

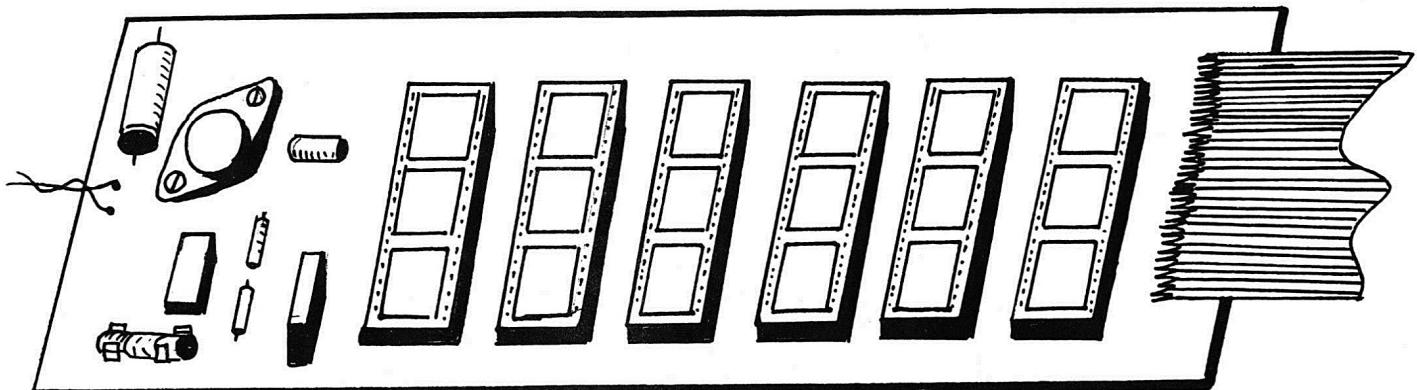


3, NEW INNS LANE  
RUBERY  
BIRMINGHAM B45 9TS

ELECTRONICS

Reg No 2594640

28.9.82.



BARE BOARD: £10.50.

MOTHERBOARD

Size 135 x 305 mm  
5 $\frac{1}{4}$ " x 12" approx.

This board consists of six 40 pin DIL sockets connected in parallel, mounted on a single sided printed circuit board. It is connected to the UK101/Superboard via a 40 way ribbon cable plugged into the J1 expansion socket. The plug is supplied moulded onto the cable and only requires soldering onto the motherboard.

There are tracks etched to provide a simple +5V supply to enable peripheral devices to be powered from the motherboard, thus avoiding the possibility of overloading the main board power supply. Three separate bus-bars run the length of the socketed area to carry extra supplies if required eg +12V, -12V etc.

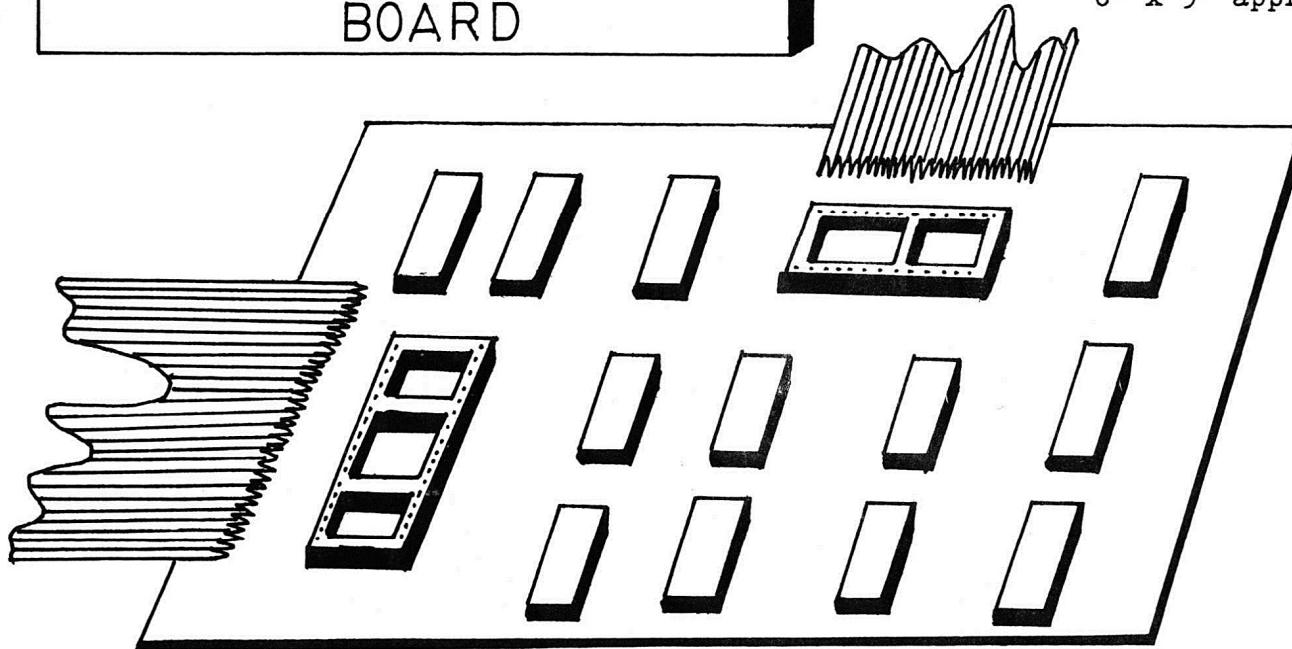
Use of the motherboard obviates the need for an expansion socket to be provided on every peripheral board or device, so the removal of one of these does not mean a difficult and possibly fault inducing re-arrangement of plugs. This also avoids the problems of "Daisy Chaining". ie long trailing leads, rounded pulses and delays caused by high interconductor capacitance etc. With this system all expansion boards can be put into a separate case eg 19" rack, all with short leads, and only needing one ribbon cable to connect to the main board.

A suitable transformer eg 9V @ 5A is required, and although the regulator can be mounted onto the motherboard, it is recommended that it is fitted onto a separate heat sink. The transformer and heat sink are not supplied.

# PROGRAMMABLE GRAPHICS BOARD

Size 152 x 229 mm

6" x 9" approx



The board allows the user the option of converting the top 128 characters (CHR\$ 128 -255) to those of his own design. This allows high resolution graphics on the UK101/Superboard, limited only by the programmers ingenuity.

Connection to the computer is by means of two ribbon cables, each with moulded plugs - no soldering required on the main board. The full ASCII set is always available and by means of a switch (hard wired or software controlled) the original graphics set can be obtained. The user programmed set is stored in its own dedicated 1K RAM on the graphics board, address decoded at E800 - EBFF and is not erased, either by a COLD START or by selecting the original graphics.

Each character is made up as shown in the diagram. Every row corresponds to an individual memory location, in which the binary representation of the pattern is stored, a "1" being a "white" pixel. Hence the 64 pixels of each character can be set on or off as required. Altering the memory contents of a displayed character instantly changes all occurrences of that character on the screen; fast moving graphics are no longer a problem.

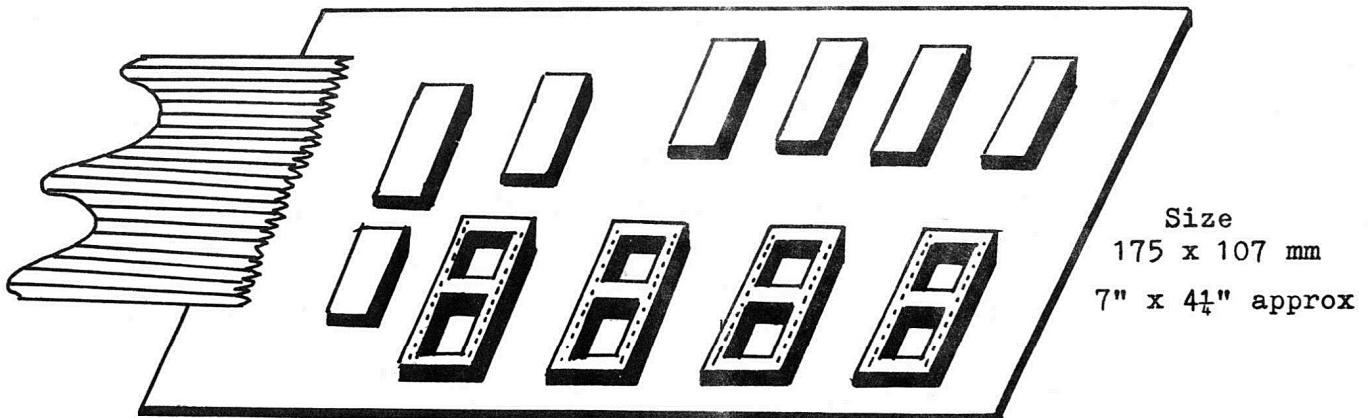
As each character occupies one full screen location, there is no gap between characters, so large block displays can be built up.

Programming can be by "POKING" from BASIC or by direct machine code access, and character sets can be "SAVED" on cassette. Character sets can be loaded in from BASIC as READ DATA statements, or loaded in machine code prior to running the BASIC program.

CHR\$(128)		Dec	Hex	Dec	Hex
1	0	59392	E800	60	3C
1	1	59393	E801	66	42
1	2	59394	E802	189	BC
1	3	59395	E803	165	A5
1	4	59396	E804	165	A5
1	5	59397	E805	189	BC
1	6	59398	E806	66	42
1	7	59399	E807	60	3C

CHARACTER EXAMPLE

# MAGNUM EPROM BOARD



The board is decoded to occupy 8K of the memory map and is located between addresses 8000 - 9FFF (Hex). It is capable of accepting four single rail 2716 type EPROMs (2K each).

All address lines are fully buffered on the board and a DD return line is generated to feed back to the main board enabling READ operations from the external device.

A high quality moulded plug is supplied with the kit that plugs directly into the J1 expansion socket or our motherboard. The only other connection being an earth and a +5V supply.

Several of these boards may be linked together at the same address and by simply switching the "board select" or the +5V, the board required can be enabled. e.g. a board containing EPROMs concerned with machine code programming could be on one board whilst EPROMs for BASIC programming (Toolkits etc) could be on a second board. It is unlikely that both sets would be required at the same time. Arranging the boards in this fashion still only requires one ribbon cable.

## PROGRAMMED EPROMS AVAILABLE:

- |                                                               |                                                                                                |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <u>Extended machine code monitor</u><br>(located 9800 - 9FFF) | - modified version of tape copy supplied with the UK101, but available quickly by typing 9800G |
| <u>Basic Toolkit</u> (2 EPROMs)<br>(located 8000 - 8FFF)      | - paused list, auto line number, find upto 20 ASCII characters, delete, trace, renumber, view  |
| <u>Graphics Programming aid</u><br>(located where desired)    | - for use with our Programmable Graphics Board, enables blocks and characters to be set up.    |

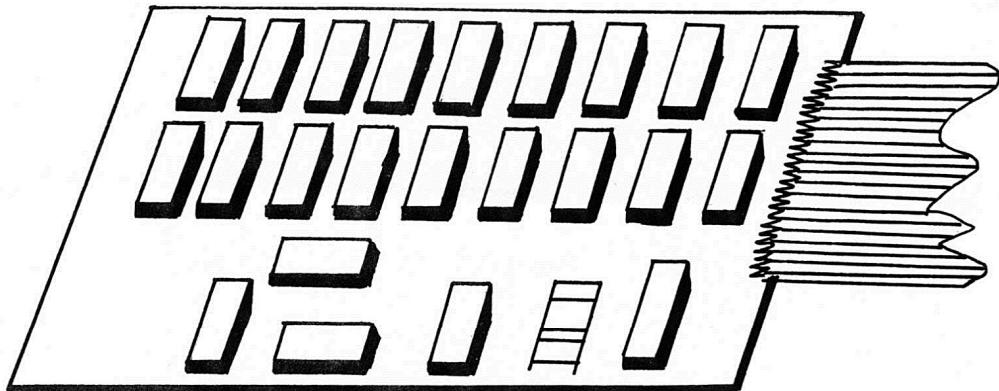
PLEASE STATE MACHINE AND MONITOR WHEN ORDERING EPROMS.

# MAGNUM RAM BOARD

Size

110 x 85 mm

4 $\frac{1}{4}$ " x 7 $\frac{1}{2}$ " approx



The board will support 8K of static 2114 RAM and is arranged so that the board can be addressed at one of three 8k blocks. These are :- 2000 - 3FFF, 4000 - 5FFF or 6000 - 7FFF. Selection is by means of soldered wire links.

All address lines are fully buffered on board and a DD return line is generated to feed back to the main board enabling READ/WRITE operations from the external device.

Connection to the main computer is by means of a 40 pin DIL plug moulded onto ribbon cable, that interfaces with socket J1. If more than one board is required, they may be interconnected by 18/20 gauge copper wire, and only one ribbon cable and plug used. The most convenient way of connecting several boards to the computer is by using the Magnum Motherboard, which provides a 5V supply and avoids overloading the main computer P.S.U.

Three of the RAM boards used in conjunction with a fully populated computer main board, provides a full 32K of RAM, which can neatly be followed in the memory map by the Magnum EPROM board. This would complete the memory map up to the beginning of BASIC and provide an extremely versatile system. Users contemplating a disc system would have the RAM necessary for full operational flexibility, and with the falling price of fast, high quality 2114s this would be an economical solution to the problem of memory expansion and discs.

The board comes complete with all components except 2114s, this is to enable the user to find the most competitive supplier of this variable cost item.

*Prototype Bare Boards only*  
ELECTRONICS.  
3, NEW INNS LANE,  
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## OTHER EPROMS AVAILABLE FROM MAGNUM

### BASIC TOOLKIT 2 EPROM SET

#### COMMANDS

- LIST (Optional line spec) \* L - Lists as normal, except it pauses after L lines, defaults to 8. Hit any key to list next 8 lines, CTL T to exit.
- AUTO L - Auto line numbering, increment 10, start L. defaults to 10 for start.
- FIND (Optional line spec) \* (up to 20 characters) - Finds string anywhere in program (specified as list) any key continues search, CTL T exits
- DELETE (L - L) - Block delete of lines within range specified.
- TRON & TROFF - Trace on & off - displays current line no. Built in delay removed by pressing L.H. shift key
- RENUM (0) - I - Renumber starting at line no. 0 in steps of I. Defaults to 10 \* 10
- VIEW - Views cassette tape. Space exits  
+ full error correction. Now the messages make sense !

### GRAPHICS PROGRAMMING AID

- (B)LOCK - Allows you to build up blocks of characters into pictures.
- (C)HARACTER - Allows you to program individual characters by displaying enlarged versions on the screen.
- (I)NVERSE - Loads an inverse video character set into the Programmable Graphics board, which is available to BASIC, either from the keyboard direct or by using print statements. Fully software controlled.
- (U)SER - Allows the user to call his own character set instead of the Inverse set.

Please note that this EPROM can be located anywhere, please specify on ordering. It will not be any use without the MAGNUM PROGRAMMABLE GRAPHICS BOARD.

## EXTENDED M/C MONITOR

EXECUTE AT \$9800

In the following AD1 etc represents a 16 bit address (ie 4 HEX digits)

### DISPLAY COMMANDS

- |       |                                                                                           |
|-------|-------------------------------------------------------------------------------------------|
| U AD1 | - OPENS LOCATION AD1 TO ALTER CONTENTS. EXPECTS 2 HEX DIGITS<br>DEFAULTS TO COMMAND MODE. |
| -     | - DECREMENTS TO PREVIOUS LOCATION                                                         |
| C/R   | - INCREMENTS TO NEXT LOCATION (ALSO INCREMENTS 'Q' COMMAND)                               |
| ;     | - DISPLAYS ASCII EQUIVALENT OF CONTENTS                                                   |
| /     | - REPRINTS CURRENT CONTENTS                                                               |
| Q AD1 | - DISASSEMBLES 13 LINES, STARTING AT AD1 (C/R INCREMENTS)                                 |
| D AD1 | - DISPLAYS 8 LOCATIONS AND ASCII EQUIVALENT (C/R INCREMENTS)                              |

### MOVING BLOCKS

- |                 |                                                              |
|-----------------|--------------------------------------------------------------|
| M AD1 = AD2,AD3 | - MOVES BLOCK AD2 TO AD3 -1 TO START AT AD1                  |
| R AD1 = AD2,AD3 | - AS ABOVE, BUT RELOCATES ANY CALLS TO ROUTINES WITHIN BLOCK |
| F AD1,AD2 = FF  | - FILLS BLOCK AD1 TO AD2-1 WITH HEX VALUE SPECIFIED          |

### SEARCHES

- |                   |                                                           |
|-------------------|-----------------------------------------------------------|
| N HEX > AD1,AD2   | - LOOKS FOR UPTO 8 HEX DIGITS BETWEEN SPECIFIED ADDRESSES |
| W ASCII > AD1,AD2 | - AS ABOVE BUT ASCII STRING                               |

### BREAKPOINTS

- |           |                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------|
| B(n),AD1  | - SETS BREAKPOINT (n = 1 to 8) AT LOCATION AD1                                                          |
| E(n)      | - ELIMINATES BREAKPOINT (n)                                                                             |
| T         | - PRINTS OUT BREAK POINT TABLE                                                                          |
| C         | - CONTINUE AFTER HITTING BREAKPOINT                                                                     |
| I         | - PRINTS LAST LOCATION HIT BY BREAKPOINT + A,X,Y,P & K                                                  |
| A X Y P K | - PRINTS CONTENTS OF A,X,Y, STATUS REG & STACK POINTER AT LAST BREAKPOINT. CAN BE ALTERED AND 'C' USED. |

### MISC COMMANDS

- |                    |                                                                                    |
|--------------------|------------------------------------------------------------------------------------|
| G AD1              | - EXECUTES PROGRAM FROM AD1                                                        |
| V                  | - VIEWS TAPE WITHOUT LOADING, SPACE EXITS                                          |
| L                  | - CHECKSUM LOADER. WILL REDUCE SCREEN SIZE IF USING CEGMON.<br>C/R EXITS ON ERROR. |
| S                  | - SCREEN CLEAR IF USING MONO 2 OR CEGMON                                           |
| H AD1,AD2(op)= AD3 | - HEX CALCULATOR, (op) = +,-,*,/                                                   |
| O                  | - PRINTS OVERFLOW FROM ABOVE CALCULATOR (IF ANY)                                   |
| Z AD1= XXXXXX DEC  | - HEX TO DECIMAL CONVERTOR. ANY NON HEX DIGIT EXITS                                |
| @                  | - JUMPS TO NORMAL RESIDENT M/C MONITOR                                             |
| J                  | - JUMPS TO \$A274 WARM START BASIC.                                                |

Please note

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Our Freepost address is

MAGNUM ELECTRONICS

FREEPOST

RUBERY

REDNAL

BIRMINGHAM

B45 8BR

NO STAMP REQUIRED