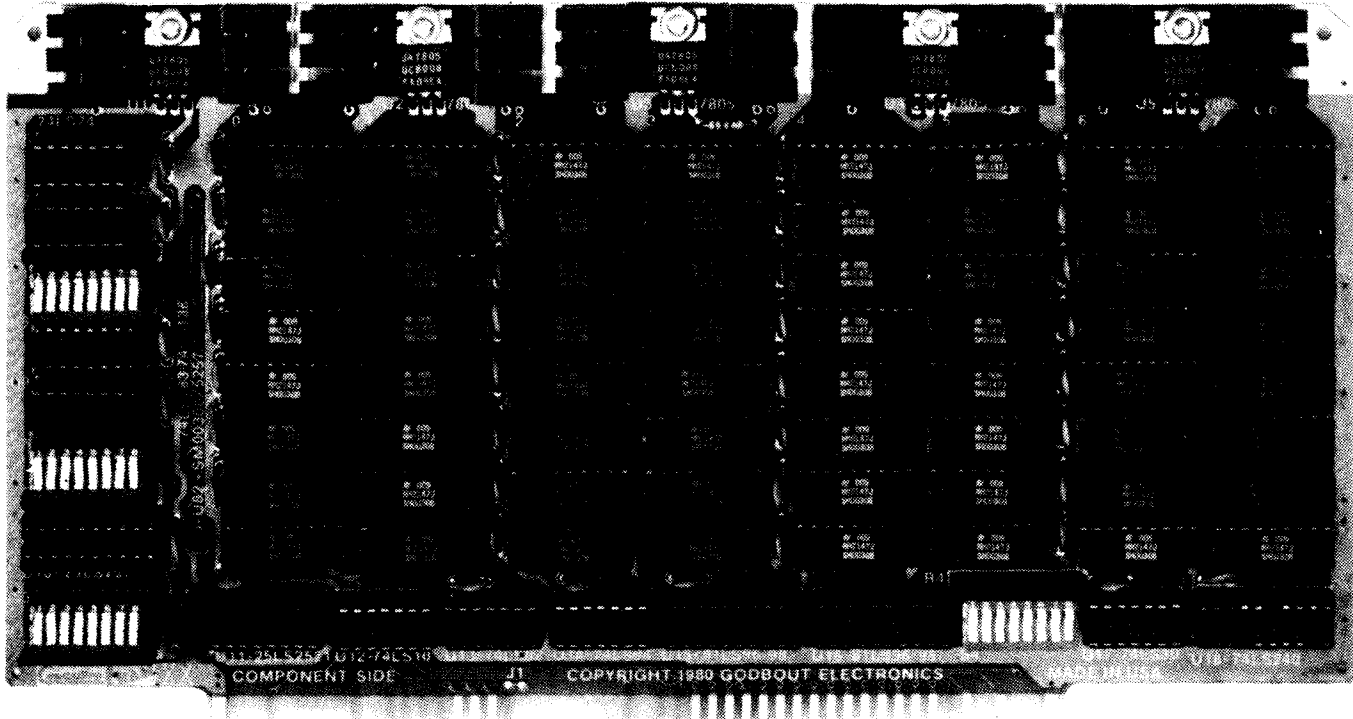


RAM XX^{T.M.}

USER'S MANUAL



IEEE · 696/S-100
32K Static RAM
Extended Addressing and
Bank Select

164

£

CompuProTM from **GODBOUT**

8/80

129

RAM XX

TECHNICAL OVERVIEW

The RAM XX is a high speed 32K byte static RAM board designed for full compatibility with the proposed IEEE S-100 bus standard of 24 address lines as well as all currently used Bank Select configurations. The user can at will alter the board for either configuration by simply moving one integrated circuit and changing several switch settings. This board is configured as one 32K byte block that can slide throughout its 64K byte page and start on any 4K boundary. In addition, an 8 position DIP switch is provided to disable any or all of the eight 4K byte blocks on this board and create as many windows in this memory as needed to avoid system memory conflicts.

With the RAM XX configured for extended 24 bit addressing, this board fully conforms to the proposed IEEE S-100 Bus standard fully, and allows the user to place the memory in any or all of the 256 - 64K byte pages. With the RAM XX configured for Bank Select mode, the user can select any I/O port as the Bank port and any bit as the Bank control bit. In addition, the user can select whether the board comes up enabled or disabled on power-up.

The RAM XX is shipped as a 16K, 24K, or 32K byte board, with sockets for all 32K bytes of RAM and all support chips. Extra heavy duty power supply traces, generous bypassing of supply lines, sockets for all integrated circuits, careful layout, conservative design techniques, and a double-sided, solder-masked printed circuit board with complete component legends make this a versatile memory board which will give exceptionally long and trouble-free service even in harsh environments.

SWITCH SETTINGS FOR COMPUPRO RAM XX

Switch 1

Switch 1 is used to enable or disable 4K blocks of RAM. When a switch is in the 'ON' position then its associated 4K row is enabled.

Switch Position	Row Number	
1.....	0	
2.....	1	
3.....	2	'ON' enables row
4.....	3	
5.....	4	
6.....	5	'OFF' disables row
7.....	6	
8.....	7	

For example, if this board is addressed to start at 0K, flipping positions 2 and 3 OFF will create a window at the 2nd and 8th 4K block of the board.

Switch 2

Switch 2 is used to select the base address of the RAM XX, whether or not the board is used for extended addressing or phantom, and whether or not the board comes up disabled or enabled for a bank select system.

Positions 1 to 4 select the base address of the RAM XX. Each switch position has a decimal number associated with it. To select the proper address for the board, merely add up the decimal numbers until they equal the starting location you want.

Switch Position	Decimal Number
1.....	4
2.....	8
3.....	16
4.....	32

Starting Location	Starting Address	Starting Location	Starting Address
0K	0000H	32K	8000H
4K	1000H	36K	9000H
8K	2000H	40K	A000H
12K	3000H	44K	B000H
16K	4000H	48K	C000H
20K	5000H	52K	D000H
24K	6000H	56K	E000H
28K	7000H	60K	F000H

For example, if you wanted the board to start at 0 (the zeroeth 4K block), you would leave the switches off. If you wanted the board to start at the 8K address boundary you would turn on switch position 2. If you wanted the board to start at the 28K boundary, you would turn on switches 1, 2 and 3 ($4+8+16=28$). NOTE: If the 32K bytes of this board are started at address 9000H or greater, the residual memory beyond FFFFH will wrap around and start at 0000H.

Switch position 5 is used to select whether or not you want the RAM XX to respond to extended addressing, meaning bank select or the 8 extended address bits specified in the IEEE S-100 standard (A16-23).

If you are using the RAM XX as a standard or global memory, you should turn switch position 5 ON. If you are using the RAM XX as an extended address memory, or bank select memory turn switch position 5 OFF.

Switch position 6 is used to enable/disable the RAM XX's response to PHANTOM. If you want the board to respond (deselect) to a PHANTOM, turn switch position 6 ON. If you don't want the RAM XX to respond to PHANTOM, turn switch position 6 OFF.

Positions 7 and 8 determine whether or not the RAM XX comes up enabled or disabled if you are using it as a bank select memory.

If you want the RAM XX to come up enabled when you turn on the computer, turn switch position 7 ON and position 8 OFF. If you want the board to come up disabled, turn switch position 7 OFF and position 8 ON. NOTE: Never leave both positions 7 and 8 either ON or OFF at the same time!

Switch 3

Switch 3 is used to set either the extended address or the bank select port address. If you are using the RAM XX as an extended address memory you should plug the 25LS2521 into position U11 (leaving U5 and U10 blank). Then switch 3 will respond as follows:

Switch Position	Address Bit	
1.....	A16	
2.....	A17	
3.....	A18	ON = '0' (does not match bit)
4.....	A19	
5.....	A20	
6.....	A21	OFF = '1' (matches bit)
7.....	A22	
8.....	A23	

If you are using the RAM XX as a bank select board you should plug the 25LS2521 into position U10 (leaving U11 blank), and a 74LS74 into position U5. Then switch 3 will select the bank select port address as follows:

Switch Position	Address Bit	
1.....	A0	
2.....	A1	
3.....	A2	ON = '1'
4.....	A3	
5.....	A4	
6.....	A5	OFF = '0'
7.....	A6	
8.....	A7	

Switch 4

If you are using the RAM XX as an extended address memory you can ignore switch 4. If you are using the RAM XX as a bank select board then switch 4 is used to select the data bit that will enable the board when written to the bank select port.

Switch Position	Data Bit	
1.....	D0	
2.....	D1	
3.....	D2	ON = '1'
4.....	D3	
5.....	D4	
6.....	D5	OFF = '0'
7.....	D6	
8.....	D7	

Note that if more than one switch is turned on then the board will be selected if any bit matches.

32Kx8 RAM. FOR S-100 BUS

PARTS LIST

- (1) RAM XX circuit board

INTEGRATED CIRCUITS (note: the following parts may have letters suffixes and prefixes along with the key numbers given below.)

(64) MM5257N-3L4Kx1 static RAM

- | | | | |
|-----|-----------|---------------------|--------------|
| (1) | 74LS02 | quad 2 input NOR | (U13) |
| (1) | 74LS04 | hex inverter | (U14) |
| (1) | 74LS10 | triple 3 input NAND | (U12) |
| (2) | 74LS30 | 8 input NAND | (U7, U17) |
| (1) | 74LS74 | dual "D" flip flop | (U6) |
| (1) | 74LS138 | decoder | (U8) |
| (1) | 74LS240 | octal buss driver | (U18) |
| (1) | 74LS283 | 4 bit adder | (U9) |
| (1) | 25LS2521 | octal comparator | (U11 or U10) |
| (2) | 81LS96/98 | octal buss driver | (U15, U16) |
| (5) | 7805 | 5 volt regulator | (U1-U5) |

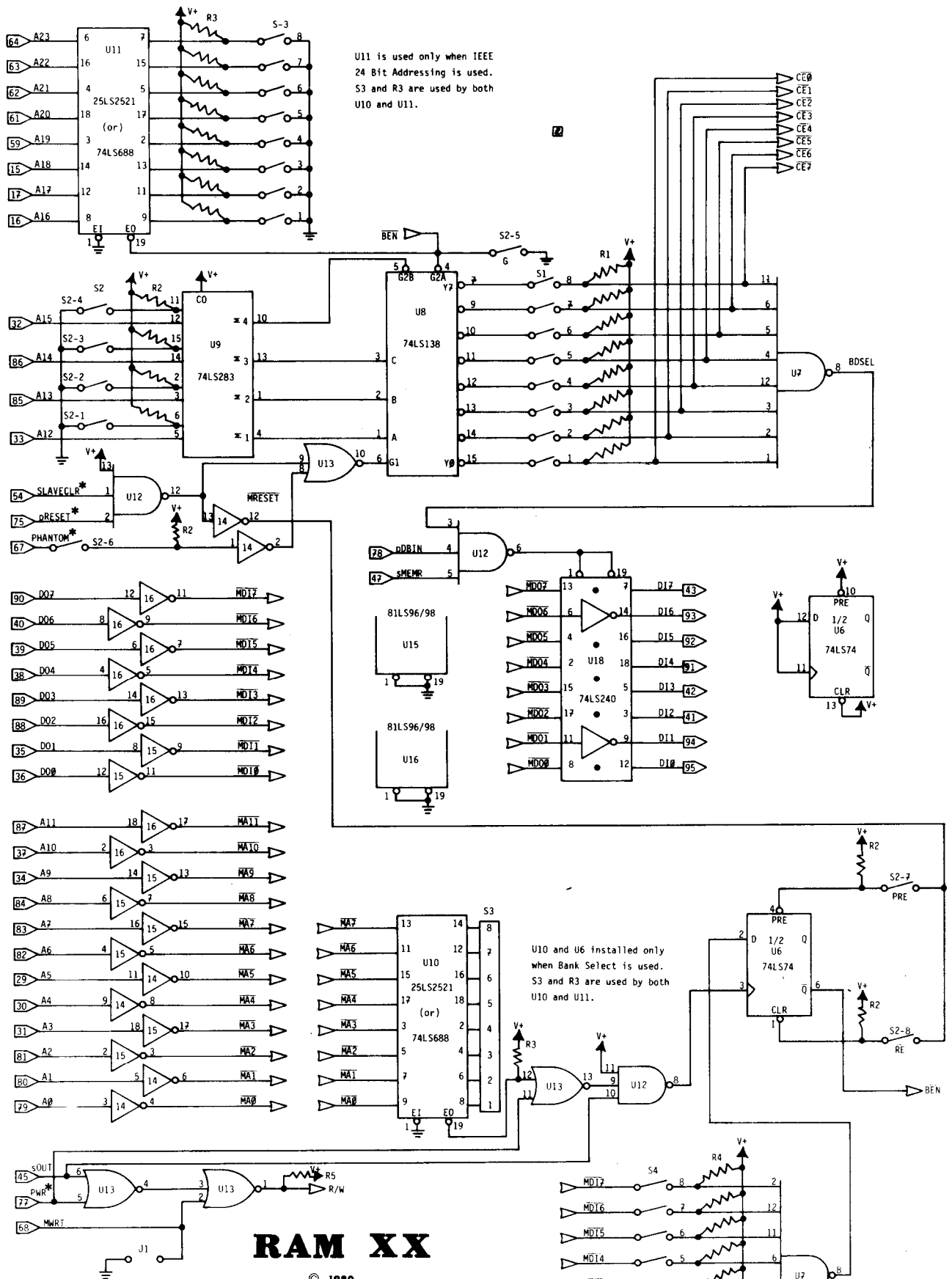
OTHER ELECTRONIC COMPONENTS

- | | | |
|------|-----------------------------|----------|
| (4) | SIP resistor packs | (R1-4)* |
| (10) | 39uf Tantalum Capacitors | (C1-C10) |
| (45) | Ceramic bypass Capacitors * | |
| (1) | 2.7K ohm resistor 1/4 W * | (R5) |

MECHANICAL COMPONENTS

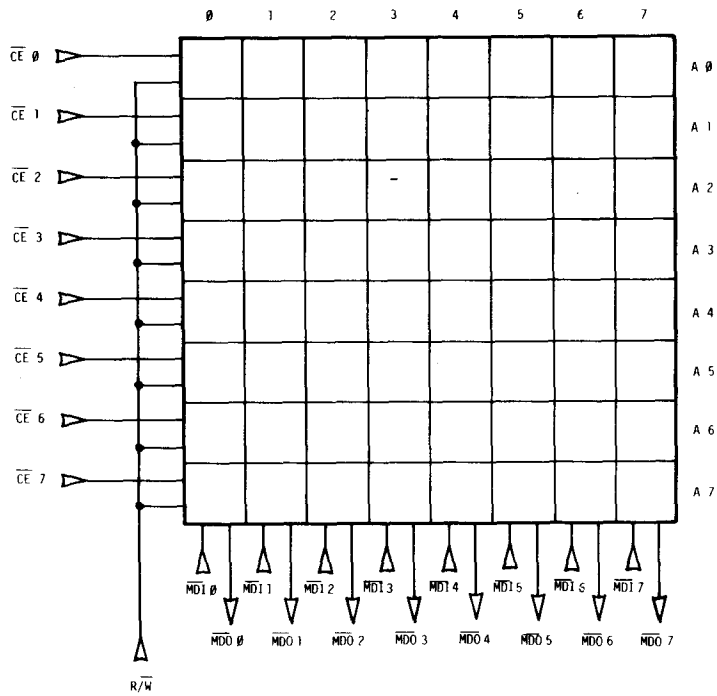
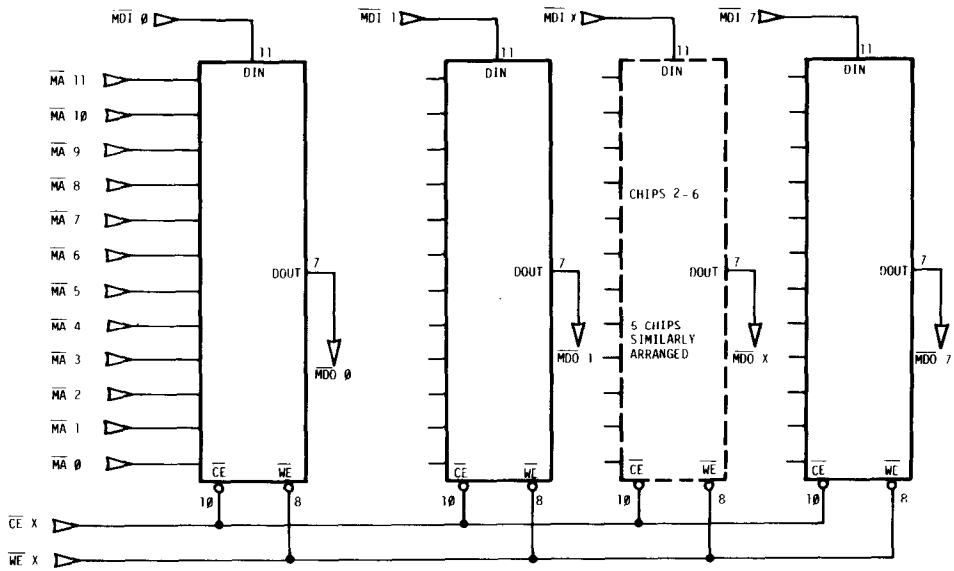
- | | | |
|------|------------------------|----------|
| (77) | Low Profile Sockets * | |
| (4) | Dip Switch, 8 position | (S1-S4)* |
| (5) | TO-220 Heat Sinks | |
| (5) | Sets 6-32 Hardware | |

* supplied already soldered on the board



RAM XX

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RAM xx
 PART 2 OF 2
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