Moog Model 35

Modules

902(x3)
904A
904B
907A
911(x3)
921
921A(x2)
921B(x4)
923
930
951
CP3(x2)
CP4A
CP35*

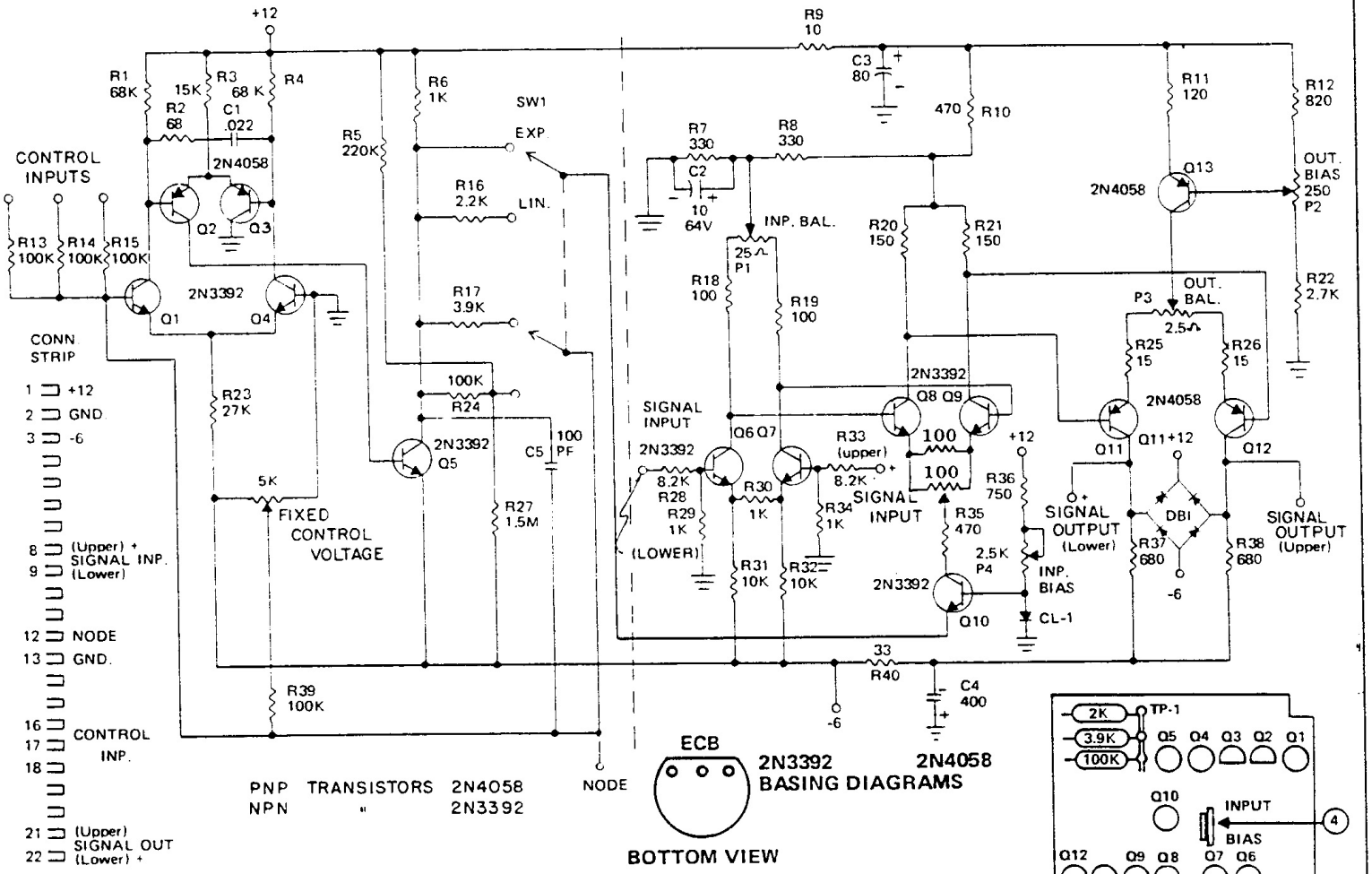
(*) Doesn't appear in schematics

902 VOLTAGE CONTROLLED AMPLIFIER TEST PROCEDURE

1. Connect dc voltmeter to TP-L (collector of Q5); low side to ground.
2. Turn FIXED CONTROL VOLTAGE pot to 6 and set CONTROL MODE switch to "EXP." DC voltage should read approximately zero.
3. Rotate FIXED CONTROL VOLTAGE pot to 0. DC voltage should read approximately +0.24V.
4. Set CONTROL MODE switch to LIN. DC voltage should read approximately +1.2V.
5. Rotate FIXED CONTROL VOLTAGE pot to 6. DC voltage should read approximately -4.8V.

NOTE
If the above voltages are observed, the adder section (Q1 thru Q5) is operating properly.

6. With FIXED CONTROL VOLTAGE in 6 and dc voltmeter connected between one of the SIGNAL OUTPUTS jacks and ground, adjust OUTPUT BIAS trimpot for zero volts.
7. Connect dc voltmeter across positive terminals of SIGNAL OUTPUTS jacks. Connect jumper between collectors of Q8 and Q9 and adjust OUTPUT BALANCE trimpot for 0 VDC.
8. Remove jumper across collectors of Q8 and Q9 and connect across collectors of Q6 and Q7. Adjust Q8 and Q9 BALANCE trimpot for 0 VDC.
9. Remove jumper and adjust INPUT BALANCE trimpot for 0 VDC.
10. Turn FIXED CONTROL VOLTAGE pot and ascertain that there is no large offset. If necessary, repeat steps 7, 8 and 9.
11. Turn FIXED CONTROL VOLTAGE pot to 6. Apply 0db 1kHz sine wave to one of the SIGNAL INPUTS. Signal output should be approximately +5db to +7db.
12. Note the output level. Set the CONTROL MODE switch to "EXP." Adjust INPUT BIAS to obtain a level equal to that noted in the "LIN" position.
13. Slowly turn FIXED CONTROL VOLTAGE pot from 6 to 0 and check for linear action in the LIN mode and exponential action in the EXP mode. At 0, signal output should be -60db maximum.
14. Turn FIXED CONTROL VOLTAGE pot to 6. With a dc bias, check each control input for proper voltage control. 0 volts should have no effect, -6 volts should cut the amplifier off completely.
15. With no signal input and FIXED CONTROL VOLTAGE set at 6, output noise should be -60db maximum.



(1) Adjusts ± output balance for exponential dc voltages with FIXED CONTROL VOLTAGE CONTROL fully counterclockwise.

(2) Adjusts zero output offset with FIXED CONTROL VOLTAGE control fully counterclockwise.

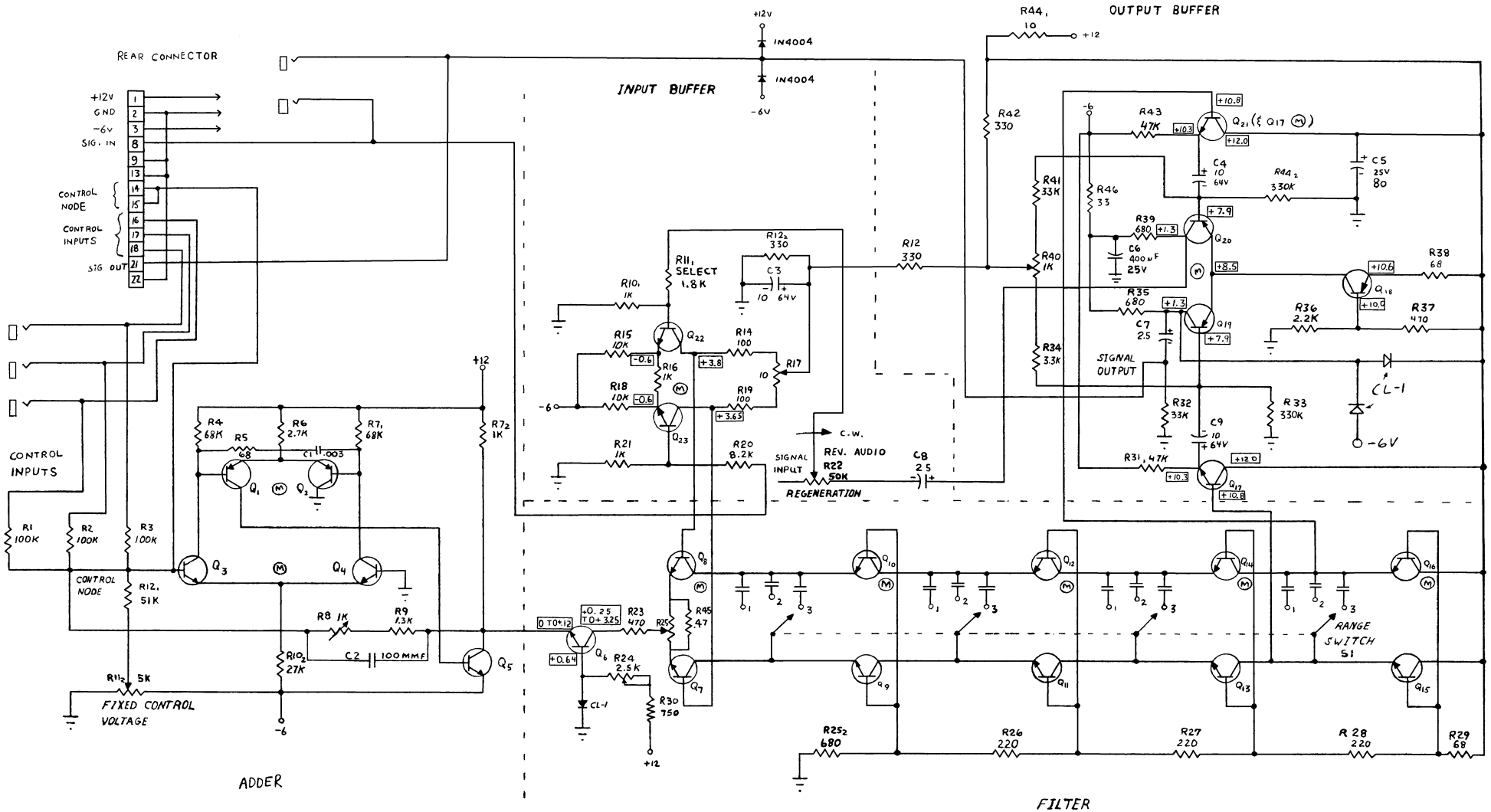
(3) Adjusts zero output offset with FIXED CONTROL VOLTAGE control fully clockwise.

(4) Adjusts amplitude level balance between linear and exponential mode with FIXED CONTROL VOLTAGE control full clockwise.

VOLTAGE CONTROLLED AMPLIFIER ALIGNMENT PROCEDURE AND ADJUSTMENT LOCATION DIAGRAM

MOOG MUSIC INC.
SCHEMATIC, 902 VOLTAGE CONTROLLED AMPLIFIER
993-041813 1068

FIGURE 9 VOLTAGE CONTROLLED AMPLIFIER MODEL 902



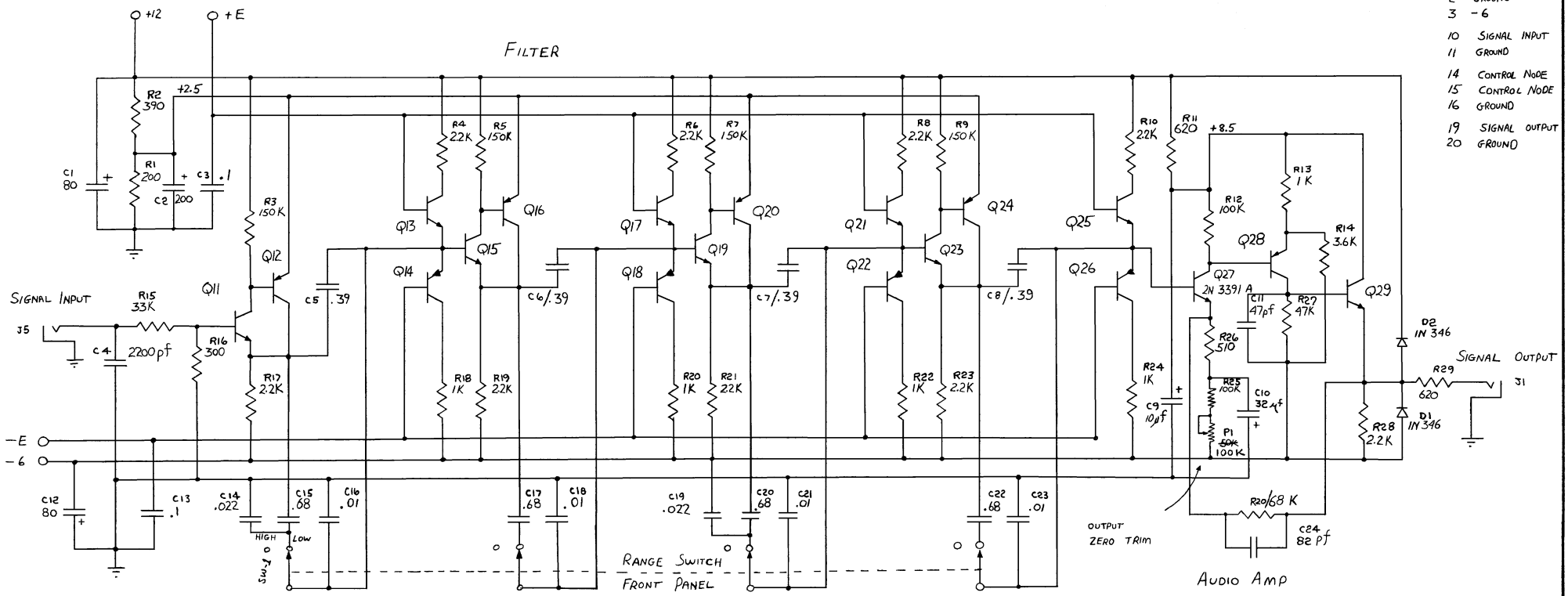
NOTES:

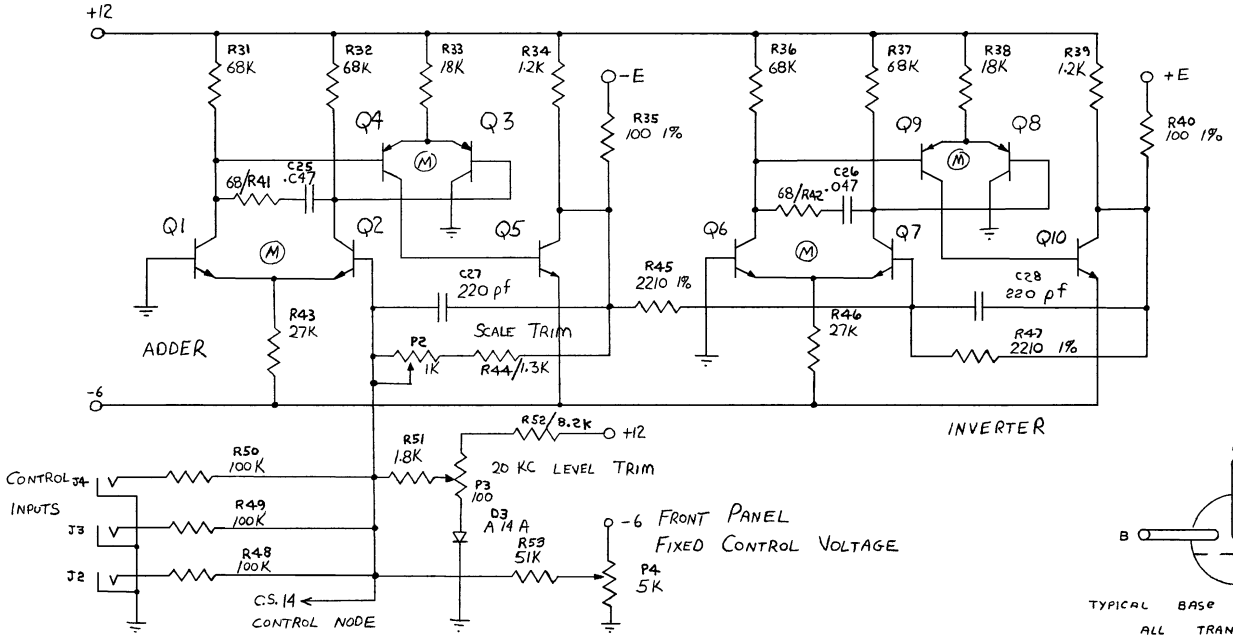
1. ALL NPN TRANSISTORS: 2N 3392
2. ALL PNP TRANSISTORS: 2N 4058
3. (M) ⇒ MATCHED PAIR
4. RANGE CAPACITOR SIZES

1	1.2 μF
2	0.3 μF
3	0.075 μF

904-A VOLTAGE CONTROLED LOW PASS FILTER		
DRAWN BY P.Y.		SCHEMATIC
APPR. BY		
DATE 7-25-67	DRAWING NUMBER SUPERCEDES NO. 1089	1149
A. A. MOOG CO. TRUMANSBURG, N.Y.		

REV. E	
REV. D	
REV. C 11/10/70 W/GS	REV.-B ~ECN-003 12-19-69
REV. A 9-8-69 - JLA	

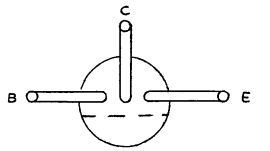




CONNECTOR STRIP

1	+12
2	GROUND
3	-6
10	SIGNAL INPUT
11	GROUND
14	CONTROL NODE
15	CONTROL NODE
16	GROUND
19	SIGNAL OUTPUT
20	GROUND

ALL NPN TRANSISTORS 2N 3392 EXCEPT Q 27
ALL PNP TRANSISTORS 2N 4058
(M) INDICATES MATCHED PAIR
ALL RESISTORS ½ WATT 5% CARBON } UNLESS OTHERWISE MARKED
ALL CAPACITORS IN µF
Q 13, 17, 21, 25 ARE A MATCHED SET
Q 14, 18, 22, 26 " " " "



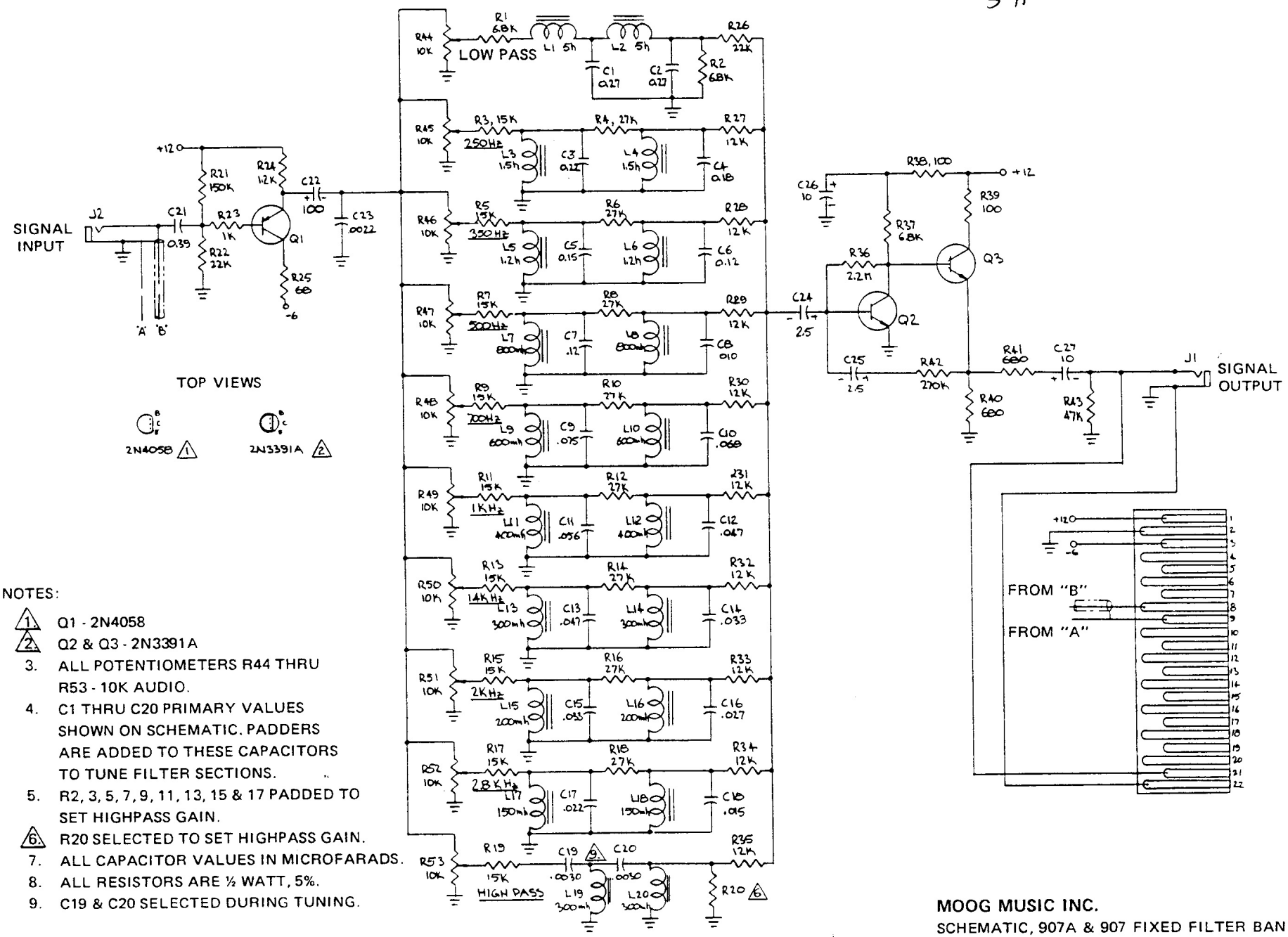
TYPICAL BASE LAY-OUT FOR ALL TRANSISTORS USED IN CIRCUITRY.

THIS DWG. APPLIES TO MODULES WITH SERIAL NUMBERS 194 AND ABOVE

REVISIONS		R. A. MOOG CO.	
C	COMPLETE REDRAWING *	TRUMANSBURG, NEW YORK	
*	OLD DWG DATED 12/12/66 OBSOLETED	TITLE 904 B NEW VERSION	
		SCALE	DR. BY Scott
		DATE 6/23/70	CK'D. BY
			DWG. NO. 1118

INDUCTORS 10mm x 5mm Body

5H



NOTES:

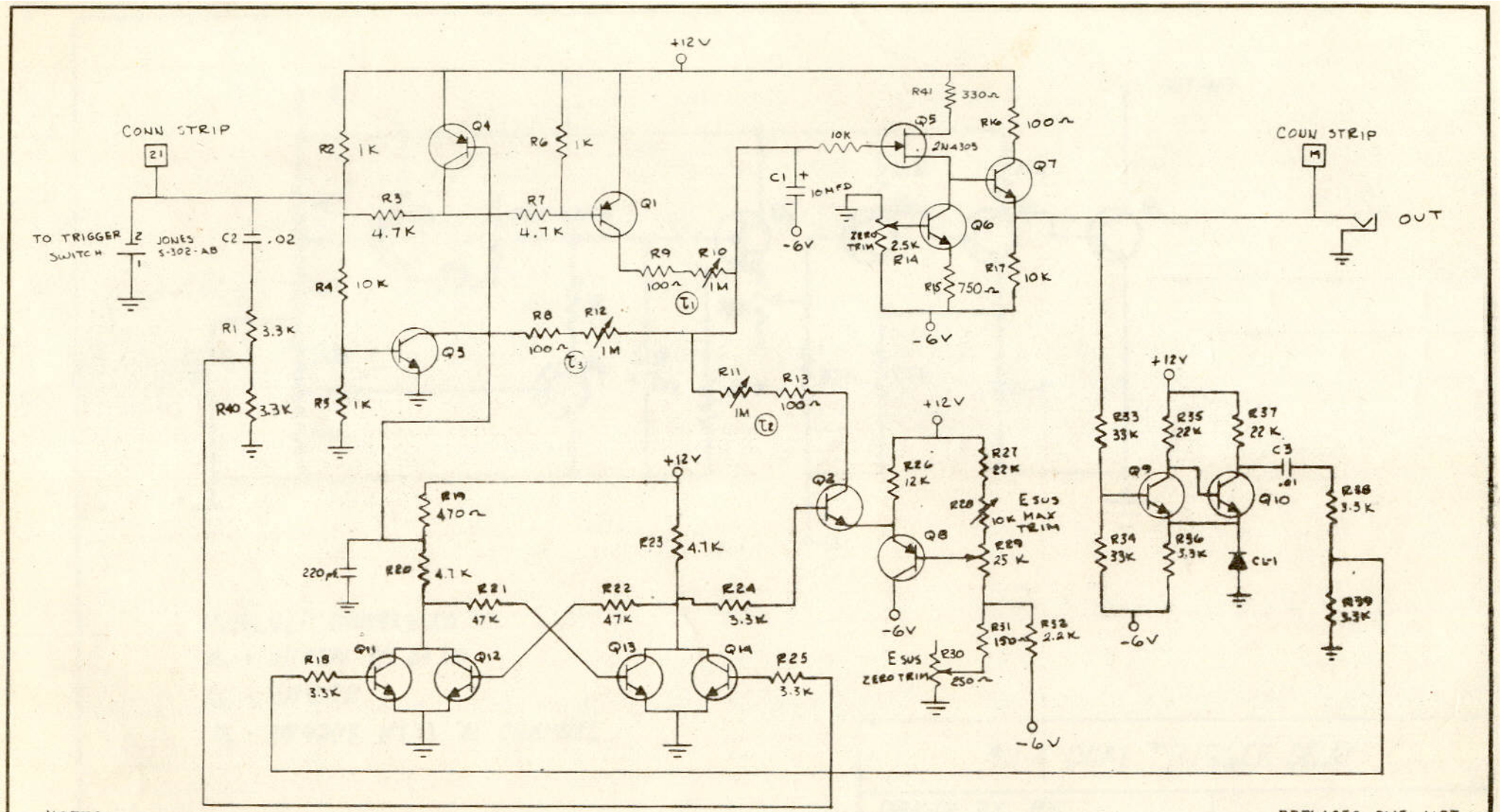
1. Q1 - 2N4058
2. Q2 & Q3 - 2N3391A
3. ALL POTENTIOMETERS R44 THRU R53 - 10K AUDIO.
4. C1 THRU C20 PRIMARY VALUES SHOWN ON SCHEMATIC. PADDERS ARE ADDED TO THESE CAPACITORS TO TUNE FILTER SECTIONS.
5. R2, 3, 5, 7, 9, 11, 13, 15 & 17 PADDED TO SET HIGHPASS GAIN.
6. R20 SELECTED TO SET HIGHPASS GAIN.
7. ALL CAPACITOR VALUES IN MICROFARADS.
8. ALL RESISTORS ARE ½ WATT, 5%.
9. C19 & C20 SELECTED DURING TUNING.

MOOG MUSIC INC.

SCHEMATIC, 907A & 907 FIXED FILTER BANK

993-041838 08-028

FIGURE 15 FIXED FILTER BANK MODELS 907 AND 907A



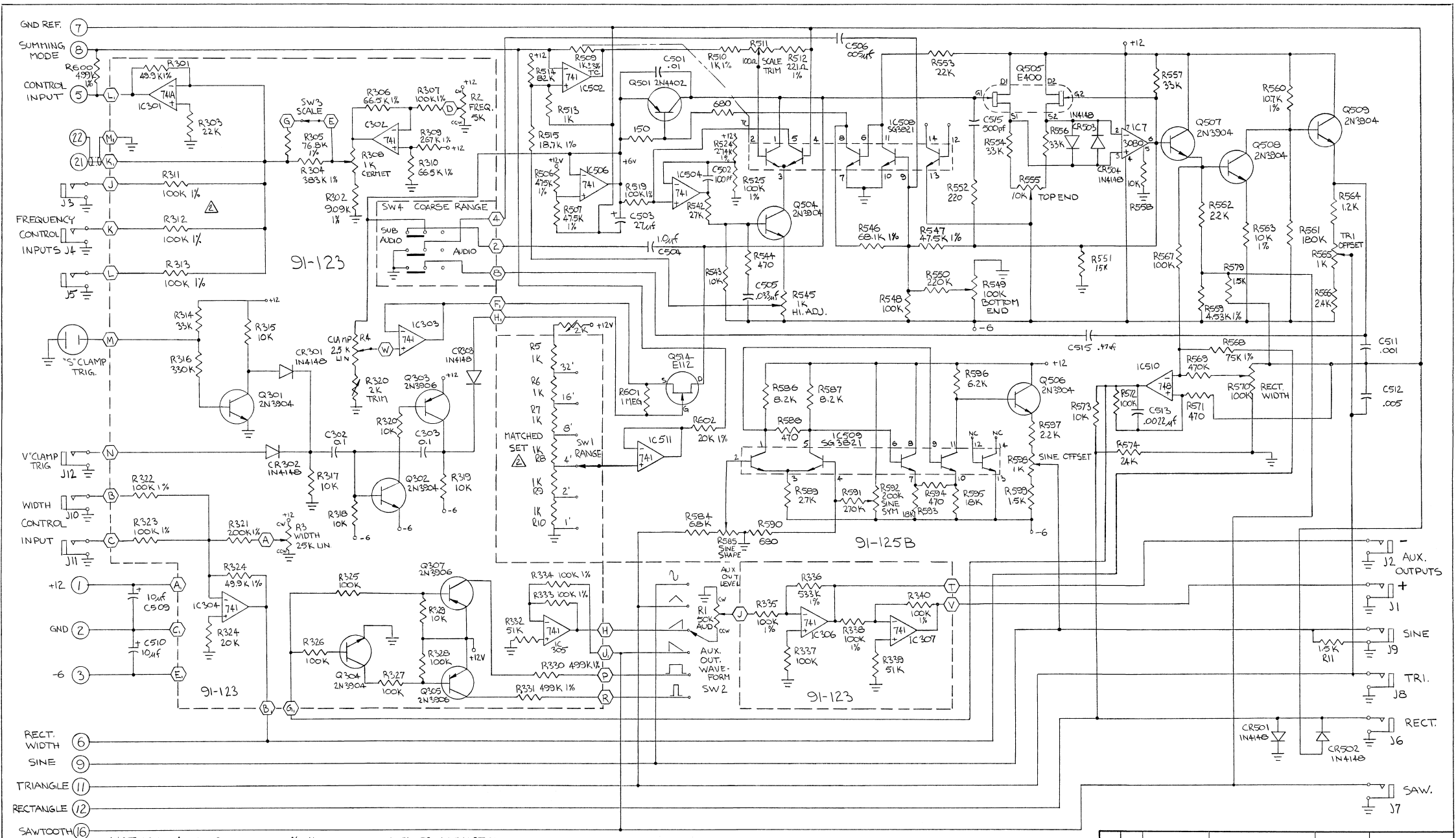
NOTES:

I. ALL PNP TRANSISTORS ARE 2N4058

II. ALL NPN TRANSISTORS ARE 2N3392

REPLACES DWG 1103

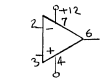
C-ECN-004 1-12-69 WRH	REVISIONS	R. A. MOOG CO.
	A- R15 From 1.5K To 820Ω	TRUMANSBURG, NEW YORK
	A- R41 FROM Q5 TO 6.2K	TITLE 911 ENVELOPE GENERATOR
	B - ECN-002	SCALE DR. BY RER DWG. NO. 1220
		DATE 8-14-68 CK'D. BY



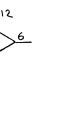
NOTES:

1. ALL RESISTORS 5%, ½ WATT UNLESS OTHERWISE NOTED
2. 1% RESISTORS MATCHED TO 0.1%
3. (X) DESIGNATES REAR CONNECTOR NUMBER (PCB 91-125)
4. (X) DESIGNATES P/C BOARD INTERCONNECTIONS

TYP. 741/748 IC



TRANSISTOR TOP VIEWS



E 400

E 112

2N3904, 2N3906

COMPONENT DESIGNATORS

NO PREFIX → FRONT PANEL
3XX → 93-123 PCB ASST
5XX, 6XX → 93-125 PCB ASST

ITEM	PART NUMBER	DESCRIPTION	MATERIAL

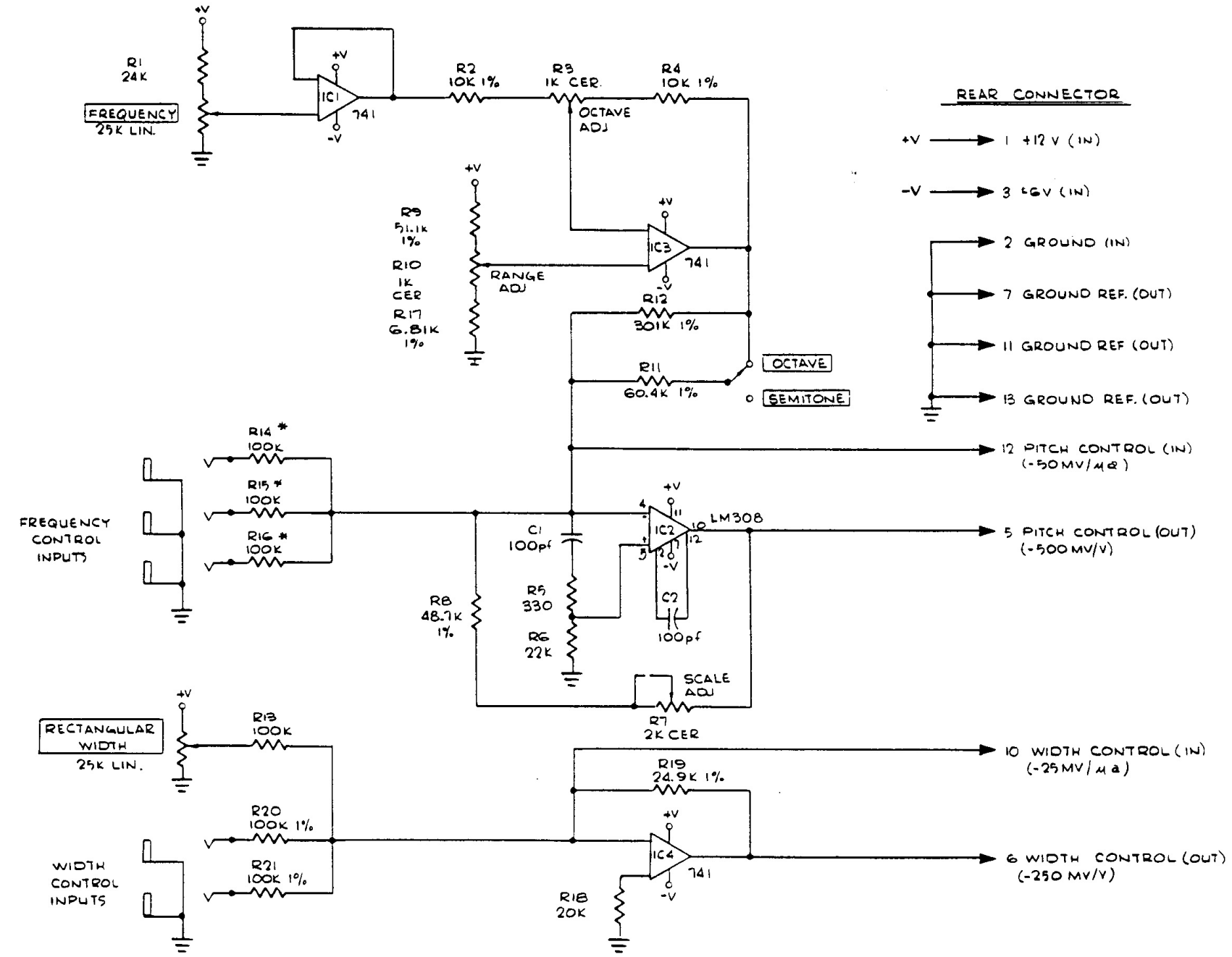
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCE FRACTIONS ± 1/64. ANGLES ± 1°. 2 PLACE DECIMALS ± .01. 125 FINISH ON ALL SURFACES. DRILLED HOLE TOL .040 – .125 DIA ±.002 TOL; .126 – .228 DIA ±.003 TOL; .229 – .500 DIA ±.004 TOL; .501 – .750 DIA ±.005 TOL

DRAWN BY	JRB 7/11/74
CHECK	
GRP ENGR.	
REVIEW QC.	
SUPERVISOR	

moog MUSIC INC. WILLIAMSVILLE, NEW YORK

921 OSCILLATOR SCHEMATIC DIAGRAM

NEXT ASSY	MODEL NO.	SIZE	CODE IDENT	
	921	C		08-036
APPLICATION		SCALE ——	WT.	SHEET 1 OF 1



NOTES:

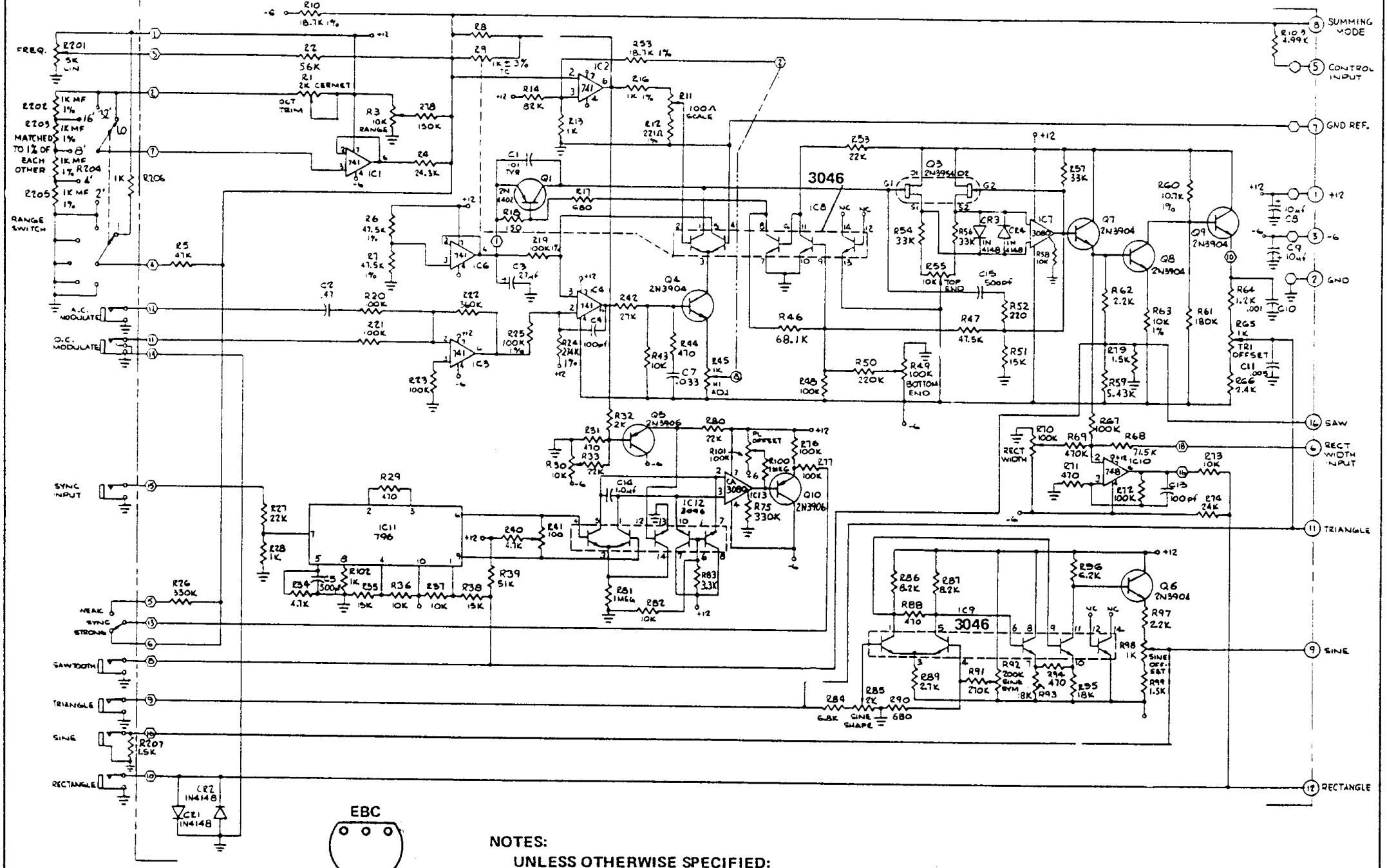
1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE ±5%, 1/2 W.
2. ALL 1% RESISTORS ARE 1/4 W.
3. * MATCHED TO 0.1%

MOOG MUSIC INC.

SCHEMATIC, 921A-OSCILLATOR DRIVER

993-041835 08-009

FIGURE 22. OSCILLATOR DRIVER MODEL 921A



EBC

BOTTOM VIEW
2N3904
2N4402
2N3906

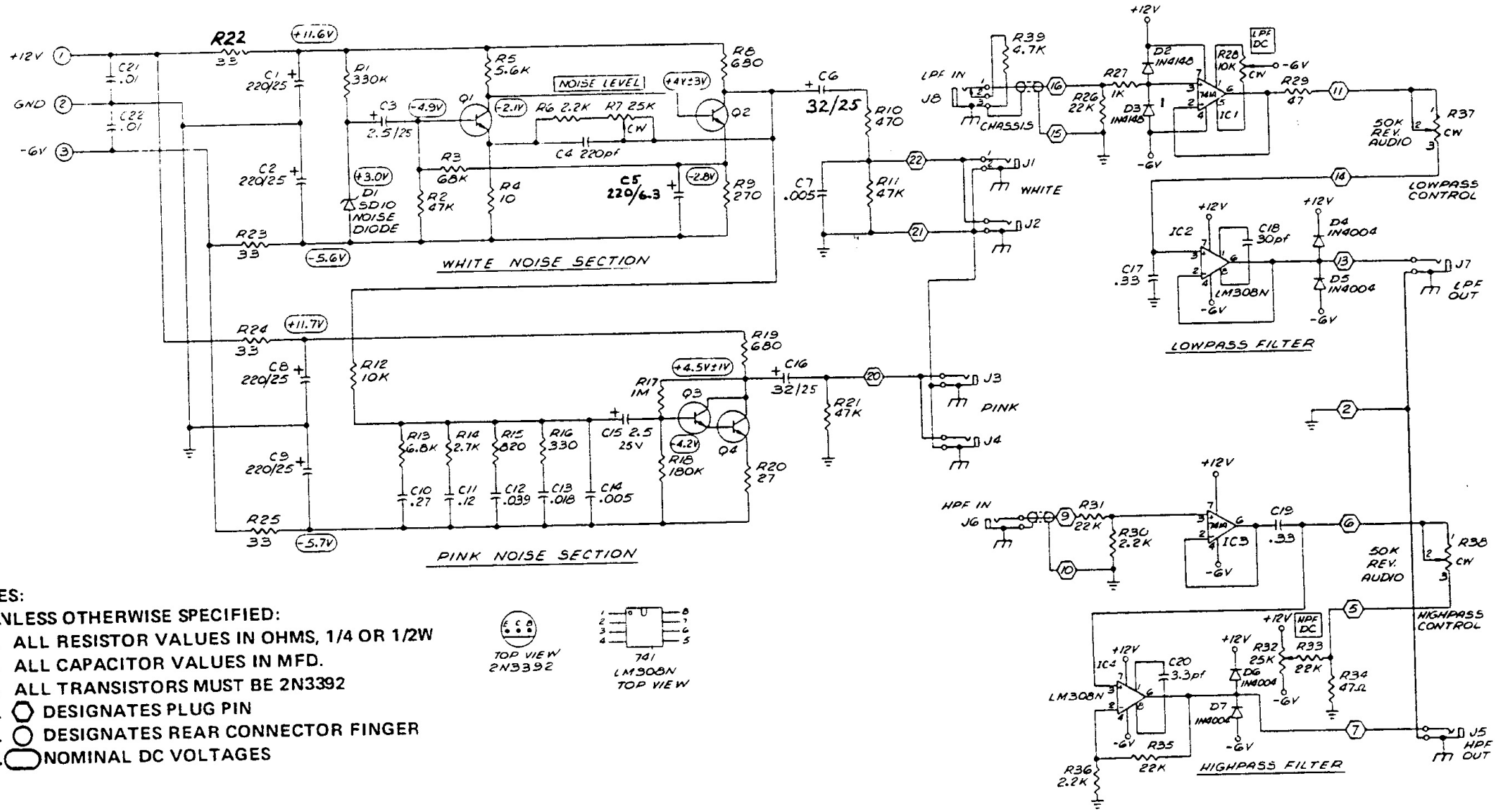
NOTES:

UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTOR VALUES IN OHMS, 1/4 OR 1/2W
2. ALL CAPACITOR VALUES IN MFD.
3. ⬡ DESIGNATES PLUG PIN
4. ○ DESIGNATES REAR CONNECTOR FINGER

MOOG MUSIC INC.
SCHEMATIC, OSCILLATOR 921B
993-041875 08-013

FIGURE 23. OSCILLATOR MODEL 921B



NOTES:

UNLESS OTHERWISE SPECIFIED:

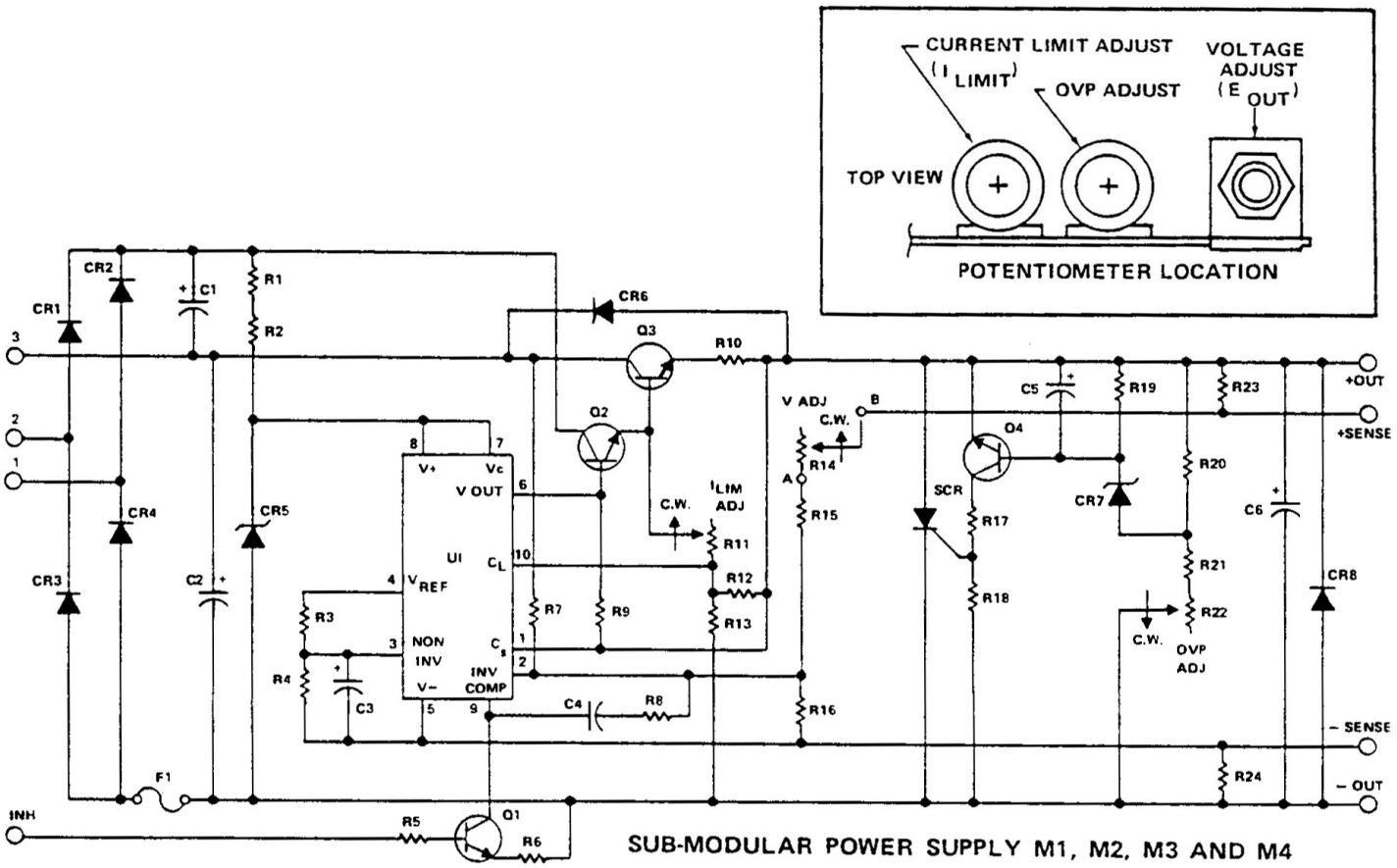
1. ALL RESISTOR VALUES IN OHMS, 1/4 OR 1/2W
2. ALL CAPACITOR VALUES IN MFD.
3. ALL TRANSISTORS MUST BE 2N3392
4. ⬡ DESIGNATES PLUG PIN
5. ○ DESIGNATES REAR CONNECTOR FINGER
6. ⬭ NOMINAL DC VOLTAGES

MOOG MUSIC INC.

SCHEMATIC, 923 FILTERS/NOISE SOURCE

993-041876 08-032

FIGURE 24 FILTERS/NOISE SOURCE MODEL 923



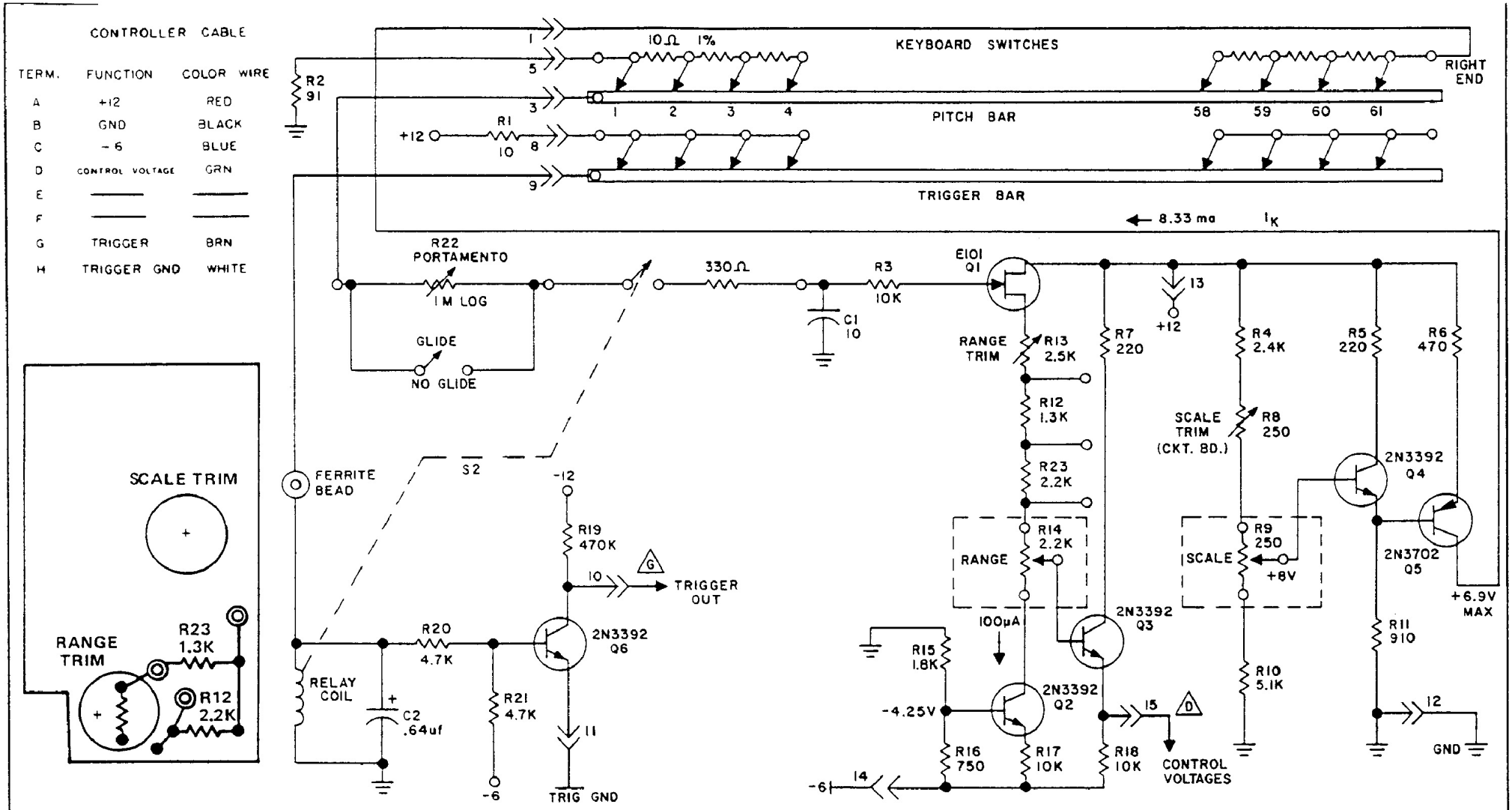
SUB-MODULAR POWER SUPPLY M1, M2, M3 AND M4

MODEL 22B-300 (M1, M2, M3) REPLACEMENT PARTS LIST

REF DESIG	DESCRIPTION
C1, C6	Capacitor, Electrolylic, 220 uf, 35V
C2	Capacitor, Electrolylic, 4000 uf, 30V
C3, C5	Capacitor, Electrolytic, 1 uf, 50V
C4	Capacitor, Film, 0.001 uf, 50V
CR 1 thru CR4	Diode, Semtek 3FI1, Motorola MR501
CR5	Diode, Zener, 1N4753A
CR6, CR8	Diode, 1N4002
CR7	Diode, Zener, 1N754A
F1	Fuse, 5 Ampere
Q1	Transistor, 2N2222A
Q2	Transistor, 13159-1
Q3	Transistor, 13002-3
Q4	Transistor, 2N2907A
R1, R2	Resistor, 750 Ohms, ±5%, 1/2 W
R3	Resistor, 470 Ohms, ±5%, 1/2 W
R4	Resistor, Not Used
R5	Resistor, 47K Ohms, ±5%, 1/2 W
R6, R9	Resistor, 1K Ohms, ±5%, 1/2 W
R18, R19	
R7	Resistor, Not Used
R8	Resistor, 3.3K Ohms, ±5%, 1/2 W
R10	Resistor, 0.22 Ohms, BWH
R11	Potentiometer, 100 Ohms
R12	Resistor, Not Used
R13	Resistor, 1.2K Ohms
R14, R22	Potentiometer, 1.5K Ohms
R15	Resistor, 309 Ohms, RN60C
R16	Resistor, 1.19K Ohms, RN60C
R17	Resistor, 270 Ohms, ±5%, 1/2 W
R20	Resistor, 1.55K Ohms, RN60C
R21	Resistor, 750 Ohms, RN60C
R23, R24	Resistor, 10 Ohms, ±5%, 1/2 W
SCR1	Silicon Control Rectifier, 2N4441
U1	Integrated Circuit, 723CE

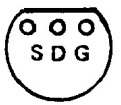
MODEL 22B-100 (M4) REPLACEMENT PARTS LIST

REF DESIG	DESCRIPTION
C1, C6	Capacitor, Electrolytic, 470 uf, 15V
C2	Capacitor, Electrolytic, 9000 uf, 15V
C3, C5	Capacitor, Electrolytic, 1 uf, 50V
C4	Capacitor, Film, 0.001 uf, 100V
CR1, CR2, CR6, CR8	Diode, 1N4002
CR3, CR4	Diode, Semtek 3FI1, Motorola MR501
CR5	Diode, Not Used
CR7	Diode, Zener, 1N751A
Q1	Transistor, 2N2222A
Q2	Transistor, 13159-2
Q3	Transistor, 13002-3
Q4	Transistor, 2N2907
R1, R2	Resistor, 51 Ohms, ±5%, 1/2 W
R3	Resistor, 3.01K Ohms, RN60C
R4	Resistor, 4.02 K Ohms, RN60C
R5	Resistor, 47K Ohms, ±5%, 1/2 W
R6, R9	
R18, R19	Resistor, 1K Ohms, ±5%, 1/2 W
R7	Resistor, Not Used
R8	Resistor, 3.3K Ohms, ±5%, 1/2 W
R10	Resistor, 0.1 Ohms, BWH
R11	Potentiometer, 100 Ohms
R12	Resistor, Not Used
R13	Resistor, 510 Ohms, ±5%, 1/2 W
R14	Potentiometer, 1.5K Ohms
R15	Resistor, Jumper
R16	Resistor, 1.5K Ohms, RN60C
R17	Resistor, 100 Ohms, ±5%, 1/2 W
R20	Resistor, 1K Ohms, RN60C
R21	Resistor, Jumper
R22	Potentiometer, 500 Ohms
SCR1	Silicon Control Rectifier, 2N4441
U1	Integrated Circuit, 723CE

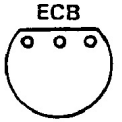


951 KEYBOARD TUNING

1. The keyboard has two adjustments to be made. The scale adjustment adjusts the current source so that the total drop across the resistor string is 5.000 volts. The range adjustment fixes the lowest key at zero volts. Adjustments are made with the external range and scale controls on the five mark.
2. Adjust the range setting with the trimpot. If adjustment cannot be made within the range of the trimpot, it may be necessary to short one or both of the two resistors in series with it.
3. Adjust the scale trimmer so that the keyboard spans five volts. If zero shifts, for example to .04, then adjust the top for 5.04. That is, always adjust for a five volt span.
4. Now readjust range trim so that first key is zero. Check to see that scale still gives 0 to 5.000 volts.



E101
TOP
VIEW



2N3702
2N3392
BOTTOM VIEW

MOOG MUSIC INC.
SCHEMATIC, 951, KEYBOARD
993-041831 1266

FIGURE 28 KEYBOARD MODEL 951

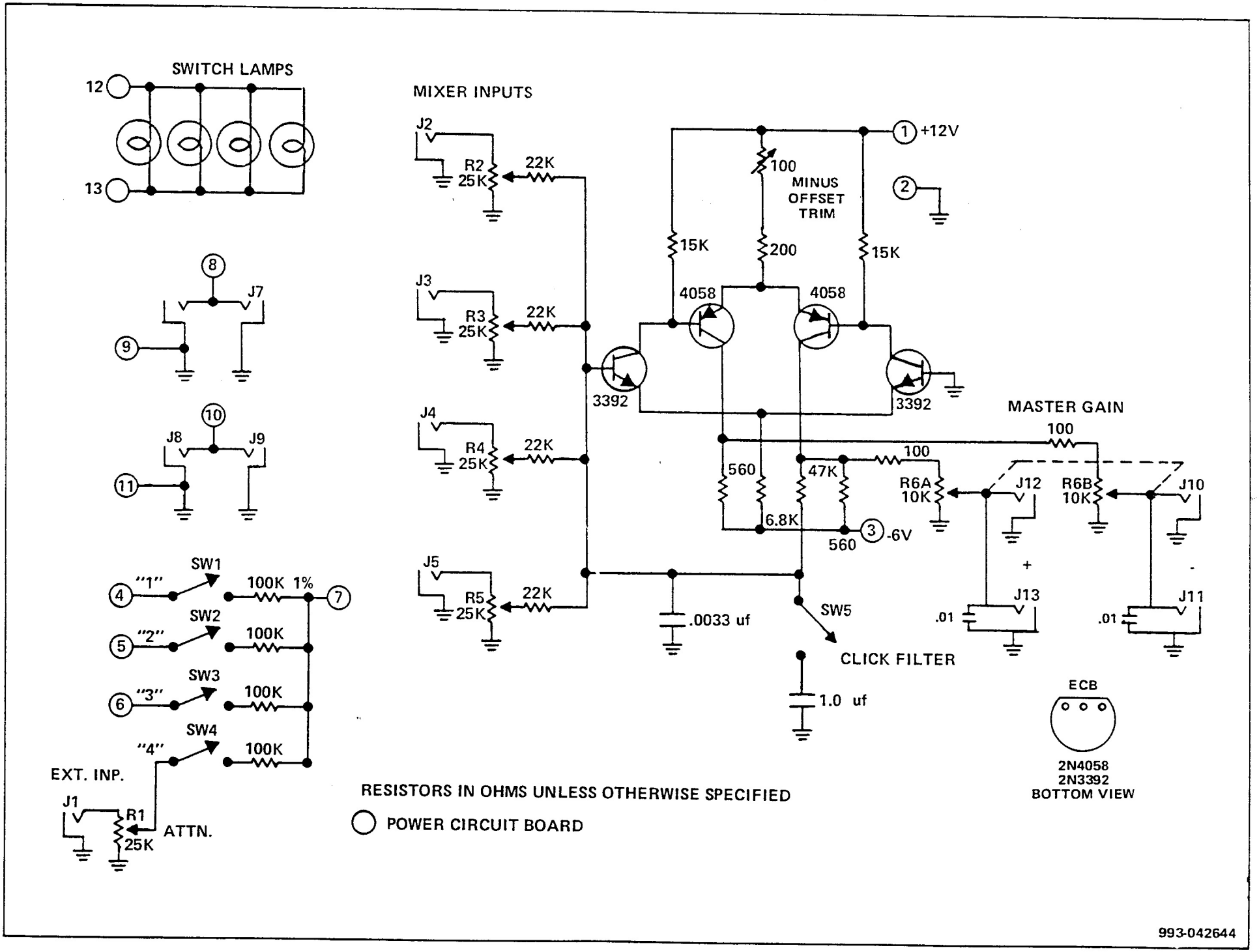
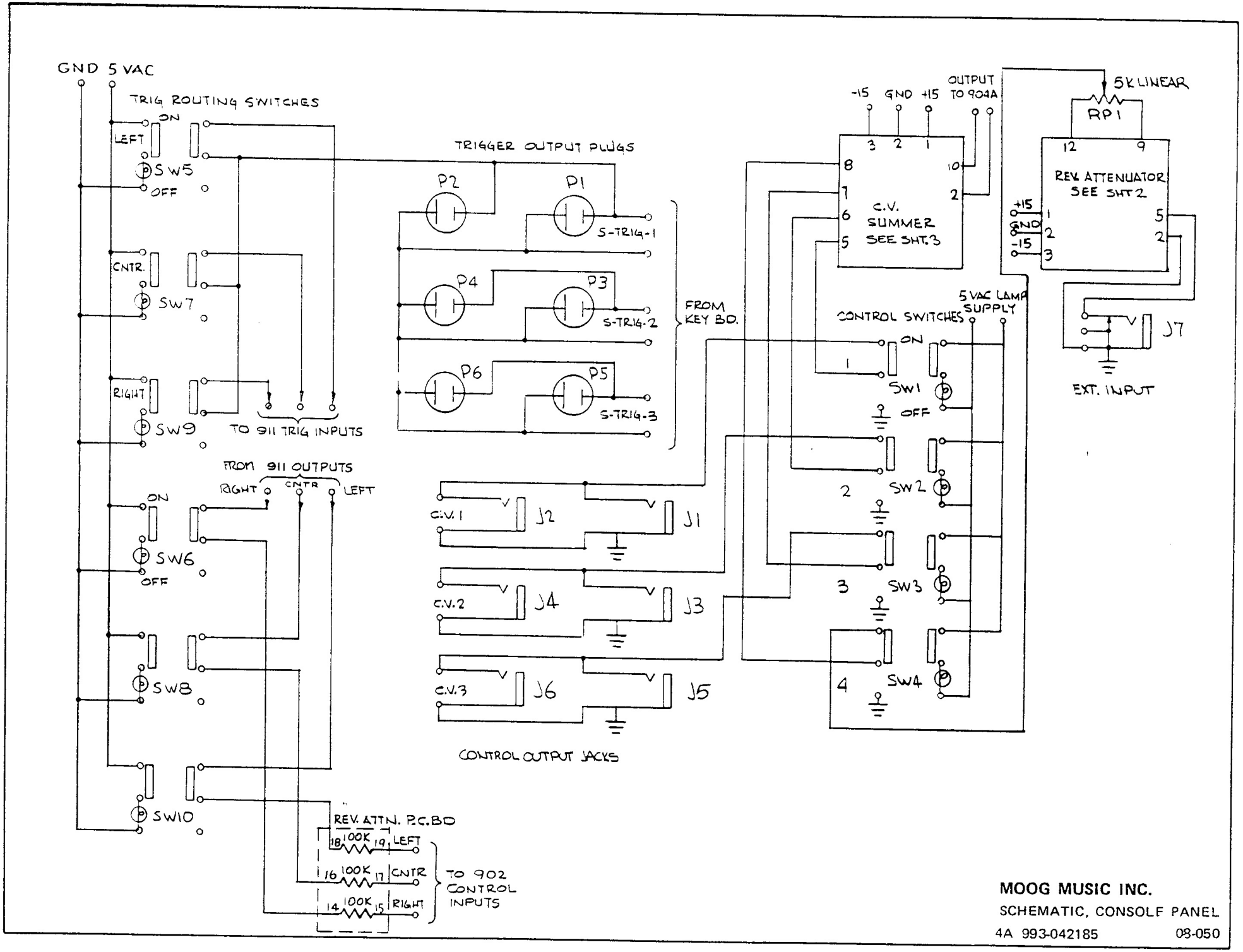


FIGURE 2 CONSOLE PANEL MODEL 3



MOOG MUSIC INC.
SCHEMATIC, CONSOLE PANEL
4A 993-042185 08-050

FIGURE 4 CONSOLE PANEL MODEL 4A