TEKTRONIX®

P7001
SEMICONDUCTOR
MEMORY
670-2981-00
670-3035-00
SERVICE

INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077

Serial Number _____

FIRST PRINTING OCT 1975 PRODUCED BY SPS INFORMATION GROUP 070-1606-00

WARRANTY

All TEKTRONIX instruments are warranted against defective materials and workmanship for one year. Any questions with respect to the warranty should be taken up with your TEKTRONIX Field Engineer or representative.

All requests for repairs and replacement parts should be directed to the TEKTRONIX Field Office or representative in your area. This will assure you the fastest possible service. Please include the instrument Type Number or Part Number and Serial Number with all requests for parts or service.

Specifications and price change privileges reserved.

U.S.A. and foreign Tektronix products covered by U.S. and foreign patents and/or patents pending.

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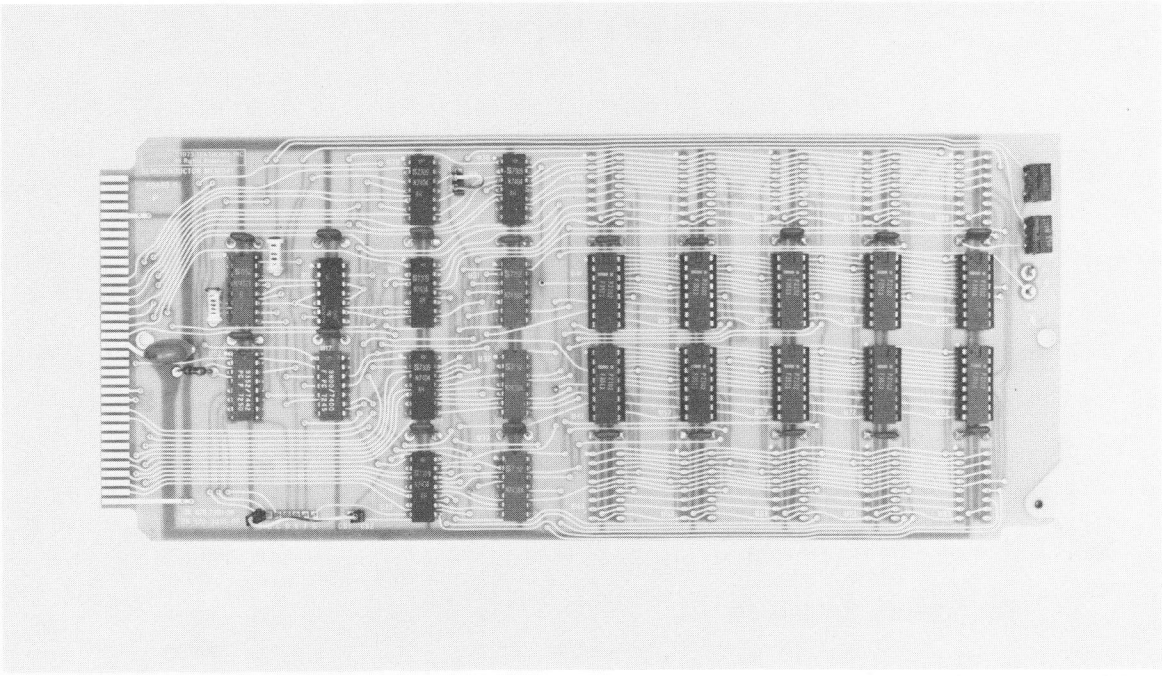
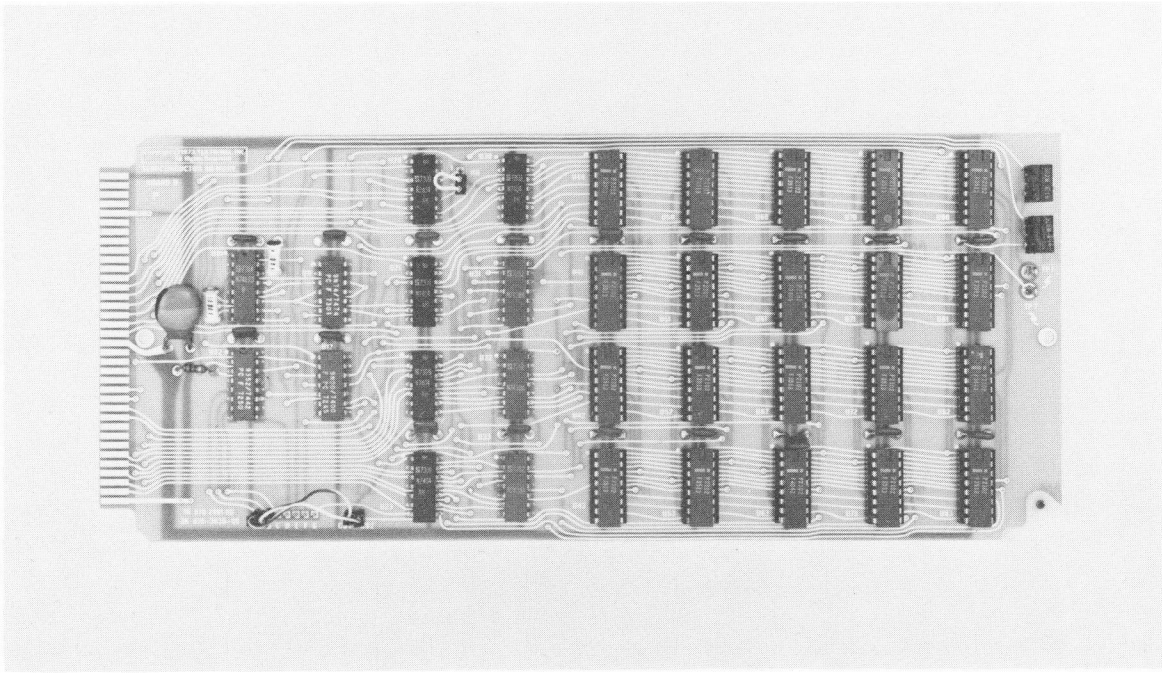


1606-01

1K Semiconductor Memory



1606-02

2K Semiconductor Memory

SECTION 1

CIRCUIT DESCRIPTION

Introduction

The semiconductor memory is available in two versions, one board of 1024 words by 10 bits and the other board of 2048 words by 10 bits. Combinations of these two boards allow four memory sizes that may be used in the P7001: 1) a 1024 word memory (1K), 2) a 2048 word memory (2K), 3) a 3072 word memory (3K), and 4) a 4096 word memory (4K). These combinations are attained by using multiples of the 1K and 2K memory boards. Both boards have the same characteristics and differ only in the number of memory cells added to the circuit board.

Strap options are available for the 1K and 2K versions to eliminate the readout storage capability and replace it with additional waveform storage capacity. Strap options are illustrated in Fig. 1-1 and described in more detail in the DPO Operators Manual (070-1599-00).

High Bit. Each memory cell is a 1024 by 1 bit Random Access Memory (RAM) integrated circuit chip. The 1K memory has 10 RAM cells and the 2K memory has 20. Address inputs A_0 through A_8 are used to address up to 512 memory locations... Address input A_9 is strap selectable between $\overline{\text{ADD 9}}$ and $\overline{\text{ADD 11}}$ by selecting HB 2 or HB 1 respectively. This option is normally utilized when a single waveform and the readout for four waveforms are to be stored in a 1K memory board.

The HB strap selects the starting address of the readout fields above the waveform. That is, when ASCII readout sotrage is desired, HB is set to 1 and then when readout locations are addressed (4000_8 to 4777_8) then the high bit, bit A_9, will come from $\overline{\text{ADD 11}}$. This permits one waveform of 512 words and four groups (512 words) of readout information. With HB set to 2 then there are two waveform locations (512 words each) available for storage. These two waveform locations are addressed continuously from 0 to 1023 (see Fig. 1-2).

Chip Select. Chip select is a strap option used to determine the starting address of memory locations. Chips are selected by setting pin 13 of the RAM high (off) or low (on). The option is exercised by selecting the outputs of U02 (A, B, C, and D), $\overline{\text{ADD 11}}$ (E), or $\overline{\text{ADD 11}}$ (F) for the Chip Select signal to CS1 or CS2. Option G selects a ground or low point. The pins A through G are jumpered in combinations with CS1 and CS2 to select the desired memory size (see Fig. 1-1 and Fig. 1-2).

The effect on addressing using the straps is as follows:

A Selects address locations 0 through 777_8

B Selects address location 1000_8 through 1777_8

C Selects address location 2000_8 through 2777_8

D Selects address location 3000_8 through 3777_8

E Selects previous waveform locations 0 through 3777_8. Used with the 1K memory without readout.

F Selects readout locations 4000_8 through 7777_8. Used with the 1K memory in the 3K combination for readout location.

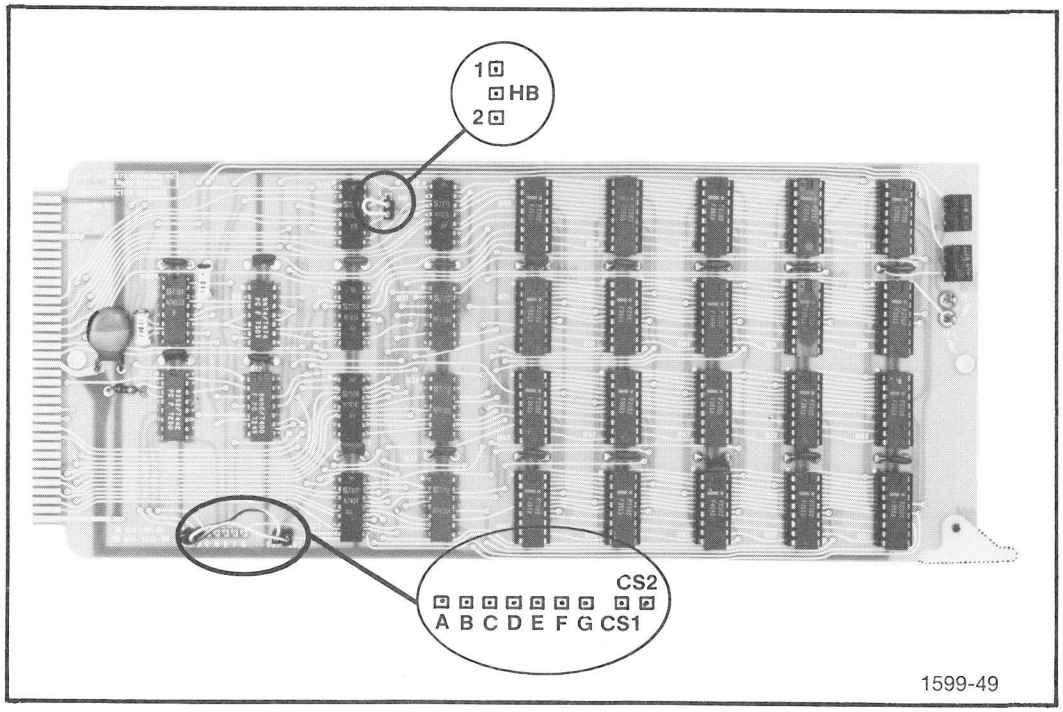


Fig. 1-1. 1K and 2K Semiconductor Memory strap location.

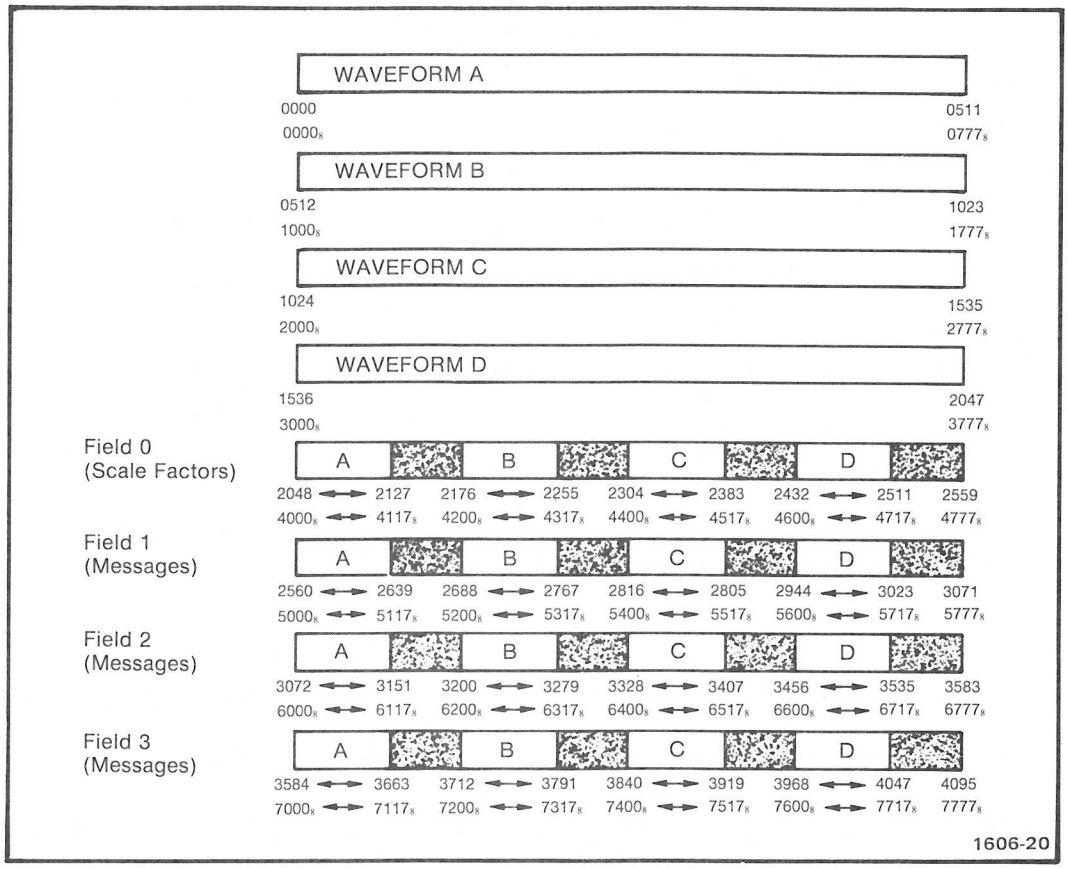


Fig. 1-2. 4K memory map.

G Selects all cells in the 1K memory when the 1K is used alone and allows address grouping by selecting the input to A_9.

NOTE

Turn off the Readout or remove the P7001 Readout Interface card when selecting semiconductor memory without readout.

Circuit Description

When address and data are placed on the P7001 bus, and we want to write into memory, the following signals must be present in their indicated state:

$\overline{\text{DATA MODE Ø}}$	low
$\overline{\text{ADD 12}}$	high
$\overline{\text{POWER FAIL}}$	high
$\overline{\text{CONTROL SYNC}}$	high

$\overline{\text{ADD 12}}$ and $\overline{\text{POWER FAIL}}$ both being high will appear on pin 9 of One Shot Multivibrator U01B as a low. When CONTROL SYNC is received on pin 10 of U01B, the one shot will fire and hold for 450 nanoseconds (address settling time). Its output clocks U11A to the next state, sending its $\overline{Q}$ to one shot multivibrator, U01A. Its Q output is the READY signal for pin 12 of U11B. The output of U11B will go high at the end of 800 nanoseconds, the firing time of U01A, sending $\overline{\text{SYNC ACK}}$ to bus pin B11. With a DATA MODE Ø at U12B during the 800 nanoseconds that U01A is firing, a "write enable" signal will be

applied to pin 3 of each memory cell via U12B. This will write into each memory cell that has been addressed and has data present at pin 11.

To read from memory, an address is placed on the P7001 address bus. The same sequence of events will occur, except DATA MODE Ø will be high. This will not send a "write" signal to pin 3 of each memory cell, but, a high will appear on pin 9 of U12C through U21D. This, along with a high READY from U11A, sends a LOAD BUS signal to the gates to place the output from the memory cells (pin 12) on the data bus.

SECTION 2

CALIBRATION

This procedure adjusts two important parameters -- the firing times of U01A and U01B. U01A firing time determines the width of the write pulse which is 800 nanoseconds minimum. U01B firing time determines address settling time which is 450 nanoseconds. The address must be stable 250 nanoseconds before reading or writing the data.

Equipment Required

1 - Test Oscilloscope, TEKTRONIX 7704A or equivalent

1 - TEKTRONIX 7B70 Time Base Unit

1 - TEKTRONIX 7A16 Vertical Amplifier

1 - 10X Probe ... TEKTRONIX P6053A

Procedures

1. Turn off the DPO power. Remove the four Phillips-head screws located on each corner of the front-panel (P7001). Carefully pull straight out on the handle located on the left side of the panel, and turn it to the left to open. The test points required and the adjustments are located on the front edge of each semiconductor memory board. Each board installed, i.e., one 1K and one 2K, for a 3K memory or two 2K boards for a 4K memory, must be adjusted. Component numbering and location are identical whether 2K or 1K board. See Fig. 2-1.

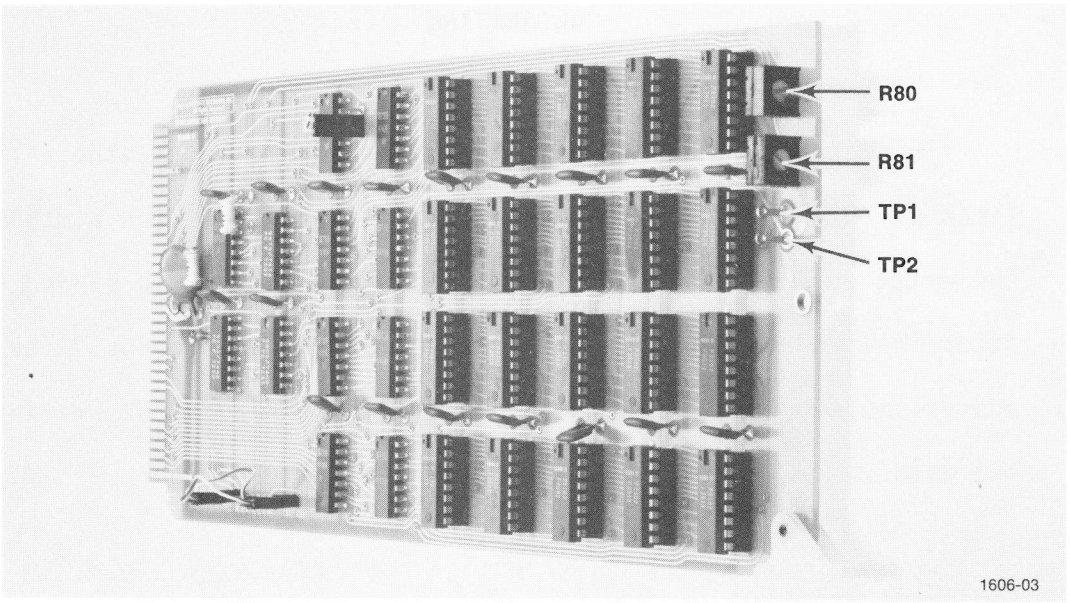


Fig. 2-1. Test Point Location

2. Turn on the DPO and allow at least 20 minutes for warm-up time.

3. Compensate the 10X probe and attach it to TP1 (see Fig. 2-1).

4. Set the time base unit for a positive slope trigger and a sweep rate of 100 ns/division.

5. Adjust R80 for 4.5 division (450 nanoseconds). See Fig. 2-2.

6. Attach the 10X probe to TP2. Trigger on the negative slope at 100 ns/division sweep rate.

7. Adjust R81 for 8 divisions (800 nanoseconds). See Fig. 2-3.

8. Repeat steps 2 and 3 for the other memory board if installed.

9. Disconnect the probe and replace the front panel using the four Phillips-head screws.

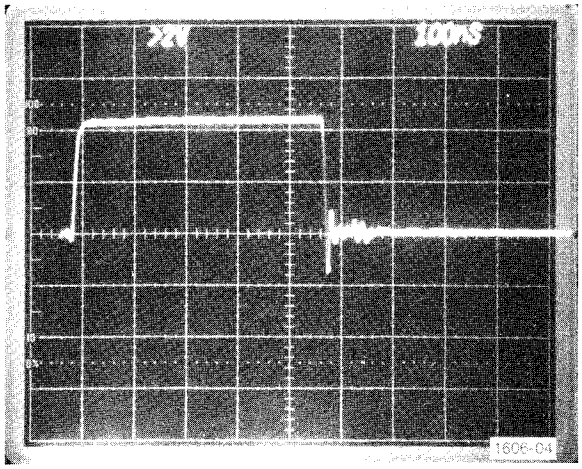


Fig. 2-2. Address Settling Time.

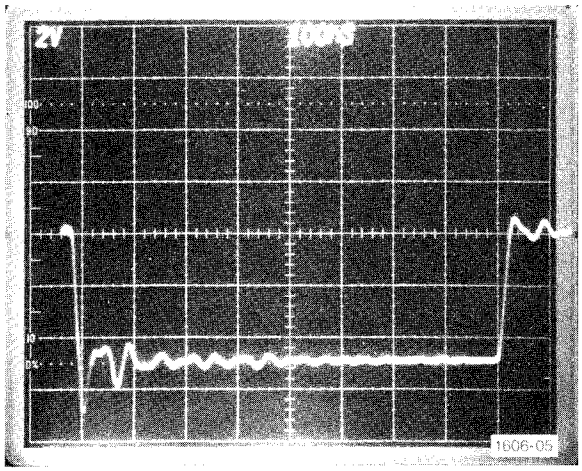


Fig. 2-3. Read/Write Time.

REPLACEABLE PARTS LIST

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5 Name & Description

Assembly and/or Component
Attaching parts for Assembly and/or Component
\- - - * - - -
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
\- - - * - - -
Parts of Detail Part
Attaching parts for Parts of Detail Part
\- - - * - - -

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol - - - * - - - indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

"	INCH
#	NUMBER SIZE
ACTR	ACTUATOR
ADPTR	ADAPTER
ALIGN	ALIGNMENT
AL	ALUMINUM
ASSEM	ASSEMBLED
ASSY	ASSEMBLY
ATTEN	ATTENUATOR
AWG	AMERICAN WIRE GAGE
BD	BOARD
BRKT	BRACKET
BRS	BRASS
BRZ	BRONZE
BSHG	BUSHING
CAB	CABINET
CAP	CAPACITOR
CER	CERAMIC
CHAS	CHASSIS
CKT	CIRCUIT
COMP	COMPOSITION
CONN	CONNECTOR
COV	COVER
CPLG	COUPLING
CRT	CATHODE RAY TUBE
DEG	DEGREE
DWR	DRAWER
ELCTRN	ELECTRON
ELEC	ELECTRICAL
ELCTLT	ELECTROLYTIC
ELEM	ELEMENT
EPL	ELECTRICAL PARTS LIST
EQPT	EQUIPMENT
EXT	EXTERNAL
FIL	FILLISTER HEAD
FLEX	FLEXIBLE
FLH	FLAT HEAD
FLTR	FILTER
FR	FRAME or FRONT
FSTNR	FASTENER
FT	FOOT
FXD	FIXED
GSKT	GASKET
HDL	HANDLE
HEX	HEXAGON
HEX HD	HEXAGONAL HEAD
HEX SOC	HEXAGONAL SOCKET
HLCPS	HELICAL COMPRESSION
HLEXT	HELICAL EXTENSION
HV	HIGH VOLTAGE
IC	INTEGRATED CIRCUIT
ID	INSIDE DIAMETER
IDENT	IDENTIFICATION
IMPLR	IMPELLER
IN	INCH
INCAND	INCANDESCENT
INSUL	INSULATOR
INTL	INTERNAL
LPHLDR	LAMPHOLDER
MACH	MACHINE
MECH	MECHANICAL
MTG	MOUNTING
NIP	NIPPLE
NON WIRE	NOT WIRE WOUND
OBD	ORDER BY DESCRIPTION
OD	OUTSIDE DIAMETER
OVH	OVAL HEAD
PH BRZ	PHOSPHOR BRONZE
PL	PLAIN or PLATE
PLSTC	PLASTIC
PN	PART NUMBER
PNH	PAN HEAD
PWR	POWER
RCPT	RECEPTACLE
RES	RESISTOR
RGD	RIGID
RLF	RELIEF
RTNR	RETAINER
SCH	SOCKET HEAD
SCOPE	OSCILLOSCOPE
SCR	SCREW
SE	SINGLE END
SECT	SECTION
SEMICOND	SEMICONDUCTOR
SHLD	SHIELD
SHLDR	SHOULDERED
SKT	SOCKET
SL	SLIDE
SLFLKG	SELF-LOCKING
SLVG	SLEEVING
SPR	SPRING
SQ	SQUARE
SST	STAINLESS STEEL
STL	STEEL
SW	SWITCH
T	TUBE
TERM	TERMINAL
THD	THREAD
THK	THICK
TNSN	TENSION
TPG	TAPPING
TRH	TRUSS HEAD
V	VOLTAGE
VAR	VARIABLE
W/	WITH
WSHR	WASHER
XFMR	TRANSFORMER
XSTR	TRANSISTOR

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
00779	AMP, INC.	P. O. BOX 3608	HARRISBURG, PA 17105
01121	ALLEN-BRADLEY CO.	1201 2ND ST. SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P. O. BOX 5012	DALLAS, TX 75222
04222	AVX CERAMIC CORP.	P.O. BOX 867	MURTLE BEACH, SC 29577
18677	SCANBE MFG. CORP.	3445 FLETCHER AVE.	EL MONTE, CA 91731
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SAN YSIDRO WAY	SANTA CLARA, CA 95051
34649	INTEL CORP.	3065 BOWERS AVE.	SANTA CLARA, CA 95051
56289	SPRAGUE ELECTRIC CO.		NORTH ADAMS, MA 01247
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
80009	TEKTRONIX, INC.	P. O. BOX 500	BEAVERTON, OR 97077

ELECTRICAL

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
				CKT BOARD ASSEMBLIES		
A1	670-2981-00			CKT BOARD ASSY:1K LOW COST MEMORY	80009	670-2981-00
A2	670-3035-00			CKT BOARD ASSY:2K LOW COST MEMORY	80009	670-3035-00
A1	670-2981-00			CKT BOARD ASSY:1K LOW COST MEMORY	80009	670-2981-00
C01	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C02	281-0637-00			CAP.,FXD,CER DI:91PF,5%,500V	72982	301000Z5D910J
C03	281-0524-00			CAP.,FXD,CER DI:150PF,+/-30PF,500V	04222	7001-1381
C04	290-0533-00			CAP.,FXD,ELCTLT:330UF,20%,,6V	56289	196D337X006MA3
C05	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C11	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C15	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C21	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C25	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C31	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C35	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C41	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C45	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C51	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C55	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C61	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C65	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C71	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C75	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C81	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
C85	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8131N075651104M
R02	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R20	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R80	311-1245-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	72X-28-0-103K
R81	311-1240-00			RES.,VAR,NONWIR:25K OHM,10%,0.50W	73138	72X-30-0-253K
U01	156-0172-00			MICROCIRCUIT,DI:DUAL MONOSTABLE MV	80009	156-0172-00
U02	156-0061-00			MICROCIRCUIT,DI:SGL,BCD TO DEC DECODER	01295	SN7442N
U11	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U12	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U20	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U21	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U22	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U23	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U30	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U31	156-0145-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7438N
U32	156-0145-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7438N
U33	156-0145-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7438N
U41	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U42	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U51	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U52	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U61	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U62	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U71	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U72	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U81	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U82	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
A2	670-3035-00			CKT BOARD ASSY:2K LOW COST MEMORY	80009	670-3035-00
C01	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C02	281-0637-00			CAP.,FXD,CER DI:91PF,5%,500V	72982	301000Z5D910J
C03	281-0524-00			CAP.,FXD,CER DI:150PF,+/-30PF,500V	04222	7001-1381
C04	290-0533-00			CAP.,FXD,ELCTLT:330UF,20%,,6V	56289	196D337X006MA3
C05	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C11	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C15	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C21	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C25	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C31	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C35	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C41	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C45	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C51	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C55	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C61	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C65	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C71	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C75	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C81	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
C85	283-0010-00			CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	273C20
R02	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R20	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R80	311-1245-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	73138	72X-28-0-103K
R81	311-1240-00			RES.,VAR,NONWIR:25K OHM,10%,0.50W	73138	72X-30-0-253K
U01	156-0172-00			MICROCIRCUIT,DI:DUAL MONOSTABLE MV	80009	156-0172-00
U20	156-0061-00			MICROCIRCUIT,DI:SGL,BCD TO DEC DECODER	01295	SN7442N
U11	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U12	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U20	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U21	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U22	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U23	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U30	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	01295	SN7404N
U31	156-0145-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7438N
U32	156-0145-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7438N
U33	156-0145-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR	01295	SN7438N
U40	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U41	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U42	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U43	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U50	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U51	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U52	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U53	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U60	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U61	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U62	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U63	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U70	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U71	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U72	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U73	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U80	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U81	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U82	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102
U83	156-0291-00			MICROCIRCUIT,DI:1024 BIT X STATIC ROM	34649	2102

MECHANICAL

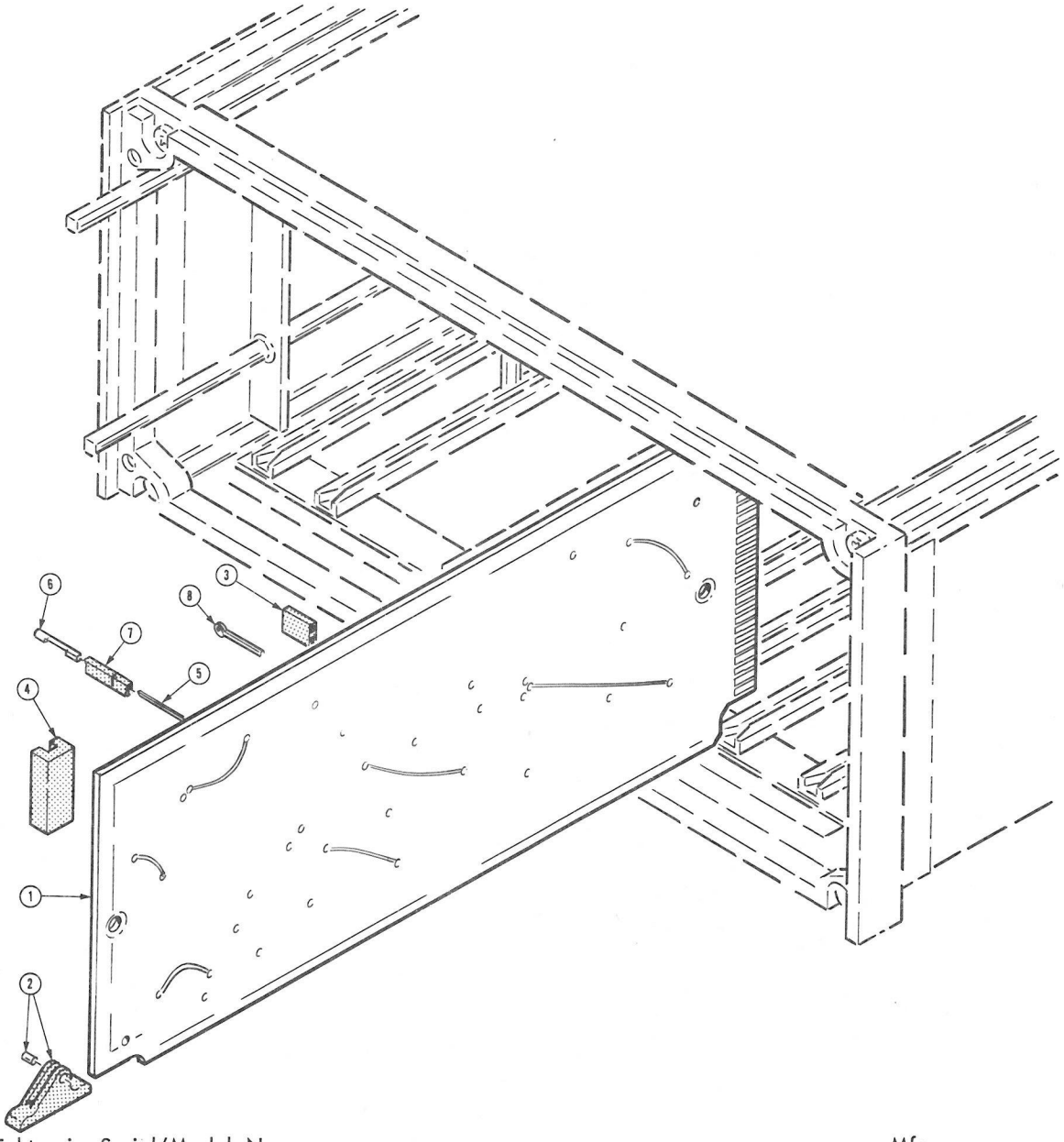
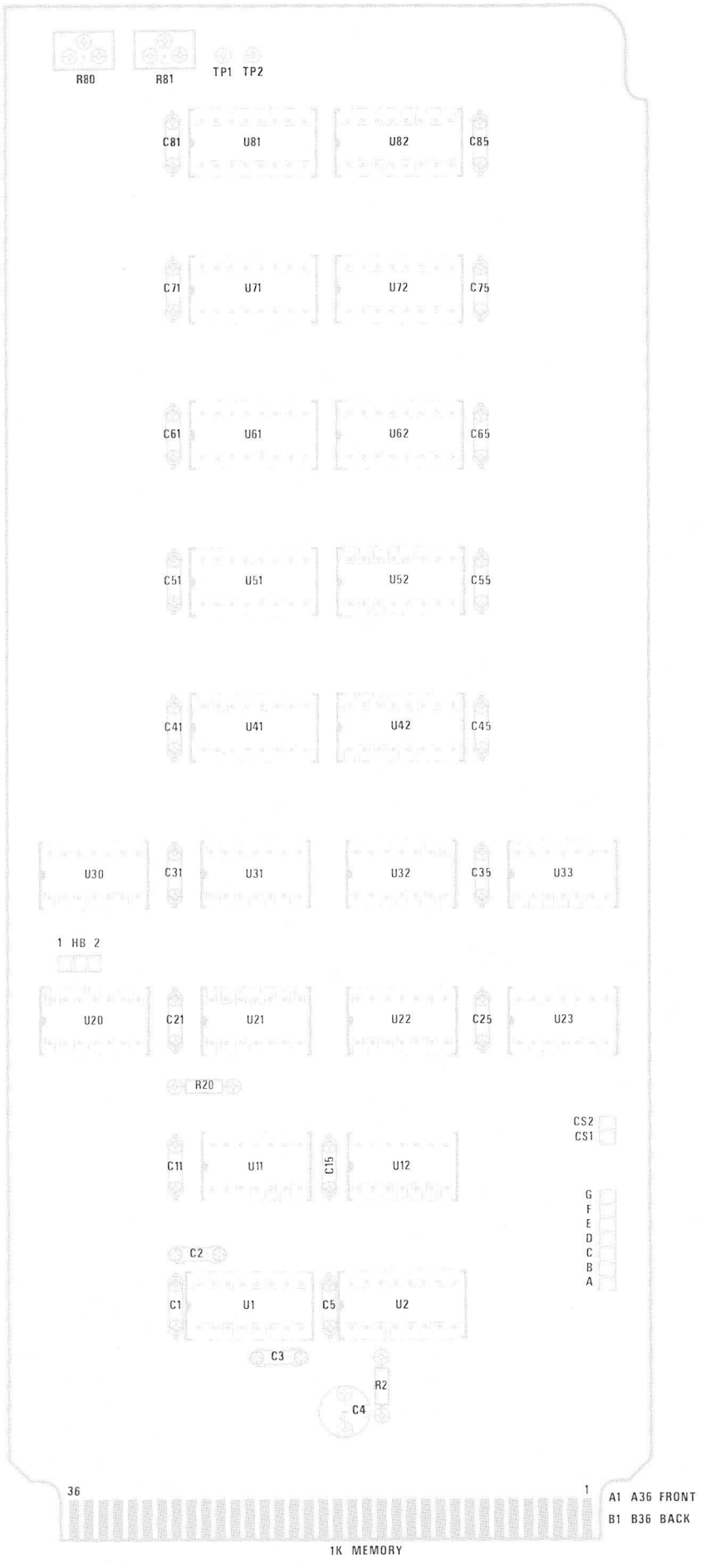
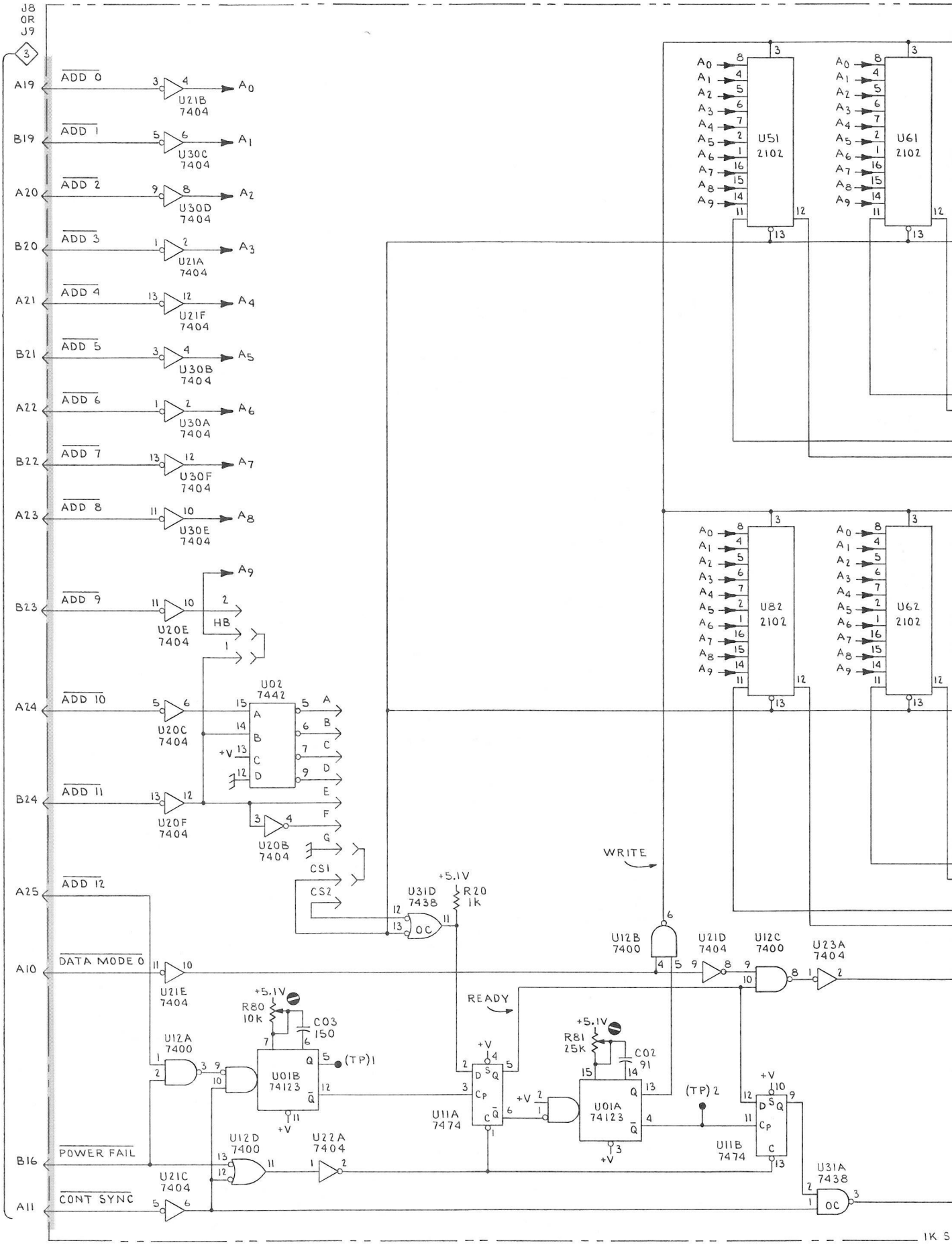
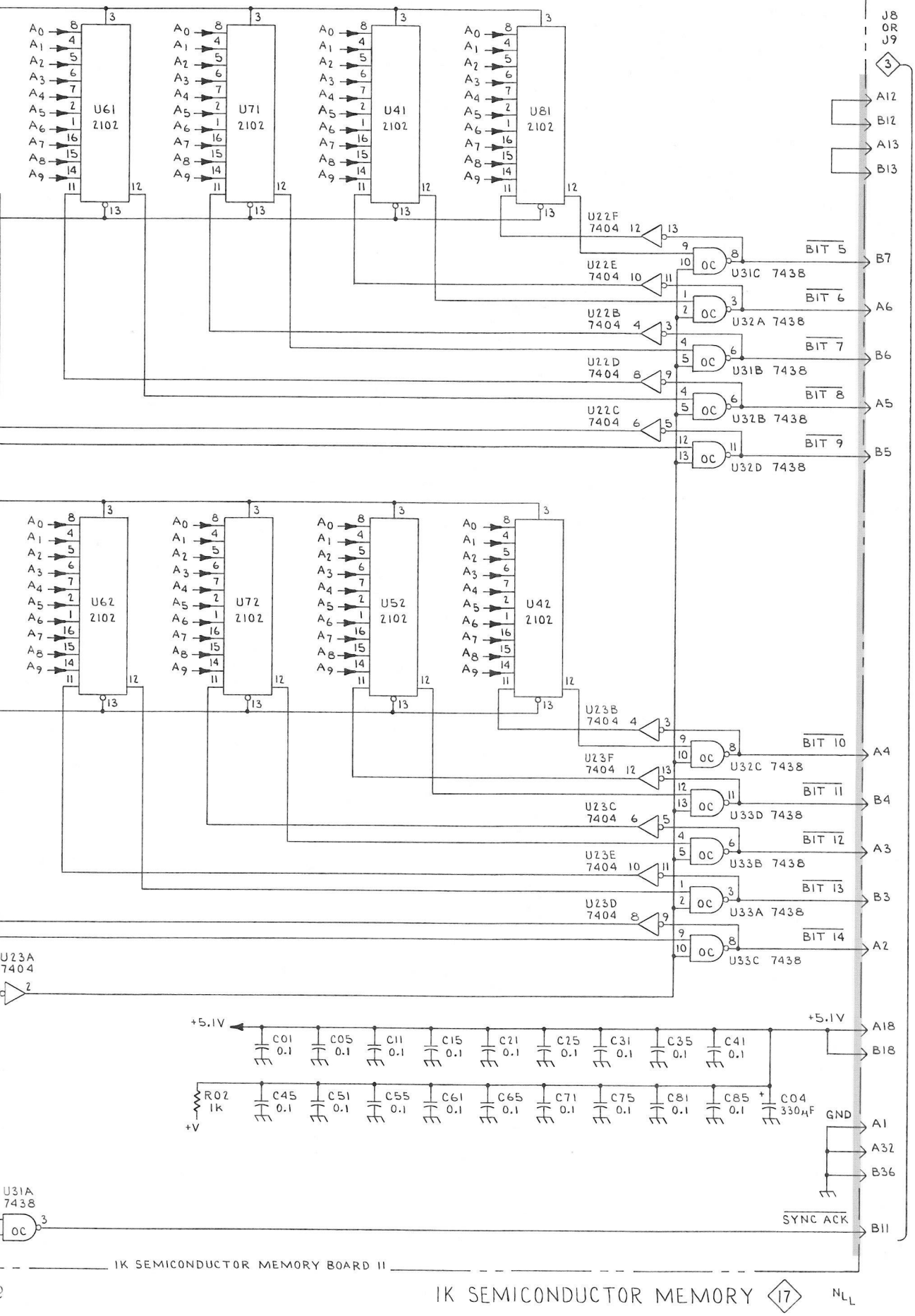


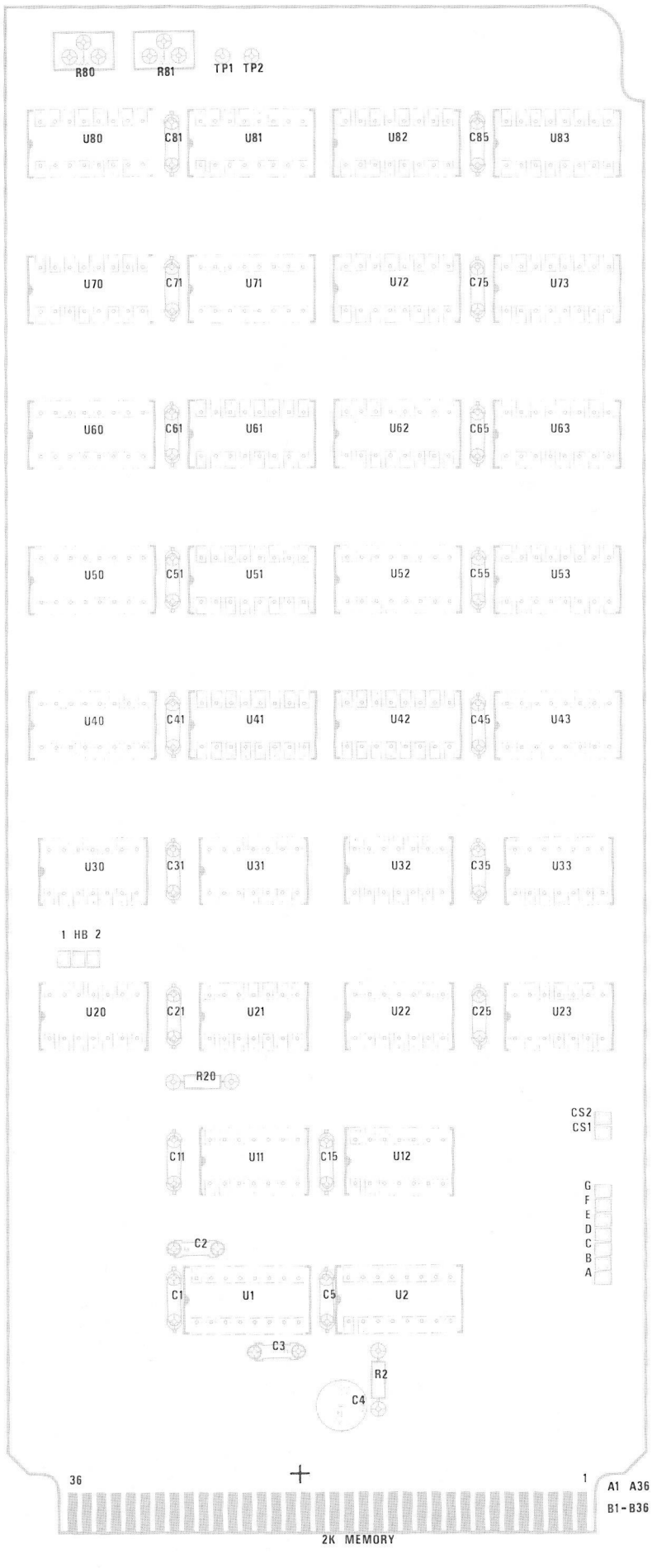
Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
1-1	----- -----			1	CKT BOARD ASSY:1K LOW COST MEMORY(SEE A1 EPL)		
-2	105-0144-00			1	. EJECTOR,CKT BD:MOLD PLASTIC,W/ROLL PIN	18677	OBD
-3	131-0993-00			1	. LINK,TERM.CONNE:2 WIRE BLACK	00779	530153-2
-4	136-0260-02			10	. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
-5	131-0608-00			12	. CONTACT,ELEC:0.365 INCH LONG	22526	47357
-6	131-0707-00			2	. CONTACT,ELEC:0.48"L,22-26 AWG WIRE	22526	47439
-7	352-0171-00			2	. CONN BODY,PL,EL:1 WIRE BLACK	80009	352-0171-00
-8	214-0579-00			2	. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
	----- -----			1	CKT BOARD ASSY:2K LOW COST MEMORY(SEE A2 EPL)		
	105-0144-00			1	. EJECTOR,CKT BD:MOLD PLASTIC,W/ROLL PIN	18677	OBD
	131-0608-00			12	. CONTACT,ELEC:0.365 INCH LONG	22526	47357
	131-0993-00			1	. LINK,TERM.CONNE:2 WIRE BLACK	00779	530153-2
	136-0260-02			20	. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
	214-0579-00			2	. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
	131-0707-00			4	. CONTACT,ELEC:0.48"L,22-26 AWG WIRE	22526	47439
	352-0171-00			4	. CONN BODY,PL,EL:1 WIRE BLACK	80009	352-0171-00

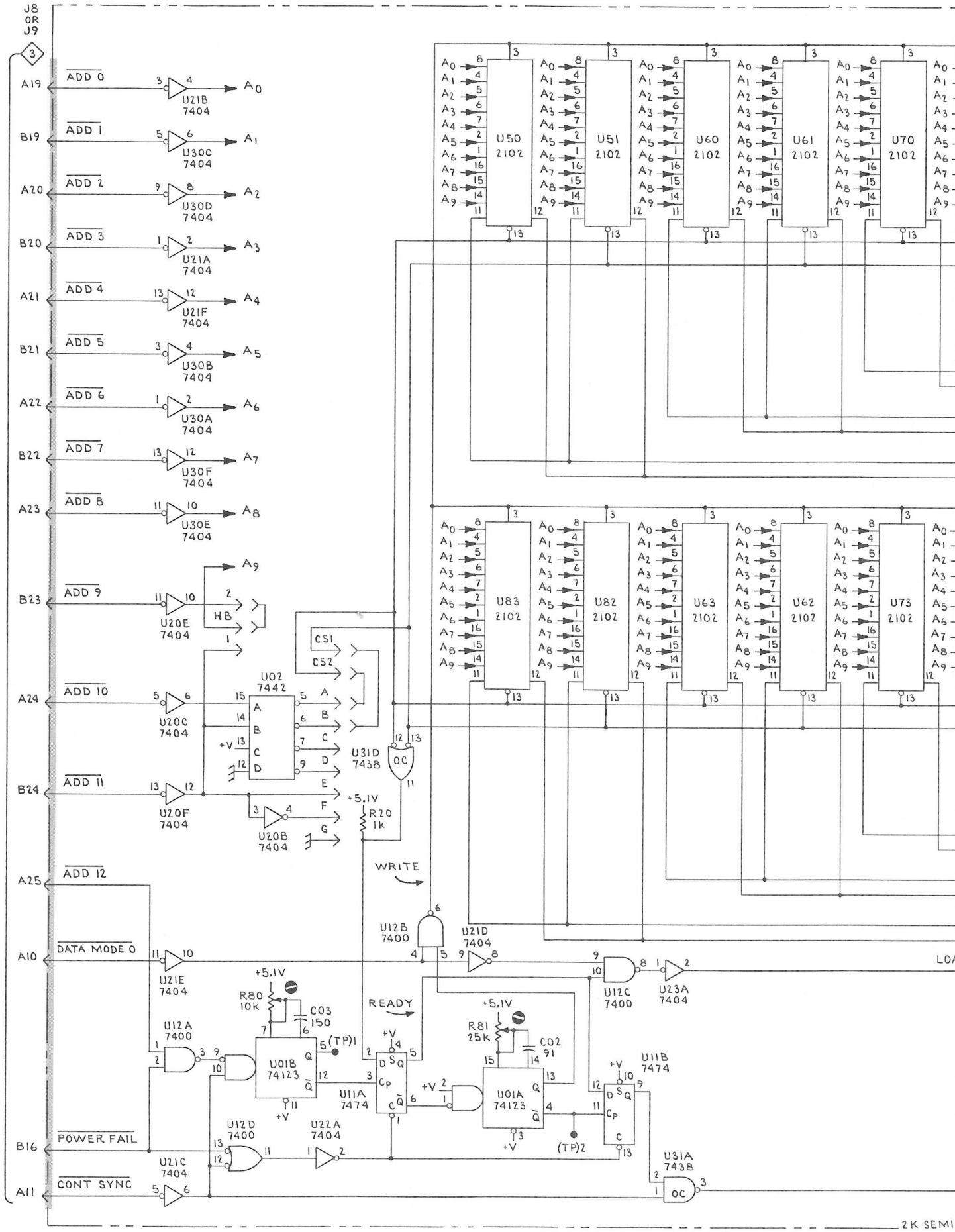

R80
R81
TP1 TP2
C81
U81
U82
C85
C71
U71
U72
C75
C61
U61
U62
C65
C51
U51
U52
C55
C41
U41
U42
C45
U30
C31
U31
U32
C35
U33
1 HB 2
U20
C21
U21
U22
C25
U23
R20
CS2
CS1
C11
U11
C15
U12
G
F
E
D
C
B
A
C2
C1
U1
C5
U2
C3
R2
C4
36
1
A1 A36 FRONT
B1 B36 BACK
1K MEMORY

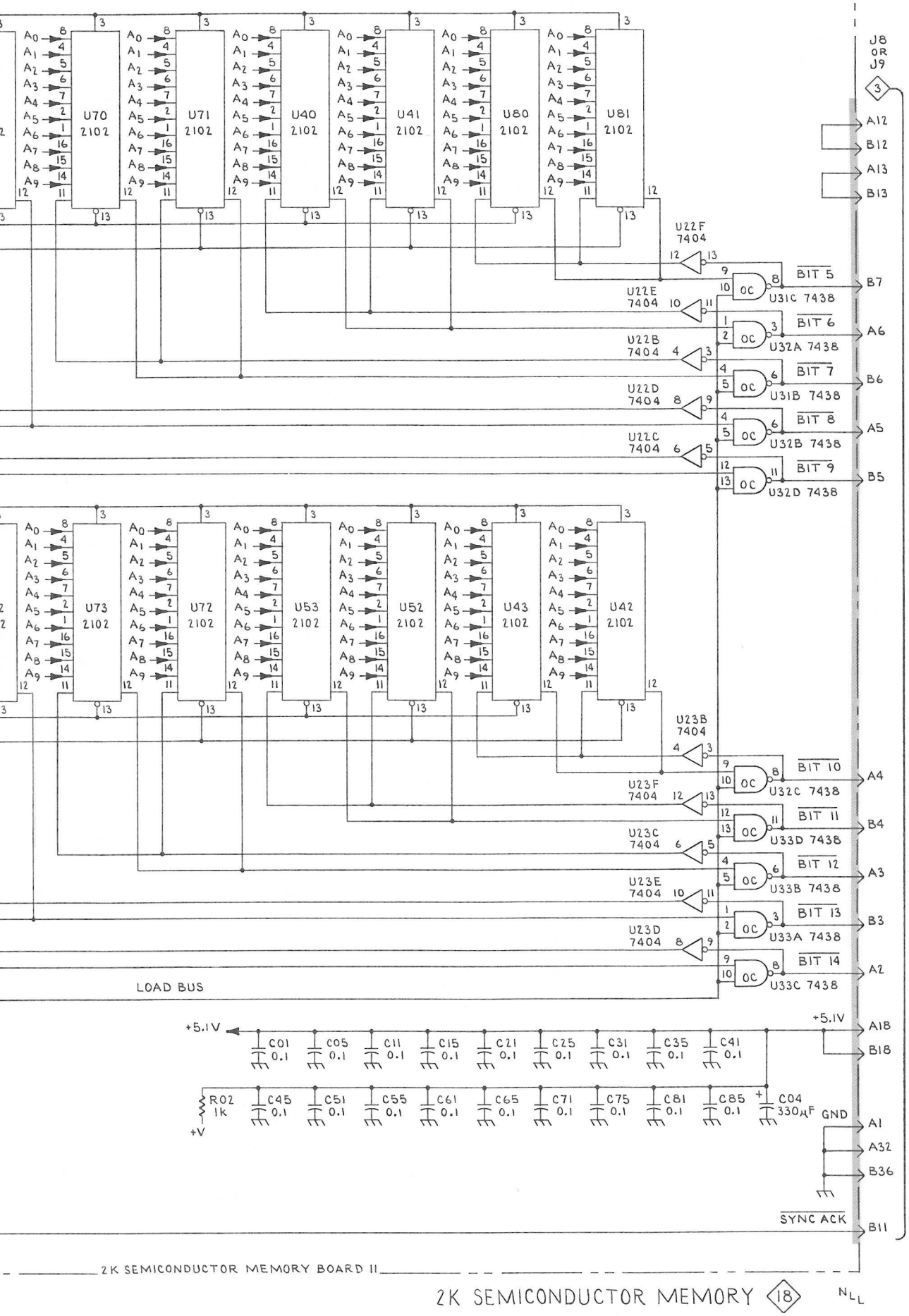

J8
OR
J9
3
A19
ADD 0
U21B
7404
A0
B19
ADD 1
U30C
7404
A1
A20
ADD 2
U30D
7404
A2
B20
ADD 3
U21A
7404
A3
A21
ADD 4
U21F
7404
A4
B21
ADD 5
U30B
7404
A5
A22
ADD 6
U30A
7404
A6
B22
ADD 7
U30F
7404
A7
A23
ADD 8
U30E
7404
A8
A9
B23
ADD 9
U20E
7404
HB
A24
ADD 10
U20C
7404
U02
7442
B24
ADD 11
U20F
7404
U20B
7404
CS1
CS2
A25
ADD 12
U31D
7438
+5.1V
R20
1k
WRITE
U51
2102
U61
2102
U82
2102
U62
2102
U12B
7400
U21D
7404
U12C
7400
U23A
7404
A10
DATA MODE 0
U21E
7404
+5.1V
R80
10k
C03
150
U12A
7400
U01B
74123
(TP)1
READY
U11A
7474
+5.1V
R81
25k
C02
91
U01A
74123
(TP)2
U11B
7474
U31A
7438
B16
POWER FAIL
U12D
7400
U22A
7404
U21C
7404
A11
CONT SYNC
P7001
@



IK SEMICONDUCTOR MEMORY BOARD 11


R80
R81
TP1
TP2
U80
C81
U81
U82
C85
U83
U70
C71
U71
U72
C75
U73
U60
C61
U61
U62
C65
U63
U50
C51
U51
U52
C55
U53
U40
C41
U41
U42
C45
U43
U30
C31
U31
U32
C35
U33
1 HB 2
U20
C21
U21
U22
C25
U23
R20
CS2
CS1
C11
U11
C15
U12
G
F
E
D
C
B
A
C2
C1
U1
C5
U2
C3
R2
C4
36
1
A1 A36 FRONT
B1-B36 BACK
2K MEMORY


J8 OR J9
3
A19 ADD 0 U21B 7404 A0
B19 ADD 1 U30C 7404 A1
A20 ADD 2 U30D 7404 A2
B20 ADD 3 U21A 7404 A3
A21 ADD 4 U21F 7404 A4
B21 ADD 5 U30B 7404 A5
A22 ADD 6 U30A 7404 A6
B22 ADD 7 U30F 7404 A7
A23 ADD 8 U30E 7404 A8
B23 ADD 9 U20E 7404 HB A9
A24 ADD 10 U20C 7404
B24 ADD 11 U20F 7404
U20B 7404
U02 7442
CS1
CS2
U31D 7438 OC
+5.1V
R20 1k
A25 ADD 12
A10 DATA MODE 0 U21E 7404
WRITE
U12B 7400
U21D 7404
U12C 7400
U23A 7404
LOA
+5.1V
R80 10k
C03 150
READY
U12A 7400
U01B 74123
(TP)1
U11A 7474
+5.1V
R81 25k
C02 91
U01A 74123
U11B 7474
(TP)2
B16 POWER FAIL
U12D 7400
U22A 7404
U21C 7404
U31A 7438 OC
A11 CONT SYNC
U50 2102
U51 2102
U60 2102
U61 2102
U70 2102
U83 2102
U82 2102
U63 2102
U62 2102
U73 2102
2K SEMI
P7001
@


U70 2102
U71 2102
U40 2102
U41 2102
U80 2102
U81 2102
U73 2102
U72 2102
U53 2102
U52 2102
U43 2102
U42 2102
J8 OR J9
U22F 7404
U22E 7404
U22B 7404
U22D 7404
U22C 7404
U23B 7404
U23F 7404
U23C 7404
U23E 7404
U23D 7404
BIT 5
BIT 6
BIT 7
BIT 8
BIT 9
BIT 10
BIT 11
BIT 12
BIT 13
BIT 14
U31C 7438
U32A 7438
U31B 7438
U32B 7438
U32D 7438
U32C 7438
U33D 7438
U33B 7438
U33A 7438
U33C 7438
LOAD BUS
+5.1V
GND
SYNC ACK
R02 1k
C01 0.1
C04 330µF
2K SEMICONDUCTOR MEMORY BOARD II

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MANUAL CHANGE INFORMATION

PRODUCT SEMI-CONDUCTOR MEMORY

CHANGE REFERENCE M21,975

DATE 9-5-74

CHANGE:	DESCRIPTION

070-1606-00 670-2981-00 (1K) and 670-3035-00 (2K)

ELECTRICAL PARTS LIST AND SCHEMATIC CHANGES

670-2981-00 CKT CARD ASSY: 1K LOW COST MEMORY

CHANGE TO:

C01	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C05	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C11	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C15	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C21	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C25	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C31	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C35	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C41	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C45	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C51	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C55	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C61	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C65	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C71	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C75	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C81	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V
C85	283-0111-00	CAP.,FXD,CER DI:0.1μF, 20%, 50V

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MANUAL CHANGE INFORMATION

Change Reference: M34035 Date: 6-6-79

Product: P7001 SEMICONDUCTOR MEMORY 070-1606-00 EFF SN B100681

CHANGE	DESCRIPTION

ELECTRICAL PARTS LIST CHANGES

CHANGE TO:

	670-2981-00	CKT BOARD ASSY:1K LOW COST MEMORY
U11	156-0041-05	MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP
U12	156-0030-02	MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE
U31	156-0145-02	MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR
U32	156-0145-02	MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR
U33	156-0145-02	MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR
	670-3035-00	CKT BOARD ASSY:2K LOW COST MEMORY
U11	156-0041-05	MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP
U12	156-0030-02	MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE
U31	156-0145-02	MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR
U32	156-0145-02	MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR
U33	156-0145-02	MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND BFR