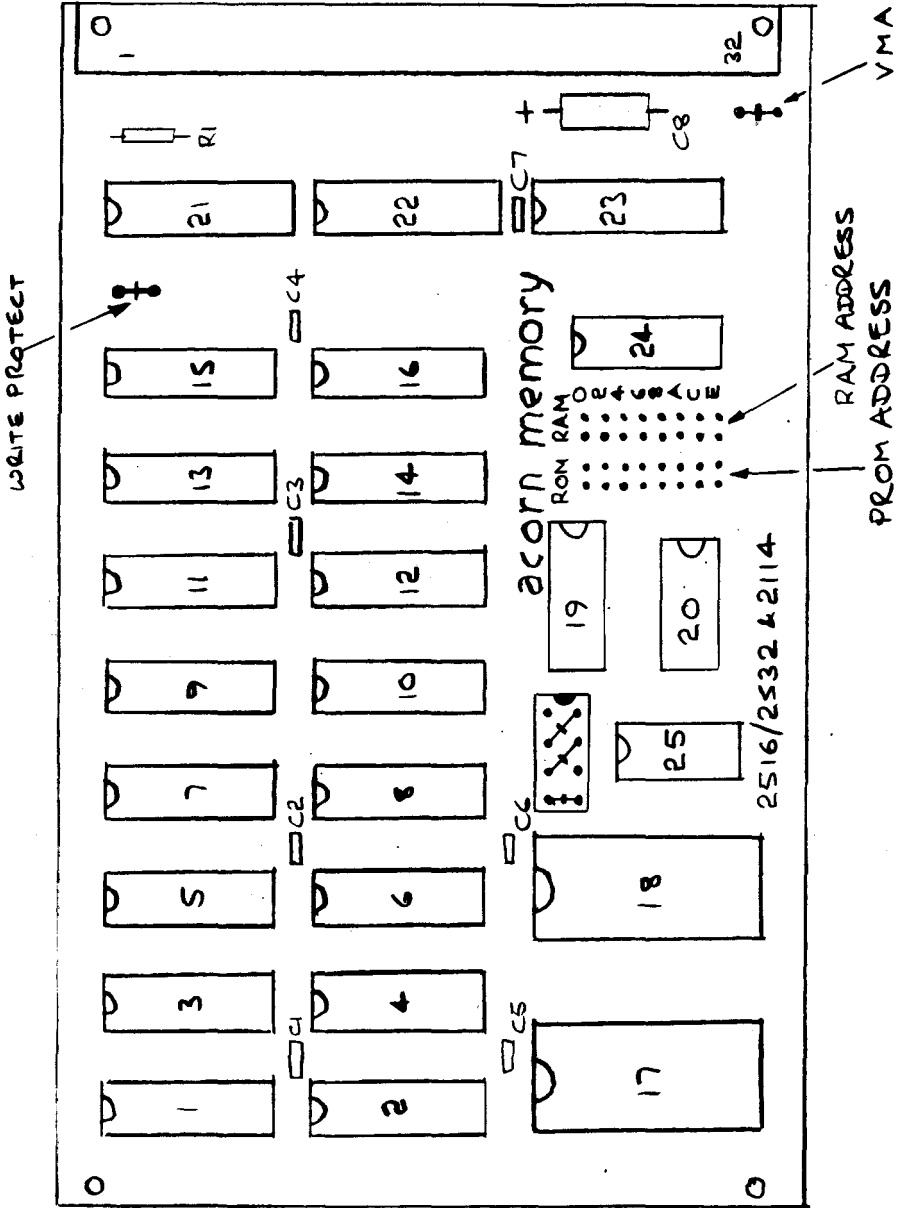RI   1K Resistor

nb. INS 8208 is equivalent to DP8304

IC1 - 2114 IC3 - 2114 IC5 - 2114 IC7 - 2114 IC9 - 2114 IC11 - 2114 IC13 - 2114 IC15 - 2114
IC2 - 2114 IC4 - 2114 IC6 - 2114 IC8 - 2114 IC10 - 2114 IC12 - 2114 IC14 - 2114 IC16 - 2114

Vcc +5v
C1-7 C8
7 × 47µ 47µ
GND 0v

ADDR BUS
DATA BUS

81LS95 IC21 E
8208 IC22 T/R CE
81LS95 IC23

R1 1K

IC19 - 74LS42 RAM. D C B A
RAMSEL
ROMSEL
¼ × IC20

IC24 - 74LS42 * R.O.M. C B A D
IC20, 74LS00

IC17 - 2516/32
IC18 - 2516/32
IC25 - 74LS00
inverter

16K - 2516
32K - 2532
64K

CS WE WRITE

EURO CONNECTOR SIDE A

1 +5v
2 A15
3 A14
4 NUDS
5 NRDS
6 NRST
7 A8
8 A7
9 A6
10 A5
11 A4
12 A3
13 A2
14 A1
15 A0
16 D7
17 D6
18 D5
19 D4
20 D3
21 D2
22 D1
23 D0
24 A13
25 A12
26 A11
27 A10
28 A9
29 Φ2
30 R/W
31 —
32 0v

24 VMA (SIDE B)

A12
A11
A10

¼ × IC20

81LS97 will replace 81LS95
INS8208 = DP8304
* IC24 from National Semiconductor ONLY.

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21-05-79

8K RAM + 8K PROM
P.C.B. CIRCUIT DIAGRAM

200.003/C

Acorn Computers Ltd.

PCB LAYOUT.

PCB layout showing components labelled: R1, C8, C7, C4, C3, C2, C6, C5, C1, and IC positions numbered 1 through 25, and 32. Labels include: VMA, WRITE PROTECT, RAM ADDRESS, PROM ADDRESS, acorn memory, ROM RAM, 2516/2532 & 2114.

ADDRESS SELECTION

Wire links must be fitted to the board to determine where the ROM and RAM exist in the address map. The RAM map for one board is shown:
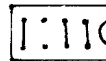
```
                    1FFF
┌──────────────────┐
│   IC  7  &  8     │  1BFF
├──────────────────┤
│   IC  5  &  6     │  17FF
├──────────────────┤
│   IC  3  &  4     │  12FF
├──────────────────┤
│   IC  9  &  10    │  0FFF
├──────────────────┤
│   IC  1  &  2     │  0BFF
├──────────────────┤
│   IC  11  &  12   │  07FF
├──────────────────┤
│   IC  13  &  14   │  03FF
├──────────────────┤
│   IC  15  &  16   │
└──────────────────┘
                    0000
```

This may be positioned to start at 0000, 2000, 4000 etc by linking in position 0, 2, 4 etc on the board.
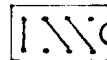
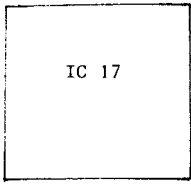Three ROM maps are possible.

```
                    1FFF
┌──────────────────┐
│      IC  18       │
├──────────────────┤
│      IC  17       │
├──────────────────┤
│      IC  18       │
├──────────────────┤
│      IC  17       │
└──────────────────┘
                    0000
```

Using 2516's or 2716's which appear twice in the 8K byte space. Wire links as shown:—


```
                    1FFF
┌──────────────────┐
│                  │
│      IC  18       │
│                  │
├──────────────────┤
│                  │
│      IC  17       │
│                  │
└──────────────────┘
                    0000
```

Using 2532's. This is the standard configuration for the board and these links are tracked on the P.C.B. and must he cut if one of the other schemes is required:-
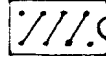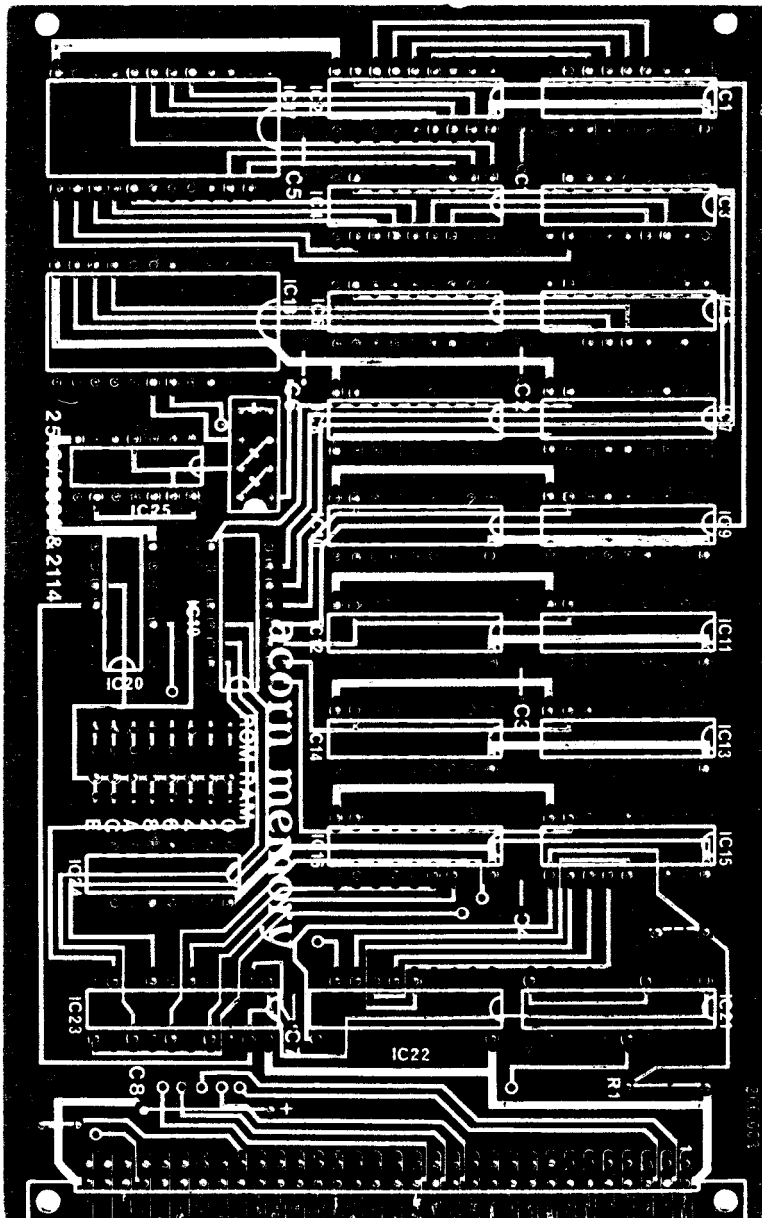
IC 17

IFFF

0000

Using one 2564 only. Wire
links as shown:-
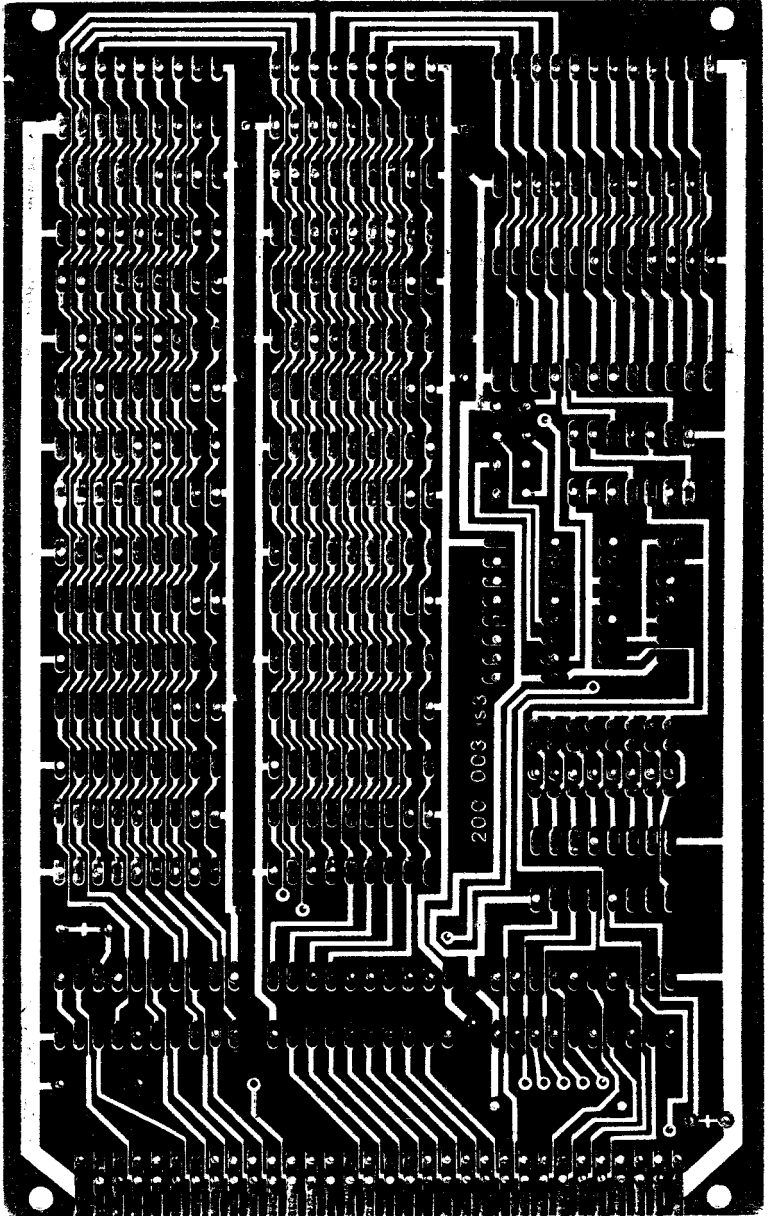

Again links in 0, 2, 4 etc will set the start address of the ROM space to be 0000,
2000, 4000 etc.

Acorn Memory Board (component side)

Acorn memory board (reverse side)