

SERVICE MANUAL for



Model 204D

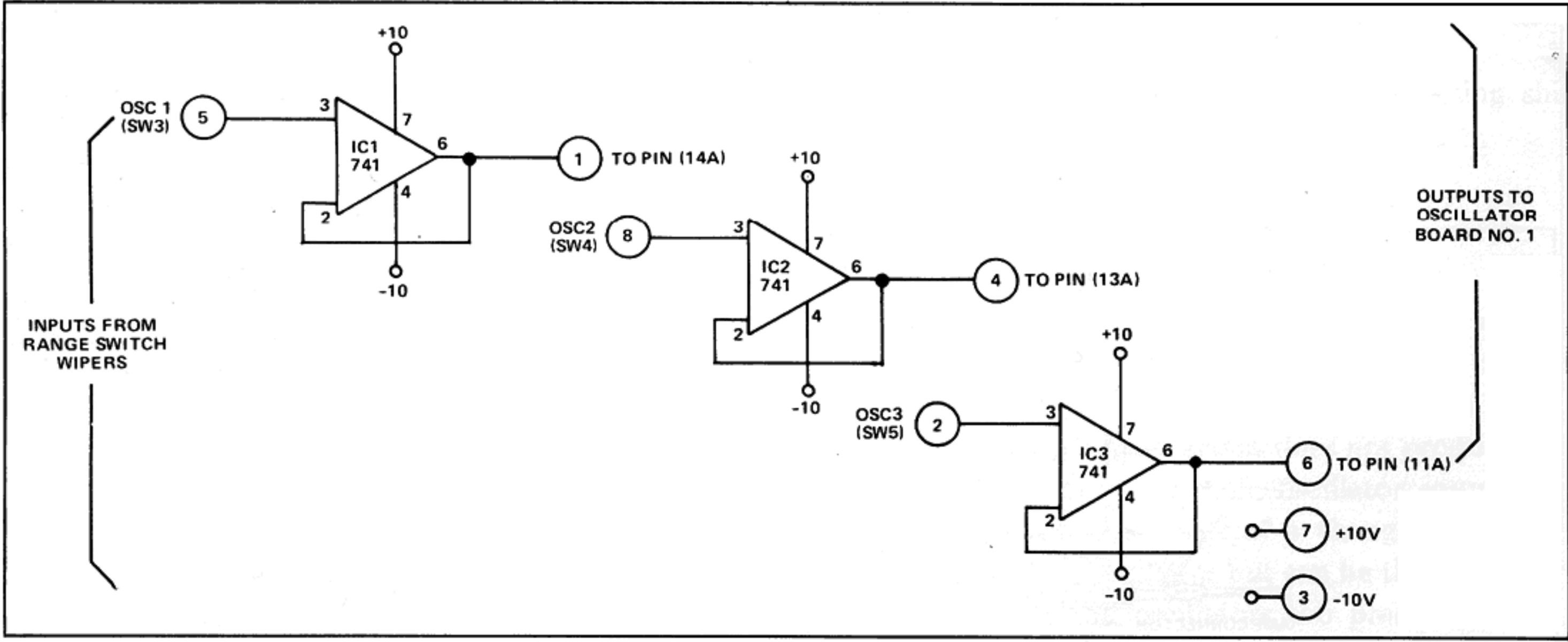
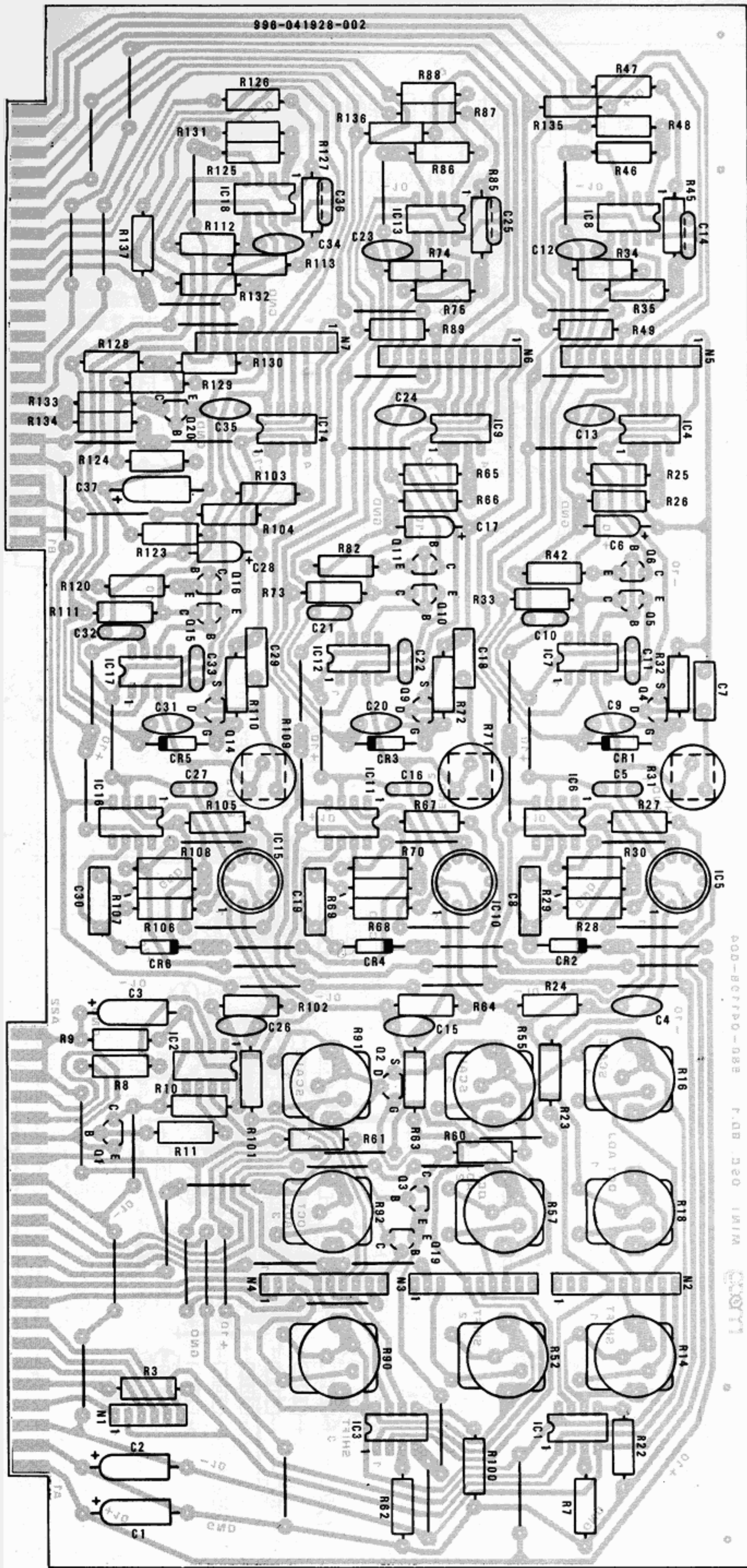


FIGURE 8-6 OCTAVE BUFFER SCHEMATIC

SECTION 9

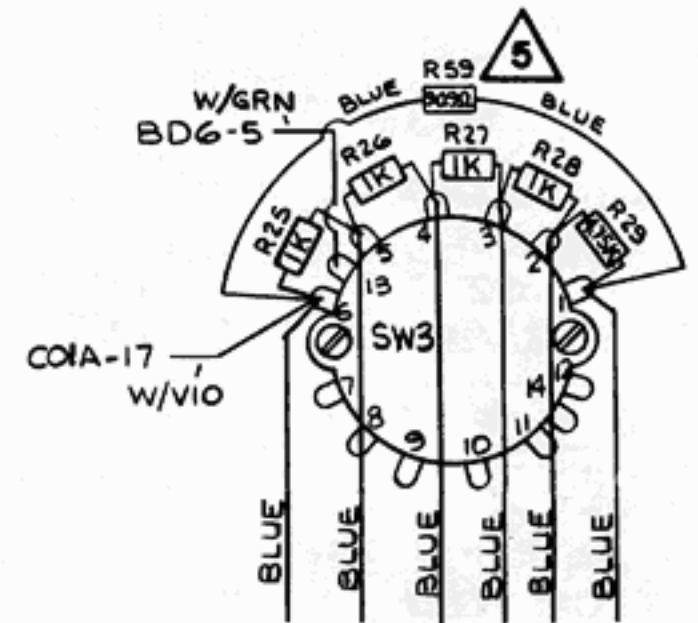
SCHEMATICS AND PRINTED CIRCUIT BOARDS

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NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL RESISTOR VALUES ARE IN OHMS 1/4W ± 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 20.5MV ± .4MV USING A 49.9K, 75K OR 100K. SIMILARLY, REPEAT FOR IC10 AND IC15.
4. FACTORY SELECTED (IF NECESSARY) TO ACHIEVE 50% ± 1% RECT. DUTY CYCLE.
5. R59 RESISTOR DELETED ON SERIAL NUMBERS ABOVE 10175.



OSCILLATOR 1 RANGE SWITCH

COMPONENT BASING (TOP VIEW)

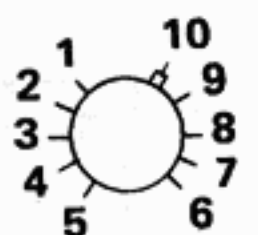
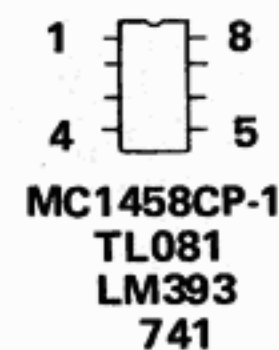
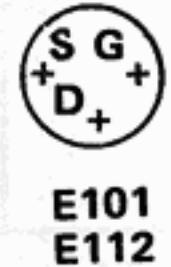


FIGURE 9-1 OSCILLATOR PRINTED CIRCUIT BOARD NO. 1 ASSEMBLY (SERIAL NUMBERS 10175 AND ABOVE)

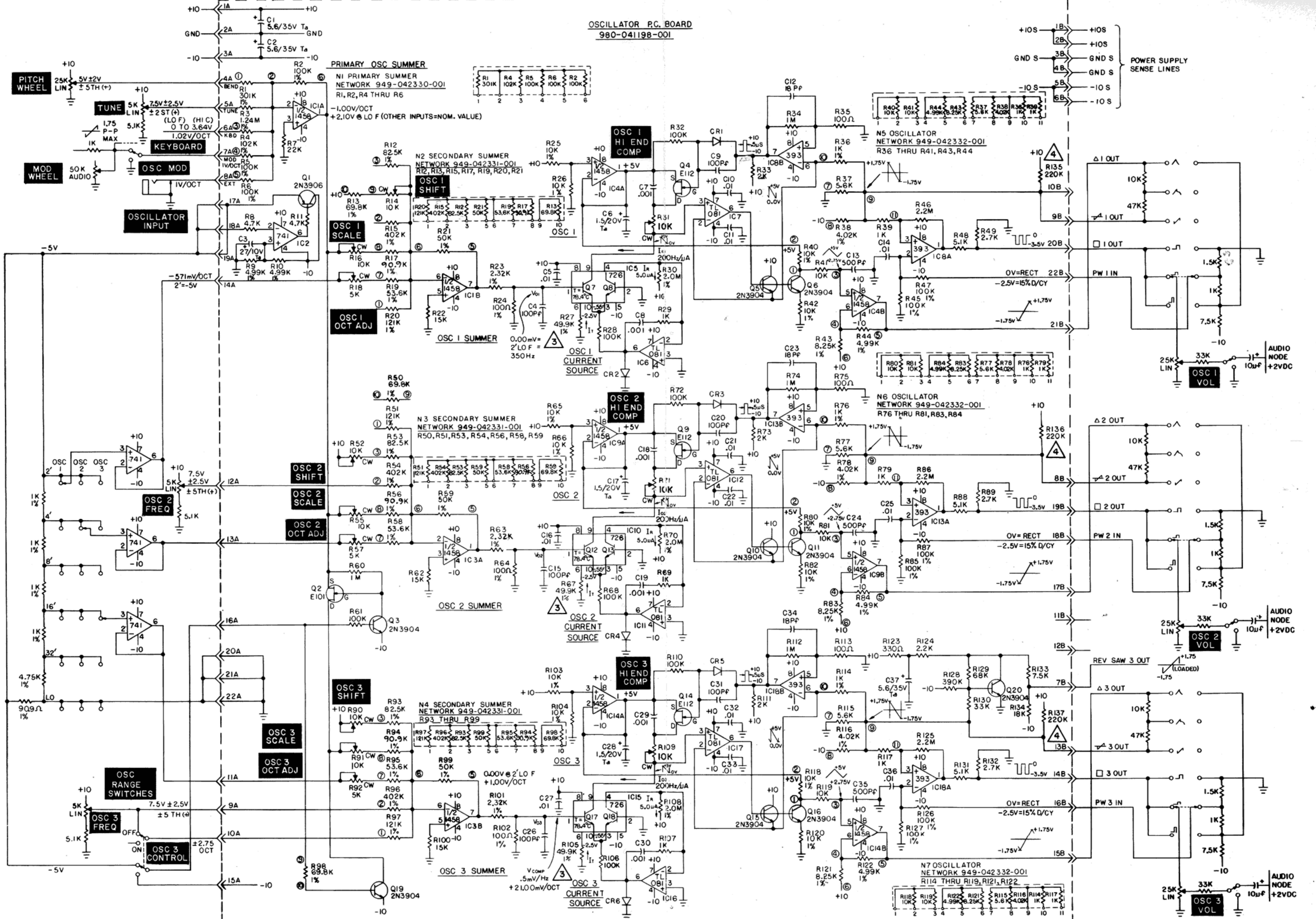
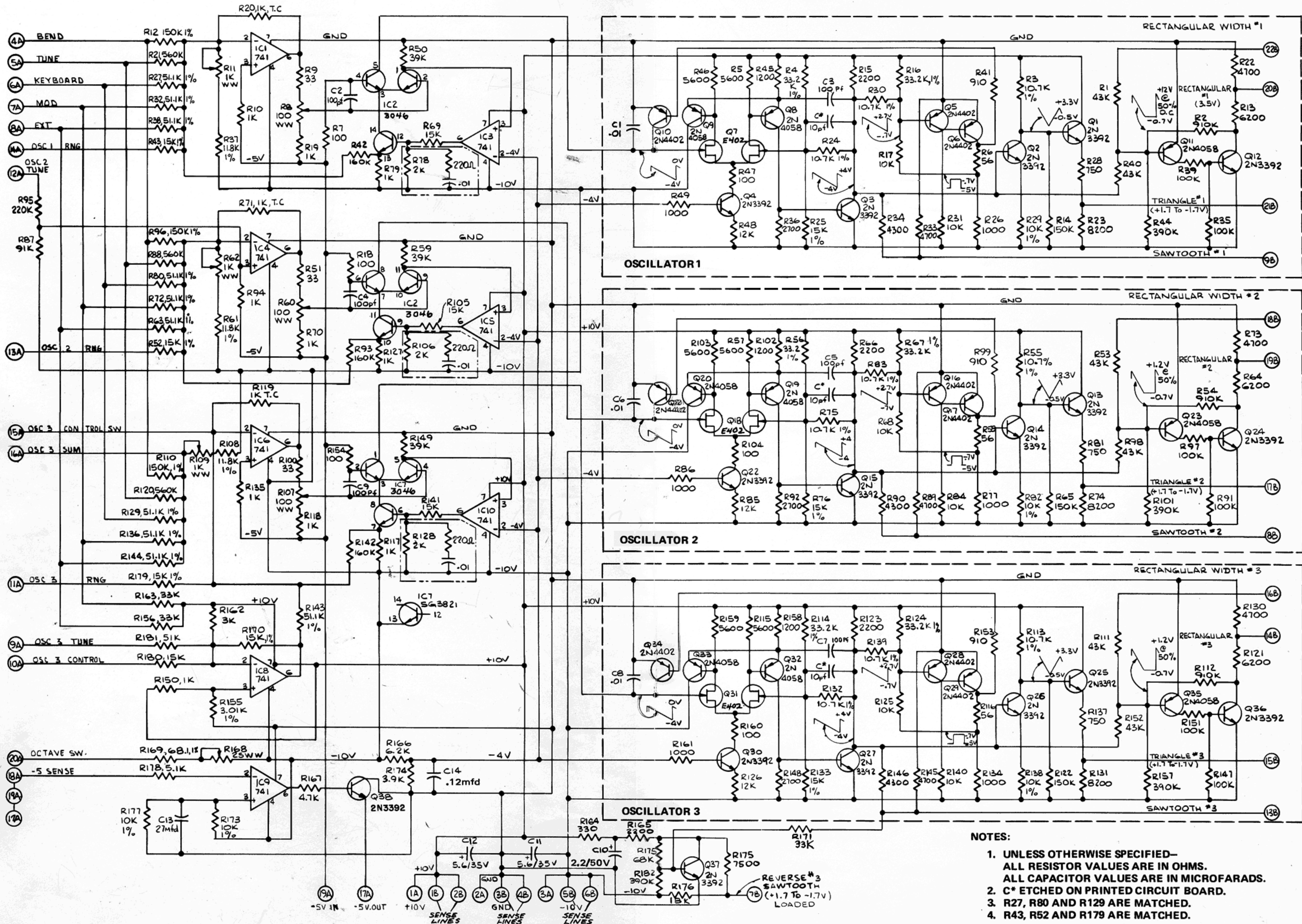


FIGURE 9-2 OSCILLATOR PRINTED CIRCUIT BOARD NO. 1 SCHEMATIC DIAGRAM (SERIAL NUMBERS 10175 AND ABOVE)



- NOTES:**
1. UNLESS OTHERWISE SPECIFIED— ALL RESISTOR VALUES ARE IN OHMS. ALL CAPACITOR VALUES ARE IN MICROFARADS.
 2. C* ETCHED ON PRINTED CIRCUIT BOARD.
 3. R27, R80 AND R129 ARE MATCHED.
 4. R43, R52 AND R179 ARE MATCHED.

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

COMPONENT BASING



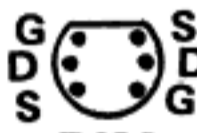
**2N3392
BOTTOM VIEW**



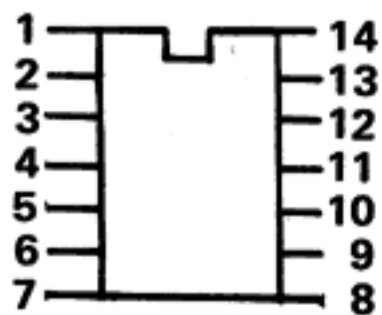
**2N4058
BOTTOM VIEW**



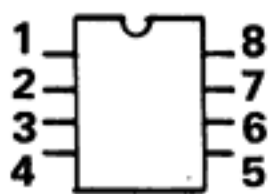
**2N4402
BOTTOM VIEW**



**E402
BOTTOM VIEW**



**3046
TOP VIEW**



**741
TOP VIEW**

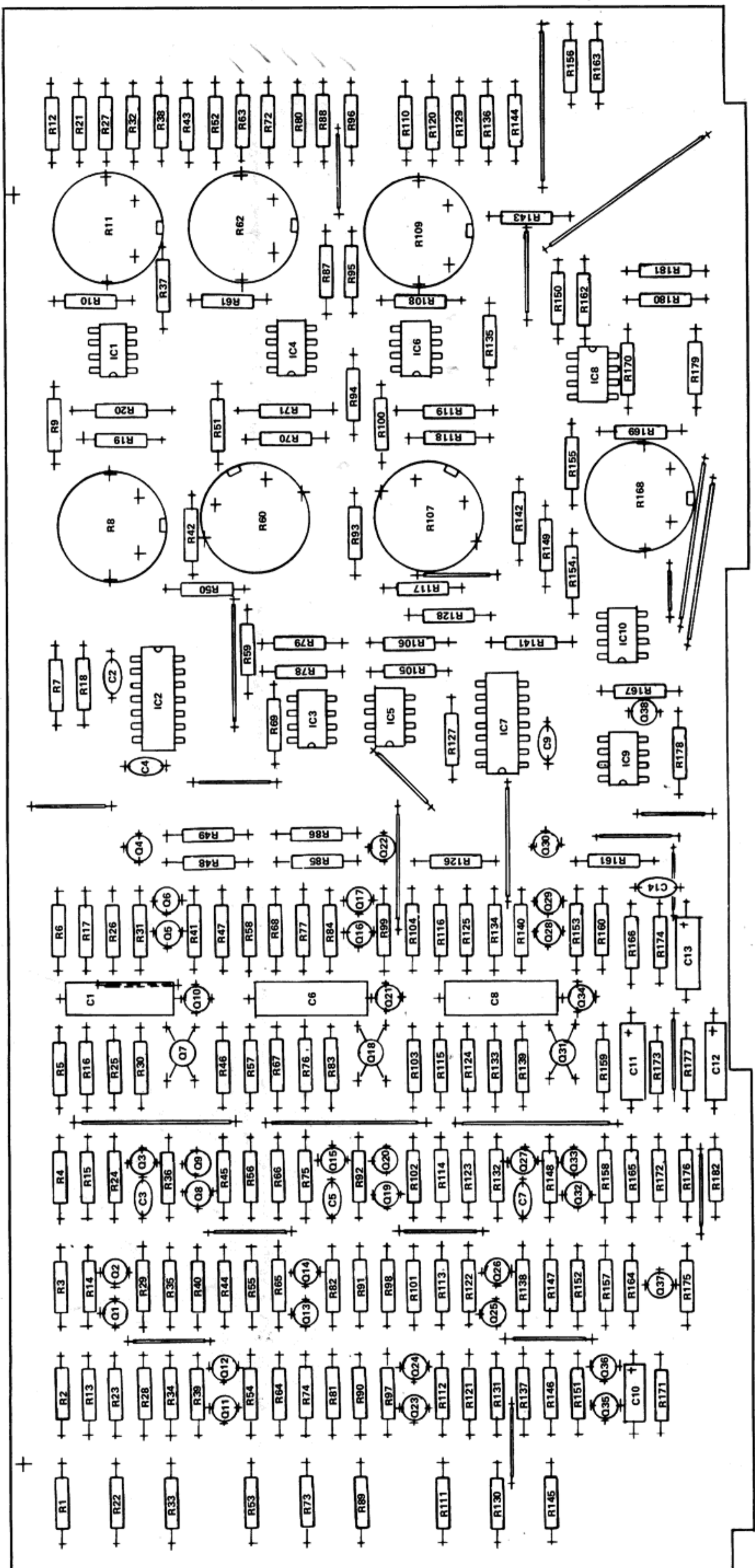
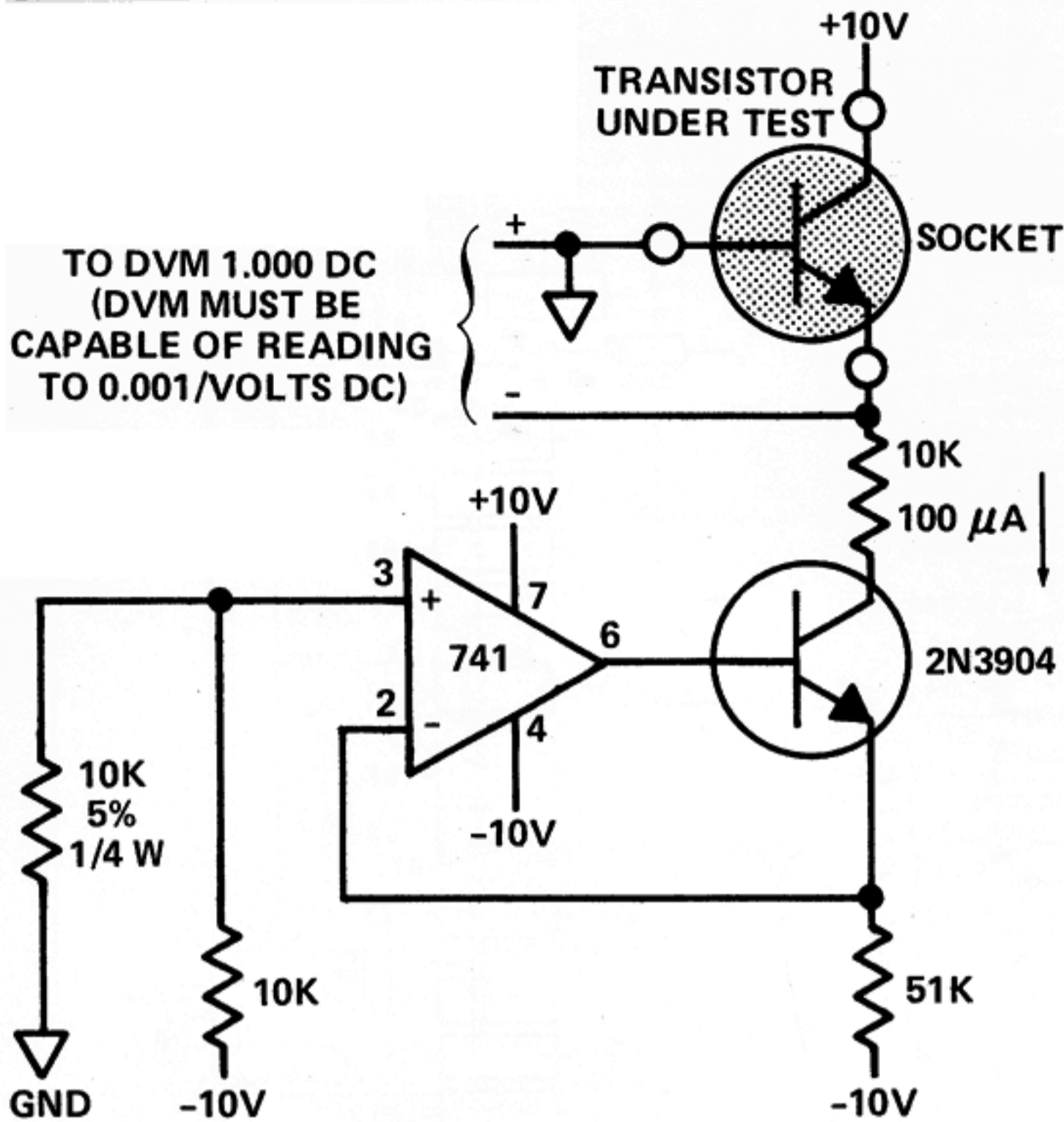
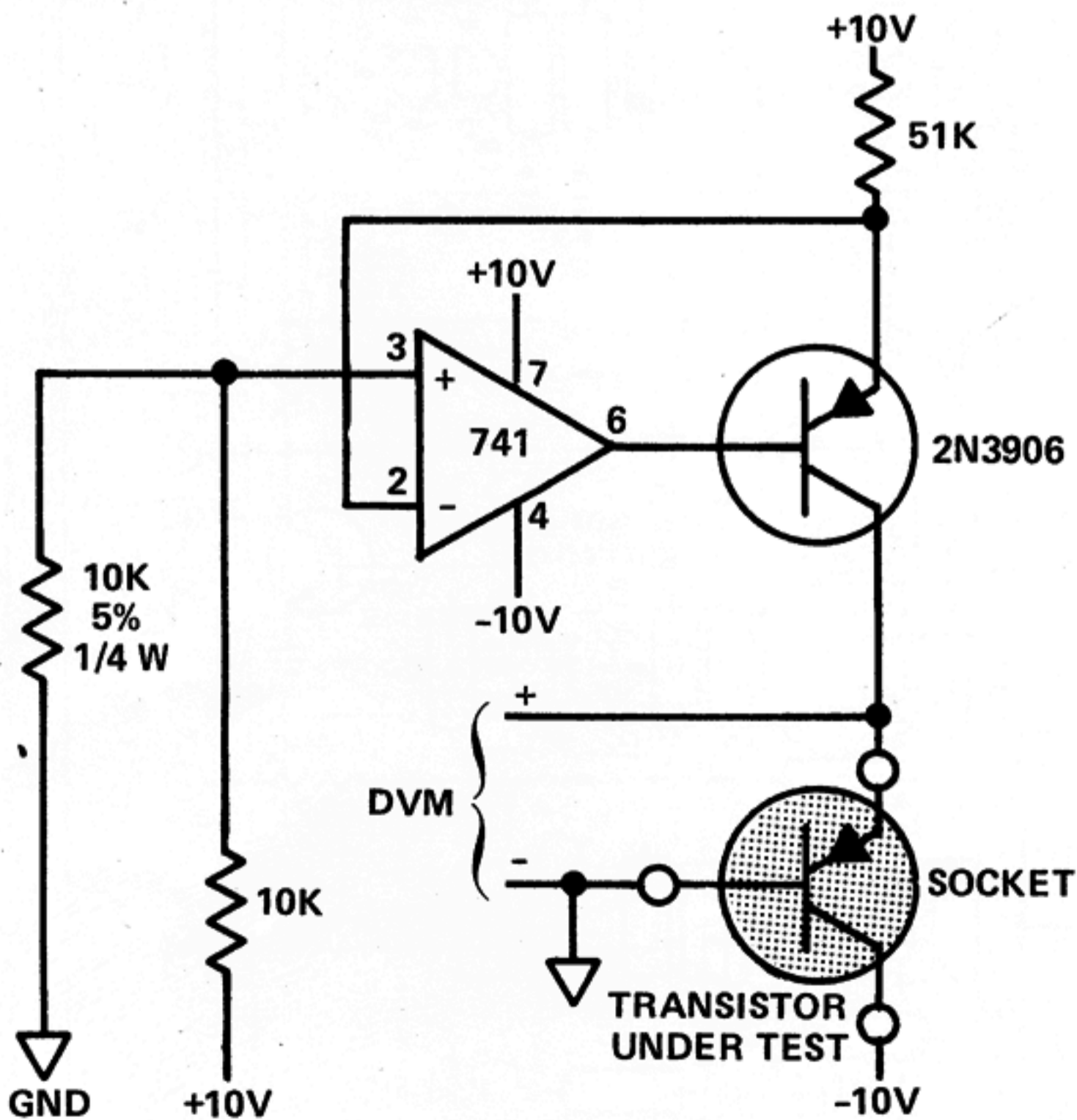


FIGURE 9-4 OSCILLATOR PRINTED CIRCUIT BOARD NO. 1 ASSEMBLY (SERIAL NUMBERS BELOW 10175)

NPN TRANSISTORS 2N3904, 2N3392 (ETC.)



PNP TRANSISTORS 2N3906, (ETC.)



MATCHING PROCEDURE

1. SETUP $\pm 10V$ SUPPLIES TO $\pm 10.00 V$ OR $\pm 15.00 V$.
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 $\pm 2 MV$.
5. EXAMPLE:

TRANSISTOR 1 = 0.600
 TRANSISTOR 2 = 0.598
 0.002

FIGURE 9-5 MATCHING TRANSISTOR CIRCUITS

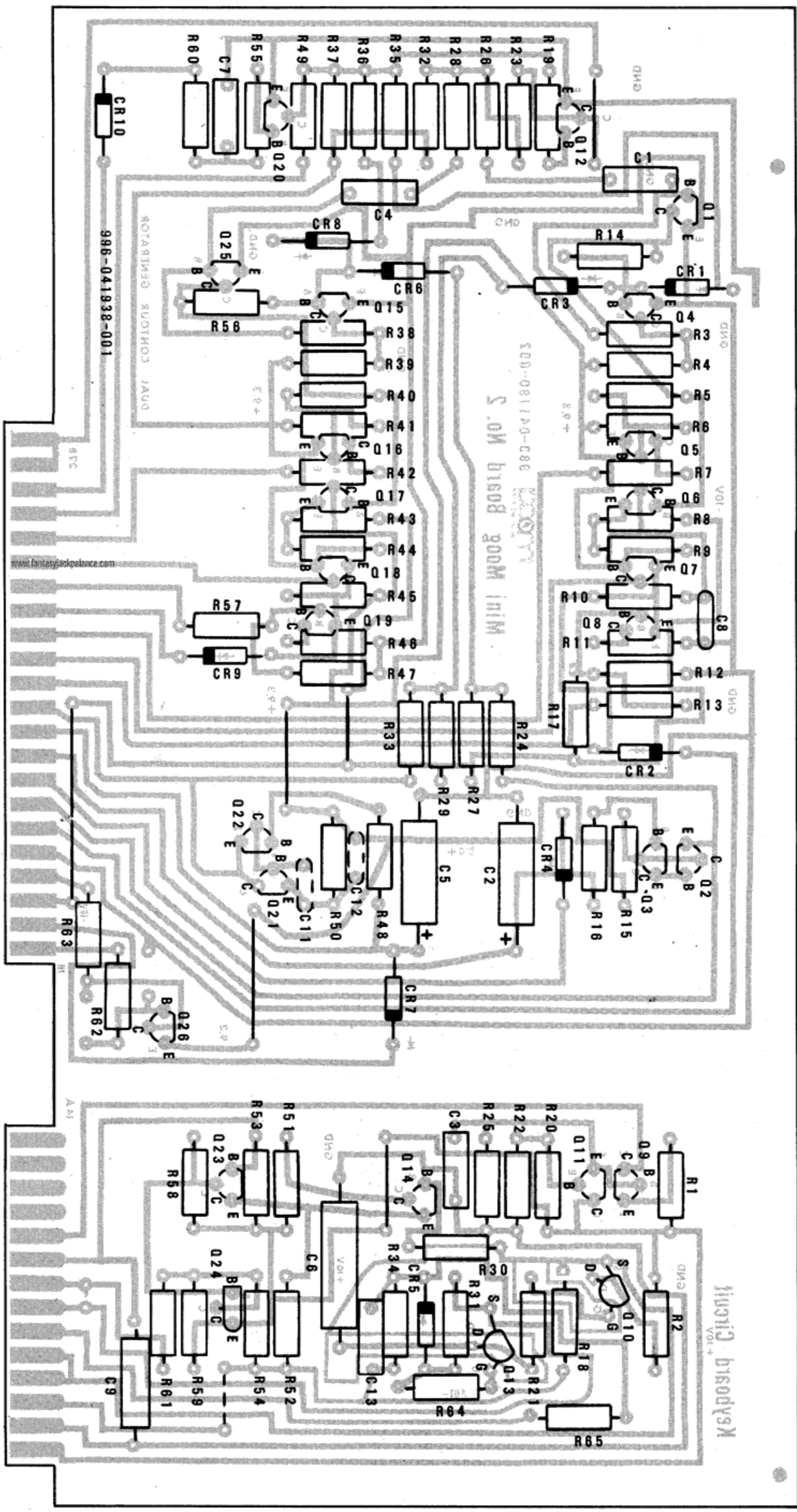
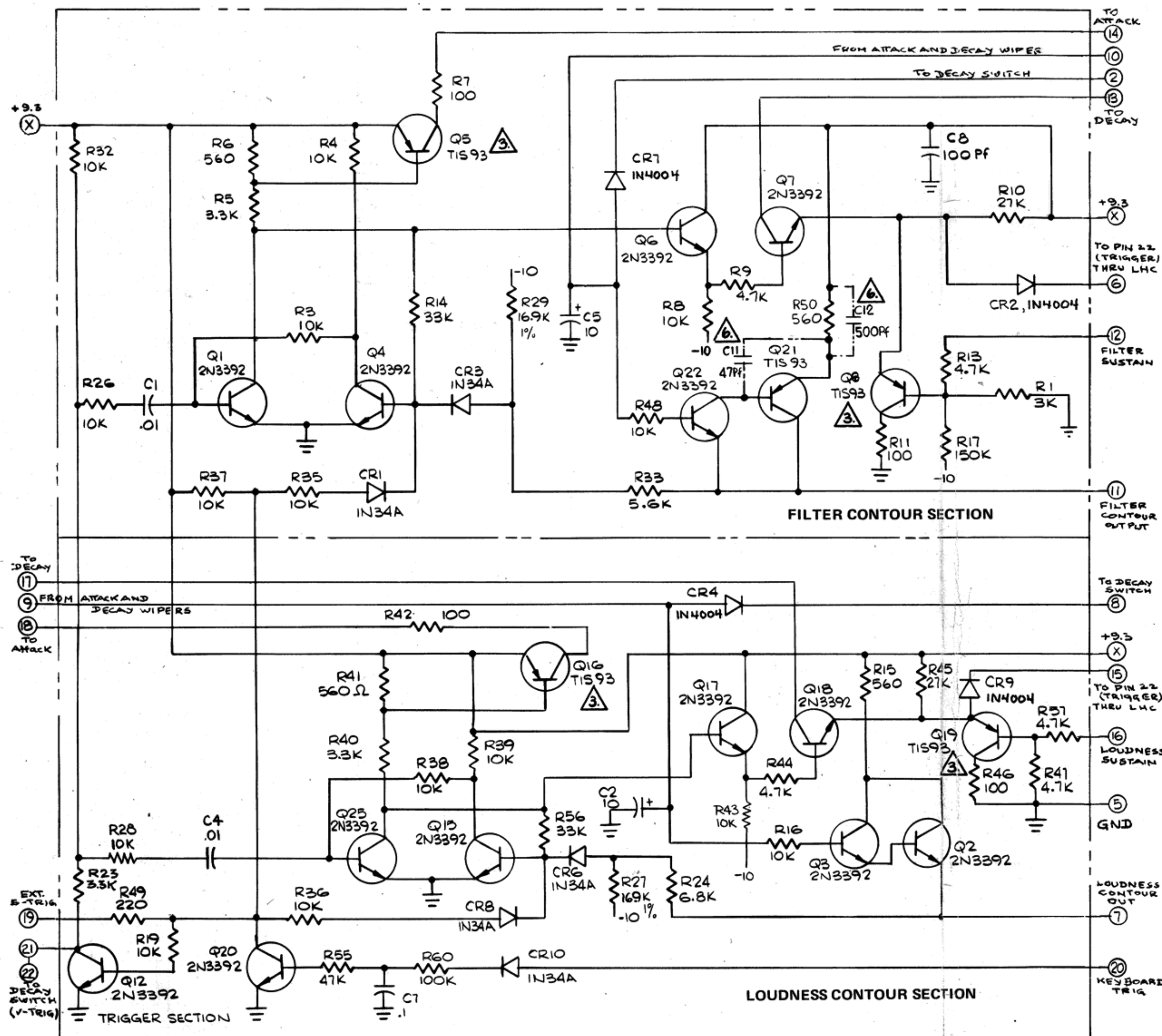
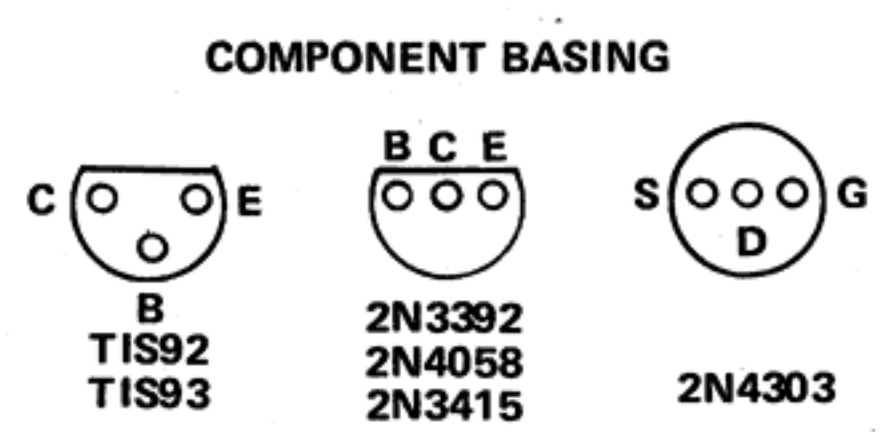


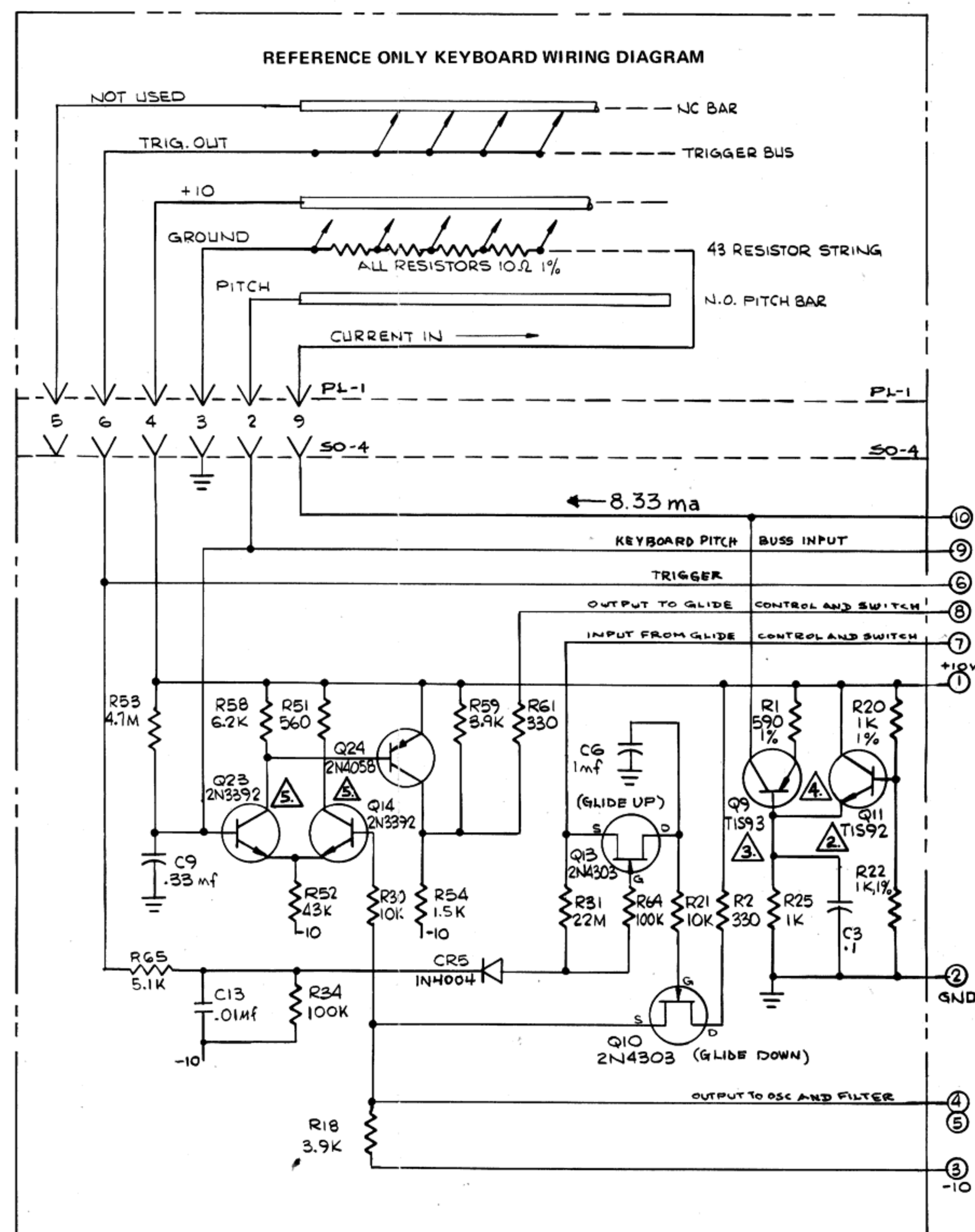
FIGURE 9-6 CONTOUR GENERATOR AND KEYBOARD PRINTED CIRCUIT BOARD NO. 2 ASSEMBLY



CIRCUIT NO. 8 - BOARD NO. 2 DUAL CONTOUR GENERATOR



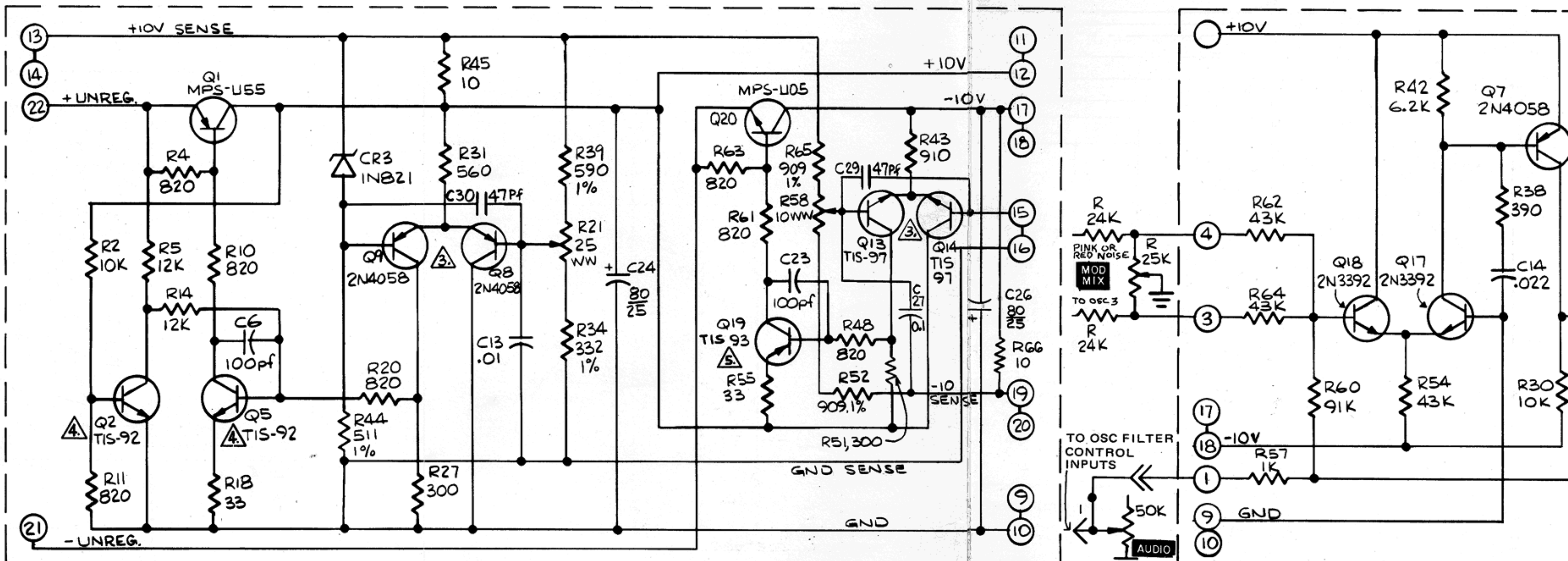
- NOTES:**
UNLESS OTHERWISE SPECIFIED -
1. ALL RESISTORS IN OHMS \pm 5%, 1/4W CARBON.
 2. ALTERNATE FOR TIS92 AND 2N3415: 2N3904.
 3. ALTERNATE FOR TIS93: 2N3906.



CIRCUIT NO. 1 - BOARD NO. 2 KEYBOARD CIRCUIT

- NOTES:**
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



- NOTES:
UNLESS OTHERWISE
INDICATED:**
1. ALL RESISTORS ARE 1/2 WATT.
 2. ALL CAPACITORS ARE IN MICROFARADS.
 3. Q14 AND Q13 ARE HEAT SUNK TOGETHER. Q8 AND Q9 ARE HEAT SUNK TOGETHER.
 4. ALTERNATE FOR TIS92, 2N3904.
 5. ALTERNATE FOR TIS93, 2N3906.

COMPONENT BASING

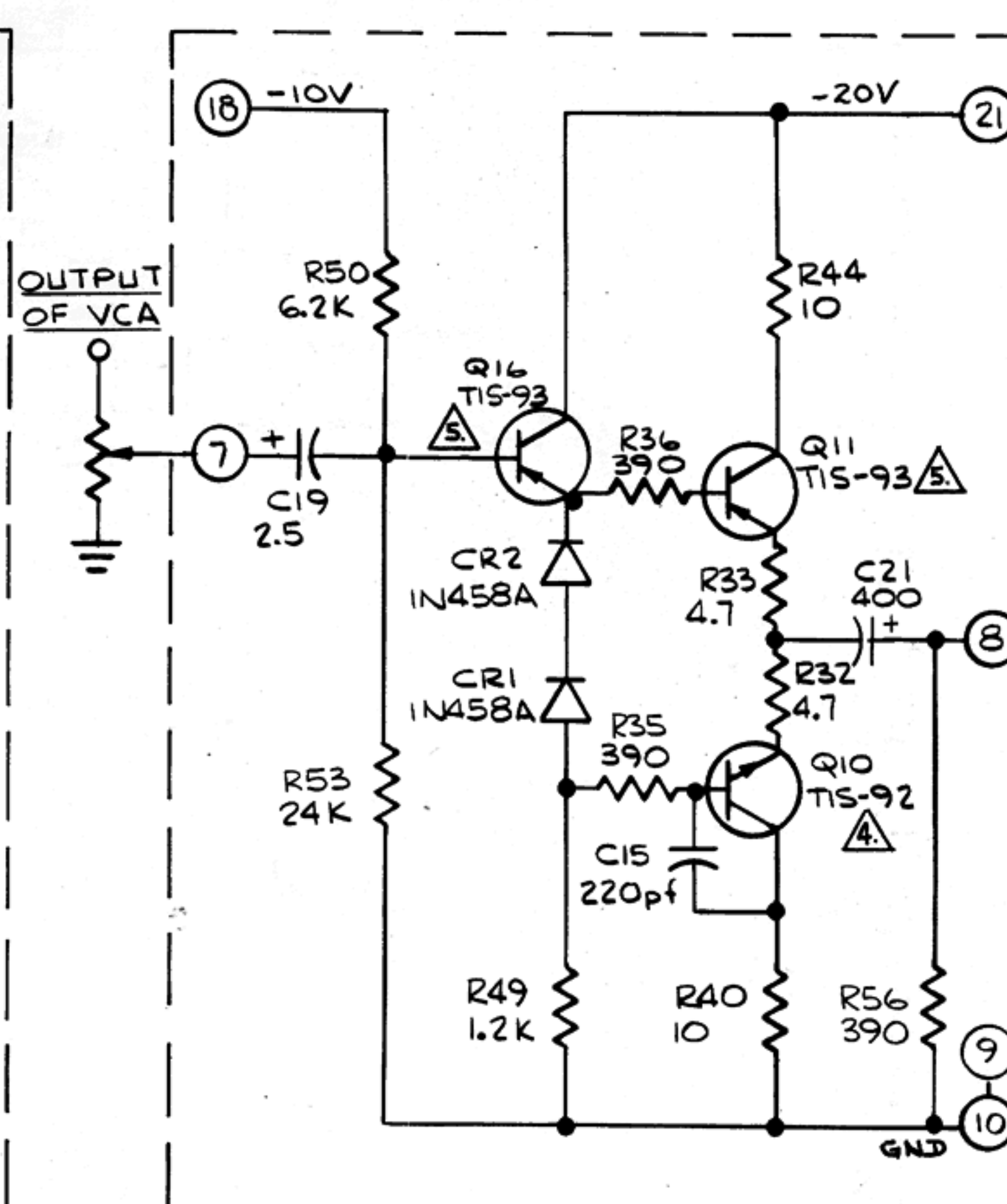
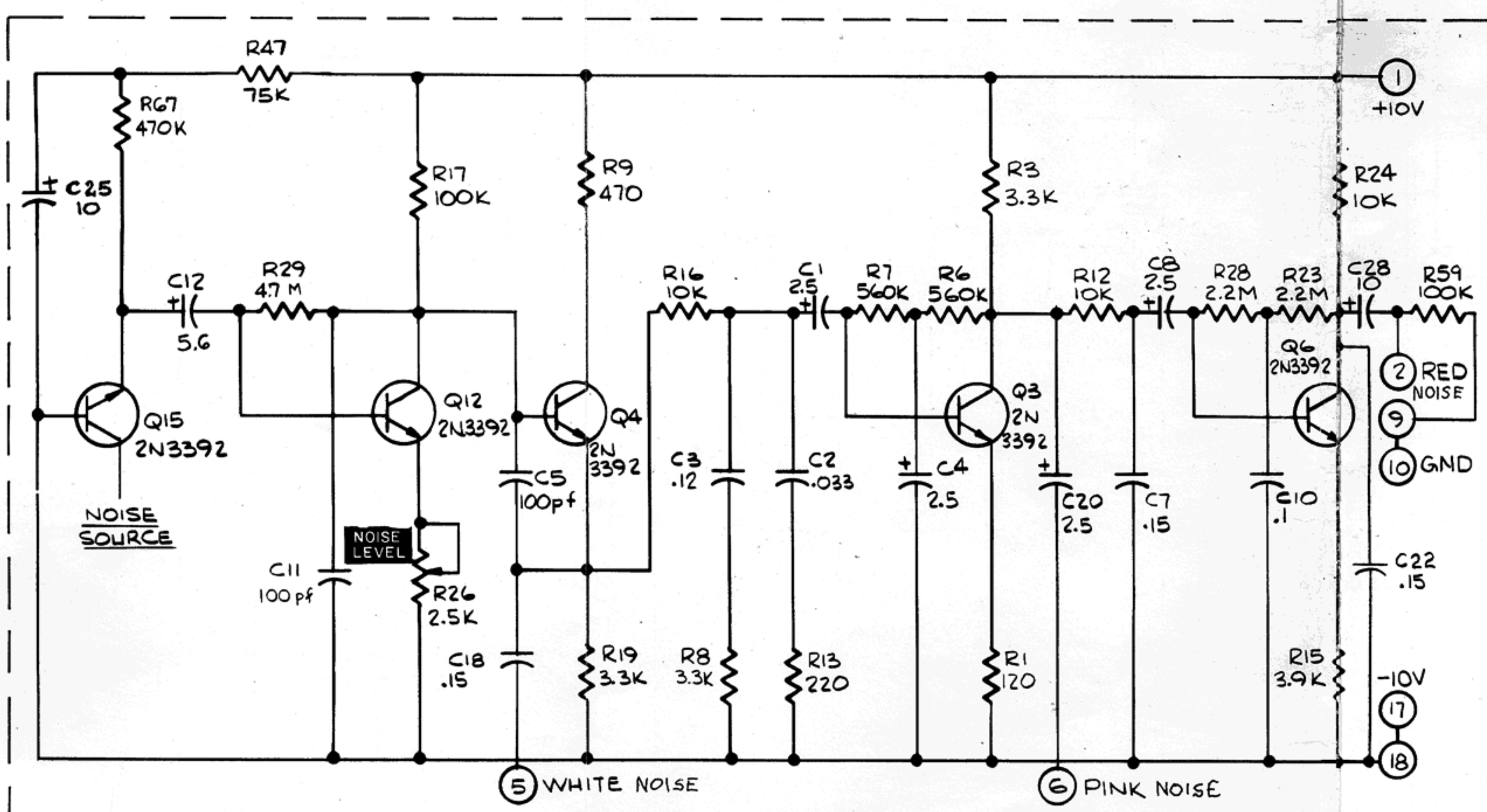
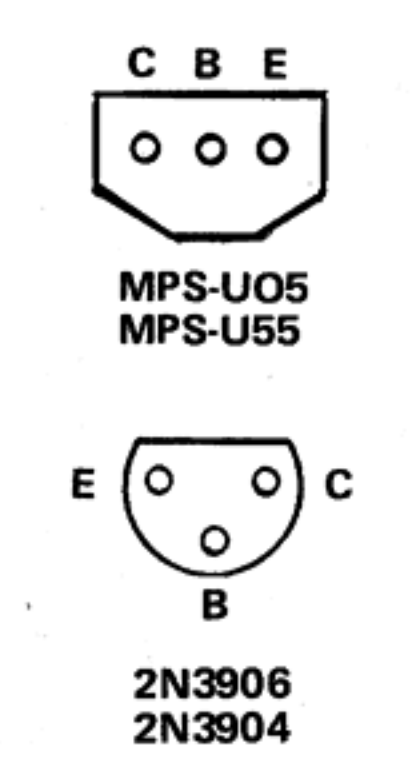
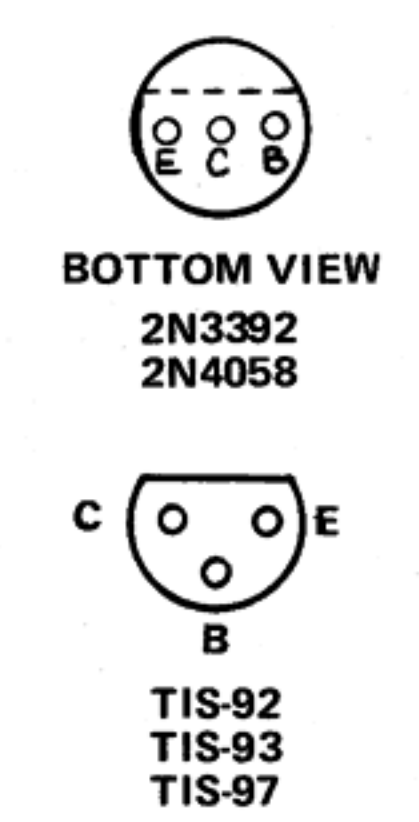


FIGURE 9-8 POWER SUPPLY PRINTED CIRCUIT BOARD NO. 3 SCHEMATIC DIAGRAM

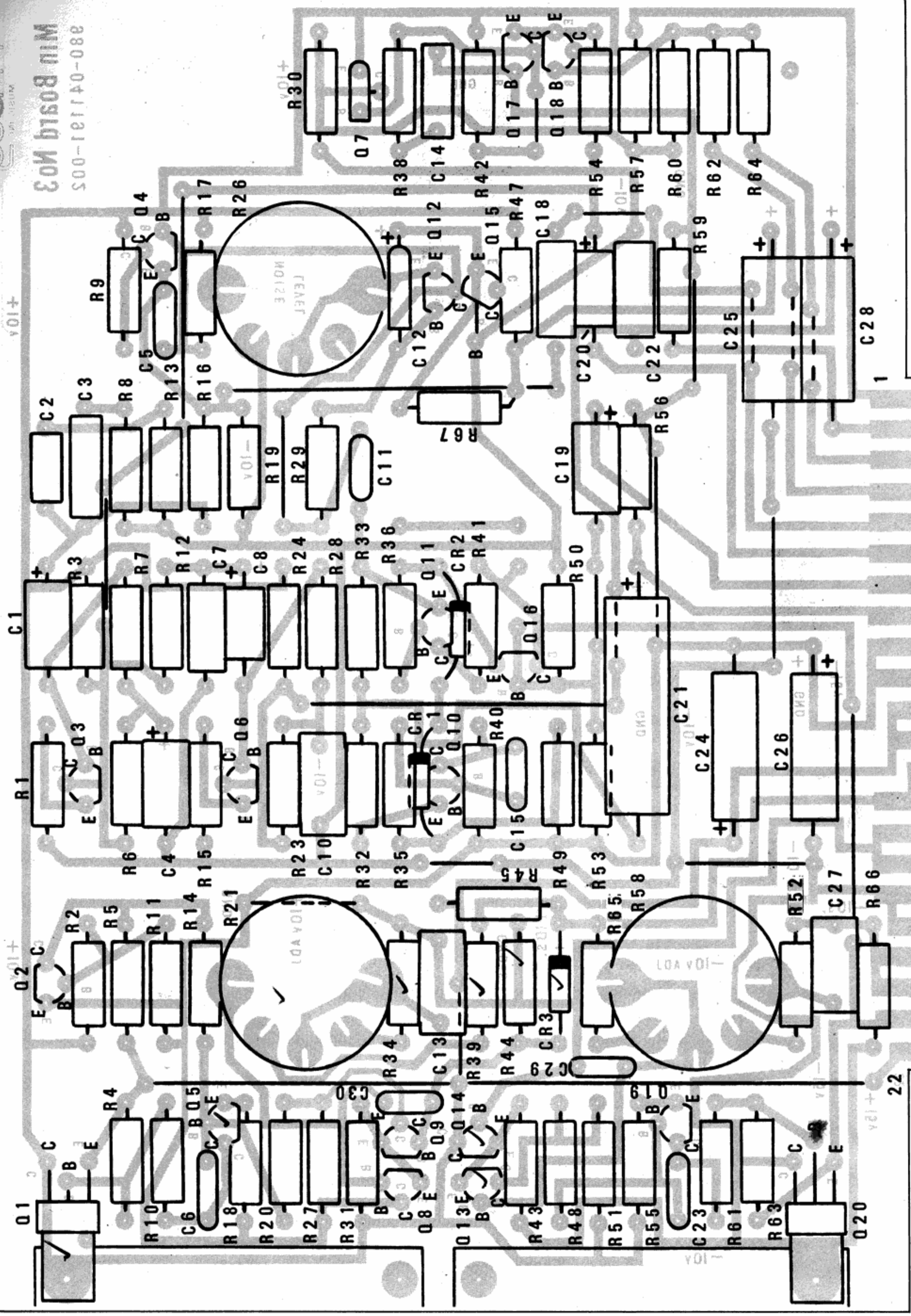


FIGURE 9-9 POWER SUPPLY PRINTED CIRCUIT BOARD NO. 3 ASSEMBLY

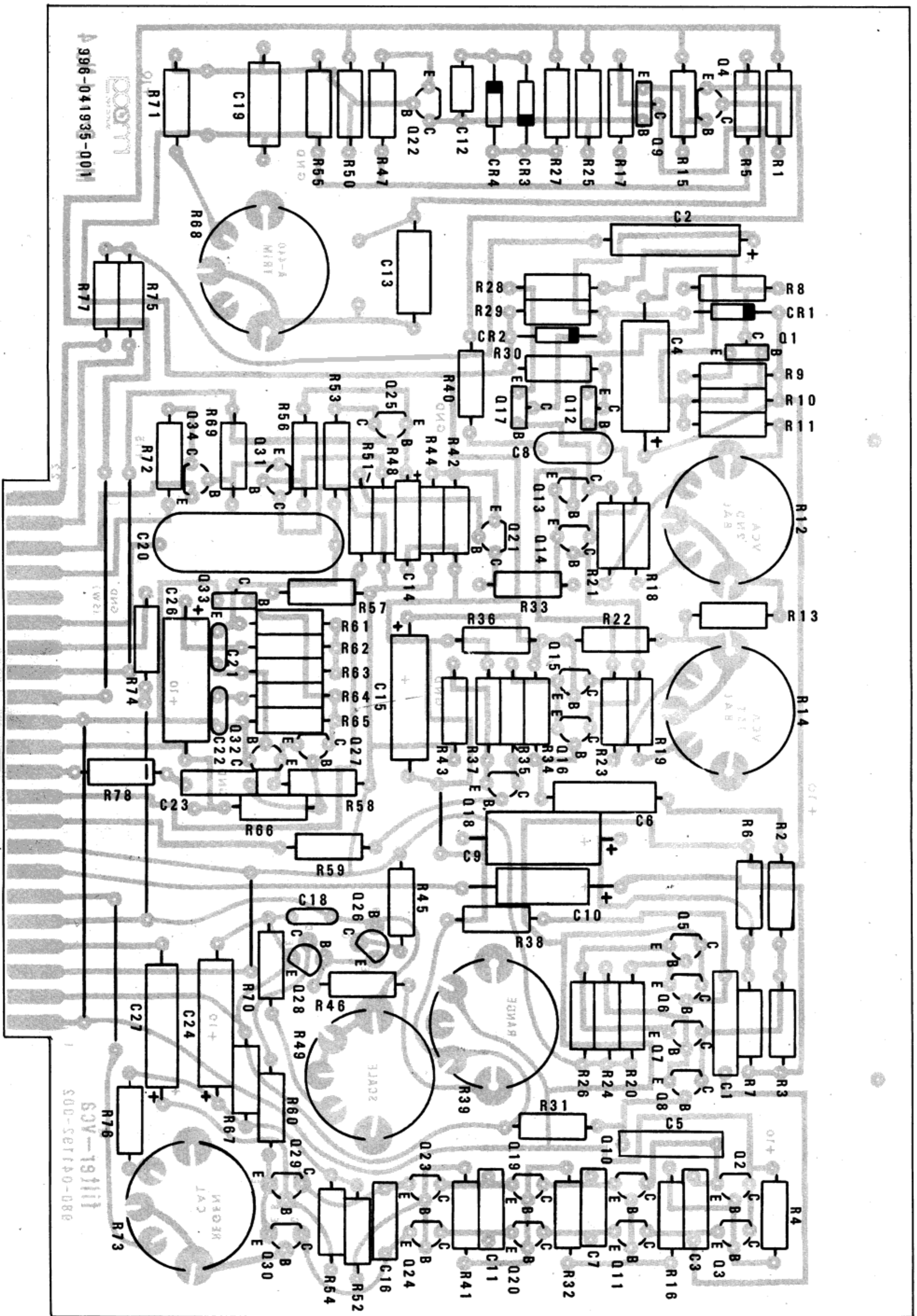


FIGURE 9-10 FILTER PRINTED CIRCUIT BOARD NO. 4 ASSEMBLY

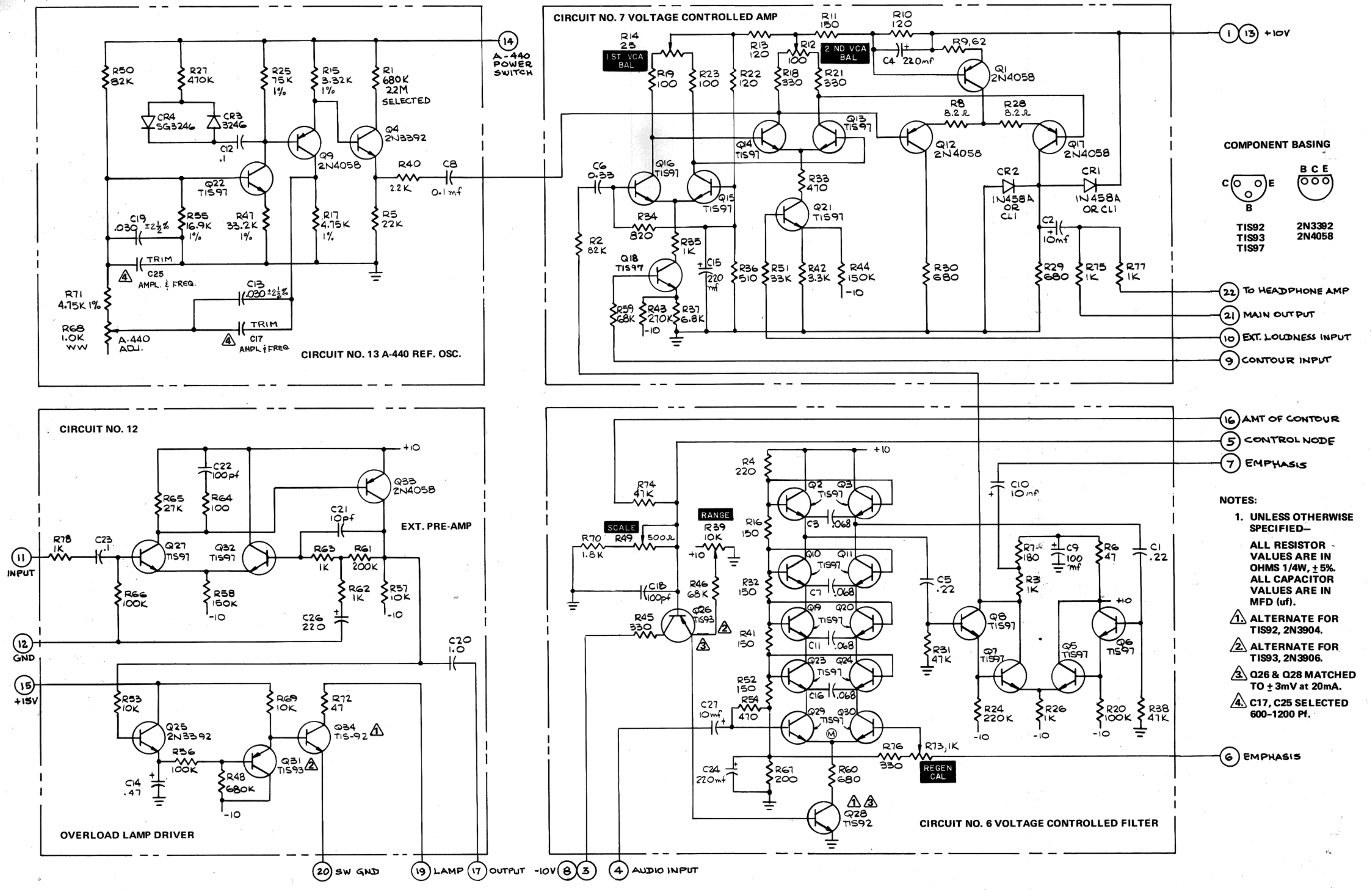


FIGURE 9-11 FILTER PRINTED CIRCUIT BOARD NO. 4 SCHEMATIC DIAGRAM

MODULATOR MIX OUT TO
OSCILLATOR & FILTER

MODULATION MIX IN
FROM CARD NO. 3

MODULATION
R1402
50K AUDIO
90° ROTATION
USED FROM
COUNTERCLOCKWISE
STOP TO CENTER

PITCH BEND OUT

+10

GROUND

GLIDE OUT

GLIDE RETURN

FINAL FILTER DECAY

FINAL LOUDNESS DECAY

CONTOUR GEN. DUMP

CONTOUR GEN.
"V" TRIG OUT

CONTOUR GEN.
"V" TRIG OUT

1

2

3

4

5

6

7

8

9

10

11

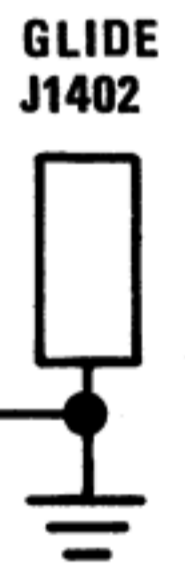
12

15K TO GROUND AT DETENT

PITCH
R1403
25 KLIN.
90° ROTATION USED

1.2K WHEN
FULLY FORWARD

(3)
ON
SW1402



R1401
1.5K
(3) ON
SW1401



PL-2 12 PIN CINCH JONES PLUG

FIGURE 9-12 LEFT HAND CONTROLLER SCHEMATIC DIAGRAM

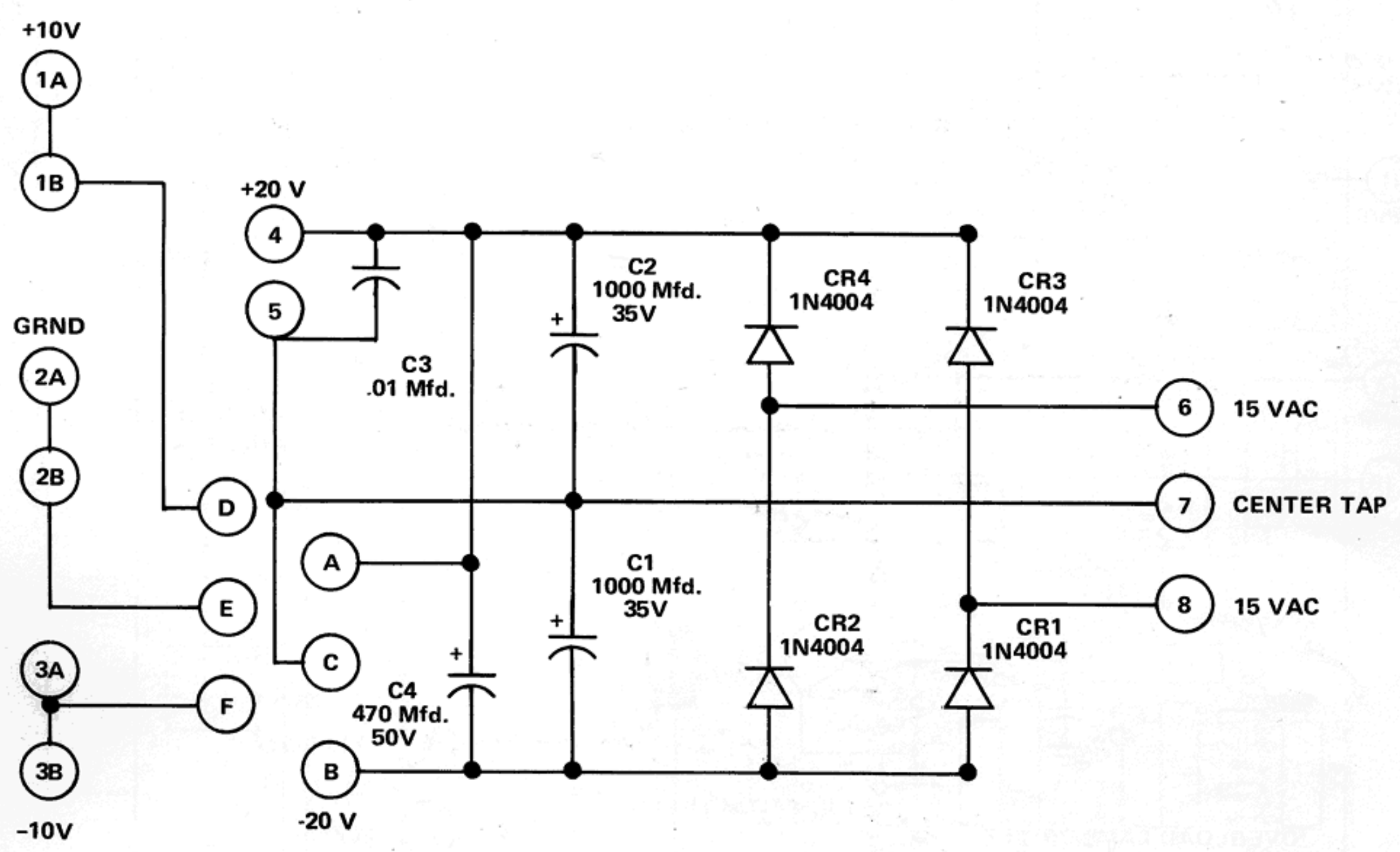
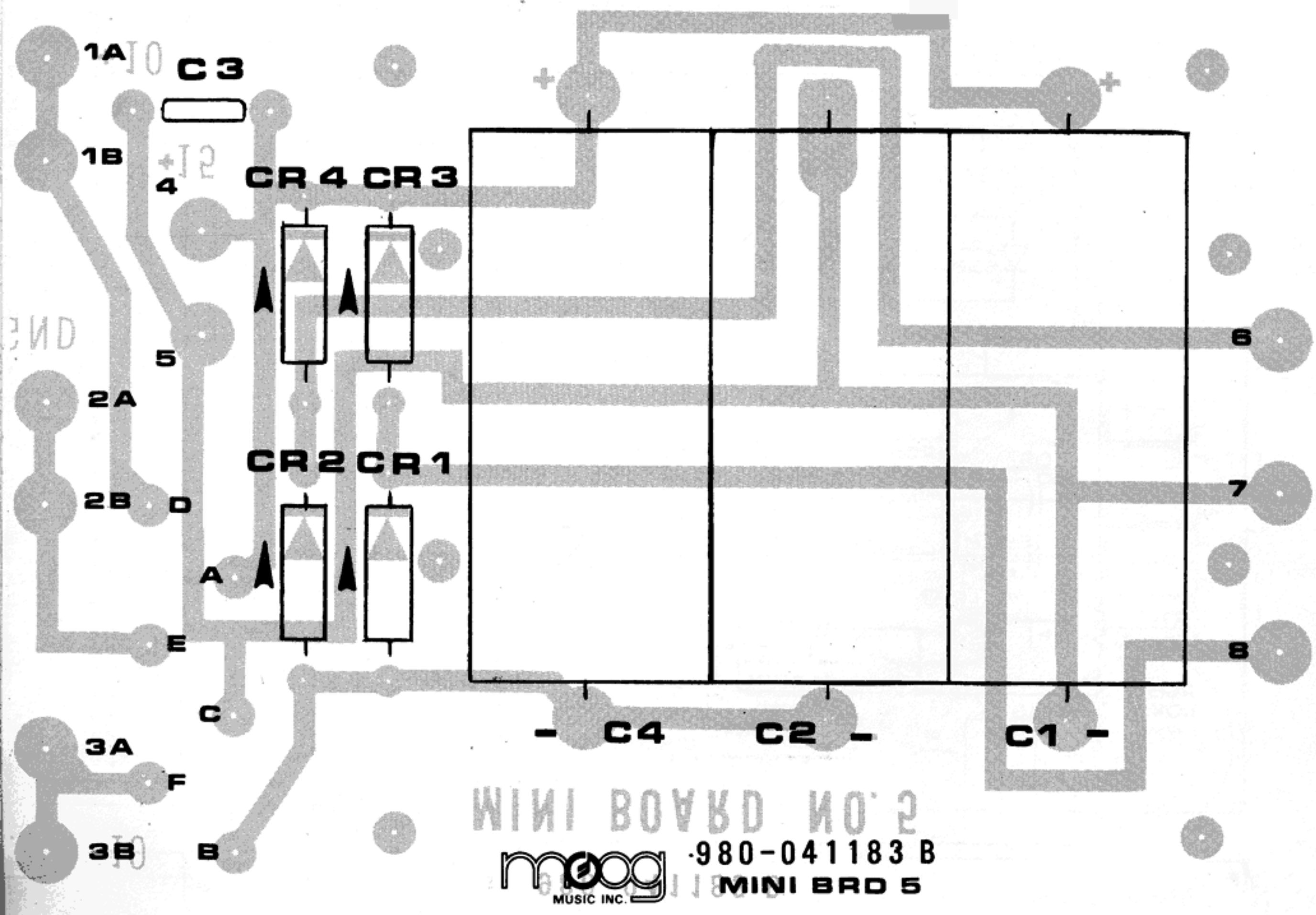


FIGURE 9-13 RECTIFIER PRINTED CIRCUIT BOARD NO. 5 SCHEMATIC DIAGRAM AND BOARD ASSEMBLY

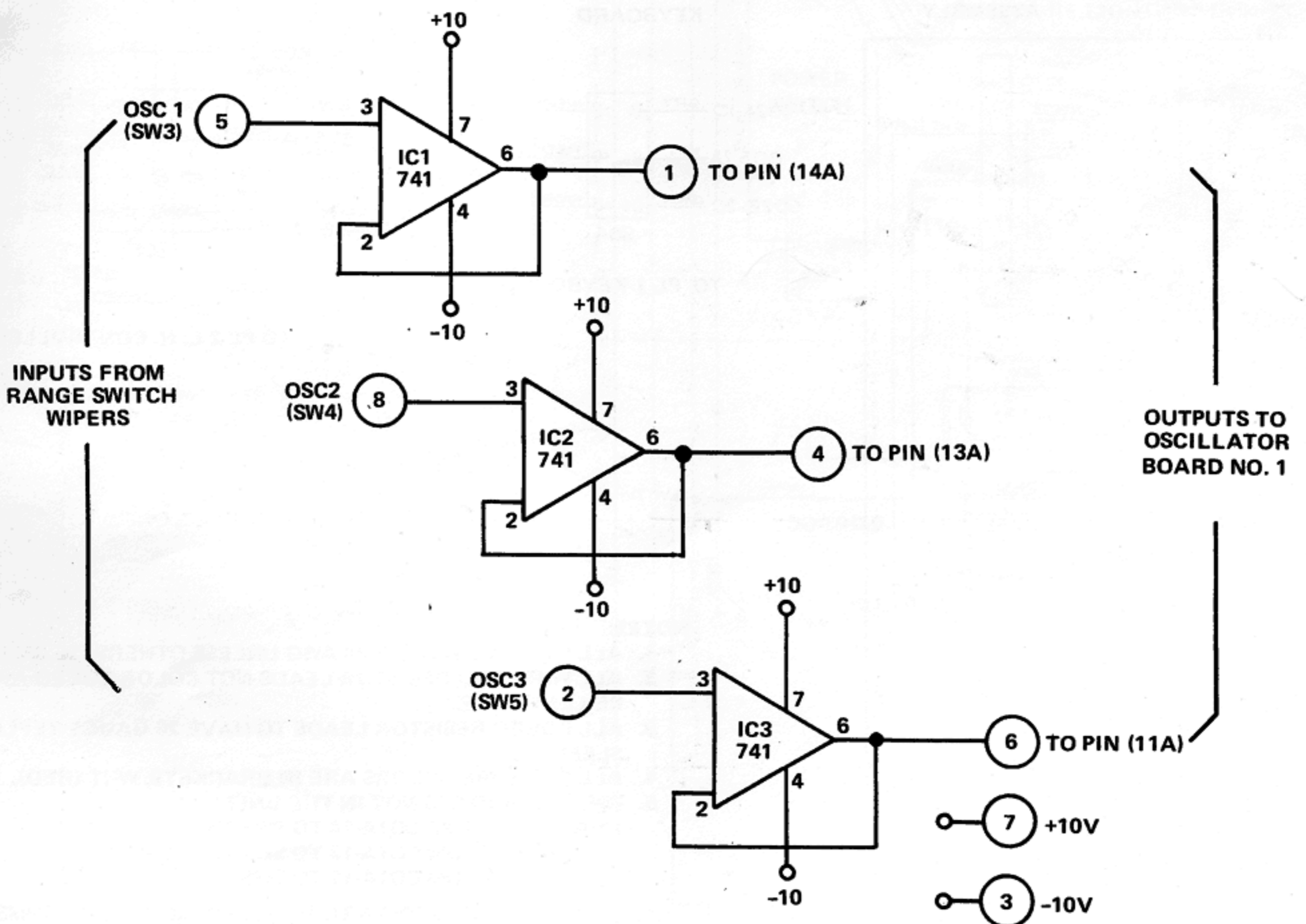
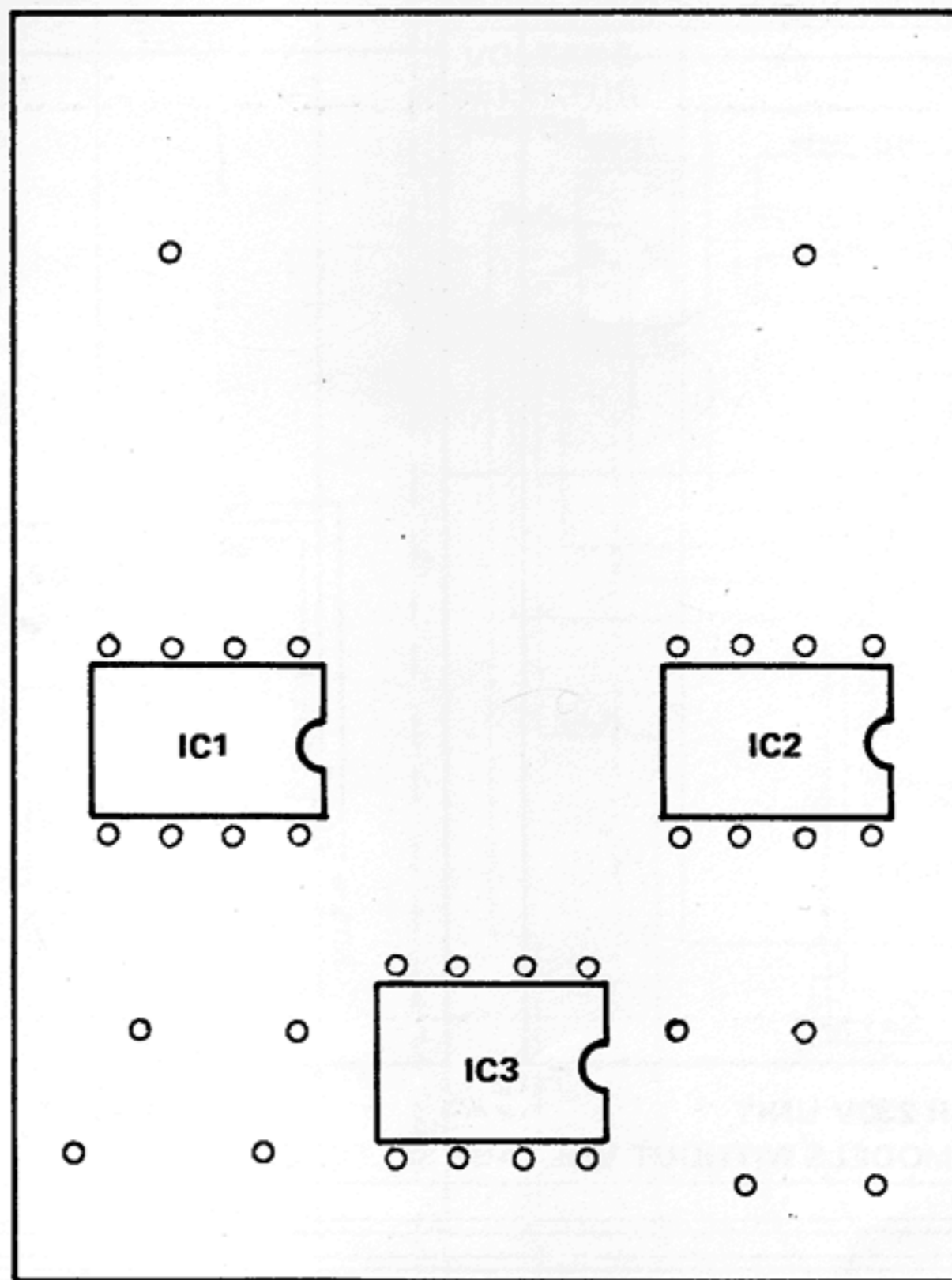
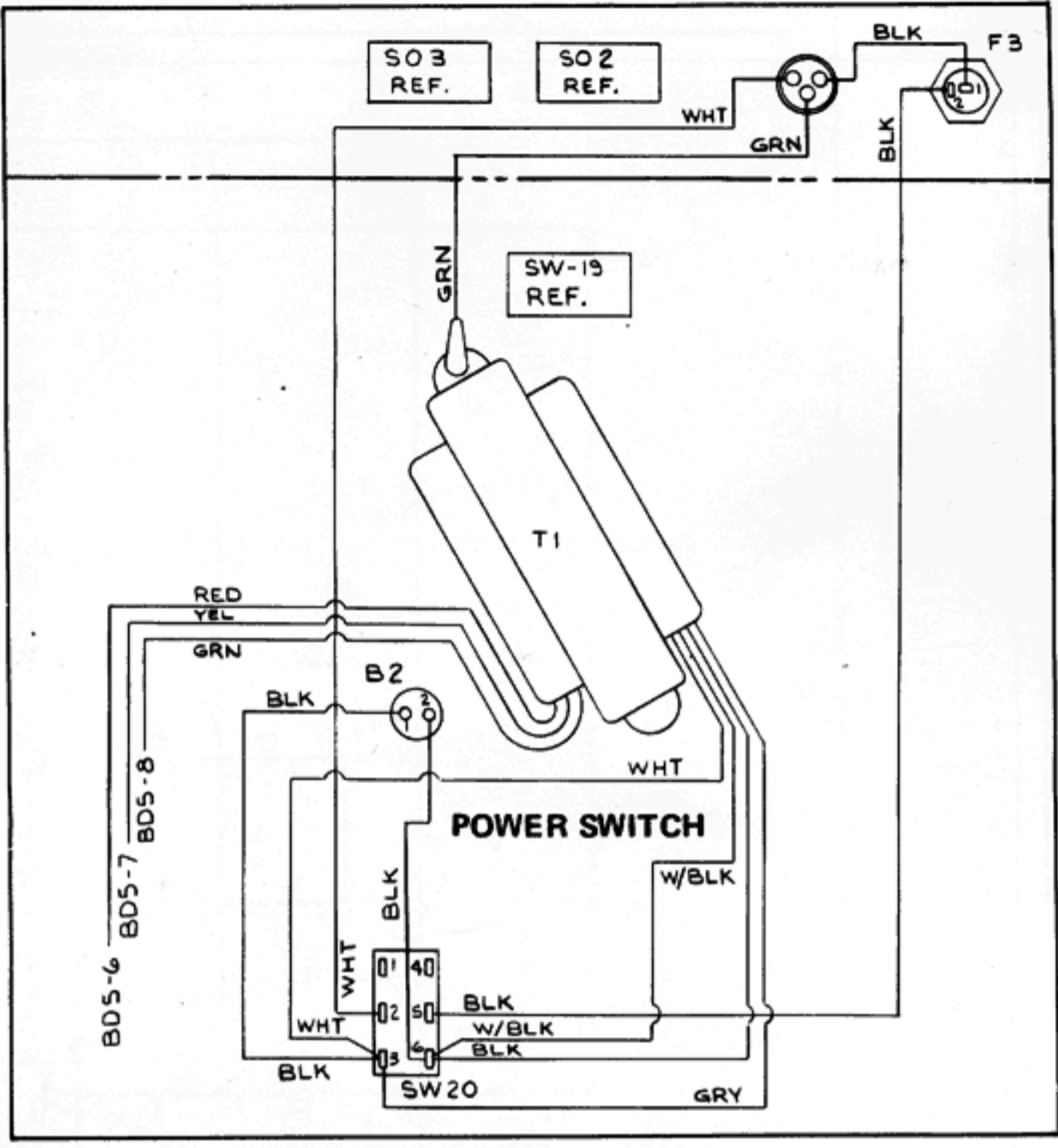
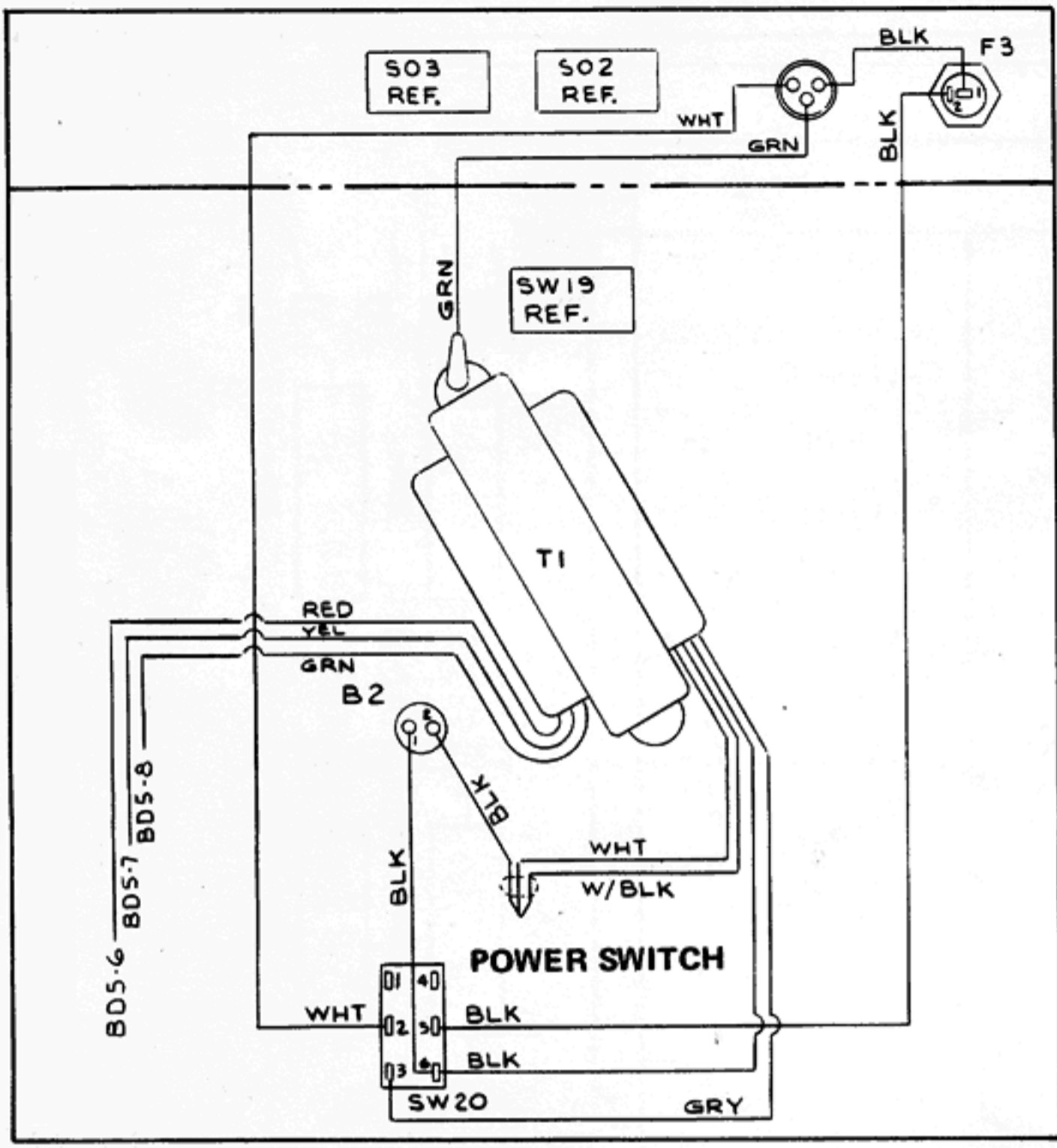
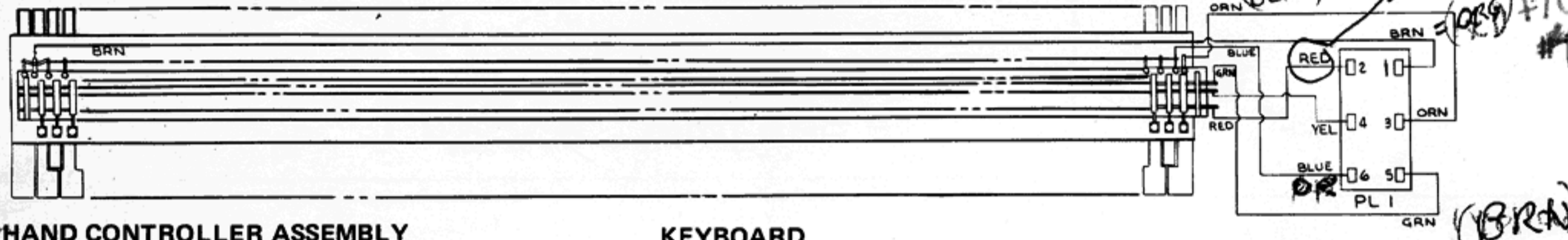


FIGURE 9-14 OCTAVE BUFFER BOARD NO. 6 SCHEMATIC DIAGRAM AND BOARD ASSEMBLY



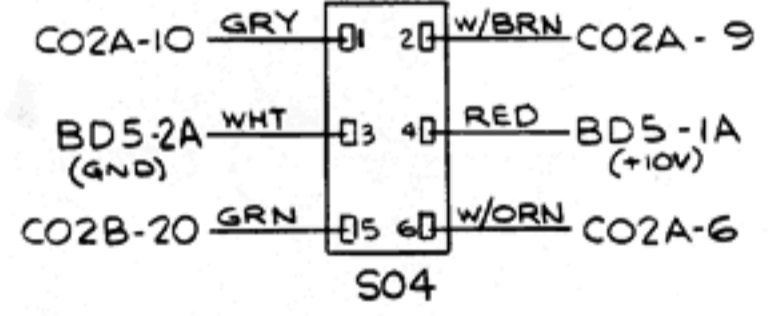
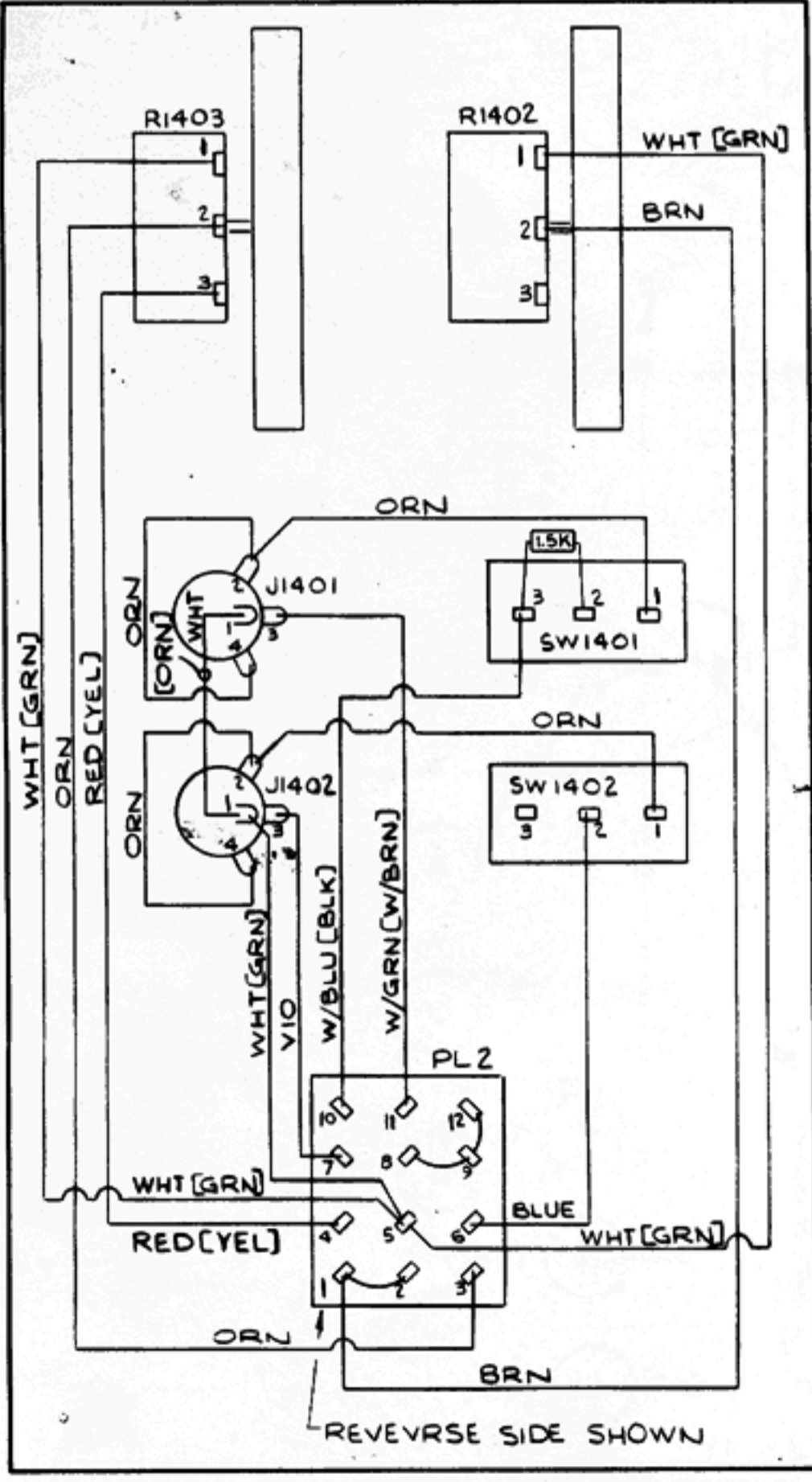
TRANSFORMER WIRING FOR 230V UNIT
FOR OLDER MODELS WITHOUT VOLTAGE SELECTOR SWITCH.

TRANSFORMER WIRING FOR 115V UNIT
FOR OLDER MODELS WITHOUT VOLTAGE SELECTOR SWITCH.

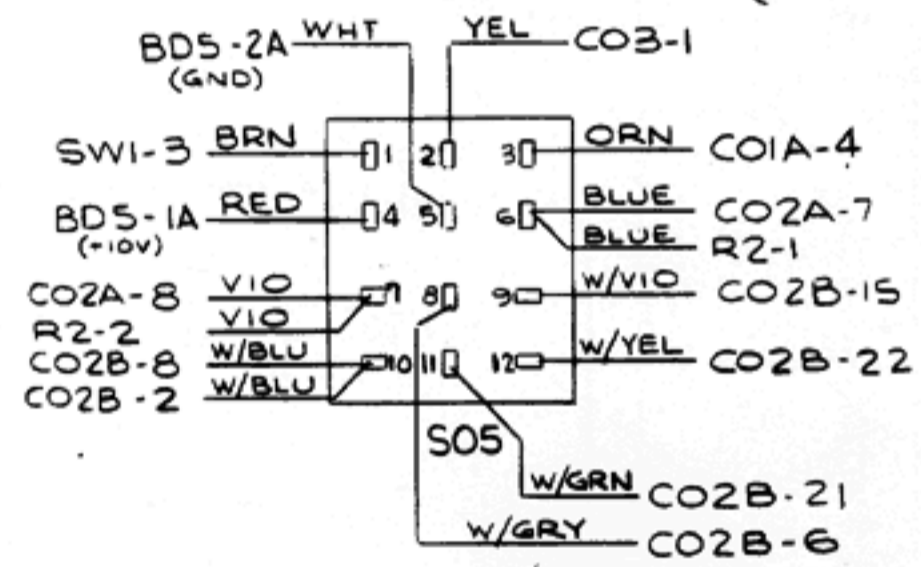


LEFT-HAND CONTROLLER ASSEMBLY

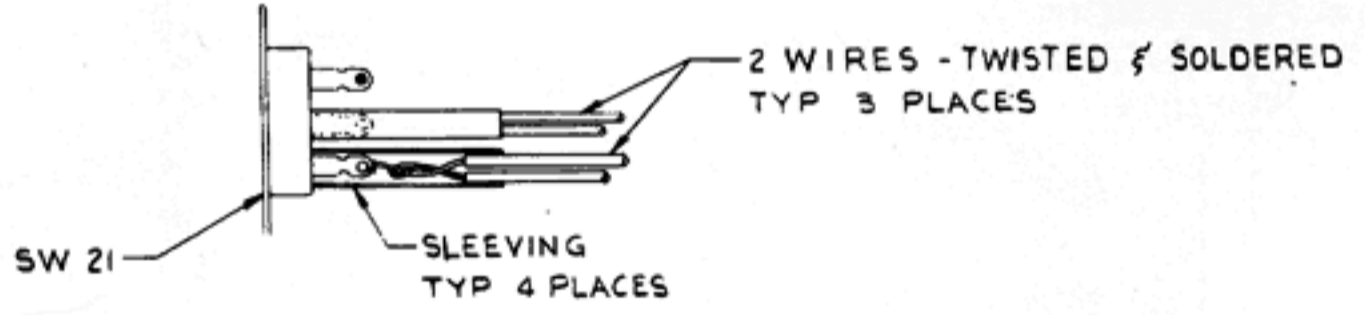
KEYBOARD



TO PL 1 KEYBOARD



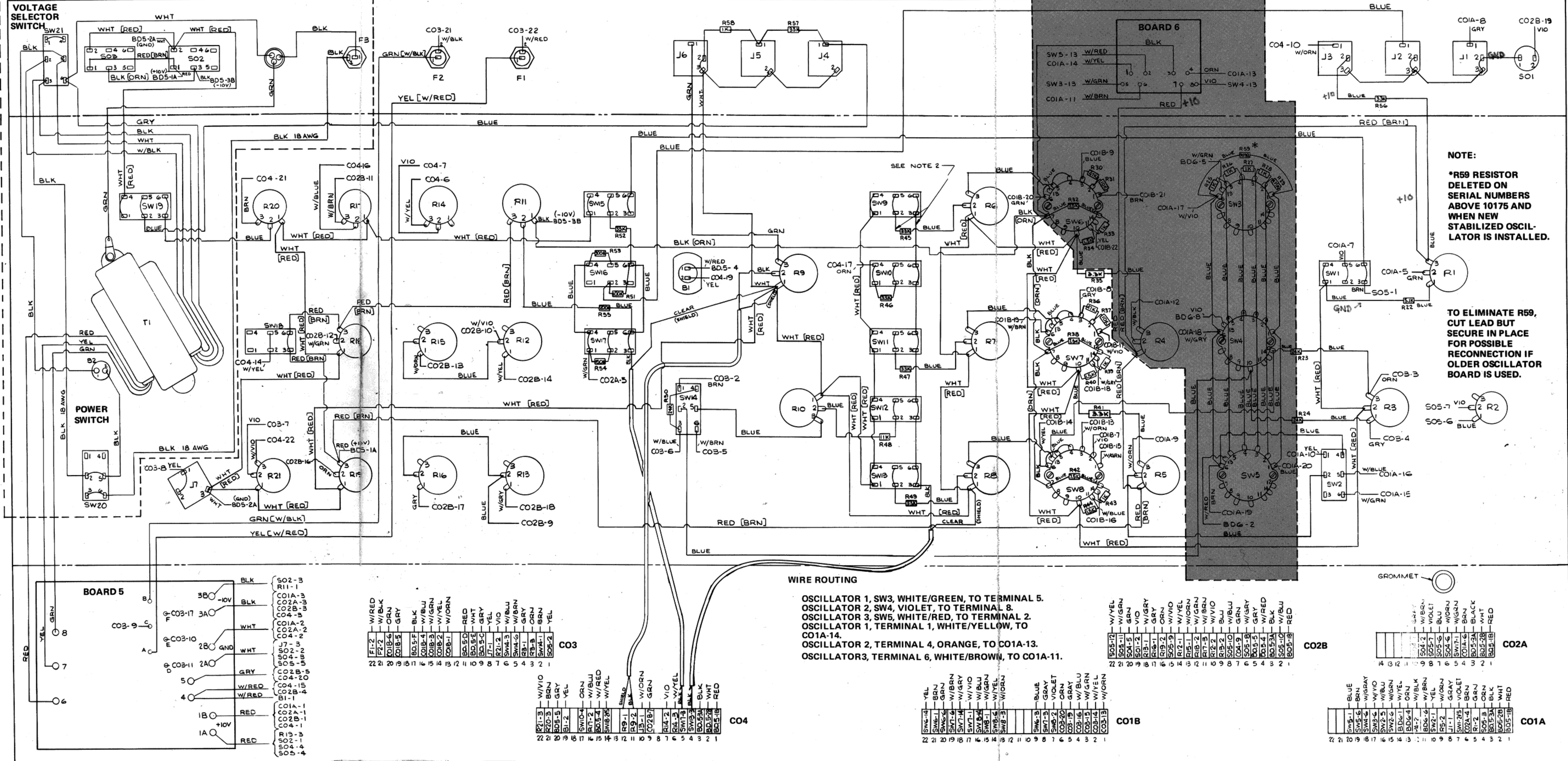
TO PL 2 L. H. CONTROLLER



- 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

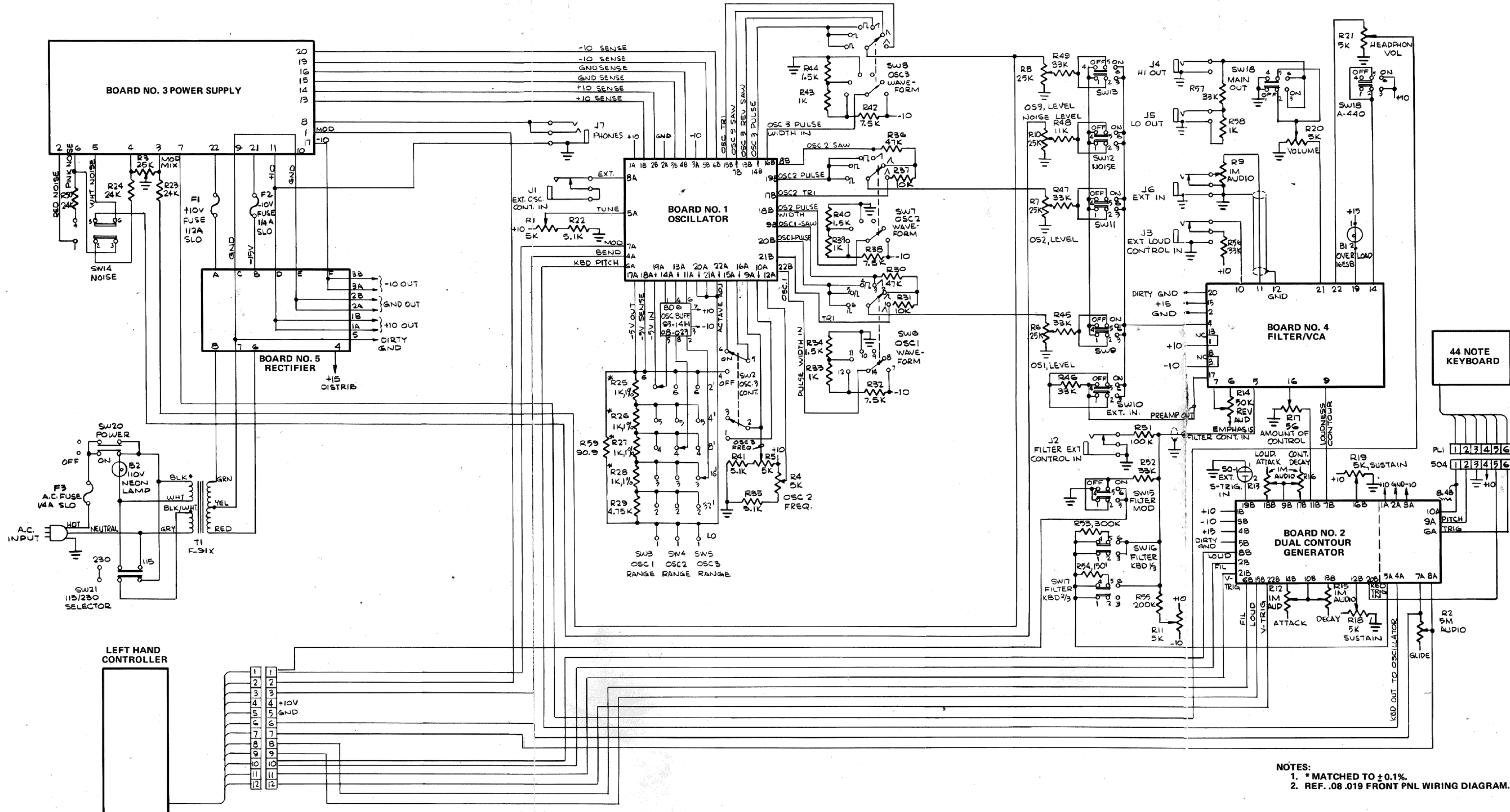
FRONT PANEL ASSEMBLY



NOTE:
*R59 RESISTOR DELETED ON SERIAL NUMBERS ABOVE 10175 AND WHEN NEW STABILIZED OSCILLATOR IS INSTALLED.

TO ELIMINATE R59, CUT LEAD BUT SECURE IN PLACE FOR POSSIBLE RECONNECTION IF OLDER OSCILLATOR BOARD IS USED.

FIGURE 9-16 FRONT PANEL ASSEMBLY WIRING DIAGRAM



NOTES:
 1. * MATCHED TO ±0.1%.
 2. REF. .08 .019 FRONT PNL 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 3.93	2	964-041418-008	White Key, F.	4
915-041917-001	Knob, Pointer 1.14	6	964-041418-009	White Key, G.	4
915-041916-001	Knob, Small 1.06	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, ± 5%, 1/2W	4
R23,R24,R50 R25,R26,R27, R28	852-512243-001	Resistor, 24K Ohm, ± 5%, 1/2W	3
R29	949-041130-001	Resistor, 1K Ohm, MATCHED SET, 4 Pieces	1
R30,R36	853-424751-031	Resistor, 4.75K Ohm, ± 1%, 1/4W	1
R31,R37	852-512473-001	Resistor, 47K Ohm, ± 5%, 1/2W	2
R32,R38,R42	852-512103-001	Resistor, 10K Ohm, ± 5%, 1/2W	2
R33,R39,R43	852-512752-001	Resistor, 7.5K Ohm, ± 5%, 1/2W	3
R40,R44	852-512102-001	Resistor, 1K Ohm, ± 5%, 1/2W	3
R45,R46,R47, R49,R52	852-512152-001	Resistor, 1.5K Ohm, ± 5%, 1/2W	2
R48	852-512333-001	Resistor, 33K Ohm, ± 5%, 1/2W	5
R51	852-512113-001	Resistor, 11K Ohm, ± 5%, 1/2W	1
R53	852-512104-001	Resistor, 100K Ohm, ± 5%, 1/2W	1
R54	852-512304-001	Resistor, 300K Ohm, ± 5%, 1/2W	1
R55	852-512154-001	Resistor, 150K Ohm, ± 5%, 1/2W	1
	852-512204-001	Resistor, 200K Ohm, ± 5%, 1/2W	1
	997-041925-001	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
		Front Panel Controls consisting of:	
B1	906-041921-001	Socket, Lamp	1
B1 Lamp	939-041922-001	Lamp.	1
B2	935-041919-001	Light Assembly, Pilot	1
J7	910-041306-004	Jack, Phone, 2 Circuit, Non-Shorting	1
J1401, J1402	910-041632-001	Jack, Phone, 0.206 Dia., 3 Conductor, Shorting.	2
R1, R4, R5, R11	925-040294-004	Resistor, Rotary Pot, <u>Linear</u> , 5K Ohm	4
R2	925-040293-001	Resistor, Rotary Pot, No. 1 Taper, 5 Megohm	1
R3, R6, R7, R8, R10, R1403	925-040294-001	Resistor, Rotary Pot, Linear, 25K Ohm	6
R9, R12, R13, 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

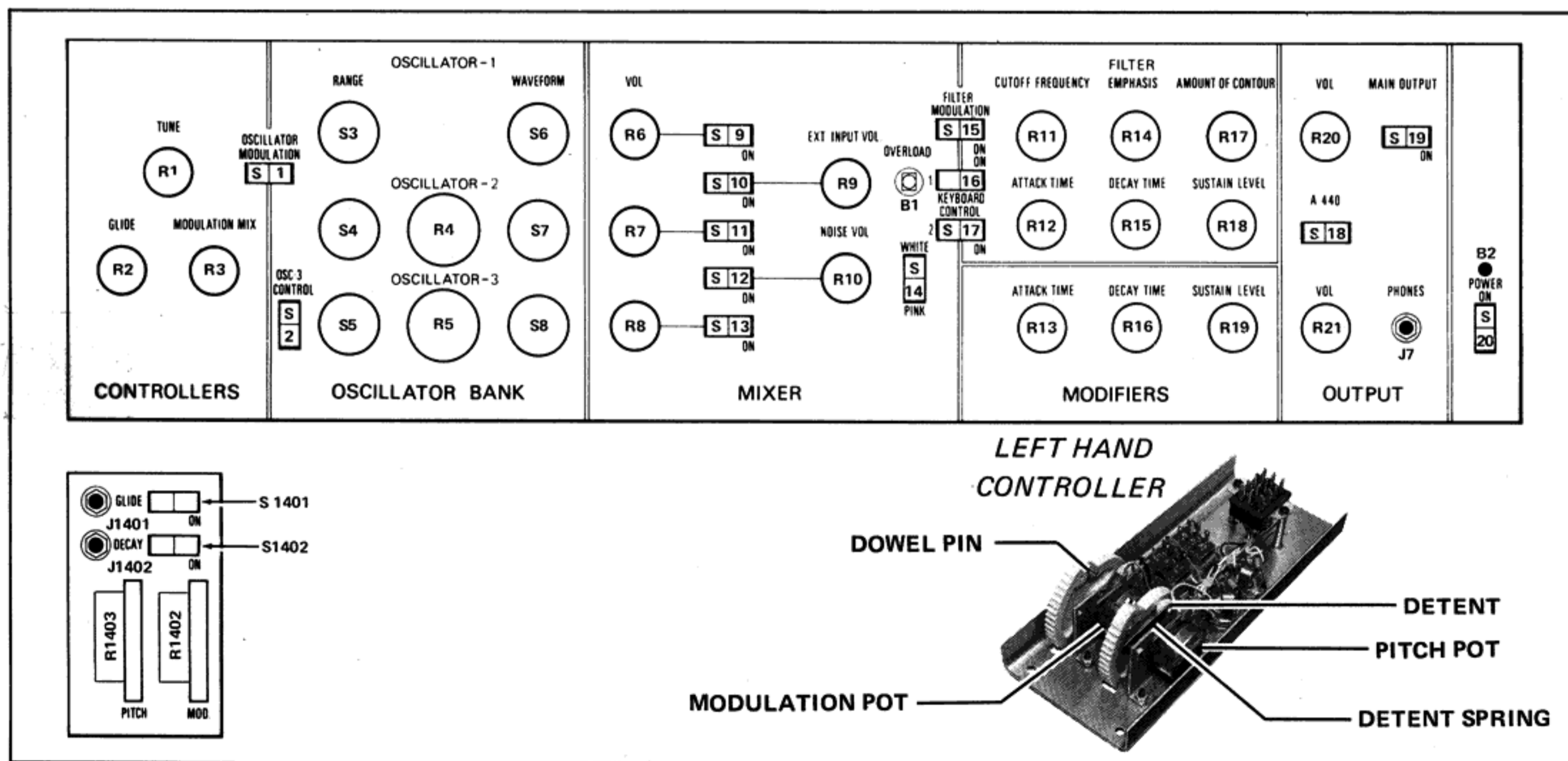


FIGURE 7-1 FRONT PANEL CONTROL DIAGRAM

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
	996-041928-002	Printed Circuit Board Assembly consisting of:	
C1,C2,C37	946-040231-005	Capacitor, Tantalum, 5.6uf, ± 10%, 35V	3
C3	946-040231-006	Capacitor, Tantalum, 27uf, ± 10%, 20V	1
C4,C9,C15, C20,C26,C31	947-042020-101	Capacitor, Ceramic Disc, 100Pf, ± 10%, 50V	6
C5,C10,C11, C14,C16,C21, C22,C25,C27, C32,C33,C36	947-040200-103	Capacitor, Ceramic Disc, 0.01uf, ± 10%, 50V	12
C6,C17,C28	946-040231-001	Capacitor, Tantalum, 1.5uf, ± 10%, 20V	3
C7,C18,C29	946-041508-102	Capacitor, Polycarbonate, 0.001uf, ± 10%, 50V	3
C8,C19,C30	946-041978-102	Capacitor, Polyester, 0.001uf, ± 10%, 50V	3
C12,C23,C34	947-042020-180	Capacitor, Ceramic Disc, 18Pf, ± 10%, 50V	3
C13,C24,C35	947-042020-501	Capacitor, Ceramic Disc, 500Pf, ± 10%, 50V	3
CR1 thru CR6	919-041075-001	Diode, 1N4148 or Alternate 1N914	6
IC1,IC3,IC4, IC9,IC14	991-041102-001	Integrated Circuit, Dual Operational Amplifier, MC1458CP-1	5
IC2	991-041101-001	Integrated Circuit, Operational Amplifier, 741	1
IC5,IC10,IC15	991-041082-001	Integrated Circuit, 726	3
IC6,IC7,IC11, IC12,IC16,IC17	991-042386-001	Integrated Circuit, Operational Amplifier, TL081	6
IC8,IC13,IC18	991-042388-001	Integrated Circuit, LM393	3
N1	949-042330-001	Resistor Network, Primary Summer	1
N2 thru N4	949-042331-001	Resistor Network, Secondary Summer	3
N5 thru N7	949-042332-001	Resistor Network, Oscillator	3
Q1	991-041052-001	Transistor, PNP, 2N3906	1
Q2	991-041275-001	Transistor, N Channel, FET, E101	1
Q3,Q5,Q6, Q10,Q11,Q15 thru Q20	991-041051-001	Transistor, NPN, 2N3904	11
Q4,Q9,Q14	991-041055-001	Transistor, Switching, FET, E112	3
R3	853-421244-031	Resistor, 1.24 Megohm, ± 1%, 1/4W	1
R7	852-312223-001	Resistor, 22K Ohm, ± 5%, 1/4W	1
R8,R11	852-312472-001	Resistor, 4.7K Ohm, ± 5%, 1/4W	2
R9,R10	853-424991-031	Resistor, 4.99K Ohm, ± 1%, 1/4W	2
R14,R16,R31, R52,R55,R71, R90,R91,R109	925-042389-002	Resistor, Trim Pot, 10K	9
R18,R57,R92	925-042390-001	Resistor, Trim Pot, 5K	3
R22,R62,R100	852-312153-001	Resistor, 15K Ohm, ± 5%, 1/4W	3
R23,R63,R101	853-422321-031	Resistor, 2.32K Ohm, ± 1%, 1/4W	3
R24,R64,R102	853-421000-031	Resistor, 100 Ohm, ± 1%, 1/4W	3
R25,R26,R42, R65,R66,R82, R103,R104, R120	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	852-312272-001	Resistor, 2.7K Ohm, $\pm 5\%$, 1/4W	3
R123	852-312331-001	Resistor, 330 Ohm, $\pm 5\%$, 1/4W	1
R124	852-312222-001	Resistor, 2.2K Ohm, $\pm 5\%$, 1/4W	1
R128	852-312394-001	Resistor, 390K Ohm, $\pm 5\%$, 1/4W	1
R129	852-312683-001	Resistor, 68K Ohm, $\pm 5\%$, 1/4W	1
R130	852-312333-001	Resistor, 33K Ohm, $\pm 5\%$, 1/4W	1
R133	852-312752-001	Resistor, 7.5K Ohm, $\pm 5\%$, 1/4W	1
R134	852-312183-001	Resistor, 18K Ohm, $\pm 5\%$, 1/4W	1
R135 thru R137	852-312224-001	Resistor, 220K Ohm, $\pm 5\%$, 1/4W	3
	906-040377-001	Socket, Integrated Circuit, 10 Pin, TO-5	3
Selected for oscillator tuning. Value may also be 75K or 100K $\pm 1\%$, 1/4W, Metal Film.			

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
	996-041928-001	Printed Circuit Board Assembly consisting of:	
C1,C6,C8	946-042021-103	Capacitor, 0.01uf, Polystyrene, ± 2%, 35V	3
C2 thru C5, C7,C9	947-042020-101	Capacitor, Ceramic Disc, 100Pf, ± 10%, 50V	6
C10	945-040209-005	Capacitor, Electrolytic, 2.2uf, +75/-10%, 50V	1
C11,C12	946-040231-005	Capacitor, Tantalum, 5.6uf, ± 10%, 35V	2
C13	946-040231-006	Capacitor, Tantalum, 27uf, ± 10%, 35V	1
C14	946-040190-124	Capacitor, Polyester, 0.12uf, ± 10%, 50V	1
IC1,IC3 thru IC6,IC8 thru IC10	991-041101-001	Integrated Circuit, 741 <i>cleaner model</i>	8
IC2,IC7	991-041104-001	Integrated Circuit, 3046	2
Q1 thru Q4,Q12 thru Q15,Q22, Q24 thru Q27, Q30,Q36 thru Q38	991-042017-001	Transistor, 2N3392	17
Q5,Q6,Q16, Q17,Q28,Q29	991-041052-001	Transistor, 2N3906	6
Q7,Q18,Q31 Q8,Q9,Q11, Q19,Q20,Q23, Q32,Q33,Q35	991-041054-001	Transistor, E402	3
Q10,Q21,Q34	991-041060-001	Transistor, 2N4058	9
R1,R40,R53, R98,R111,R152	991-041063-001	Transistor, 2N4402	3
R2,R112,R153	852-512433-001	Resistor, 43K Ohm, ± 5%, 1/2W	6
R3,R24,R30, R55,R75,R83, R113,R132, R139	852-512914-001	Resistor, 910K Ohm, ± 5%, 1/2W	3
R4,R16,R56, R67,R114,R124	853-421072-031	Resistor, 10.7K Ohm, ± 1%, 1/4W	9
R5,R46,R57, R103,R115, R159	853-423322-031	Resistor, 33.2K Ohm, ± 1%, 1/4W	6
R6,R58,R116	852-512562-001	Resistor, 5.6K Ohm, ± 5%, 1/2W	6
R7,R18,R47, R104,R154, R160	852-512560-001	Resistor, 56 Ohm, ± 5%, 1/2W	3
R8,R60,R107	852-512101-001	Resistor, 100 Ohm, ± 5%, 1/2W	6
R9,R51,R100, R156,R171	925-040279-003	Resistor, Trim Pot, 100 Ohm	3
	852-512330-001	Resistor, 33 Ohm, ± 5%, 1/2W.	5

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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, R121,R166	853-421503-031	Resistor, 150K Ohm, $\pm 1\%$, 1/4W.	3
R14,R65,R122	852-512622-001	Resistor, 6.2K Ohm, $\pm 5\%$, 1/2W	4
R15,R66, R123,R165	852-512154-001	Resistor, 150K Ohm, $\pm 5\%$, 1/2W.	3
R17,R31,R68, R84,R125,R140	852-512222-001	Resistor, 2.2K Ohm, $\pm 5\%$, 1/2W	4
R20,R71,R119	852-512103-001	Resistor, 10K Ohm, $\pm 5\%$, 1/2W	6
R21,R88,R120	924-040183-001	Resistor, 1K Ohm, $\pm 3\%$, 1W, Temperature Compensating	3
R22,R33,R73, R89,R130,R145, R167	852-512564-001	Resistor, 560K Ohm, $\pm 5\%$, 1/2W.	3
R23,R74,R131	852-512472-001	Resistor, 4.7K Ohm, $\pm 5\%$, 1/2W	7
R25,R76,R133, R170	852-512822-001	Resistor, 8.2K Ohm, $\pm 5\%$, 1/2W	3
R27,R80,R129	853-421502-031	Resistor, 15K Ohm, $\pm 1\%$, 1/4W	4
R28,R81,R137	949-041121-001	Resistor, 51.1K Ohm, $\pm 1\%$, 1/4W (MATCHED SET of 3)	1
R29,R82,R138, R173,R177	852-512751-001	Resistor, 750 Ohm, $\pm 5\%$, 1/2W	3
R32,R38,R63, R72,R136	853-421002-031	Resistor, 10K Ohm, $\pm 1\%$, 1/4W	5
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, R157,R182	949-041122-001	Resistor, 15K Ohm, $\pm 1\%$, 1/4W, (MATCHED SET of 3)	1
R45,R102,R158	852-512394-001	Resistor, 390K Ohm, $\pm 5\%$, 1/2W.	4
R48,R85,R126	852-512122-001	Resistor, 1.2K Ohm, $\pm 5\%$, 1/2W	3
R50,R59,R149	852-512123-001	Resistor, 12K Ohm, $\pm 5\%$, 1/2W	3
	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:	
C2,C5	946-041978-103	Capacitor, Polyester, 0.01uf, $\pm 10\%$, 50V	3
C3,C7	945-040209-008	Capacitor, Electrolytic, 10uf, +50/-10%, 50V	2
C6	946-041978-104	Capacitor, Polyester, 0.1uf, $\pm 10\%$, 50V	2
C8	946-040226-105	Capacitor, Polyester, 1uf, $\pm 10\%$, 63V	1
C9	947-042020-101	Capacitor, Ceramic Disc, 100Pf, $\pm 10\%$, 50V	1
C11	946-040190-334	Capacitor, Polyester, 0.33uf, $\pm 10\%$, 50V	1
C12	947-042020-470	Capacitor, Ceramic Disc, 47Pf, $\pm 10\%$, 50V	1
CR1,CR3,CR6, CR8,CR10	947-042020-501	Capacitor, Ceramic Disc, 500Pf, $\pm 10\%$, 50V	1
CR2,CR4,CR5, CR7,CR9	919-041074-001	Diode, 1N34A	5
Q1 thru Q4,Q6, Q7,Q15,Q17, Q18,Q20,Q22,	919-042019-001	Diode, 1N4004	5

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
	996-041931-001	Printed Circuit Board Assembly consisting of:	
C1,C4,C8, C19,C20	945-040209-005	Capacitor, Electrolytic, 2.2uf, +75/-10%, 50V	5
C2	946-041978-333	Capacitor, Polyester, 0.033uf, ± 10%, 50V	1
C3	946-042280-124	Capacitor, Polyester, 0.12uf, ± 10%, 50V	1
C5,C6,C11,C23	947-042020-101	Capacitor, Ceramic Disc, 100Pf, ± 10%, 50V	4
C7,C18,C22	946-042280-154	Capacitor, Polyester, 0.15uf, ± 10%, 50V	3
C10,C13,C27	946-041978-104	Capacitor, Polyester, 0.1uf, ± 10%, 50V	3
C12	946-040231-005	Capacitor, Polyester, 5.6uf, ± 10%, 50V	1
C14	946-041978-223	Capacitor, Polyester, 0.022uf, ± 10%, 50V	1
C15	947-042020-221	Capacitor, Ceramic Disc, 220Pf, ± 10%, 50V	1
C21	945-040209-010	Capacitor, Electrolytic, 470uf, +50/-10%, 50V	1
C24,C26	945-040209-009	Capacitor, Electrolytic, 100uf, +50/-10%, 25V	2
C25,C28	945-040209-008	Capacitor, Electrolytic, 10uf, +50/-10%, 50V	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	3
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

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MPSA05

2N369A

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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
	996-041395-001	Printed Circuit Board Assembly consisting of:	
C1,C5	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

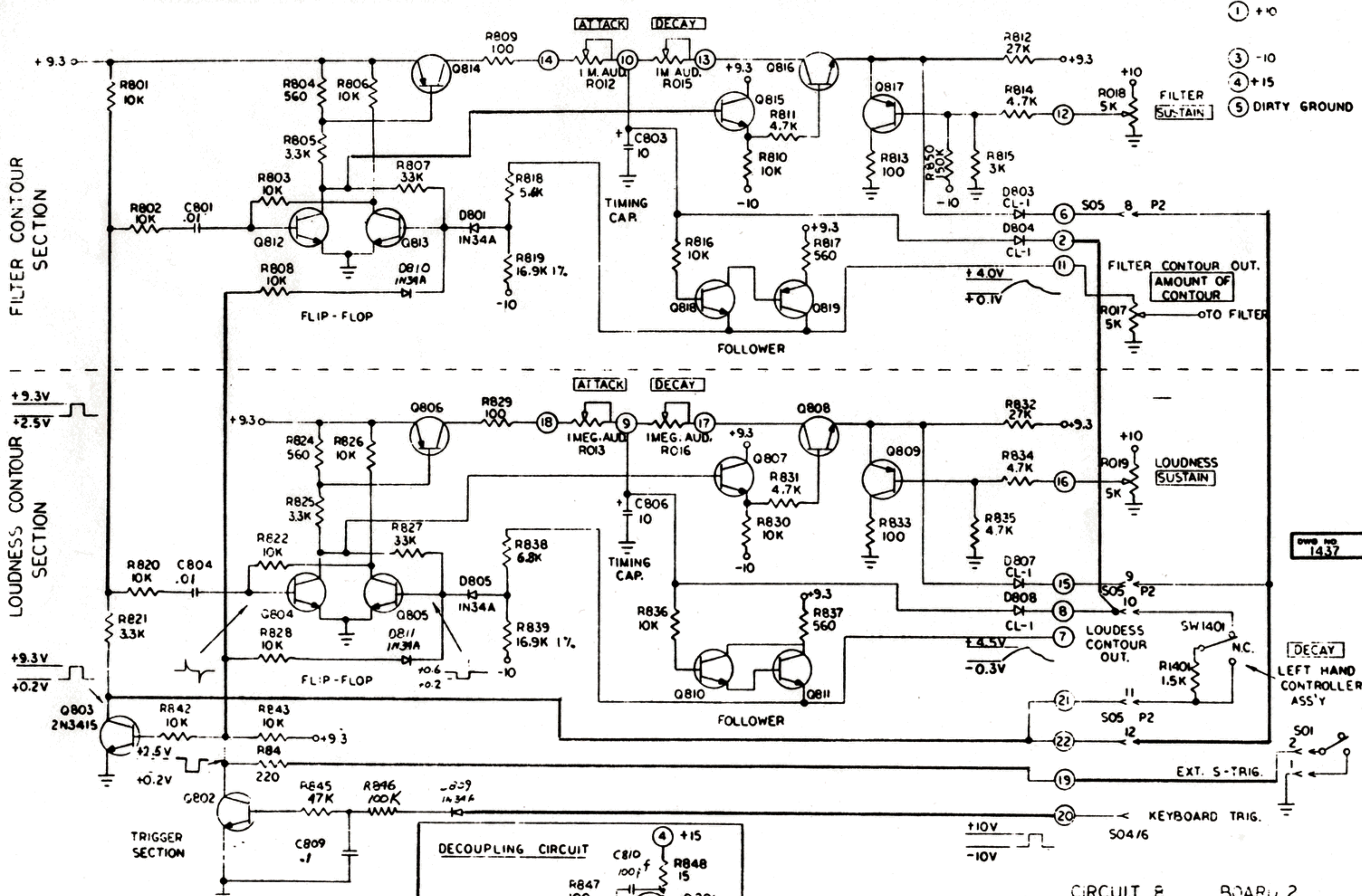
INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
C1,C2 C3 C4 CR1 thru CR4	996-041906-001	Printed Circuit Board Assembly consisting of:	
	945-040209-011	Capacitor, Electrolytic, 1000uf, +50/-10%, 35V	2
	946-040190-103	Capacitor, Polyester, 0.01uf, ± 10%, 50V	1
	945-040209-010	Capacitor, Electrolytic, 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

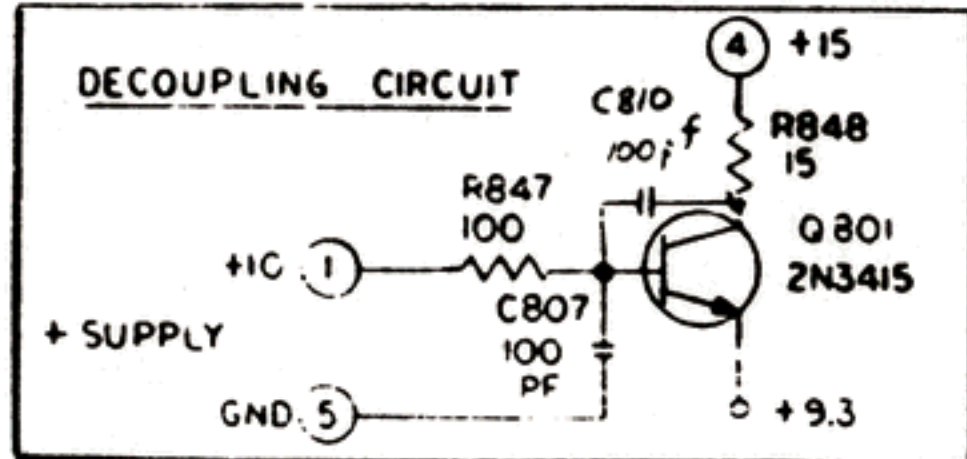
INDEX NO. OR REF DESIG	PART NUMBER	DESCRIPTION	QTY
CR1,CR2 J1,J2 PL2 R1,R3 R2 R4 R5 R6 R7 SW1,SW2	980-042902-001	Printed Circuit Board Assembly consisting of:	
	980-042901-001	Printed Circuit Board	1
	997-040585-001	Ribbon Assembly	1
	997-041597-001	Wheel Assembly	1
	919-041075-001	Diode, Signal	2
	910-041632-001	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
	852-312222-001	Resistor, 2.2K Ohm, ± 5%, 1/4W, Carbon Film, Fixed	1
	925-040294-001	Resistor, Potentiometer, Rotary, 50K Ohm	1
	852-312152-001	Resistor, 1.5K Ohm, ± 5%, 1/4W, Carbon Film, Fixed	1
	960-042638-002	Switch, Slide, SPDT	1



FILTER CONTOUR SECTION

LOUDNESS CONTOUR SECTION

TRIGGER SECTION



ALL PNP TRANSISTORS : TIS93
 ALL UNMARKED NPN : 2N3392
 ALL RESISTORS IN OHMS
 5% CARBON UNLESS OTHERWISE MARKED

ALL CAPACITORS IN μ F
 UNLESS OTHERWISE MARKED

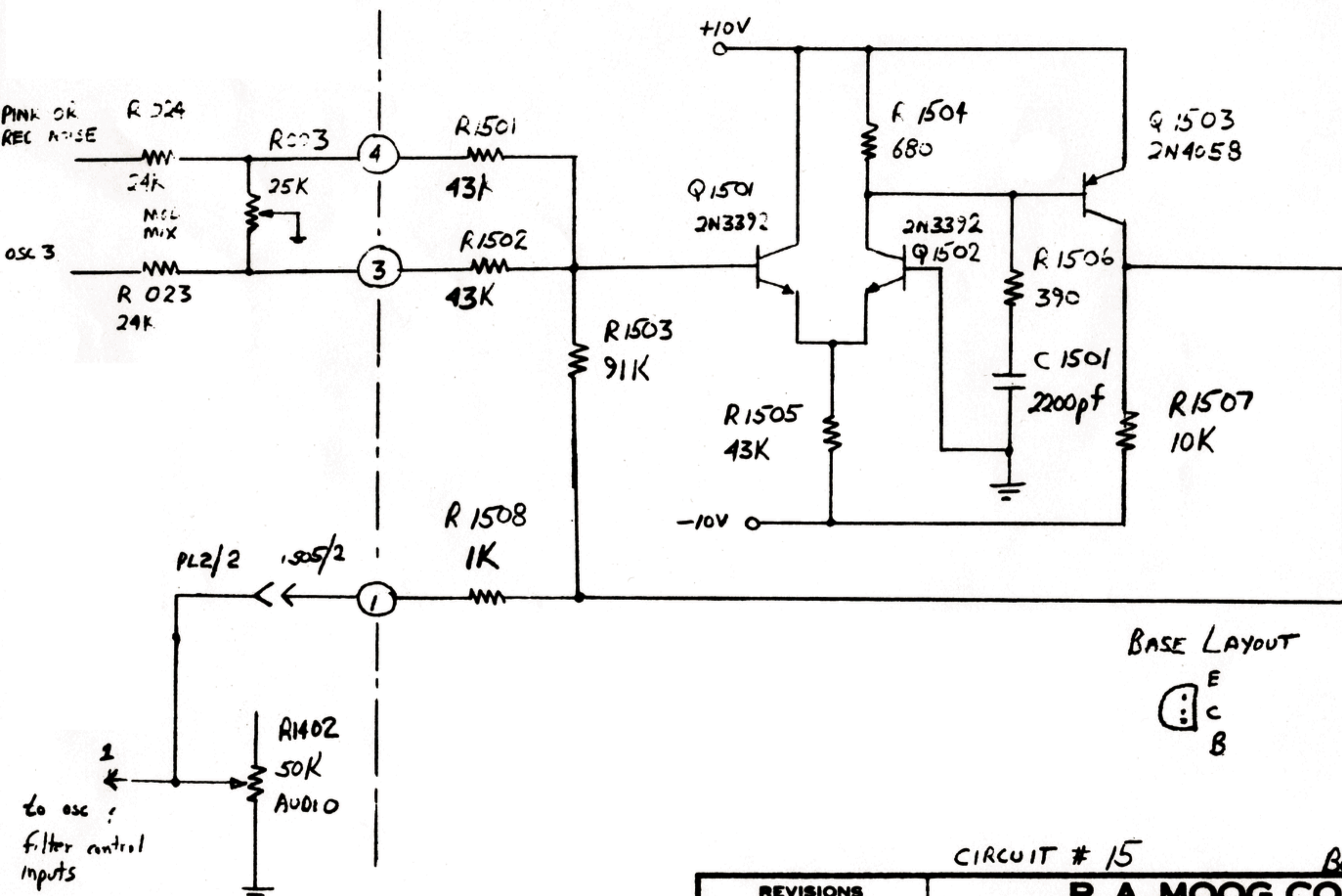


CIRCUIT 8 BOARD 2

OLD DRAWING 1437R-A FILED OBSOLETE. THIS DRAWING WAS USED FOR ALL PCB'S 91-114A. SERIAL NO. 1001 THRU 1059.

REVISIONS		R. A. MOOG CO. TRUMANSBURG, NEW YORK	
REV. A	1-26-71	TITLE	MINI MOOGS CONTOUR GENERATOR
REV. B	3-22-71	SCALE	OR BY JA
REV. C	4-2-71	DATE	3-24-71
REV. D	4-2-71	CHK BY	1437

DRW NO. 1437



BASE LAYOUT

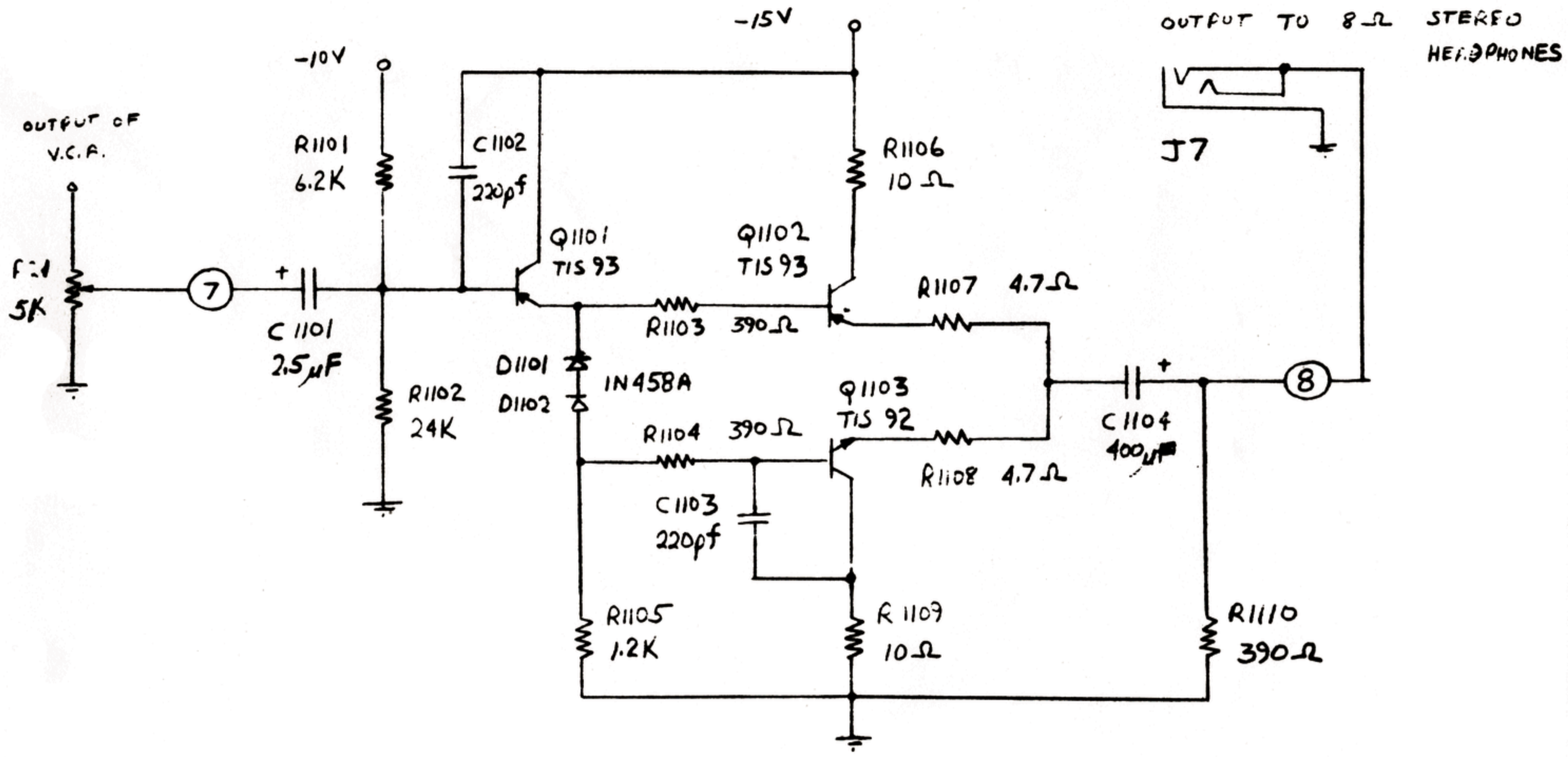


LEFT HAND
AMOUNT OF MODULATION
CONTROL

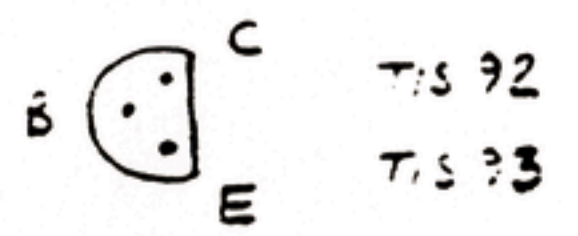
CIRCUIT # 15

BOARD # 3

REVISIONS		R. A. MOOG CO. TRUMANSBURG, NEW YORK	
		TITLE MINI D MODULATION MIX AMP	
		SCALE	DR. BY Scott
		DATE 12/31/70	CK'D. BY
		DWG. NO. 1444	



BASE LAYOUT



CIRCUIT # 11

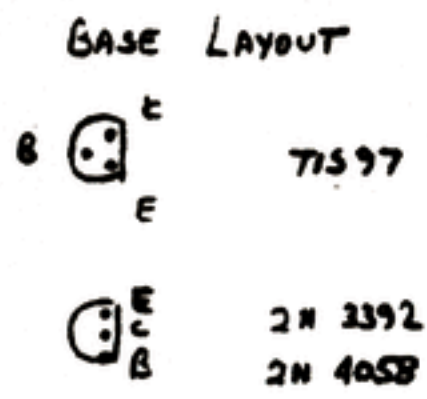
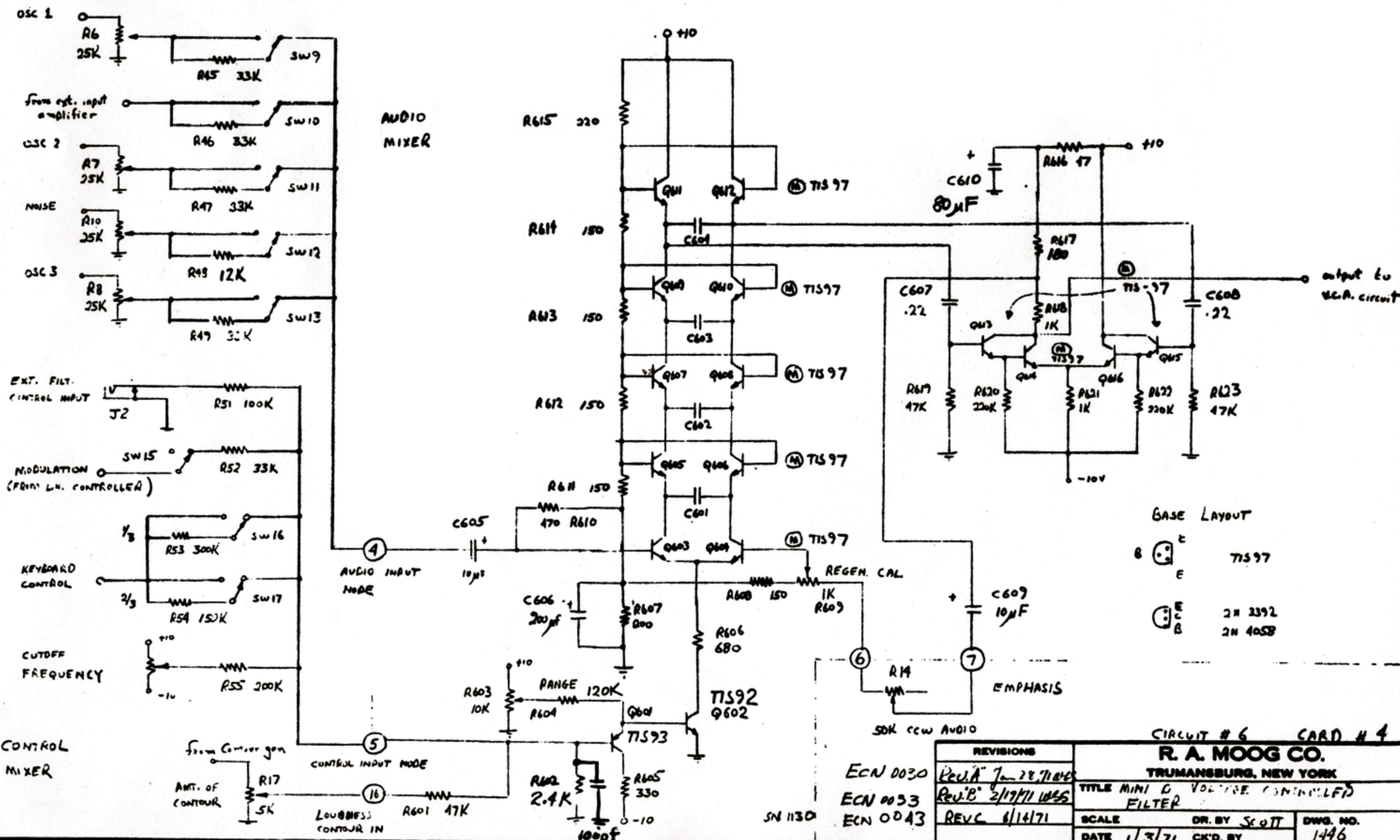
BOARD # 3

REVISIONS		R. A. MOOG CO. TRUMANSBURG, NEW YORK	
		TITLE MINI MOOG D HEADPHONE AMPLIFIER	
SCALE	DR. BY JLS	DWG. NO.	
DATE 1/5/70	CK'D. BY	1447	

INPUT SECTION, (FRONT PANEL)

FILTER

BUFFER

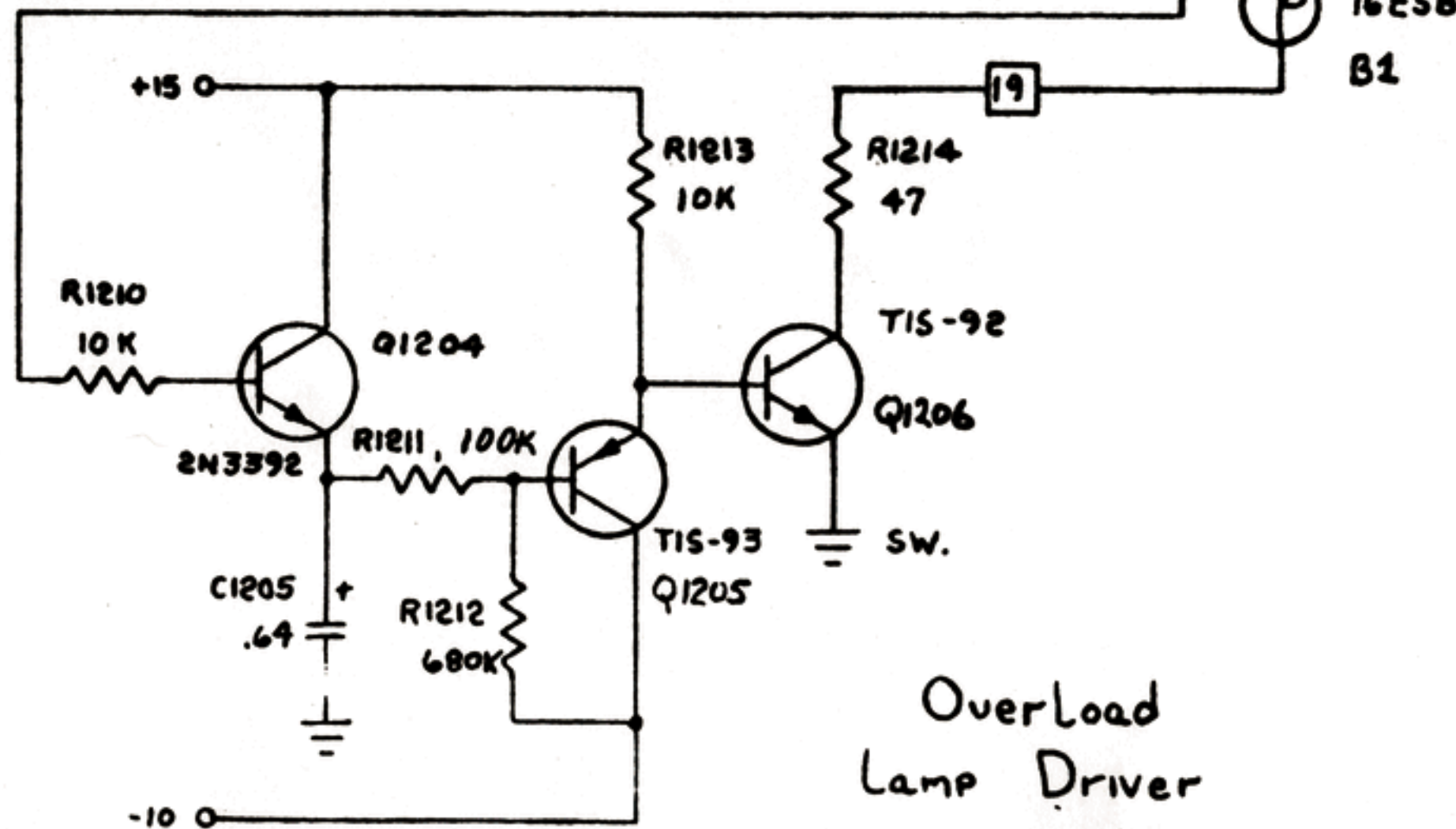
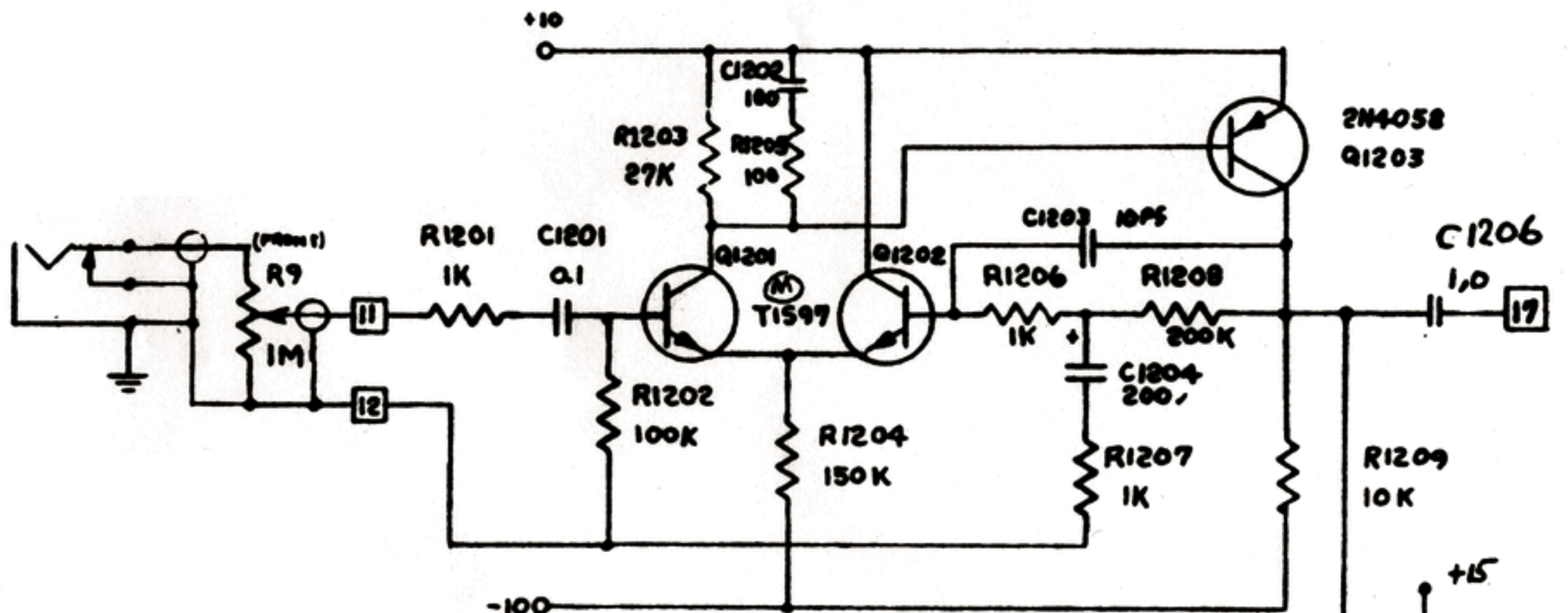


REVISIONS		R. A. MOOG CO.	
ECN 0030	Rev. A 7-28-71	TRUMANSBURG, NEW YORK	
ECN 0033	Rev. B 2/17/71	TITLE MINI-D VOLTAGE CONTROLLED FILTER	
ECN 0043	Rev. C 6/14/71	SCALE	DR. BY SCOTT
		DATE 1/3/71	CK'D. BY
			DWG. NO. 1446

SN 1130

CIRCUIT # 6 CARD # 4

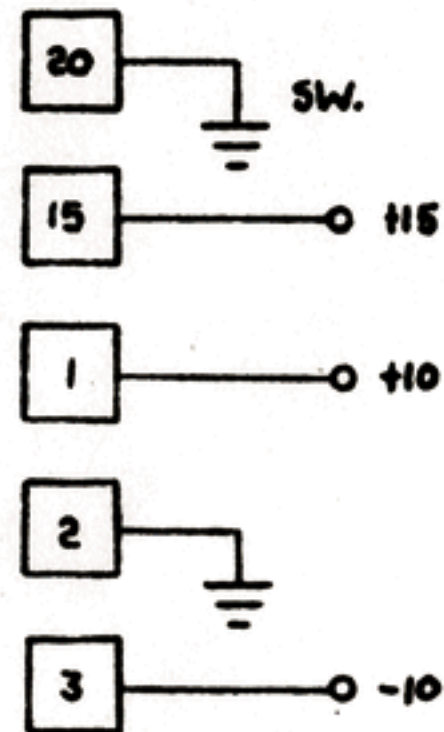
External Input Preamp



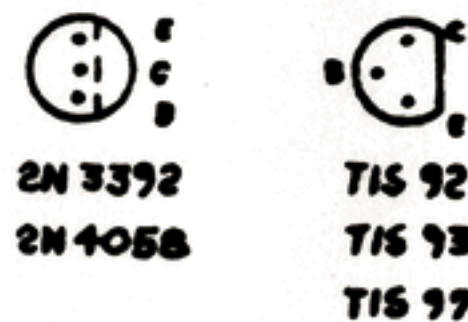
Overload Lamp Driver

NOTES:

- A) RESISTORS IN OHMS.
- B) CAPACITORS IN μF .



BASE LAYOUT



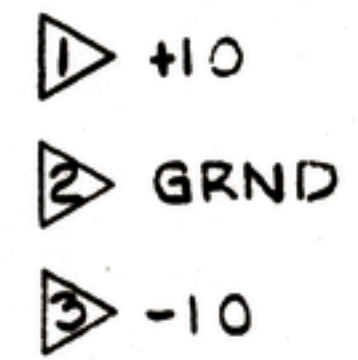
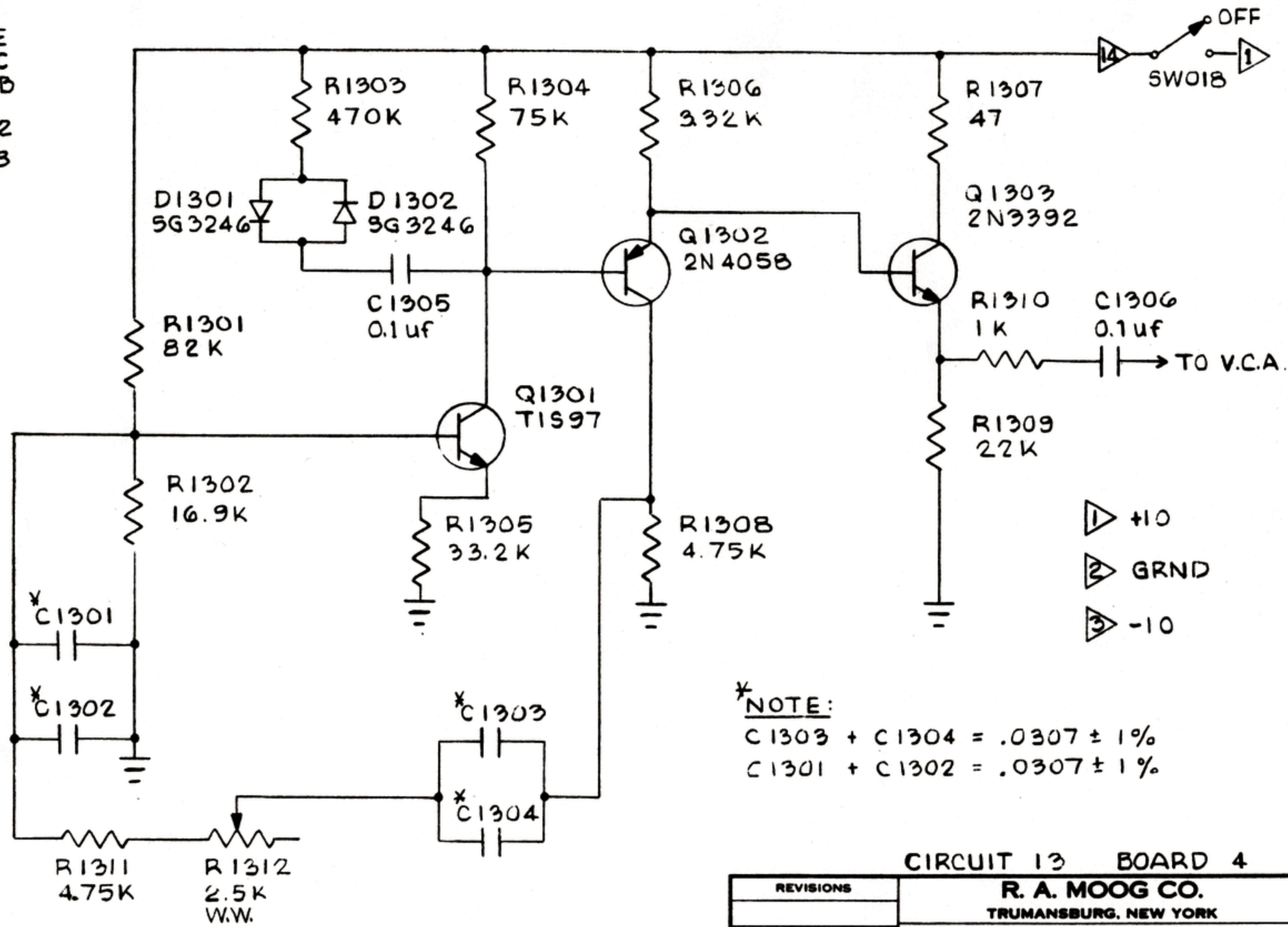
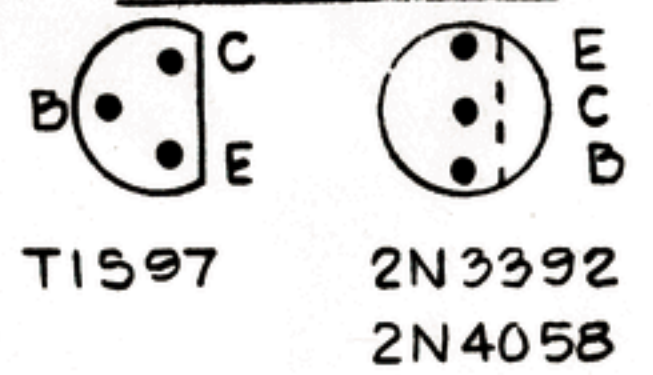
CONNECTOR COF

CIRCUIT # 12 BOARD # 4

REVISIONS		R. A. MOOG CO.	
Rev. A Feb. 1971		TRUMANSBURG, NEW YORK	
TITLE MINI SCHEMATIC		EXT. PREAMP	
SCALE —		LAMP DRIVER	
DATE 12- -70		DR. BY JLA	DWG. NO 1442
		CHKD. BY	

ECN 033

BASE LAYOUTS
BOTTOM VIEW

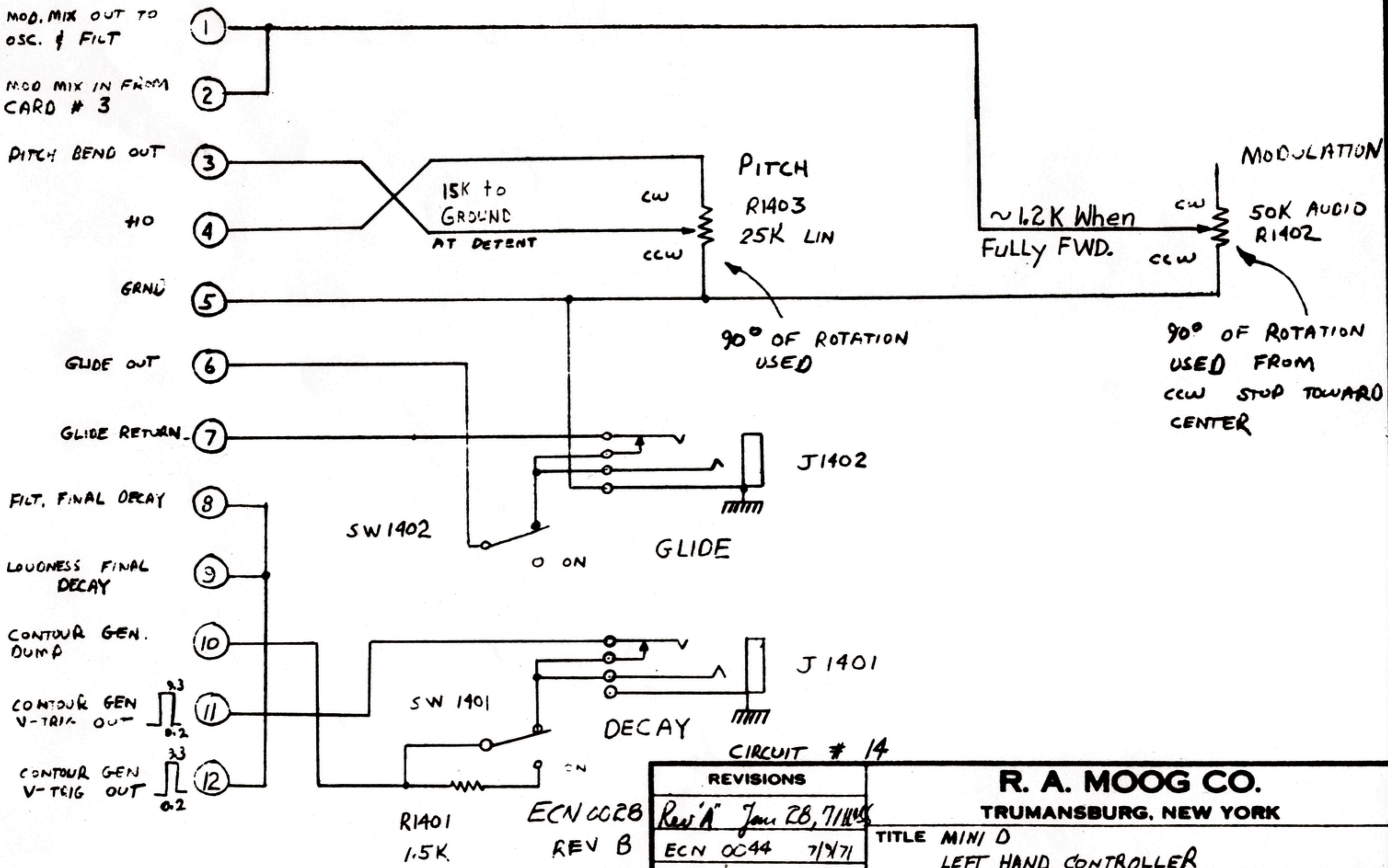


*NOTE:
C1303 + C1304 = .0307 ± 1%
C1301 + C1302 = .0307 ± 1%

CIRCUIT 13 BOARD 4

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

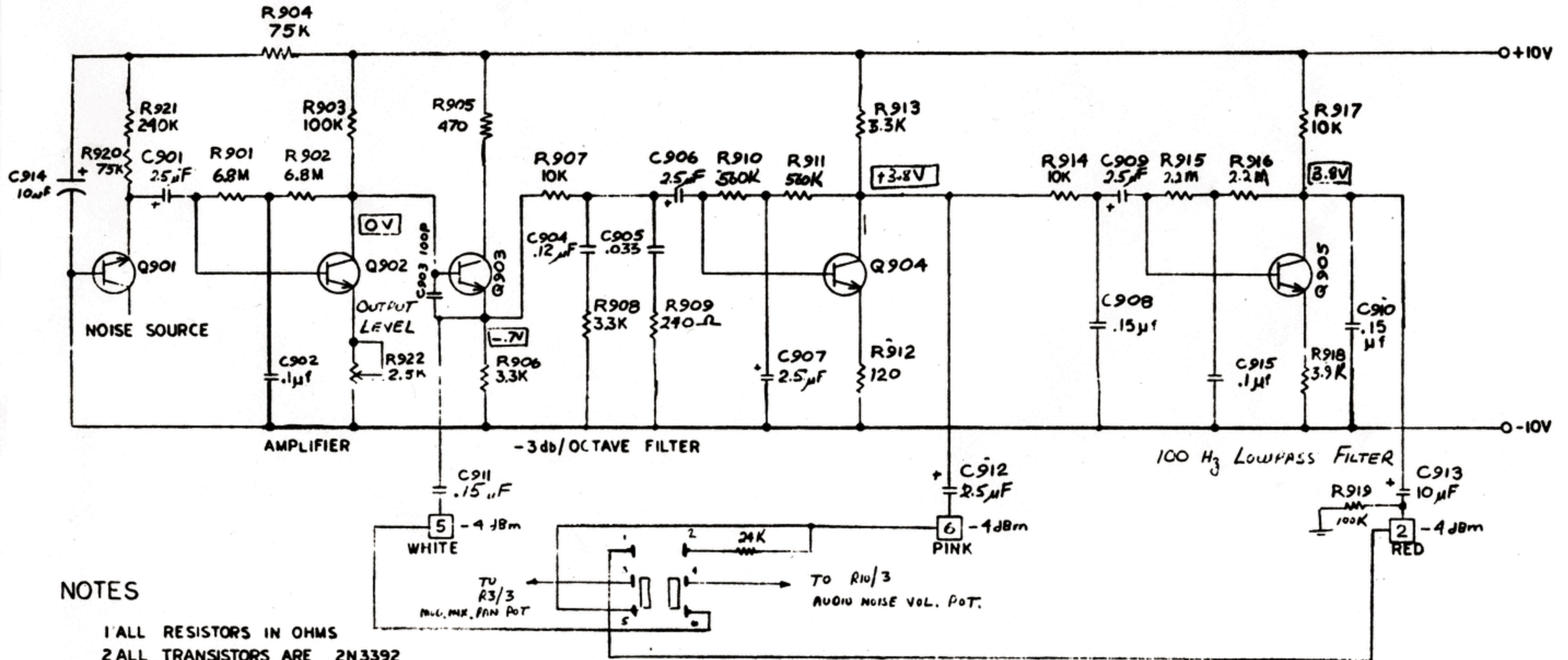
PL-2 12 PIN CINCH JONES PLUG



REVISIONS		R. A. MOOG CO.	
Rev A Jan 28, 7/11/55		TRUMANSBURG, NEW YORK	
ECN 0044 7/1/71		TITLE MINI D LEFT HAND CONTROLLER	
SCALE	DR. BY JLS	DWG. NO. 1449	
DATE	CK'D. BY		

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

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



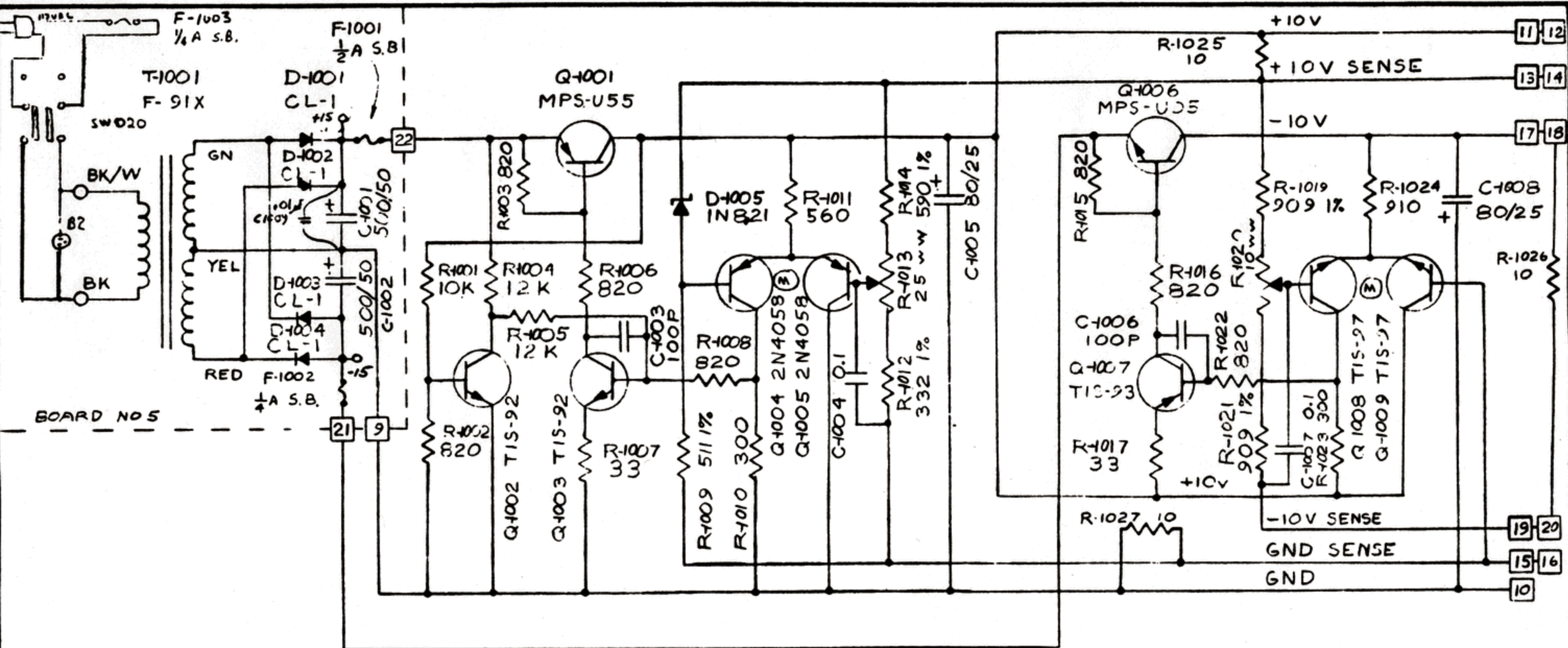
NOTES

- 1 ALL RESISTORS IN OHMS
- 2 ALL TRANSISTORS ARE 2N3392 (Q901 IS SELECTED)



91-115 BOARD # 3 CONNECTOR 3

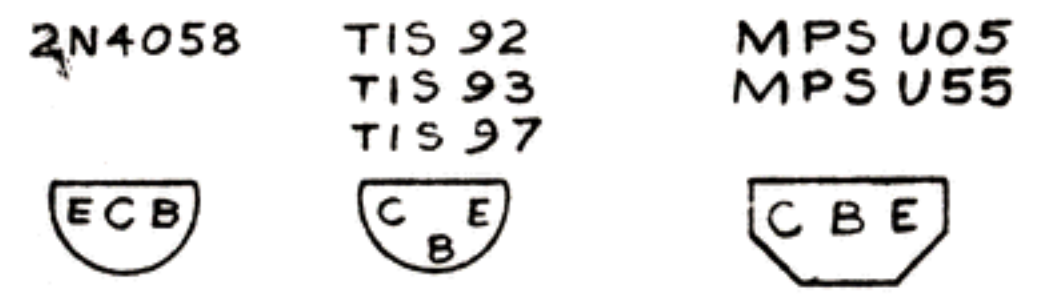
REVISIONS	R. A. MOOG CO. TRUMANSBURG, NEW YORK	
	TITLE RANDOM SIGNAL GENERATOR (FOR THE MINI SYN.)	
	SCALE ——— DR. BY JA	DWG. NO.
	DATE 11/3/70 CK'D. BY	1431



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 " " " "

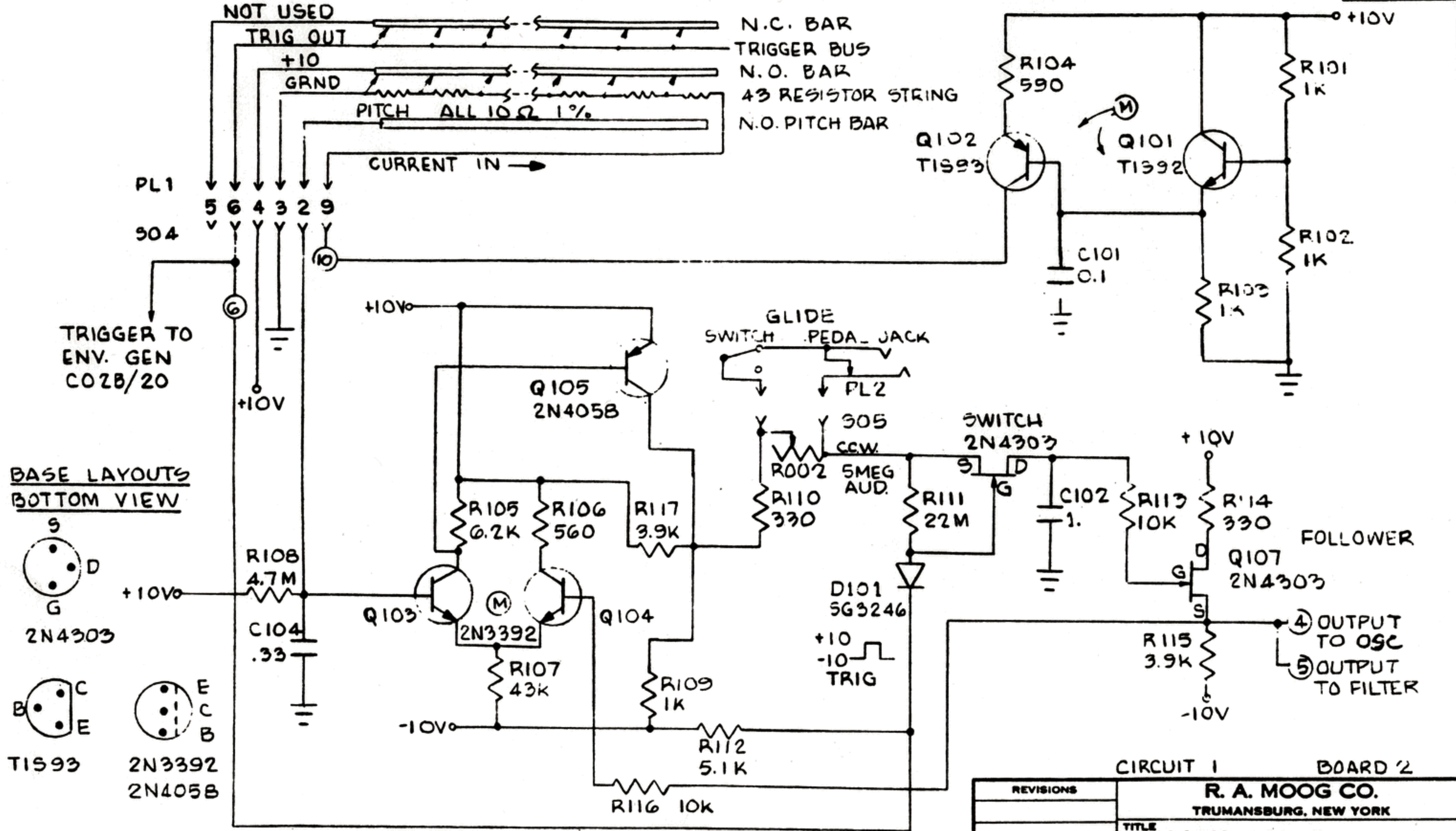
BASE LAYOUTS



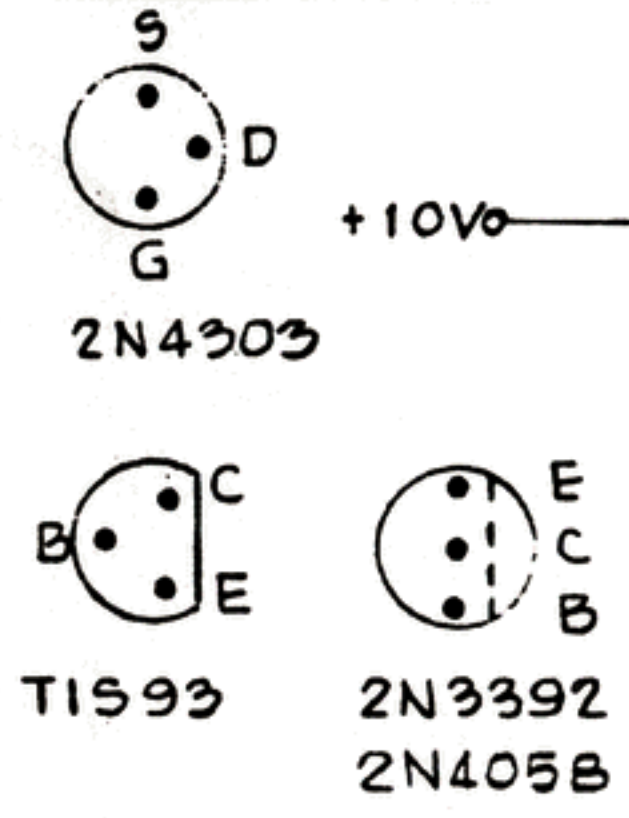
ECN 0036

CIRCUIT 10 BOARD NO. 3 91-115	
REVISIONS	R. A. MOOG CO. TRUMANSBURG, NEW YORK
REV A 4/2/71	TITLE POWER SUPPLY, MIN-D
SCALE —	DR. BY CLH
DATE 11-9-70	CK'D. BY WPH
	DWG. NO. 1435

8.48 Ma. SOURCE



BASE LAYOUTS
BOTTOM VIEW

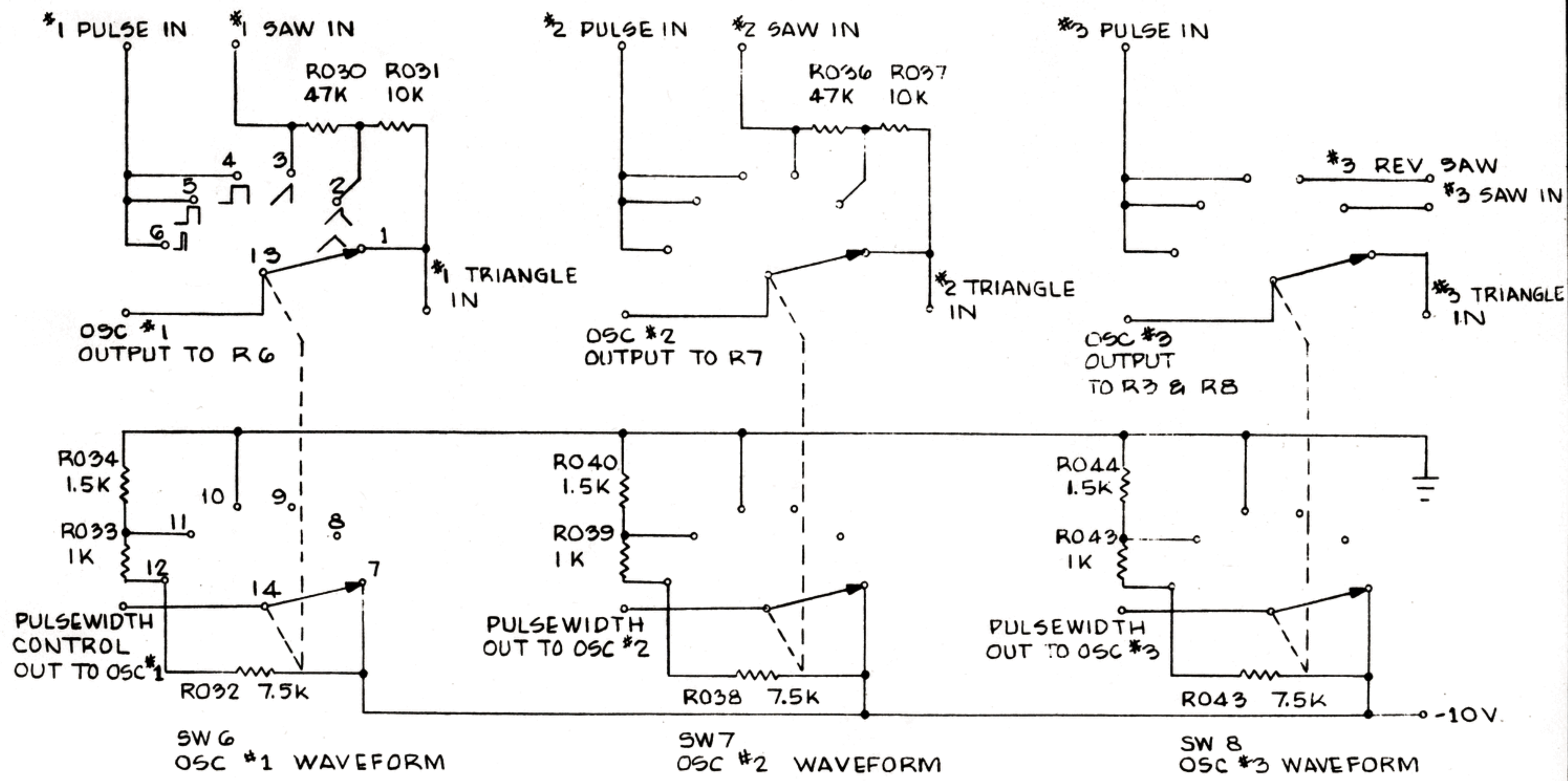


NOTES 1. ALL EDGE CONNECTIONS MATE WITH CO2A.
2. ALL CAPACITOR VALUES IN MICROFARADS.

REVISIONS		R. A. MOOG CO.		DWG. NO. 1436
		TRUMANSBURG, NEW YORK		
TITLE		SCALE	DR. BY	DATE
KEYBOARD CIRCUIT			CK'D. BY	

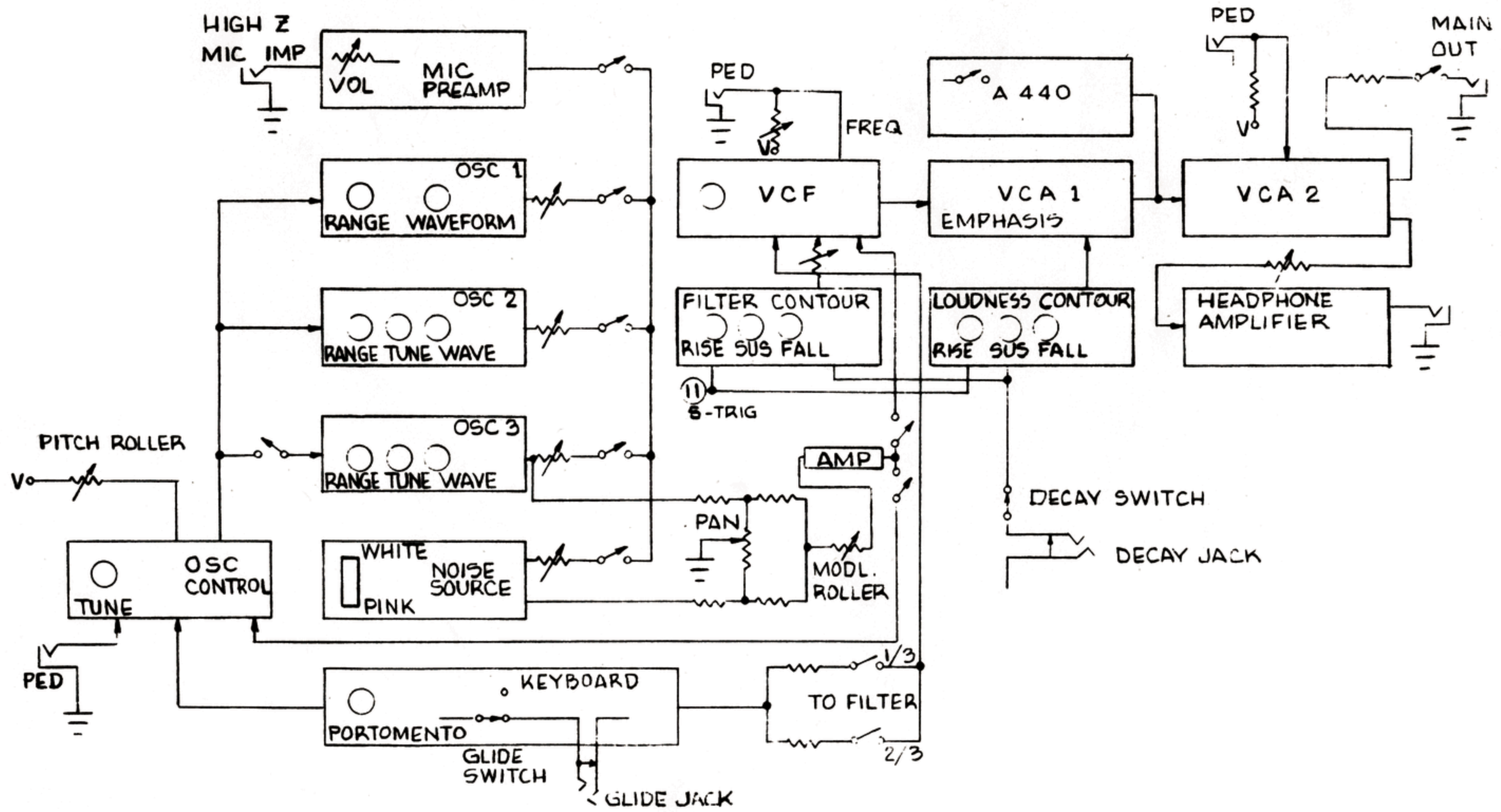
CIRCUIT 1 BOARD 2

4) OUTPUT TO OSC
5) OUTPUT TO FILTER



CIRCUIT #000 FRONT PANEL

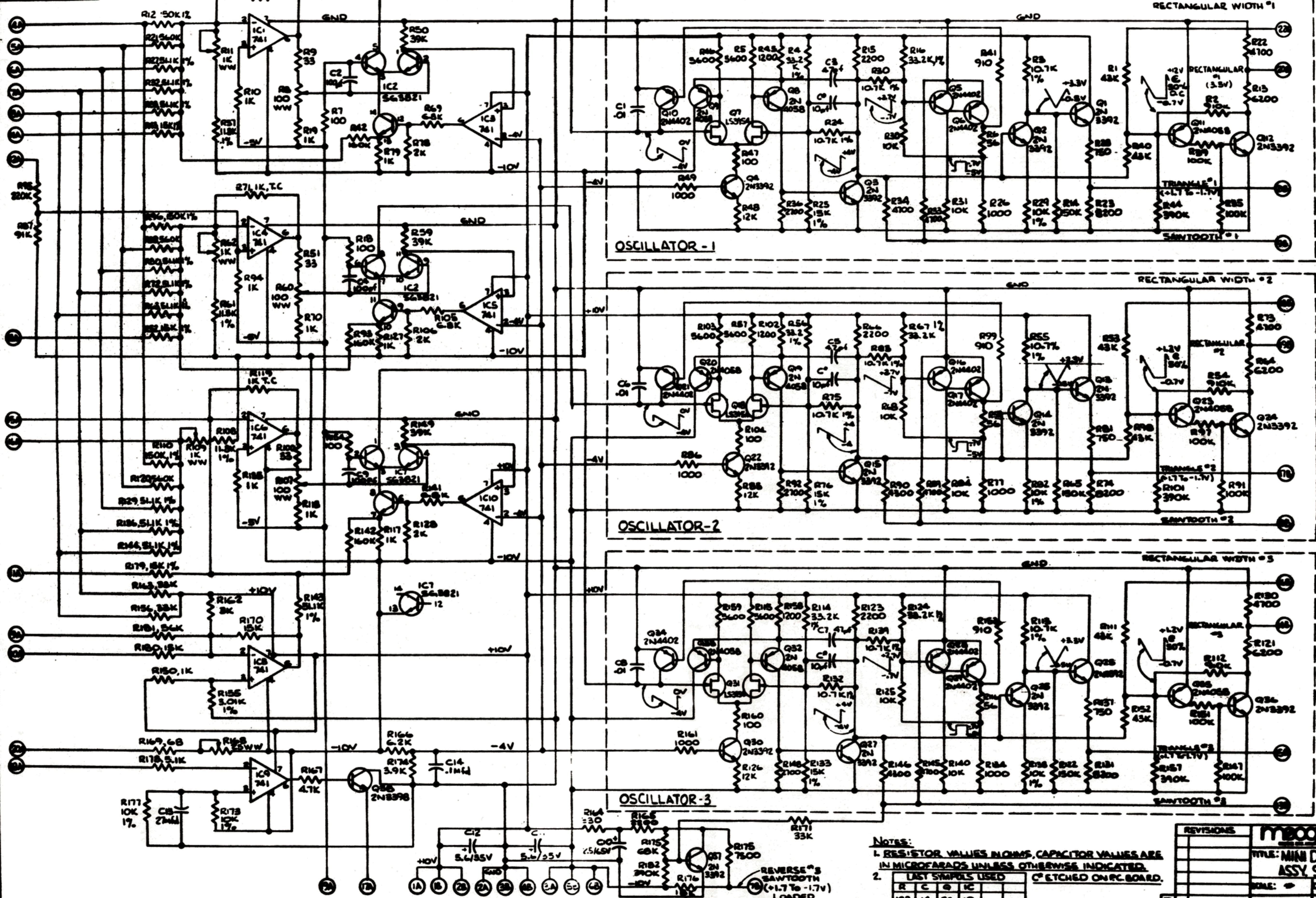
REVISIONS		R. A. MOOG CO. TRUMANSBURG, NEW YORK		DWG. NO. 1448
TITLE		WAVEFORM SWITCHING MINI'D		
SCALE	DR. BY			
DATE	CK'D. BY			



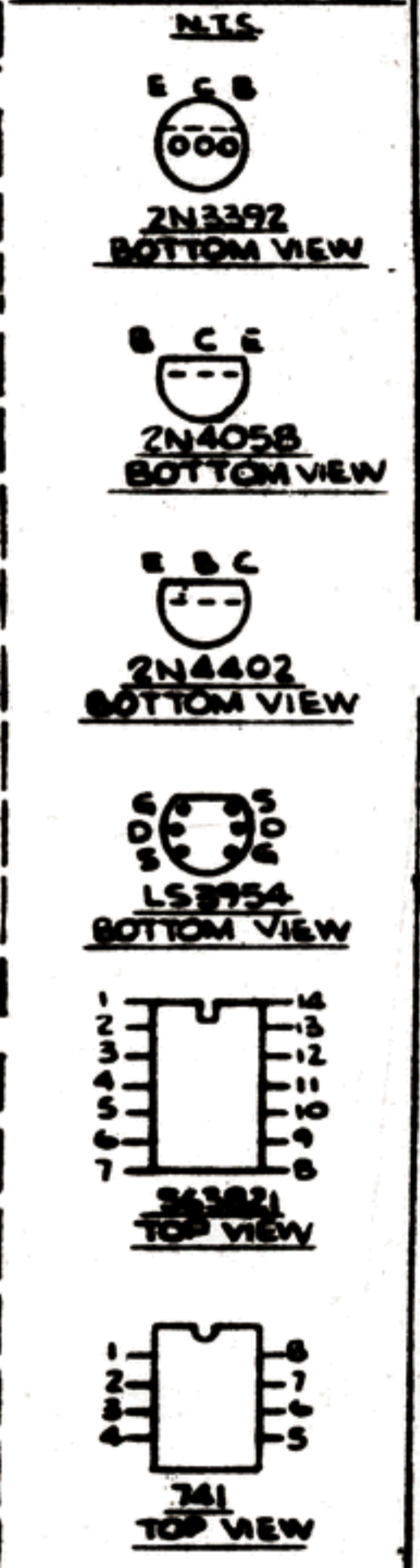
960 SEQUENCER COMPATIBLE

ALL EXTERNAL CONTROLLERS (✓ AND (II)) ARE OPTIONAL EXTRAS.

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



COMPONENT REE



NOTES:
 1. RESISTOR VALUES NORMS, CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE INDICATED.
 2. LAST SYMBOL USED C* ETCHED ON P.C. BOARD.

R	C	Q	IC
182	14	38	10

REVISIONS	DATE	BY	CHK

TITLE: MINI D OSCILLATOR PC BRD ASSY SCHEMATIC
 DATE: 4-10-72
 Dwg. No. 08-001