

SERVICE MANUAL

for



Model 204D

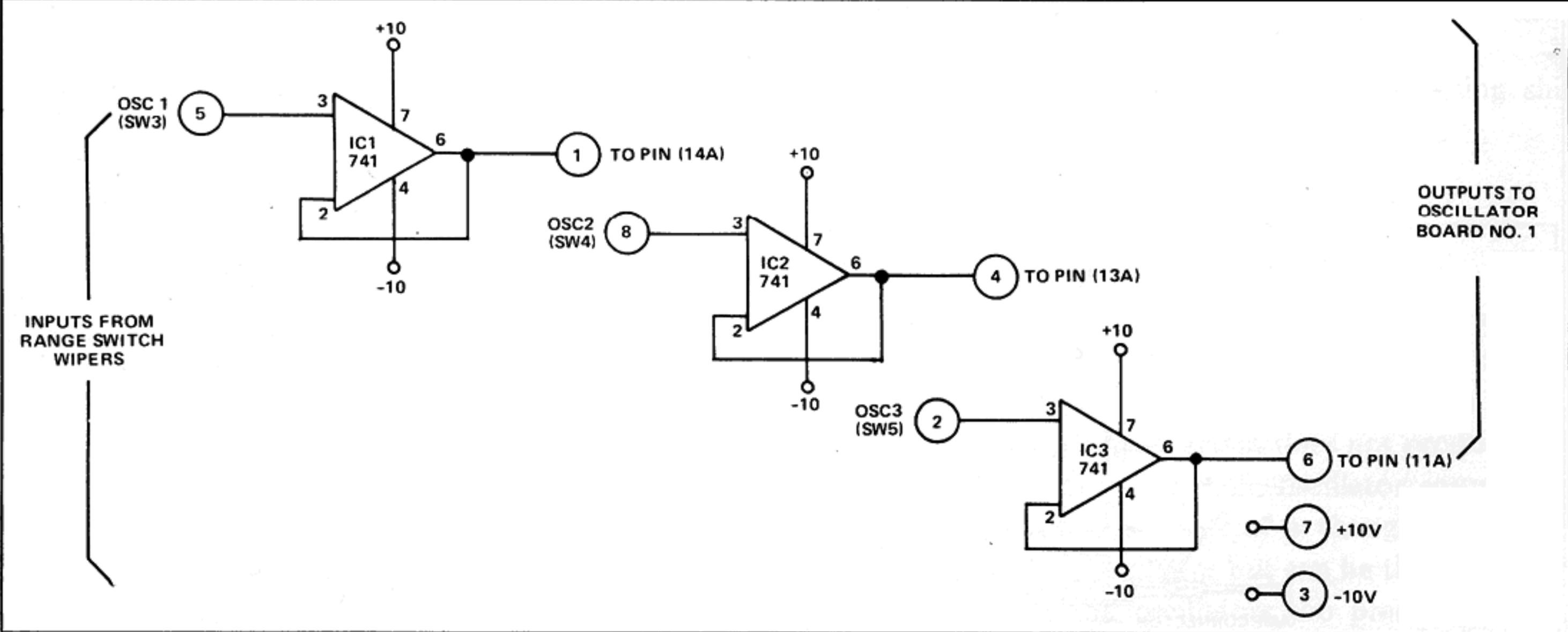
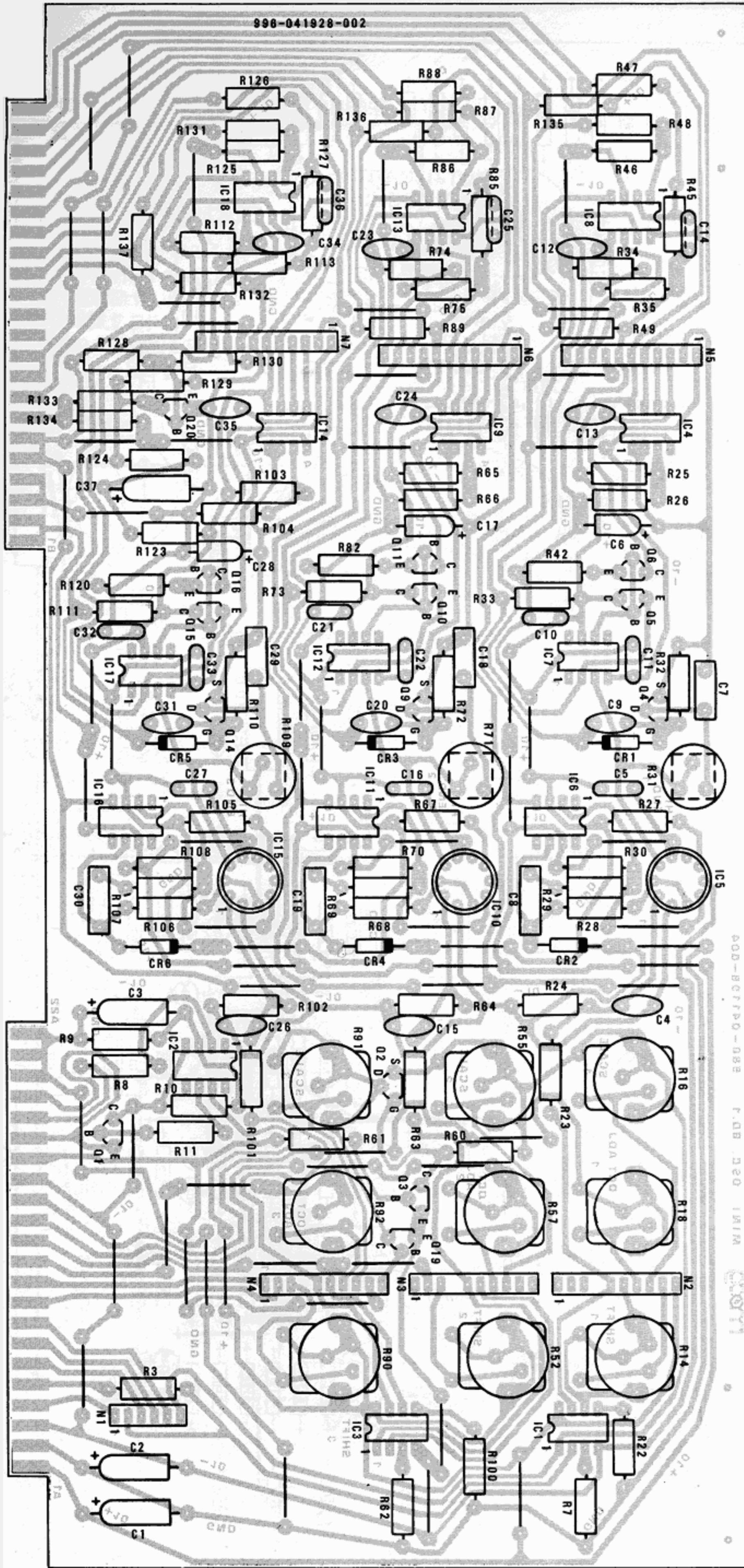


FIGURE 8-6 OCTAVE BUFFER SCHEMATIC

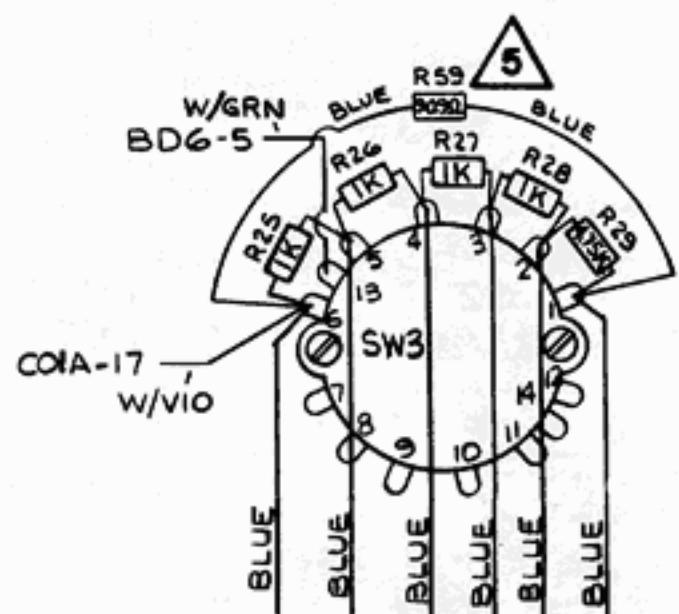
SECTION 9 SCHEMATICS AND PRINTED CIRCUIT BOARDS

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NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL RESISTOR VALUES ARE IN OHMS $1/4W \pm 5\%$.
 2. MINIMOOG BETWEEN SERIAL NUMBER 11362 AND 11794 MAY HAVE 726 INTEGRATED CIRCUITS FROM DATE CODES 7850 AND 7907 WHICH WILL NOT HOLD THE INSTRUMENT IN TUNE. THESE DEVICES SHOULD BE REPLACED IF FOUND WITH PARTS OF DATED CODES PRIOR TO OR SUBSEQUENT TO THESE DATE CODES.
 3. R27, R67 AND R105 ARE SELECTED TO CAUSE OSCILLATOR TO CHANGE EXACTLY ONE OCTAVE WITH DVM ACROSS PINS 1 AND 10 OF IC5. SELECT R27 FOR $20.5\text{MV} \pm .4\text{MV}$ USING A 49.9K, 75K OR 100K. SIMILARLY, REPEAT FOR IC10 AND IC15.
 4. FACTORY SELECTED (IF NECESSARY) TO ACHIEVE $50\% \pm 1\%$ RECT. DUTY CYCLE.
 5. R59 RESISTOR DELETED ON SERIAL NUMBERS ABOVE 10175.



OSCILLATOR 1 RANGE SWITCH

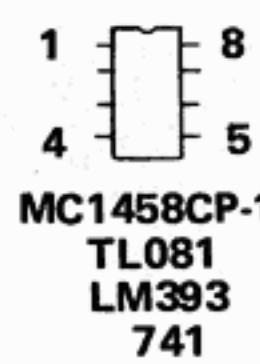
COMPONENT BASING (TOP VIEW)



**2N3904
2N3906**



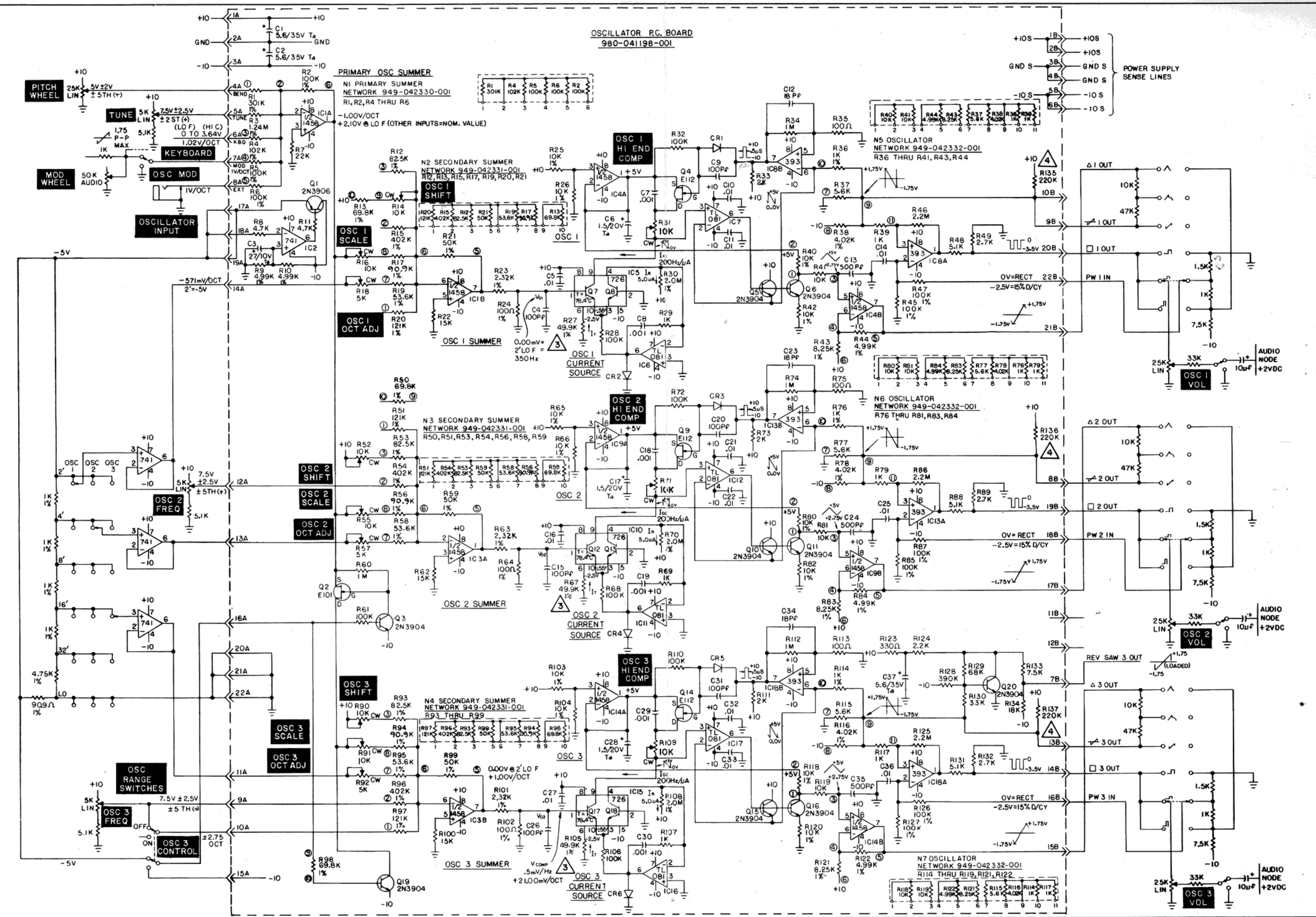
E101
E112



A circular diagram with ten points labeled 1 through 10 around its perimeter. The labels are positioned as follows: 1 at the top, 10 at the top-right, 9 at the right, 8 at the bottom-right, 7 at the bottom, 6 at the bottom-left, 5 at the left, 4 at the top-left, 3 at the top-right, and 2 at the top-left.

726

FIGURE 9-1 OSCILLATOR PRINTED CIRCUIT BOARD NO. 1 ASSEMBLY (SERIAL NUMBERS 10175 AND ABOVE)



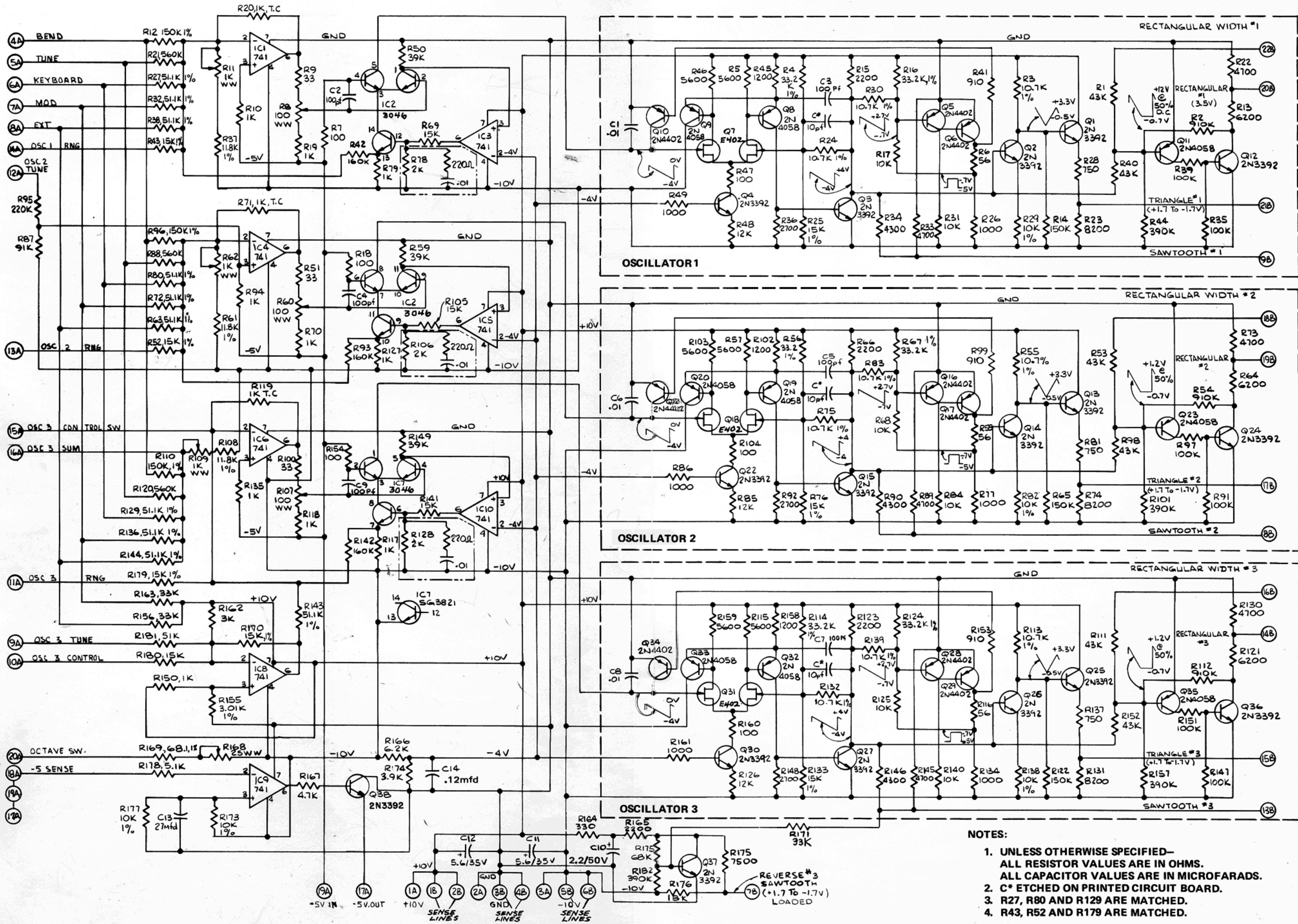
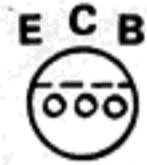
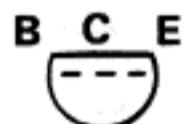


FIGURE 9-3 OSCILLATOR PRINTED CIRCUIT BOARD NO. 1 SCHEMATIC DIAGRAM (SERIAL NUMBERS BELOW 10175)

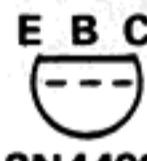
COMPONENT BASING



**2N3392
BOTTOM VIEW**



**2N4058
BOTTOM VIEW**



**2N4402
BOTTOM VIEW**



**E402
BOTTOM VIEW**

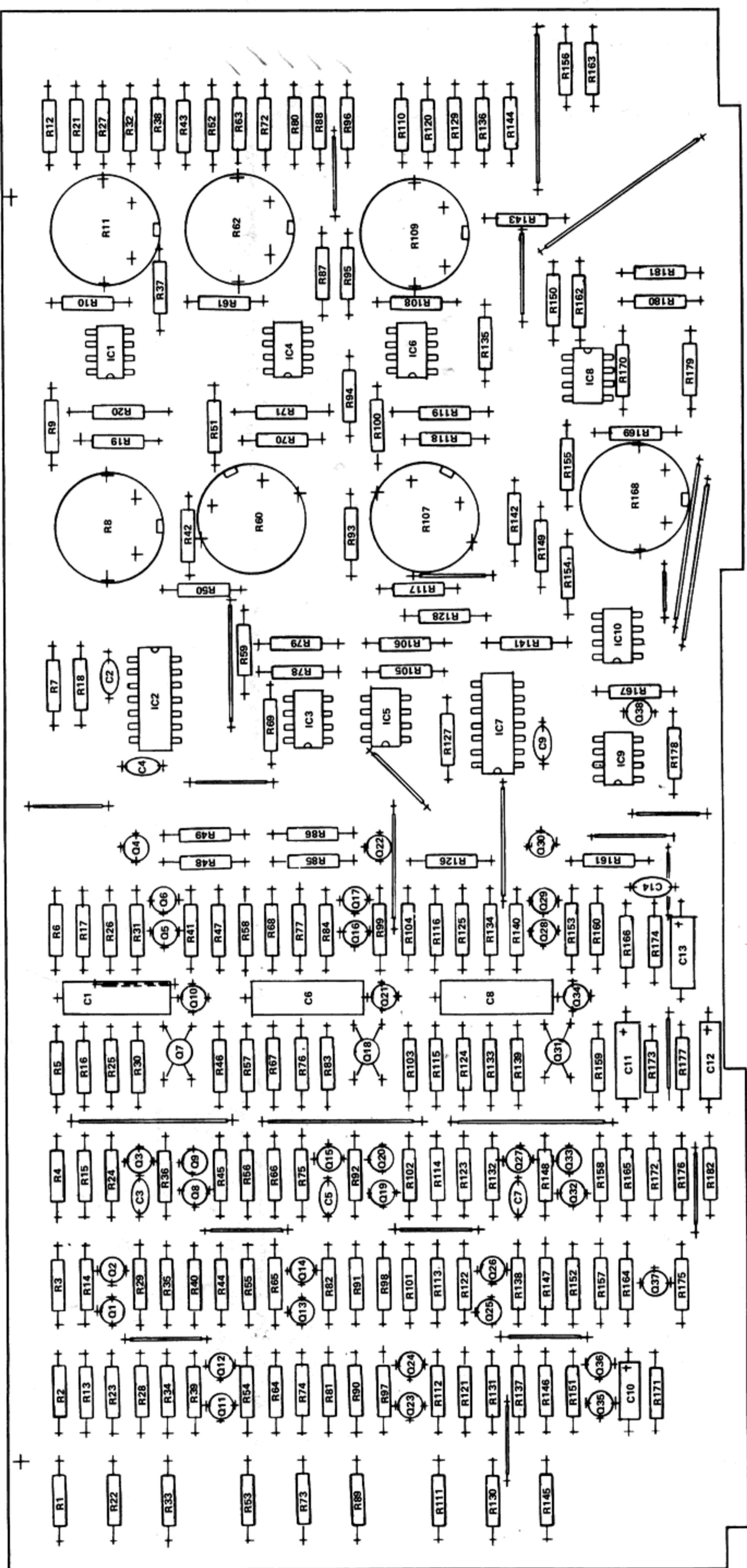
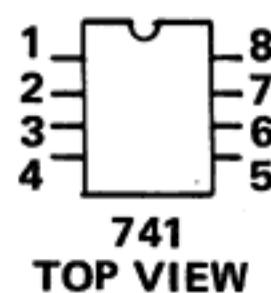
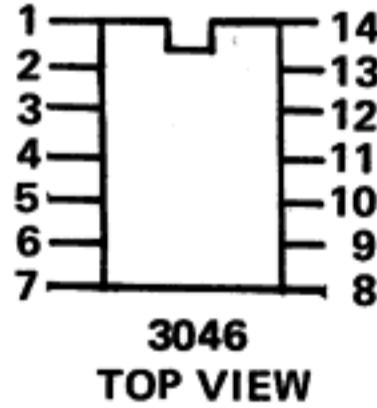
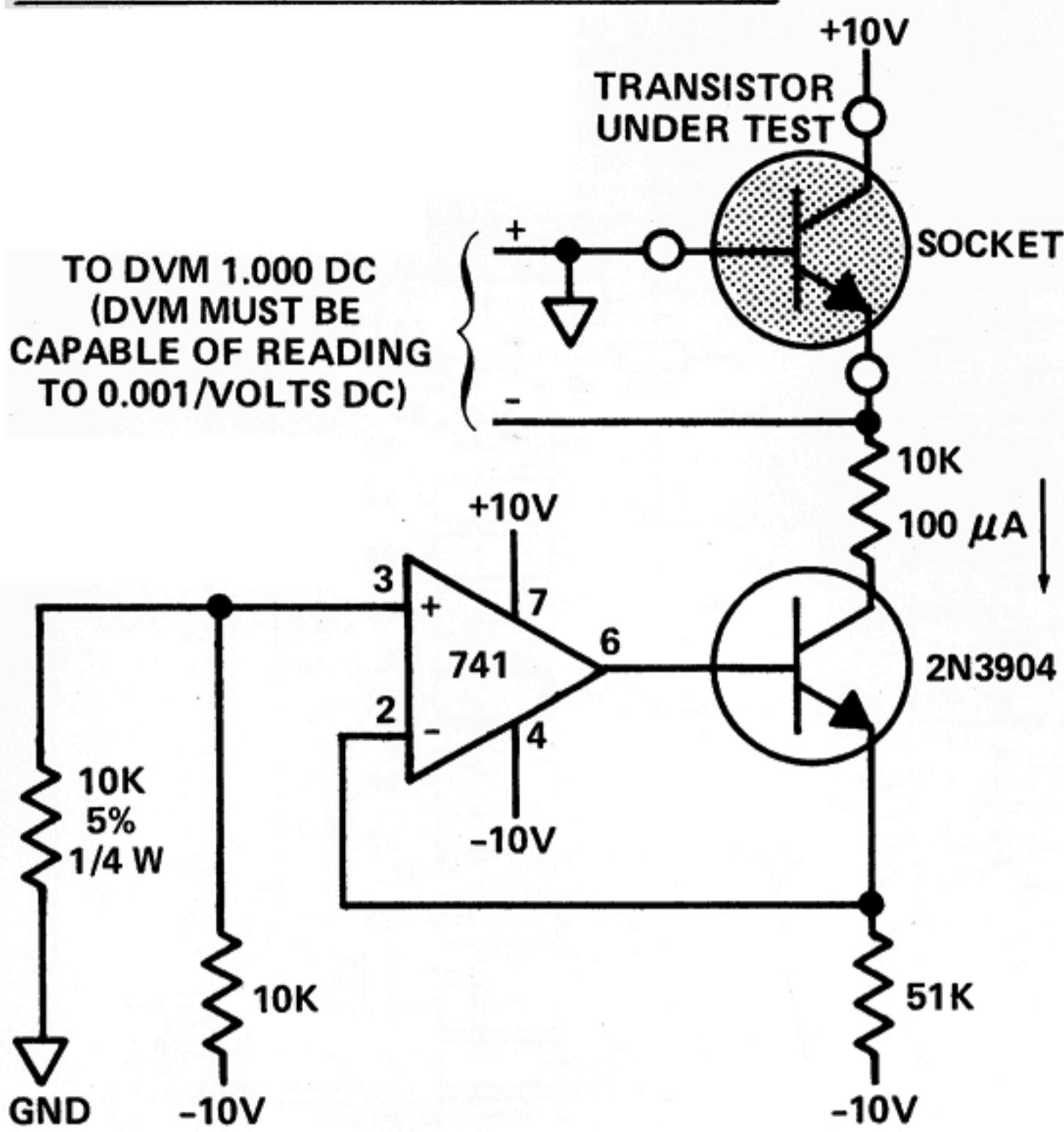
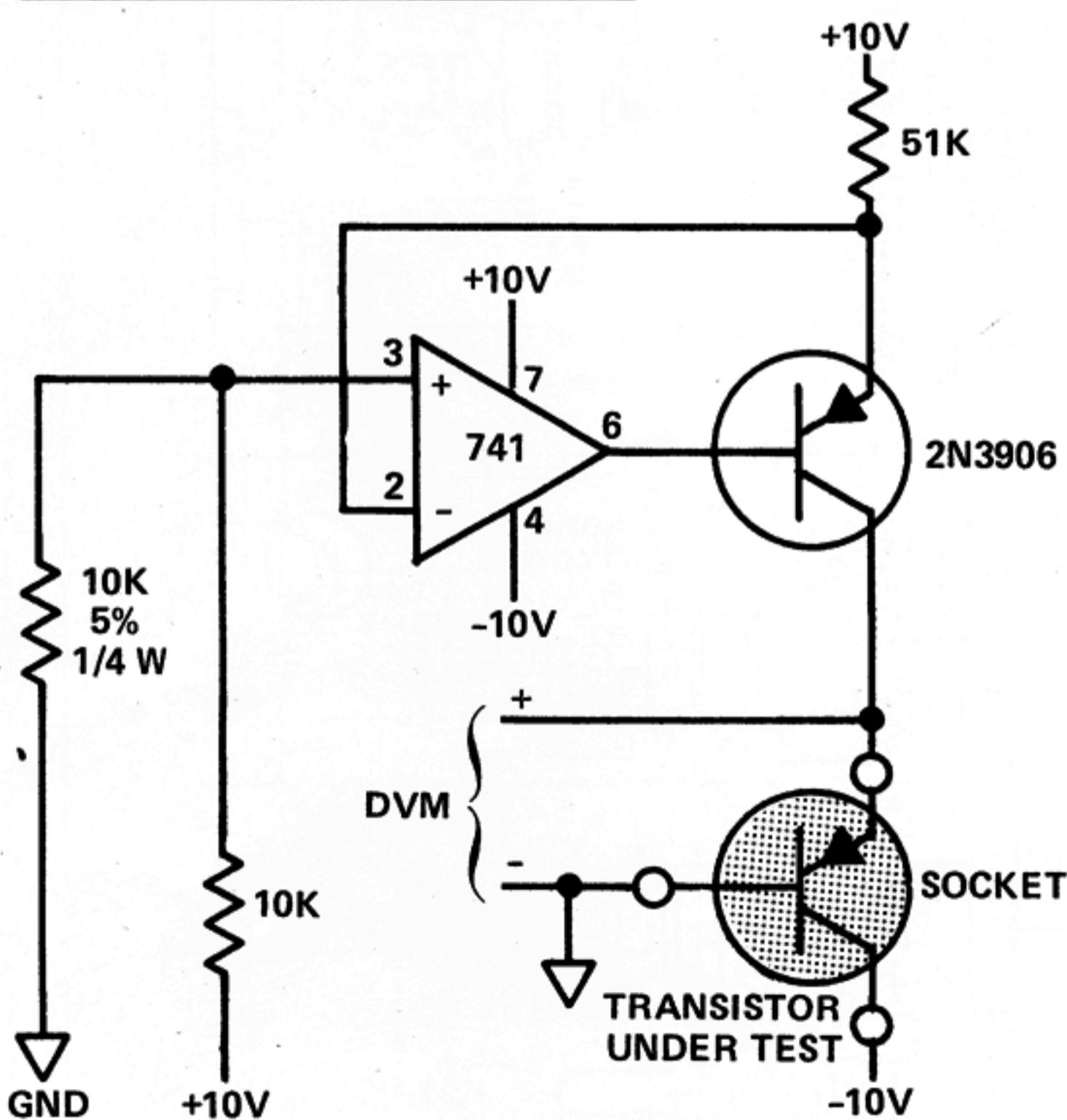


FIGURE 9-4 OSCILLATOR PRINTED CIRCUIT BOARD NO. 1 ASSEMBLY (SERIAL NUMBERS BELOW 10175)

NPN TRANSISTORS 2N3904, 2N3392 (ETC.)



PNP TRANSISTORS 2N3906, (ETC.)



MATCHING PROCEDURE

1. SETUP $\pm 10\text{V}$ SUPPLIES TO $\pm 10.00\text{ V}$ OR $\pm 15.00\text{ V}$.
2. TAKE TRANSISTORS (APPROXIMATELY 20) AND PLACE THEM IN STYROFOAM TO STABILIZE AT ROOM TEMPERATURE.
3. PLACE TRANSISTORS INTO SOCKET, ONE AT A TIME, AND MEASURE BASE TO Emitter VOLTAGE. **DO NOT USE YOUR FINGERS.** USE GLOVES OR PLIERS WITH INSULATING JAWS. YOUR FINGER HEAT WILL CAUSE THE READINGS TO VARY.
4. MARK DOWN THE V_{be} FROM THE DVM AND FIND TWO TRANSISTORS THAT THE V_{be} MATCHES to $\pm 2\text{ MV}$.
5. EXAMPLE:

TRANSISTOR 1 = 0.600

TRANSISTOR 2 = 0.598

0.002

FIGURE 9-5 MATCHING TRANSISTOR CIRCUITS

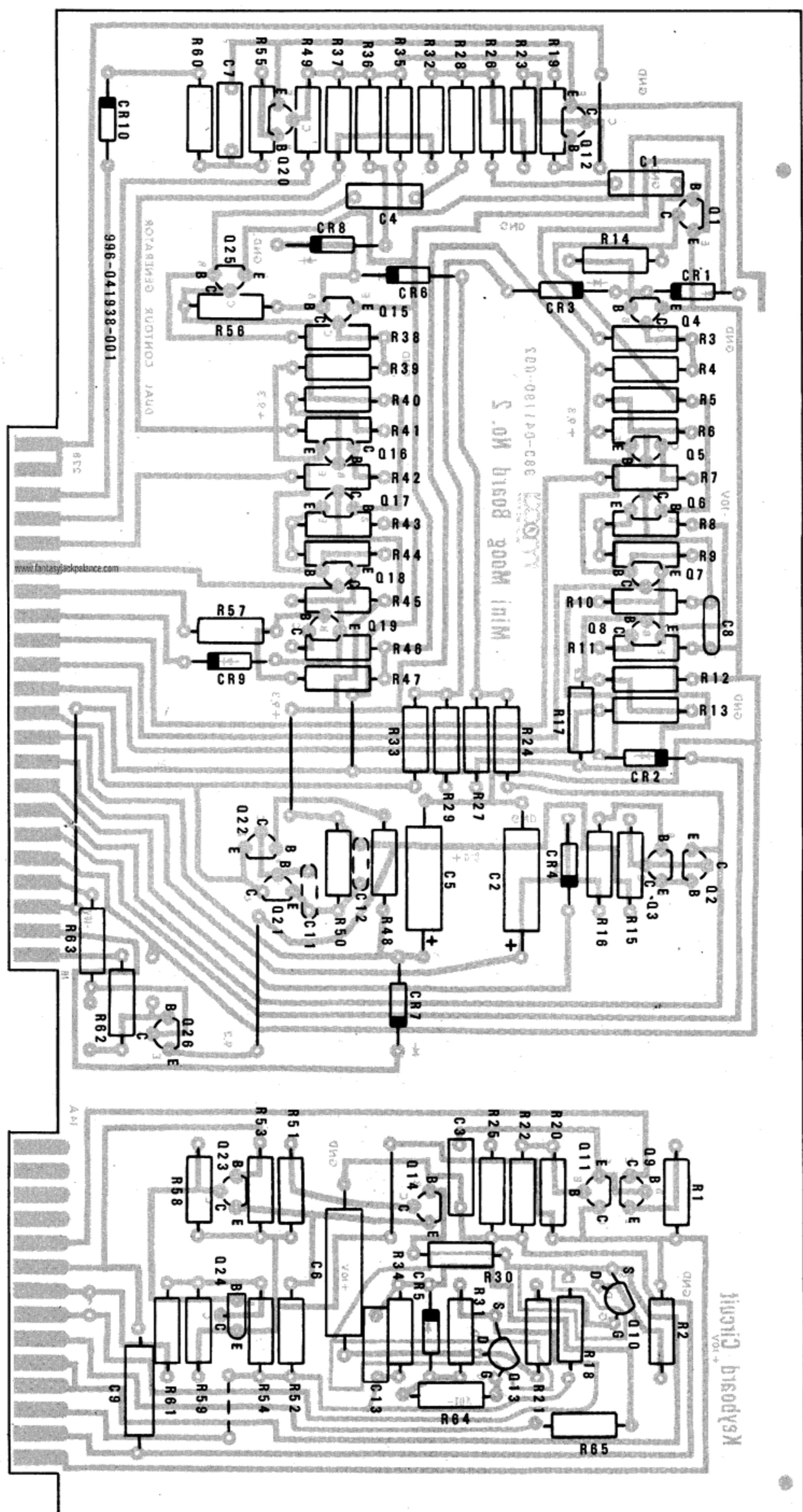
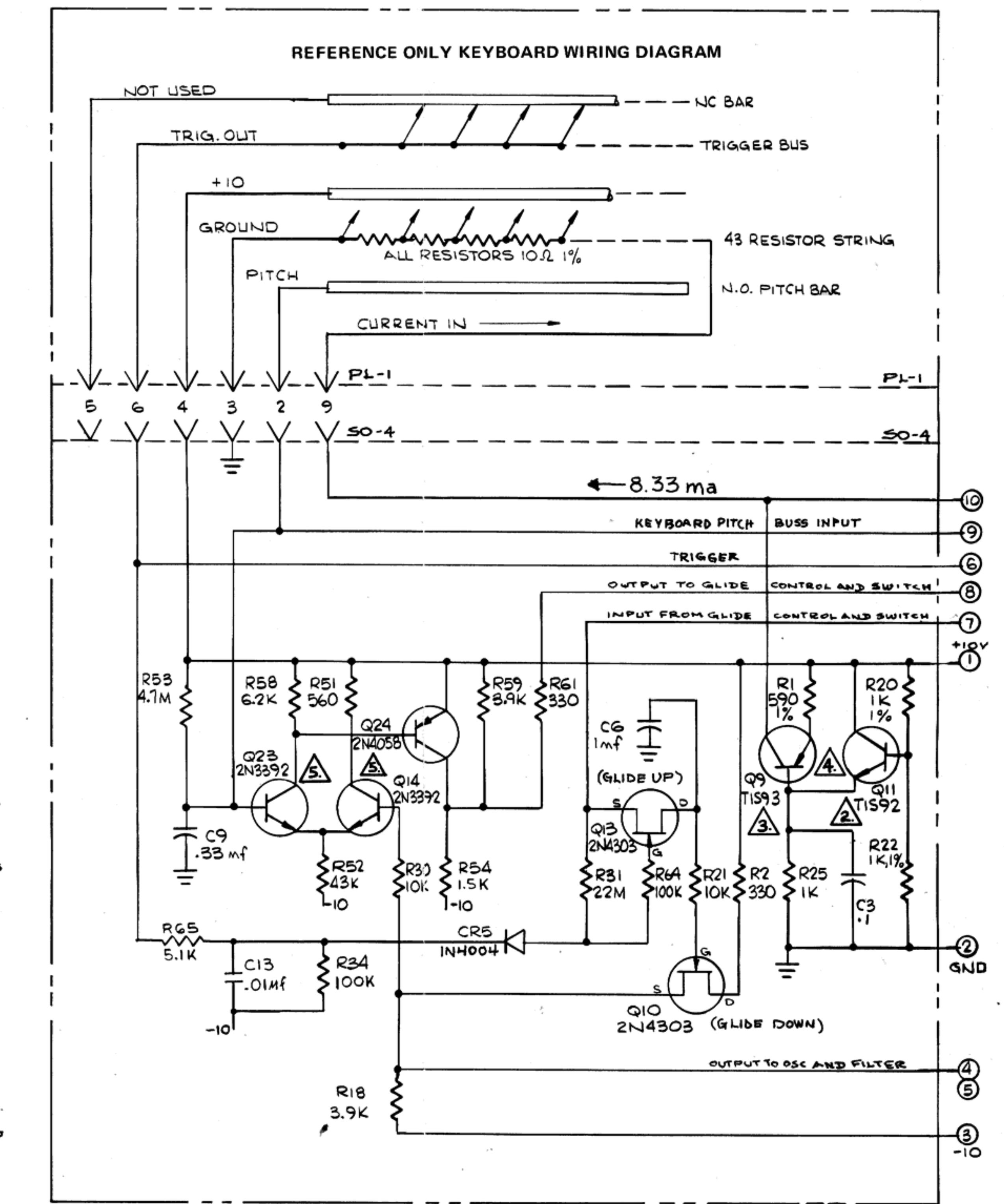
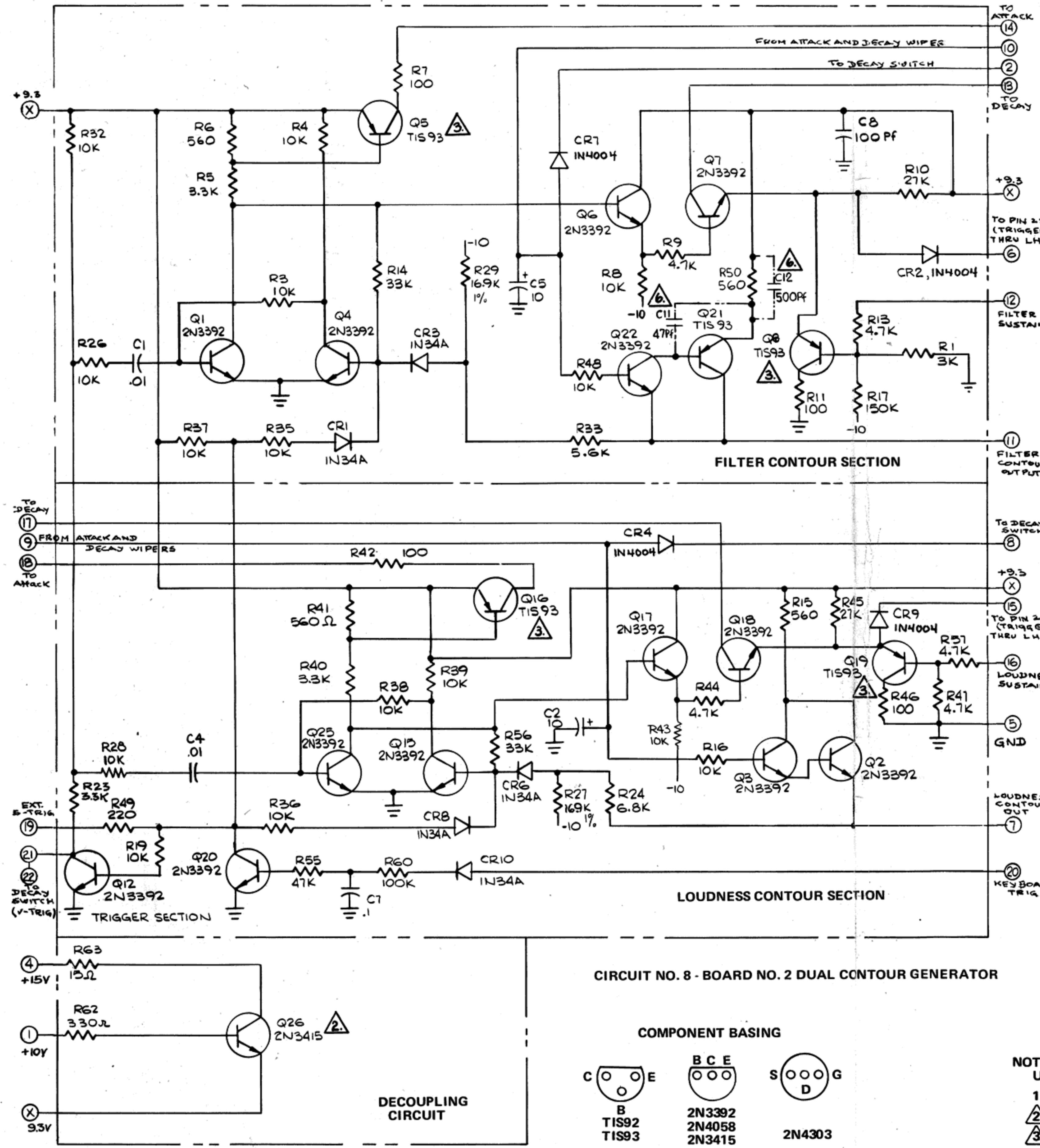


FIGURE 9-6 CONTOUR GENERATOR AND KEYBOARD PRINTED CIRCUIT BOARD NO. 2 ASSEMBLY



- NOTES:**
UNLESS OTHERWISE SPECIFIED –
1. ALL RESISTORS IN OHMS $\pm 5\%$, 1/4W CARBON.
 2. ALTERNATE FOR TIS92 AND 2N3415: 2N3904.
 3. ALTERNATE FOR TIS93: 2N3906.

4. Q9 AND Q11 MATCHED PAIR. PNP
10mV TO 20mV LOWER THAN NPN
AT 200mA.
5. Q14 AND Q23 MATCHED PAIR.
6. USE C11 OR C12 AS REQUIRED
TO PREVENT PARASITIC OSCILLATION.

FIGURE 9-7 CONTOUR GENERATOR AND KEYBOARD NO. 2 SCHEMATIC DIAGRAM

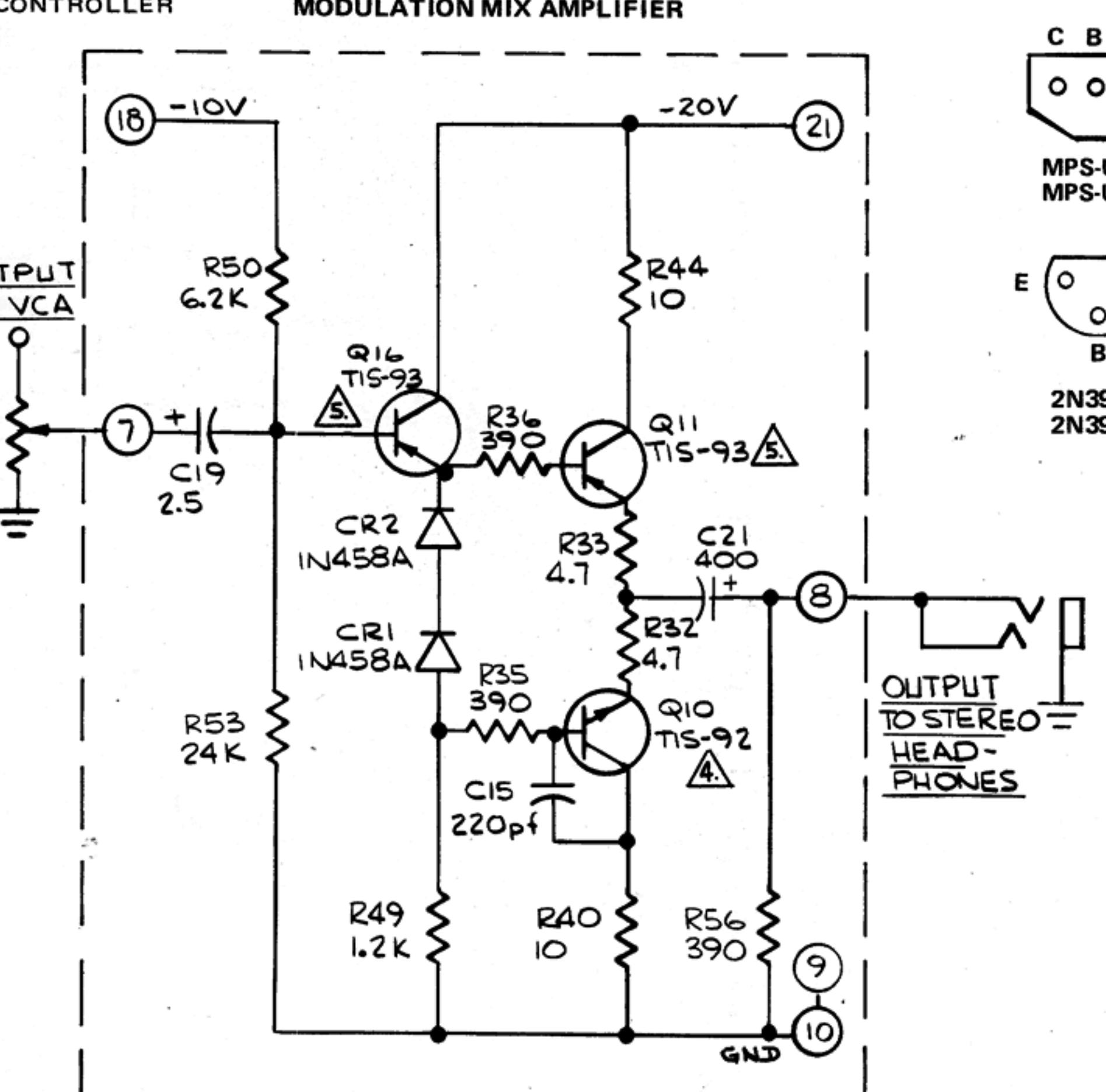
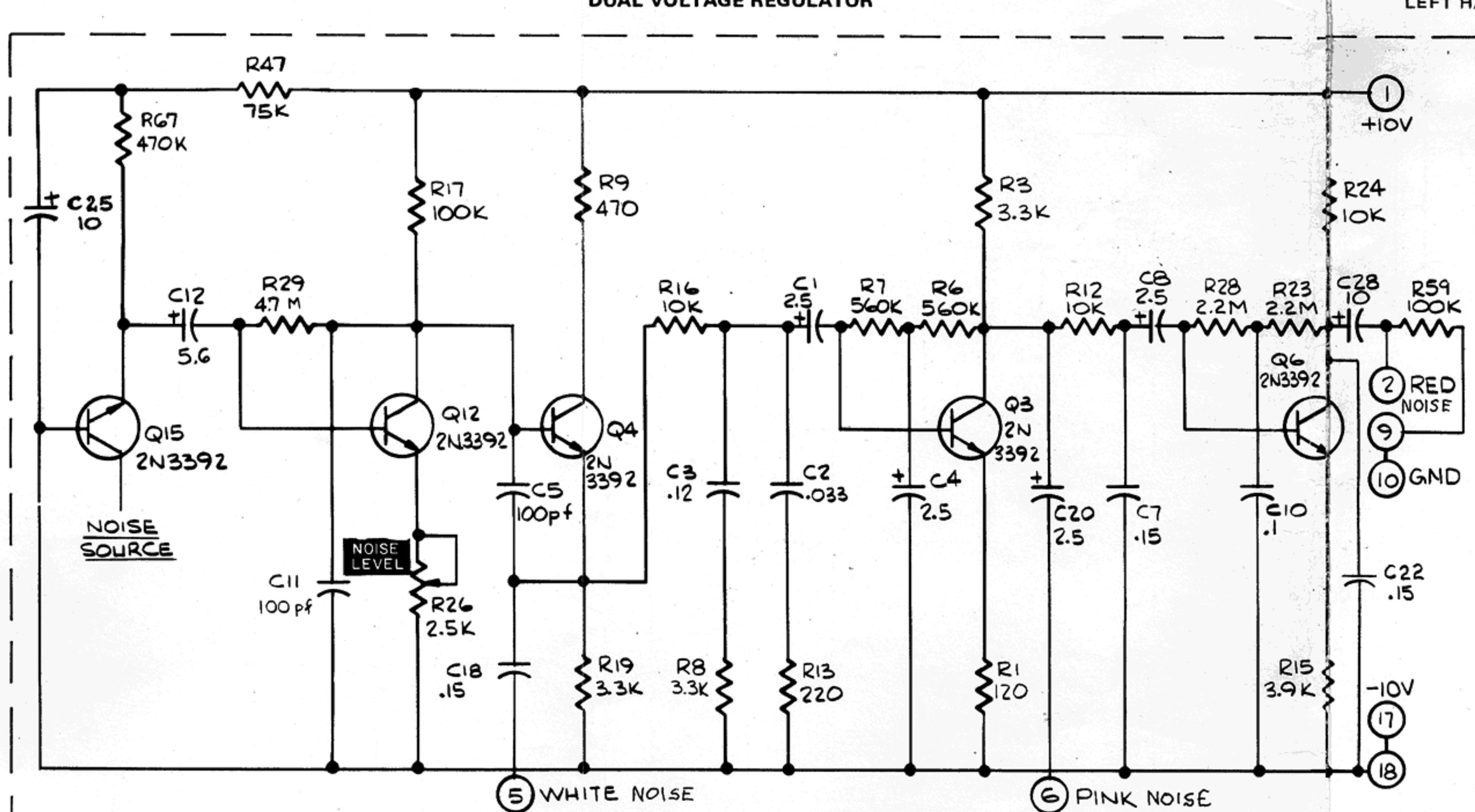
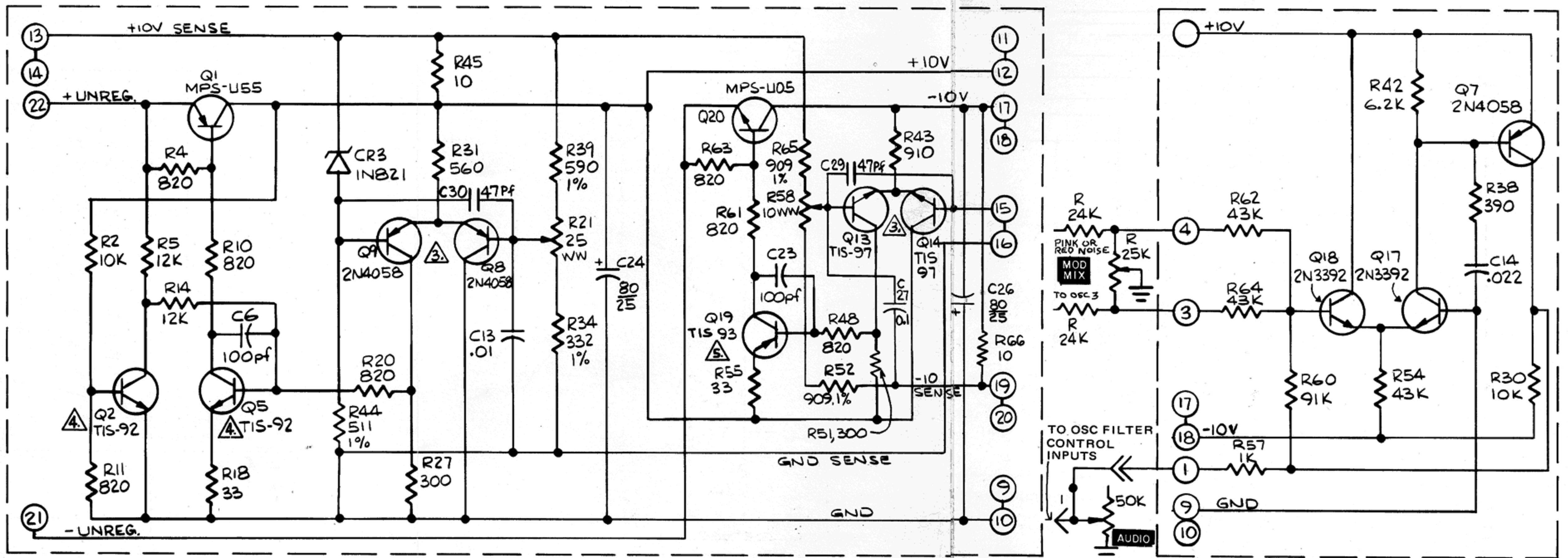
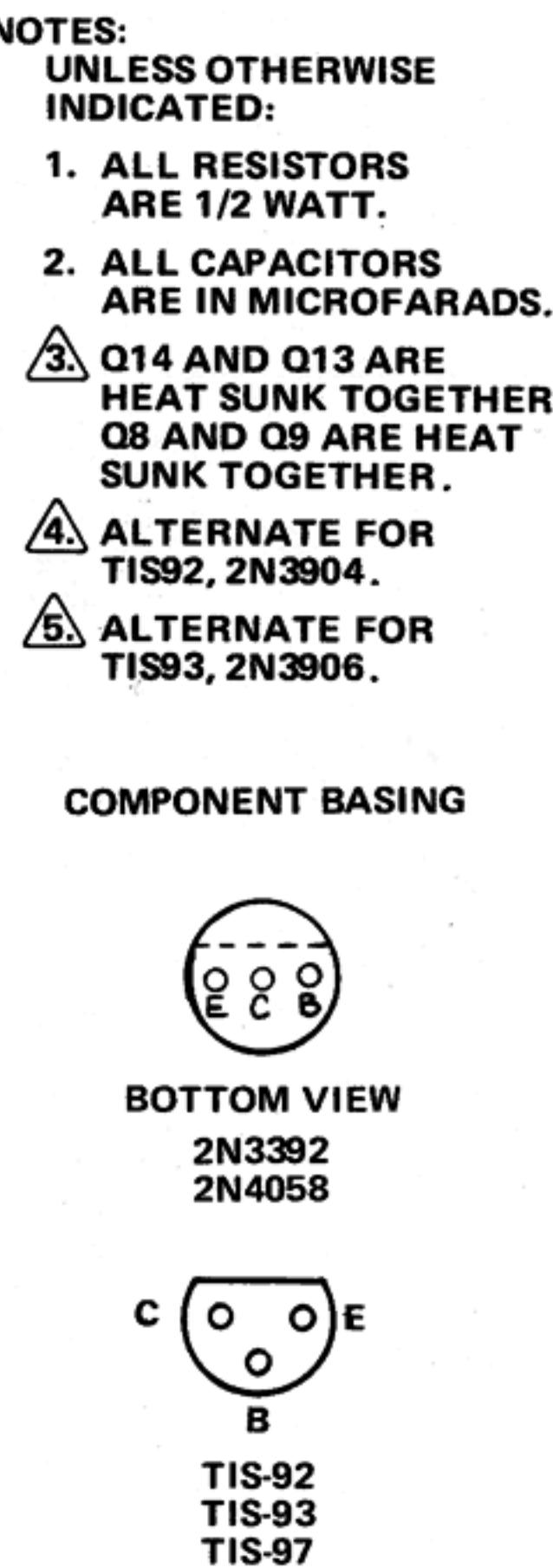


FIGURE 9-8 POWER SUPPLY PRINTED CIRCUIT BOARD NO. 3 SCHEMATIC DIAGRAM

996-041931-001

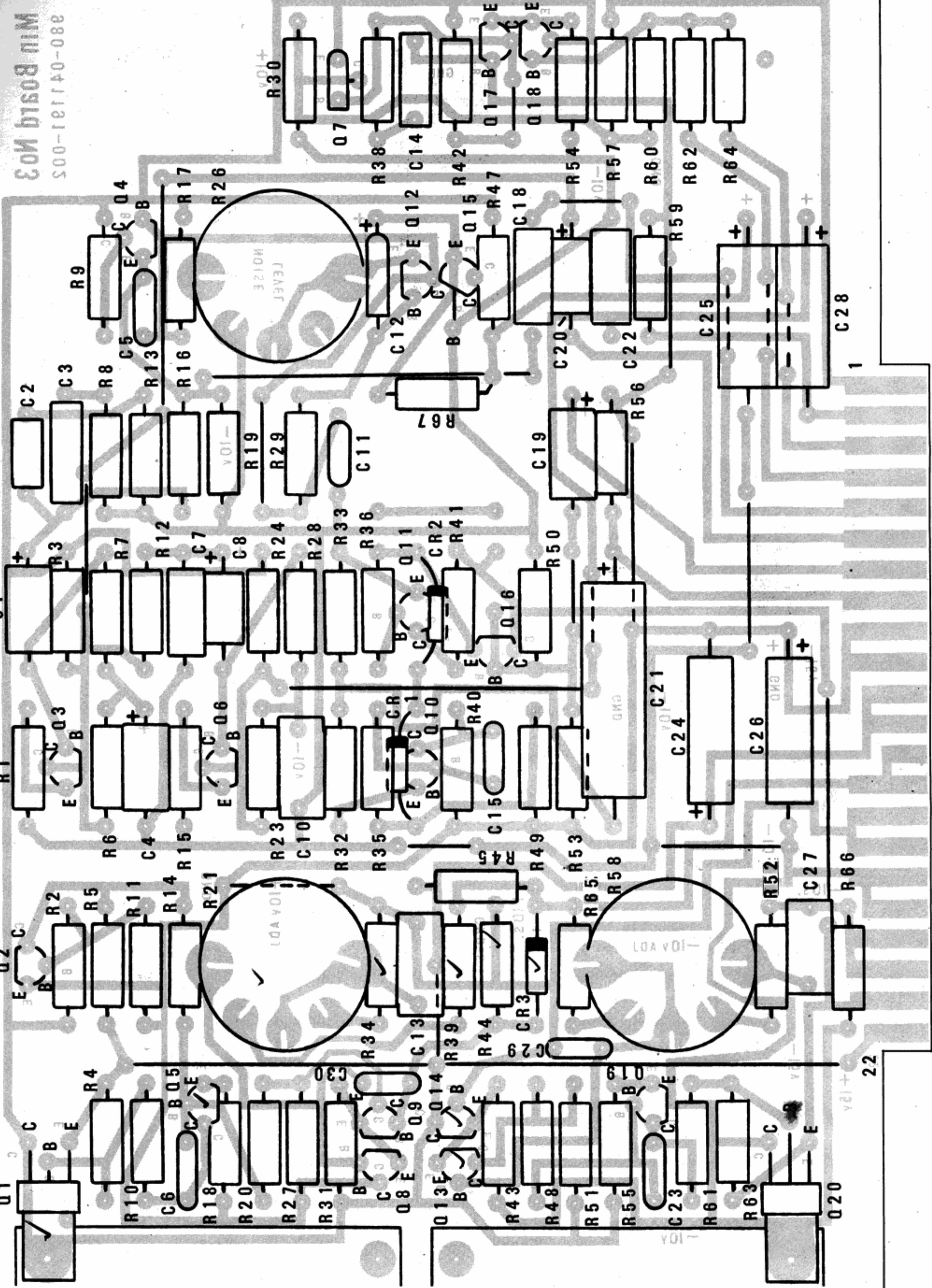


FIGURE 9-9 POWER SUPPLY PRINTED CIRCUIT BOARD NO. 3 ASSEMBLY

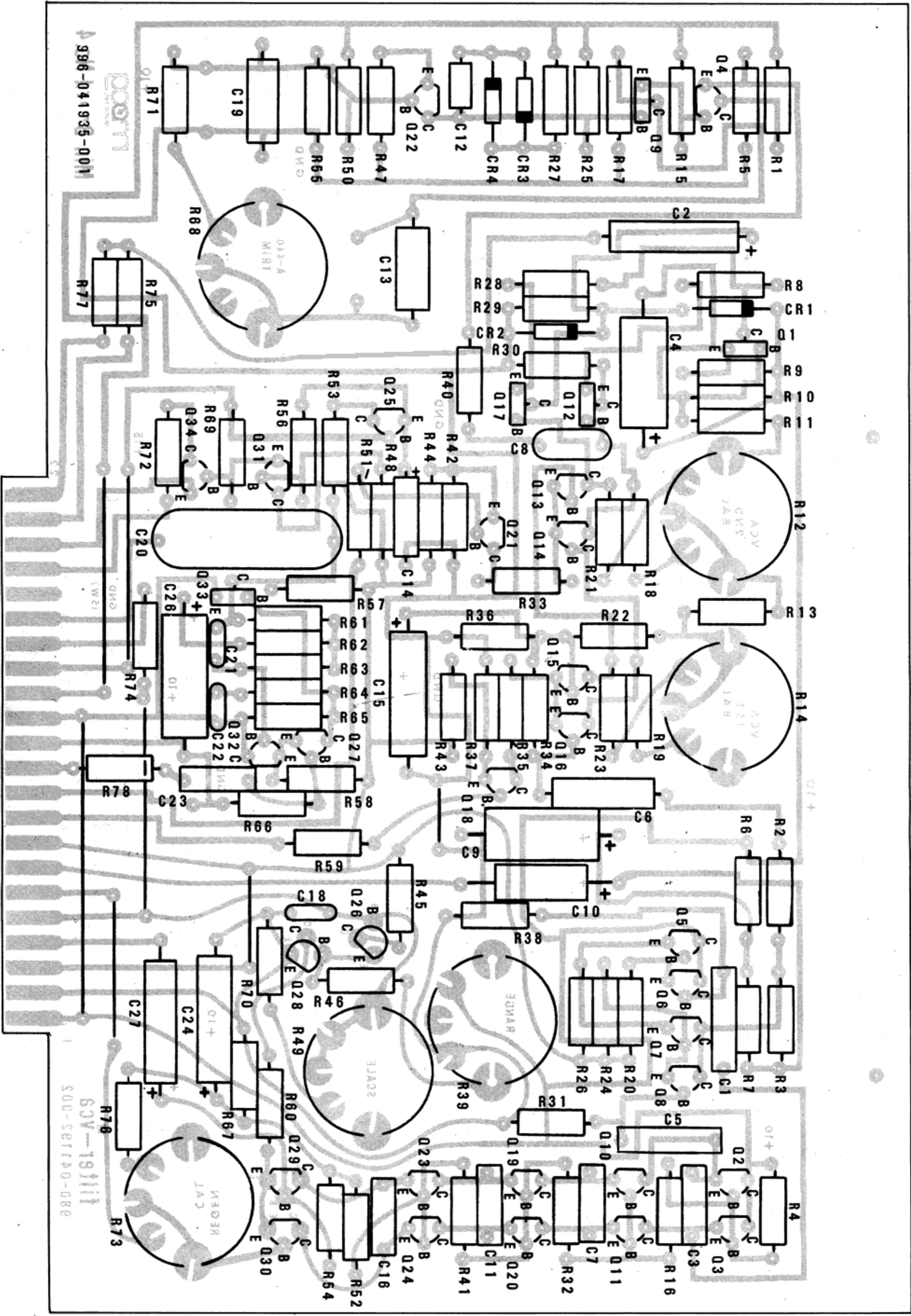
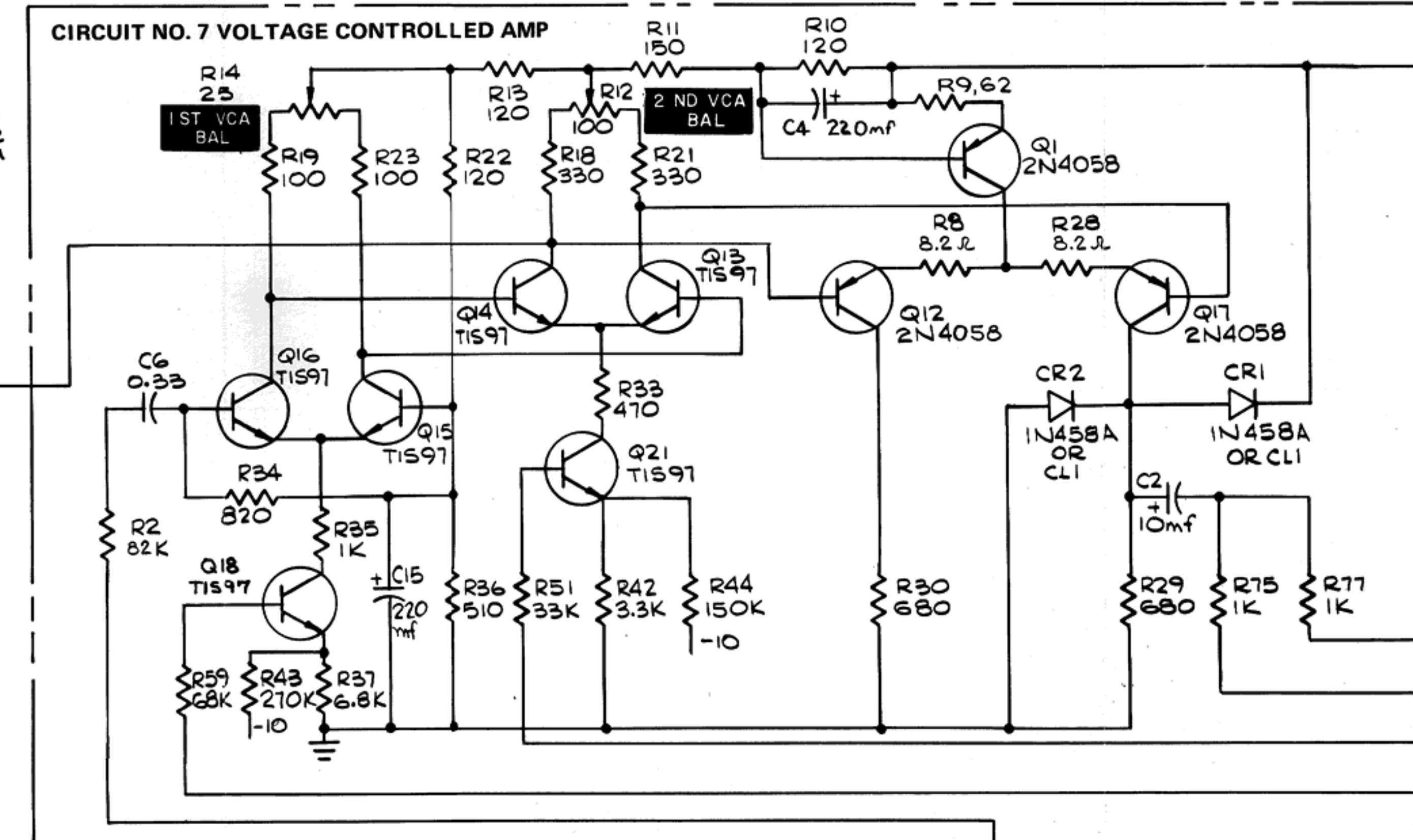
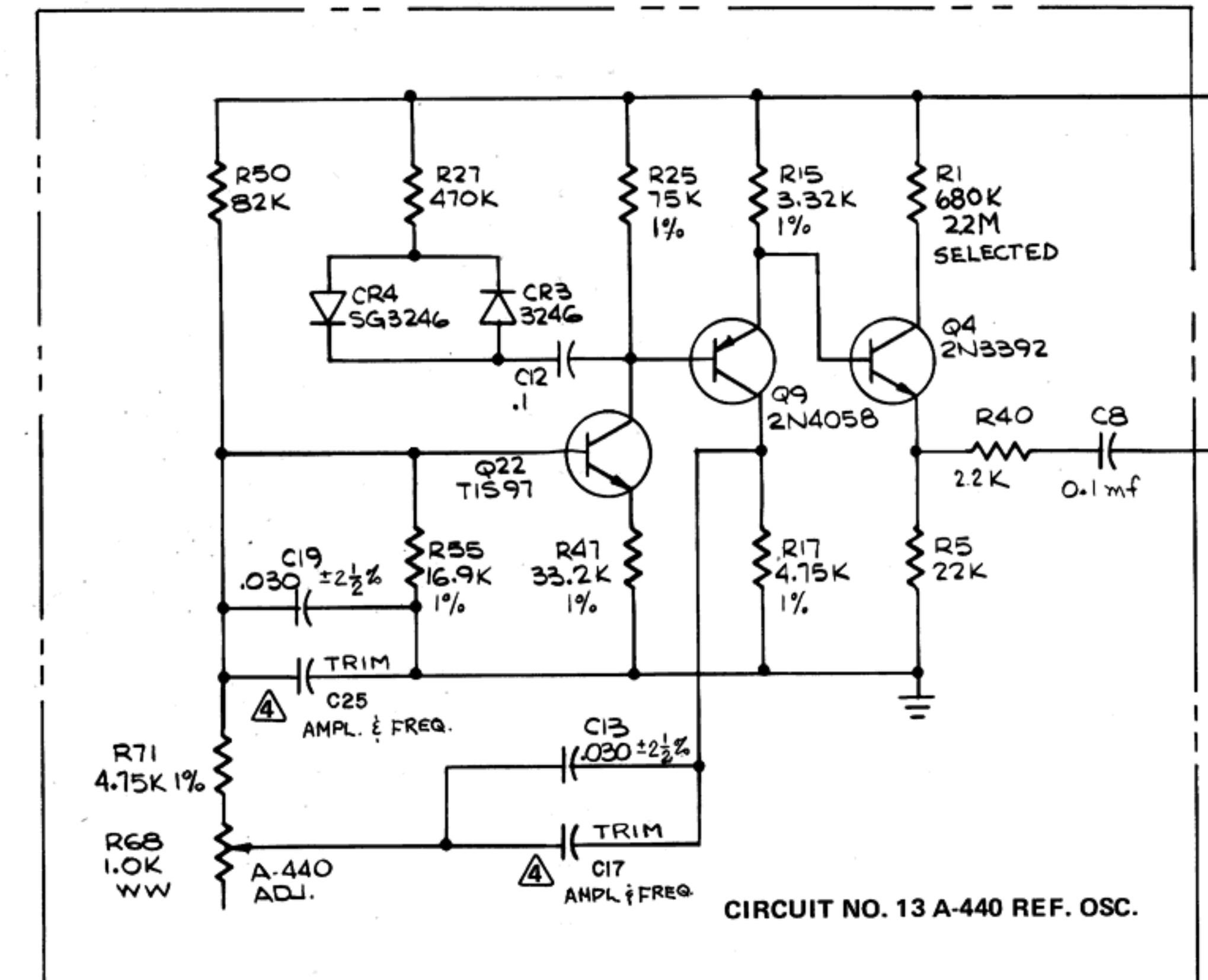
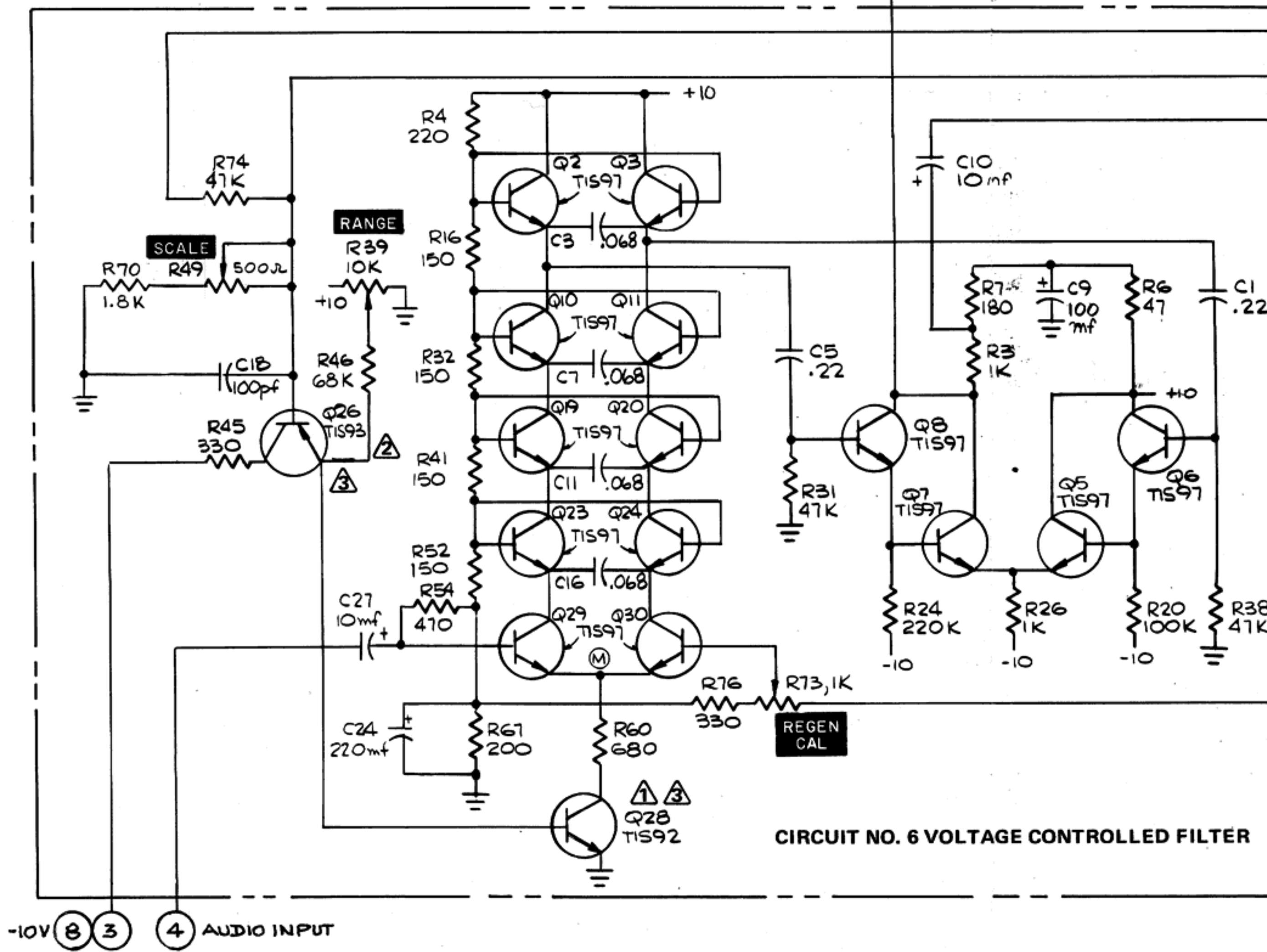
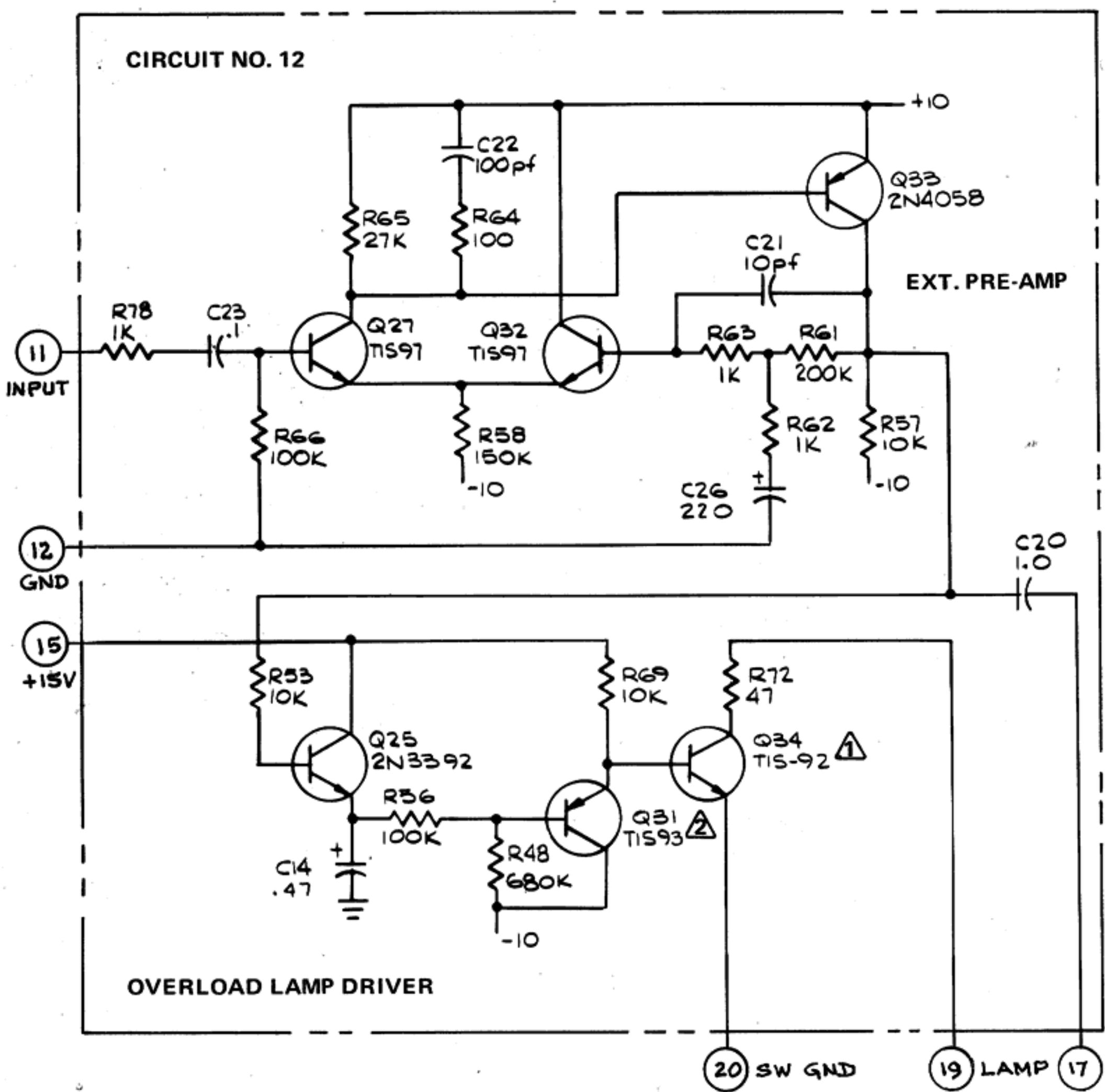


FIGURE 9-10 FILTER PRINTED CIRCUIT BOARD NO. 4 ASSEMBLY



- COMPONENT BASING**
- | | |
|-------------------------|------------------|
| B | E |
| TIS92
TIS93
TIS97 | 2N3392
2N4058 |
- TO HEADPHONE AMP**
- MAIN OUTPUT**
- EXT. LOUDNESS INPUT**
- CONTOUR INPUT**



- AMT OF CONTOUR**
- CONTROL NODE**
- EMPHASIS**
- NOTES:**
1. UNLESS OTHERWISE SPECIFIED—
ALL RESISTOR VALUES ARE IN OHMS 1/4W, $\pm 5\%$.
ALL CAPACITOR VALUES ARE IN MFD (uf).
 2. ALTERNATE FOR TIS92, 2N3904.
 3. ALTERNATE FOR TIS93, 2N3906.
 4. Q26 & Q28 MATCHED TO $\pm 3\text{mV}$ at 20mA.
 5. C17, C25 SELECTED 600-1200 Pf.

EMPHASIS

FIGURE 9-11 FILTER PRINTED CIRCUIT BOARD NO. 4 SCHEMATIC DIAGRAM

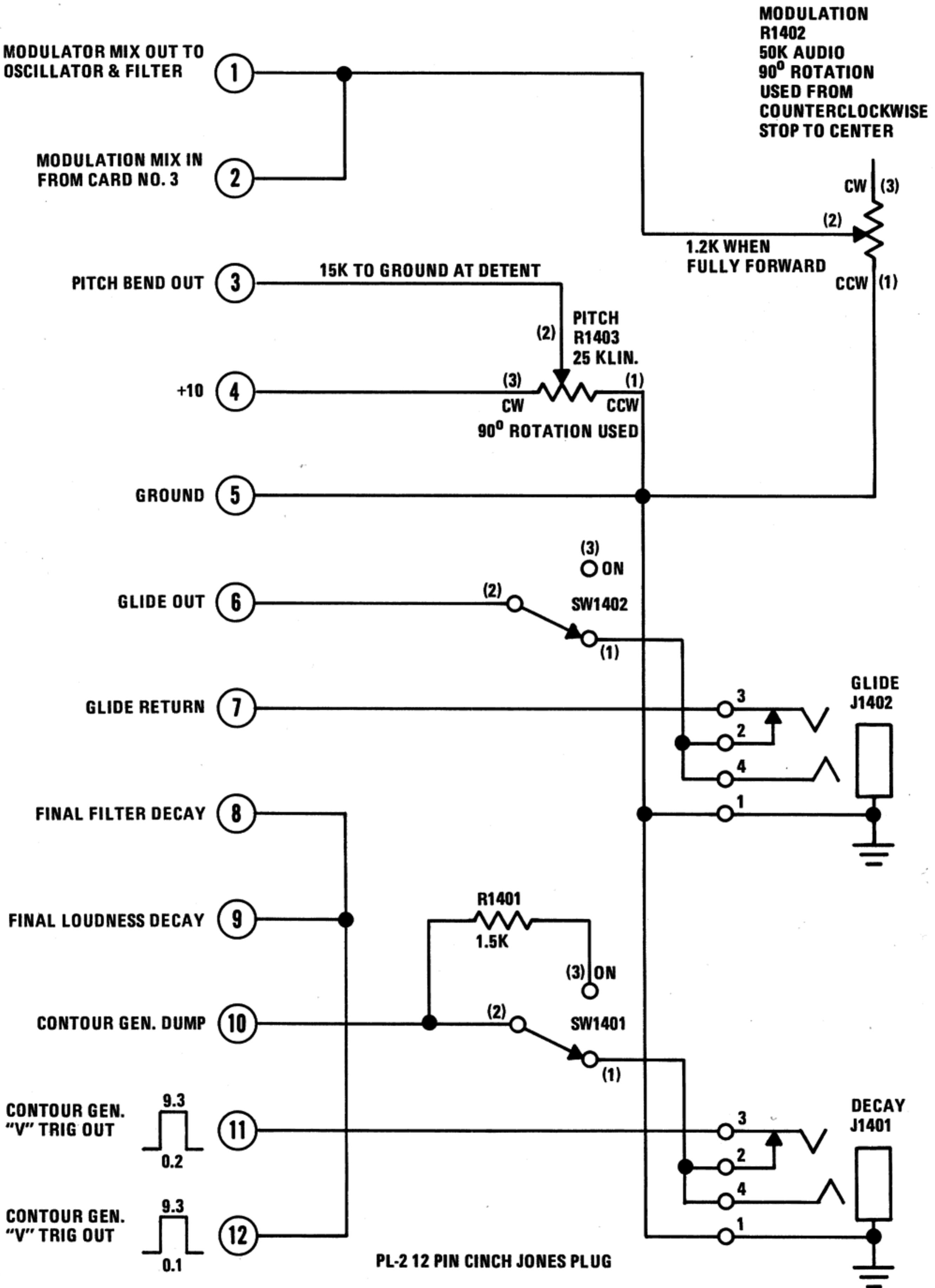


FIGURE 9-12 LEFT HAND CONTROLLER SCHEMATIC DIAGRAM

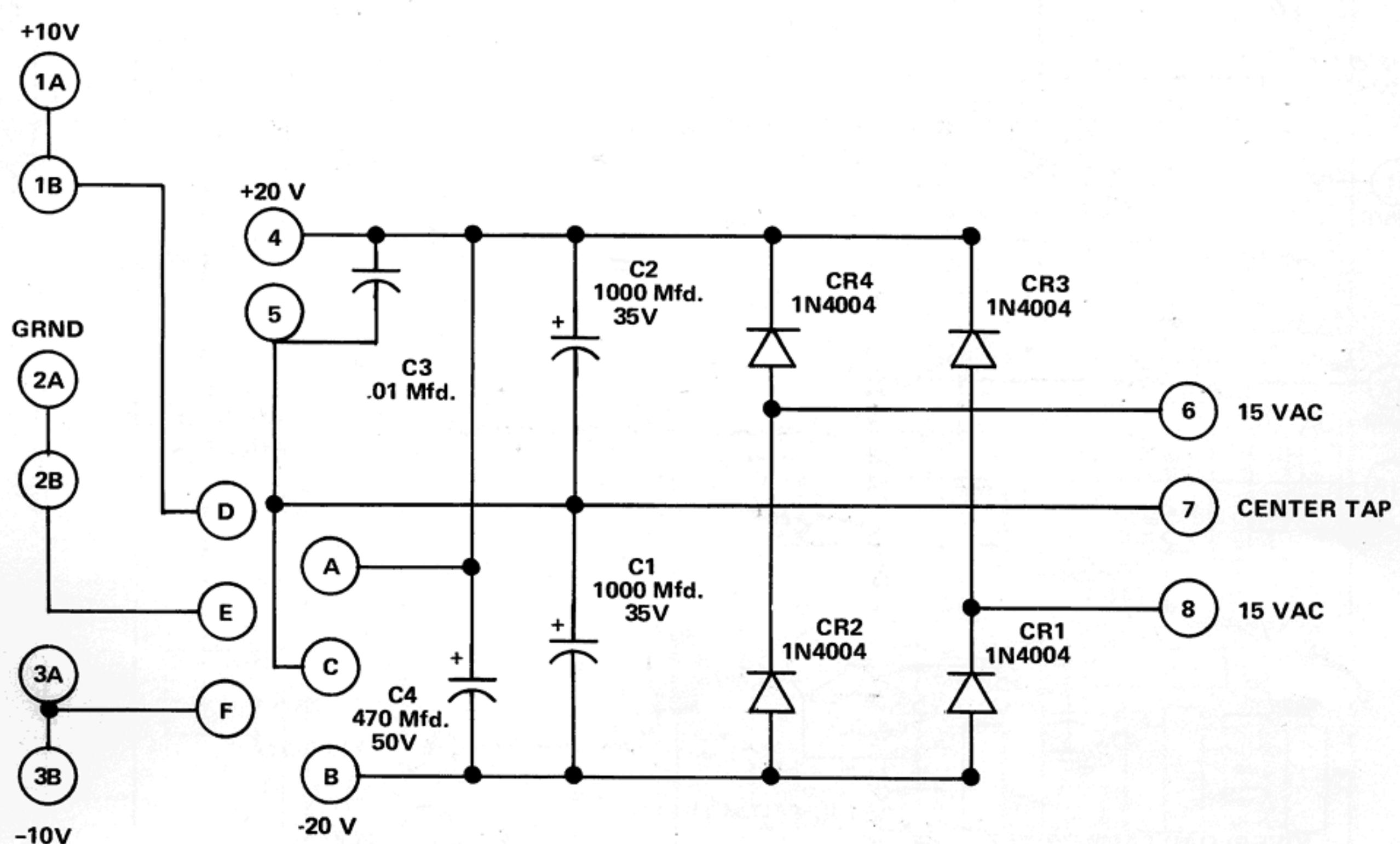
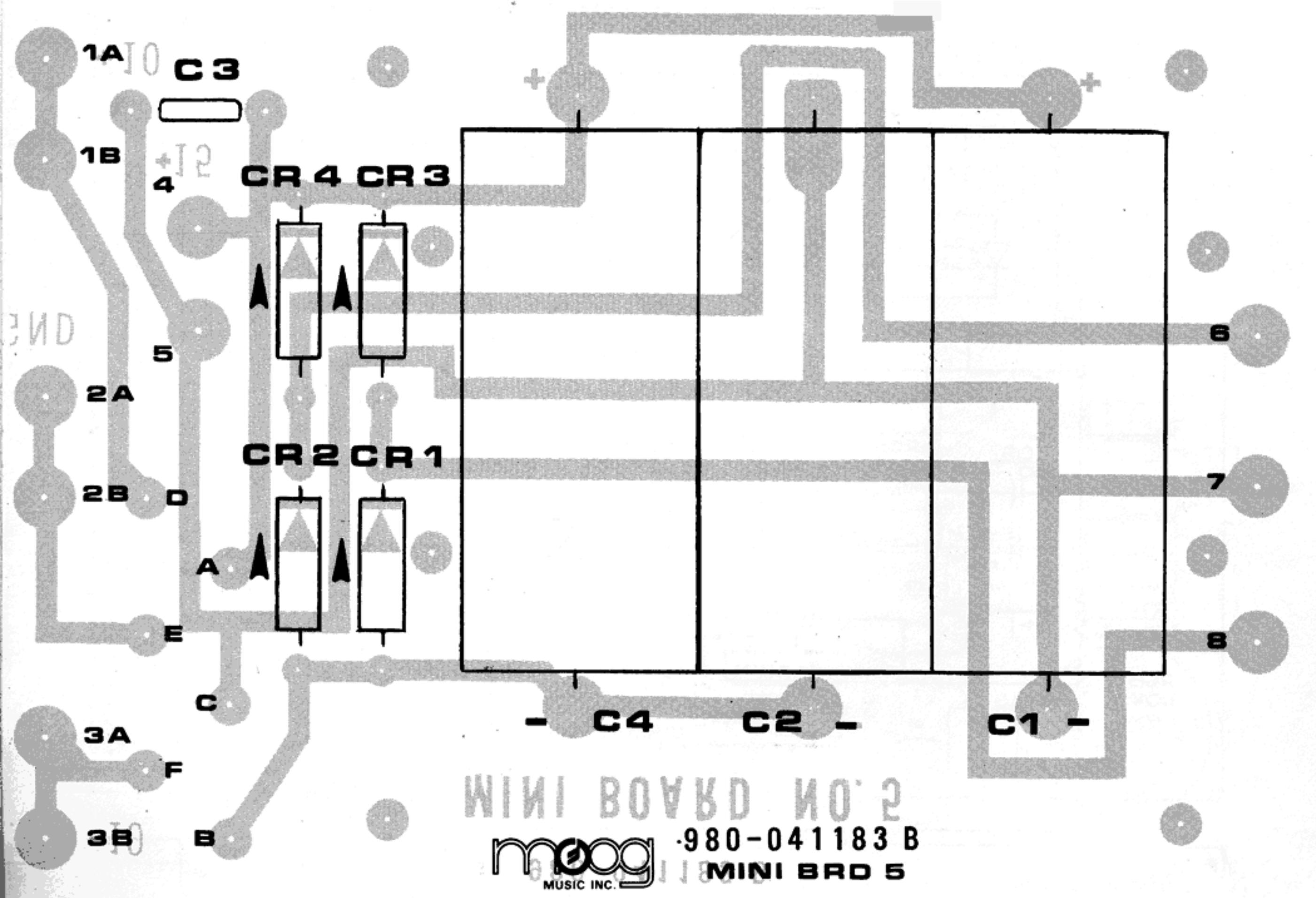


FIGURE 9-13 RECTIFIER PRINTED CIRCUIT BOARD NO. 5 SCHEMATIC DIAGRAM AND BOARD ASSEMBLY

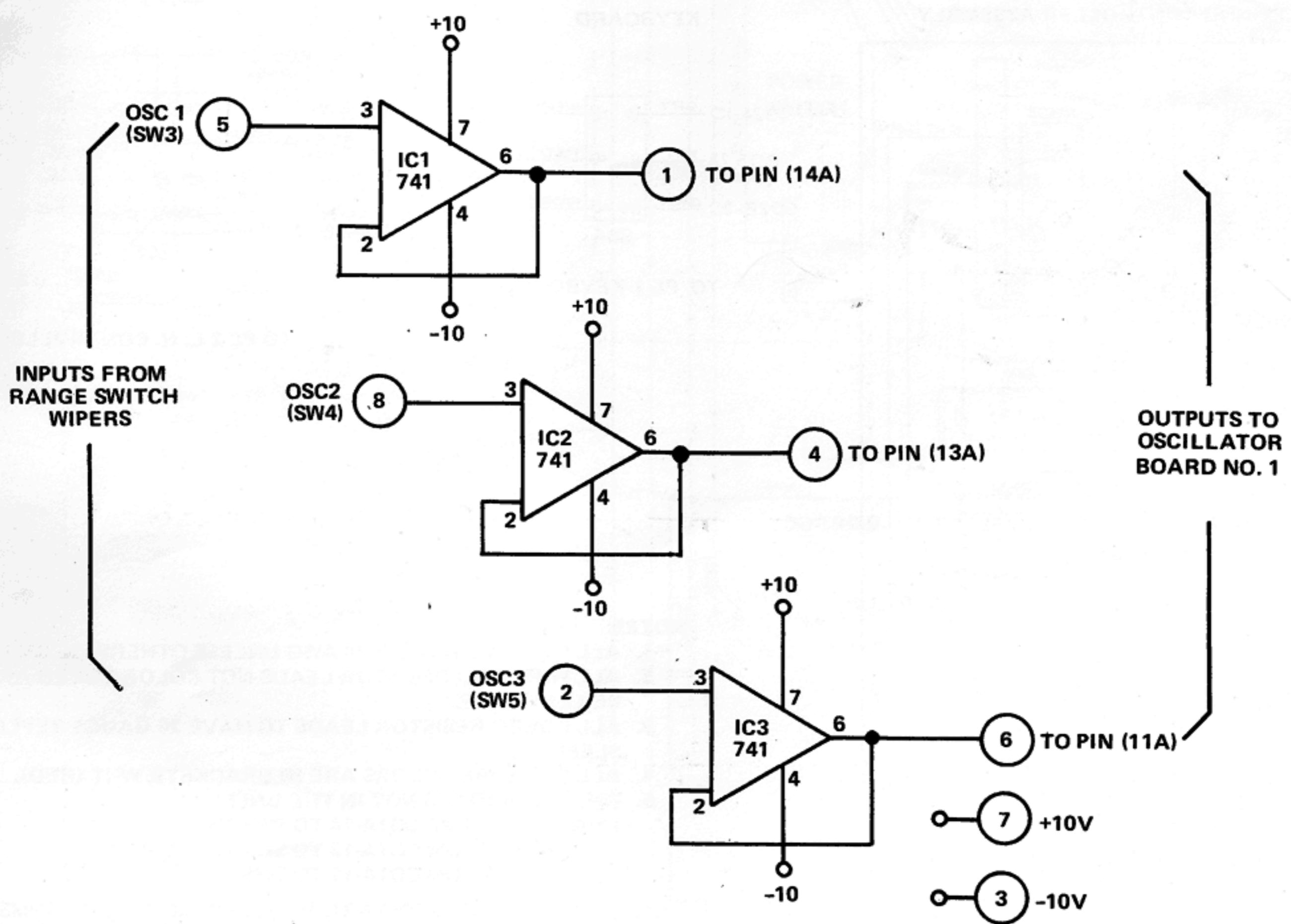
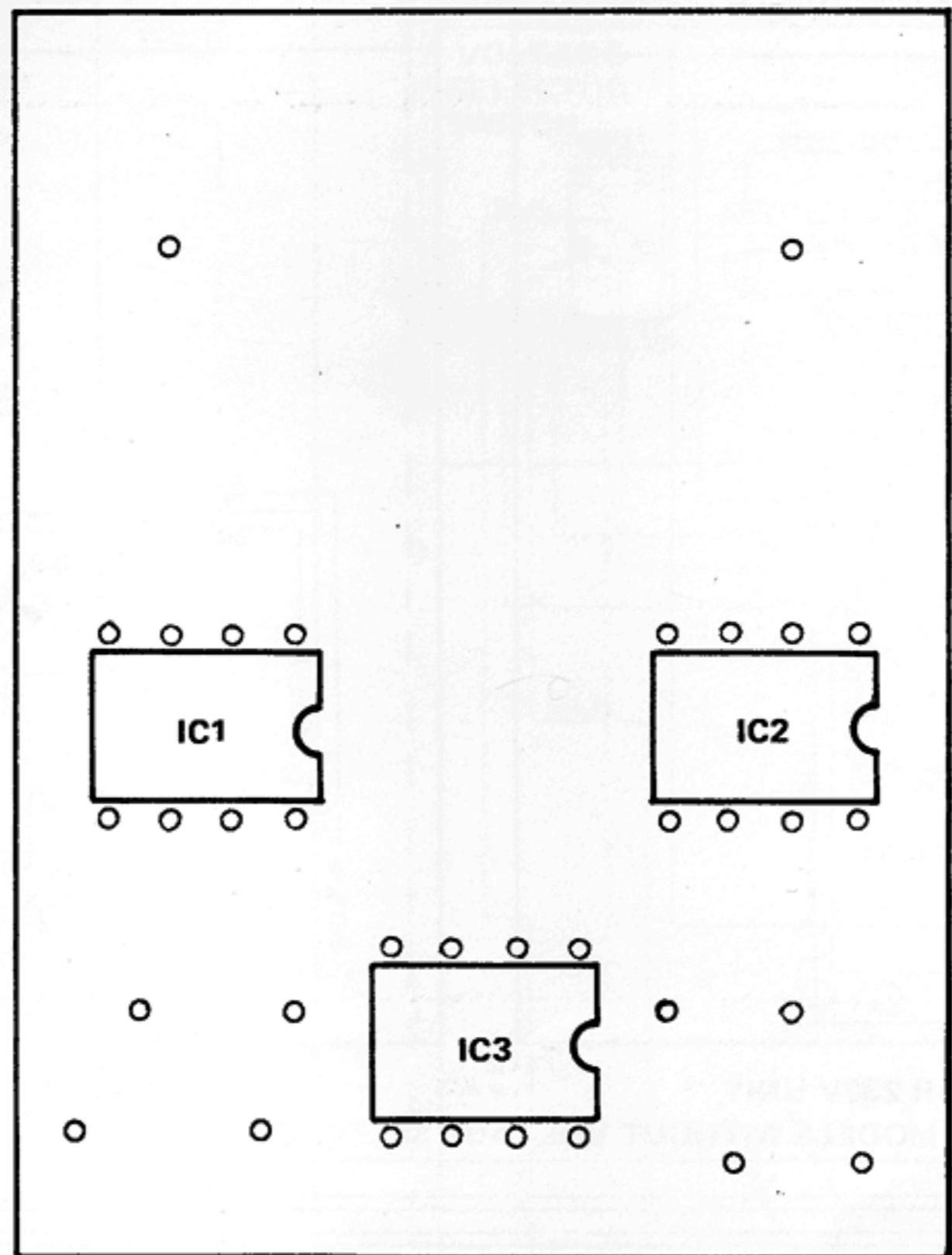
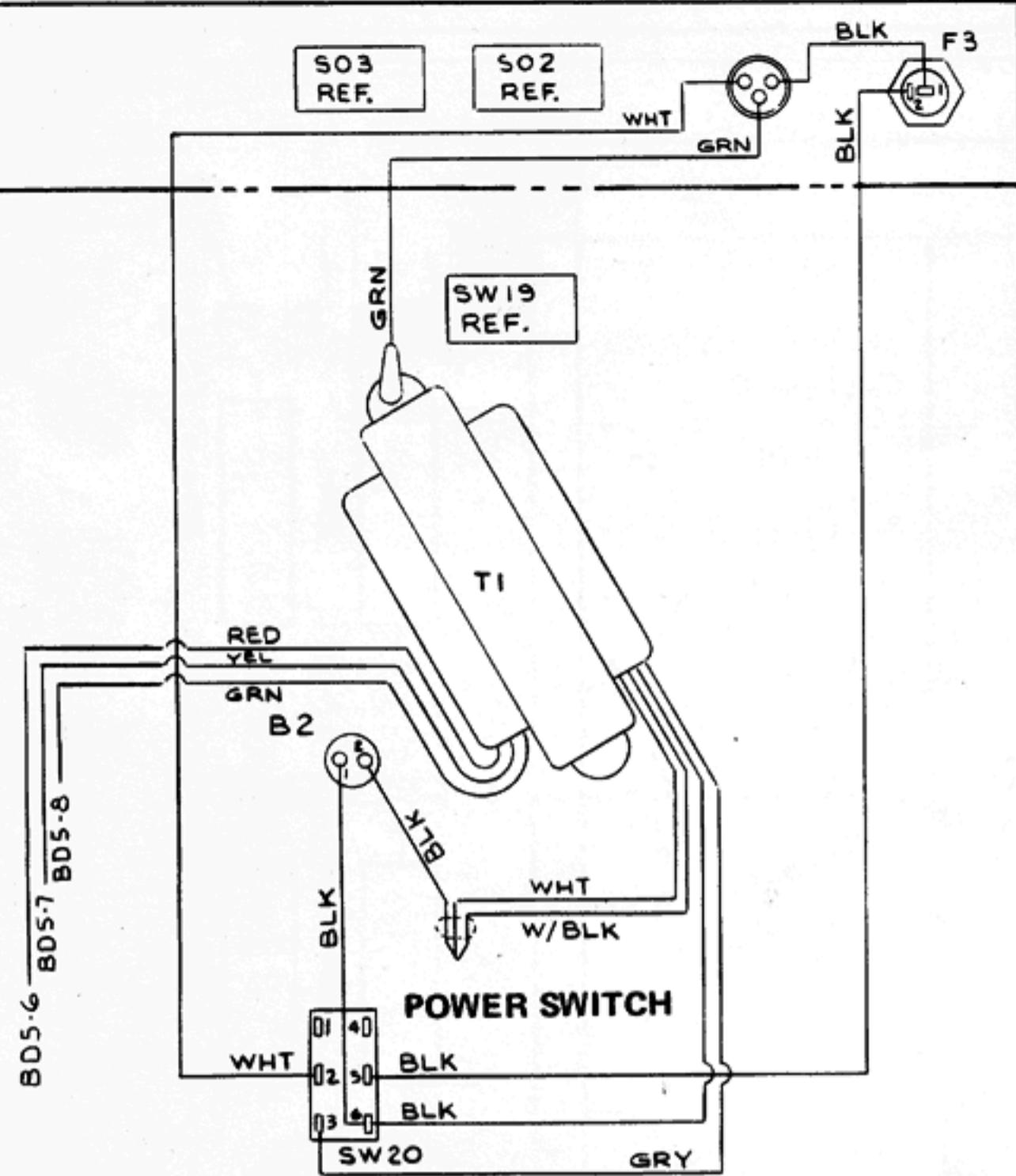
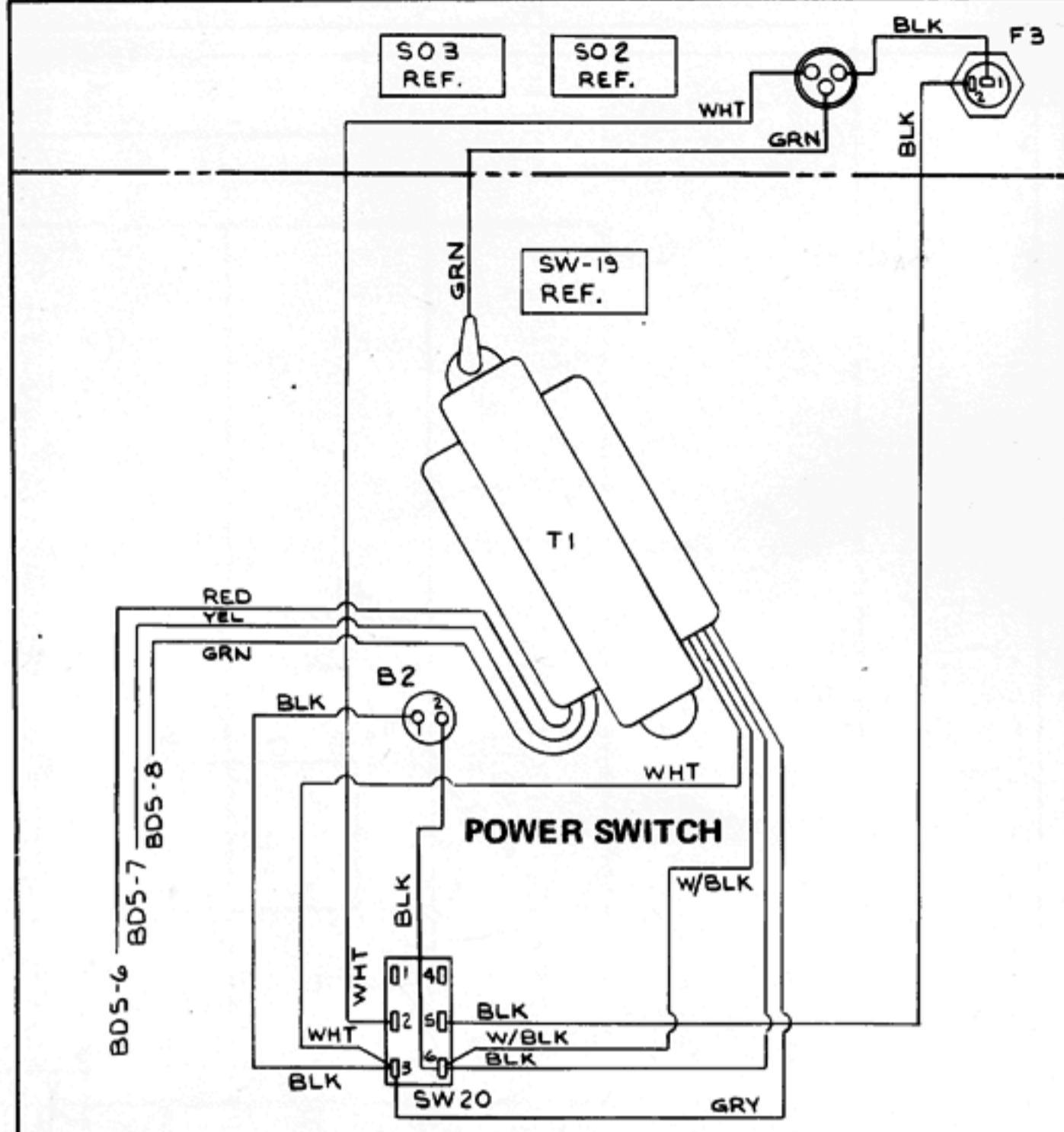


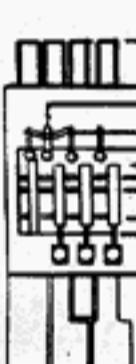
FIGURE 9-14 OCTAVE BUFFER BOARD NO. 6 SCHEMATIC DIAGRAM AND BOARD ASSEMBLY



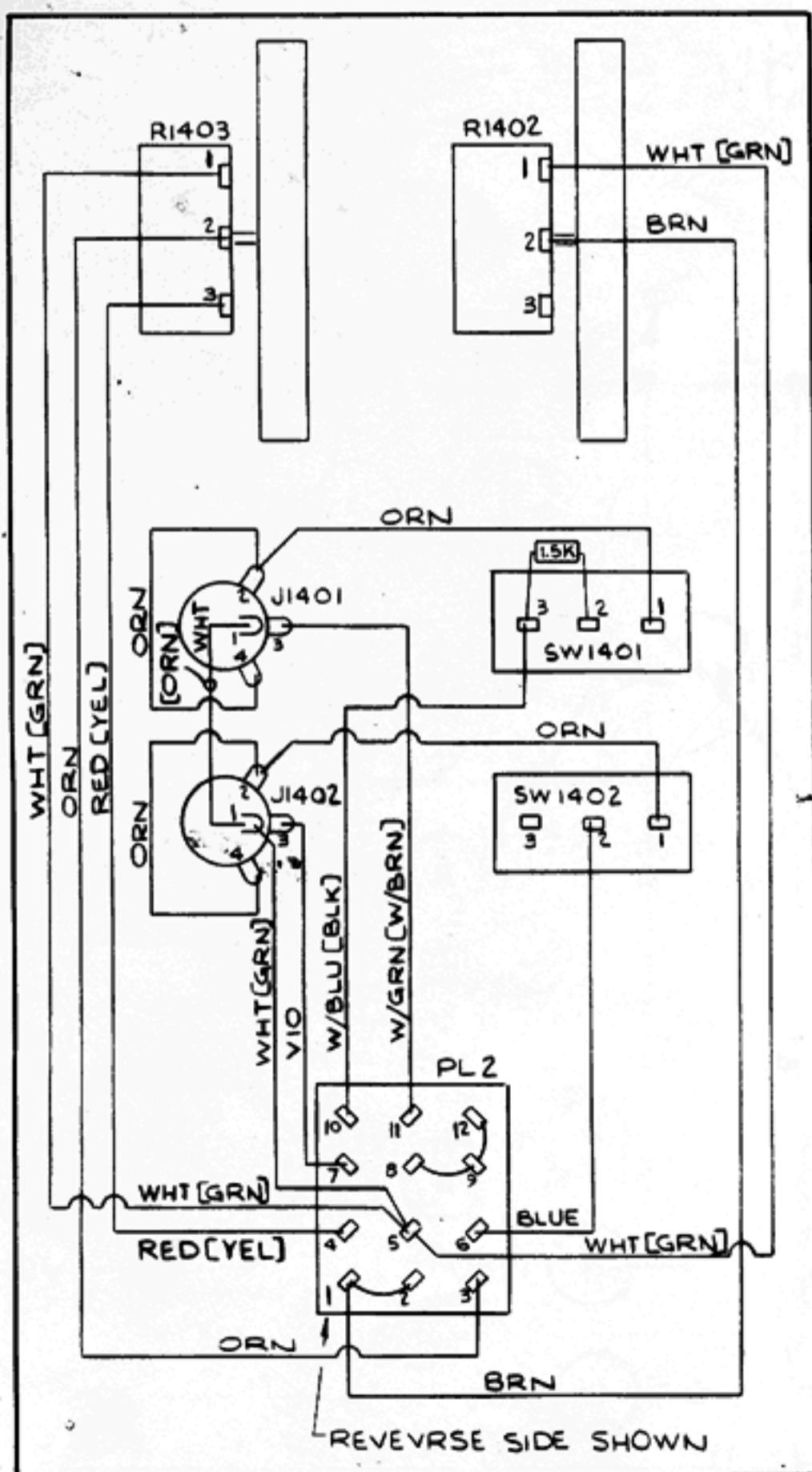
TRANSFORMER WIRING FOR 230V UNIT
FOR OLDER MODELS WITHOUT VOLTAGE SELECTOR SWITCH.



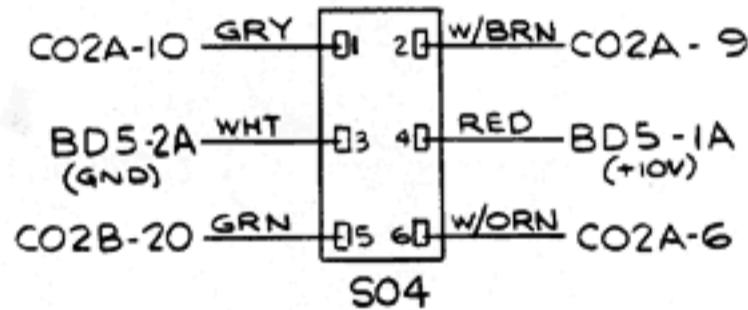
TRANSFORMER WIRING FOR 115V UNIT



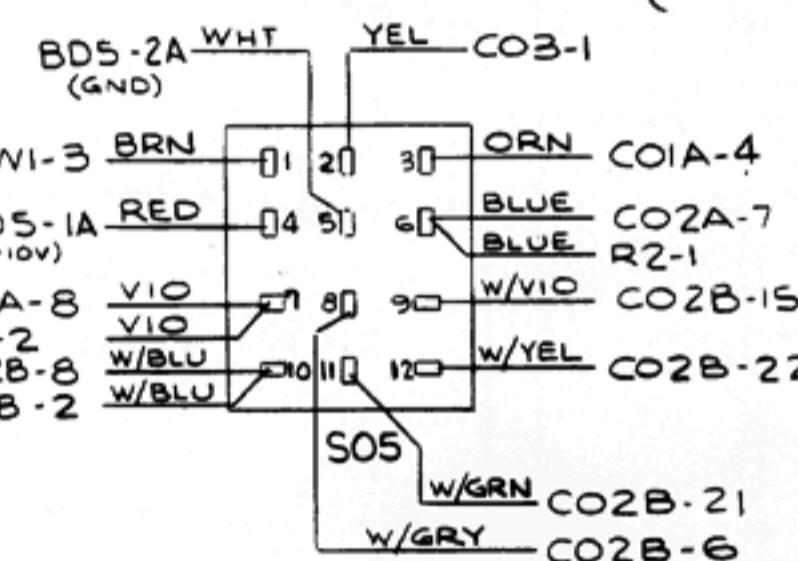
LEFT-HAND CONTROLLER ASSEMBLY



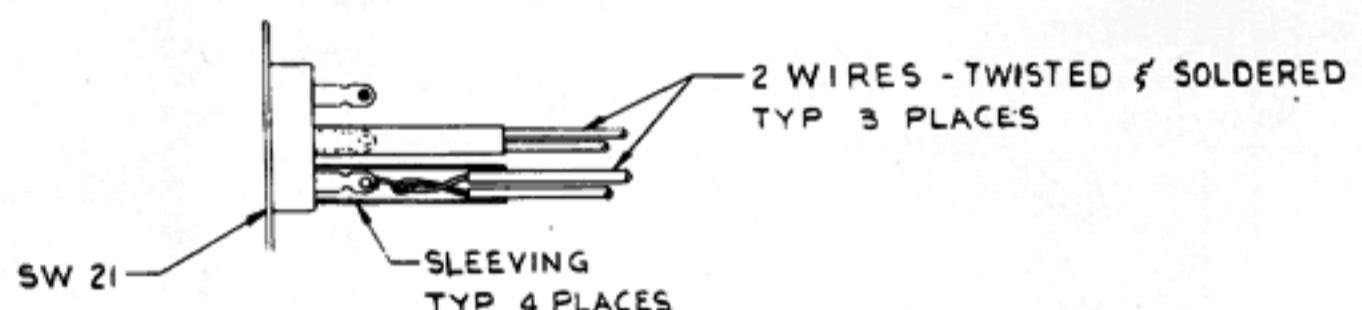
KEYBOARD



TO PL 1 KEYBOARD



TO PL 2 L. H. CONTROLLER



NOTES:

1. ALL WIRES ARE TO BE 24 AWG UNLESS OTHERWISE SPECIFIED.
2. ALL WIRE AND RESISTOR LEADS NOT COLOR CODED ARE TO BE LEFT BARE.
3. ALL CODED RESISTOR LEADS TO HAVE 20 GAUGE TEFLON SLEEVING.
4. ALL OLD WIRE COLORS ARE IN BRACKETS. WHT (RED).
5. WHEN BOARD 6 IS NOT IN THE UNIT -
 - A) WIRE FROM CO1A-14 TO SW3-13
 - WIRE FROM CO1A-13 TO SW4-13
 - WIRE FROM CO1A-11 TO SW5-13
- B) RESISTORS ON SW3 CHANGE FROM 1K TO 10 OHMS, FROM 4.75K TO 47 OHMS.

FIGURE 9-15 LEFT HAND CONTROLLER ASSEMBLY AND TRANSFORMER WIRING

FRONT PANEL ASSEMBLY

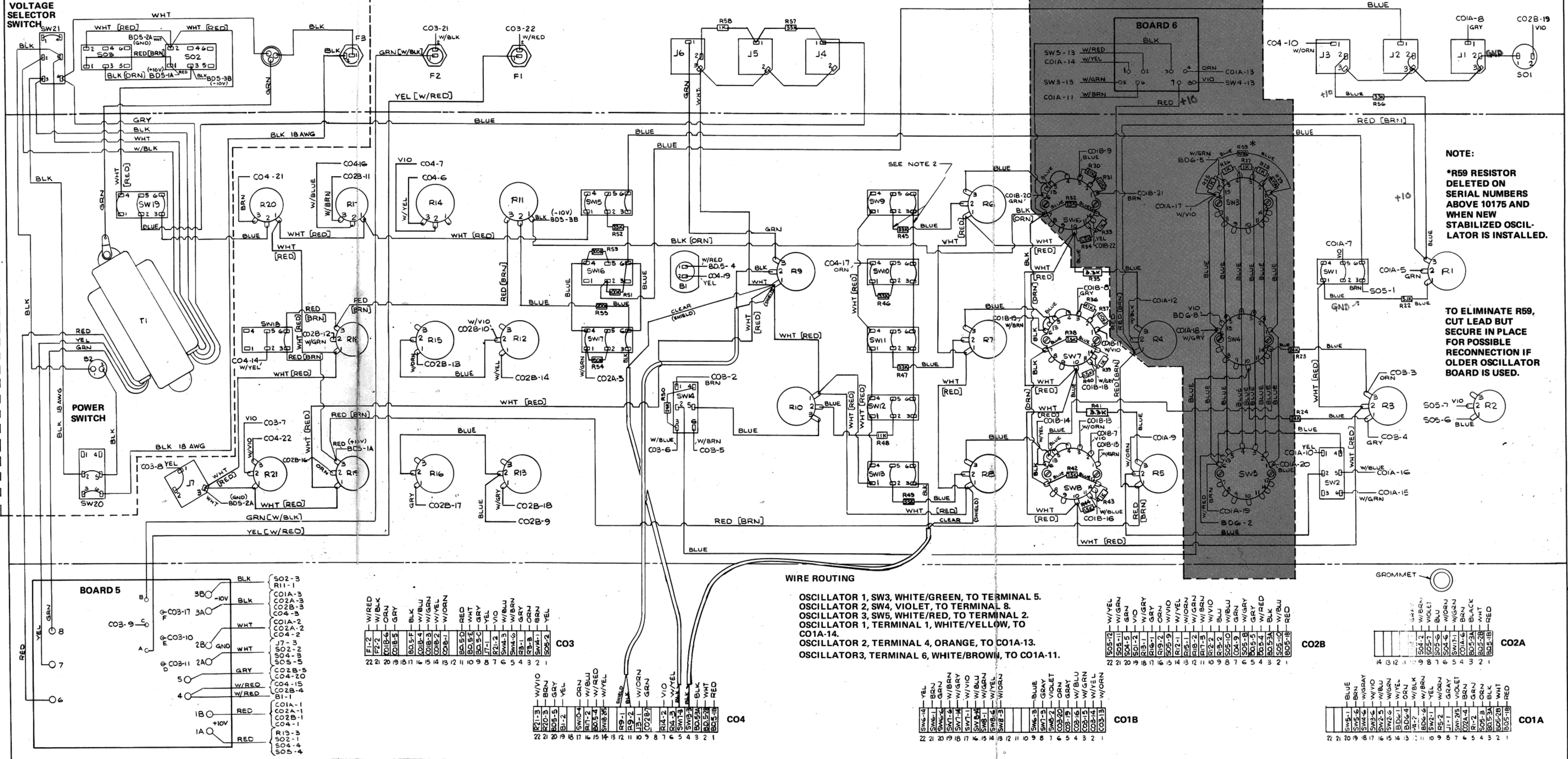


FIGURE 9-16 FRONT PANEL ASSEMBLY WIRING DIAGRAM

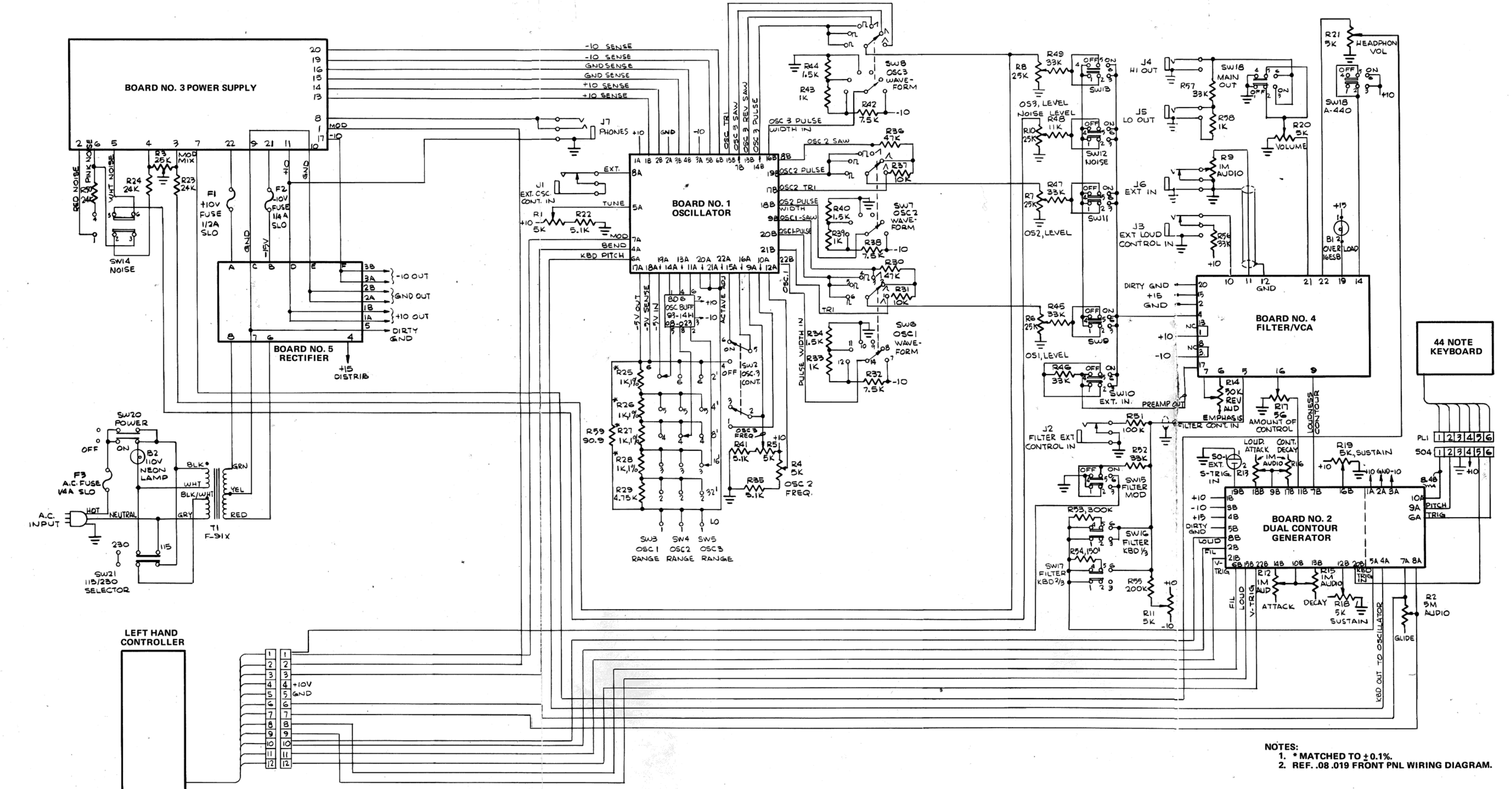


FIGURE 9-17 INTERCONNECTING WIRING DIAGRAM

SECTION 7

REPLACEMENT PARTS LIST

7.1 ORDERING

The following lists specify parts available from Moog Music Inc., Customer Service Department, 2500 Walden Avenue, Buffalo, New York 14225, (716) 681-7242. Please specify the unit name, model, serial number, part description, electrical reference designator if applicable and part number when ordering. Parts may be ordered through the agencies listed on the back cover of this manual.

TABLE 7-1
GENERAL MECHANICAL REPLACEMENT PARTS LIST

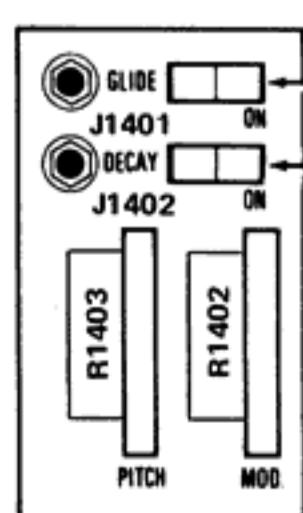
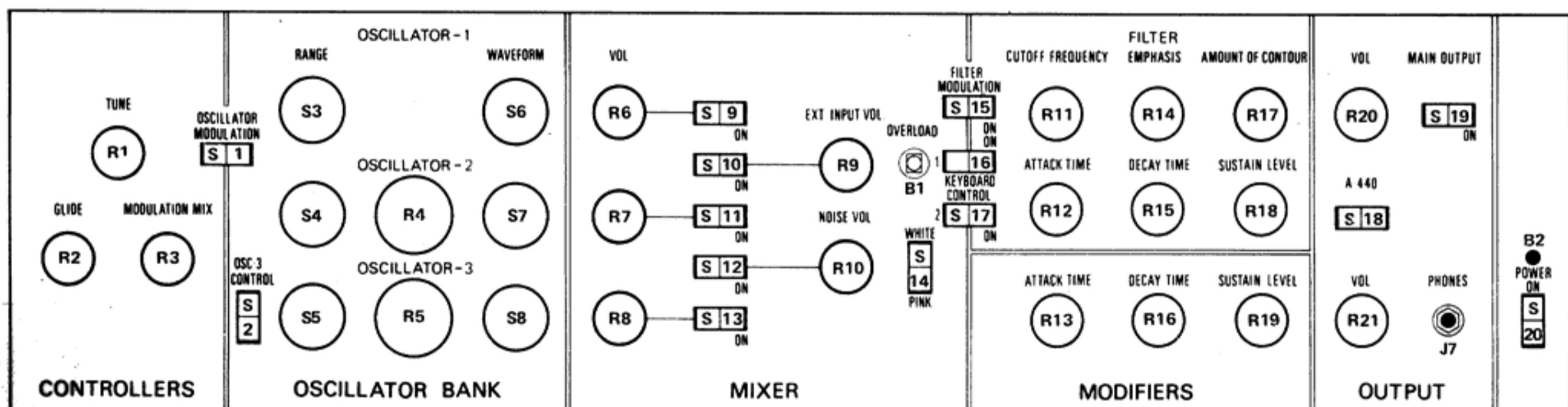
PART NUMBER	DESCRIPTION	QTY	PART NUMBER	DESCRIPTION	QTY
997-041940-001	Back Cover	1	932-041179-001	Shipping Carton	1
918-043238-002	Buss Bar, Gold Plated	3	993-041181-001	S-Trig Plug	1
978-041204-001	Cabinet, Complete	1	964-042611-001	Black Key.....	18
978-943379-001	Cabinet, Top Trim Strip.....	1	964-041418-003	White Key, A.....	4
961-043266-001	"Flag Tool (For Connectors) ..	1	964-041418-004	White Key, B.....	4
997-041950-001	Front Panel	1	964-041418-005	White Key, C.....	3
997-041900-001	Keyboard, 44 Note	37 ¹	964-041418-006	White Key, D.....	3
917-043235-001	Key Contact, Gold Plated Spring ..	88	964-041418-007	White Key, E.....	3
915-041916-002	Knob, Large	2	964-041418-008	White Key, F.....	4
915-041917-001	Knob, Pointer	6	964-041418-009	White Key, G.....	4
915-041916-001	Knob, Small	19	964-041418-010	White Key, High C	1
957-041789-001	Power Cord, 120VAC	1			

TABLE 7-2
FRONT PANEL ASSEMBLY REPLACEMENT PARTS LIST

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
R22,R34,R35, R41	852-512512-001	Resistor, 3.3K Ohm, $\pm 5\%$, 1/2W	4
R23,R24,R50	852-512243-001	Resistor, 24K Ohm, $\pm 5\%$, 1/2W	3
R25,R26,R27, R28	949-041130-001	Resistor, 1K Ohm, MATCHED SET, 4 Pieces	1
R29	853-424751-031	Resistor, 4.75K Ohm, $\pm 1\%$, 1/4W	1
R30,R36	852-512473-001	Resistor, 47K Ohm, $\pm 5\%$, 1/2W	2
R31,R37	852-512103-001	Resistor, 10K Ohm, $\pm 5\%$, 1/2W	2
R32,R38,R42	852-512752-001	Resistor, 7.5K Ohm, $\pm 5\%$, 1/2W	3
R33,R39,R43 R40,R44	852-512102-001 852-512152-001	Resistor, 1K Ohm, $\pm 5\%$, 1/2W	3
R45,R46,R47, R49,R52	852-512152-001 852-512333-001	Resistor, 1.5K Ohm, $\pm 5\%$, 1/2W	2
R48	852-512113-001	Resistor, 33K Ohm, $\pm 5\%$, 1/2W	5
R51	852-512104-001	Resistor, 11K Ohm, $\pm 5\%$, 1/2W	1
R53	852-512304-001	Resistor, 100K Ohm, $\pm 5\%$, 1/2W	1
R54	852-512154-001	Resistor, 300K Ohm, $\pm 5\%$, 1/2W	1
R55	852-512204-001 997-041925-001	Resistor, 150K Ohm, $\pm 5\%$, 1/2W	1
		Panel, Front, Mechanical Assembly	1

TABLE 7-3
FRONT PANEL AND LEFT HAND CONTROLLER REPLACEMENT PARTS LIST

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
B1	906-041921-001	Front Panel Controls consisting of:	
B1 Lamp	939-041922-001	Socket, Lamp	1
B2	935-041919-001	Lamp.....	1
J7	910-041306-004	Light Assembly, Pilot	1
J1401,J1402	910-041632-001	Jack, Phone, 2 Circuit, Non-Shorting	1
R1,R4,R5,R11	925-040294-004	Jack, Phone, 0.206 Dia., 3 Conductor, Shorting.....	2
R2	925-040293-001	Resistor, Rotary Pot, <u>Linear, 5K Ohm</u>	4
R3,R6,R7, R8,R10,R1403	925-040294-001	Resistor, Rotary Pot, No. 1 Taper, 5 Megohm	1
R9,R12,R13,		Resistor, Rotary Pot, Linear, 25K Ohm	6
R15,R16	925-040294-005	Resistor, Rotary Pot, Audio, 1 Megohm	5
R14	925-040294-003	Resistor, Rotary Pot, Rev. Audio, 50K Ohm	1
R17 thru R21	925-040292-001	Resistor, Rotary Pot, Linear, 5K Ohm	5
R1402	925-040294-002	Resistor, Rotary Pot, Audio, 50K Ohm.	1
S1,S2,S15, S16,S17	960-041761-002	Switch, Rocker, Orange, DPDT	5
S3 thru S14	960-041760-001	Switch, Rotary, 2 Pole, 6 Position	12
S18,S19	960-041761-001	Switch, Rocker, Blue, DPDT	2
S20	960-041755-001	Switch, Rocker, Black, DPDT.....	1
S1401,S1402	960-041761-003	Switch, Rocker, White, DPDT.....	2
	964-040865-001	Wheel, Left Hand Controller	2
	909-040938-001	Pin, Dowel, 0.06 inch x 0.5 inch	4
	962-041179-001	Detent	1
	961-041178-001	Detent Spring	1
	903-040486-062	Screw, Allen Set 6-32 x 0.38 inch	2



**LEFT HAND
CONTROLLER**

FIGURE 7-1 FRONT PANEL CONTROL DIAGRAM

TABLE 7-4
NEW OSCILLATOR PRINTED CIRCUIT BOARD ASSEMBLY BOARD 1
REPLACEMENT PARTS LIST (SERIAL NUMBERS 10175 AND ABOVE)

INDEX NO. OR REF INDEX	PART NUMBER	DESCRIPTION	QTY
C1,C2,C37	996-041928-002	Printed Circuit Board Assembly consisting of:	
C3	946-040231-005	Capacitor, Tantalum, 5.6uf, ± 10%, 35V	3
C4,C9,C15, C20,C26,C31	946-040231-006	Capacitor, Tantalum, 27uf, ± 10%, 20V	1
C5,C10,C11, C14,C16,C21, C22,C25,C27, C32,C33,C36	947-042020-101	Capacitor, Ceramic Disc, 100Pf, ± 10%, 50V	6
C6,C17,C28	947-040200-103	Capacitor, Ceramic Disc, 0.01uf, ± 10%, 50V	12
C7,C18,C29	946-040231-001	Capacitor, Tantalum, 1.5uf, ± 10%, 20V	3
C8,C19,C30	946-041508-102	Capacitor, Polycarbonate, 0.001uf, ± 10%, 50V	3
C12,C23,C34	947-042020-180	Capacitor, Polyester, 0.001uf, ± 10%, 50V	3
C13,C24,C35	947-042020-501	Capacitor, Ceramic Disc, 18Pf, ± 10%, 50V	3
CR1 thru CR6	919-041075-001	Capacitor, Ceramic Disc, 500Pf, ± 10%, 50V	3
IC1,IC3,IC4, IC9,IC14	991-041102-001	Diode, 1N4148 or Alternate 1N914	6
IC2	991-041101-001	Integrated Circuit, Dual Operational Amplifier, MC1458CP-1	5
IC5,IC10,IC15	991-041082-001	Integrated Circuit, Operational Amplifier, 741	1
IC6,IC7,IC11, IC12,IC16,IC17	991-042386-001	Integrated Circuit, 726	3
IC8,IC13,IC18	991-042388-001	Integrated Circuit, Operational Amplifier, TL081	6
N1	949-042330-001	Integrated Circuit, LM393	3
N2 thru N4	949-042331-001	Resistor Network, Primary Summer	1
N5 thru N7	949-042332-001	Resistor Network, Secondary Summer	3
Q1	991-041052-001	Resistor Network, Oscillator	3
Q2	991-041275-001	Transistor, PNP, 2N3906	1
Q3,Q5,Q6, Q10,Q11,Q15 thru Q20	991-041051-001	Transistor, N Channel, FET, E101	1
Q4,Q9,Q14	991-041055-001	Transistor, NPN, 2N3904	11
R3	853-421244-031	Transistor, Switching, FET, E112	3
R7	852-312223-001	Resistor, 1.24 Megohm, ± 1%, 1/4W	1
R8,R11	852-312472-001	Resistor, 22K Ohm, ± 5%, 1/4W	1
R9,R10	853-424991-031	Resistor, 4.7K Ohm, ± 5%, 1/4W	2
R14,R16,R31, R52,R55,R71, R90,R91,R109	853-424991-031	Resistor, 4.99K Ohm, ± 1%, 1/4W	2
R18,R57,R92	925-042389-002	Resistor, Trim Pot, 10K	9
R22,R62,R100	925-042390-001	Resistor, Trim Pot, 5K	3
R23,R63,R101	852-312153-001	Resistor, 15K Ohm, ± 5%, 1/4W	3
R24,R64,R102	853-422321-031	Resistor, 2.32K Ohm, ± 1%, 1/4W	3
R25,R26,R42, R65,R66,R82, R103,R104, R120	853-421000-031	Resistor, 100 Ohm, ± 1%, 1/4W	3
	853-421002-031	Resistor, 10K Ohm, ± 1%, 1/4W	9

TABLE 7-4
NEW OSCILLATOR PRINTED CIRCUIT BOARD ASSEMBLY BOARD 1
REPLACEMENT PARTS LIST (SERIAL NUMBERS 10175 AND ABOVE) (Continued)

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
R27,R67,R105	923-044092-001	Resistor, 49.9K Ohm, $\pm 1\%$, 1/4W, Metal Film	3
R28,R32,R61, R68,R72,R106, R110	852-312104-001	Resistor, 100K Ohm, $\pm 5\%$, 1/4W	7
R29,R69,R107	852-312102-001	Resistor, 1K Ohm, $\pm 5\%$, 1/4W	3
R30,R70,R108	853-422004-031	Resistor, 2.0 Megohm, $\pm 1\%$, 1/4W	3
R31,R71,R109	925-042389-001	Resistor, Trim Pot, 5K Ohm	3
R33,R73,R111	852-312202-001	Resistor, 2K Ohm, $\pm 5\%$, 1/4W	3
R34,R60,R74, R112	852-312105-001	Resistor, 1 Megohm, $\pm 5\%$, 1/4W	4
R35,R75,R113	852-312101-001	Resistor, 100 Ohm, $\pm 5\%$, 1/4W	3
R45,R47,R85, R87,R126,R127	853-421003-031	Resistor, 100K Ohm, $\pm 1\%$, 1/4W	6
R46,R86,R125	852-312225-001	Resistor, 2.2 Megohm, $\pm 5\%$, 1/4W	3
R48,R88,R131	852-312512-001	Resistor, 5.1K Ohm, $\pm 5\%$, 1/4W	3
R49,R89,R132 R123	852-312272-001 852-312331-001	Resistor, 2.7K Ohm, $\pm 5\%$, 1/4W	3
R124	852-312222-001	Resistor, 330 Ohm, $\pm 5\%$, 1/4W	1
R128	852-312394-001	Resistor, 2.2K Ohm, $\pm 5\%$, 1/4W	1
R129	852-312683-001	Resistor, 390K Ohm, $\pm 5\%$, 1/4W	1
R130	852-312333-001	Resistor, 68K Ohm, $\pm 5\%$, 1/4W	1
R133	852-312752-001	Resistor, 33K Ohm, $\pm 5\%$, 1/4W	1
R134	852-312183-001	Resistor, 7.5K Ohm, $\pm 5\%$, 1/4W	1
R135 thru R137	852-312224-001 906-040377-001	Resistor, 18K Ohm, $\pm 5\%$, 1/4W	1
		Selected for oscillator tuning. Value may also be 75K or 100K $\pm 1\%$, 1/4W, Metal Film.	3
		Socket, Integrated Circuit, 10 Pin, TO-5	3

TABLE 7-5
OLD OSCILLATOR PRINTED CIRCUIT BOARD ASSEMBLY BOARD 1
REPLACEMENT PARTS LIST (SERIAL NUMBERS BELOW 10175)

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
C1,C6,C8	996-041928-001	Printed Circuit Board Assembly consisting of:	
C2 thru C5, C7,C9	946-042021-103	Capacitor, 0.01uf, Polystyrene, $\pm 2\%$, 35V	3
C10	947-042020-101	Capacitor, Ceramic Disc, 100Pf, $\pm 10\%$, 50V	6
C11,C12	945-040209-005	Capacitor, Electrolytic, 2.2uf, +75/-10%, 50V	1
C13	946-040231-005	Capacitor, Tantalum, 5.6uf, $\pm 10\%$, 35V	2
C14	946-040231-006	Capacitor, Tantalum, 27uf, $\pm 10\%$, 35V	1
IC1,IC3 thru IC6,IC8 thru IC10	946-040190-124	Capacitor, Polyester, 0.12uf, $\pm 10\%$, 50V	1
IC2,IC7			
Q1 thru Q4,Q12 thru Q15,Q22, Q24 thru Q27, Q30,Q36 thru Q38	991-041101-001	Integrated Circuit, 741 <i>- cleaner model</i> 8	8
Q5,Q6,Q16, Q17,Q28,Q29	991-041104-001	Integrated Circuit, 3046 2	2
Q7,Q18,Q31			
Q8,Q9,Q11, Q19,Q20,Q23, Q32,Q33,Q35	991-042017-001	Transistor, 2N3392	17
Q10,Q21,Q34	991-041052-001	Transistor, 2N3906	6
R1,R40,R53, R98,R111,R152	991-041054-001	Transistor, E402	3
R2,R112,R153	991-041060-001	Transistor, 2N4058	9
R3,R24,R30, R55,R75,R83, R113,R132, R139	991-041063-001	Transistor, 2N4402	3
R4,R16,R56, R67,R114,R124	852-512433-001	Resistor, 43K Ohm, $\pm 5\%$, 1/2W	6
R5,R46,R57, R103,R115, R159	852-512914-001	Resistor, 910K Ohm, $\pm 5\%$, 1/2W	3
R6,R58,R116	853-421072-031	Resistor, 10.7K Ohm, $\pm 1\%$, 1/4W	9
R7,R18,R47, R104,R154, R160	853-423322-031	Resistor, 33.2K Ohm, $\pm 1\%$, 1/4W	6
R8,R60,R107	852-512562-001	Resistor, 5.6K Ohm, $\pm 5\%$, 1/2W	3
R9,R51,R100, R156,R171	852-512560-001	Resistor, 56 Ohm, $\pm 5\%$, 1/2W	6
	925-040279-003	Resistor, Trim Pot, 100 Ohm	3
	852-512330-001	Resistor, 33 Ohm, $\pm 5\%$, 1/2W	5

TABLE 7-5
OLD OSCILLATOR PRINTED CIRCUIT BOARD ASSEMBLY BOARD 1
REPLACEMENT PARTS LIST (SERIAL NUMBERS BELOW 10175) (Continued)

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
R10,R19,R26, R49,R70,R77, R79,R86,R94, R117,R118, R127,R134, R135,R161	852-512102-001	Resistor, 1K Ohm, $\pm 5\%$, 1/2W	15
R11,R62,R109	925-040279-004	Resistor, Trim Pot, 1K Ohm	3
R12,R96,R110 R13,R64,	853-421503-031	Resistor, 150K Ohm, $\pm 1\%$, 1/4W.	3
R121,R166	852-512622-001	Resistor, 6.2K Ohm, $\pm 5\%$, 1/2W	4
R14,R65,R122 R15,R66,	852-512154-001	Resistor, 150K Ohm, $\pm 5\%$, 1/2W.	3
R123,R165	852-512222-001	Resistor, 2.2K Ohm, $\pm 5\%$, 1/2W	4
R17,R31,R68, R84,R125,R140	852-512103-001	Resistor, 10K Ohm, $\pm 5\%$, 1/2W	6
R20,R71,R119	924-040183-001	Resistor, 1K Ohm, $\pm 3\%$, 1W, Temperature Compensating	3
R21,R88,R120	852-512564-001	Resistor, 560K Ohm, $\pm 5\%$, 1/2W.	3
R22,R33,R73, R89,R130,R145, R167	852-512472-001	Resistor, 4.7K Ohm, $\pm 5\%$, 1/2W	7
R23,R74,R131	852-512822-001	Resistor, 8.2K Ohm, $\pm 5\%$, 1/2W	3
R25,R76,R133, R170	853-421502-031	Resistor, 15K Ohm, $\pm 1\%$, 1/4W	4
R27,R80,R129	949-041121-001	Resistor, 51.1K Ohm, $\pm 1\%$, 1/4W (MATCHED SET of 3)	1
R28,R81,R137	852-512751-001	Resistor, 750 Ohm, $\pm 5\%$, 1/2W	3
R29,R82,R138, R173,R177	853-421002-031	Resistor, 10K Ohm, $\pm 1\%$, 1/4W	5
R32,R38,R63, R72,R136			
R143,R144	853-425112-031	Resistor, 51.1K Ohm, $\pm 1\%$, 1/4W	7
R34,R90,R146	852-512432-001	Resistor, 4.3K Ohm, $\pm 5\%$, 1/2W	3
R35,R39,R91, R97,R147,R151	852-512104-001	Resistor, 100K Ohm, $\pm 5\%$, 1/2W.	6
R36,R92,R148	852-512272-001	Resistor, 2.7K Ohm, $\pm 5\%$, 1/2W.	3
R37,R61,R108	853-421182-031	Resistor, 11.8K Ohm, $\pm 1\%$, 1/4W	3
R41,R54,R112	852-512911-001	Resistor, 910 Ohm, $\pm 5\%$, 1/2W	3
R42,R93,R142	852-512164-001	Resistor, 160K Ohm, $\pm 5\%$, 1/2W	3
R43,R52,R179 R44,R101,	949-041122-001	Resistor, 15K Ohm, $\pm 1\%$, 1/4W, (MATCHED SET of 3)	1
R157,R182	852-512394-001	Resistor, 390K Ohm, $\pm 5\%$, 1/2W.	4
R45,R102,R158	852-512122-001	Resistor, 1.2K Ohm, $\pm 5\%$, 1/2W	3
R48,R85,R126	852-512123-001	Resistor, 12K Ohm, $\pm 5\%$, 1/2W	3
R50,R59,R149	852-512393-001	Resistor, 39K Ohm, $\pm 5\%$, 1/2W	3

TABLE 7-5
OLD OSCILLATOR PRINTED CIRCUIT BOARD ASSEMBLY BOARD 1
REPLACEMENT PARTS LIST (SERIAL NUMBERS BELOW 10175) (Continued)

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
R69,R105, R141,R180	852-512153-001	Resistor, 15K Ohm, $\pm 5\%$, 1/2W	4
R78,R106,R128	949-041129-001	Resistance Capacitance Network	1
R87	852-512913-001	Resistor, 91K Ohm, $\pm 5\%$, 1/2W	1
R95	852-512224-001	Resistor, 220K Ohm, $\pm 5\%$, 1/2W.	1
R99	852-512911-001	Resistor, 910 Ohm, $\pm 5\%$, 1/2W	1
R148	852-512272-001	Resistor, 2.7K Ohm, $\pm 5\%$, 1/2W.	1
R150	853-421001-031	Resistor, 1K Ohm, $\pm 1\%$, 1/4W	1
R155,R162	853-423011-031	Resistor, 3.01K Ohm, $\pm 1\%$, 1/4W	2
R163	852-512333-001	Resistor, 33K Ohm, $\pm 5\%$, 1/2W	1
R164	852-512331-001	Resistor, 330 Ohm, $\pm 5\%$, 1/2W	1
R168	925-040279-002	Resistor, Trim Pot, 25 Ohm	1
R169	853-426818-031	Resistor, 68.1 Ohm, $\pm 1\%$, 1/4W	1
R172	852-512752-001	Resistor, 7.5K Ohm, $\pm 5\%$, 1/2W	1
R174	852-512392-001	Resistor, 3.9K Ohm, $\pm 5\%$, 1/2W.	1
R175	852-512683-001	Resistor, 68K Ohm, $\pm 5\%$, 1/2W	1
R176	852-512183-001	Resistor, 18K Ohm, $\pm 5\%$, 1/2W	1
R178	852-512512-001	Resistor, 5.1K Ohm, $\pm 5\%$, 1/2W.	1
R181	852-512513-001	Resistor, 51K Ohm, $\pm 5\%$, 1/2W	1
	903-040307-007	Socket, Integrated Circuit, 7 Pin	4

TABLE 7-6
CONTOUR GENERATOR PRINTED CIRCUIT BOARD ASSEMBLY BOARD 2
REPLACEMENT PARTS LIST

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
C1,C4,C13	996-041938-001	Printed Circuit Board Assembly consisting of:	
	946-041978-103	Capacitor, Polyester, 0.01uf, $\pm 10\%$, 50V	3
C2,C5	945-040209-008	Capacitor, Electrolytic, 10uf, +50/-10%, 50V	2
C3,C7	946-041978-104	Capacitor, Polyester, 0.1uf, $\pm 10\%$, 50V	2
C6	946-040226-105	Capacitor, Polyester, 1uf, $\pm 10\%$, 63V	1
C8	947-042020-101	Capacitor, Ceramic Disc, 100Pf, $\pm 10\%$, 50V	1
C9	946-040190-334	Capacitor, Polyester, 0.33uf, $\pm 10\%$, 50V	1
C11	947-042020-470	Capacitor, Ceramic Disc, 47Pf, $\pm 10\%$, 50V	1
C12	947-042020-501	Capacitor, Ceramic Disc, 500Pf, $\pm 10\%$, 50V	1
CR1,CR3,CR6, CR8,CR10	919-041074-001	Diode, 1N34A	5
CR2,CR4,CR5, CR7,CR9	919-042019-001	Diode, 1N4004	5
Q1 thru Q4,Q6, Q7,Q15,Q17, Q18,Q20,Q22,			

TABLE 7-6
CONTOUR GENERATOR PRINTED CIRCUIT BOARD ASSEMBLY BOARD 2
REPLACEMENT PARTS LIST (Continued)

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
Q25	991-042017-001	Transistor, 2N3392	12
Q5,Q8,Q16, Q19,Q21	991-041062-001	Transistor, TIS93, Alternate 2N3906	5
Q9,Q11	991-041128-001	Transistor, TIS93, Alternate 2N3906, Matched with TIS92, Alternate 2N3904 (furnished as a set)	1
Q10,Q13	991-041064-001	Transistor, 2N4303	2
Q12,Q26	991-041059-001	Transistor, 2N3415, Alternate 2N3392	2
Q14,Q23	991-041124-001	Transistor, 2N3392, Matched with 2N3392, (furnished as a set) . . .	1
Q24	991-041060-001	Transistor, 2N4058	1
R1	853-425900-031	Resistor, 590 Ohm, $\pm 1\%$, 1/4W ,	1
R2,R61,R62	852-512331-001	Resistor, 330 Ohm, $\pm 5\%$, 1/2W	3
R3,R4,R8,R16, R19,R21,R26, R28,R30,R32, R35 thru R39,			
R43,R48	852-512103-001	Resistor, 10K Ohm, $\pm 5\%$, 1/2W	17
R5,R23,R40	852-512332-001	Resistor, 3.3K Ohm, $\pm 5\%$, 1/2W	3
R6,R15,R41, R50,R51	852-512561-001	Resistor, 560 Ohm, $\pm 5\%$, 1/2W	5
R7,R11,R42, R46,R60	852-512101-001	Resistor, 100 Ohm, $\pm 5\%$, 1/2W	5
R9,R13,R44, R47,R57	852-512472-001	Resistor, 4.7K Ohm, $\pm 5\%$, 1/2W	5
R10,R45	852-512273-001	Resistor, 27K Ohm, $\pm 5\%$, 1/2W	2
R12	852-512302-001	Resistor, 3K Ohm, $\pm 5\%$, 1/2W	1
R14,R56	852-512333-001	Resistor, 33K Ohm, $\pm 5\%$, 1/2W	2
R17	852-512154-001	Resistor, 150K Ohm, $\pm 5\%$, 1/2W	1
R18,R59	852-512392-001	Resistor, 3.9K Ohm, $\pm 5\%$, 1/2W	2
R20,R22	853-421001-031	Resistor, 1K Ohm, $\pm 1\%$, 1/4W	2
R24	852-512682-001	Resistor, 6.8K Ohm, $\pm 5\%$, 1/2W	1
R25	852-512162-001	Resistor, 1K Ohm, $\pm 5\%$, 1/2W	1
R27,R29	853-421692-031	Resistor, 16.9K Ohm, $\pm 1\%$, 1/4W	2
R31	852-513226-001	Resistor, 22 Megohm, $\pm 10\%$, 1/2W	1
R33	852-512562-001	Resistor, 5.6K Ohm, $\pm 5\%$, 1/2W	1
R34,R60,R64	852-512104-001	Resistor, 100K Ohm, $\pm 5\%$, 1/2W.	3
R49	852-512221-001	Resistor, 220 Ohm, $\pm 5\%$, 1/2W	1
R52	852-512433-001	Resistor, 43K Ohm, $\pm 5\%$, 1/2W	1
R53	852-513475-001	Resistor, 4.7 Megohm, $\pm 10\%$, 1/2W	1
R54	852-512152-001	Resistor, 15K Ohm, $\pm 5\%$, 1/2W	1
R55	852-512473-001	Resistor, 47K Ohm, $\pm 5\%$, 1/2W	1
R58	852-512622-001	Resistor, 6.2K Ohm, $\pm 5\%$, 1/2W	1
R63	852-512150-001	Resistor, 15 Ohm, $\pm 5\%$, 1/2W.	1
R65	852-512152-001	Resistor, 5.1K Ohm, $\pm 5\%$, 1/2W	1

TABLE 7-7
POWER SUPPLY PRINTED CIRCUIT BOARD ASSEMBLY BOARD 3
REPLACEMENT PARTS LIST

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
C1,C4,C8, C19,C20	996-041931-001	Printed Circuit Board Assembly consisting of:	
C2	945-040209-005	Capacitor, Electrolytic, 2.2uf, +75/-10%, 50V	5
C3	946-041978-333	Capacitor, Polyester, 0.033uf, ± 10%, 50V	1
C5,C6,C11,C23	946-042280-124	Capacitor, Polyester, 0.12uf, ± 10%, 50V	1
C7,C18,C22	947-042020-101	Capacitor, Ceramic Disc, 100Pf, ± 10%, 50V	4
C10,C13,C27	946-042280-154	Capacitor, Polyester, 0.15uf, ± 10%, 50V	3
C12	946-041978-104	Capacitor, Polyester, 0.1uf, ± 10%, 50V	3
C14	946-040231-005	Capacitor, Polyester, 5.6uf, ± 10%, 50V	1
C15	946-041978-223	Capacitor, Polyester, 0.022uf, ± 10%, 50V	1
C21	947-042020-221	Capacitor, Ceramic Disc, 220Pf, ± 10%, 50V	1
C24,C26	945-040209-010	Capacitor, Electrolytic, 470uf, +50/-10%, 50V	1
C25,C28	945-040209-009	Capacitor, Electrolytic, 100uf, +50/-10%, 25V	2
C29,C30	945-040020-470	Capacitor, Ceramic Disc, 47Pf, ± 10%, 50V	2
CR1,CR2	919-041081-001	Diode, 1N458	2
CR3	919-041078-001	Diode, 1N821	1
Q1	991-041057-001	Transistor, MPS-U55	1
Q2,Q5,Q10	991-041061-001	Transistor, TIS92	2
Q3,Q4,Q6, Q12,Q17,Q18	991-042017-001	Transistor, 2N3392	6
Q7,Q8,Q9	991-041060-001	Transistor, 2N4058	3
Q11,Q16,Q19	991-041062-001	Transistor, TIS93	3
Q13,Q14	991-041126-001	Transistor, TIS97	2
Q15	991-041062-001	Transistor, 2N3392 Selected	1
Q19	991-041062-001	Transistor, TIS93, Alternate 2N3906	1
Q20	991-041056-001	Transistor, MPS-U05	1
R1	852-512121-001	Resistor, 120 Ohm, ± 5%, 1/2W	1
R2,R12,R16, R24,R30	852-512103-001	Resistor, 10K Ohm, ± 5%, 1/2W	5
R3,R8,R19	852-512332-001	Resistor, 3.3K Ohm, ± 5%, 1/2W	3
R4,R10,R11, R20,R48,R61,			
R63	852-512821-001	Resistor, 820 Ohm, ± 5%, 1/2W	7
R5,R14	852-512123-001	Resistor, 12K Ohm, ± 5%, 1/2W	2
R6,R7	852-512564-001	Resistor, 560K Ohm, ± 5%, 1/2W	2
R9	852-512471-001	Resistor, 470 Ohm, ± 5%, 1/2W	1
R13	852-512221-001	Resistor, 220 Ohm, ± 5%, 1/2W	1
R15	852-512392-001	Resistor, 3.9K Ohm, ± 5%, 1/2W	1
R17,R59	852-512104-001	Resistor, 100K Ohm, ± 5%, 1/2W	2
R18,R55	852-512330-001	Resistor, 33 Ohm, ± 5%, 1/2W	2
R21	925-040279-002	Resistor, Trim Pot, 25 Ohm	1
R23,R28	853-513225-001	Resistor, 2.2 Megohm, ± 10%, 1/2W	2

TABLE 7-7
POWER SUPPLY PRINTED CIRCUIT BOARD ASSEMBLY BOARD 3
REPLACEMENT PARTS LIST (Continued)

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
R26	925-040279-005	Resistor, Trim Pot, 2.5K Ohm	1
R27,R51	852-512301-001	Resistor, 300 Ohm, $\pm 5\%$, 1/2W	2
R29	852-513475-001	Resistor, 4.7 Megohm, $\pm 10\%$, 1/2W	1
R31	852-512561-001	Resistor, 560 Ohm, $\pm 5\%$, 1/2W	1
R32,R33	852-512047-001	Resistor, 4.7 Ohm, $\pm 5\%$, 1/2W	2
R34	853-423010-031	Resistor, 301 Ohm, $\pm 1\%$, 1/4W	1
R35,R36,			
R38,R56	852-512391-001	Resistor, 390 Ohm, $\pm 5\%$, 1/2W	4
R39,R44	853-425110-031	Resistor, 511 Ohm, $\pm 1\%$, 1/4W	2
R40,R41,			
R45,R66	852-512100-001	Resistor, 10 Ohm, $\pm 5\%$, 1/2W	4
R42,R50	852-512622-001	Resistor, 6.2 Ohm, $\pm 5\%$, 1/2W	2
R43	852-512911-001	Resistor, 910 Ohm, $\pm 5\%$, 1/2W	1
R47	852-512753-001	Resistor, 75K Ohm, $\pm 5\%$, 1/2W	1
R49	852-512122-001	Resistor, 1.2K Ohm, $\pm 5\%$, 1/2W	1
R52,R65	853-429090-031	Resistor, 909 Ohm, $\pm 1\%$, 1/4W	2
R53	852-512243-001	Resistor, 24K Ohm, $\pm 5\%$, 1/2W	1
R54, R62, R64	852-512433-001	Resistor, 43K Ohm, $\pm 5\%$, 1/2W	3
R55	852-512330-001	Resistor, 33 Ohm, $\pm 5\%$, 1/2W	1
R57	852-512102-001	Resistor, 1K Ohm, $\pm 5\%$, 1/2W	1
R58	925-040279-001	Resistor, Trim Pot, 10 Ohm	1
R60	852-512913-001	Resistor, 91K Ohm, $\pm 5\%$, 1/2W	1
R67	852-512474-001	Resistor, 470K Ohm, $\pm 5\%$, 1/2W	1
	801-023221-000	Nut, 4-40	2
	806-023039-006	Screw, Pan Hd., 4-40 x 3/8 in.	2
	904-040495-015	Washer, Lock, No. 4	2
	905-040498-004	Rivet, Pop, 1/8 in. Dia.	2
	967-041195-001	Heat Sink	2

TABLE 7-8
FILTER PRINTED CIRCUIT BOARD ASSEMBLY BOARD 4
REPLACEMENT PARTS LIST

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
C1,C5	996-041395-001	Printed Circuit Board Assembly consisting of:	
	946-040280-224	Capacitor, Polyester, 0.22uf, ± 10%, 50V	2
C2,C10,C27	945-040209-008	Capacitor, Aluminum Electrolytic, 10uf, +50/-10%, 50V	3
C3,C7,C11,C16	946-041978-683	Capacitor, Polyester, 0.068uf, ± 10%, 50V	4
C4,C15,C24,C26	945-040209-003	Capacitor, Aluminum Electrolytic, 220uf, +50/-10%, 6V	4
C6	946-040190-334	Capacitor, Polyester, 0.33uf, ± 10%, 50V	1
C8,C12,C23	946-041978-104	Capacitor, Polyester, 0.1uf, ± 10%, 50V	3
C9	945-040209-009	Capacitor, Aluminum Electrolytic, 100uf, +50/-10%, 25V	1
C13,C19	946-042021-303	Capacitor, Polystyrene, 0.030uf, ± 2.5%, 35V	2
C14	945-040209-006	Capacitor, Aluminum Electrolytic, 0.47uf, +75/-10%, 50V	1
C17,C25	946-042021-xxx	Capacitor, Polystyrene, 600-1200Pf, Selected	2
C18,C22	945-042020-101	Capacitor, Ceramic Disc, 100Pf, ± 10%, 50V	2
C20	946-040226-105	Capacitor, Polyester, 1uf, ± 10%, 63V	1
C21	947-042020-100	Capacitor, Ceramic Disc, 10Pf, ± 10%, 50V	1
CR1,CR2	919-041081-001	Diode, 1N458A	2
CR3,CR4	919-041075-001	Diode, 1N4148	2
Q1,Q9,Q12, Q17,Q33	991-041060-001	Transistor, 2N4058	5
Q2,Q3,Q10, Q11,Q18 thru Q24	991-041126-001	Transistor, TIS97S	12
Q4,Q25	991-042017-001	Transistor, 2N3392	2
Q5,Q7	991-041127-001	Transistor, TIS97, Matched Pair	1
Q6,Q8	991-041127-001	Transistor, TIS97, Matched Pair	1
Q13,Q14	991-041127-001	Transistor, TIS97, Matched Pair	1
Q15,Q16	991-041127-001	Transistor, TIS97, Matched Pair	1
Q26,Q28	991-041123-001	Transistor, TIS93, Alternate 3906, Matched with TIS92, Alternate 3904	1
Q27,Q32	991-041127-001	Transistor, TIS97, Matched Pair	1
Q29,Q30	991-041127-001	Transistor, TIS97, Matched Pair	1
Q31	991-041062-001	Transistor, TIS93, Alternate 3906	1
Q34	991-041061-001	Transistor, TIS92, Alternate 3904	1
R1	852-512xxx-001	Resistor, 2.2 Megohm, Selected	1
R2	852-512823-001	Resistor, 82K Ohm, ± 5%, 1/2W	1
R3,R26,R35, R62,R63,R75, R77,R78	852-512102-001	Resistor, 1K Ohm, ± 5%, 1/2W	8
R4	852-512221-001	Resistor, 220 Ohm, ± 5%, 1/2W	1
R5	852-512223-001	Resistor, 22K Ohm, ± 5%, 1/2W	1
R6,R72	852-512470-001	Resistor, 47 Ohm, ± 5%, 1/2W	2
R7	852-512181-001	Resistor, 180 Ohm, ± 5%, 1/2W	1
R8,R28	852-512082-001	Resistor, 8.2 Ohm, ± 5%, 1/2W	2
R9	852-512620-001	Resistor, 62 Ohm, ± 5%, 1/2W	1
R10,R13,R22	852-512121-001	Resistor, 120 Ohm, ± 5%, 1/2W	3
R11,R16,R32, R41,R52	852-512151-001	Resistor, 150 Ohm, ± 5%, 1/2W	5

TABLE 7-8
FILTER PRINTED CIRCUIT BOARD ASSEMBLY BOARD 4
REPLACEMENT PARTS LIST (Continued)

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
R12	925-040279-003	Resistor, Trim Pot, 100 Ohm	1
R14	925-040279-002	Resistor, Trim Pot, 25 Ohm	1
R15	853-423321-031	Resistor, 3.32K Ohm, $\pm 1\%$, 1/2W	1
R17,R71	853-424751-031	Resistor, 4.75K Ohm, $\pm 1\%$, 1/2W	2
R18,R21,R45, R76	852-512331-001	Resistor, 330 Ohm, $\pm 5\%$, 1/2W	4
R19,R23,R64	852-512101-001	Resistor, 100 Ohm, $\pm 5\%$, 1/2W	3
R20,R56,R66	852-512104-001	Resistor, 100K Ohm, $\pm 5\%$, 1/2W	3
R24	852-512224-001	Resistor, 220K Ohm, $\pm 5\%$, 1/2W	1
R25	853-427502-031	Resistor, 75K Ohm, $\pm 1\%$, 1/4W	1
R27	852-512474-001	Resistor, 470K Ohm, $\pm 5\%$, 1/2W	1
R29,R30,R60	852-512681-001	Resistor, 680 Ohm, $\pm 5\%$, 1/2W	3
R31,R38,R74	852-512473-001	Resistor, 47K Ohm, $\pm 5\%$, 1/2W	3
R33,R54	852-512471-001	Resistor, 470 Ohm, $\pm 5\%$, 1/2W	2
R34	852-512821-001	Resistor, 820 Ohm, $\pm 5\%$, 1/2W	1
R36	852-512511-001	Resistor, 510 Ohm, $\pm 5\%$, 1/2W	1
R37	852-512682-001	Resistor, 6.8K Ohm, $\pm 5\%$, 1/2W	1
R39	925-040279-006	Resistor, Trim Pot, 10K Ohm	1
R40	852-512222-001	Resistor, 2.2K Ohm, $\pm 5\%$, 1/2W	1
R41,R52	852-512151-001	Resistor, 150 Ohm, $\pm 5\%$, 1/2W	2
R42	852-512332-001	Resistor, 3.3K Ohm, $\pm 5\%$, 1/2W	1
R43	852-512274-001	Resistor, 270K Ohm, $\pm 5\%$, 1/2W	1
R44,R58	852-512154-001	Resistor, 150K Ohm, $\pm 5\%$, 1/2W	2
R46,R59	852-512683-001	Resistor, 68K Ohm, $\pm 5\%$, 1/2W	2
R47	853-423322-031	Resistor, 33.2K Ohm, $\pm 1\%$, 1/4W	1
R48	852-512684-001	Resistor, 680K Ohm, $\pm 5\%$, 1/4W	1
R49	925-040280-001	Resistor, Trim Pot, 500 Ohm	1
R50	852-512823-001	Resistor, 82K Ohm, $\pm 5\%$, 1/2W	1
R51	852-512333-001	Resistor, 33K Ohm, $\pm 5\%$, 1/2W	1
R53,R57,R69	852-512103-001	Resistor, 10K Ohm, $\pm 5\%$, 1/2W	3
R55	853-421692-031	Resistor, 16.9K Ohm, $\pm 1\%$, 1/4W	1
R59	852-512683-001	Resistor, 68K Ohm, $\pm 5\%$, 1/2W	1
R61	852-512204-001	Resistor, 200K Ohm, $\pm 5\%$, 1/2W	1
R65	852-512273-001	Resistor, 27K Ohm, $\pm 5\%$, 1/2W	1
R67	852-512201-001	Resistor, 200 Ohm, $\pm 5\%$, 1/2W	1
R68,R73	925-040279-004	Resistor, Trim Pot, 1K Ohm	2
R70	852-512182-001	Resistor, 1.8K Ohm, $\pm 5\%$, 1/2W	1

TABLE 7-9
RECTIFIER AND FILTER PRINTED CIRCUIT BOARD ASSEMBLY BOARD 5
REPLACEMENT PARTS LIST

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
C1,C2 C3 C4 CR1 thru CR4	996-041906-001	Printed Circuit Board Assembly consisting of:	
	945-040209-011	Capacitor, Electrolytic, 1000uf, +50/-10%, 35V	2
	946-040190-103	Capacitor, Polyester, 0.01uf, ± 10%, 50V	1
	945-040209-010	Capacitor, Electrolytic, 470uf, +50/-10%, 50V	1
	919-042019-001	Diode, 1N4004	4
	911-041866-001	Lug, Turret	11
	976-040791-001	Tie Wrap	1

TABLE 7-10
OCTAVE BUFFER PRINTED CIRCUIT BOARD ASSEMBLY BOARD 6
REPLACEMENT PARTS LIST

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
IC1,IC2,IC3	996-041895-001	Octave Buffer Printed Circuit Board Assembly consisting of:	
	991-041101-001	Integrated Circuit, Operational Amplifier, IC741	3
	980-041184-001	Printed Circuit Board, Octave Buffer	1
	995-040982-003	Bracket, Angle	1
	904-040495-015	Washer, Lock No. 4	2
	806-023039-004	Screw, Phillips, 4-40 x 1/4 in.	2

TABLE 7-11
RIBBON CONTROLLER
REPLACEMENT PARTS LIST

INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
CR1,CR2 J1,J2 PL2 R1,R3 R2 R4 R5 R6 R7 SW1,SW2	980-042902-001	Printed Circuit Board Assembly consisting of:	
	980-042901-001	Printed Circuit Board	1
	997-040585-001	Ribbon Assembly	1
	997-041597-001	Wheel Assembly	1
	919-041075-001	Diode, Signal	2
	910-041632-001	Jack, Phone	2
	910-042832-012	Connector, 12 Pin	1
	853-424751-031	Resistor, 4.75K Ohm, ± 1%, 1/4W, Metal Film, Fixed	2
	925-042389-001	Resistor, 5K Ohm, Trim Cermet	1
	925-040275-001	Resistor, 100K Ohm, Trim Carbon	1

Resistor, 2.2K Ohm, ± 5%, 1/4W, Carbon Film, Fixed

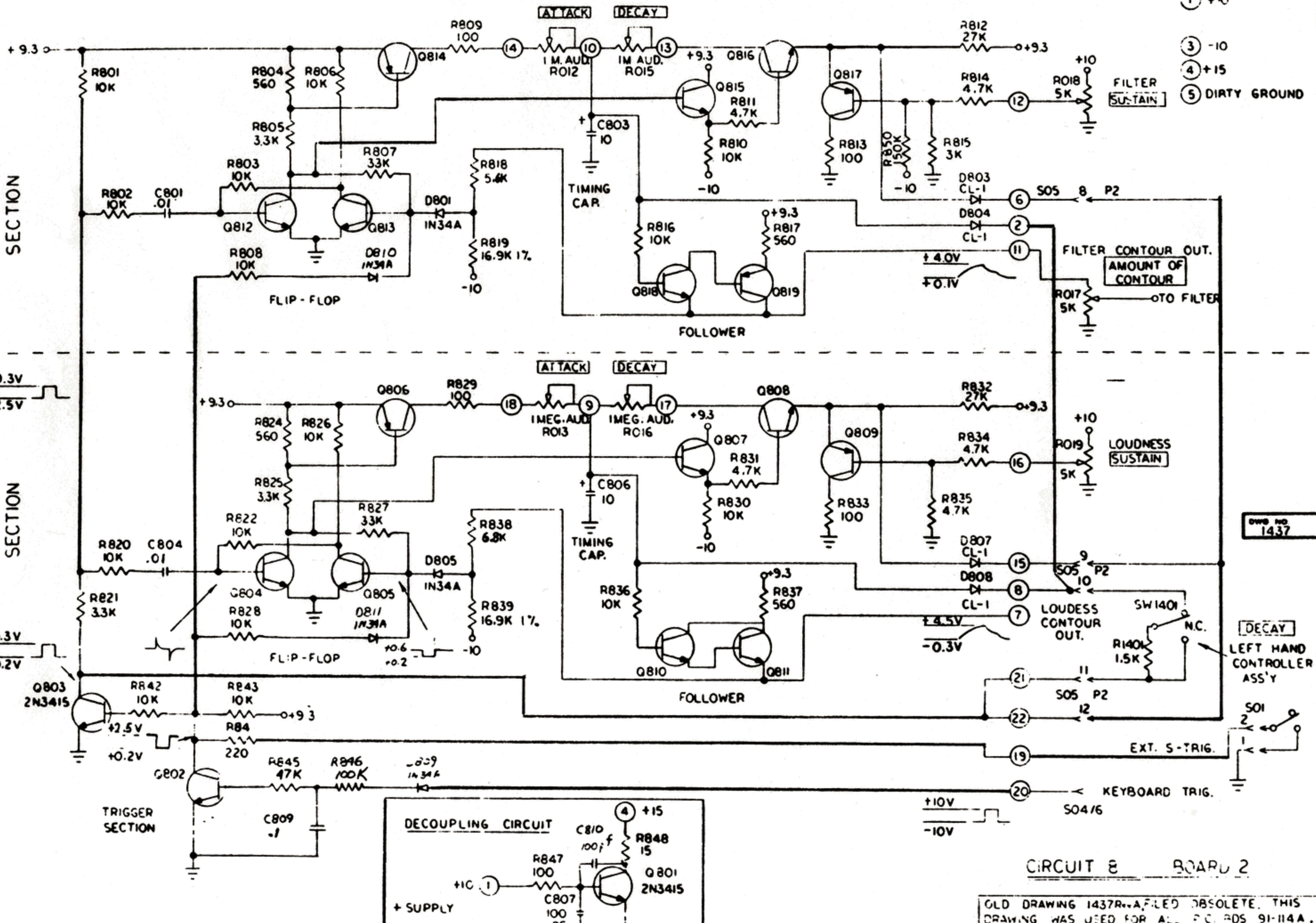
Resistor, Potentiometer, Rotary, 50K Ohm

Resistor, 1.5K Ohm, ± 5%, 1/4W, Carbon Film, Fixed

Switch, Slide, SPDT

FILTER CONTOUR SECTION

LOUDNESS CONTOUR SECTION



2N3392

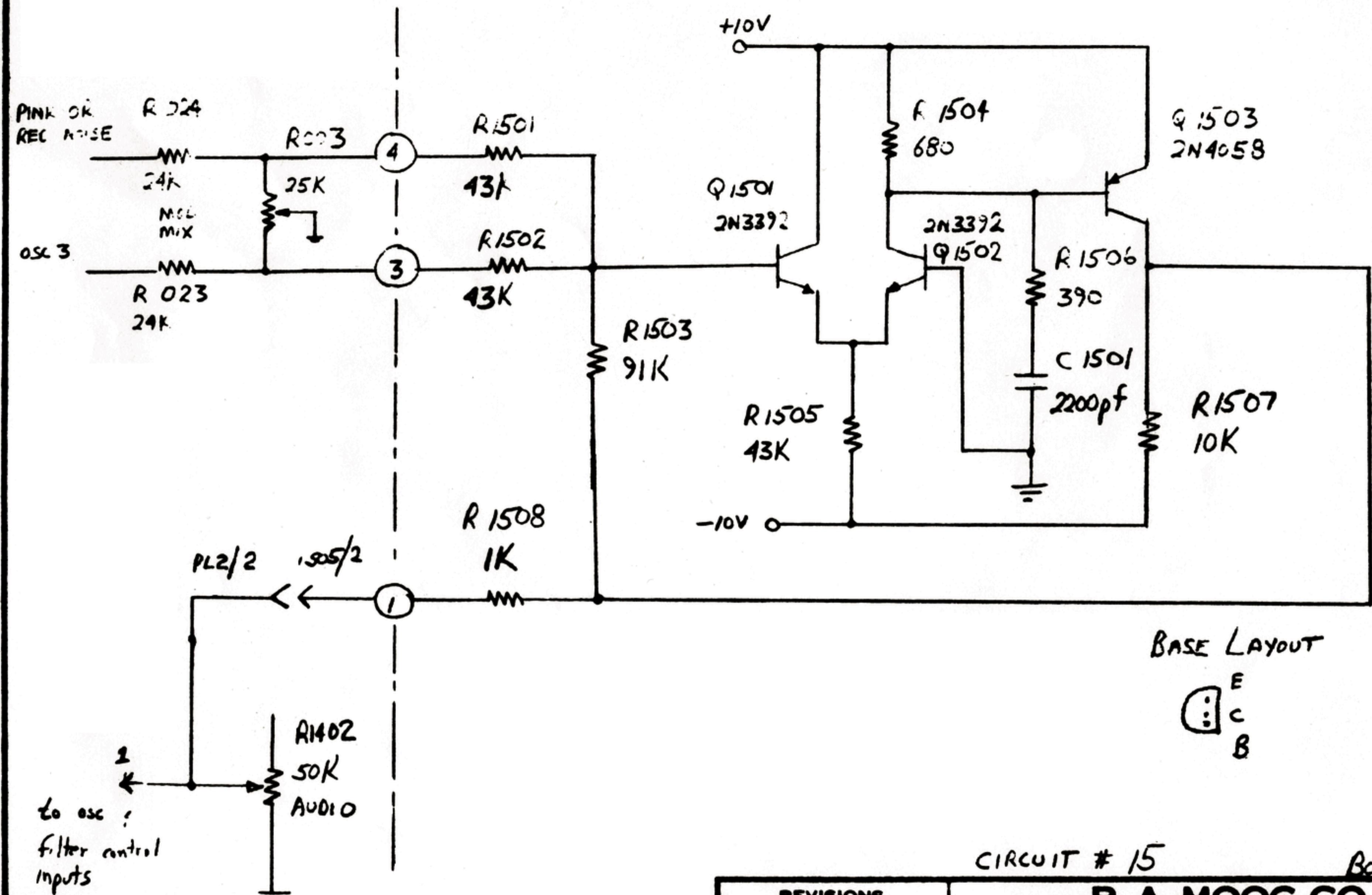


TIS 93

ALL PNP TRANSISTORS : TIS 93
ALL UNMARKED NPN : 2N3392
ALL RESISTORS IN OHMS

57. CARBON UNLESS OTHERWISE MARKED

ALL CAPACITORS IN μ F
UNLESS OTHERWISE MARKEDECN 0029
ECN 0034
ECN 0138
ECN 0153OLD DRAWING 1437R-A FILED OBSOLETE. THIS
DRAWING WAS USED FOR ALL P.C. BOARDS 91-114A.
SERIAL NO. 1001 THRU 1059.

DWG. NO.
1444

CIRCUIT # 15

BOARD # 3

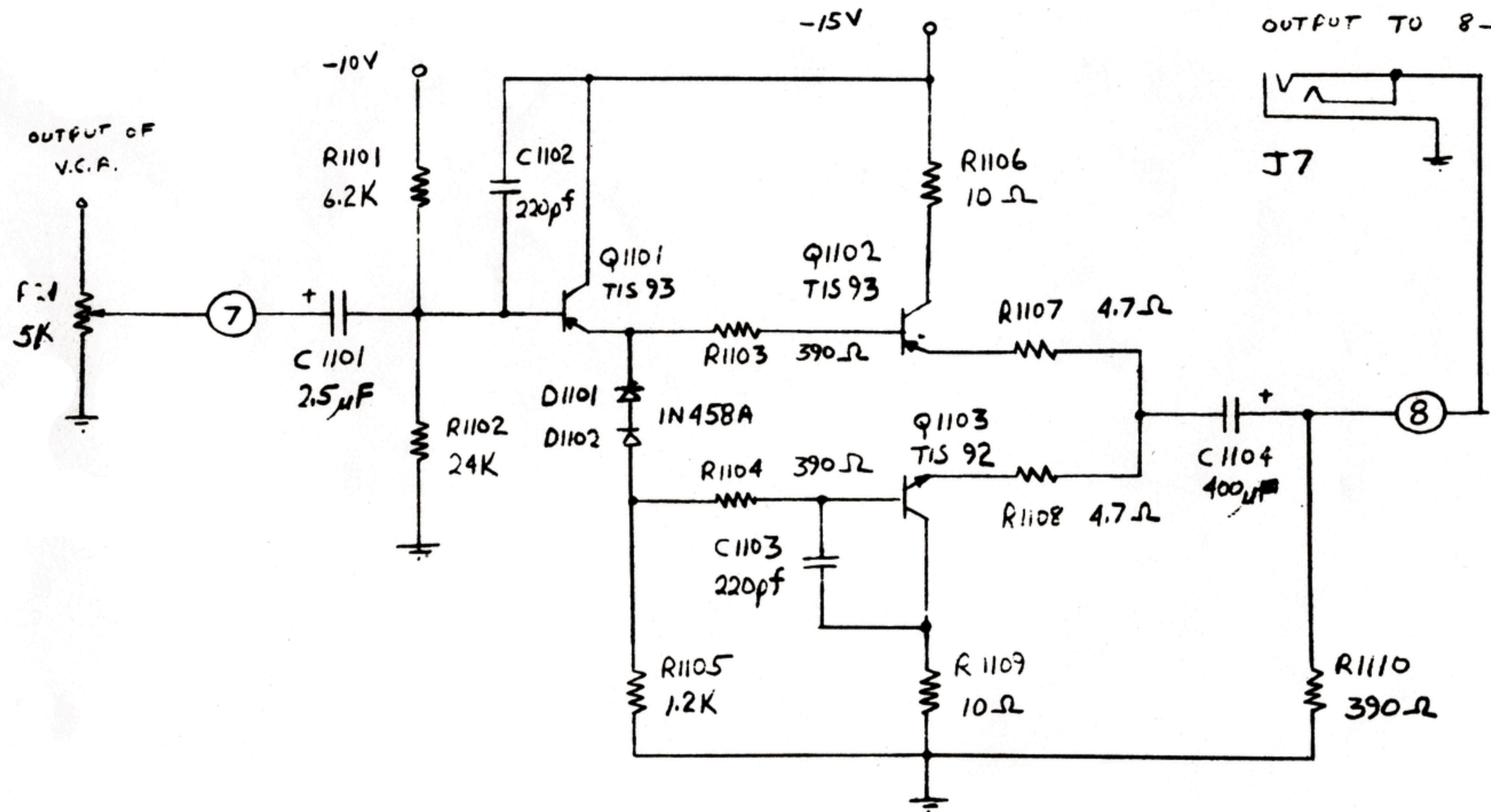
R. A. MOOG CO.

TRUMANSBURG, NEW YORK

TITLE MINI D MODULATION MIX AMP

REVISIONS			
SCALE	DR. BY	SCOTT	DWG. NO.
DATE 12/31/70	CK'D. BY		1444

DWG. NO.
1447



BASE LAYOUT

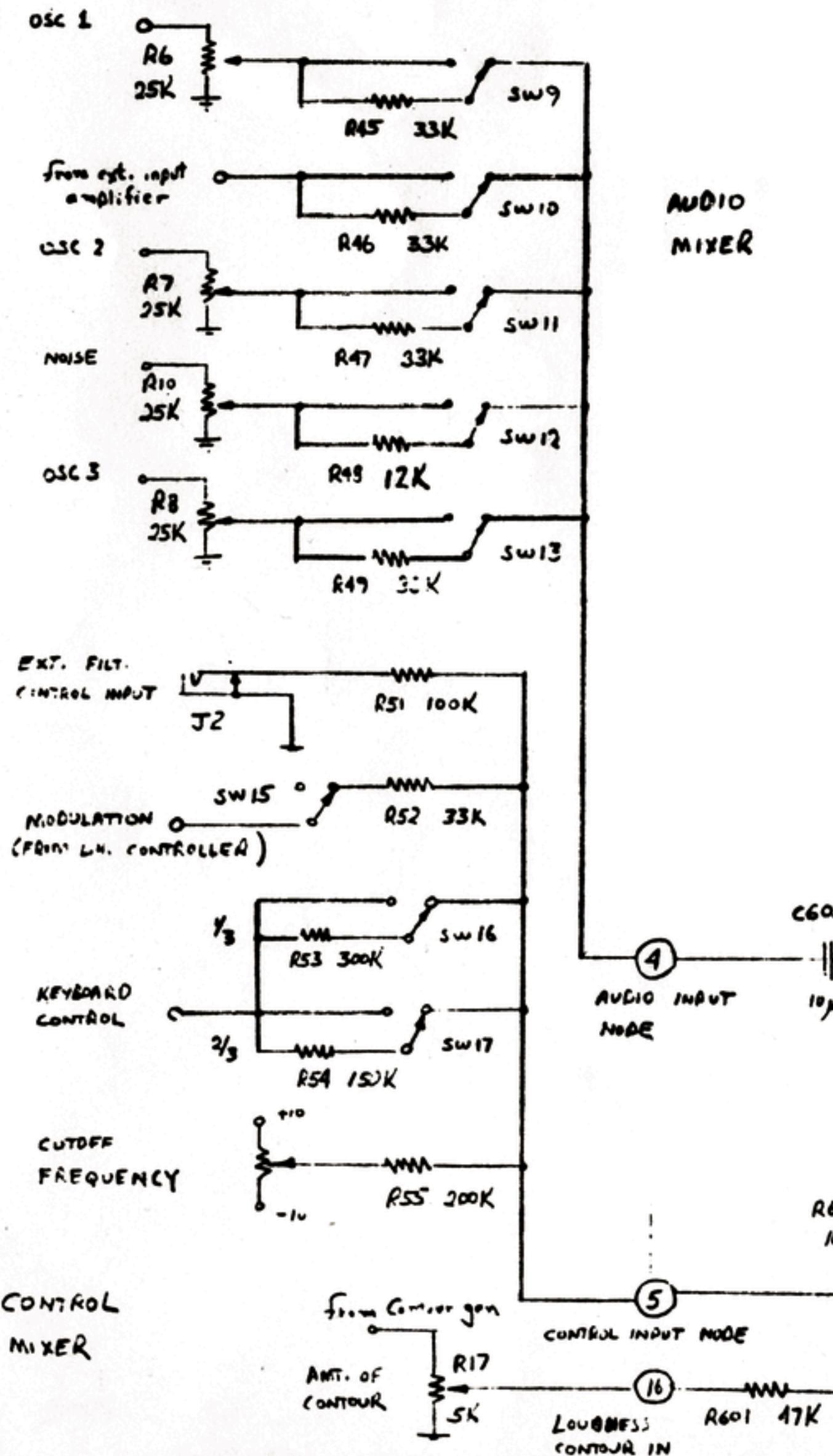
T.S. 93
T.S. 93

CIRCUIT # 11

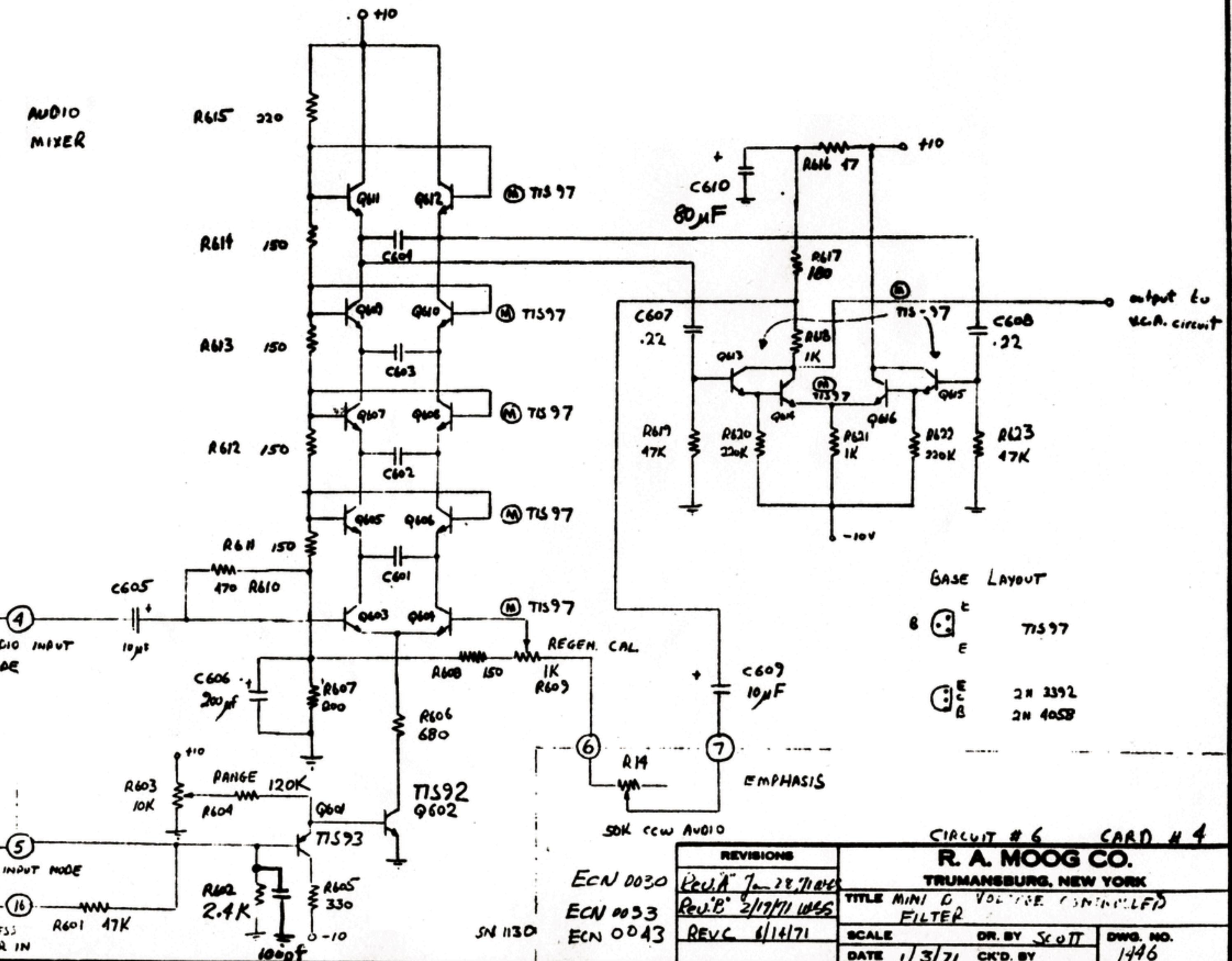
EGRG # 3

REVISIONS	R. A. MOOG CO. TRUMANSBURG, NEW YORK
	TITLE MINI MOOG D HEADPHONE AMPLIFIER
	SCALE DR. BY TJS
	DATE 1/5/70 CK'D. BY
	DWG. NO. 447

INPUT SECTION. (FRONT PANEL)



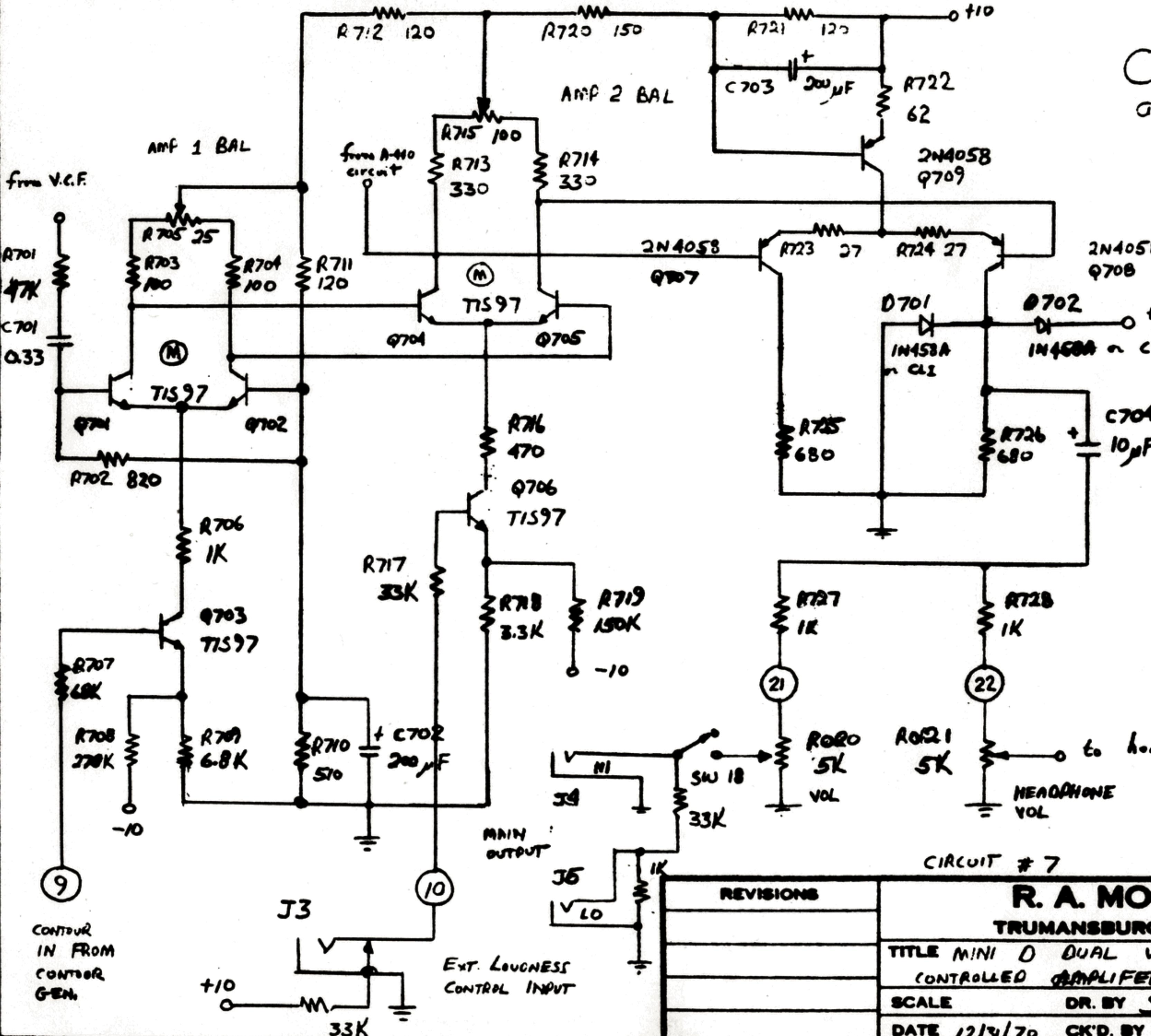
FILTER



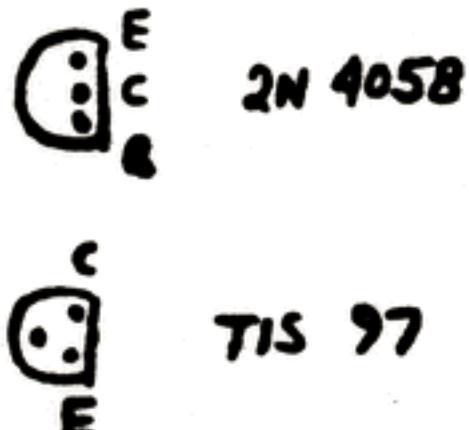
DWG. NO.
1445

○ ⇒ edge connector
All resistances in Ω

- ① +10V
- ② GND
- ③ -10V



BASE LAYOUTS



CIRCUIT #7 BOARD #4

R. A. MOOG CO.
TRUMANSBURG, NEW YORK

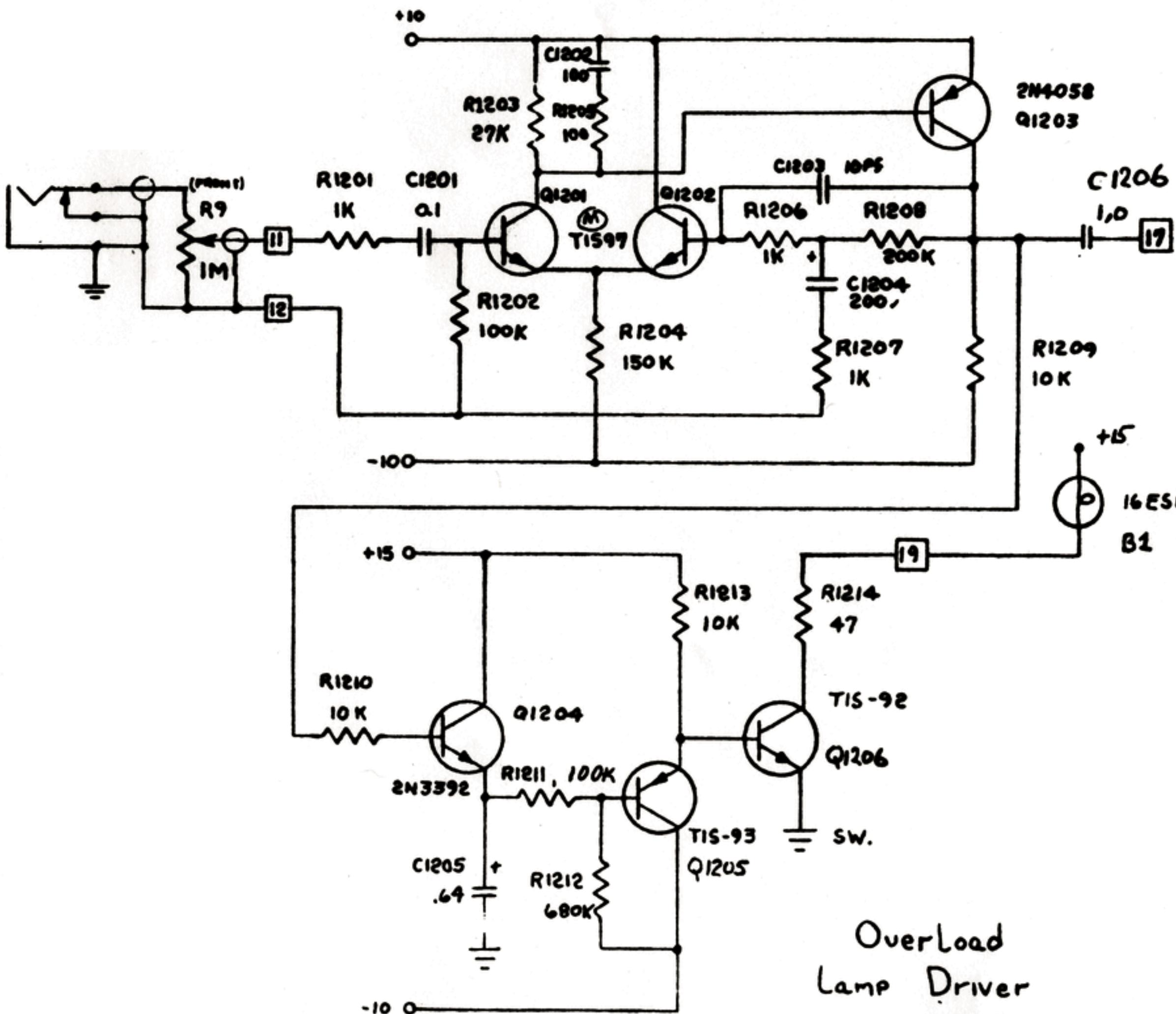
TITLE MINI D DUAL VOLTAGE
CONTROLLED AMPLIFIER

SCALE DR. BY SCOTT

DATE 12/3/70 CK'D. BY

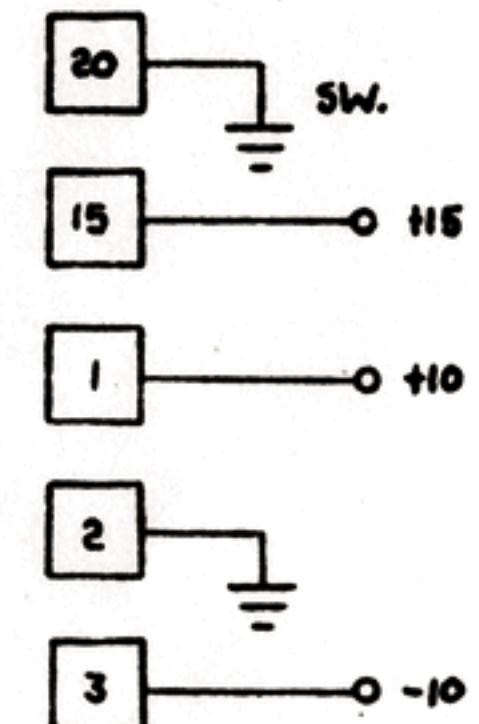
DWG. NO.
1445

External Input
Preamplifier

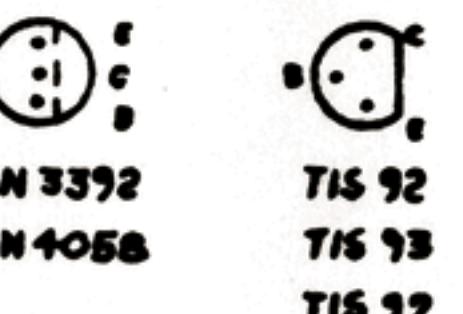


NOTES:

- A) RESISTORS IN OHMS.
- B) CAPACITORS IN μ F.

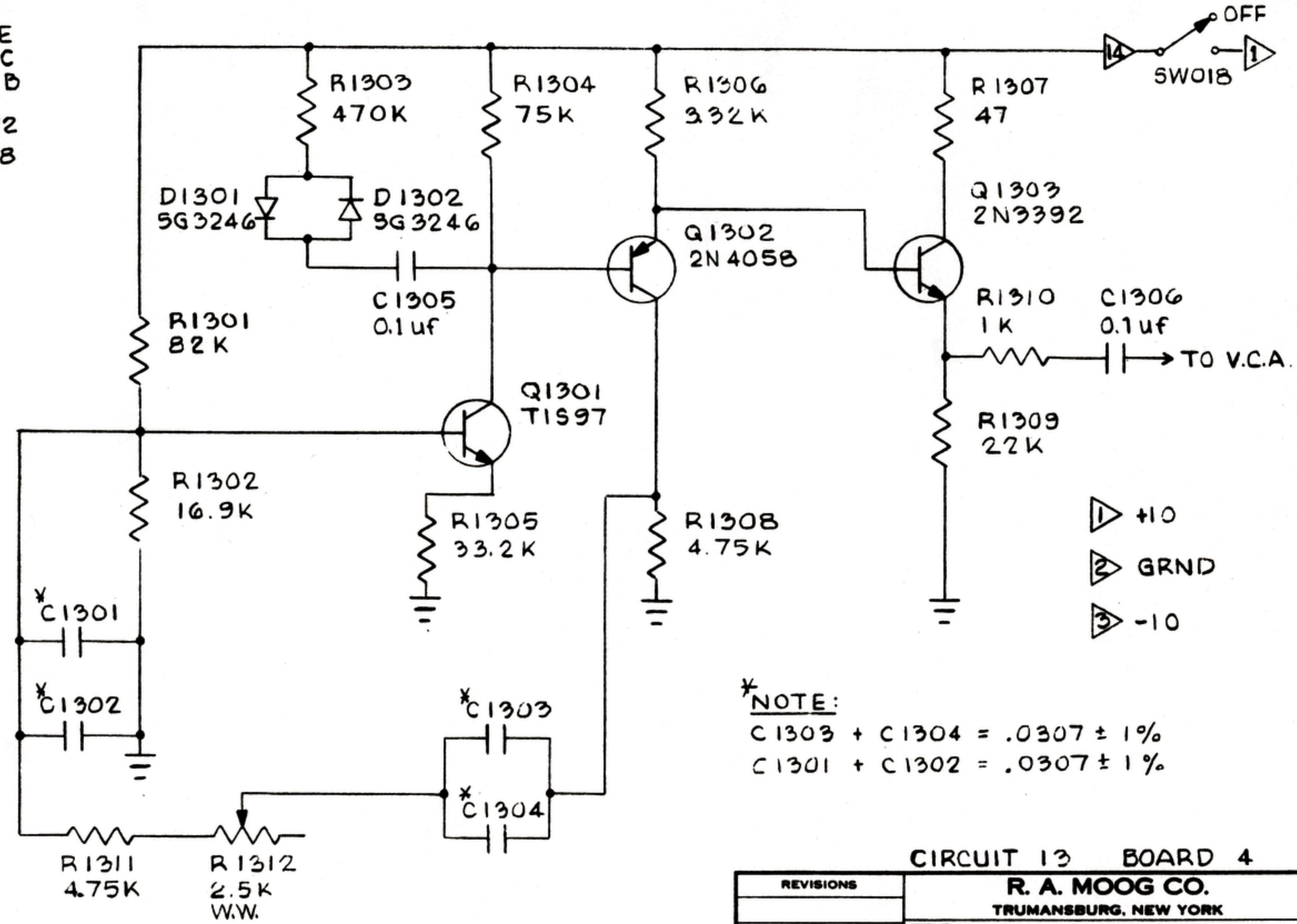
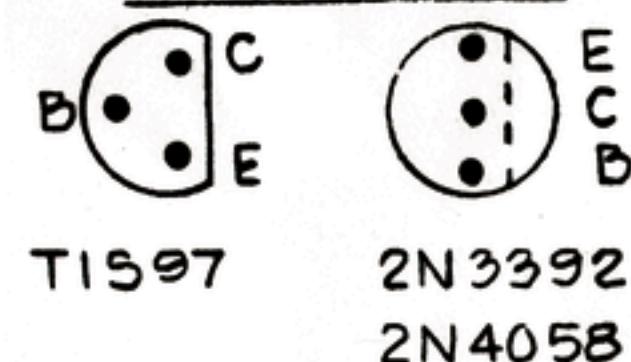


BASE LAYOUT



CONNECTOR COF
CIRCUIT # 12 BOARD # 4

REVISIONS		R. A. MOOG CO.	
Rev. A 7-6-1971 WSS		TRUMANSBURG, NEW YORK	
TITLE		MINI SCHEMATIC { EXT PREAMP	
{		{ FLAME DRIVER	
SCALE	DR. BY JLA	DWG. NO	1442
DATE 12- -70	CRD. BY		
ECN 033			

BASE LAYOUTSBOTTOM VIEW

CIRCUIT 13 BOARD 4

REVISIONS	R. A. MOOG CO.	
	TRUMANSBURG, NEW YORK	
TITLE	MINI 'D' A440 REF DSC	
SCALE	DR. BY	DWG. NO.
DATE	CK'D. BY	1443

PL-2 12 PIN CINCH JONES PLUG

MOD. MIX OUT TO
OSC. & FILTMOD MIX IN FROM
CARD # 3

PITCH BEND OUT

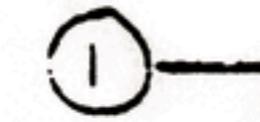
+10

GRND

GLIDE OUT

GLIDE RETURN

FILT. FINAL DECAY

LOUDNESS FINAL
DECAYCONTOUR GEN.
DUMPCONTOUR GEN
V-TRIG OUTCONTOUR GEN
V-TRIG OUT15K to
GROUND
AT DETENTcw
ccw

PITCH

R1403
25K LIN90° OF ROTATION
USED

MODULATION
 $\sim 1.2\text{K}$ When
Fully FWD. cw
 ccw

90° OF ROTATION
USED FROM
ccw STOP TOWARD
CENTER

J1402

GLIDE

SW1402

O ON

J1401

DECAY

CIRCUIT # 14

R1401

1.5K

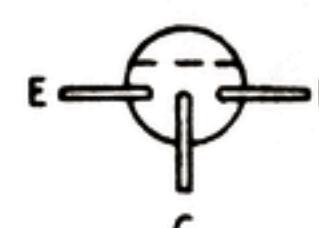
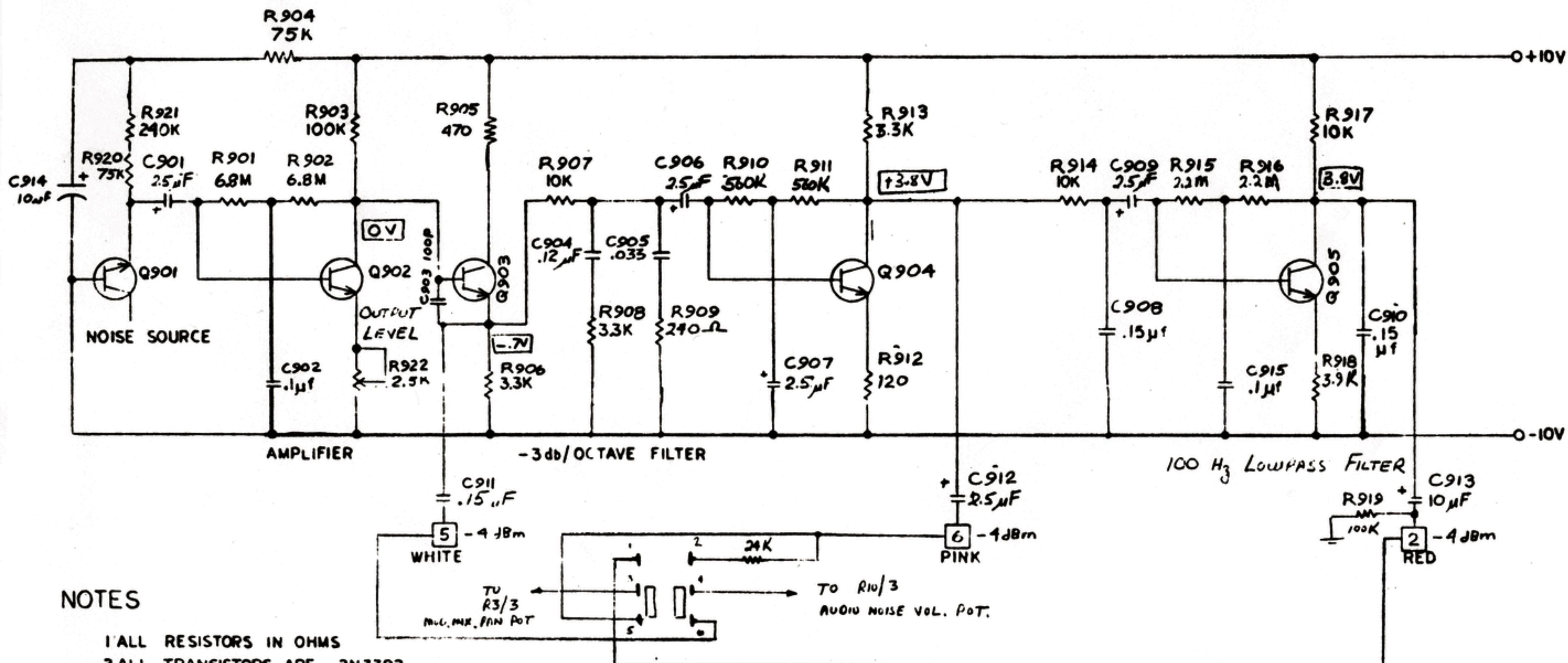
ECN 0028
REV B

REVISIONS
Rev 'A' Jan 28, 71/11/5
ECN 0044 7/9/71

R. A. MOOG CO.
TRUMANSBURG, NEW YORKTITLE MINI D
LEFT HAND CONTROLLERSCALE DR. BY JLS
DATE CK'D. BYDWG. NO.
1449

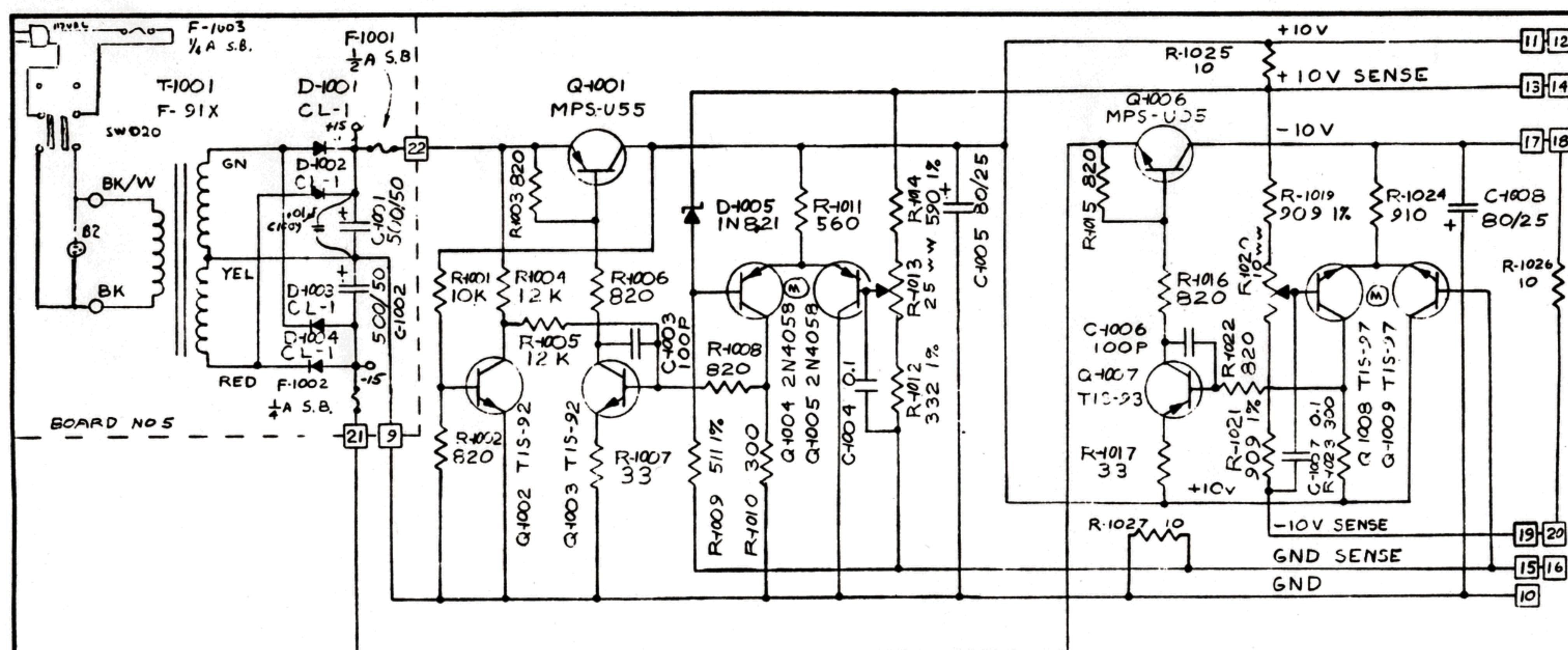
- [1] +10
- [2] GND
- [3] -10

ALL D.C. VOLTAGES $\pm 3V$



2N3392 BOTTOM VIEW

REVISIONS	R. A. MOOG CO.	
	TRUMANSBURG, NEW YORK	
TITLE	RANDOM SIGNAL GENERATOR	
	(FOR THE MINI SYN.)	
SCALE	DR. BY JA	DWG. NO.
DATE 11/3/70	CK'D. BY	1431



ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE NOTED
ALL RESISTORS IN OHMS 1/2 W
P.C. BOARD 91-115

Q-1004 & Q-1005 MATCHED & SUNK TOGETHER
Q-1008 & Q-1009 " " " "

BASE LAYOUTS

2N4058

TIS 92
TIS 93
TIS 97



MPS U05
MPS U55



CIRCUIT 10 BOARD NO. 3 91-115

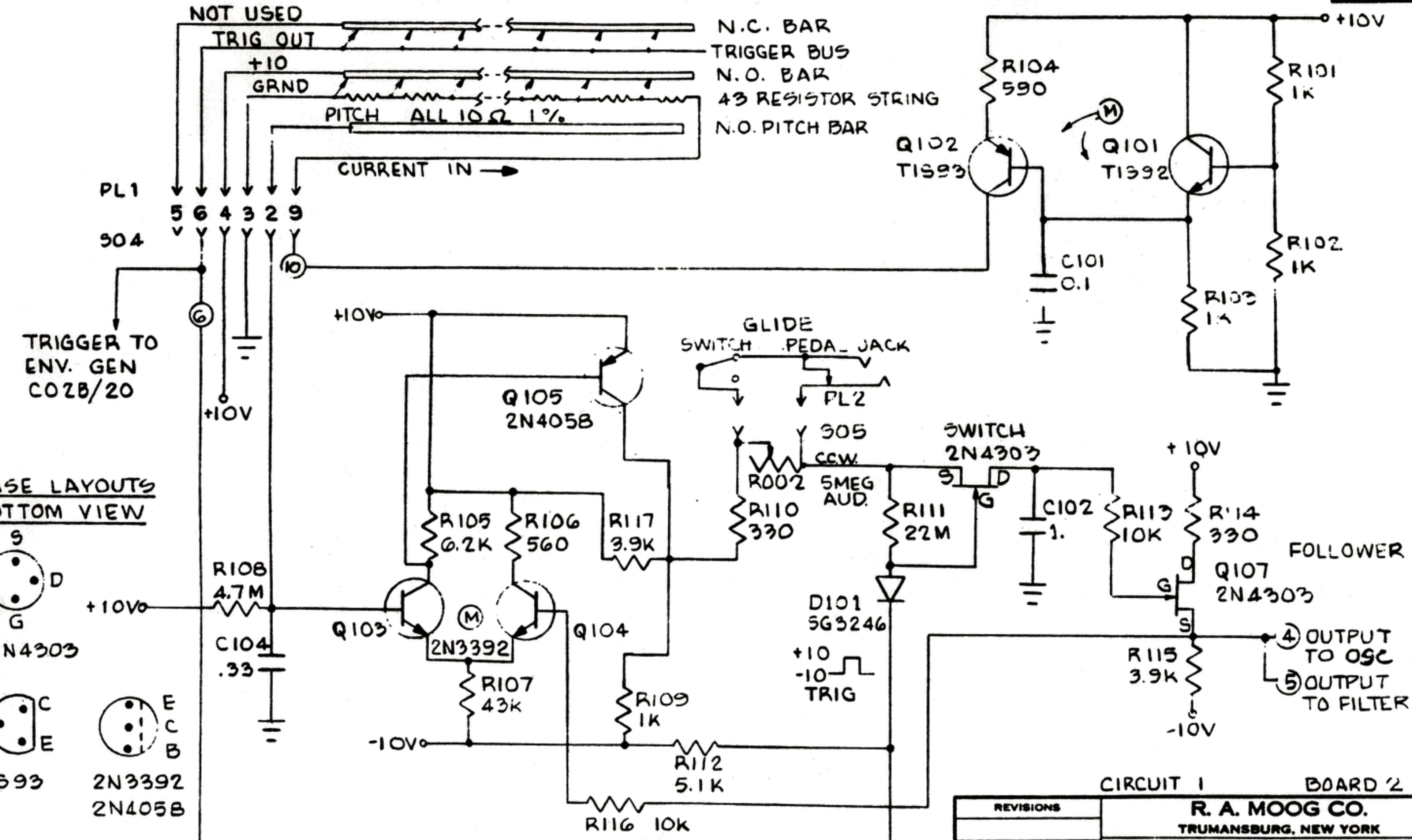
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REVISIONS
REV A 4/2/71

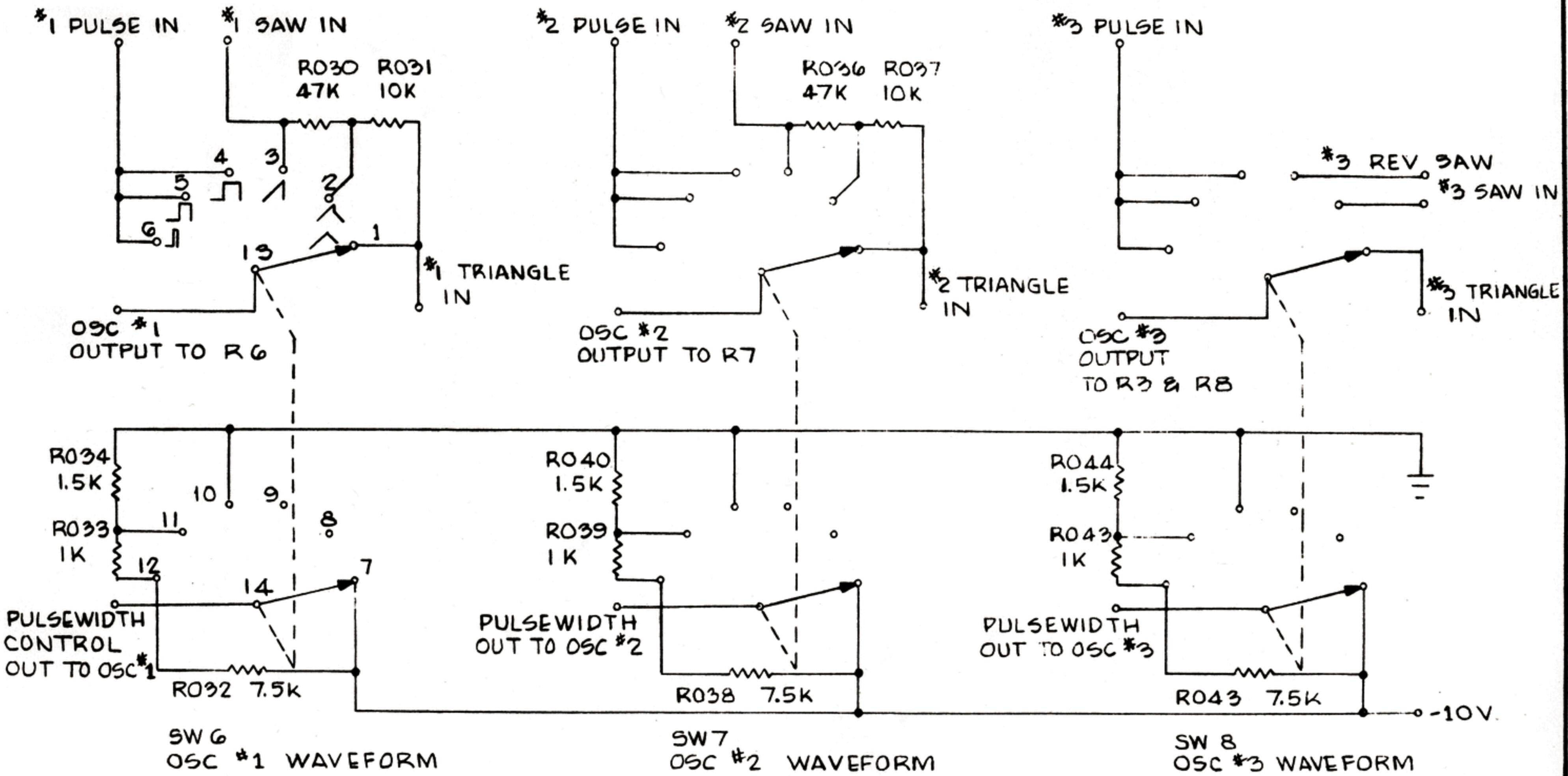
R. A. MOOG CO.
TRUMANSBURG, NEW YORK

SCALE — DR. BY CLH	DWG. NO.
DATE 11-9-70 CK'D. BY WRH	1435

5.48 MA. SOURCE

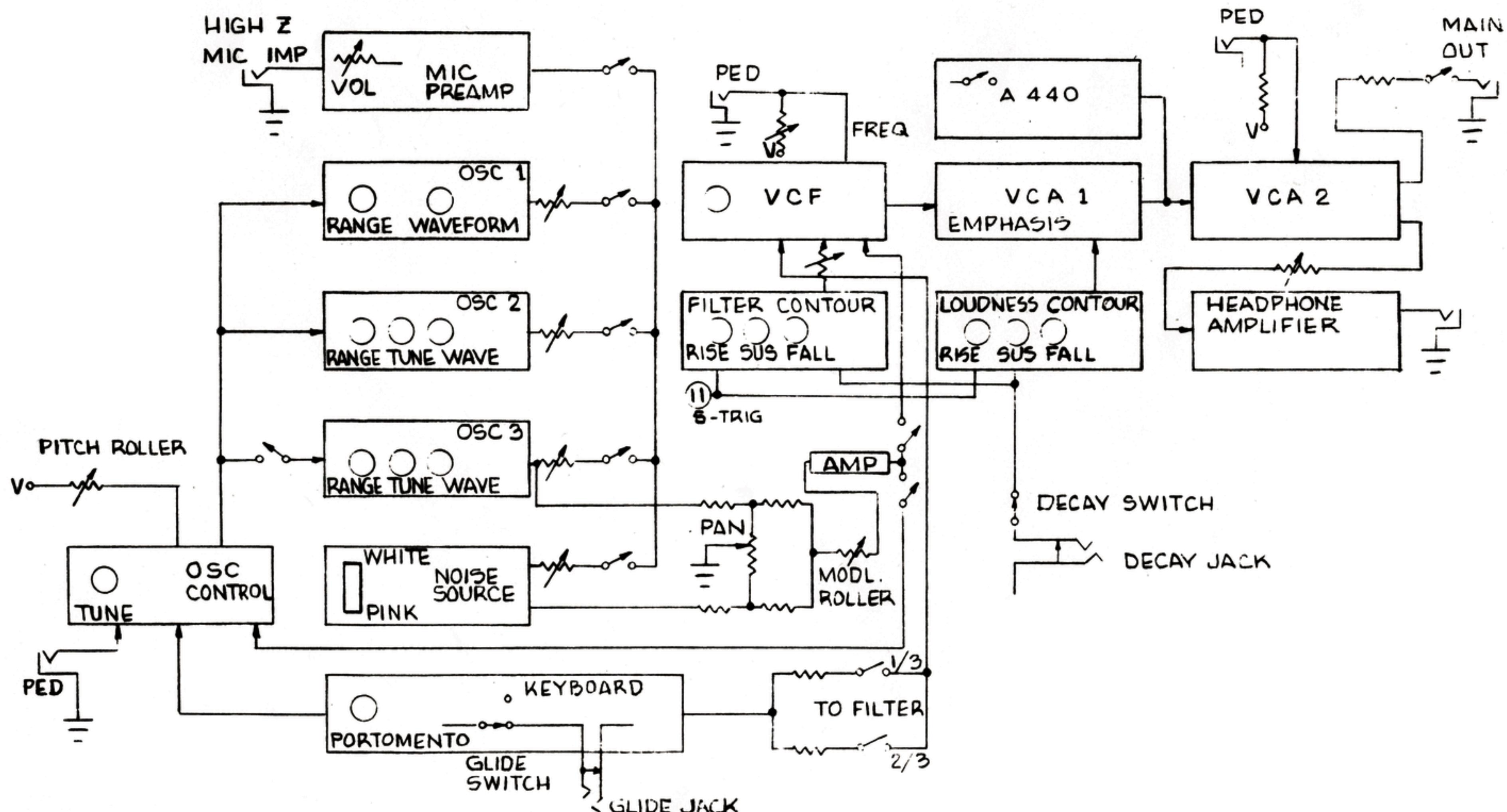


NOTES 1. ALL EDGE CONNECTIONS MATE WITH CO2A
2. ALL CAPACITOR VALUES IN MICROFARADS.



CIRCUIT #000 FRONT PANEL

REVISIONS	R. A. MOOG CO.	
	TRUMANSBURG, NEW YORK	
TITLE	WAVEFORM SWITCHING MINI'D'	
SCALE	DR. BY	DWG. NO.
DATE	CK'D. BY	1448



REVISIONS	R. A. MOOG CO.	
	TRUMANSBURG, NEW YORK	
TITLE	MINI SYNTH BLOCK DIAG.	
SCALE	DR. BY	DWG. NO.
DATE	CK'D. BY	1429

100-80

