



SERIES E

Manual FO-650-13

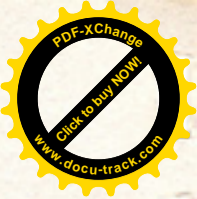
Printed Circuit Board
Schematics/Parts Lists
for all
Electronic Slot Machines

Bally

Manufacturing Corporation
Export Corporation

2640 Belmont Avenue, Chicago, Illinois 60618 USA
Telephone: (312) 267-6060 Cables: Balfan Telex: 253076

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WARNING

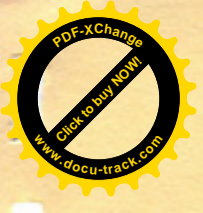
THIS GAME MUST BE GROUNDED, FAILURE TO DO SO MAY RESULT IN DESTRUCTION TO ELECTRONIC COMPONENTS.

This EQUIPMENT complies with the requirements in part 15 of FCC rules for a class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to RADIO and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

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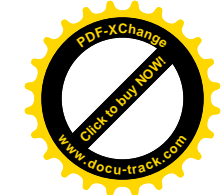
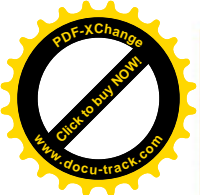
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M.P.U. BOARD
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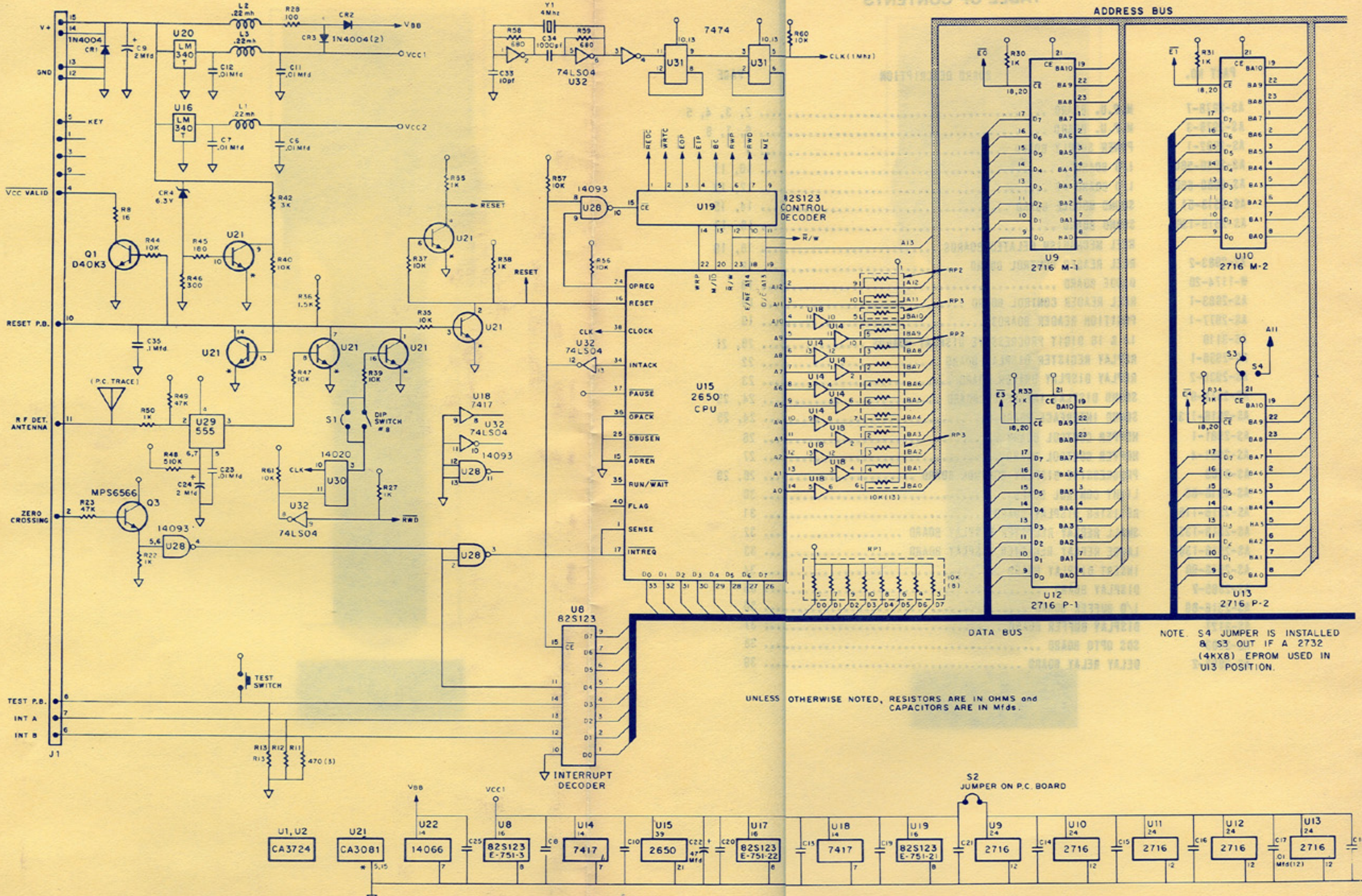
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M.P.U. BOARD

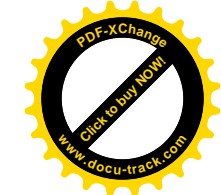
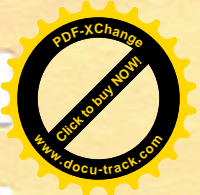
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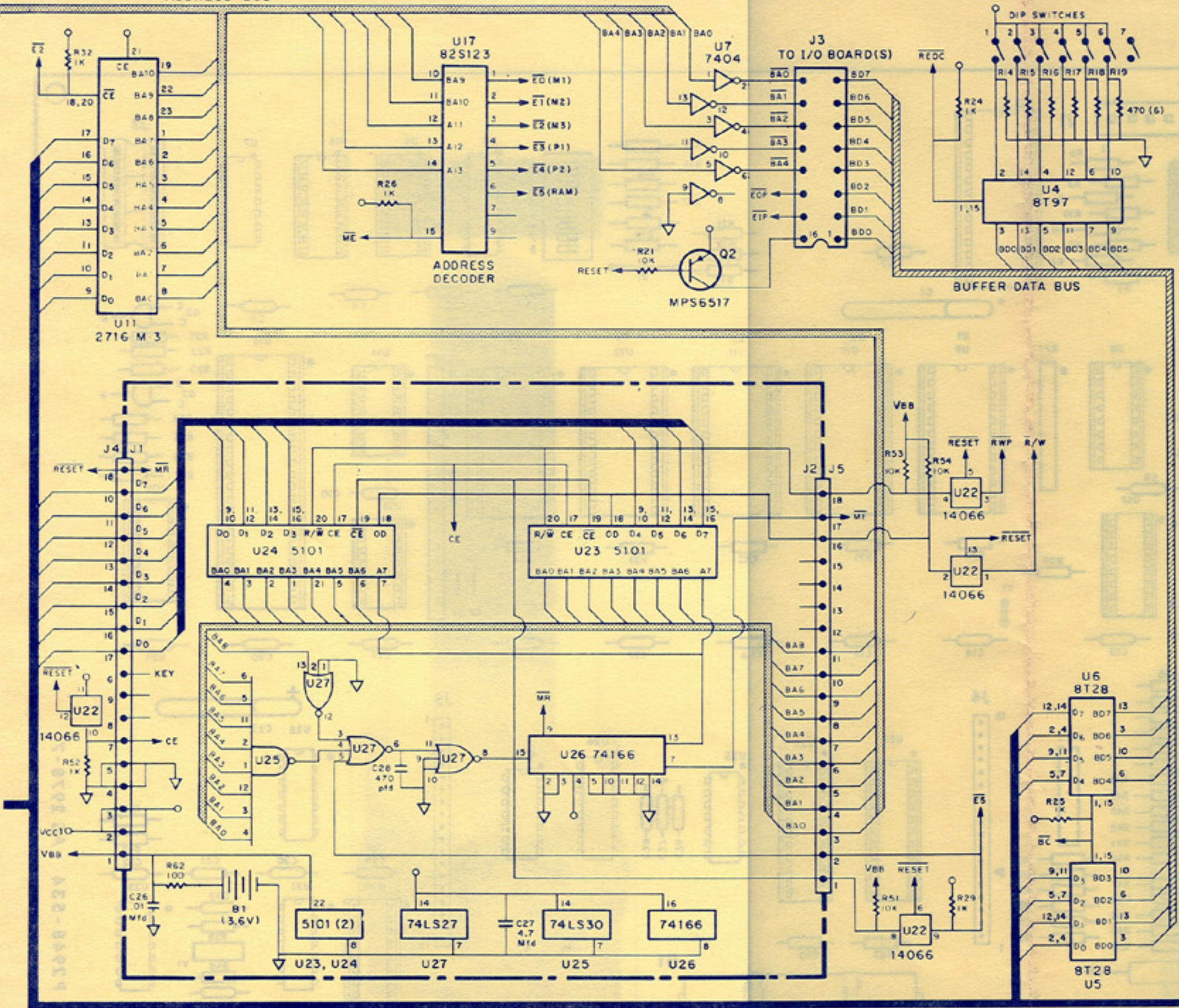
NOTE: S4 JUMPER IS INSTALLED & S3 OUT IF A 2732 (4KX8) EPROM USED IN U13 POSITION.

UNLESS OTHERWISE NOTED, RESISTORS ARE IN OHMS and CAPACITORS ARE IN Mfd.

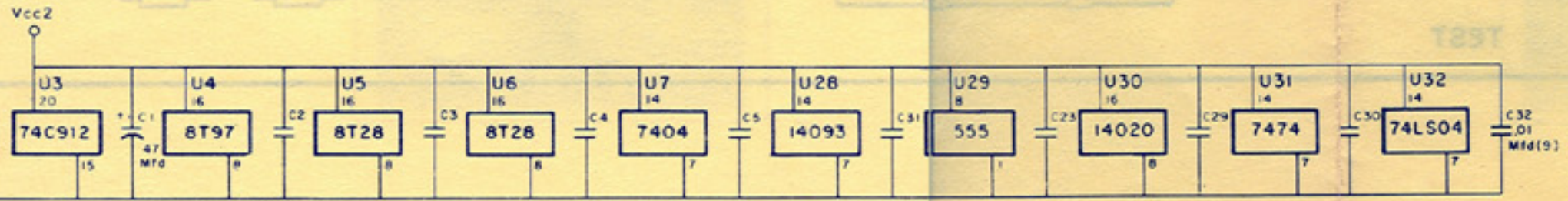
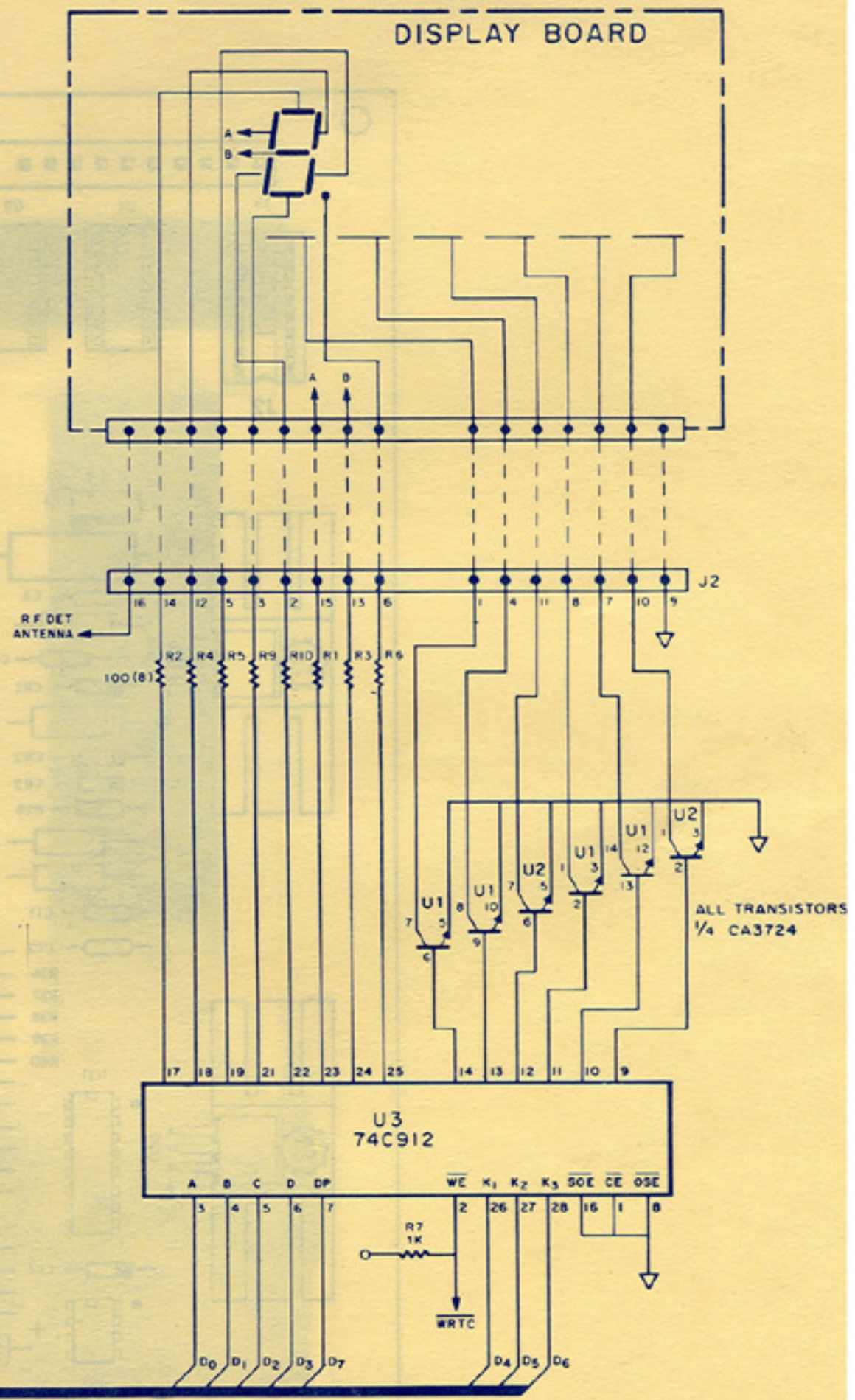
S2 JUMPER ON P.C. BOARD

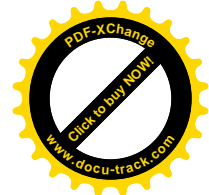


ADDRESS BUS



DISPLAY BOARD





M.P.U. BOARD

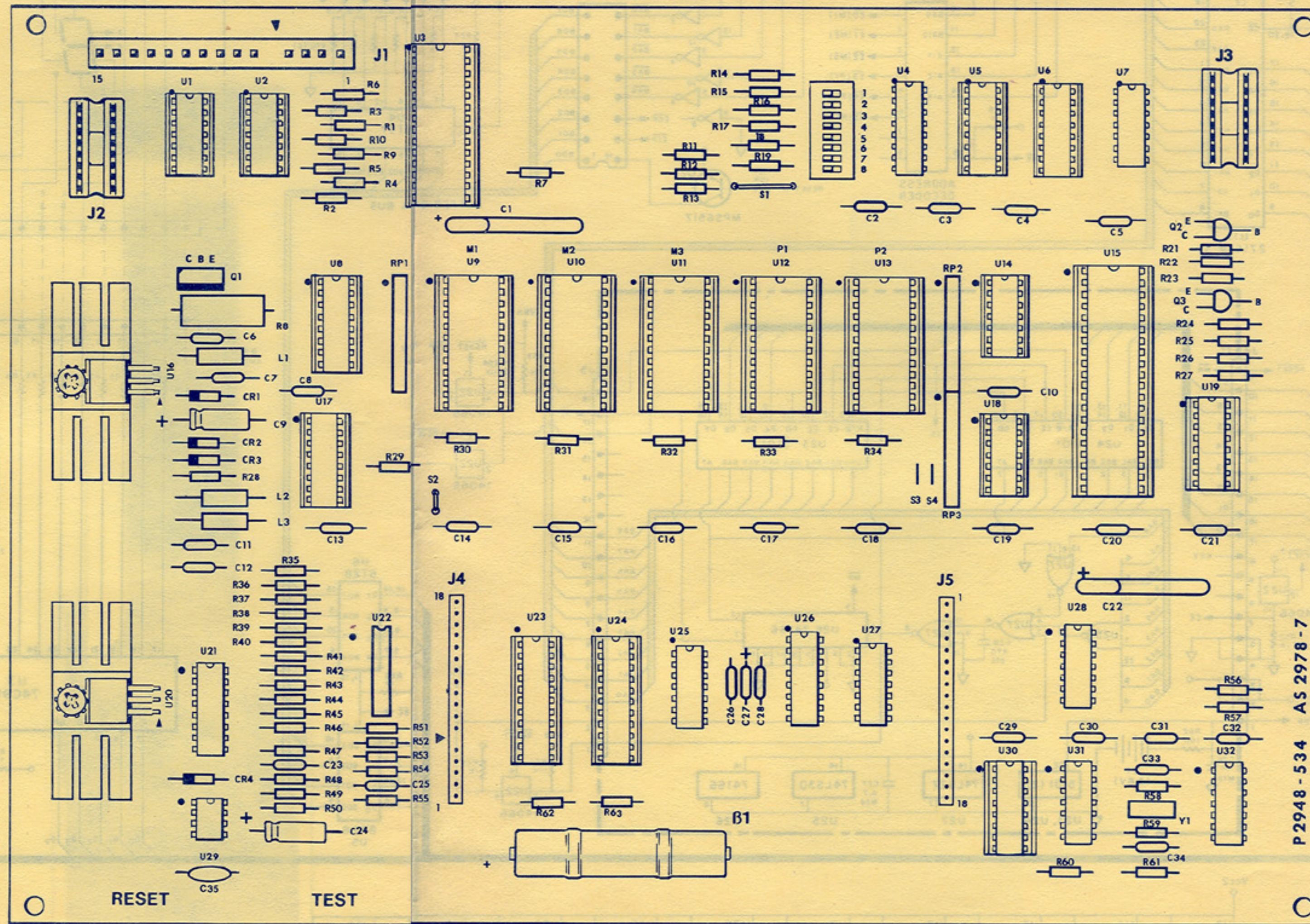
AS-2978-7 M.P.U. BOARD ASSEMBLY

SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION
U1, U2	E-681-1	I.C. CA3724 NPN Trans. Array	U21	E-681	I.C. 3081 NPN Transistor Array	R48	E-105-304	510K Ohm Resistor
	E-712-5	14 Pin D.I.P. Socket	U22	E-620-196	I.C. 14066 Quad Analog Switch	R49	E-105-263	47K Ohm Resistor
U3	E-620-244	I.C. 74C912 Display Controller/Dr.	U23, U24	E-620-42	I.C. P-5101L-3 CMOS Ram	R50	E-105-230	1K Ohm Resistor
	E-712-26	26 Pin D.I.P. Socket		E-712-3	22 Pin D.I.P. Socket	R51	E-105-185	10K Ohm Resistor
U4	E-620-69	I.C. 8T97 Tri-State Buffer	U25	E-620-81	I.C. 74LS30 Eight Input NAND	R52	E-105-230	1K Ohm Resistor
U5, U6	E-620-68	I.C. 8T28 Tri-State Transceiver	U26	E-620-86	I.C. 74166 Eight Bit S.R.	R53, R54	E-105-185	10K Ohm Resistor
	E-712-4	16 Pin D.I.P. Socket	U27	E-620-80	I.C. 74LS27 Triple Input Nor	R55	E-105-230	1K Ohm Resistor
U7	E-620-10	I.C. 7404 Hex Inverter	U28	E-620-170	I.C. 14093 Quad Schmitt Trigger	R56, R57	E-105-185	10K Ohm Resistor
U8	E-751-3	I.C. 82S123 Interrupt Decoder Prom	U29	E-620-4	I.C. 555 Timer	R58, R59	E-105-277	680 Ohm Resistor
	E-712-4	16 Pin D.I.P. Socket	U30	E-620-67	I.C. 14020 Counter	R60, R61	E-105-185	10K Ohm Resistor
U9 *	E-755 Series	I.C. Memory (M-1)		E-712-4	16 Pin D.I.P. Socket	R62	E-105-301	100 Ohm Resistor
	E-712	24 Pin D.I.P. Socket	U31	E-620-25	I.C. 7474 Dual D-FF	R63	Not used	
U10 *	E-755 Series	I.C. Memory (M-2)	U32	E-620-60	I.C. 74LS04 Hex Inverter	RP1 Thru RP3	E-835-9	10K SIP (10 Pin) (Pull-Up)
	E-712	24 Pin D.I.P. Socket	Q1	E-585-75	D40K3 NPN Darlington Trans.	C1	E-586-148	47 mfd. 16V. Electrolytic
U11 *	E-755 Series	I.C. Memory (M-3)	Q2	E-585-4	MPS6517 PNP Transistor	C2 Thru C8	E-586-85	.01 mfd. 25V. Ceramic
	E-712	24 Pin D.I.P. Socket	Q3	E-585-2	MPS6566 NPN Transistor	C9	E-586-8	2 mfd. 25V. Min. Electrolytic
U12	E-712	24 Pin D.I.P. Socket (P-1)	CR1 Thru CR3	E-587-6	1N4004 Diode	C10 Thru C21	E-586-85	.01 mfd. 25V. Ceramic
U13	E-712	24 Pin D.I.P. Socket (P-2)	CR4	E-598-19	6.3V. 1% Zener Diode	C22	E-586-148	47 mfd. 16V. Electrolytic
U14	E-620-65	I.C. 7417 Hex Buffer	R1 Thru R6	E-105-301	100 Ohm Resistor	C23	E-586-85	.01 mfd. 25V. Ceramic
	E-712-5	14 Pin D.I.P. Socket	R7	E-105-230	1K Ohm Resistor	C24	E-586-8	2 mfd. 25V. Min. Electrolytic
U15	E-620-53	I.C. 2850 CPU	R8	E-105-408	16 Ohm 1W. 5% Carbon Resistor	C25, C26	E-586-85	.01 mfd. 25V. Ceramic
	E-712-1	40 Pin D.I.P. Socket	R9, R10	E-105-301	100 Ohm Resistor	C27	E-586-73	4.7 mfd. Tantalum
U16	E-620-66	LM-340T-5 5VDC Regulator	R11 Thru R19	E-105-280	470 Ohm Resistor	C28	E-586-94	470 pfd. Ceramic
	E-682-10	Heat Sink THM-6070 (Upper)	R20	Deleted		C29 Thru C32	E-586-85	.01 mfd. 25V. Ceramic
	E-682-9	Heat Sink THM-6071 (Lower)	R21	E-105-185	10K Ohm Resistor	C33	E-586-93	10 pfd. Ceramic
	LSPR-632-1106	Screw	R22	E-105-230	1K Ohm Resistor	C34	E-586-95	1000 pfd. Ceramic
	M-1700-6	Lockwasher	R23	E-105-263	47K Ohm Resistor	C35	E-586-44	.1 mfd. 100V. Polyester
	N-632-2112	Nut	R24 Thru R27	E-105-230	1K Ohm Resistor	L1 Thru L3	E-604-3	.22 MH Inductor
U17	E-751-27	I.C. 82S123 Memory Address Decoder Prom	R28	E-105-301	100 Ohm Resistor	Dip Switch	E-677	(8) SPST
	E-712-4	16 Pin D.I.P. Socket	R29 Thru R34	E-105-230	1K Ohm Resistor	Test-Reset	Not used	
U18	E-620-65	I.C. 7417 Hex Buffer	R35	E-105-185	10K Ohm Resistor	Y1	E-744	4 MHZ Quartz Crystal
	E-712-5	14 Pin D.I.P. Socket	R36	E-105-229	1.5K Ohm Resistor	J1	E-736-15	15 Pin KK156 Wafer
U19	E-751-21	I.C. 82S123 Control Decoder Prom	R37	E-105-185	10K Ohm Resistor	J2, J3	E-712-8	16 Pin Dip Socket
	E-712-4	16 Pin D.I.P. Socket	R38	E-105-230	1K Ohm Resistor	J4, J5	Not used	
U20	E-620-66	LM-340T-S 5VDC Regulator	R39, R40	E-105-185	10K Ohm Resistor	B1	E-628-4	Battery (3.6 VDC. NI-CAD.)
	E-682-10	Heat Sink THM-6070	R42	E-105-333	3K Ohm Resistor	S1		Wire Jumper in Circuit
	E-682-9	Heat Sink THM-6071	R44	E-105-185	10K Ohm Resistor	S2		Wire Jumper in Circuit
	LSPR-632-1106	Screw	R45	E-105-235	180 Ohm Resistor	S3		Wire Jumper in Circuit
	M-1700-6	Lockwasher	R46	E-105-406	300 Ohm Resistor	S4		Not Used
	N-632-2112	Nut	R47	E-105-185	10K Ohm Resistor			

* Universal Slot Program (USP) Versions will vary.

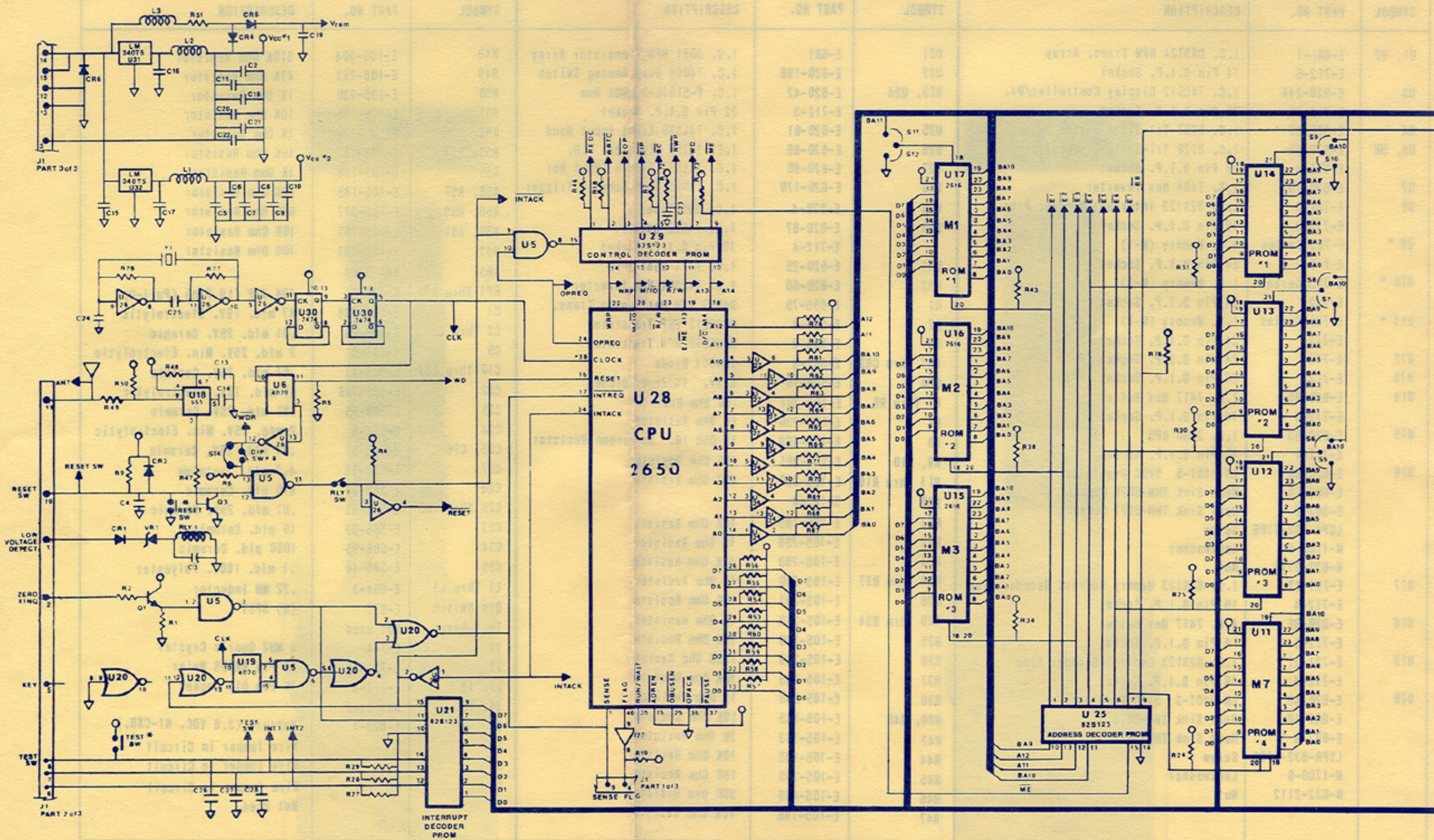
NOTE: All Resistors are Carbon Type, 1/4 W. 5% Unless Noted.
U16 & U20; Use Thermal Compound as Needed.

M.P.U. BOARD

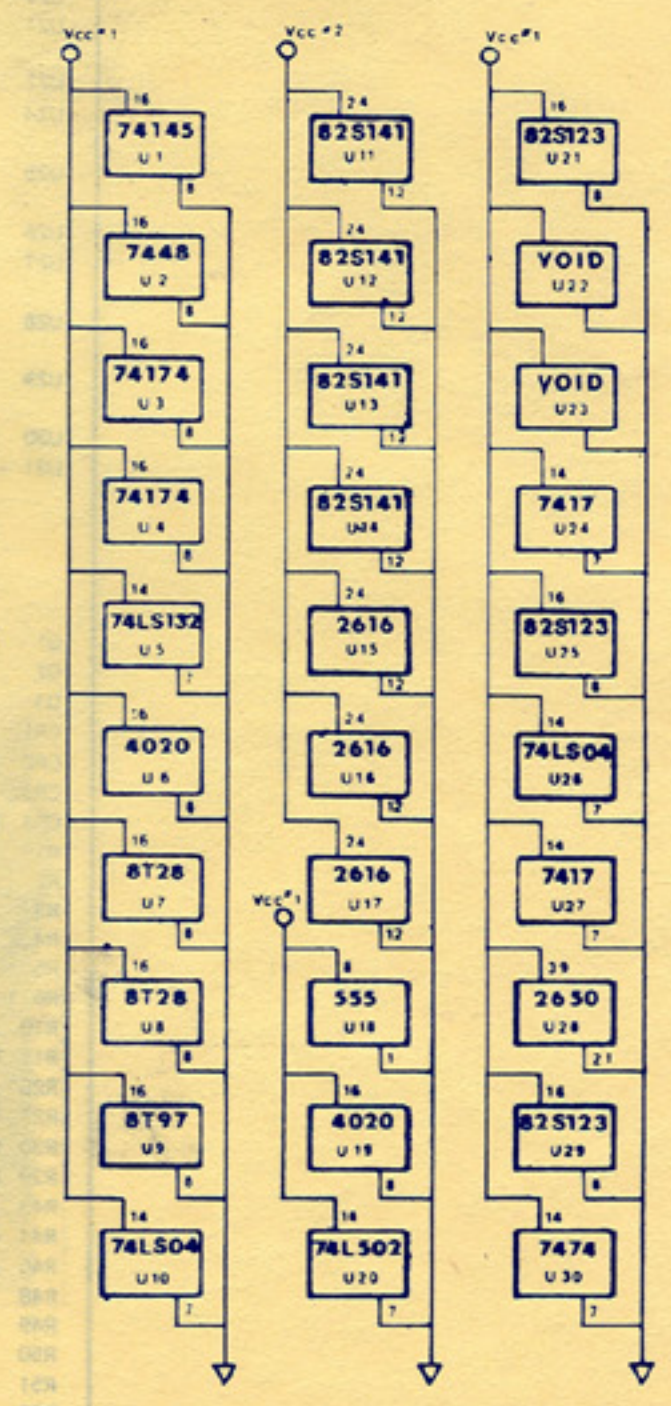
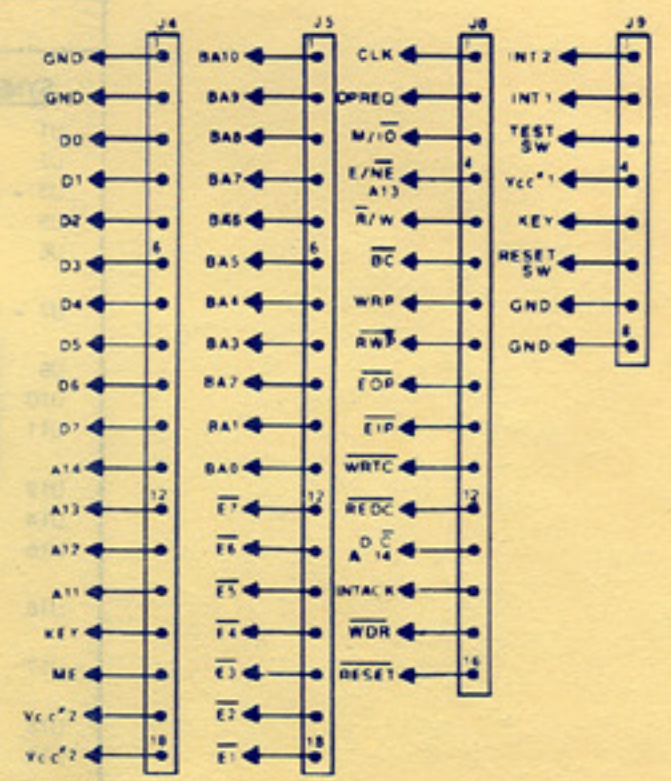
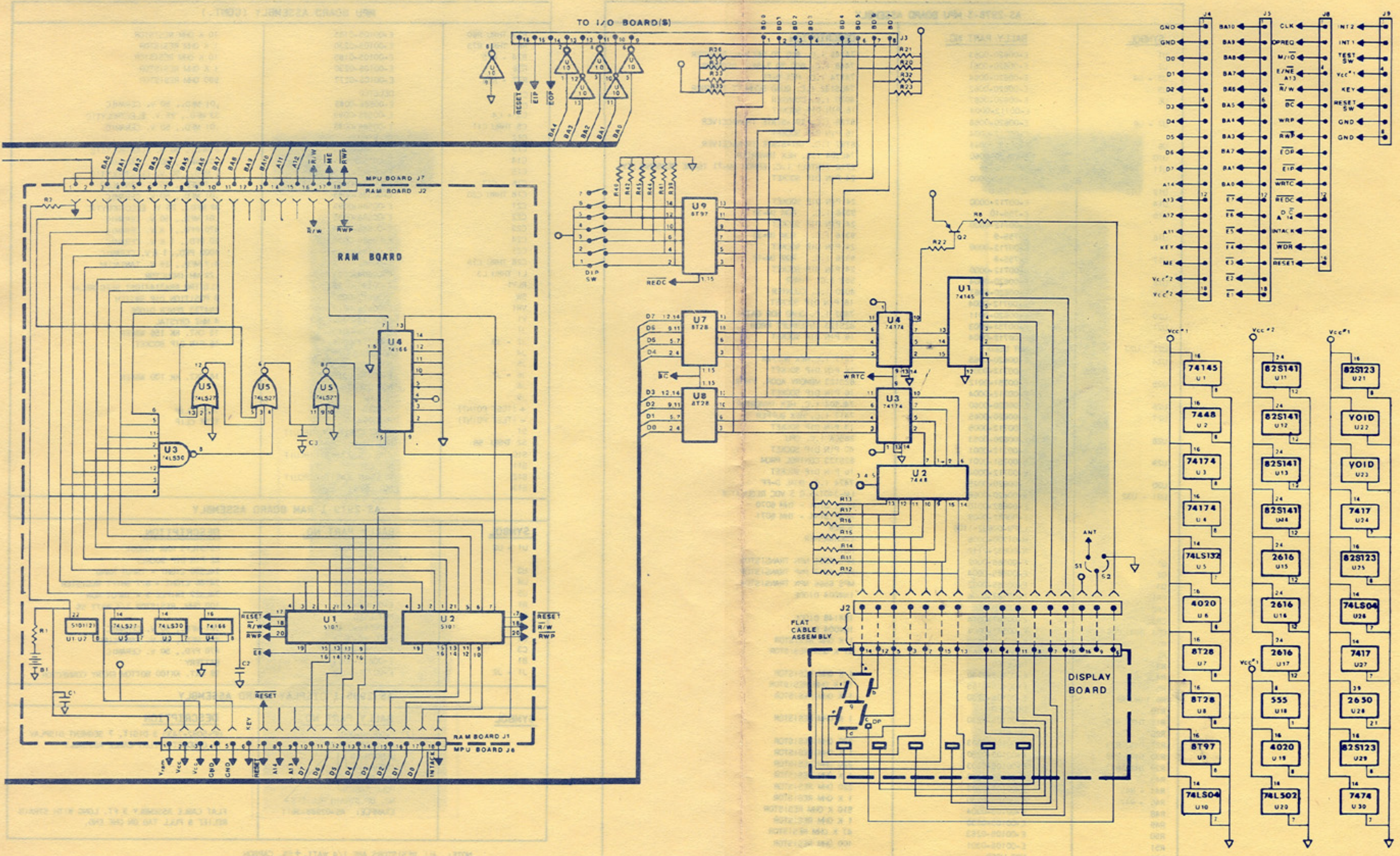


P 2948 - 534 AS 2978 - 7

M.P.U. BOARD



*These switches are not installed
 NOTE: All resistors are Carbon Type, 1/4 W. or Unless Noted.
 U18 & U19: See Thermal Compound as Needed.





AS-2978-3 MPU BOARD ASSEMBLY

<u>SYMBOL</u>	<u>BALLY PART NO.</u>	<u>DESCRIPTION</u>
U1	E-00620-0063	74145 I.C. BCD TO DECIMAL DECODER
U2	E-00620-0061	7448 I.C. BCD TO 7-SEG. DECODER
U3 - U4	E-00620-0064	74174 I.C. HEX D-FF
U5	E-00620-0062	74LS132 I.C. QUAD SCHMITT TRIGGER
U6	E-00620-0067 E-00712-0004	4020 I.C. COUNTER 16 PIN DIP SOCKET
U7 - U8	E-00620-0068 E-00712-0004	8T28 I.C. TRI-STATE TRANSCEIVER 16 PIN DIP SOCKET
U9	E-00620-0069	8T97 I.C. TRI-STATE TRANSCEIVER
U10	E-00620-0060	74LS04 I.C. HEX INVERTER
U11	EWRO-M2716 E-00712-0000	2716 (INTEL) I.C. EPROM (M-7) (GAME PERSONALITY) 24 PIN DIP SOCKET
U12 U13	NOT USED	
U14	E-00712-0000	24 PIN DIP SOCKET
U15	E-755-10 E-00712-0000	9316 I.C. ROM (M-3) 24 PIN DIP SOCKET
U16	E-755-9 E-00712-0000	9316 I.C. ROM (M-2) 24 PIN DIP SOCKET
U17	E-755-8 E-00712-0000	9316 I.C. ROM (M-1) 24 PIN DIP SOCKET
U18	E-00620-0004	555 I.C. TIMER
U19	E-00620-0067 E-00712-0004	4020 I.C. COUNTER 16 PIN DIP SOCKET
U20	E-00620-0011	7402 I.C. QUAD NOR GATE
U21	E-00751-0003 E-00712-0004	82S123 INTERRUPT PROM 16 PIN DIP SOCKET
U22 U23	NOT USED	
U24	E-00620-0065 E-00712-0005	7417 I.C. HEX BUFFER 14 PIN DIP SOCKET
U25	E-00751-0012 E-00712-0004	82S123 MEMORY ADDR. PROM 16 PIN DIP SOCKET
U26	E-00620-0060	74LS04 I.C. HEX INVERTER
U27	E-00620-0065 E-00712-0005	7417 I.C. HEX BUFFER 14 PIN DIP SOCKET
U28	E-00620-0053 E-00712-0001	2650A I.C. CPU 40 PIN DIP SOCKET
U29	E-00751-0001 E-00712-0004	82S123 CONTROL PROM 16 PIN DIP SOCKET
U30	E-00620-0025	7474 I.C. DUAL D-FF
U31 - U32	E-00620-0066 E-00682-0010 E-00682-0009 LSPR-00632-1106 M-01700-0006 N-00632-2112	LM-340T-5.0 5 VDC REGULATOR HEAT SINK - THM 6070 HEAT SINK - THM 6071 SCREW LOCKWASHER NUT
Q1	E-00585-0002	MPS 8566 NPN TRANSISTOR
Q2	E-00585-0004	MPS 8517 PNP TRANSISTOR
Q3	E-00585-0002	MPS 8566 NPN TRANSISTOR
CR1	E-00587-0006	1N4004 DIODE
CR2	DELETED	
CR3	E-00587-0014	1N4148 DIODE
CR4 THRU CR6	E-00587-0006	1N4004 DIODE
R1	E-00105-0230	1 K OHM RESISTOR
R2	E-00105-0263	47 K OHM RESISTOR
R3	DELETED	
R4	E-00105-0230	1 K OHM RESISTOR
R5	E-00105-0185	10 K OHM RESISTOR
R6 THRU R9	E-00105-0230	1 K OHM RESISTOR
R10	DELETED	
R11 THRU R25	E-00105-0230	1 K OHM RESISTOR
R26	DELETED	
R27 THRU R29	E-00105-0303	220 OHM RESISTOR
R30 THRU R38	E-00105-0230	1 K OHM RESISTOR
R39 THRU R42	E-00105-0303	220 OHM RESISTOR
R43	E-00105-0230	1 K OHM RESISTOR
R44 - R45	E-00105-0303	220 OHM RESISTOR
R46 - R47	E-00105-0230	1 K OHM RESISTOR
R48	E-00105-0304	510 K OHM RESISTOR
R49	E-00105-0230	1 K OHM RESISTOR
R50	E-00105-0263	47 K OHM RESISTOR
R51	E-00105-0301	100 OHM RESISTOR
R52	NOT USED	

MPU BOARD ASSEMBLY (CONT.)

R53 THRU R60	E-00105-0185	10 K OHM RESISTOR
R61 THRU R73	E-00105-0230	1 K OHM RESISTOR
R74 - R75	E-00105-0185	10 K OHM RESISTOR
R76	E-00105-0230	1 K OHM RESISTOR
R77 - R78	E-00105-0277	680 OHM RESISTOR
C1	DELETED	
C2	E-00586-0085	.01 MFD., 50 V. CERAMIC
C3 - C4	E-00586-0099	33 MFD., 25 V. ELECTROLYTIC
C5 THRU C11	E-00586-0085	.01 MFD., 50 V. CERAMIC
C12	DELETED	
C13	E-00586-0008	2 MFD., 50 V. ELECTROLYTIC
C14	E-00586-0085	.01 MFD., 50 V. CERAMIC
C15	E-00586-0008	2 MFD., 50 V. ELECTROLYTIC
C16 - C17	E-00586-0073	4.7 MFD., 25 V. TANTALUM
C18 THRU C20	E-00586-0085	.01 MFD., 50 V. CERAMIC
C21	E-00586-0099	33 MFD., 25 V. ELECTROLYTIC
C22	E-00586-0085	.01 MFD., 50 V. CERAMIC
C23	E-00586-0094	470 PFD., 1 K.V. CERAMIC
C24	E-00586-0093	10 PFD., 1 K.V. CERAMIC
C25	E-00586-0095	1000 PFD., 1 K.V. CERAMIC
C26 THRU C28	E-00586-0073	4.7 MFD., 25 V. TANTALUM
L1 THRU L3	E-00604-0003	.22 MH INDUCTOR
RLY1	E-00146-0796	ELECTRO #RA31441051 REED RELAY
SW	E-00677-0000	8 POSITION DIP SWITCH
VR1	E-00598-0013	1N4733 ZENER DIODE
Y1	E-00744-0000	4 MHZ CRYSTAL
J1	E-00736-0015	15 CKT. KK 156 WAFER
J2 - J3	E-00712-0008	16 PIN DIP SOCKET
J4	NOT USED	
J5	NOT USED	
J6 - J7	E-00770-0018	18 CKT. KK 100 WAFER
J8	NOT USED	
J9	NOT USED	
+ (TEST POINT)	P-5399	TEST CLIP
- (TEST POINT)	P-5399	TEST CLIP
S1	WIRE JUMPER IN CIRCUIT	
S2 THRU S9	NOT USED	
S10	WIRE IN JUMPER CIRCUIT	
S11	NOT USED	
S12	WIRE IN JUMPER CIRCUIT	
S13	NOT USED	

AS-2979-1 RAM BOARD ASSEMBLY

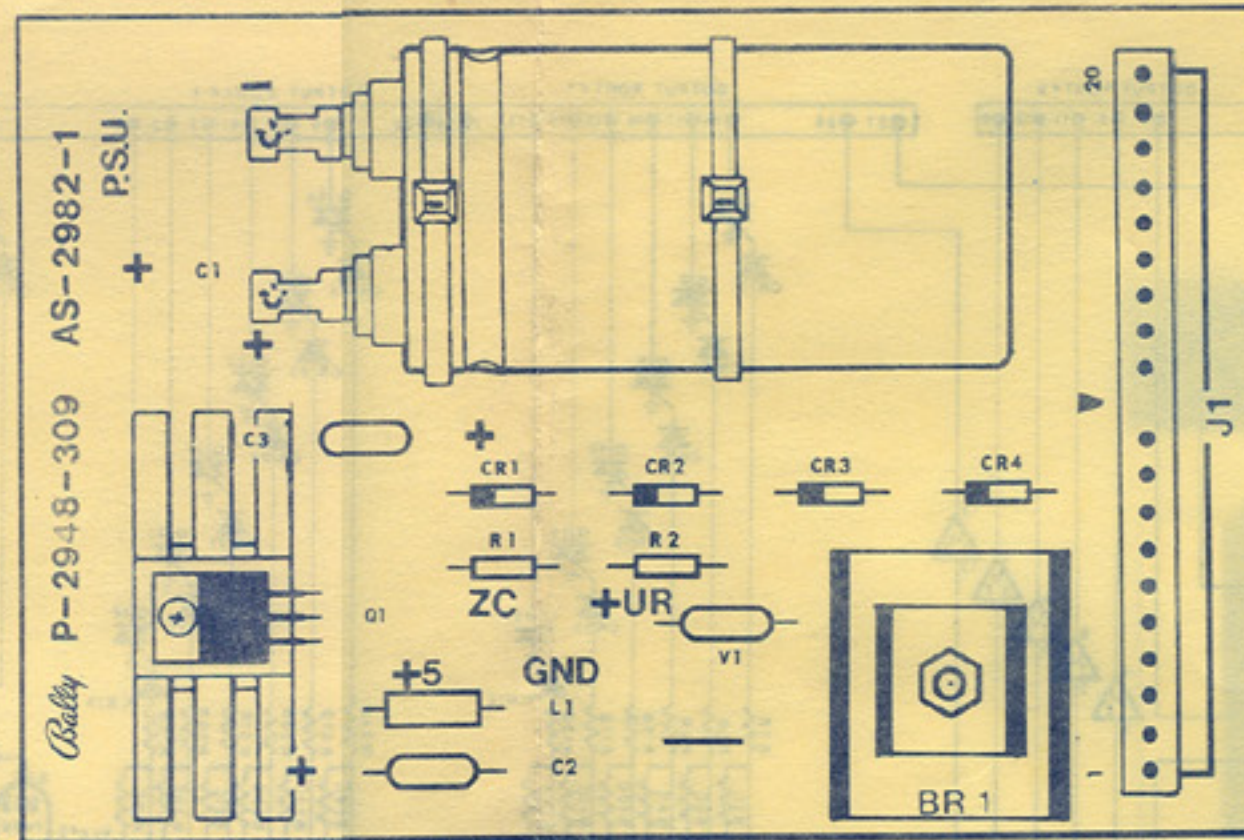
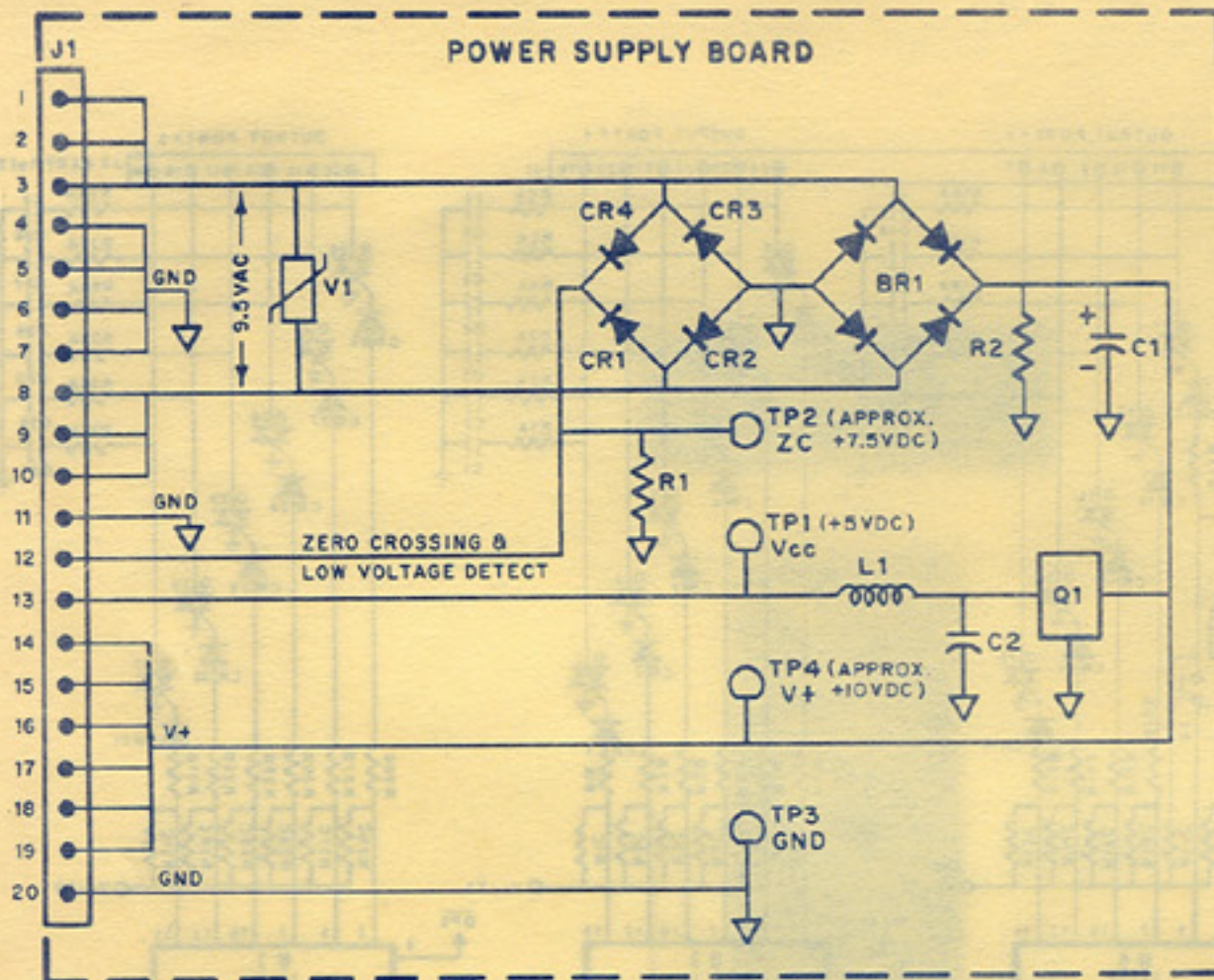
<u>SYMBOL</u>	<u>BALLY PART NO.</u>	<u>DESCRIPTION</u>
U1 - U2	E-00620-0042 (2) E-00712-0003	P5101L-3 RAM (QMS) 22 PIN DIP SOCKET
U3	E-00620-0081	74LS30 EIGHT - INPUT NAND
U4	E-00620-0086	74166 EIGHT - BIT SHIFT REGISTER
U5	E-00620-0080	74LS27 TRIPLE 3 - INPUT NOR
R1	E-00105-0301	100 OHM. RESISTOR 1/4 WATT 5%
R2	NOT USED	
C1	E-00586-0085	.01 MFD., 50 V. CERAMIC
C2	E-00586-0073	4.7 MFD., 25 V. TANTALUM
C3	E-00586-0094	470 PFD., 50 V. CERAMIC
B1	E-00628-0003	BATTERY
J1 - J2	E-00771-0018	18 CKT. KK100 BOTTOM ENTRY CONNECTOR

AS-2985-1 DISPLAY BOARD ASSEMBLY

<u>SYMBOL</u>	<u>BALLY PART NO.</u>	<u>DESCRIPTION</u>
	(2) E-00680-0002 AS-02988-XYZ LENGTH IN INCHES NO. OF PULL TABS NO. OF STRAIN RELIEFS EXAMPLE: AS-02988-3611	HP-5082-7433 3 DIGIT, 7 SEGMENT DISPLAY 16 CONDUCTOR FLAT CABLE ASSEMBLY FLAT CABLE ASSEMBLY 3 FT. LONG WITH STRAIN RELIEF & PULL TAB ON ONE END.

NOTE: ALL RESISTORS ARE 1/4 WATT, ±5%, CARBON

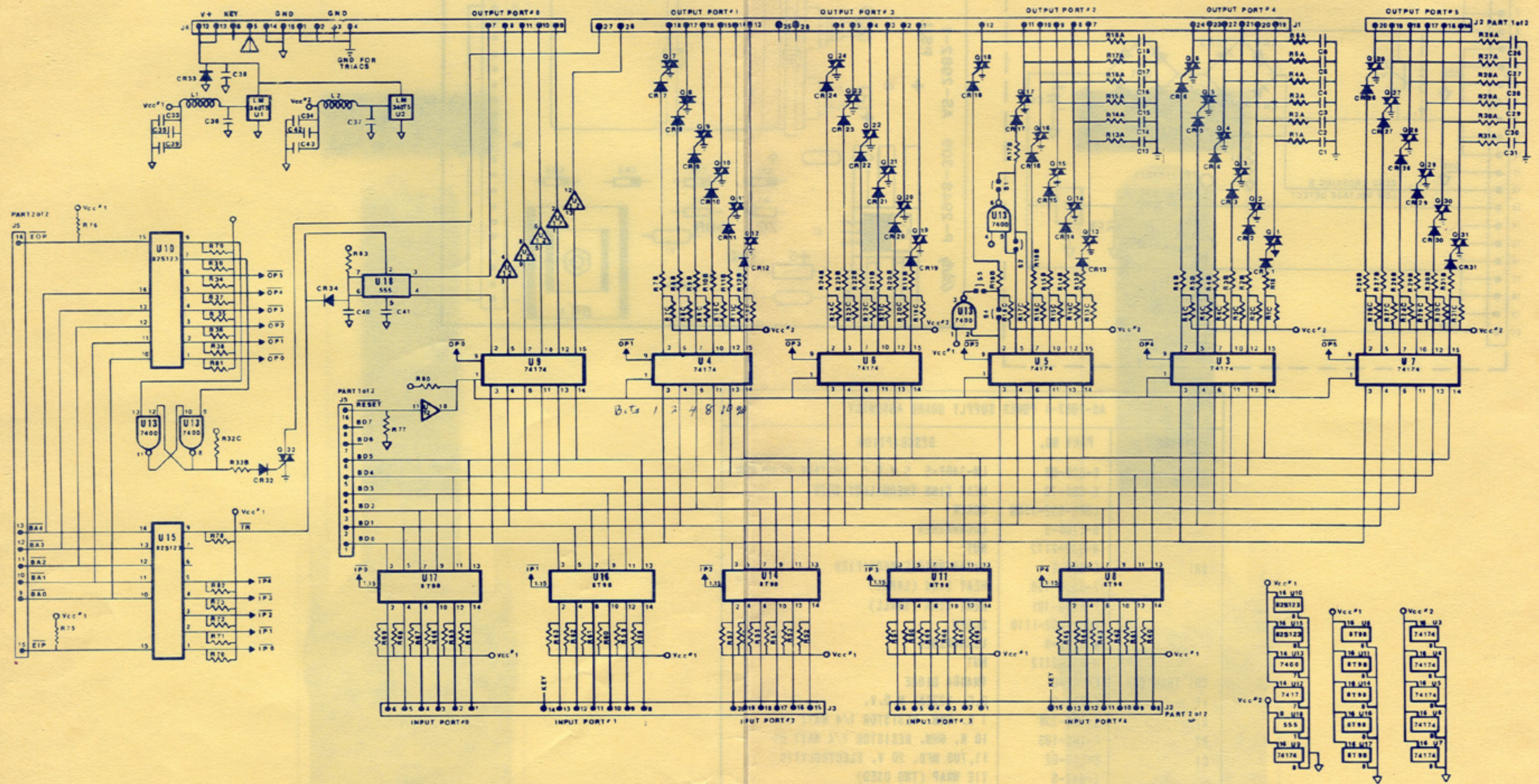
POWER SUPPLY BOARD



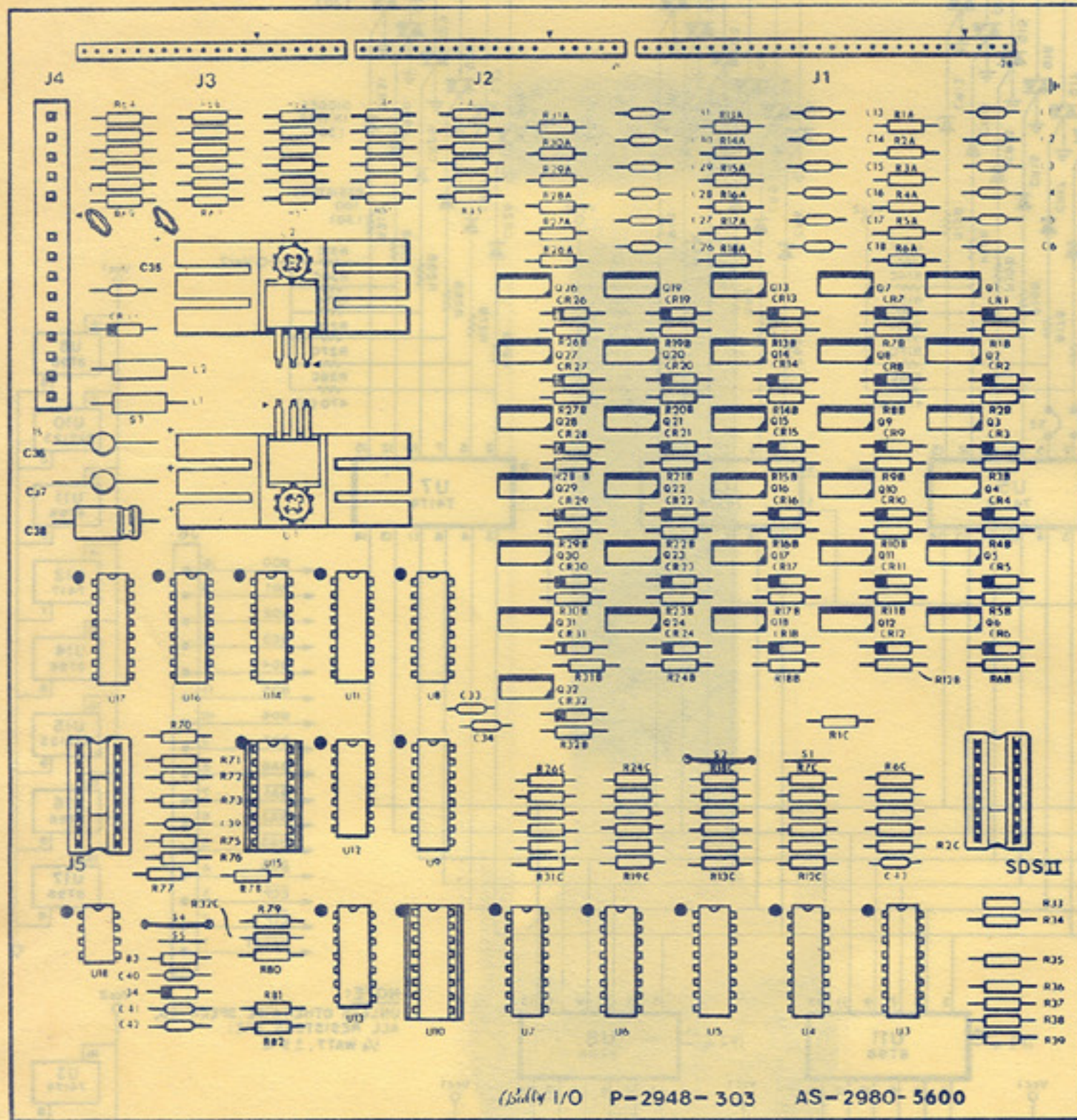
AS-2982-1 POWER SUPPLY BOARD ASSEMBLY		
SYMBOL	PART NO.	DESCRIPTION
Q1	E-620-66	LM-340T-5 5 V.D.C. VOLTAGE REGULATOR
	E-882-10	HEAT SINK THERMALLOY 6070
	LSPR-632-1106	SCREW
	M-1700-6	LOCKWASHER
	N-832-2112	NUT
BR1	E-602-3	VJ248 BRIDGE RECTIFIER
	P-6629-158	HEAT SINK (LARGE)
	P-6629-191	HEAT SINK (SMALL)
	LSPR-632-1110	SCREW
	M-1700-6	LOCKWASHER
CR1 THRU CR4	N-832-2112	NUT
	E-587-6	1N4004 DIODE
	V1	G.E. V22ZA1 M.O.V.
R1	E-105-230	1 K. OHM. RESISTOR 1/4 WATT 5%
R2	E-105-185	10 K. OHM. RESISTOR 1/4 WATT 5%
C1	E-586-62	11,700 MFD. 20 V. ELECTROLYTIC
	E-647-5	TIE WRAP (TWO USED)
C2	E-586-8	2 MFD. 50 V. ELECTROLYTIC
C3	NOT USED	
L1	E-604-3	.22 M.H. INDUCTOR
TP1 THRU TP4	P-5399	TEST CLIP (TEST POINT)
J1	E-736-10	10 CKT. KK156 WAFER (2)
S1		WIRE JUMPER IN CIRCUIT



I/O BOARD

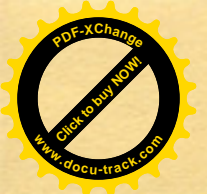


I/O BOARD

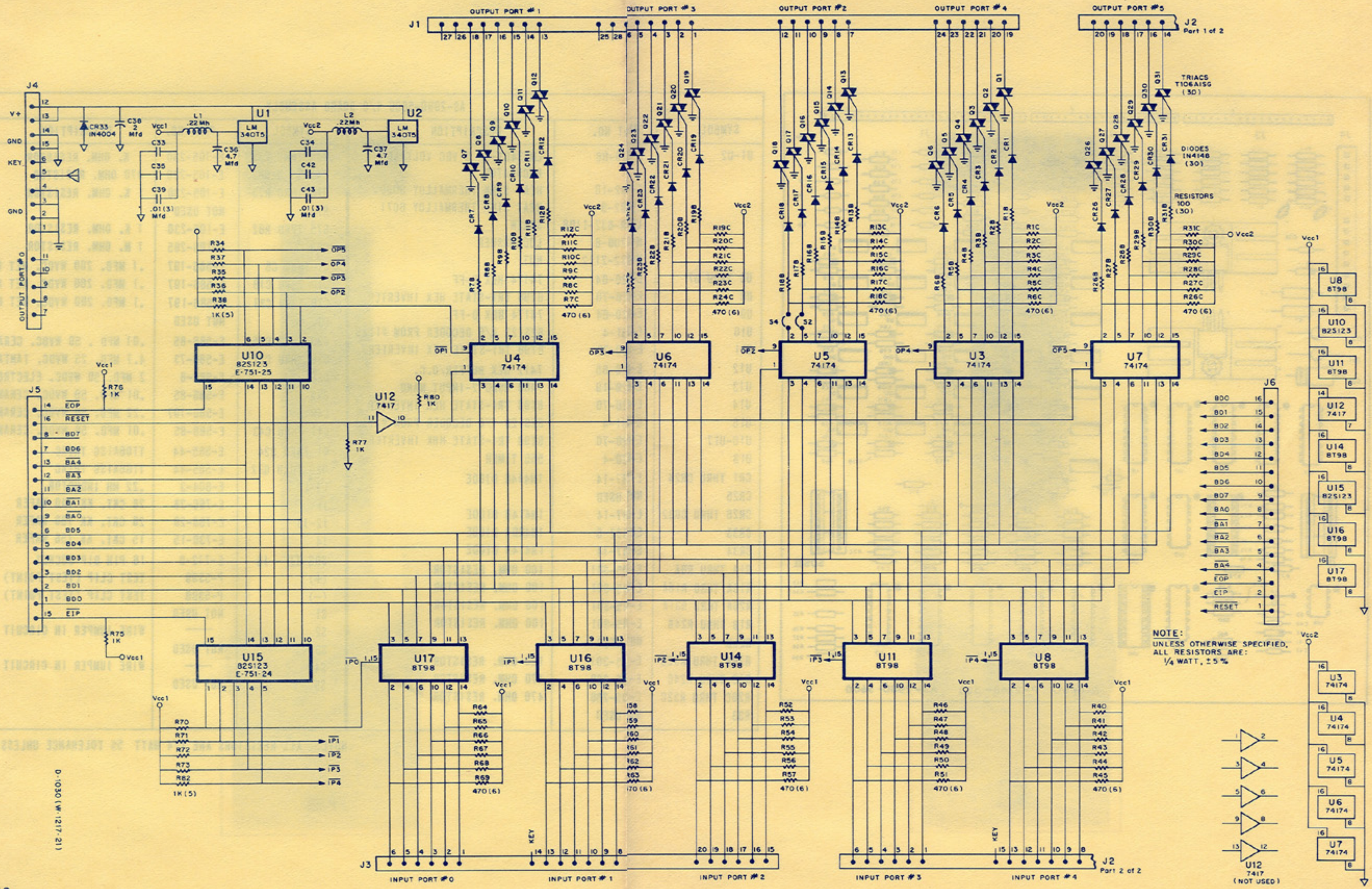


AS-2980-5600 I/O BOARD ASSEMBLY					
SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION
U1-U2	E-620-66	LM-340T-5 5 VDC VOLTAGE REGULATOR	R34 THRU R39	E-105-230	1 K. OHM. RESISTOR
	E-662-10	HEAT SINK THERMALLOY 6070	R40 THRU R69	E-105-280	470 OHM. RESISTOR
	E-682-9	HEAT SINK THERMALLOY 6071	R70 THRU R73	E-105-230	1 K. OHM. RESISTOR
	LSPR-632-1106	SCREW	R74	NOT USED	
	M-1700-6	LOCKWASHER	R75 THRU R82	E-105-230	1 K. OHM. RESISTOR
	N-632-2112	NUT	R83	E-105-285	1 M. OHM. RESISTOR
U3 THRU U7	E-620-64	74174 HEX D-FF	C1 THRU C6	E-586-197	.1 MFD. 200 WVDC. MET FILM
U8	E-620-70	8T98 TRI-STATE HEX INVERTER	C13 THRU C18	E-586-197	.1 MFD. 200 WVDC. MET FILM
U9	E-620-64	74174 HEX D-FF	C26 THRU C31	E-586-197	.1 MFD. 200 WVDC. MET FILM
U10	E-751-4	82S123 I/O DECODER PROM #1129	C32	NOT USED	
U11	E-620-70	8T98 TRI-STATE HEX INVERTER	C33 THRU C35	E-586-85	.01 MFD . 50 WVDC. CERAMIC
U12	E-620-65	7417 HEX BUFFER/O.C.	C36 THRU C37	E-586-73	4.7 MFD. 25 WVDC. TANTALUM
U13	E-620-19	7400 QUAD 2-INPUT NAND	C38	E-586-8	2 MFD. 50 WVDC. ELECTROLYTIC
U14	E-620-70	8T98 TRI-STATE HEX INVERTER	C39	E-586-85	.01 MFD. 50 WVDC. CERAMIC
U15	E-751-4	82S123 I/O DECODER PROM #1129	C40	E-586-107	.22 MFD. 50 WVDC. CERAMIC
U16-U17	E-620-70	8T98 TRI-STATE HBX INVERTER	C41 THRU C43	E-586-85	.01 MFD. 50 WVDC. CERAMIC
U18	E-620-4	555 TIMER	Q1 THRU Q24	E-585-44	T106A1SG TRIAC
CR1 THRU CR24	E-587-14	1N4148 DIODE	Q26 THRU Q32	E-585-44	T106A1SG TRIAC
CR25	NOT USED		L1-L2	E-604-3	.22 MH INDUCTOR
CR26 THRU CR32	E-587-14	1N4148 DIODE	J1	E-766-28	28 CKT. KK 100 WAFER
CR33	EP-587-6	1N4004 DIODE	J2-J3	E-766-20	20 CKT. KK 100 WAFER
CR34	E-587-14	1N4148 DIODE	J4	E-736-15	15 CKT. KK 156 WAFER
R1A THRU R6A	E-105-301	100 OHM. RESISTOR	SDS II - J5	E-712-8	16 PIN DIP SOCKET
R13A THRU R18A	E-105-301	100 OHM. RESISTOR	(+)	P-5399	TEST CLIP (TEST POINT)
R26A THRU R31A	E-105-301	100 OHM. RESISTOR	(-)	P-5399	TEST CLIP (TEST POINT)
R1B THRU R24B	E-105-301	100 OHM. RESISTOR	S1	NOT USED	
R25B	NOT USED		S2	---	WIRE JUMPER IN CIRCUIT
R26B THRU R32B	E-105-301	100 OHM. RESISTOR	S3	NOT USED	
R1C THRU R24C	E-105-280	470 OHM. RESISTOR	S4	---	WIRE JUMPER IN CIRCUIT
R26C THRU R32C	E-105-280	470 OHM. RESISTOR	S5	NOT USED	
R33	NOT USED				

NOTE: ALL RESISTORS ARE 1/4 WATT 5% TOLERANCE UNLESS NOTED.



I/O BOARD #2

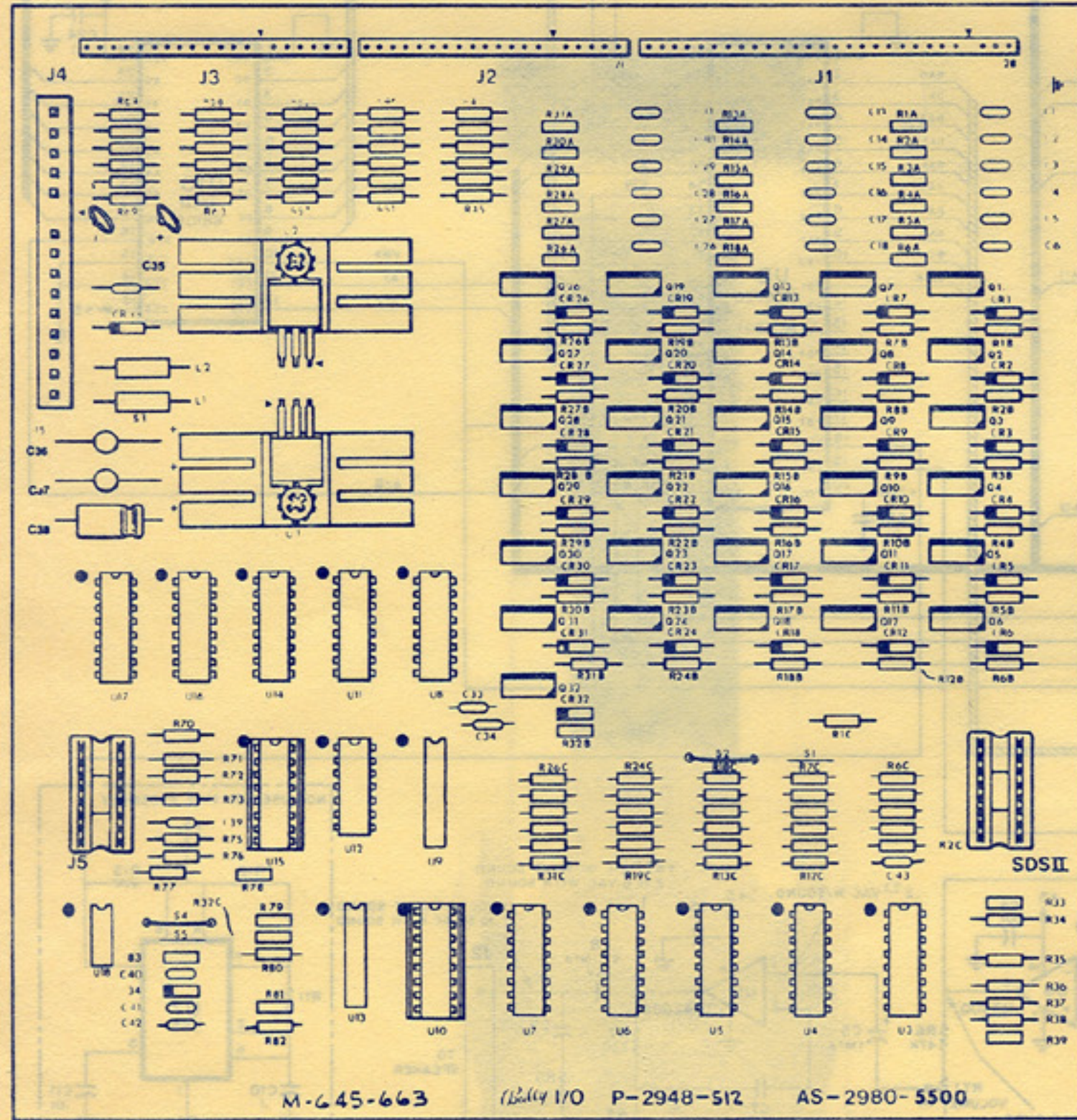


NOTE:
UNLESS OTHERWISE SPECIFIED,
ALL RESISTORS ARE:
1/4 WATT, ± 5 %

D-1030 (W-1217-211)



I/O BOARD #2

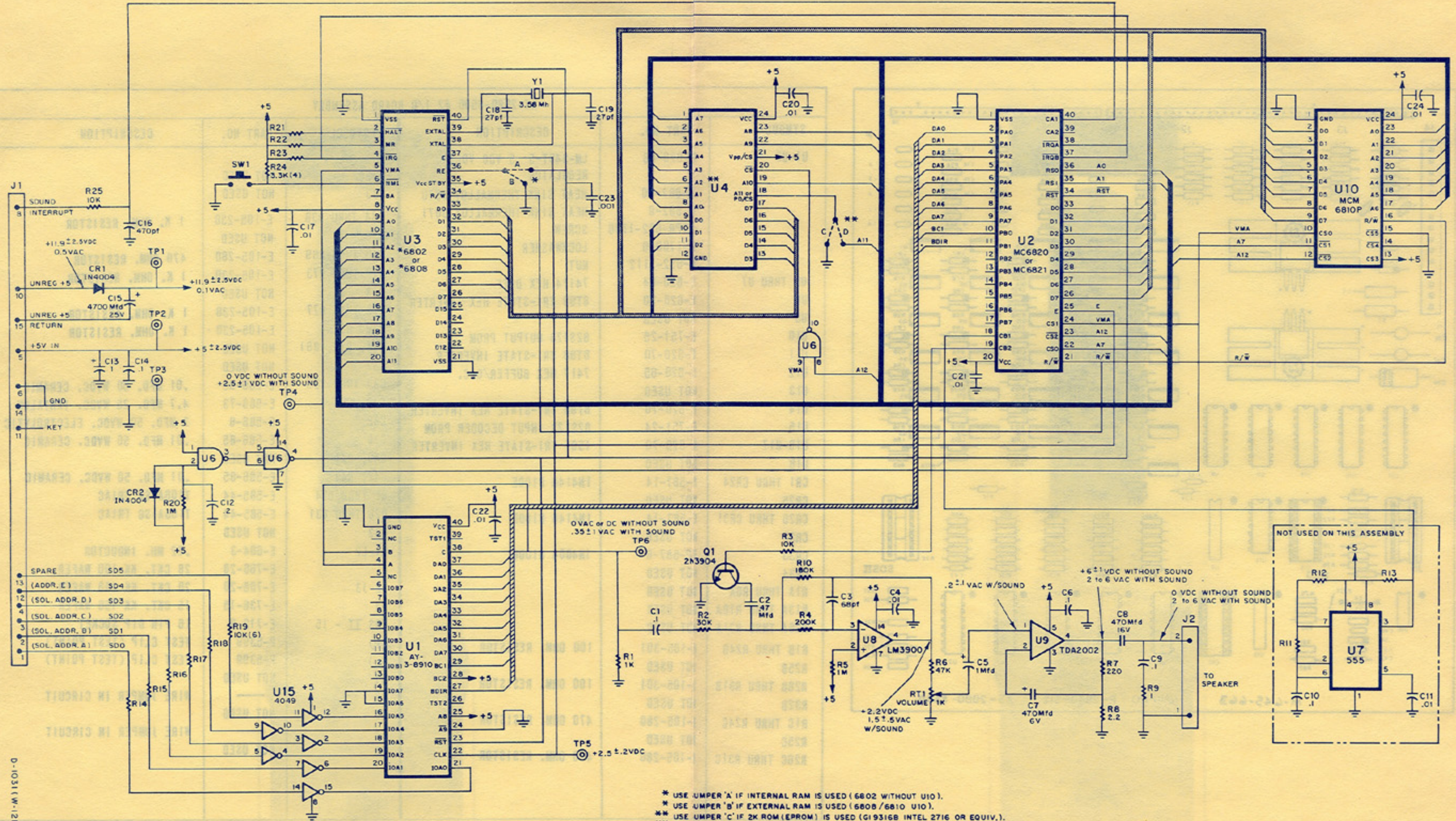


AS-2980-5500 #2 I/O BOARD ASSEMBLY

SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION
U1-U2	E-620-66	LM-340T-5 5 VDC VOLTAGE REGULATOR	R32C	NOT USED	
	E-682-10	HEAT SINK THERMALLOY 6070	R33	NOT USED	
	E-682-9	HEAT SINK THERMALLOY 6071	R34 THRU R38	E-105-230	1 K. OHM. RESISTOR
	LSPR-632-1106	SCREW	R39	NOT USED	
	M-1700-6	LOCKWASHER	R40 THRU R69	E-105-280	470 OHM. RESISTOR
	N-632-2112	NUT	R70 THRU R73	E-105-230	1 K. OHM. RESISTOR
U3 THRU U7	E-620-64	74174 HEX D-FF	R74	NOT USED	
U8	E-620-70	8T98 TRI-STATE HEX INVERTER	R75 THRU R77	E-105-230	1 K. OHM. RESISTOR
U9	NOT USED		R80, R82	E-105-230	1 K. OHM. RESISTOR
U10	E-751-25	82S123 OUTPUT PROM	R78, R79, R81	NOT USED	
U11	E-620-70	8T98 TRI-STATE INVERTER	C32	NOT USED	
U12	E-620-65	7417 HEX BUFFER/D.C.	C33 THRU C35	E-586-85	.01 MFD. 50 WVDC. CERAMIC
U13	NOT USED		C36, C37	E-586-73	4.7 MFD. 25 WVDC. TANTALUM
U14	E-620-70	8T98 TRI-STATE HEX INVERTER	C38	E-586-8	2 MFD. 50 WVDC. ELECTROLYTIC
U15	E-751-24	82S123 INPUT DECODER PROM	C39	E-586-85	.01 MFD. 50 WVDC. CERAMIC
U16-U17	E-620-70	1501 TRI-STATE HEX INVERTER	C40, C41	NOT USED	
U18	NOT USED		C42, C43	E-586-85	.01 MFD. 50 WVDC. CERAMIC
CR1 THRU CR24	E-587-14	1N4148 DIODE	Q1 THRU Q24	E-585-44	T106A1SG TRIAC
CR25	NOT USED		Q26 THRU Q31	E-585-44	T106A1SG TRIAC
CR26 THRU CR31	E-587-14	1N4148 DIODE	Q32	NOT USED	
CR32	NOT USED		L1-L2	E-604-3	.22 MH. INDUCTOR
CR33	EP-587-6	1N4004 DIODE	J1	E-766-28	28 CKT. KK 100 WAFER
CR34	NOT USED		J2-J3	E-766-20	20 CKT. KK 100 WAFER
R1A THRU R6A	NOT USED		J4	E-736-15	15 CKT. KK 156 WAFER
R13A THRU R18A	NOT USED		SDS II - J5	E-712-8	16 PIN DIP SOCKET
R26A THRU R31A	NOT USED		(+)	P-5399	TEST CLIP (TEST POINT)
R1B THRU R24B	E-105-301	100 OHM. RESISTOR	(-)	P-5399	TEST CLIP (TEST POINT)
R25B	NOT USED		S1	NOT USED	
R26B THRU R31B	E-105-301	100 OHM. RESISTOR	S2	---	WIRE JUMPER IN CIRCUIT
R32B	NOT USED		S3	NOT USED	
R1C THRU R24C	E-105-280	470 OHM. RESISTOR	S4	---	WIRE JUMPER IN CIRCUIT
R25C	NOT USED		S5	NOT USED	
R26C THRU R31C	E-105-280	470 OHM. RESISTOR			

NOTE: ALL RESISTORS ARE 1/4 WATT 5% TOLERANCE UNLESS NOTED.

SOUND MODULE BOARD



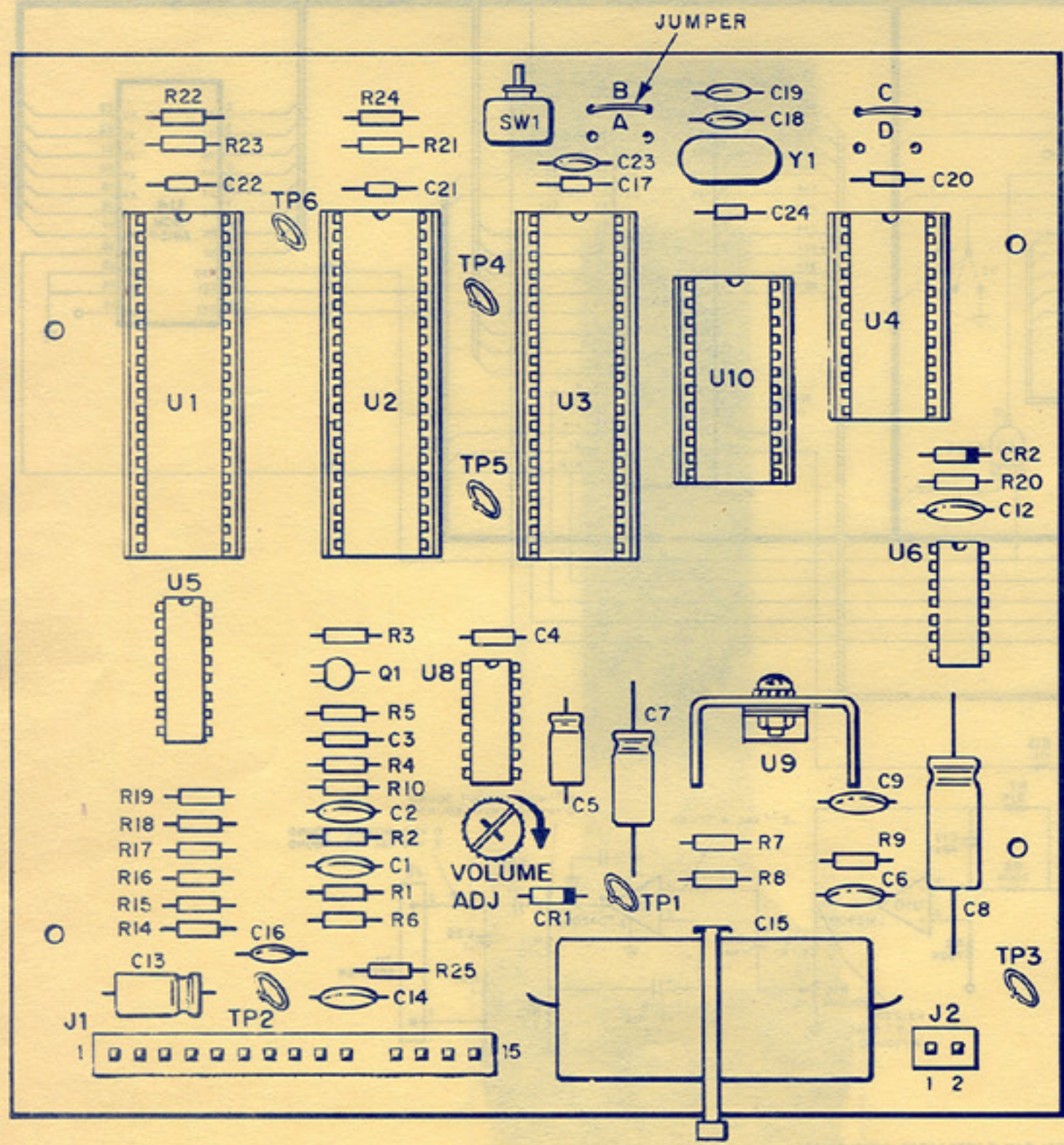
- * USE UMPER 'A' IF INTERNAL RAM IS USED (6802 WITHOUT U10).
- ** USE UMPER 'B' IF EXTERNAL RAM IS USED (6808/6810 U10).
- ** USE UMPER 'C' IF 2K ROM (EPROM) IS USED (G193168 INTEL 2716 OR EQUIV.).
- ** USE UMPER 'D' IF 4K ROM (EPROM) IS USED (T1TMS 2532, TMS4732 OR EQUIV.).

UNLESS OTHERWISE NOTED, ALL RESISTORS ARE IN OHMS and ALL CAPACITORS ARE IN Mfd.

D-1031 (W-1211)



SOUND BOARD

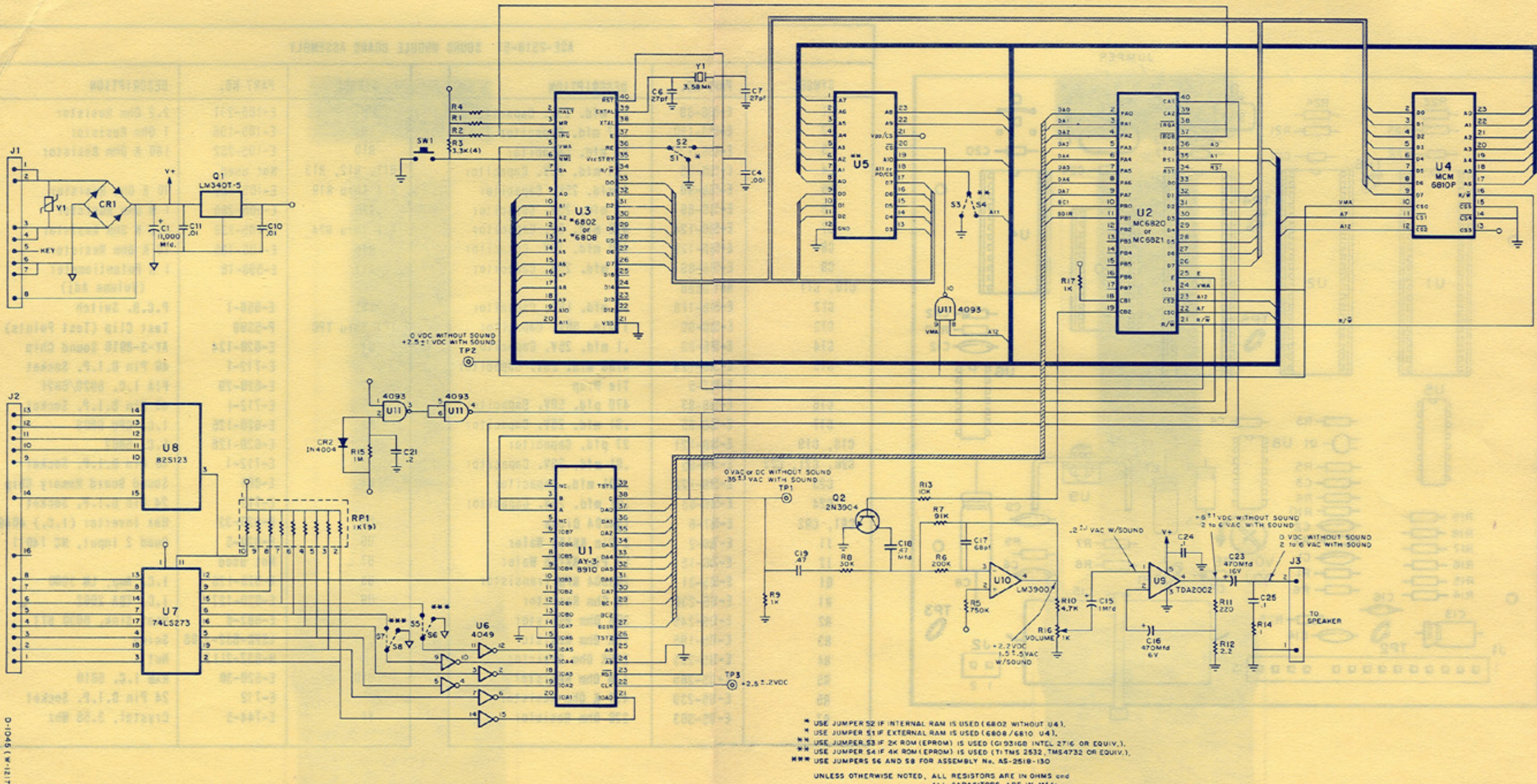


ASE-2518-51 SOUND MODULE BOARD ASSEMBLY

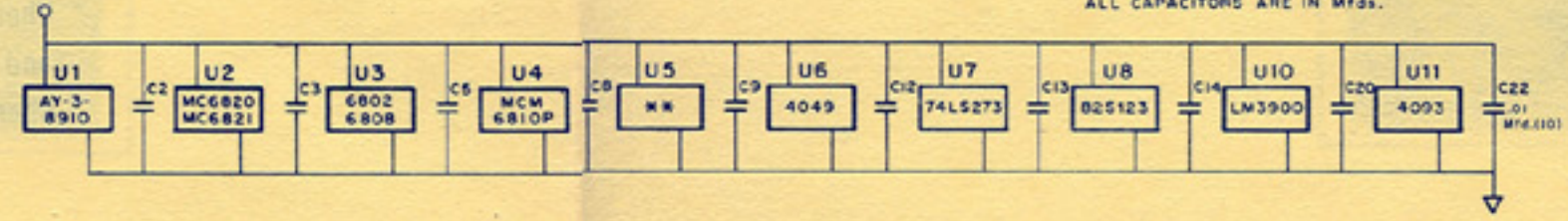
SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION
C1	E-586-89	.1 mfd. 25V. Capacitor	R8	E-105-211	2.2 Ohm Resistor
C2	E-586-130	.47 mfd. Capacitor	R9	E-105-196	1 Ohm Resistor
C3	E-586-120	68 pfd. Capacitor	R10	E-105-252	180 K Ohm Resistor
C4	E-586-85	.01 mfd. 25V. Capacitor	R11, R12, R13	Not used	
C5	E-586-90	1 mfd. 25V. Capacitor	R14 Thru R19	E-105-185	10 K Ohm Resistor
C6	E-586-89	.1 mfd. 25V. Capacitor	R20	E-105-285	1 M Ohm Resistor
C7	E-586-124	470 mfd. 6V. Capacitor	R21 Thru R24	E-105-238	3.3 K Ohm Resistor
C8	E-586-129	470 mfd. 16V. Capacitor	R25	E-105-185	10 K Ohm Resistor
C9	E-586-89	.1 mfd. 25V. Capacitor	RT1	E-599-16	1 K Potentiometer (Volume Adj)
C10, C11	Not used		SW1	E-658-1	P.C.B. Switch
C12	E-586-118	.2 mfd. 16V. Capacitor	TP1 Thru TP6	P-5399	Test Clip (Test Points)
C13	E-586-90	1 mfd. 50V. Capacitor	U1	E-620-124	AY-3-8910 Sound Chip
C14	E-586-89	.1 mfd. 25V. Capacitor	U2	E-620-29	40 Pin D.I.P. Socket
C15	E-586-123	4700 mfd. 25V. Capacitor	U3	E-620-125	40 Pin D.I.P. Socket
C16	E-647-5	Tie Wrap	* U3	E-620-128	I.C. CPU 6808
C17	E-586-83	470 pfd. 50V. Capacitor	U4	E-620-128	I.C. 6802
C18, C19	E-586-121	27 pfd. Capacitor	U4	E-712-1	40 Pin D.I.P. Socket
C20, C21, C22	E-586-85	.01 mfd. 25V. Capacitor	U4	E-861	Sound Board Memory Chip
C23	E-586-122	.001 mfd. Capacitor	U5	E-712	24 Pin D.I.P. Socket
C24	E-586-85	.01 mfd. 25V. Capacitor	U5	E-620-33	Hex Inverter (I.C.) 4049
CR1, CR2	E-587-6	1N4004 Diode	U6	E-620-5	Quad 2 Input, MC 14011
J1	E-736-2	2 Pin KK156 Wafer	U7	Not used	
J2	E-736-15	15 Pin KK156 Wafer	U8	E-620-126	I.C. Amp, LM 3900
Q1	E-585-31	2N3904 NPN Transistor	U9	E-620-127	I.C. TDA 2002
R1	E-105-230	1K Ohm Resistor	U9	E-682-8	Heat Sink, 6030 BTT
R2	E-105-245	30K Ohm Resistor	U9	E-632-1106	Screw
R3	E-105-185	10K Ohm Resistor	U9	N-632-2112	Nut
R4	E-105-225	200K Ohm Resistor	* U10	E-620-30	RAM I.C. 6810
R5	E-105-285	1 M Ohm Resistor	U10	E-712	24 Pin D.I.P. Socket
R6	E-105-239	4.7 K Ohm Resistor	Y1	E-744-5	Crystal, 3.58 Mhz
R7	E-105-303	220 Ohm Resistor			

* When using U3 Part No. E-620-125, You Must use U10 Part No. E-620-30 and Jumper 'B'.
 When using U3 Part No. E-620-128, Delete U10 and use Jumper 'A'.

SOUND BOARD



* USE JUMPER S2 IF INTERNAL RAM IS USED (6802 WITHOUT U4).
 ** USE JUMPER S1 IF EXTERNAL RAM IS USED (6808/6810 U4).
 *** USE JUMPER S3 IF 2K ROM (EPROM) IS USED (GD31GD INTEL 2716 OR EQUIV.).
 **** USE JUMPER S4 IF 4K ROM (EPROM) IS USED (T1TMS 2532, TMS4732 OR EQUIV.).
 ***** USE JUMPERS S6 AND S8 FOR ASSEMBLY No. AS-2518-130
 UNLESS OTHERWISE NOTED, ALL RESISTORS ARE IN OHMS and
 ALL CAPACITORS ARE IN MFDs.

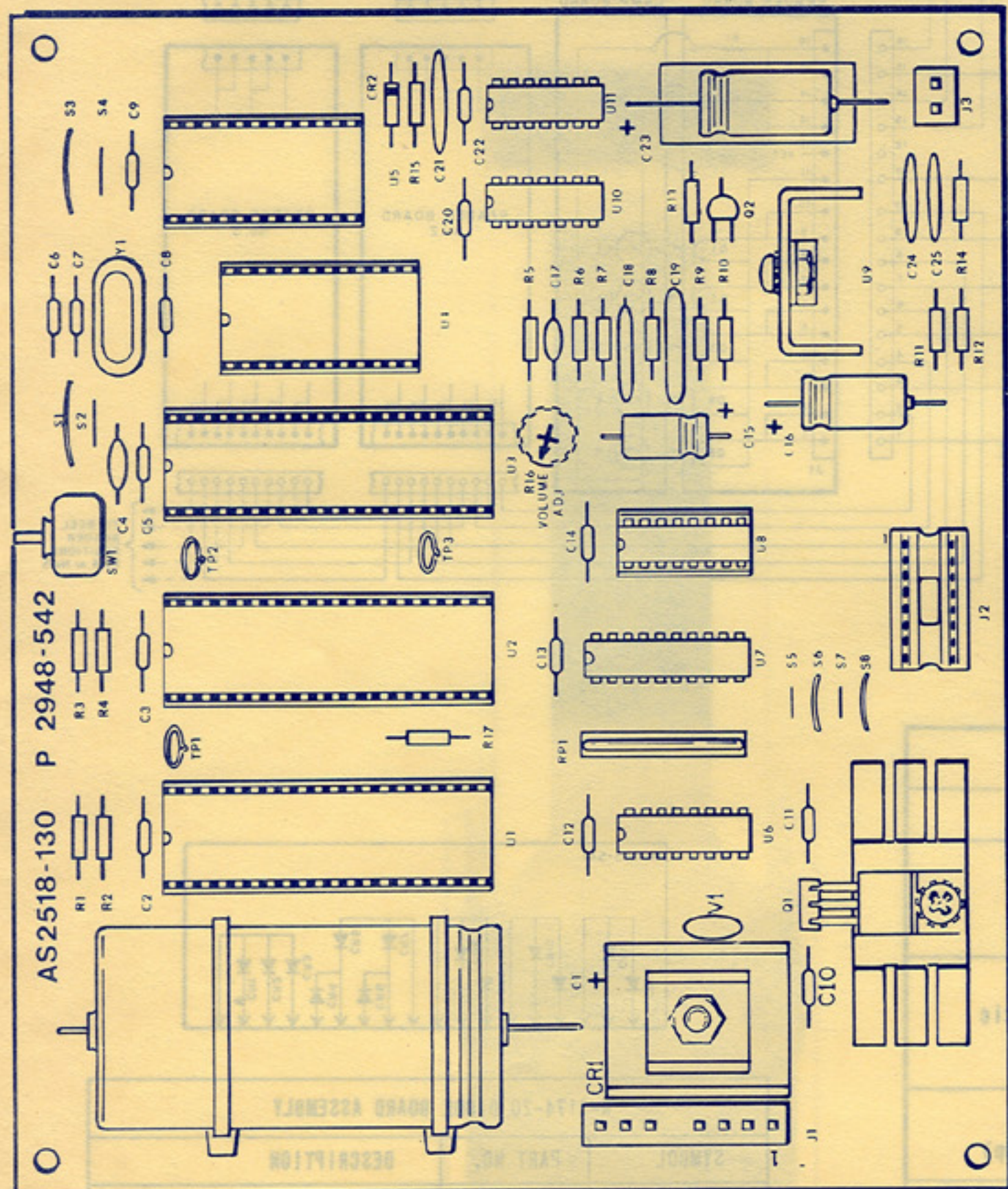


D-1046 (W-1217-33)



REEL MECHANISM RELATED BOARDS

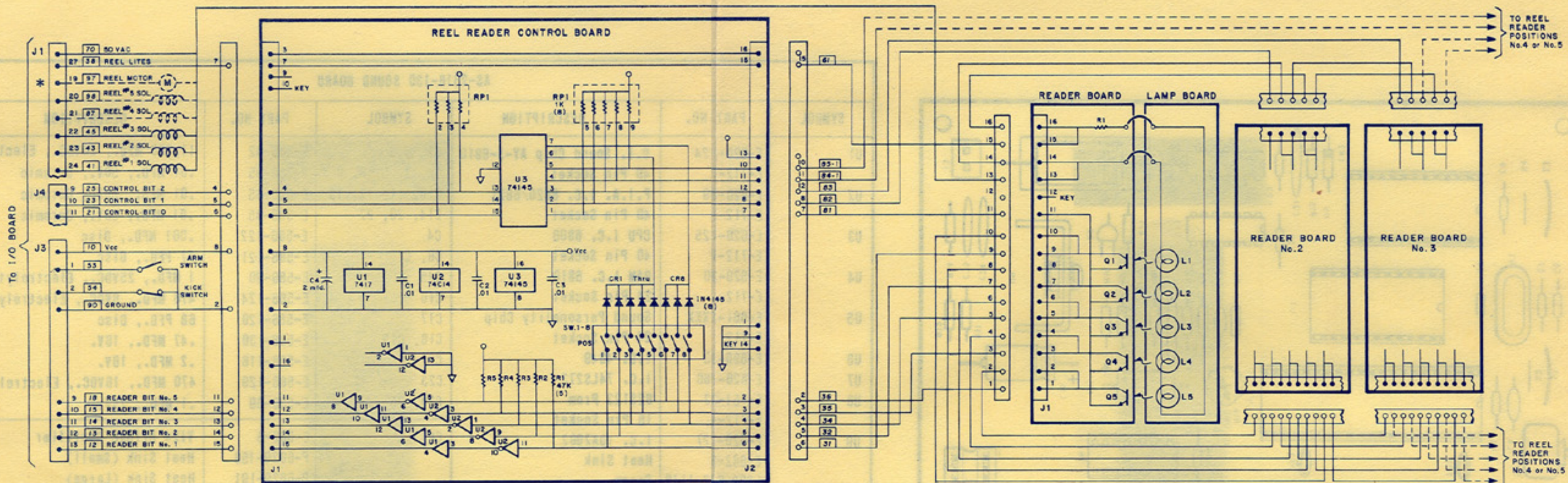
REEL READER CONTROL BOARD



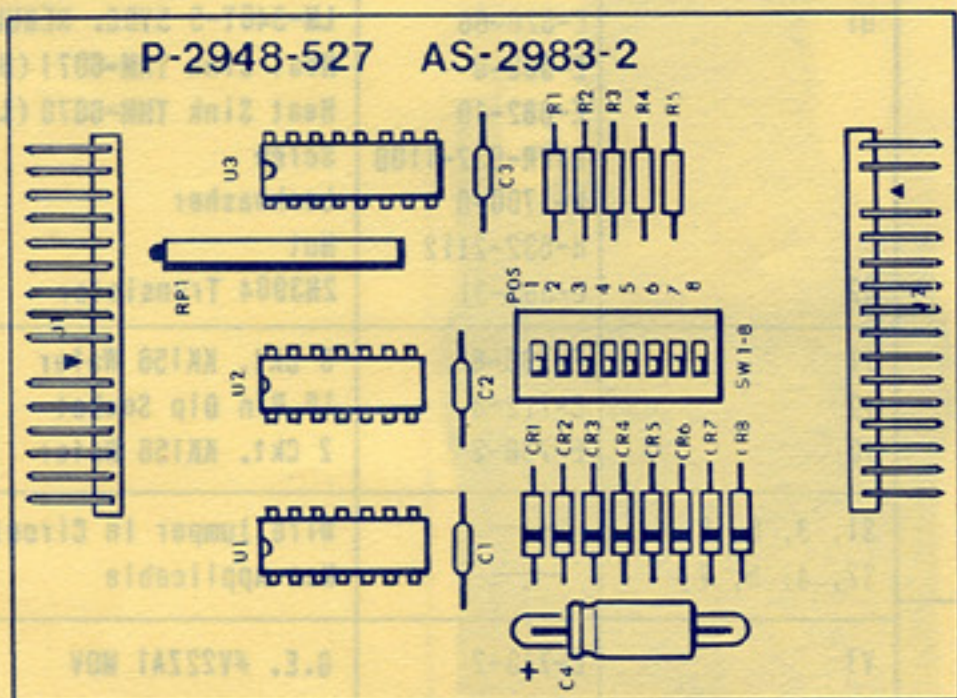
AS-2518-130 SOUND BOARD

SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION
U1	E-620-124 E-712-1	G.I. Sound Chip AY-3-8910 40 Pin Socket	C1	E-586-62	11,700 MFD., 20VDC., Electrolytic
U2	E-620-29 E-712-1	P.I.A. I.C. 6820/6821 40 Pin Socket	C2, 3, 5, 8, 9	E-586-85	.01 MFD., 50V., Ceramic
U3	E-620-125 E-712-1	CPU I.C. 6808 40 Pin Socket	C10, 11, 12, 13	E-586-85	.01 MFD., 50V., Ceramic
U4	E-620-30 E-712	RAM I.C. 6810 24 Pin Socket	C14, 20, 22	E-586-85	.01 MFD., 50V., Ceramic
U5	E-881-XXXX E-712	Sound Personality Chip 24 Pin Socket	C4	E-586-122	.001 MFD., Disc
U6	E-620-33	I.C. 4049	C6, C7	E-586-121	27 PFD., Disc
U7	E-620-180	I.C. 74LS273	C15	E-586-90	1 MFD., 25VDC., Electrolytic
U8	E-751-23 E-712-4	82S123 Prom 16 Pin Socket	C16	E-586-124	470 MFD., 6VDC., Electrolytic
U9	E-620-127 E-682-8 LSPR-632-1110 M-1700-6 N-632-2112	I.C. TDA2002 Heat Sink Screw Lockwasher Nut	C17	E-586-120	68 PFD., Disc
U10	E-620-126	I.C. LM3900	C18, C19	E-586-130	.47 MFD., 16V.
U11	E-620-170	I.C. 4093	C21	E-586-118	.2 MFD., 16V.
R1, 2, 3, 4	E-105-238	3.3K. Ohm Resistor	C23	E-586-129	470 MFD., 16VDC., Electrolytic
R5	E-105-344	750K. Ohm Resistor	C24, 25	E-586-89	.1 MFD., 25V.
R6	E-105-225	200K. Ohm Resistor	CR1	E-602-3	VJ24 Bridge Rectifier
R7	E-105-313	91K. Ohm Resistor		P-6629-158	Heat Sink (Small)
R8	E-105-245	30K. Ohm Resistor		P-6629-191	Heat Sink (Large)
R9, R17	E-105-230	1K. Ohm Resistor		LSPR-632-1106	Screw
R10	E-105-239	4.7K. Resistor		M-1700-6	Lockwasher
R11	E-105-303	220 Ohm Resistor		N-632-2112	Nut
R12	E-105-211	2.2 Ohm Resistor	Q1	E-620-66	LM-340T-5 5VDC. REGULATOR
R13	E-105-185	10K. Ohm Resistor		E-682-9	Heat Sink THM-6071 (Upper)
R14	E-105-196	1 Ohm Resistor		E-682-10	Heat Sink THM-6070 (Lower)
R15	E-105-285	1M. Ohm Resistor		LSPR-632-1106	Screw
R16	E-599-16	Trimmer (1K. POT)		M-1700-6	Lockwasher
RPI	E-835-8	1K. Ohm SIP		N-632-2112	Nut
SW1	E-658-1	Push Button PCB Switch	Q2	E-585-31	2N3904 Transistor
TP1, 2, 3	P-5399	Test Clip	J1	E-736-8	8 Ckt. KK156 Wafer
			J2	E-712-8	16 Pin Dip Socket
			J3	E-736-2	2 Ckt. KK156 Wafer
			S1, 3, 6, 8	---	Wire Jumper In Circuit
			S2, 4, 5, 7	---	Not Applicable
			V1	E-713-2	G.E. #V22ZA1 MOV
			Y1	E-744-5	3.58 MHZ Quartz XTAL

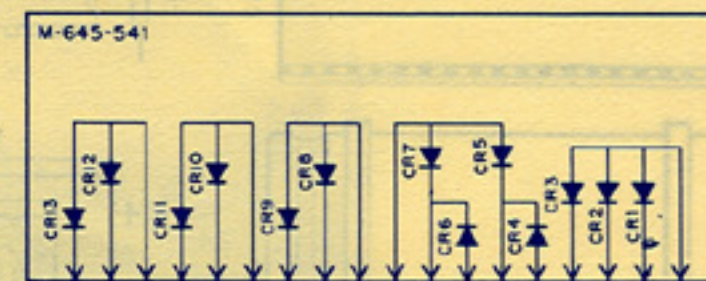
REEL MECHANISM RELATED BOARDS



* Cabinet Cable I/O Board Connector J1-Pins 19 & 20 are used for 3, 4 Reel Mech. and J2-Pins 14 & 16 are used for 5 Reel Mech.



AS-2983-2 REEL READER CONTROL BOARD		
SYMBOL	PART NO.	DESCRIPTION
U1	E-620-65	I.C. 7417
U2	E-620-78	I.C. 74C14
U3	E-620-63	I.C. 74145
C1, 2, 3	E-586-85	.01 MFD., 50V., Ceramic
C4	E-586-8	2 MFD., 50V., Electrolytic
CR1 thru CR8	E-587-14	1N4148 Diode
R1 thru R5	E-105-26	47 K Ohm Resistor
RP1	E-835-8	1 K SIP (10 Pin) (Pull Up)
SW1	E-677	8 Position SPST Dip Switch
J1, J2	E-768-16	16 Ckt. KK100 Right Angle Wafer



W-1174-20 DIODE BOARD ASSEMBLY		
SYMBOL	PART NO.	DESCRIPTION
CR1 THRU CR13	E-587-16 P-2948-433	Diode P.C. Board