64K S100 MEMORY BOARD

"JAWS"

ASSEMBLY INSTRUCTIONS

FOR MODELS 6416 - 16K KIT
6432 - 32K KIT
6448 - 48K KIT
6464 - 64K KIT
16EXP - 16K EXPANSION KIT

NETRONICS RESEARCH AND DEVELOPMENT LIMITED
333 LITCHFIELD ROAD (RTE. 202) NEW MILFORD, CONNECTICUT 06776
(203) 354-9375

64K S100 MEMORY BOARD
ASSEMBLY INSTRUCTIONS

Please check all components against the parts list below.

DESCRIPTION	QUANTITY PER KIT TYPE				
	64/16	64/32	64/48	64/64	16K Expandor
IC D8202	1	1	1	1	
IC 8212	1	1	1	1	
IC 74LS03	1	1	1	1	
IC 74LS74	1	1	1	1	
IC 74LS30	1	1	1	1	
IC 74LS138	1	1	1	1	
IC 74LS04	1	1	1	1	
LM 340T-5 (7805) Regulator	1	1	1	1	
LM 340T-12 (7812) Regulator	1	1	1	1	
IC 4116 (or Netronics #26260596)	8	16	24	32	8
Diode IN4001	3	3	3	3	
Diode IN4733	1	1	1	1	
Crystal 18.4320	1	1	1	1	
Resistor 4.7K (Yellow, Violet, Red)	12	12	12	12	
Resistor 200 ohm (Red, Black, Brown)	1	1	1	1	
Resistor 470 ohm (Yellow, Violet,Brown)	1	1	1	1	
Capacitor 1000 uf Electrolytic	2	2	2	2	
Capacitor 100 uf Electrolytic	1	1	1	1	
Capacitor 10 uf Electrolytic	1	1	1	1	
Capacitor 100pf Disc	1	1	1	1	
Capacitor .01 Disc	19	27	35	43	8
PC Board	1	1	1	1	
Socket 40 Pin	1	1	1	1	
IC Socket 24 Pin	1	1	1	1	
IC Socket 16 Pin	9	17	25	33	8
IC Socket 14 Pin	4	4	4	4	
Instruction Book	1	1	1	1	1
6/32 x 3/8" Screw	2	2	2	2	
6/32 Nut	2	2	2	2	

INTRODUCTION

READ THIS BEFORE STARTING ASSEMBLY

Before attempting to assemble this board, please read this section carefully. Mistakes can be very costly. If you have purchased more than one 16K block DO NOT install more than one 16K block at a time. This even includes sockets for the additional memory. This precaution is necessary to simplify trouble shooting in the event of any difficulties.

The 64K memory board memory section is divided into four banks. Bank #1 is addressed between ØØØØ and 3FFF. Bank #2 is addressed between 4ØØØ and 7FFF. Bank #3 is addressed between 8ØØØ and BFFF. Bank #4 is addressed between CØØØ and FFFF. These addresses are not switchable. A decision is required now as to which bank you will install the first 16K. After that decision has been made proceed to the assembly instructions.

REFUND POLICY: No refunds are made on kit products which have been assembled by the customer. Refer to the Limited Warranty section for the schedule of additional service fees which are available in the event of difficulty.

ASSEMBLY INSTRUCTIONS (Refer to Assembly Drawing)

( ) 1. Install 40 pin IC socket at location U34. Solder.

( ) 2. Install 24 pin IC socket at location U33. Solder.

( ) 3. Install four 14 pin IC sockets at locations U35, U36, U37, and U39. Solder.

( ) 4. Install a 16 pin IC socket at location U38. Solder.

( ) 5. Install eight 16 pin IC sockets in the bank selected in the introduction. Solder.

( ) 6. Install regulator LM340T-5 (7805) at location Q1. Solder. (Use 6/32 screw and nut).

( ) 7. Install regulator LM340T-12 (7812) at location Q2. Solder. (Use 6/32 screw and nut).

( ) 8. Install crystal Y1 as shown. Solder. Wrap a piece of electrical tape around crystal body to avoid crystal case shorting foil pattern on PC board.

( ) 9. Install 200 ohm resistor R2 (red, black, brown). Solder.

( ) 10. Install 4.7K ohm resistors R3-R14 (yellow, violet, red). Solder.

( ) 11. Install zener diode D2, IN4733, in the direction shown. Solder.

( ) 12. Install capacitor C1, 10uf Electrolytic. Note polarity. Solder.

( ) 13. Install .01 disc capacitors C2, C6, C7, C8, C10, C11, C12, C13, C14, C47, C48. Solder.

( ) 14. Note that each of the 4116 memory IC's has one disc capacitor. Depending on the bank that you selected, install the eight remaining .01 disc capacitors at these locations.

( ) 15. Install capacitor C4 100uf. Note polarity. Solder.

( ) 16. Install capacitor C9 100pf. Solder.

( ) 17. Install jumper J2. Note that the holes for this jumper are just above the nomenclature J2 on the board. See the assembly drawing for clarification.

( ) 18. Provision is made for an 8 position dip switch at location SW-1 (not supplied). These jumpers are 8K block enables which allows disabling any 8K portion of a 16K bank. To enable a specific bank a jumper or switch closure must be installed. For example, if the memory is installed in bank #1 a jumper at S1-0 will enable the memory from ØØØØ to 1FFF. A jumper at S1-2 will enable memory from 2ØØØ to 3FFF, etc.

( ) 19. The remaining components and jumpers require a decision as to the power supply being used. If this board is being used in a S100 bus where ±16V are available, install jumper J1 and resistor R1 (470 ohm, yellow, violet, brown). Solder. Skip step #20.

( ) 20. If you are using the Netronics power supply do not install J1 or R1. The AC input is used to generate the +12 and -5V voltages required. Install diodes D1, D3 and D4 (IN4001), and C3, C5 (1000uf capacitors). Note the polarity on the 1000uf capacitors and diodes.

( ) 21. Before placing any IC's into their sockets install the board into your S100 bus. Measure the voltages at the output of Q1, Q2 and D2. These voltages should be +5V, +12V and -5V respectively. If these voltages are not correct do not proceed as you will surely cause damage to expensive components.

( ) 22. If you are installing the board into an Explorer 85 equipped with a Netronics AP-1 power supply connect the AC terminal on the power supply to the AC input terminal on the Explorer mother board. Remove resistor R229 on the Explorer mother board and replace with an insulated jumper. This modification will supply the necessary voltage to power the 64K board.

( ) 23. Now install the IC's as shown in the assembly drawing. Note the position of pin #1. IC's installed backwards will be destroyed.

( ) 24. Power up your system and test.

( ) 25. You are now ready to install the additional 16K banks--one at a time please. Install the IC sockets, eight .01 capacitors, the appropriate S-1 jumpers or dip switch, and finally the 4116 IC's. Again remember pin #1. Refer to assembly drawing.

S-1 JUMPER	8K PAGE SELECTED
0	Selects Memory ØØØØ to 1FFF
2	Selects Memory 2ØØØ to 3FFF
4	Selects Memory 4ØØØ to 5FFF
6	Selects Memory 6ØØØ to 7FFF
8	Selects Memory 8ØØØ to 9FFF
A	Selects Memory AØØØ to BFFF
C	Selects Memory CØØØ to DFFF
E	Selects Memory EØØØ to FFFF

LIMITED WARRANTY: All components of this kit are warranteed for six months from the date of shipment. Defective components will be replaced free of charge if returned within six months with $1.00 each to cover testing and return postage. Return parts in a suitable package and ship insured to Netronics Research & Development Limited, Route 202, New Milford, Connecticut 06776, attention: Service Department, with a letter explaining the defect. Any parts received damaged due to poor packaging will be returned. (i.e., DO NOT ship IC's in envelopes via the mail).

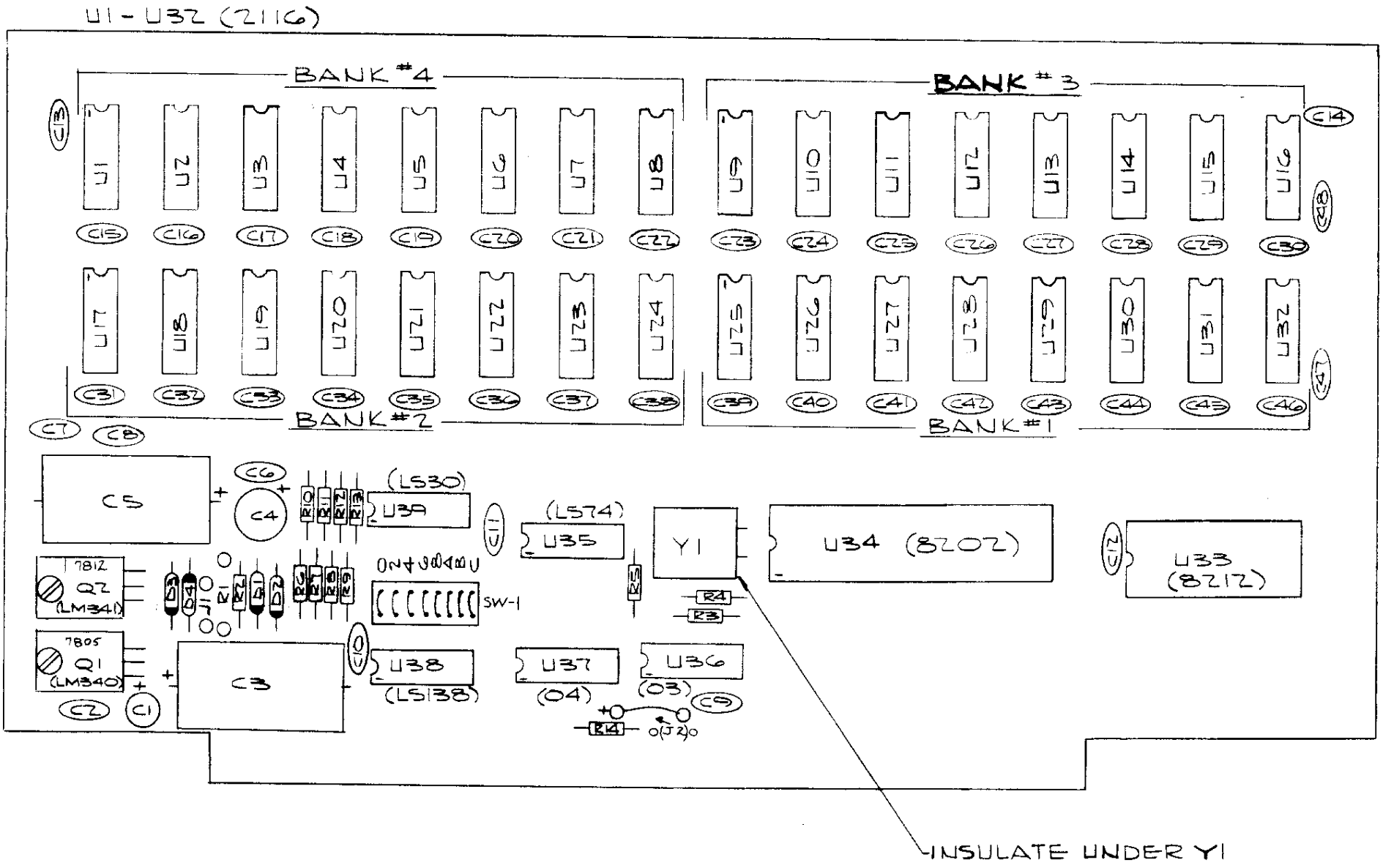
IN CASE OF DIFFICULTY: After having carefully checked your work and you still have difficulty getting your Memory Board to work, the Factory Service Department will repair, fully test, and return your system for a flat fee (see below). This covers all parts, except parts destroyed by your negligence, (i.e., IC installed backwards, broken, etc.). Package the unit carefully and return insured with a letter describing the difficulty.

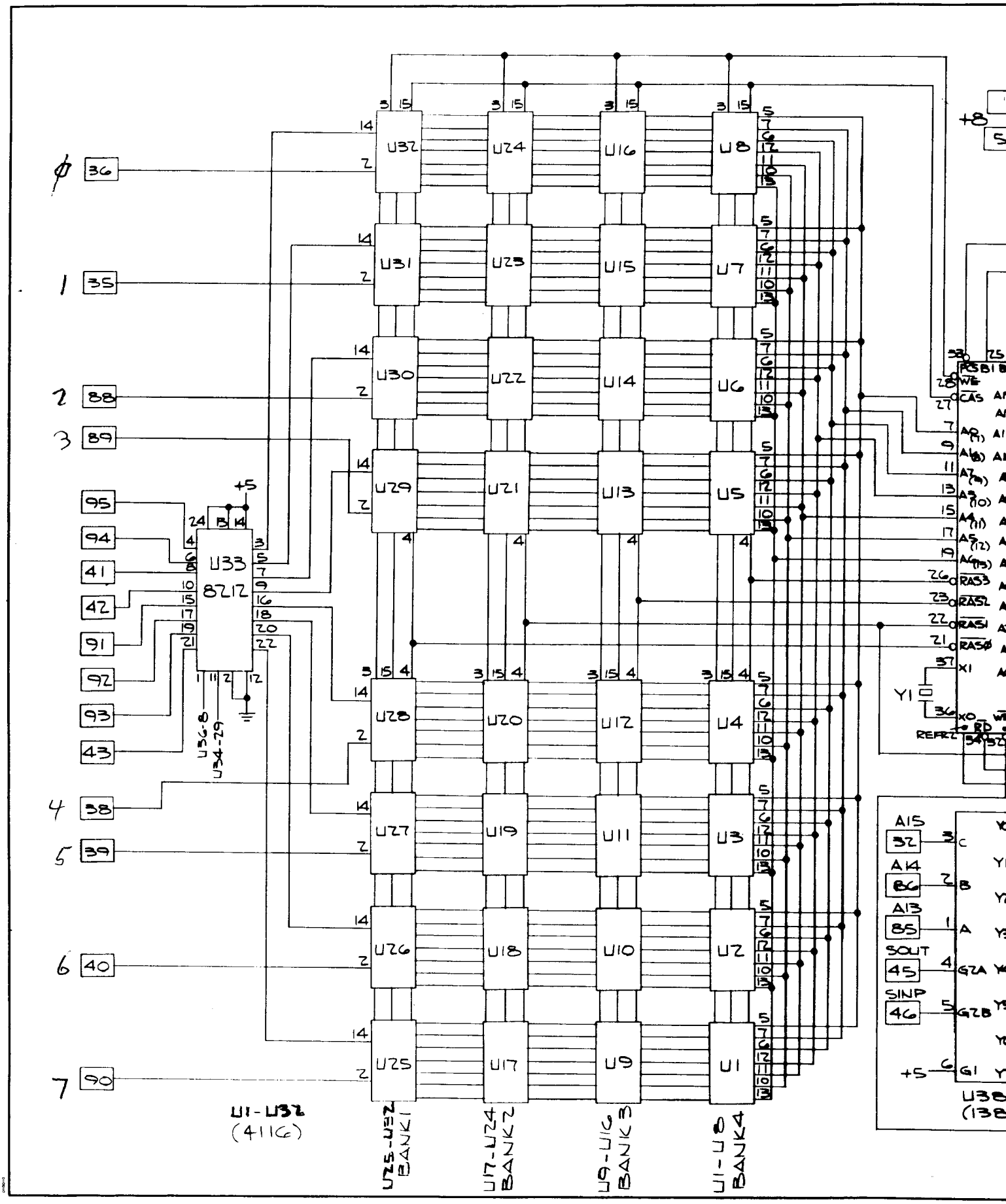
SCHEDULE OF IN WARRANTY FACTORY TROUBLESHOOTING PRICES*

6416 16K Memory	$15.00
6432 32K Memory	20.00
6448 48K Memory	25.00
6464 64K Memory	30.00

NOTE: No boards are accepted for repair unless equipped with original factory components. If you use parts from other sources both the warranty and factory troubleshooting service is not available. No exceptions please.

*Covers cost of all parts except those destroyed by the customer. These prices are not valid for levels added using parts not obtained from Netronics. If you have parts not supplied by Netronics send your unit and request a quotation.

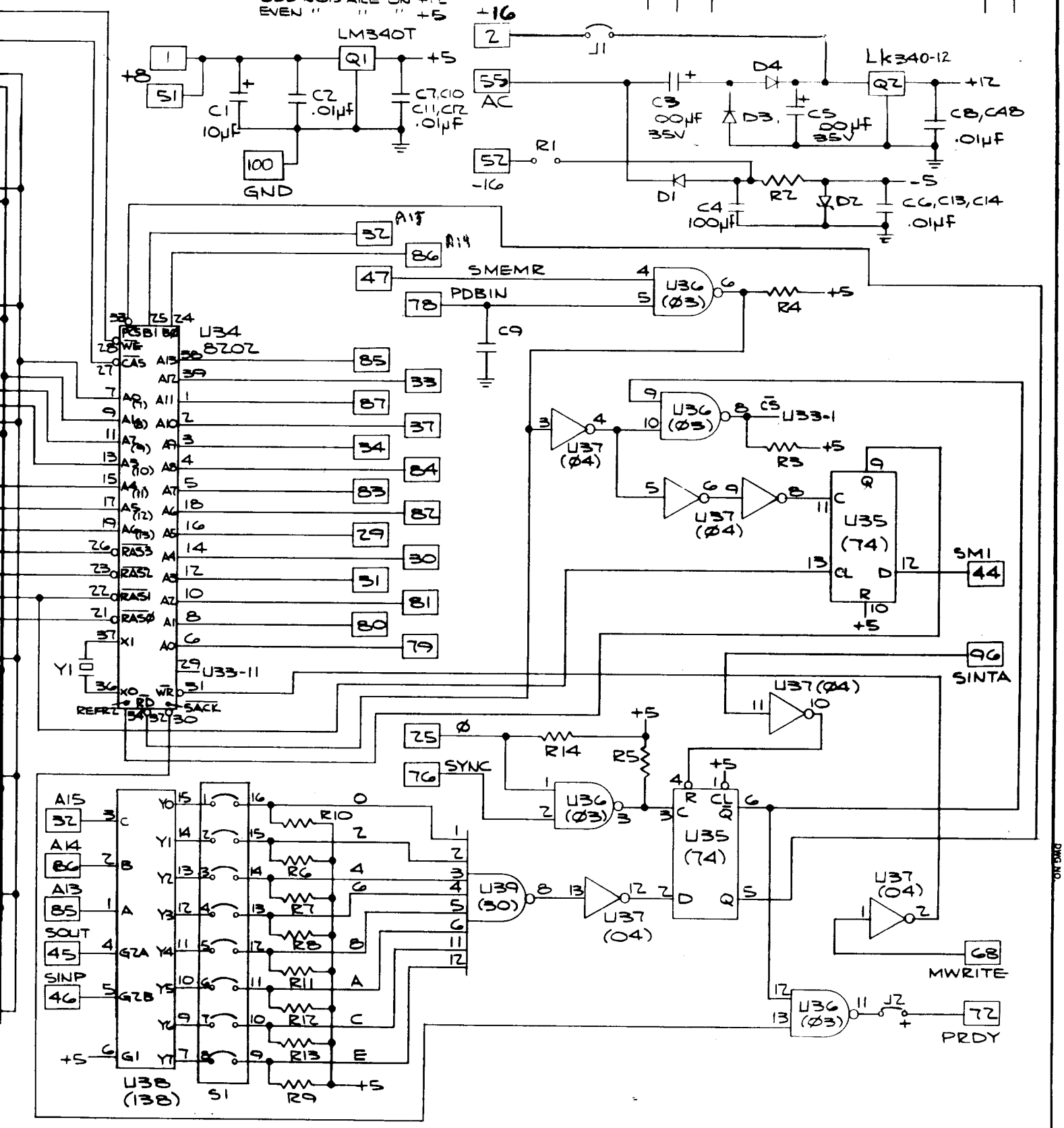

U1 - U32 (2116)
BANK #4
BANK #3
BANK #2
BANK #1
U1
U2
U3
U4
U5
U6
U7
U8
U9
U10
U11
U12
U13
U14
U15
U16
U17
U18
U19
U20
U21
U22
U23
U24
U25
U26
U27
U28
U29
U30
U31
U32
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33
C34
C35
C36
C37
C38
C39
C40
C41
C42
C43
C44
C45
C46
C47
C48
7812
Q2
(LM341)
7805
Q1
(LM340)
D1
D2
D3
D4
D5
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
J1
J2
SW-1
(LS30)
U39
(LS74)
U35
Y1
U34 (8202)
U33
(8212)
U38
(LS138)
U37
(04)
U36
(03)
INSULATE UNDER Y1


U32
U24
U16
U8
U31
U23
U15
U7
U30
U22
U14
U6
U29
U21
U13
U5
U28
U20
U12
U4
U27
U19
U11
U3
U26
U18
U10
U2
U25
U17
U9
U1
U33
8212
φ
1
2
3
4
5
6
7
+5
U1-U32
(4116)
U25-U32
BANK1
U17-U24
BANK2
U9-U16
BANK3
U1-U8
BANK4
Y1
RAS3
RAS2
RAS1
RAS0
REFRZ
A15
A14
A13
SOUT
SINP

DWG NO

REVISION				
REV	EN	DESCRIPTION	DATE	APPD

NOTE: C15 - C47 ARE .01μF
ODD NO.S ARE ON +12
EVEN " " " +5



ADDENDUM

64 K "JAWS" MEMORY BOARD

REVISION B (WITH PHANTHOM LINE)

PLEASE MAKE THE FOLLOWING CHANGES TO YOUR "JAWS" MANUAL

1 PAGE 1
CHANGE THE QUANITY OF 4.7K RESISTORS IN THE PARTS LIST FROM 12 TO 13

2 PAGE 2
STEP 10 CHANGE R3-14 TO R3-15

3 MAKE THE FOLLOWING CHANGES TO YOUR SCHMATIC.
[A] REMOVE THE CONNECTION BETWEEN U33 PIN 13 AND +5V
[B] ADD A 4.7K RESISTOR BETWEEN U33 PIN 13 AND +5V.
[C] ADD A LINE FROM U33 PIN 13 TO S100 BUS TERMINAL 67

THESE CHANGES REFLECT THE ADDITION OF A PHANTOM LINE TO THE JAWS BOARD. IF YOU AR USING THIS BOARD WITH THE NETRONICS FLOPPY-1 CONTROLLER OMIT THE PHANTOM LINE MODS DESCRIBED IN THE INSTALLATION INSTRUCTIONS.

NETRONICS R&D LTD
333 LITCHFIELD RD
NEW MILFORD CT 06776

JAWSMOD.1