

TECHNICAL SERVICE MANUAL for

MAESTRO[®] ACCESSORIES



PRICE LIST

Bass Brass Master Model BB-1	\$ 69.95
Boomerang Pedal Model BG-1	69.95
Boomerang Pedal Model BG-2	79.95
Fuzz Phazzer Model FP-1	89.95
Fuzz Phazzer Model FP-2	89.95
Fuzz Phazzer Model FP-3	89.95
Full Range Booster Model FRB-1	69.95
Fuzz Tone Model FZ-1A	39.95
Fuzz Tone Model FZ-1B (Version 1)	39.95
Fuzz Tone Model FZ-1B (Version 2)	39.95
Filter — Sample and Hold Model FSH-1A	129.95
Super Fuzz Model FZ-1S	59.95
Envelope Modifier Model ME-1	99.95
Maestro Multiplier Model MM-1	139.95
Mini Phase Shifter Model MPS-2	139.95
Octave Box Model OB-1	79.95
Octave Box Model OB-2	119.95
Phase Shifter Model PS-1	199.95
Phase Shifter Model PS-1A	199.95
Phase Shifter Model PS-1B	199.95
Ring Modulator Model RM-1A	249.95
Ring Modulator Model RM-1B	249.95
Signal Isolator Model SI-G1	40.00
Signal Isolator Model SI-G2	59.95
Sustainer Model SS-1	69.95
Sustainer Model SS-2	72.95
Sustainer Model SS-3	89.95
Theremin Model TH-1	149.95
Volume Pedal Model VP-1	49.95
Wha Wha Pedal Model WW-2	59.95
Rover Rotary Speaker Model RO-1	429.95
Universal Synthesizer Model USS-1A	549.95

Prices Subject To Change Without Notice

INTRODUCTION

This technical service manual contains schematic diagrams for Maestro Accessories produced during the 1970's. Also included for some models as an aid in troubleshooting this equipment are circuit board component location diagrams, selected replacement parts and photographs. To assist in locating technical data for a specific model, a table of contents appears on the opposing page.

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maestro BASS BRASSMASTER

brass vol.

1 brass 2

sensitivity

1 harmonic 2

bass vol.

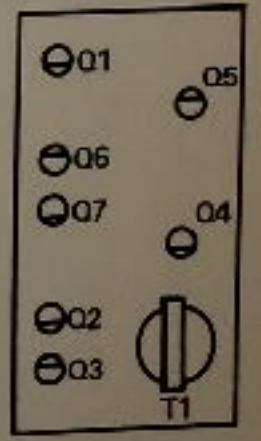
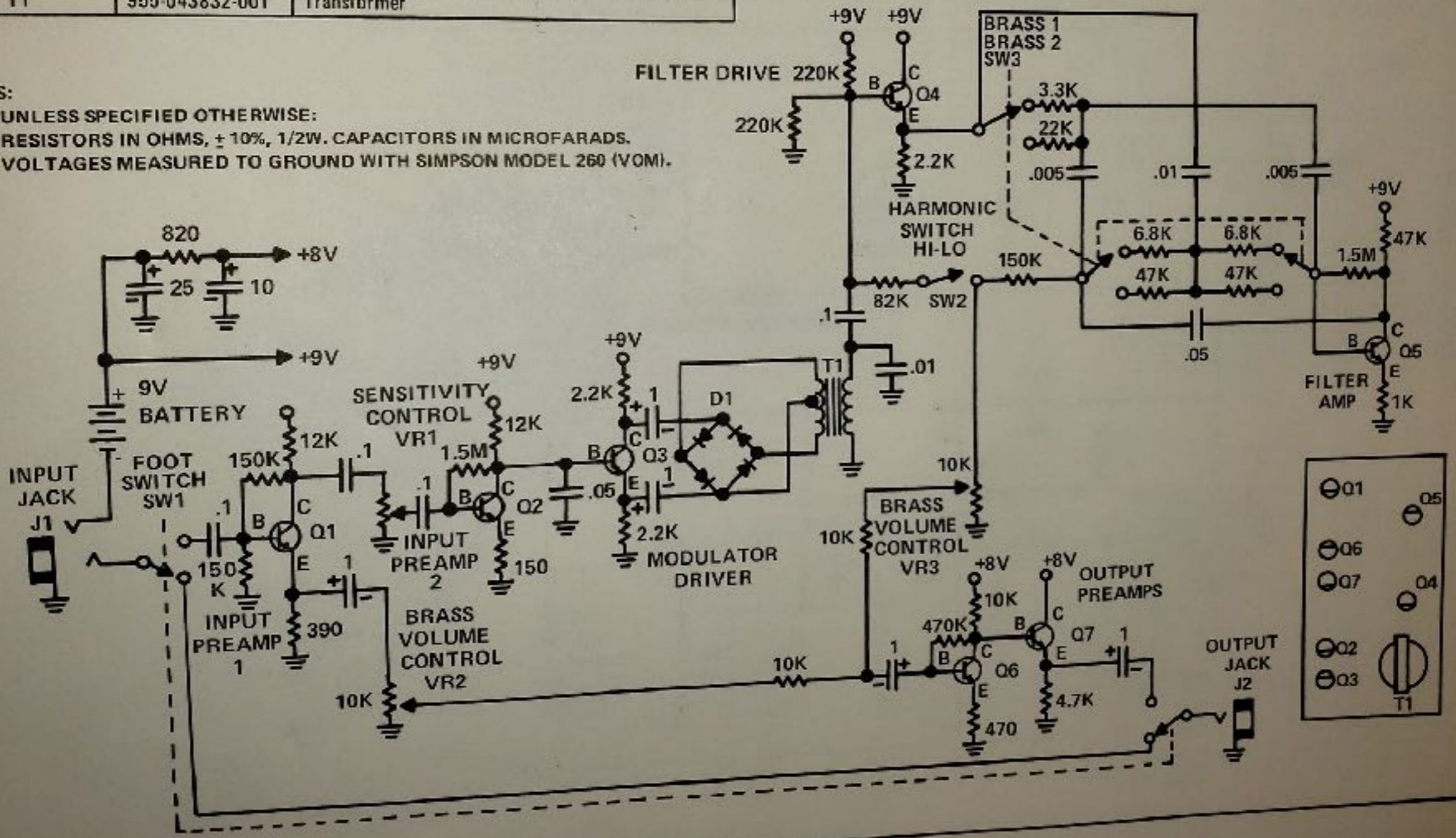
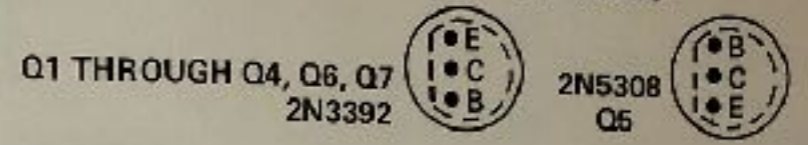
BASS BRASS MASTER MODEL BB-1

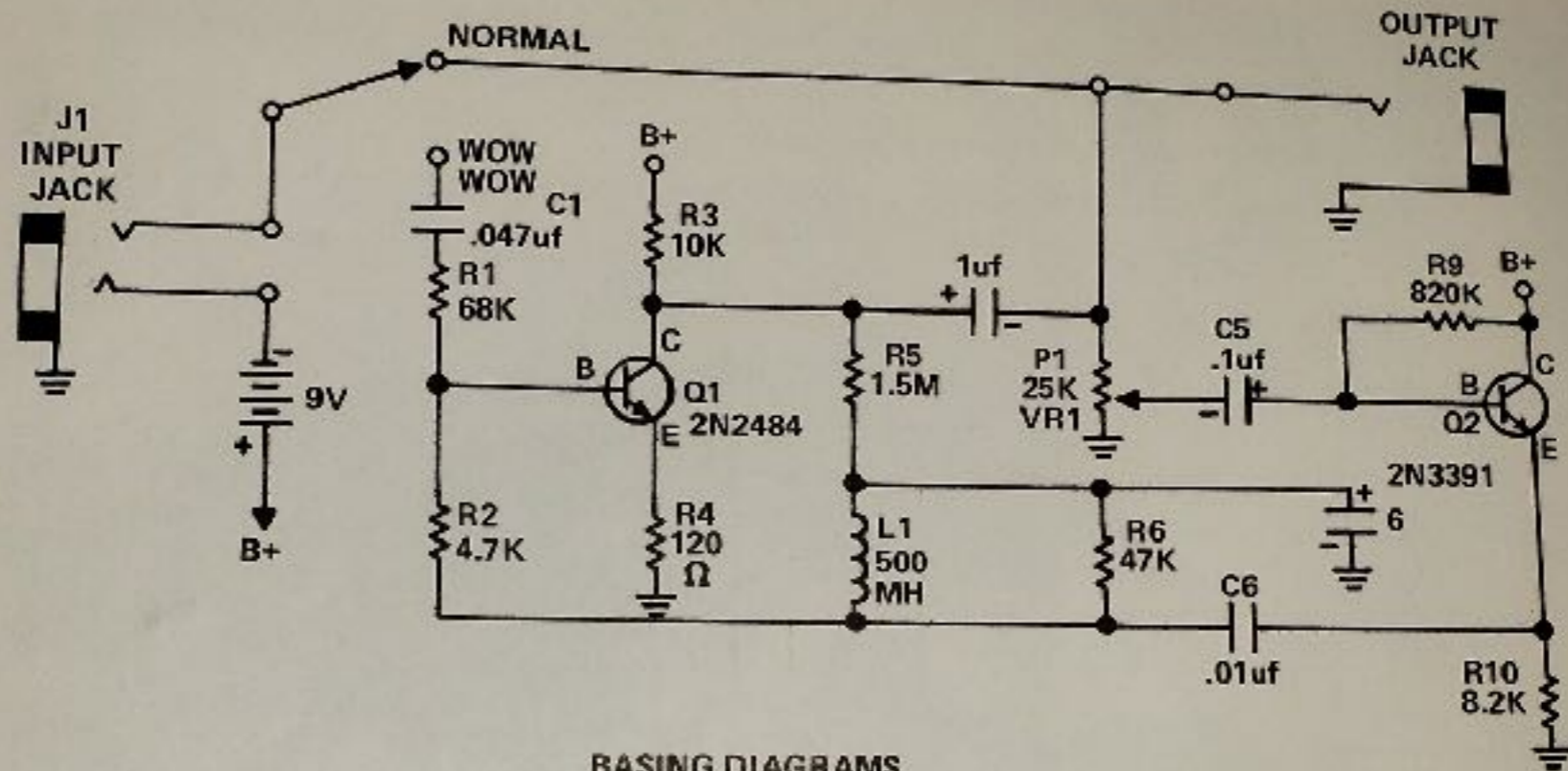
REF DESIG	PART NO.	DESCRIPTION
D1	919-041075-001	Diode, 1N4148
J1	910-041306-004	Jack, .250, 3 Conductor
J2	910-041306-001	Jack, .250, 2 Conductor
Q1 thru Q4, Q6, Q7	991-042017-001	Transistor, 2N3392
Q5	991-043341-001	Transistor, 2N5308
SW1	960-040042-001	Switch, DPDT, Push
SW2, SW3	960-043044-001	Switch, DPDT, Slide
VR1	925-043246-001	Potentiometer, 10K Linear Sensitivity
VR2, VR3	925-043246-002	Potentiometer, 10K, Dual Linear Brass Volume
T1	955-043832-001	Transformer

NOTES:

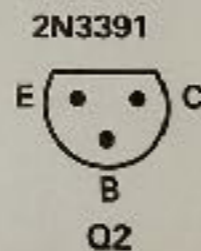
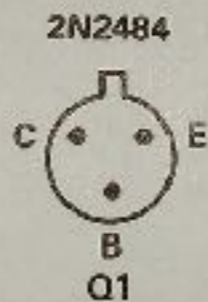
1. UNLESS SPECIFIED OTHERWISE:
RESISTORS IN OHMS, $\pm 10\%$, 1/2W. CAPACITORS IN MICROFARADS.
2. VOLTAGES MEASURED TO GROUND WITH SIMPSON MODEL 260 (VOM).

**BASING DIAGRAMS
TOP VIEWS**



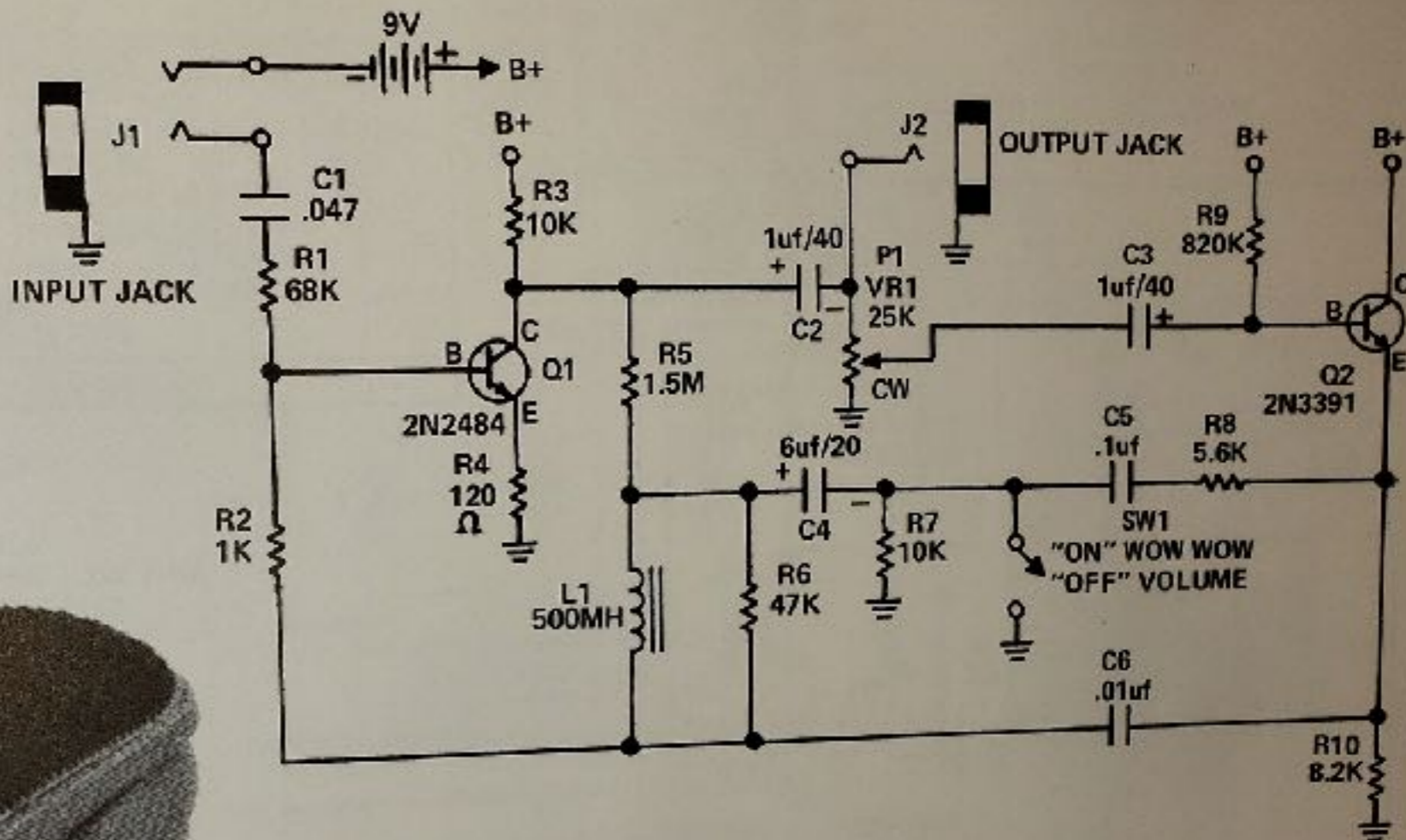
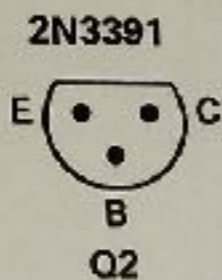
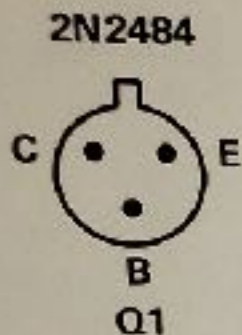


BASING DIAGRAMS
TOP VIEWS



REF DESIG	PART NO.	DESCRIPTION
B1		Battery, Eveready 226 or Equivalent
J1	910-041306-004	Phone Jack, .250", 3 Conductor
J2	910-041306-002	Phone Jack, .250", 2 Conductor
L1	952-043259-001	Choke, 500 Mhy
Q1	991-041150-001	Transistor, 2N2484
Q2	991-041067-001	Transistor, 2N3391
S1	960-043004-001	Switch, SPST, Push
VR1	925-043260-001	Potentiometer, 25K, Special Taper

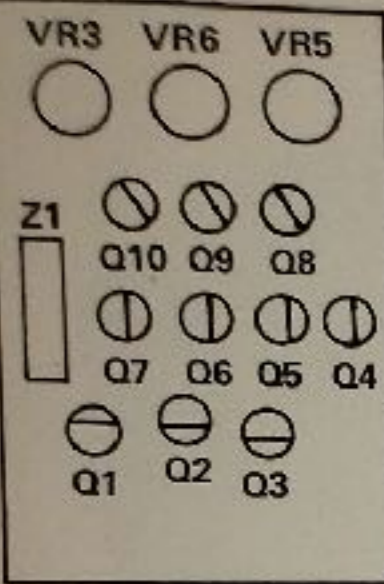
BASING DIAGRAMS
TOP VIEWS



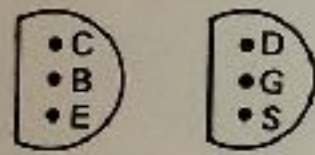
REF DESIG	PART NO.	DESCRIPTION
B1	910-041306-004	Battery, Eveready 226 or Equivalent
J1	910-041306-004	Phone Jack, .250", 3 Conductor
J2	910-041306-002	Phone Jack, .250", 2 Conductor
L1	952-043259-001	Choke, 500 Mhy
Q1	991-041150-001	Transistor, 2N2484
Q2	991-041067-001	Transistor, 2N3391
S1	960-043004-001	Switch, SPST, Push
VR1	925-043260-001	Potentiometer, 25 K, Special Taper

BOOMERANG PEDAL MODEL BG-2 (VERSION 2)

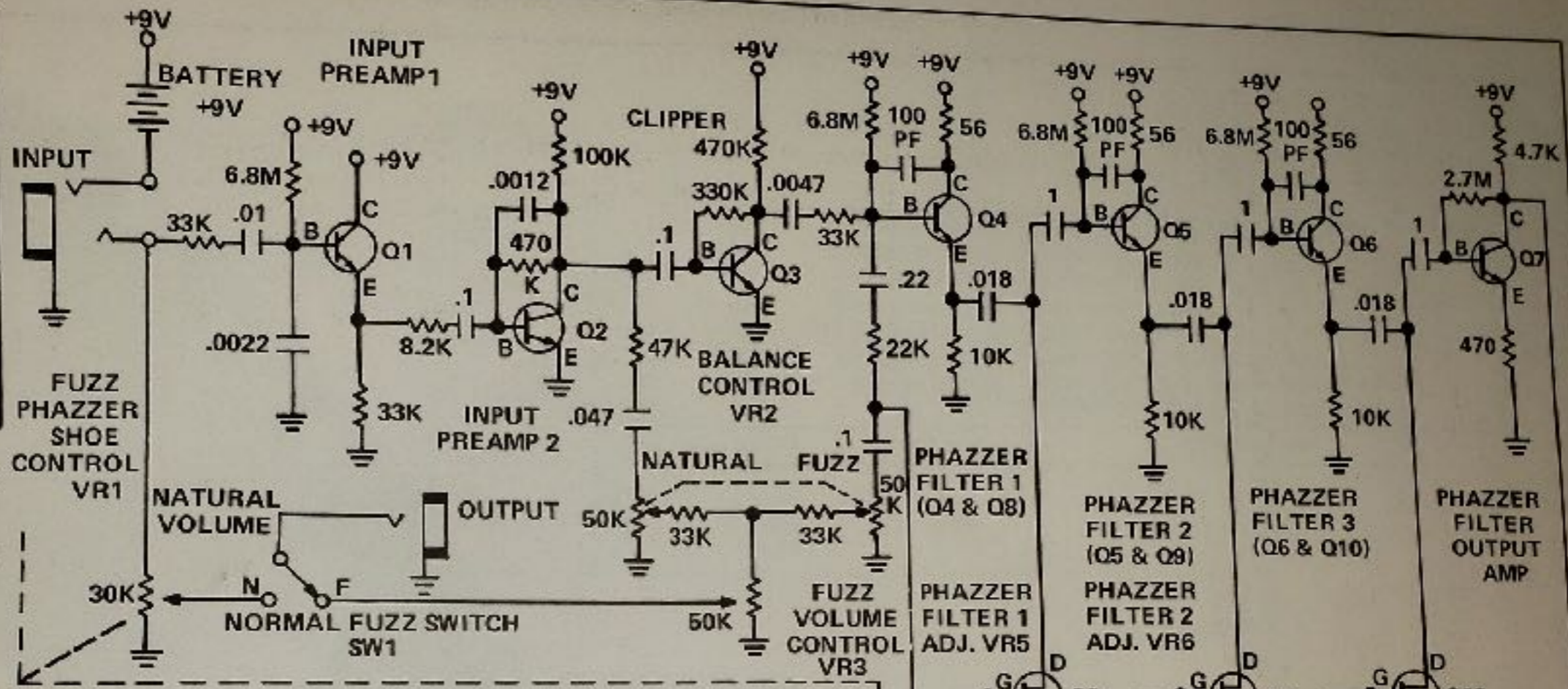
P.C. BOARD



BASING DIAGRAMS



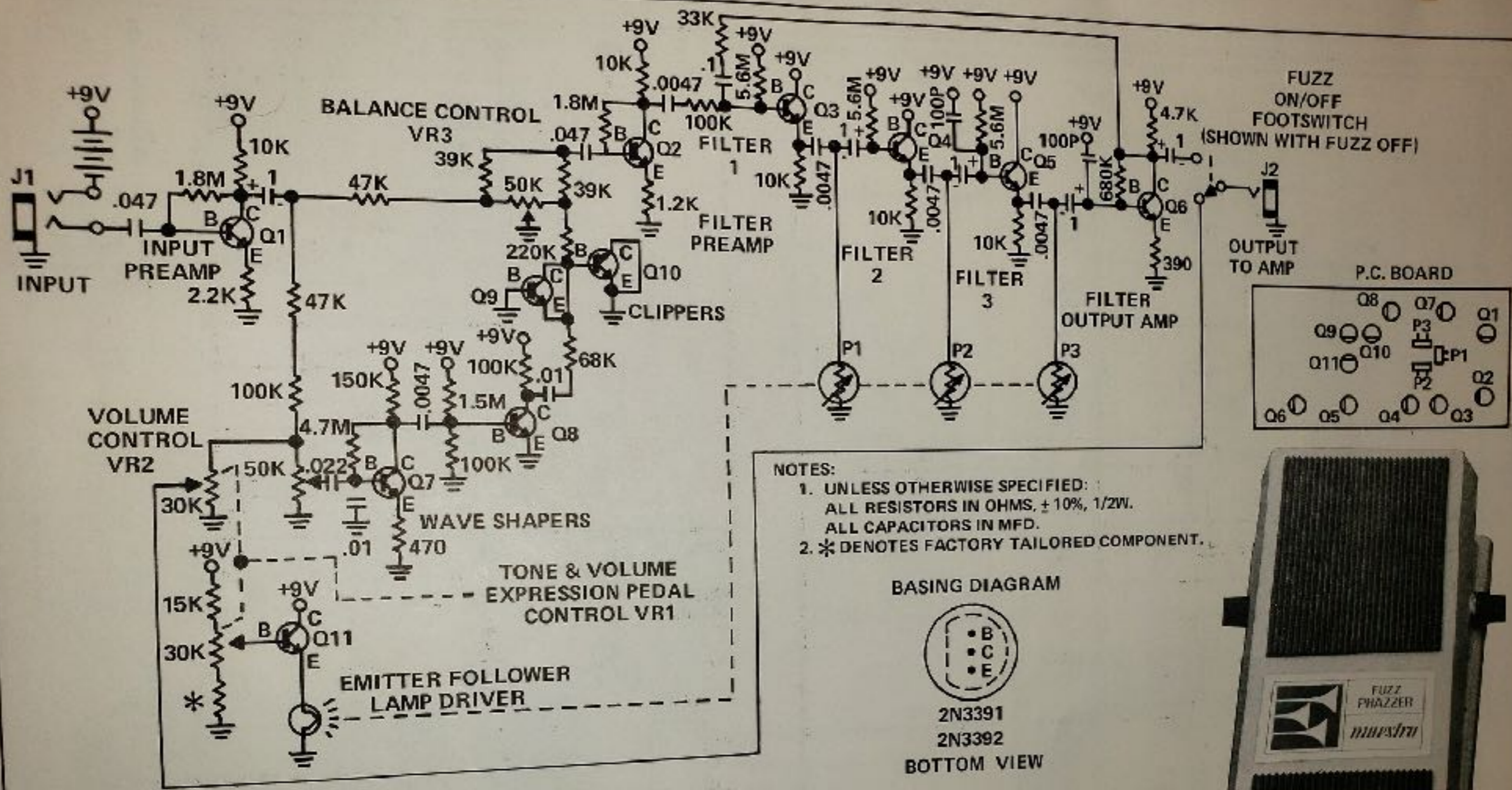
2N5088 TIS58
BOTTOM VIEWS



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS IN OHMS, ± 10%, 1/2W.
ALL CAPACITORS IN MFD.

REF DESIG	PART NO.	DESCRIPTION
Q1 thru Q7	991-043180-001	Transistor, 2N5088
Q8, Q9, Q10	991-041145-001	Transistor, TIS58
SW1	960-040127-001	Switch, SPDT, Push
VR1	925-043830-001	Potentiometer, Linear, Dual, 30K
VR2	925-043833-001	Potentiometer, Linear, Dual, 50K
VR3	925-043834-001	Potentiometer, Linear, 50K
VR4	925-040277-003	Potentiometer, Trim, 50K
VR5, VR6	925-040277-004	Potentiometer, Trim, 1 Meg
Z1	919-041077-001	Diode, Zener, 6.8V, T26.8

FUZZ PHAZER MODEL FP-1 (VERSION 1)



- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS IN OHMS, $\pm 10\%$, 1/2W.
ALL CAPACITORS IN MFD.
 2. * DENOTES FACTORY TAILORED COMPONENT.

BASING DIAGRAM

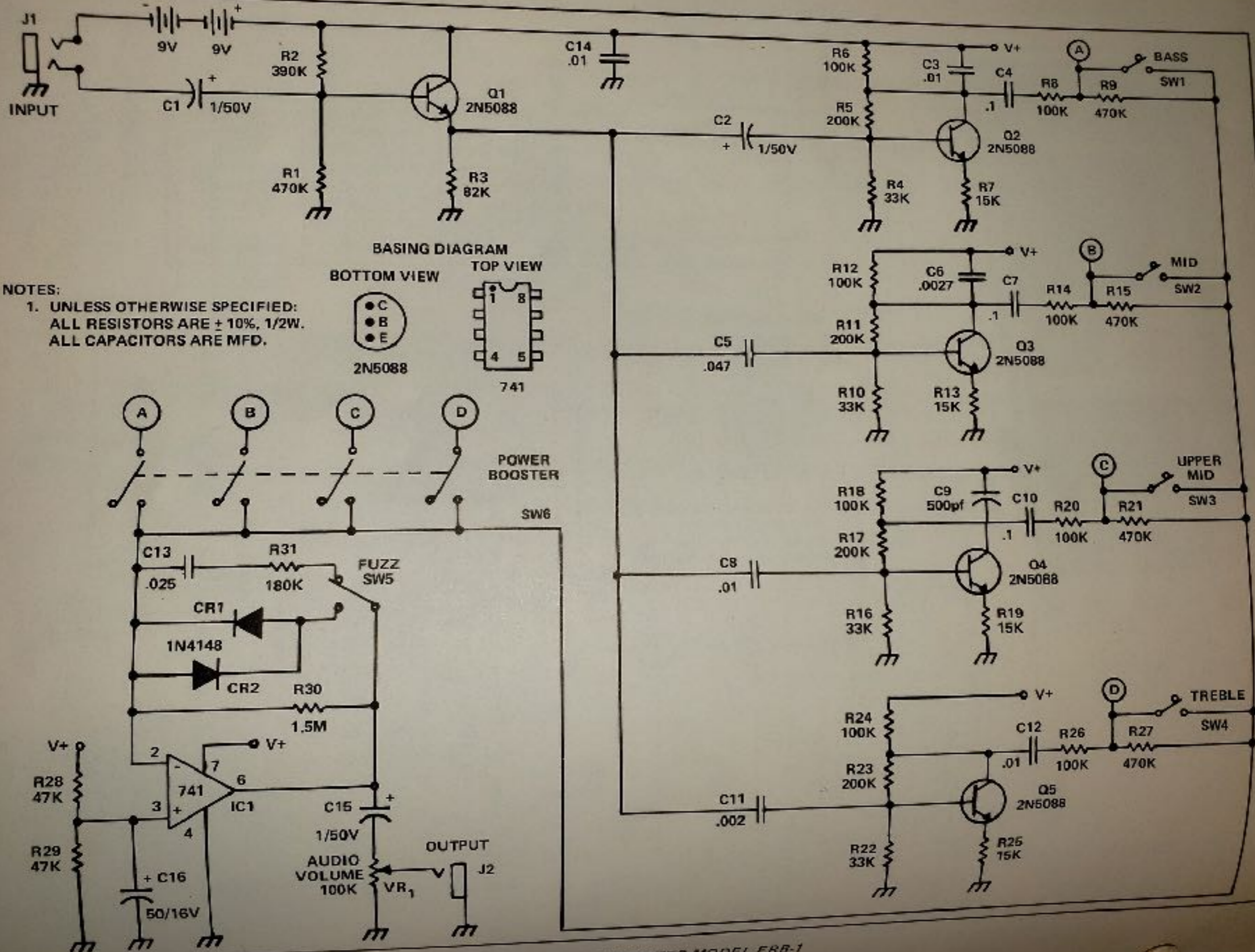


2N3391
2N3392
BOTTOM VIEW

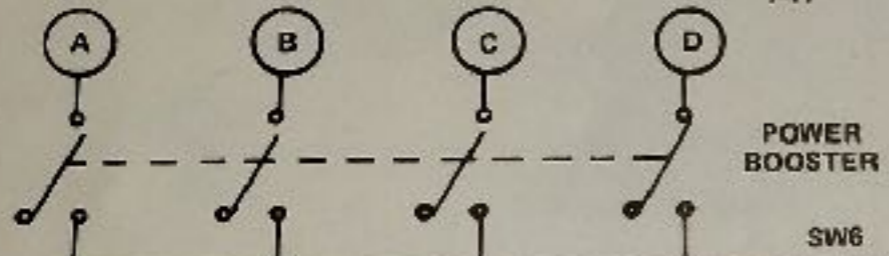
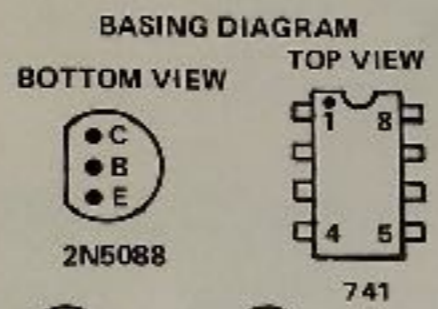
REF DESIG	PART NO.	DESCRIPTION
L1	939-043247-001	Lamp, Mura 0312
P1 thru P3	948-043835-001	Photocell, National 3872
Q1 thru Q6	991-041067-001	Transistor, 2N3391
Q7 thru Q11	991-042017-001	Transistor, 2N3392
SW1	960-040127-001	Switch, SPDT, Push
VR1	925-043830-001	Potentiometer, Dual Linear, 30K
VR2, VR3	925-040261-001	Potentiometer, Linear, 50K



FUZZ PHAZZER MODELS FP-2 AND FP-3 (VERSIONS 2 AND 3)



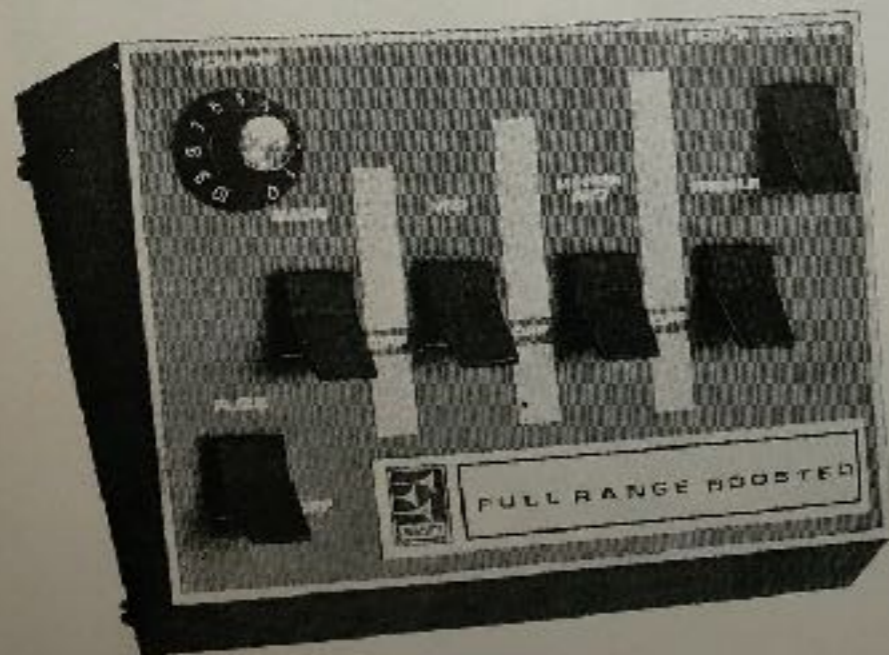
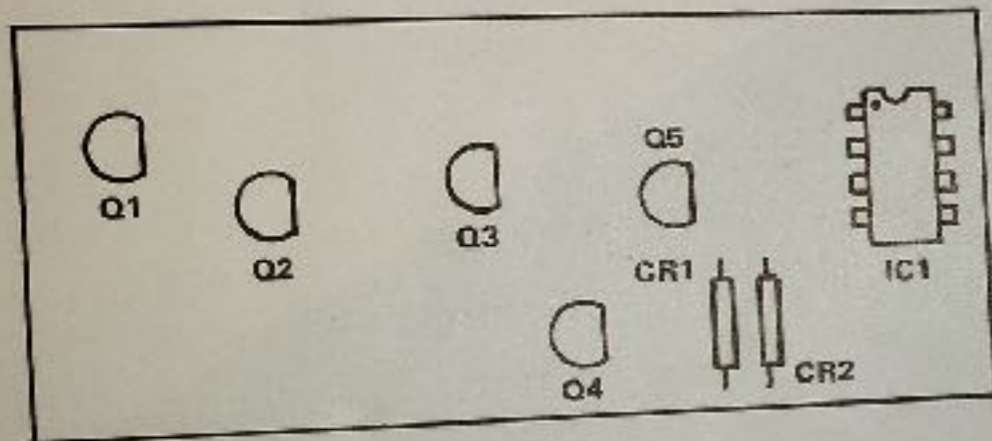
NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS ARE $\pm 10\%$, 1/2W.
 ALL CAPACITORS ARE MFD.



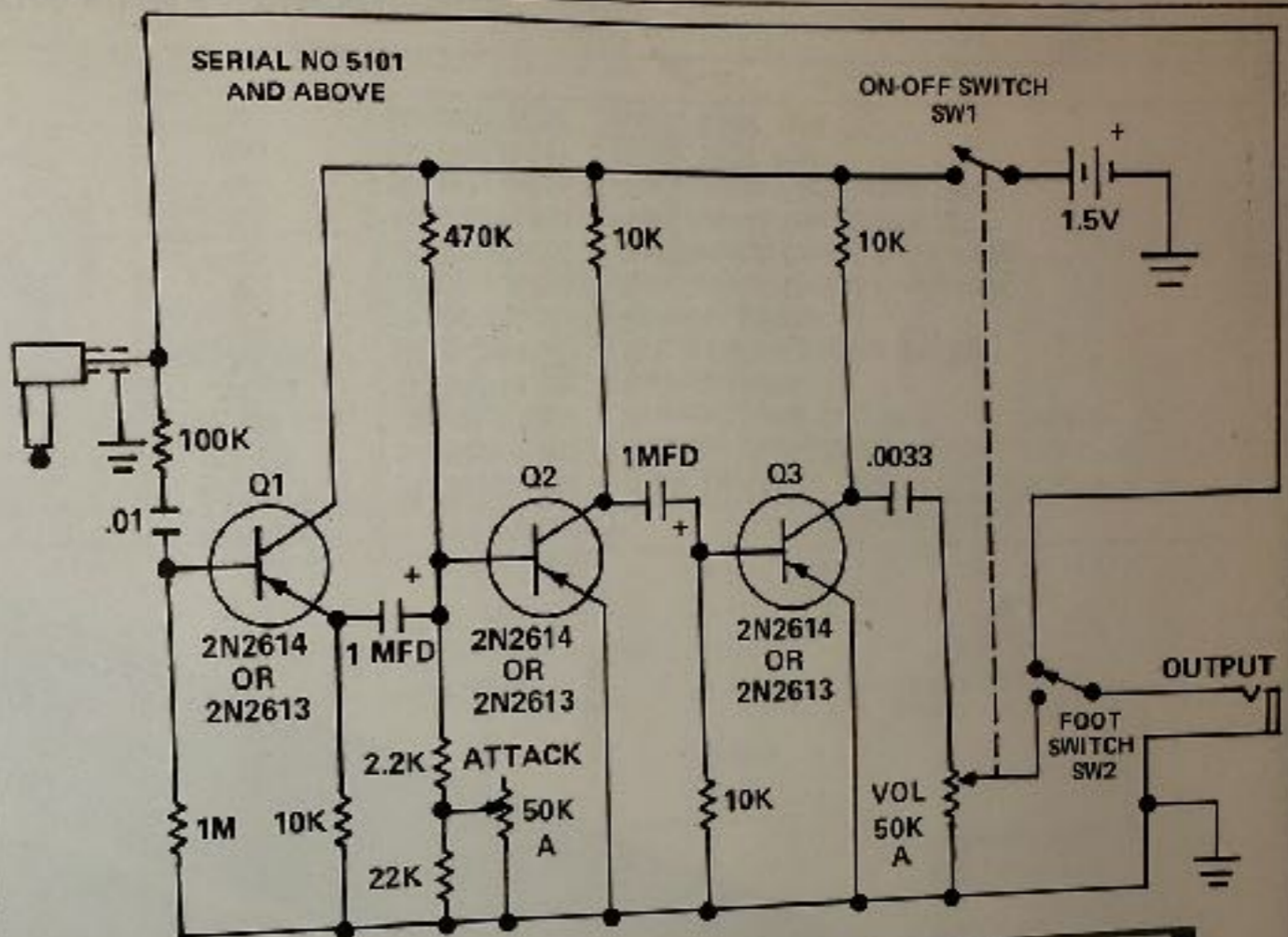
FULL RANGE BOOSTER MODEL FRB-1

REF DESIG	PART NO.	DESCRIPTION
CR1, CR2	919-041075-001	Diode, 1N4148
IC1	991-041101-001	Integrated Circuit, 741
J1	910-041306-004	Jack, .250", 3 Conductor
J2	910-041306-001	Jack, .250", 2 Conductor
Q1 thru Q5	991-043180-001	Transistor, 2N5088
SW1 thru SW5	960-043048-001	Switch, Slide with Toggle Handle, SPDT
SW6	960-043849-001	Switch, Slide with Toggle Handle, 4PDT
VR1	925-043256-001	Potentiometer, Audio, 10K

P.C. BOARD

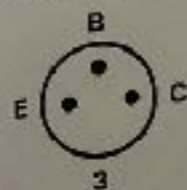


FULL RANGE BOOSTER MODEL FRB-1



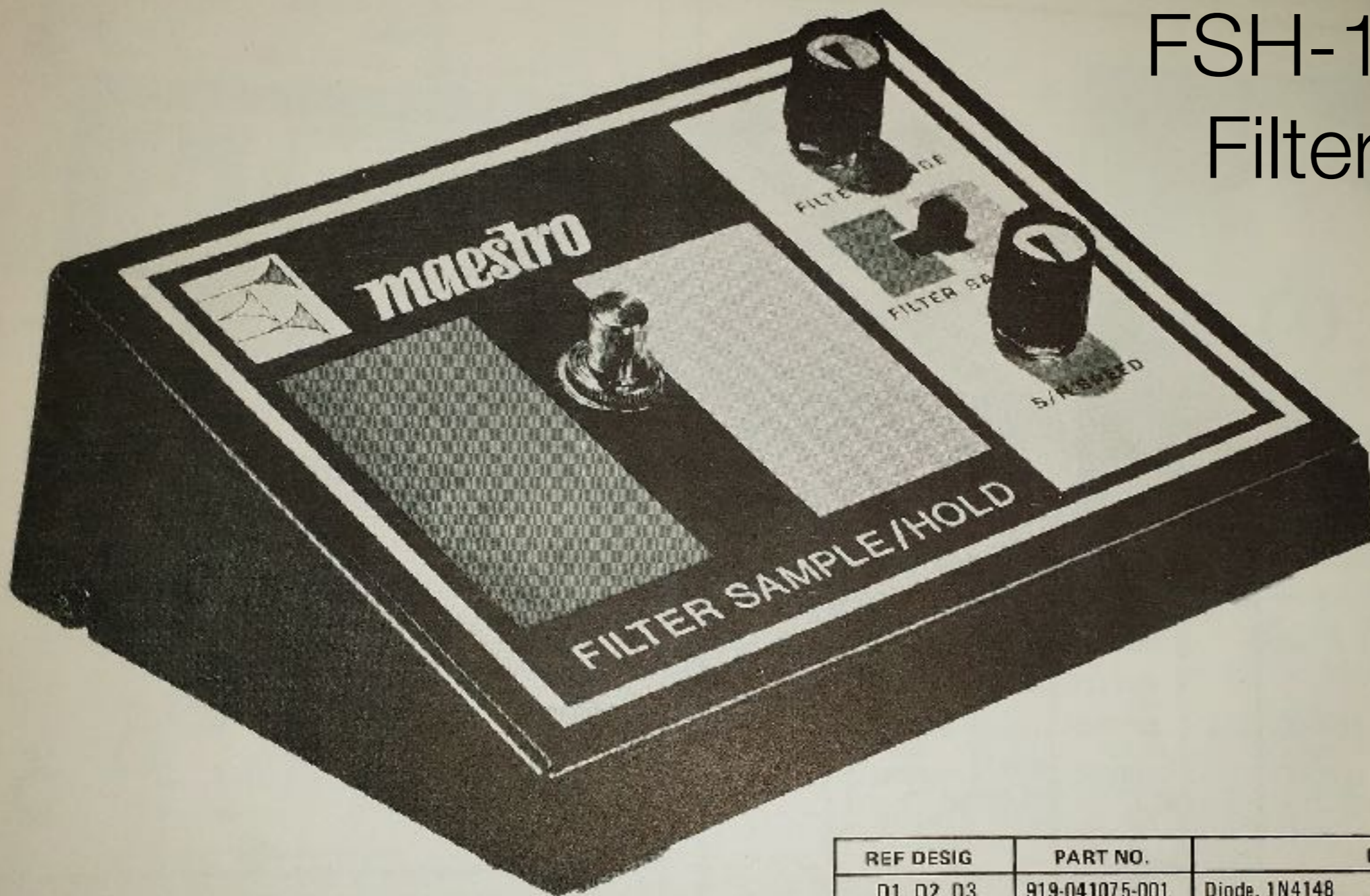
ALL TRANSISTORS, PART NO.
991-043350-001, 2N2614
OR 2N2613

BASING DIAGRAM
BOTTOM VIEW

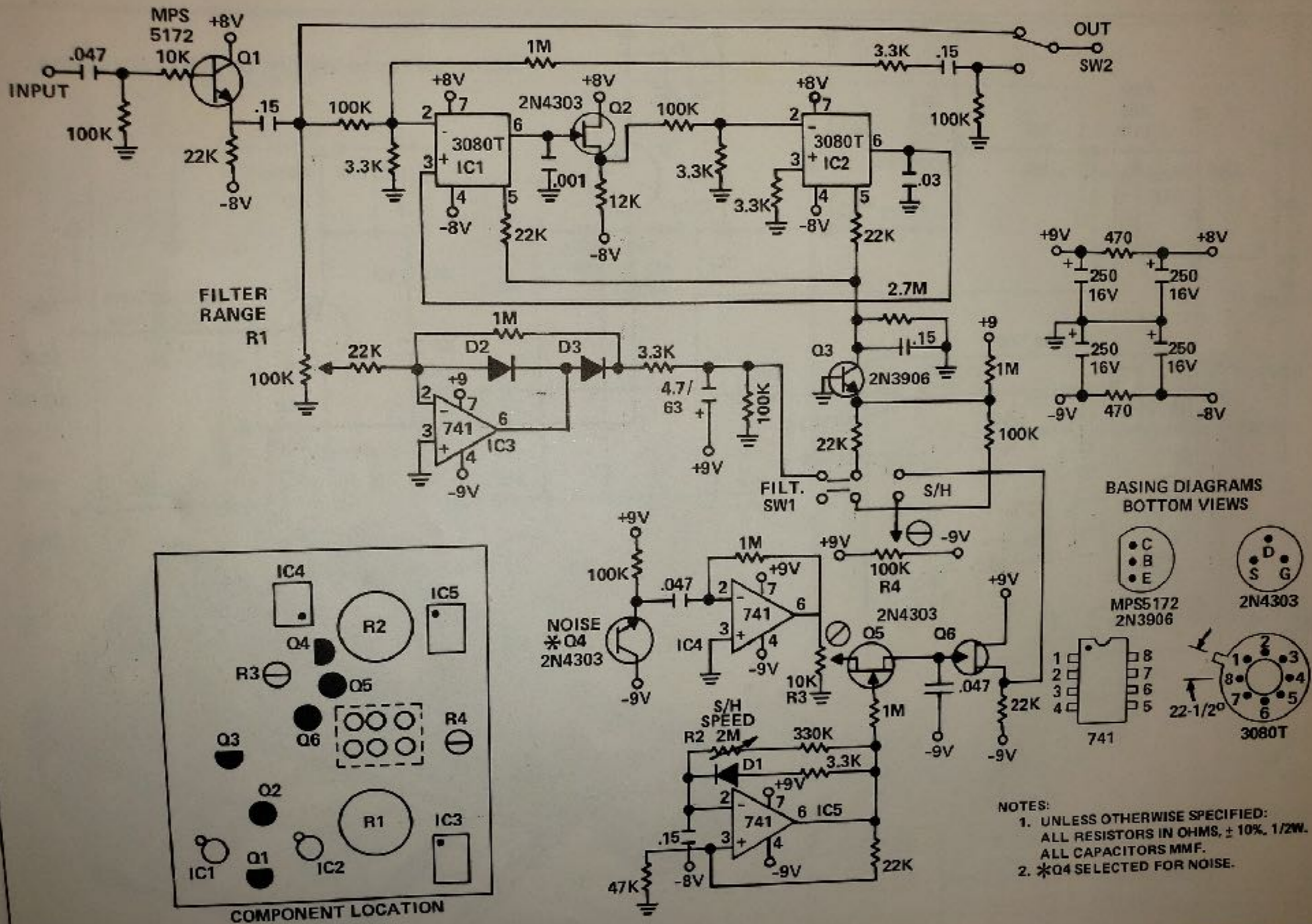


FUZZ TONE MODEL FZ-1A

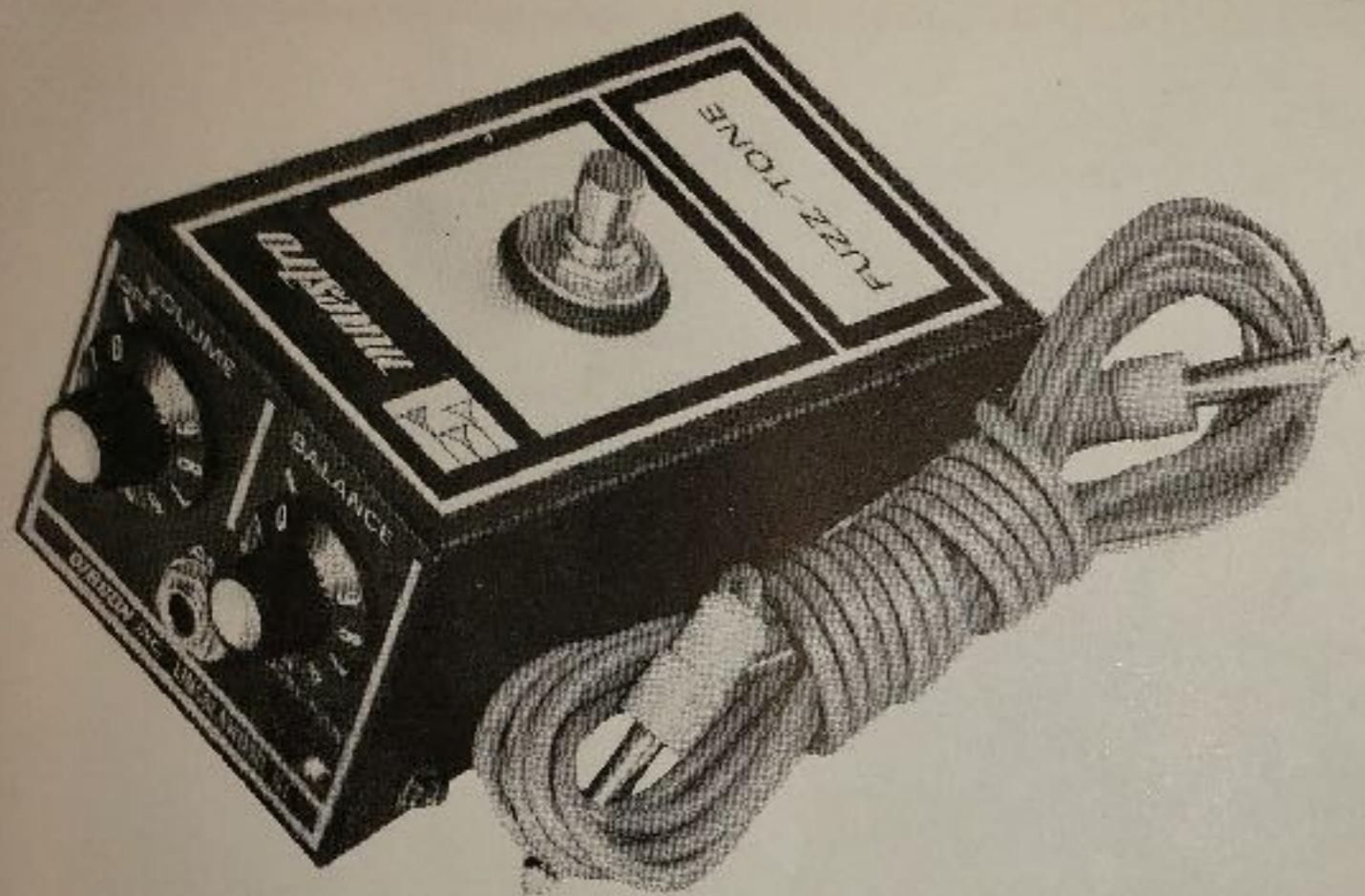
FSH-1A Filter



REF DESIG	PART NO.	DESCRIPTION
D1, D2, D3	919-041075-001	Diode, 1N4148
IC1, IC2	991-041089-001	Integrated Circuit, 3080T
IC3, IC4, IC5	991-041101-001	Integrated Circuit, 741
Q1, Q4	991-043151-001	Transistor, MPS5172
Q2, Q5, Q6	991-041064-001	FET, N-Channel Junction, 2N4303
Q3	991-041052-001	Transistor, 2N3906
R1	925-043836-001	Potentiometer, Control, Linear, 100K
R2	925-043000-001	Potentiometer, Control, Audio, 2 Meg
R3	925-040275-004	Potentiometer, Trim, Carbon, 10K
R4	925-040275-001	Potentiometer, Trim, Carbon, 100K
SW1	960-040127-001	Switch, SPDT, Push
SW2	960-043044-001	Switch, DPDT, Slide

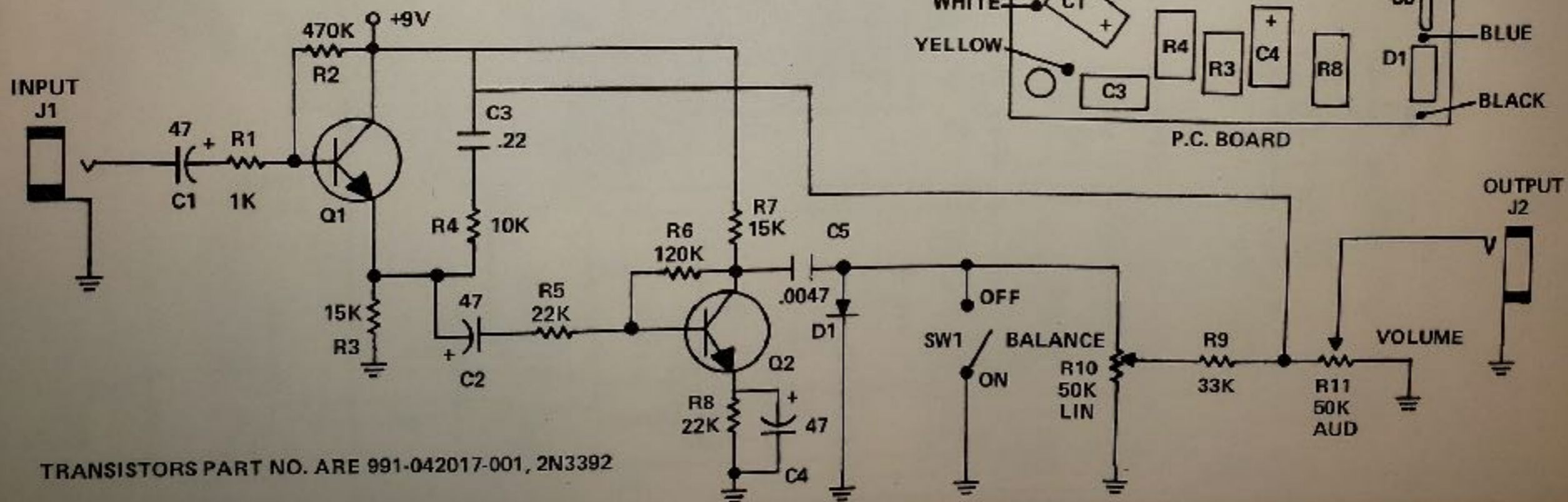
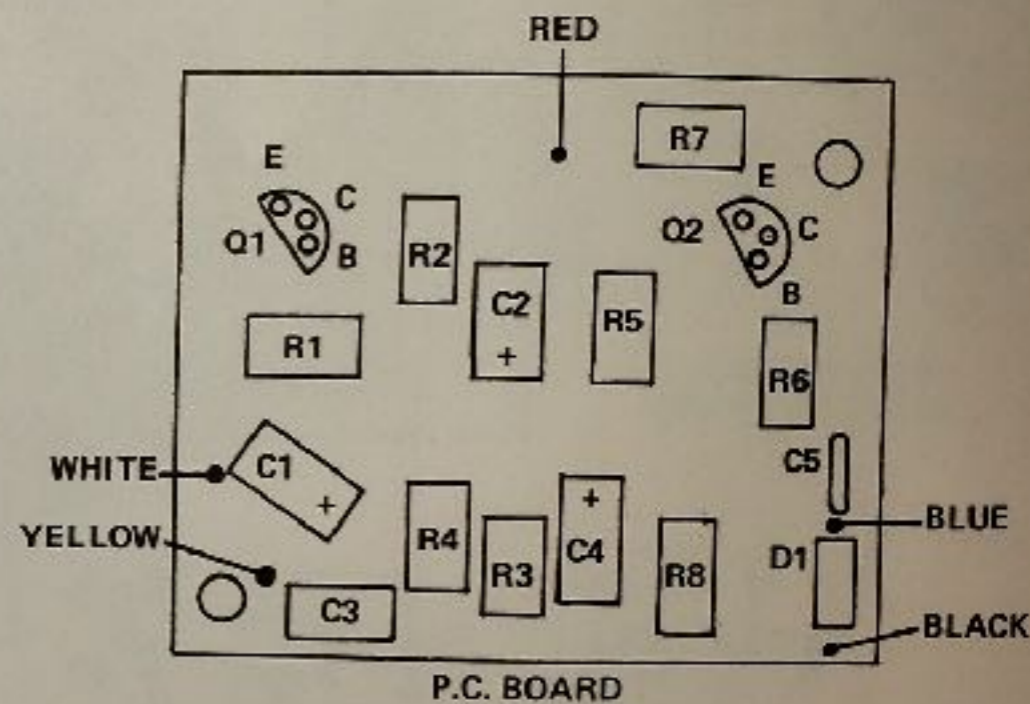
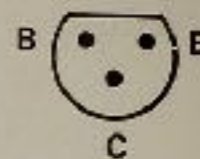


FILTER - SAMPLE AND HOLD MODEL FSH-1A

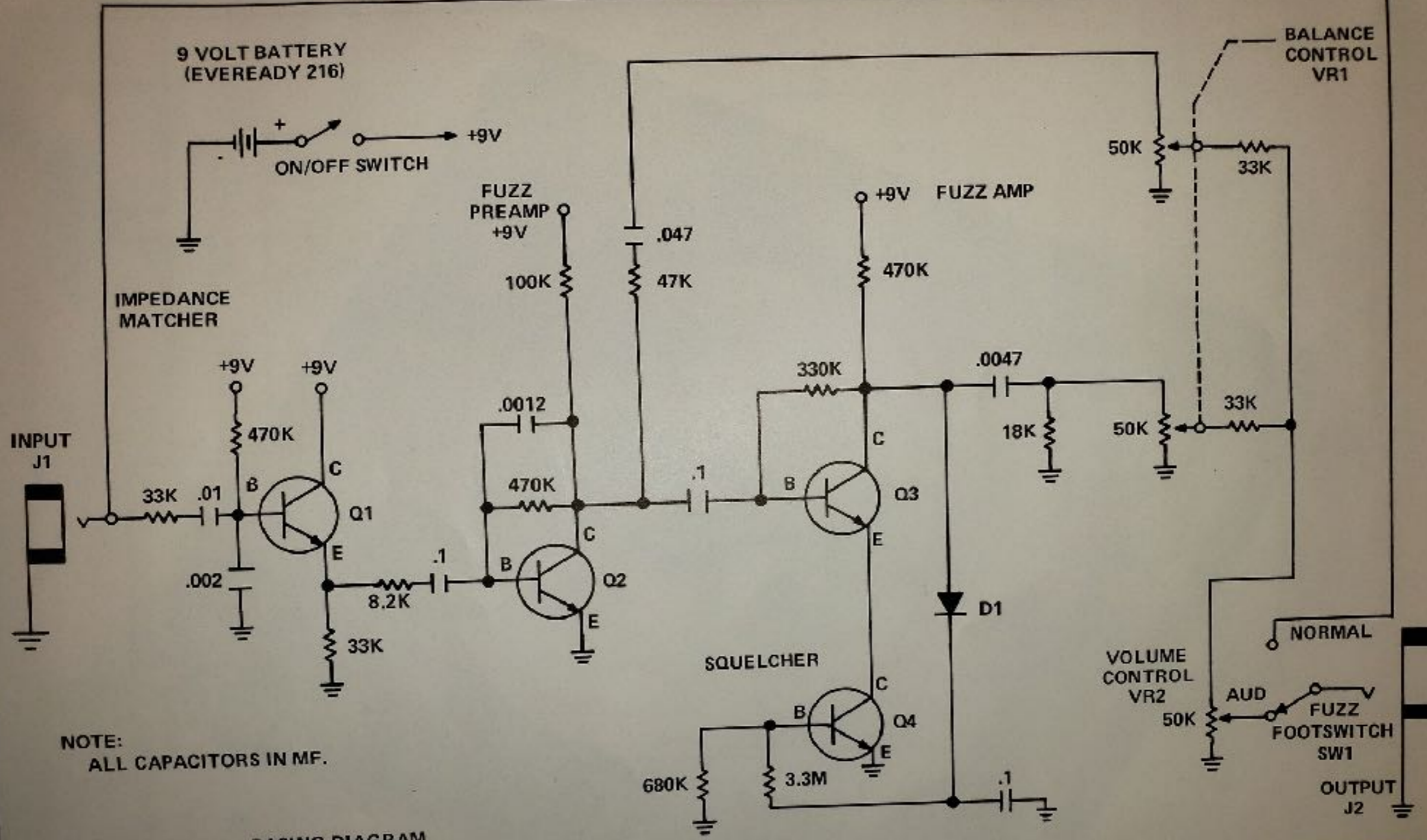


BASING DIAGRAM

TOP VIEW



TRANSISTORS PART NO. ARE 991-042017-001, 2N3392



NOTE:
ALL CAPACITORS IN MF.

BASING DIAGRAM

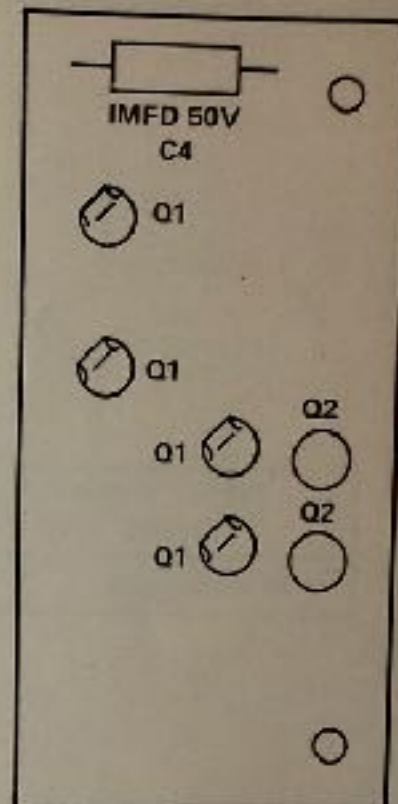
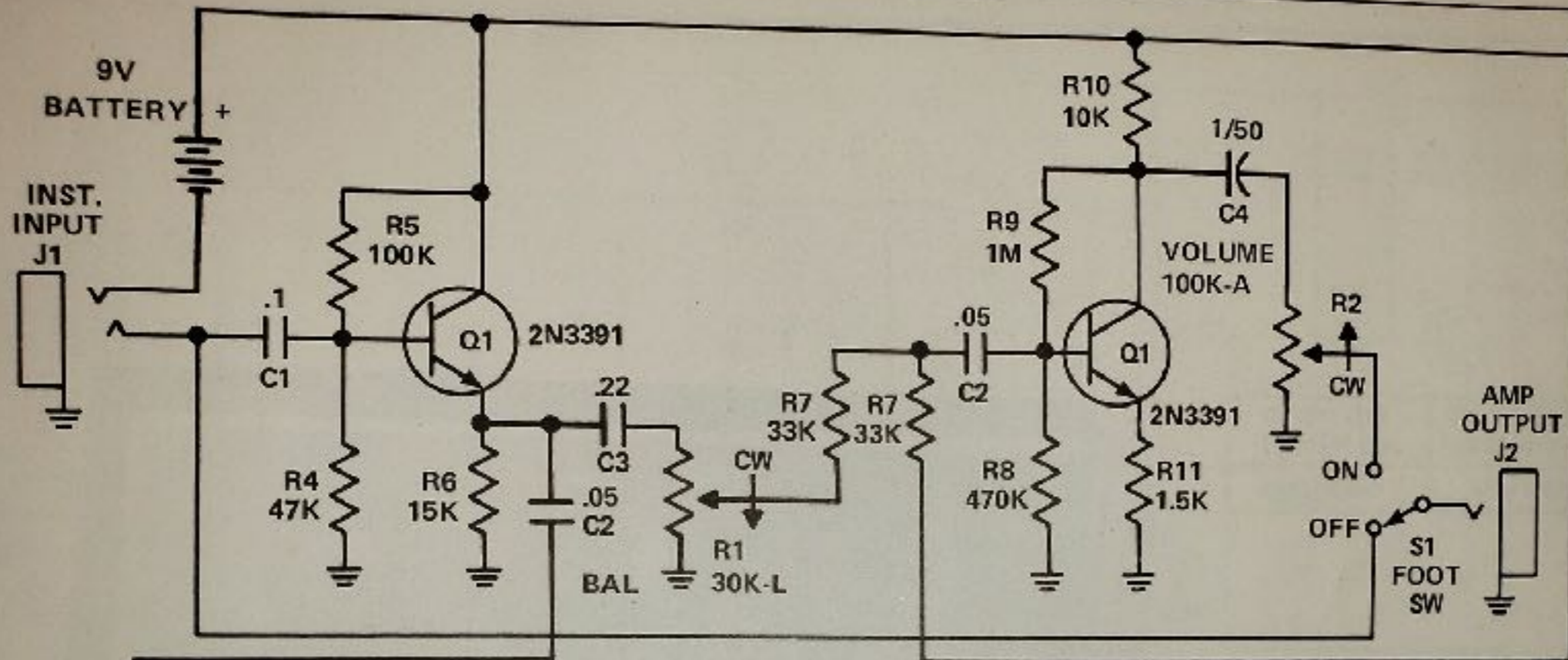


REF DESIG	PART NO.	DESCRIPTION
D1	919-042321-001	Diode, 1N457A
Q1 thru Q4	991-042017-001	Transistor, 2N3392
SW1	960-044605-002	Footswitch

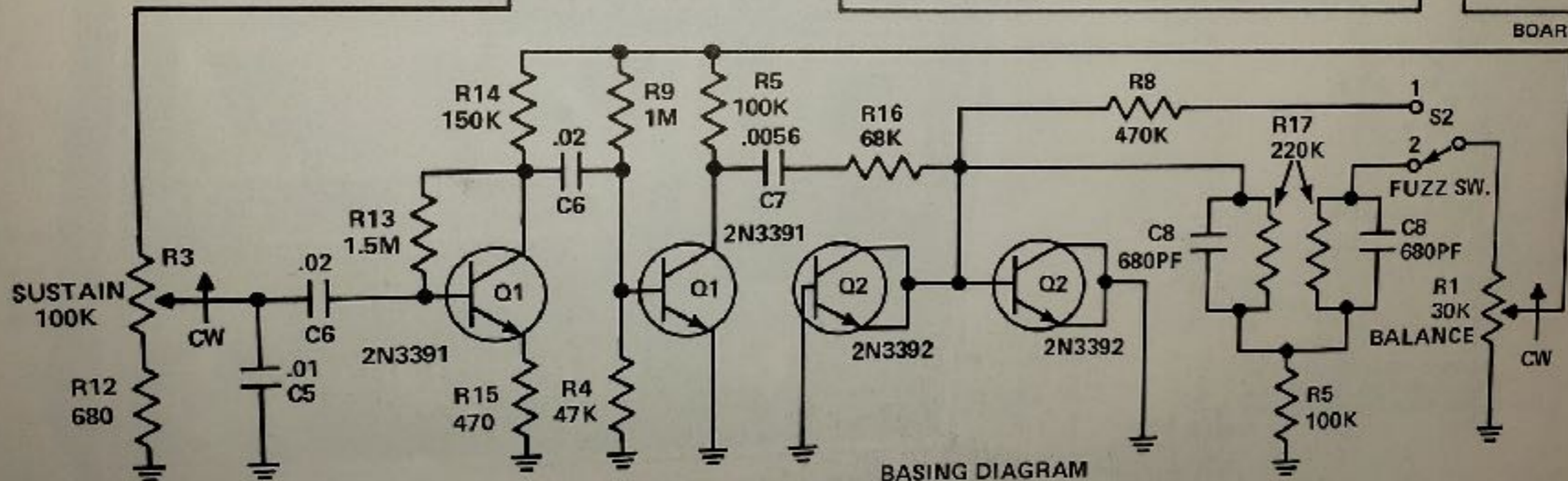
FUZZ TONE MODEL FZ-1B (VERSION 2)



SUPER FUZZ MODEL FZ-15



BOARD TOP VIEW



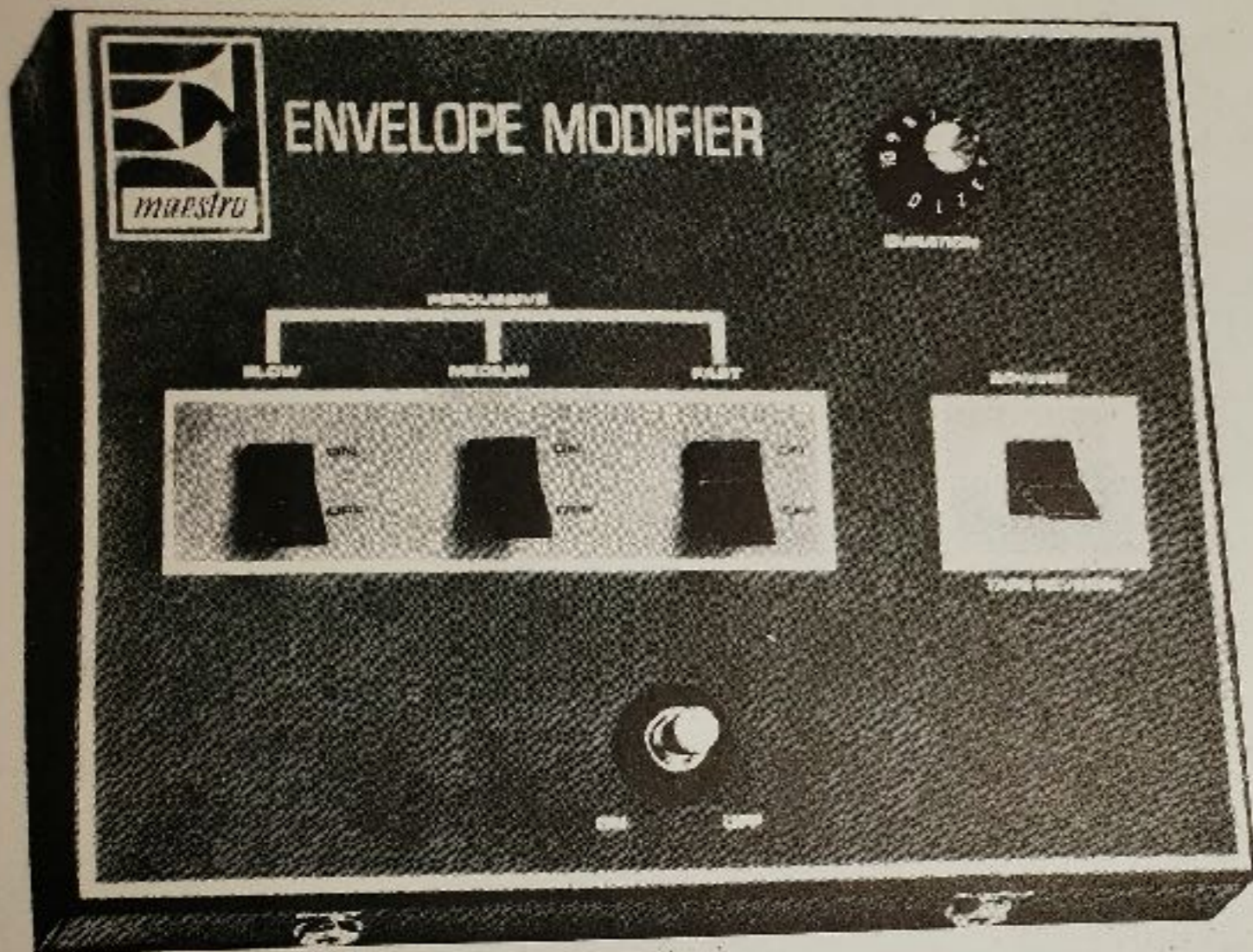
BASING DIAGRAM
BOTTOM VIEW



2N3391
2N3392

REF DESIG	PART NO.	DESCRIPTION
Q1	991-041067-001	Transistor, 2N3391
Q2	991-042017-001	Transistor, 2N3392
R1	925-043002-001	Resistor, Variable, 30K, Dual Linear
R2	925-043003-001	Resistor, Variable, 100K, Audio
R3	925-043001-001	Resistor, Variable, 100K, Linear
S1	960-040127-001	Switch, Push, SPDT
S2	960-042136-001	Switch, Slide, SPDT

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS IN OHMS. $\pm 10\%$, 1/2W.
ALL CAPACITORS IN MFD.



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS IN OHMS, 1/2W, $\pm 10\%$.
ALL CAPACITORS IN MFD.

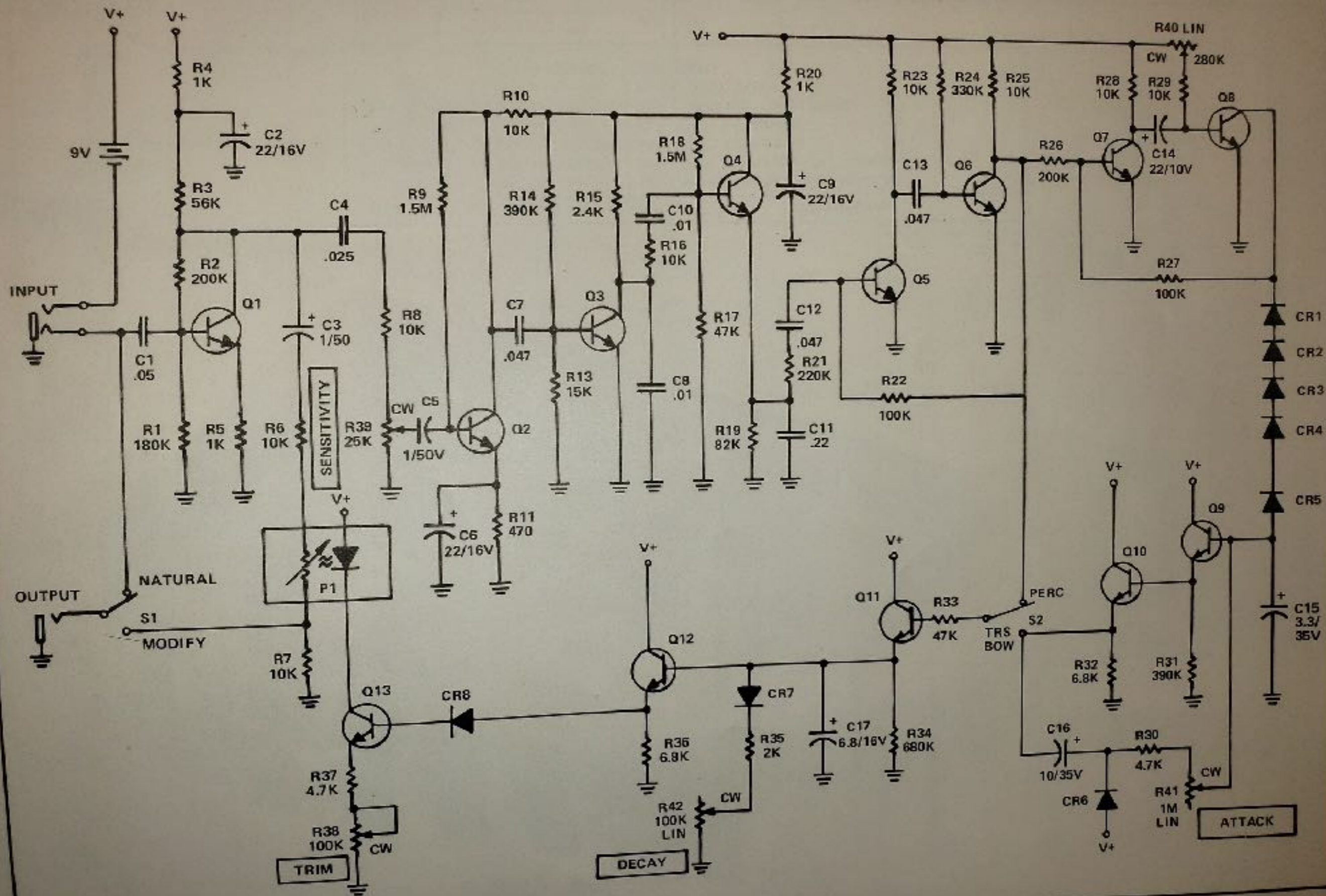
ME-1

BASING DIAGRAM
BOTTOM VIEW

Envelope



REF DESIG	PART NO.	DESCRIPTION
CR1 thru CR7	919-041075-001	Diode, 1N4148
Q1 thru Q13	991-043025-001	Transistor, 2N3566

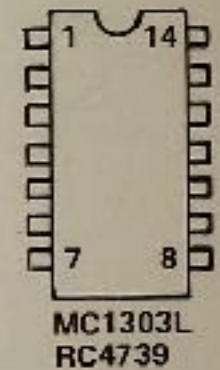


ENVELOPE MODIFIER MODEL ME-1

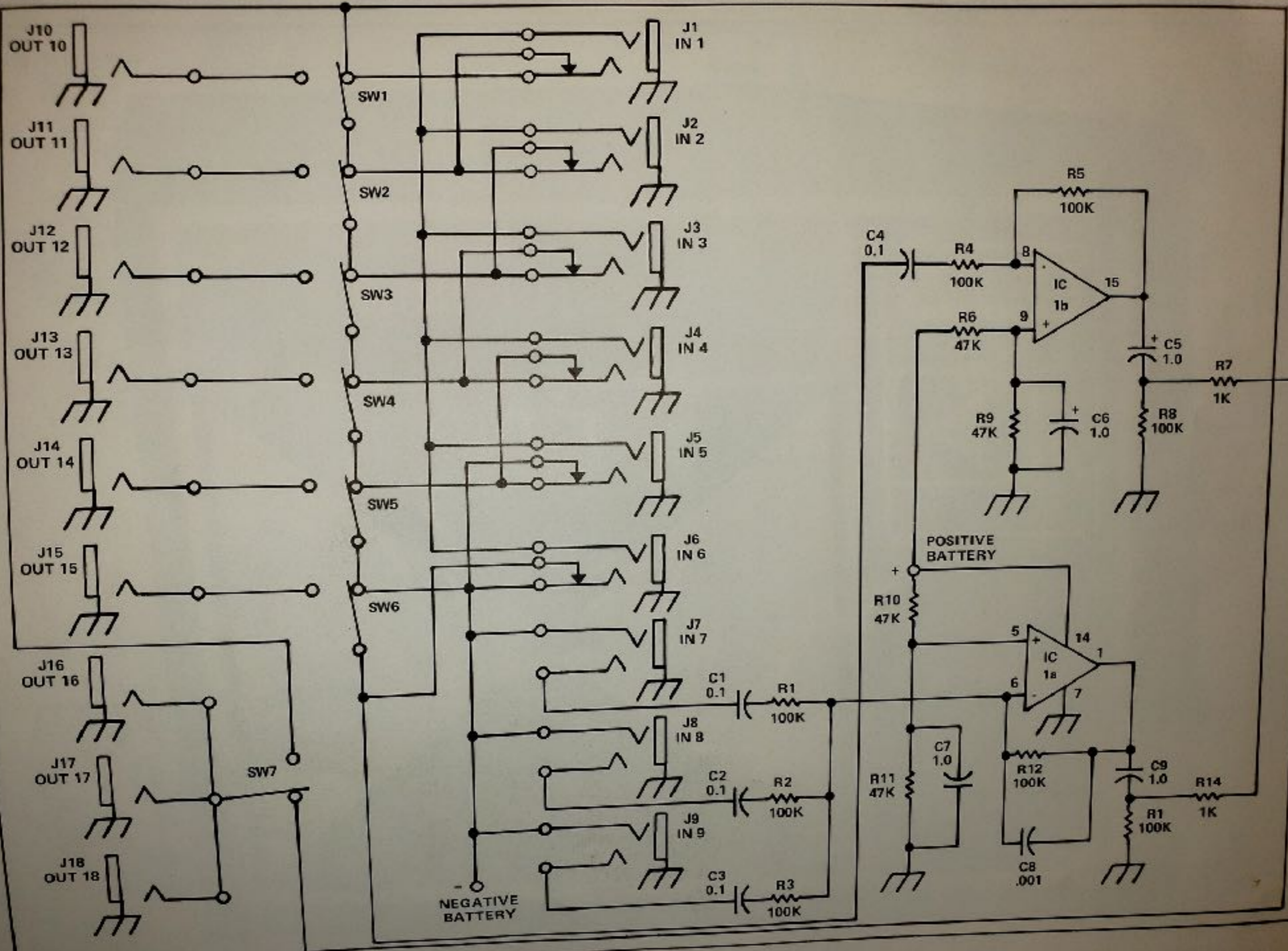


NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS $\pm 10\%$, 1/2W.
 ALL CAPACITORS IN MFD.

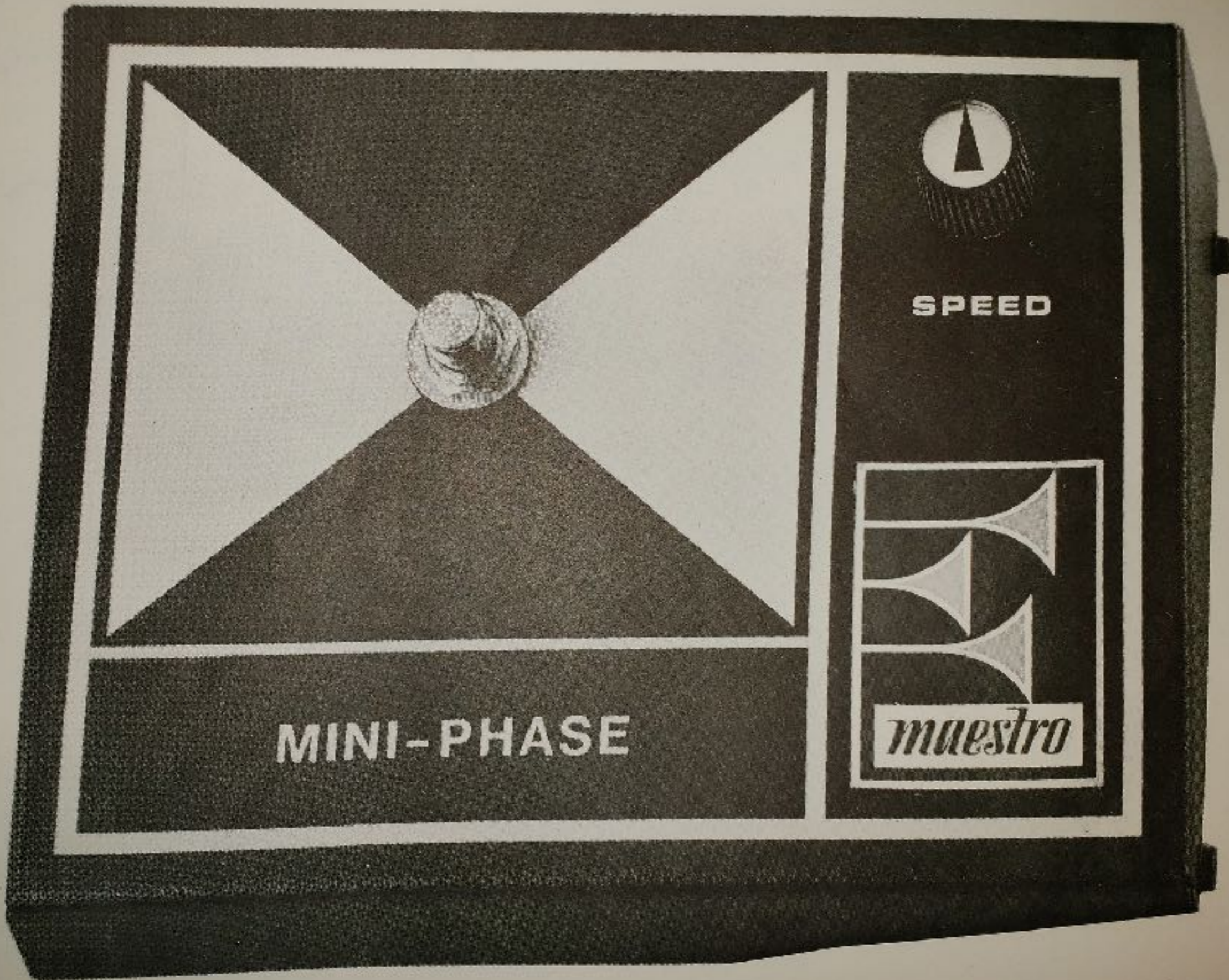
COMPONENT BASING
 TOP VIEW



REF DESIG	PART NO.	DESCRIPTION
IC1	991-043036-001	Integrated Circuit, MC1303L (RCA739)
J1 thru J6	910-041306-008	Jack, .250", 3 Conductor, N.C. Switch
J7 thru J9	910-041306-004	Jack, .250", 3 Conductor
J10 thru J18	910-041306-001	Jack, .250", 2 Conductor
SW1 thru SW6	960-043048-001	Switch, Slide with Toggle Handle
SW7	960-040127-001	Switch, SPDT, Push
	935-041601-001	Battery Clip



MAESTRO MULTIPLIER MODEL MM-1



MINI-PHASE

SPEED



MINI PHASE SHIFTER MODEL MPS-2

BASING DIAGRAMS

BOTTOM VIEWS

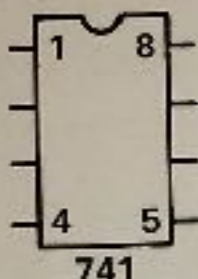


TIS97



2N4303

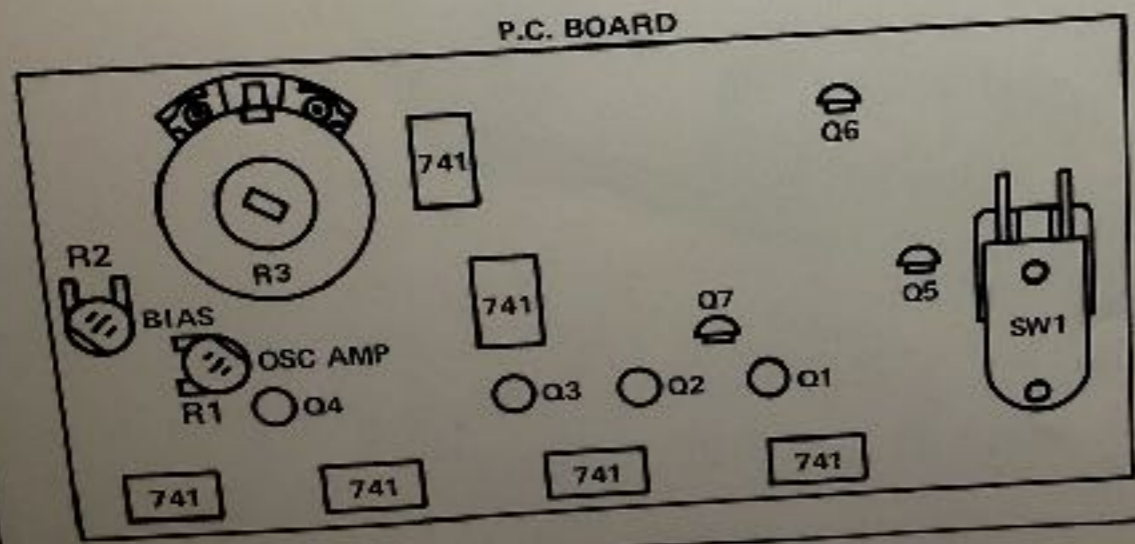
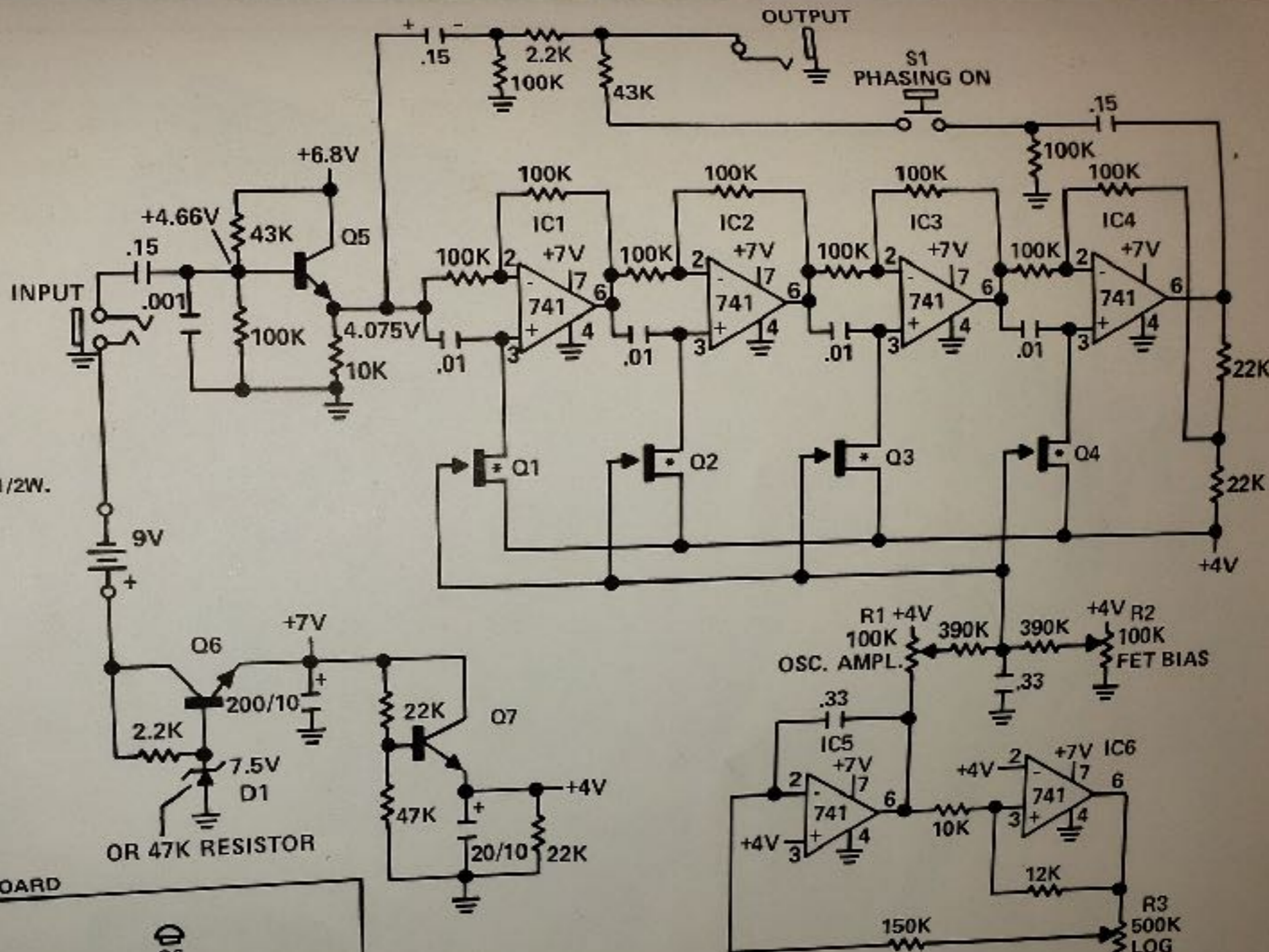
TOP VIEW



741

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS IN OHMS, $\pm 5\%$, 1/2W.
ALL CAPACITORS IN MFD.
2. * Q1 THRU Q4 SELECTED.



REF DESIG	PART NO.	DESCRIPTION
D1	919-043007-001	Diode, Zenner, 7.5V, 1N755A
IC1 thru IC6	991-041101-001	Amplifier, Operational, SN72741
Q1 thru Q4	991-043005-001	Transistor, Matched Set, 2N4303
Q5 thru Q7	991-041265-001	Transistor, TIS97
R1, R2	925-040281-006	Resistor, Variable, 100K
R3	925-043006-001	Resistor, Variable, 500K
S1	960-043004-001	Switch, Push, SPST

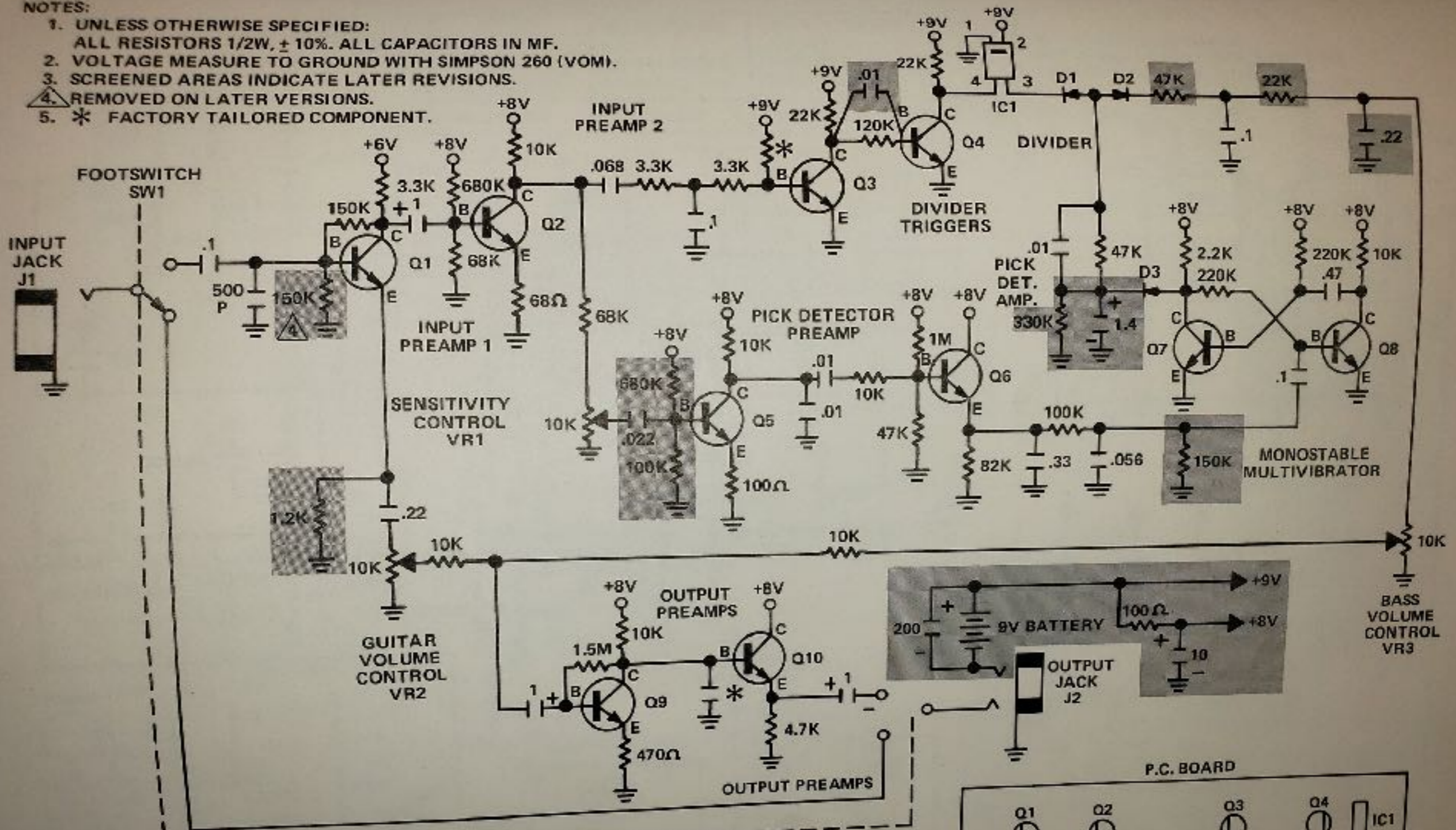
MINI PHASE SHIFTER MODEL MPS-2



OCTAVE BOX MODEL OB-1 (VERSION 1)

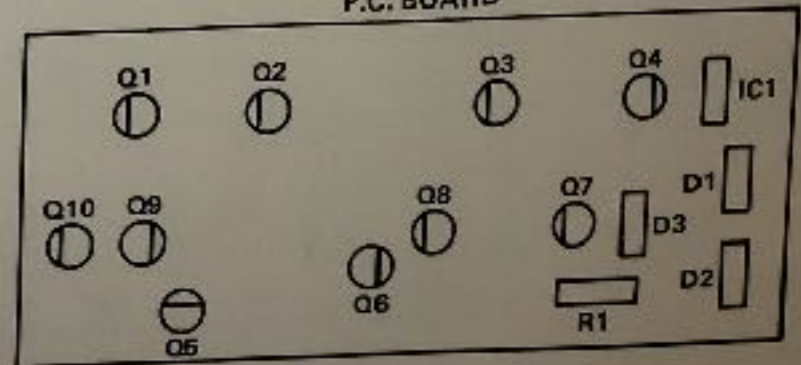
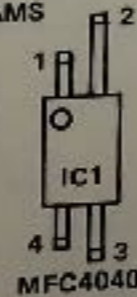
NOTES:

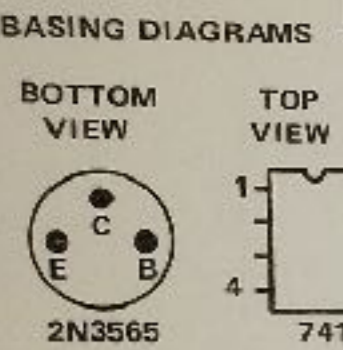
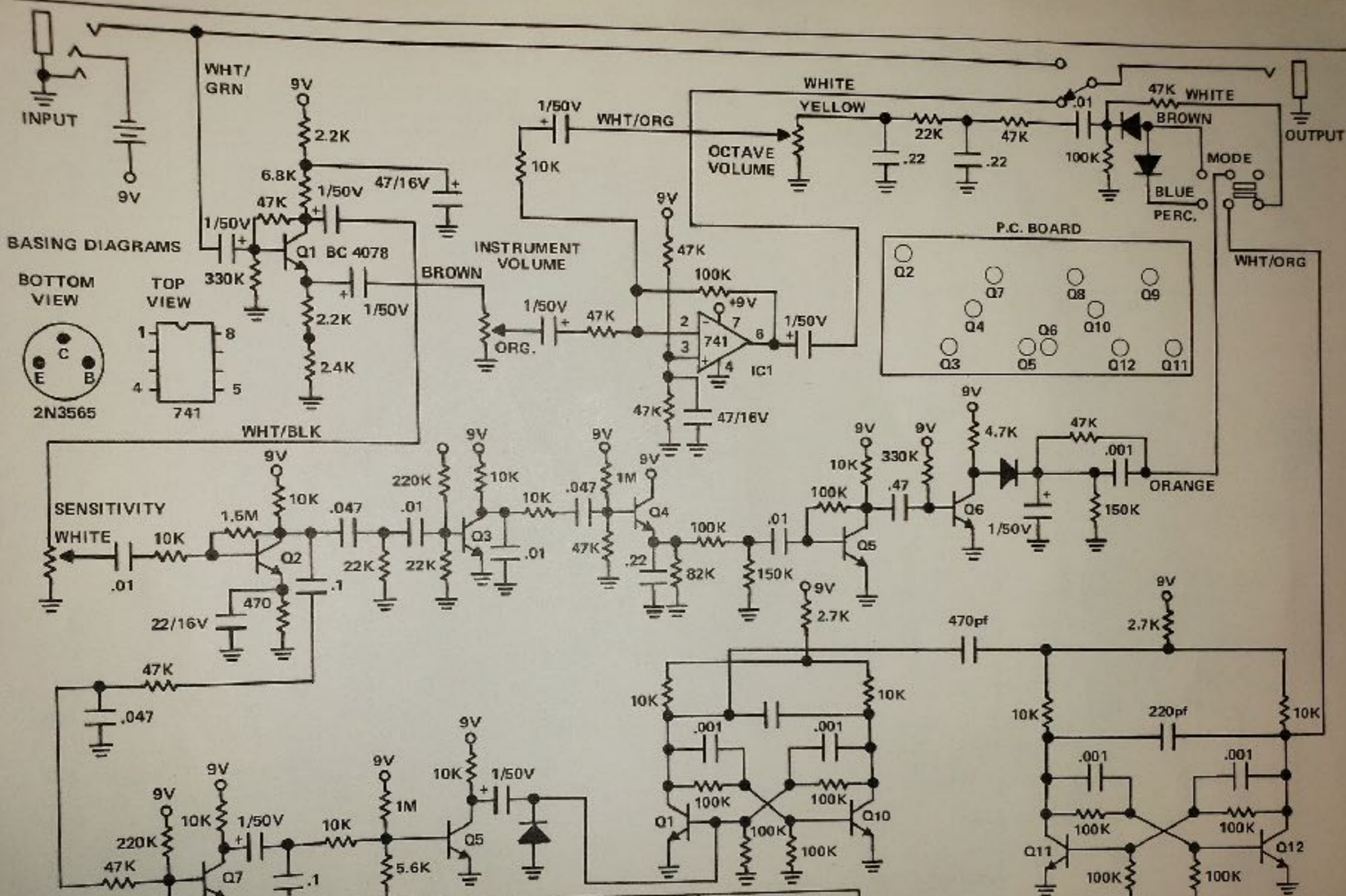
1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS 1/2W, ± 10%. ALL CAPACITORS IN MF.
2. VOLTAGE MEASURE TO GROUND WITH SIMPSON 260 (VOM).
3. SCREENED AREAS INDICATE LATER REVISIONS.
4. REMOVED ON LATER VERSIONS.
5. * FACTORY TAILORED COMPONENT.



REF DESIG	PART NO.	DESCRIPTION
D1 thru D3	991-041075-001	Diode, 1N4148
IC1	991-043837-001	Divider, Integrated Circuit
Q1 thru Q10	991-042017-001	Transistor, 2N3392
SW1	960-040042-001	Switch, Push, DPDT
VR1	925-043246-001	Potentiometer, 10K, Linear
VR2, VR3	925-043256-001	Potentiometer, 10K, Audio

BASING DIAGRAMS



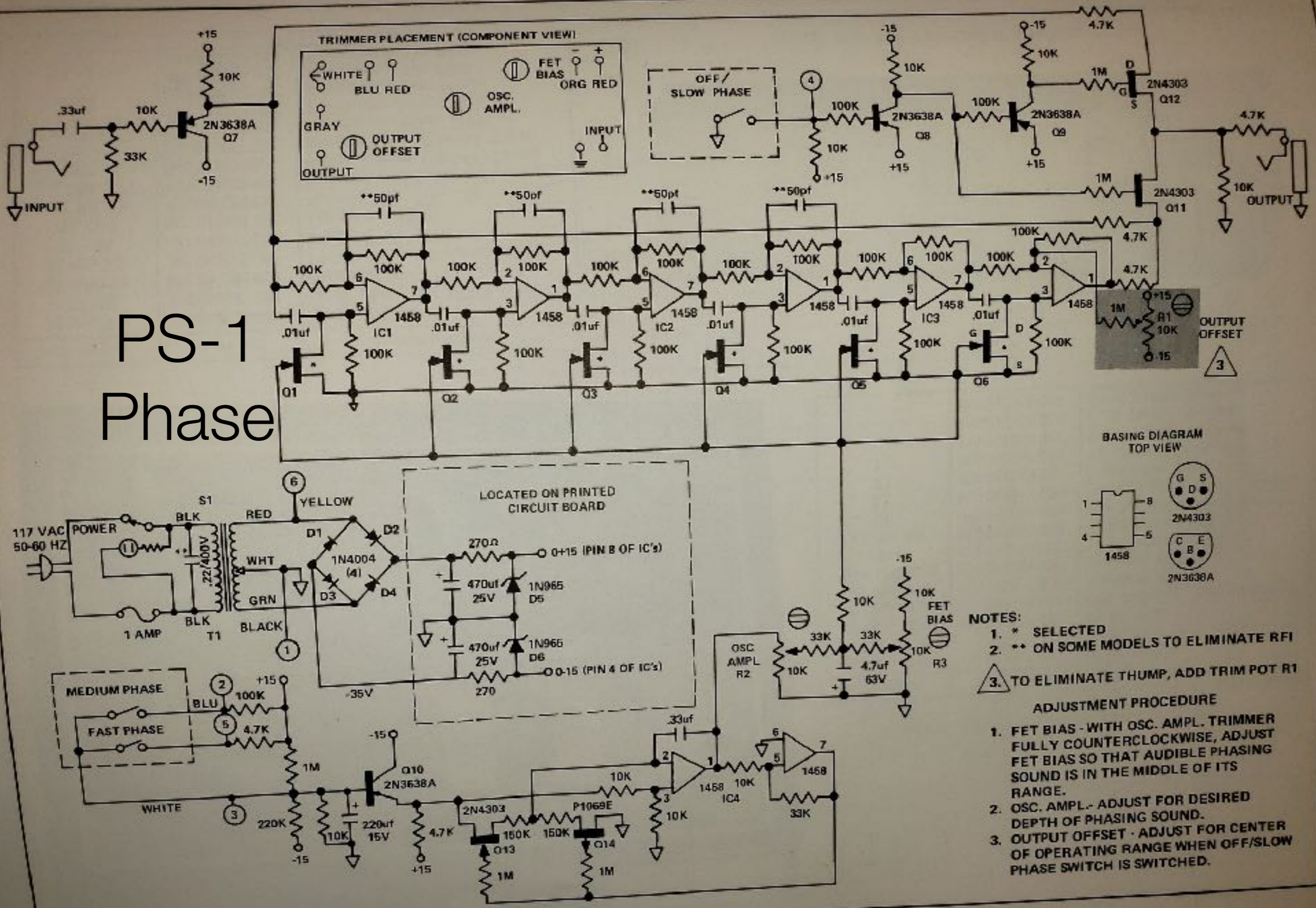


REF DESIG	PART NO.	DESCRIPTION
ALL CR's	919-041075-001	Diode, 1N4148
IC1	991-041101-001	Integrated Circuit, LM741
ALL Q's	991-043025-001	Transistor, 2N3565

NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS IN OHMS, ± 10%, 1/2W.
 ALL CAPACITORS IN MFD.

OCTAVE BOX MODEL OB-2 (VERSION 2)

PS-1 Phase

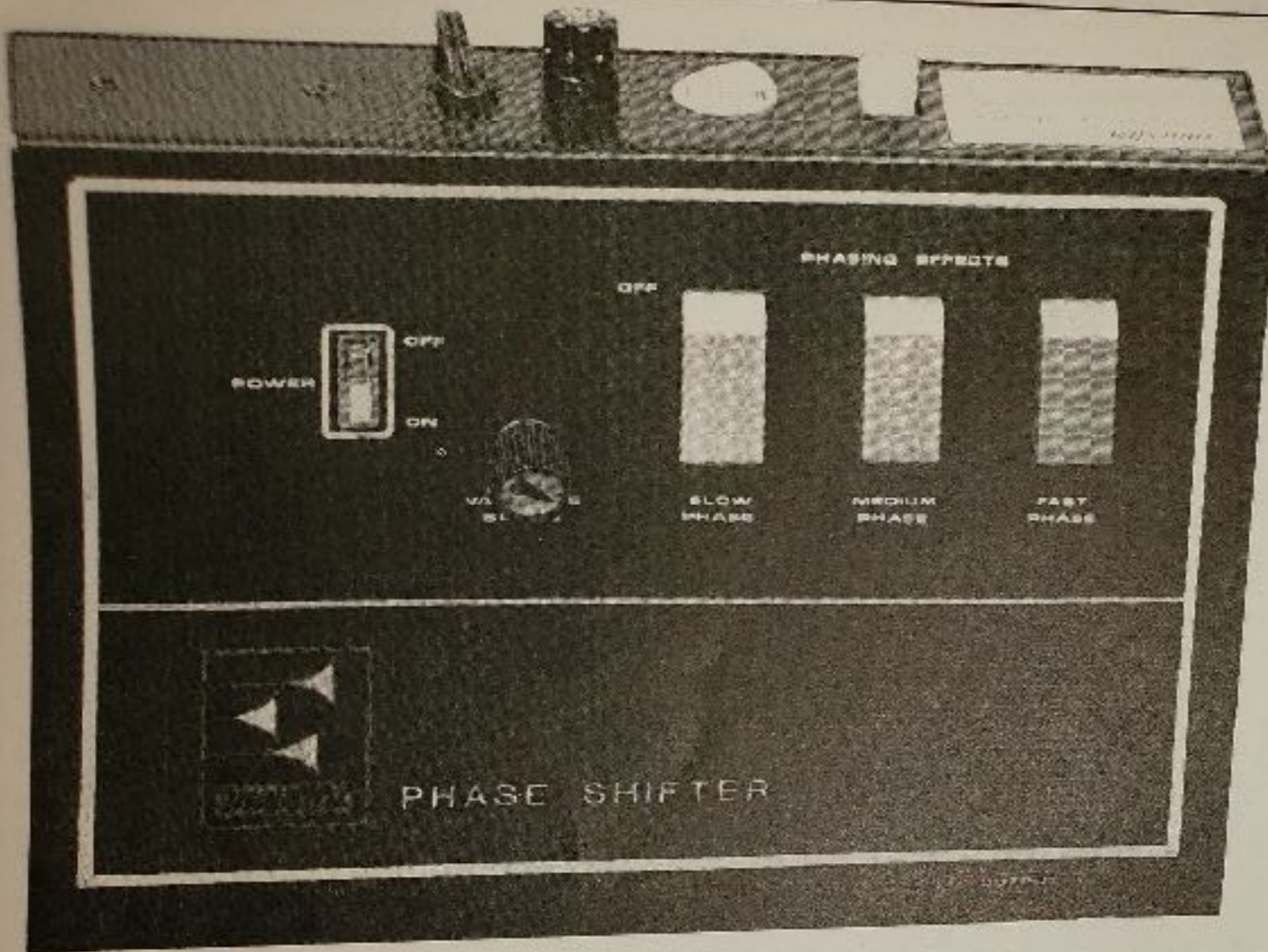


- NOTES:**
1. * SELECTED
 2. ** ON SOME MODELS TO ELIMINATE RFI
 3. TO ELIMINATE THUMP, ADD TRIM POT R1

ADJUSTMENT PROCEDURE

1. FET BIAS - WITH OSC. AMPL. TRIMMER FULLY COUNTERCLOCKWISE, ADJUST FET BIAS SO THAT AUDIBLE PHASING SOUND IS IN THE MIDDLE OF ITS RANGE.
2. OSC. AMPL. - ADJUST FOR DESIRED DEPTH OF PHASING SOUND.
3. OUTPUT OFFSET - ADJUST FOR CENTER OF OPERATING RANGE WHEN OFF/SLOW PHASE SWITCH IS SWITCHED.

PHASE SHIFTER MODEL PS-1 (VERSION 1)



PHASE SHIFTER MODEL PS-1 (VERSION 1)

REF DESIG	PART NO.	DESCRIPTION
D1 thru D4	919-042019-001	Diode, 1N4004
D5, D6	919-043021-001	Diode, Zener, 15V, 1N965
IC1 thru IC4	991-041102-001	IC, MC1458C
Q1 thru Q6	991-043005-001	FET, N-Channel, Matched Set of 6
Q7 thru Q10	991-043011-001	Transistor, 2N3638A
Q11, Q12, Q13	991-041064-001	Transistor, 2N4303
Q14	991-043018-001	FET, N-Channel, 2N4360
R1, R2, R3	925-040281-005	Potentiometer, Trim, 10K
S1	960-010075-001	Switch, Lighted, ON/OFF, Rocker
S1	960-043012-001	Switch, Lighted, ON/OFF, Carling
T1	954-043013-001	Transformer, Power, 115V
T1	954-043013-002	Transformer, Power, 230V
	915-043258-001	Knob, Switch Tab, Orange
	915-043258-002	Knob, Switch Tab, Gold
	915-043258-003	Knob, Switch Tab, Aqua

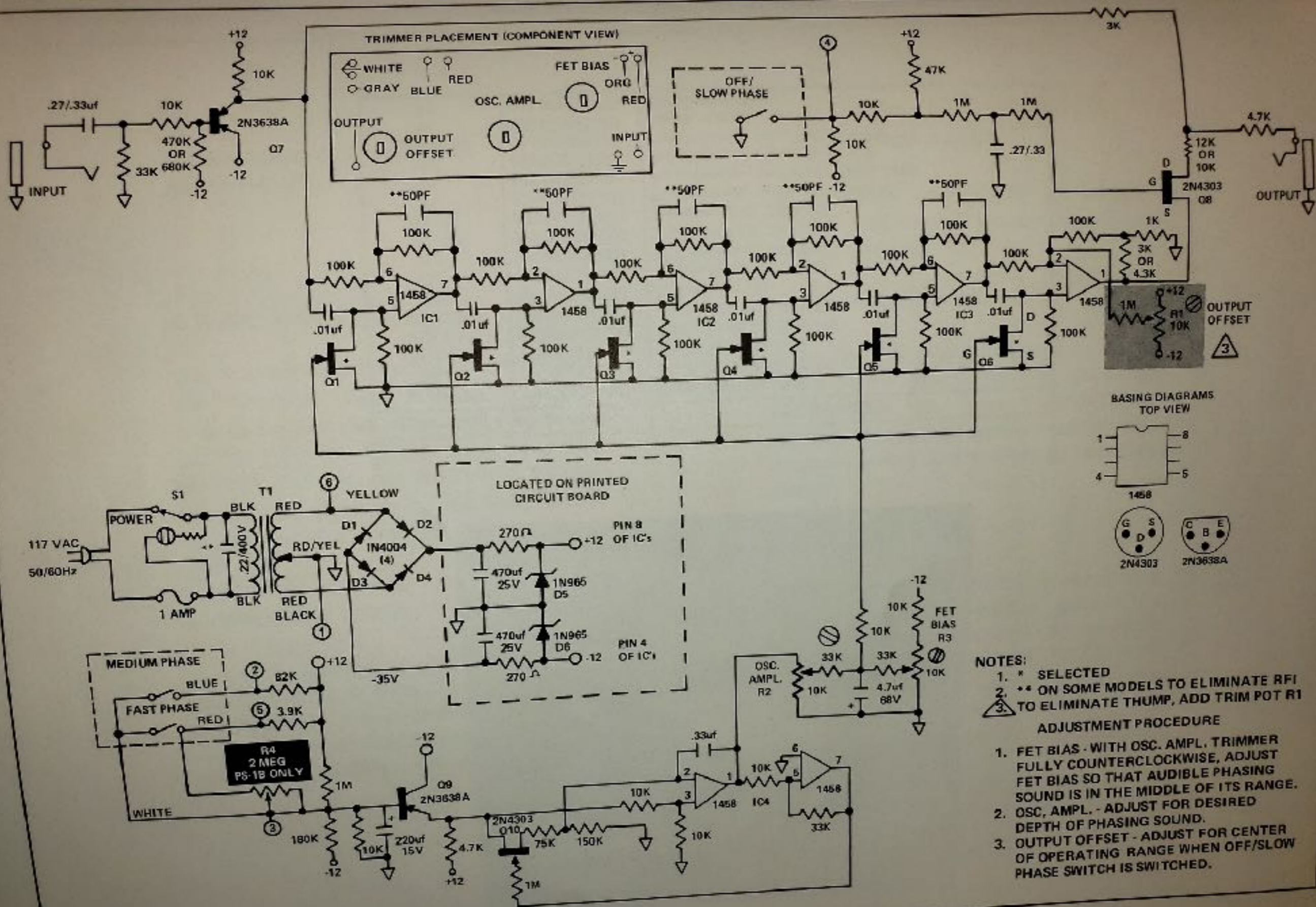
PS-1A

PS-1B

REF DESIG	PART NO.	DESCRIPTION
D1 thru D4	919-042019-001	Diode, 1N4004
D5, D6	919-043021-001	Diode, Zener, 15V, 1N965
IC1 thru IC4	991-041102-001	IC, MC1458C
Q1 thru Q6	991-043005-001	FET, N-Channel, Matched Set of 6
Q7, Q9	991-043011-001	Transistor, 2N3638A
Q8, Q10	991-041064-001	Transistor, 2N4303
R1, R2, R3	925-040281-005	Potentiometer, Trim, 10K
*R4	925-043000-001	Potentiometer, Audio, 2 Meg
S1	960-043012-001	Switch, Lighted, ON/OFF, Carling
S1	960-010075-001	Switch, Lighted, ON/OFF, Rocker
T1	954-043013-001	Transformer, Power, 110V
T1	954-043013-002	Transformer, Power, 230V
	915-043258-001	Knob, Switch Tab, Orange
	915-043258-002	Knob, Switch Tab, Gold
*PS-1B Only	915-043258-003	Knob, Switch Tab, Aqua



PHASE SHIFTER FOOTSWITCH MODEL PSFS-1



- NOTES:**
- 1. * SELECTED
 - 2. ** ON SOME MODELS TO ELIMINATE RFI
 - 3. TO ELIMINATE THUMP, ADD TRIM POT R1
- ADJUSTMENT PROCEDURE**
1. FET BIAS - WITH OSC. AMPL. TRIMMER FULLY COUNTERCLOCKWISE, ADJUST FET BIAS SO THAT AUDIBLE PHASING SOUND IS IN THE MIDDLE OF ITS RANGE.
 2. OSC. AMPL. - ADJUST FOR DESIRED DEPTH OF PHASING SOUND.
 3. OUTPUT OFFSET - ADJUST FOR CENTER OF OPERATING RANGE WHEN OFF/SLOW PHASE SWITCH IS SWITCHED.

PHASE SHIFTER MODELS PS-1A AND PS-1B (VERSIONS 2 AND 3)

RM-1A/B Ring



REF DESIG	PART NO.	DESCRIPTION
D1 thru D4	919-042019-001	Diode, Rectifier, 1N4004
D5, D6	919-043021-001	Diode, Zener, 15V, 1N965
D7, D8, D9	919-041075-001	Diode, Signal, 1N4148
D10, D11	919-043022-001	Diode, Zener, 3.3V, 1N746
IC1, IC2	991-041102-001	IC, Dual Op Amp, MC1458C
IC3	991-041101-001	IC, Op Amp, 741
IC4	991-043020-001	IC, Quad Mult DIP, 1495L
Q1	991-043018-001	FET, P-Channel, 2N4360
Q2, Q3	991-043025-001	Transistor, NPN, 2N3566
Q4, Q5	991-043011-001	Transistor, PNP, 2N3638A
R1	925-043023-002	Potentiometer, Audio, Slide, 50K
R2	925-043023-001	Potentiometer, Dual Audio, Slide, 150K
R3	925-043023-003	Potentiometer, Linear, Slide, 50K
R4 thru R8	925-043024-001	Potentiometer, Trim, Carbon, 4.7K
S1	960-043257-001	Switch, Rocker, Lighted
T1	954-043013-001	Transformer, Power

RING MODULATOR TRIMMER ADJUSTMENTS

1. SIGNAL NULL ADJUST

Disable internal oscillator operation by turning the "Oscillator Adjust" trimmer fully clockwise, or by inserting an unwired phone plug into the Pitch Pedal Input. Apply a signal to the INST. jack, advance the VOLUME potentiometer and adjust the "Signal Null Adjust" trimmer for minimum signal at test point (B).

2. OSCILLATOR ADJUST

Remove unwired phone plug if used in step 1. Adjust "Oscillator Adjust" trimmer for a signal of 5.5 volts peak-to-peak at test point (A). For this test set PITCH potentiometer at 10 and PITCH RANGE switch at HIGH.

3. CARRIER NULL ADJUST

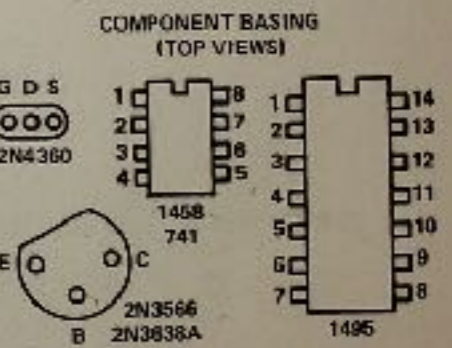
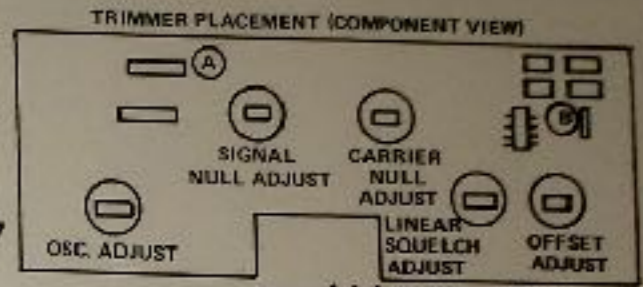
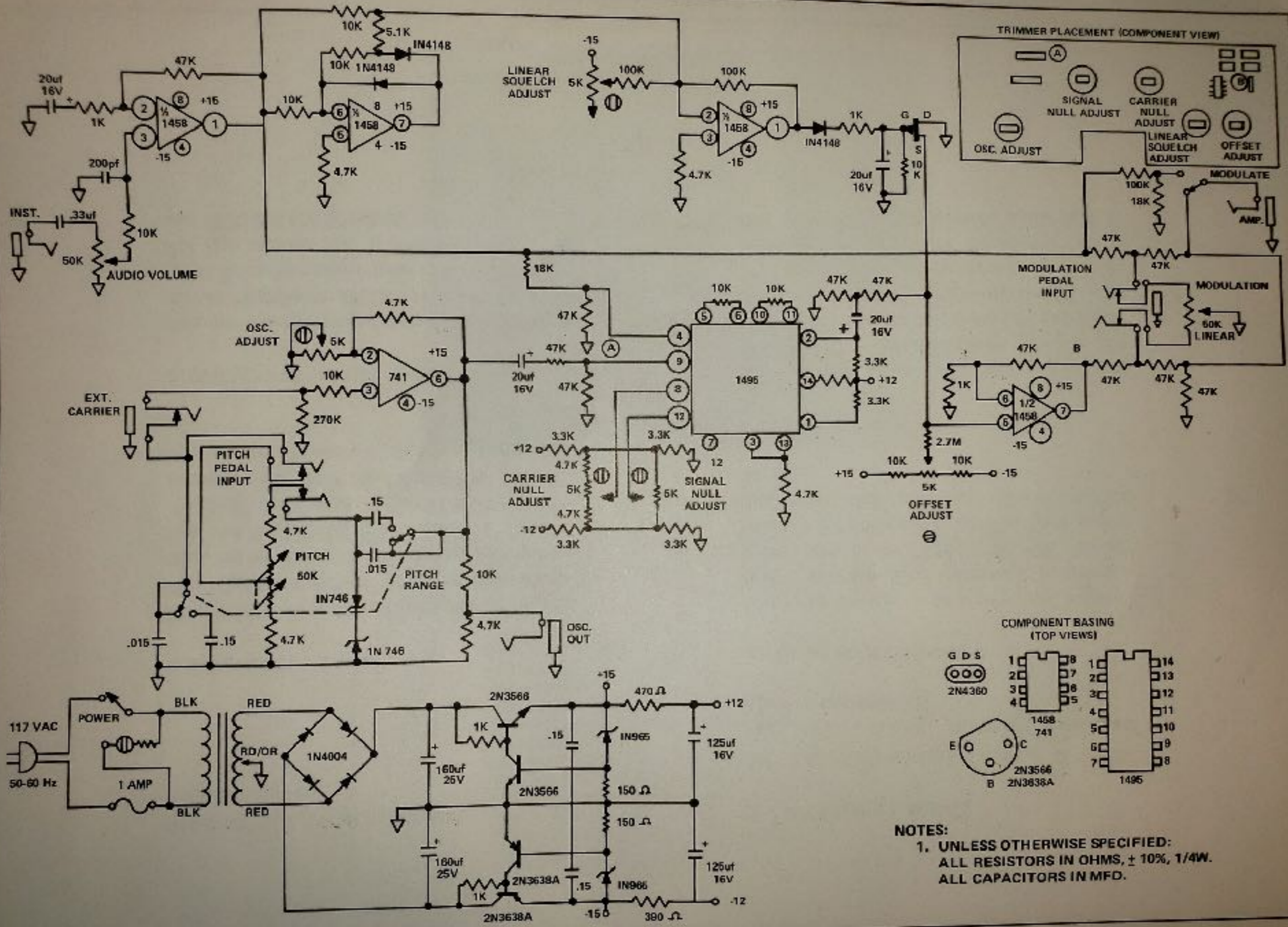
Set VOLUME potentiometer at 0. Adjust "Carrier Null Adjust" trimmer for minimum signal at test point (B).

4. LINEAR SQUELCH ADJUST

Using the device in an operational manner, that is with a musical instrument providing a signal, adjust the "Linear Squelch Adjust" trimmer for optimum balance between carrier suppression and natural-sounding instrument decay.

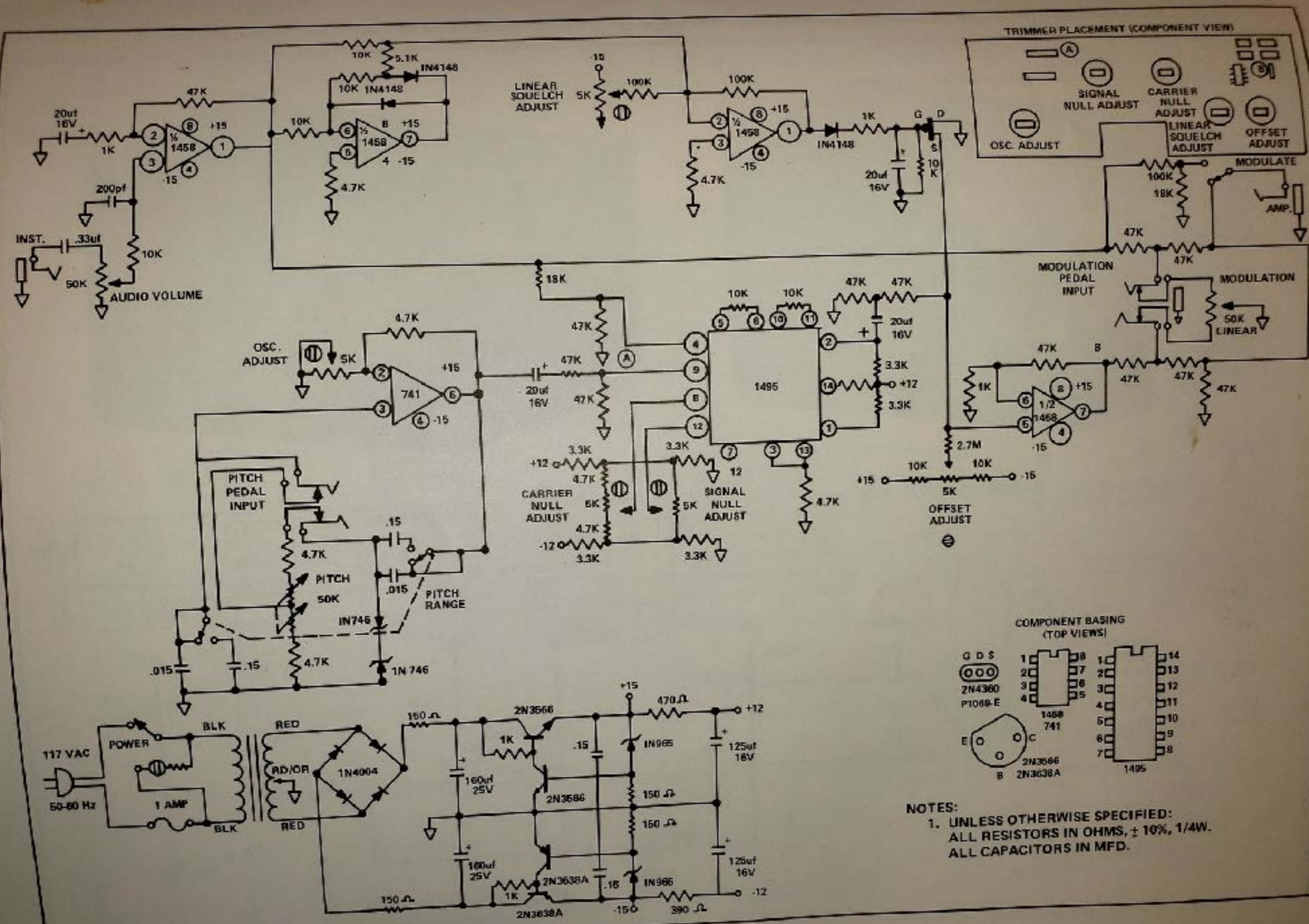
5. OFFSET ADJUST

Apply a signal to the INST. jack, and advance the VOLUME potentiometer. Observe the average DC level at test point (B) and adjust "Offset Adjust" trimmer until the DC level does not change appreciably as the VOLUME potentiometer is moved between a setting that produces an observable signal and 0.



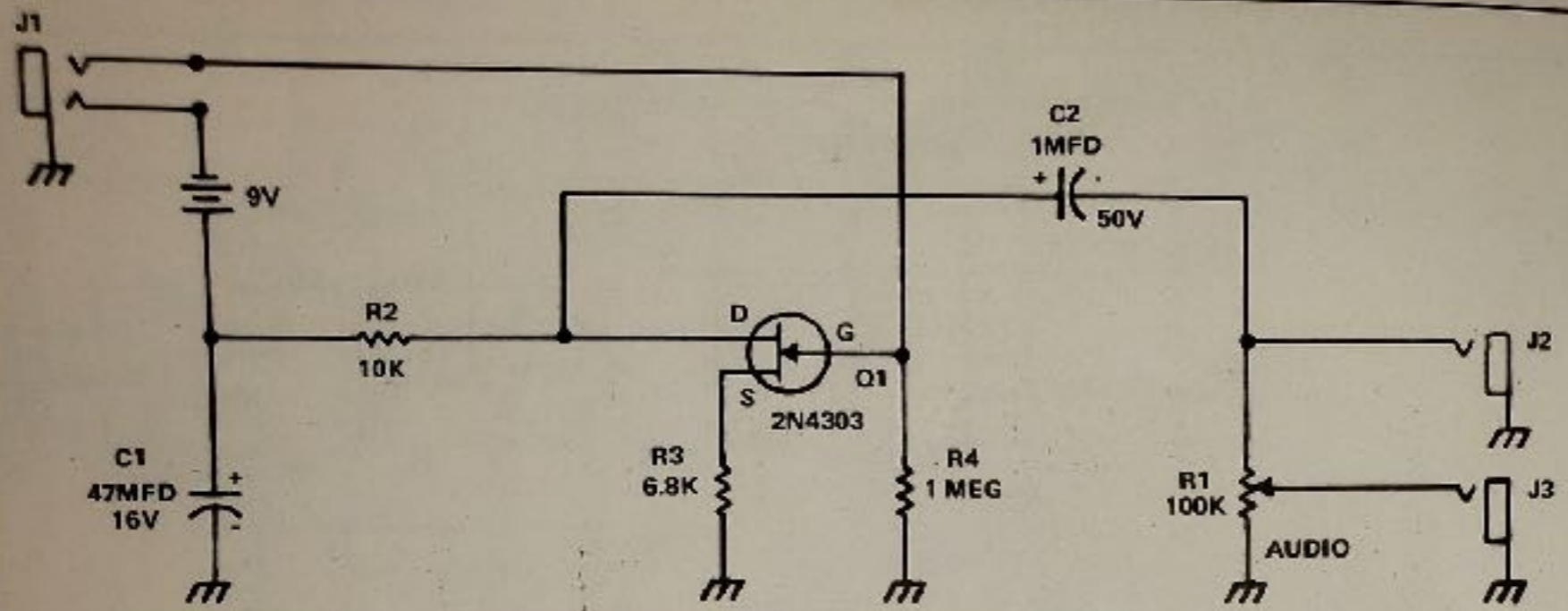
NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS IN OHMS, ± 10%, 1/4W.
 ALL CAPACITORS IN MFD.

RING MODULATOR MODEL RM-1A



NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS IN OHMS, ± 10%, 1/4W.
 ALL CAPACITORS IN MFD.

RING MODULATOR MODEL RM-1B



NOTE:
ALL RESISTORS $\pm 10\%$, 1/4W

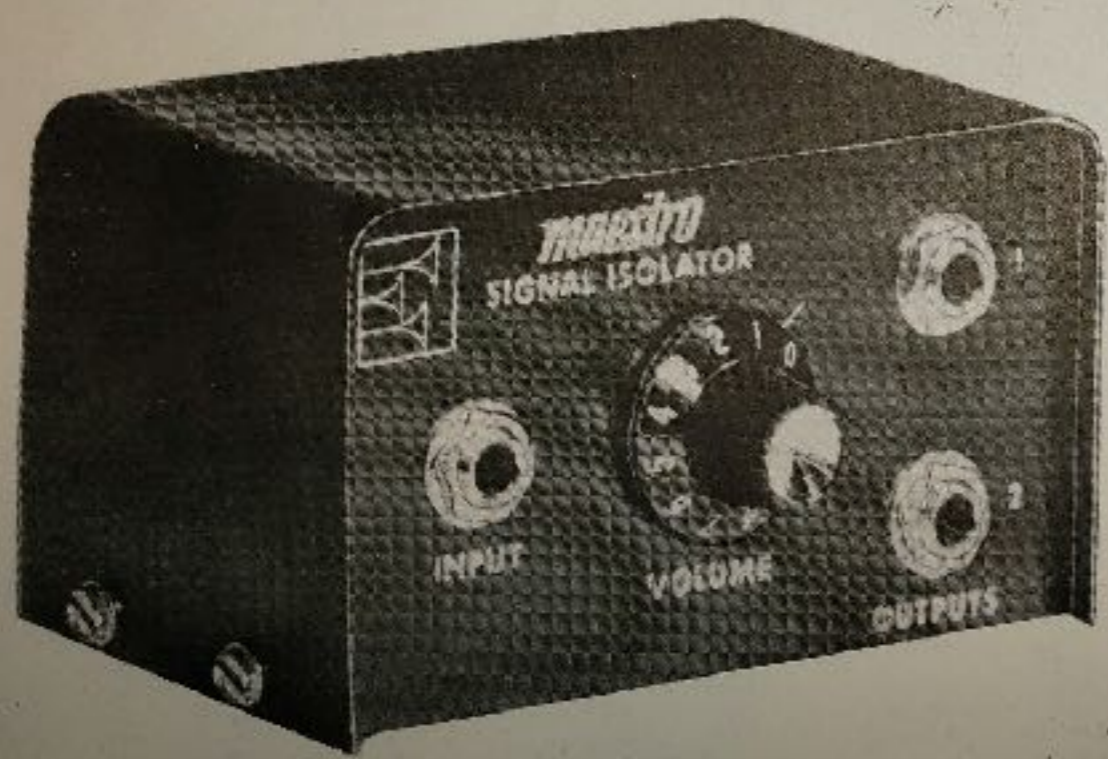
BASING DIAGRAM

BOTTOM VIEW



REF DESIG	PART NO.	DESCRIPTION
J1	910-041306-004	Phone Jack, .250", 3 Conductor
J2, J3	910-041306-001	Phone Jack, .250", 2 Conductor
Q1	991-041064-001	FET, N-Channel Junction, 2N4303
R1	925-043003-001	Potentiometer, Audio, 100K

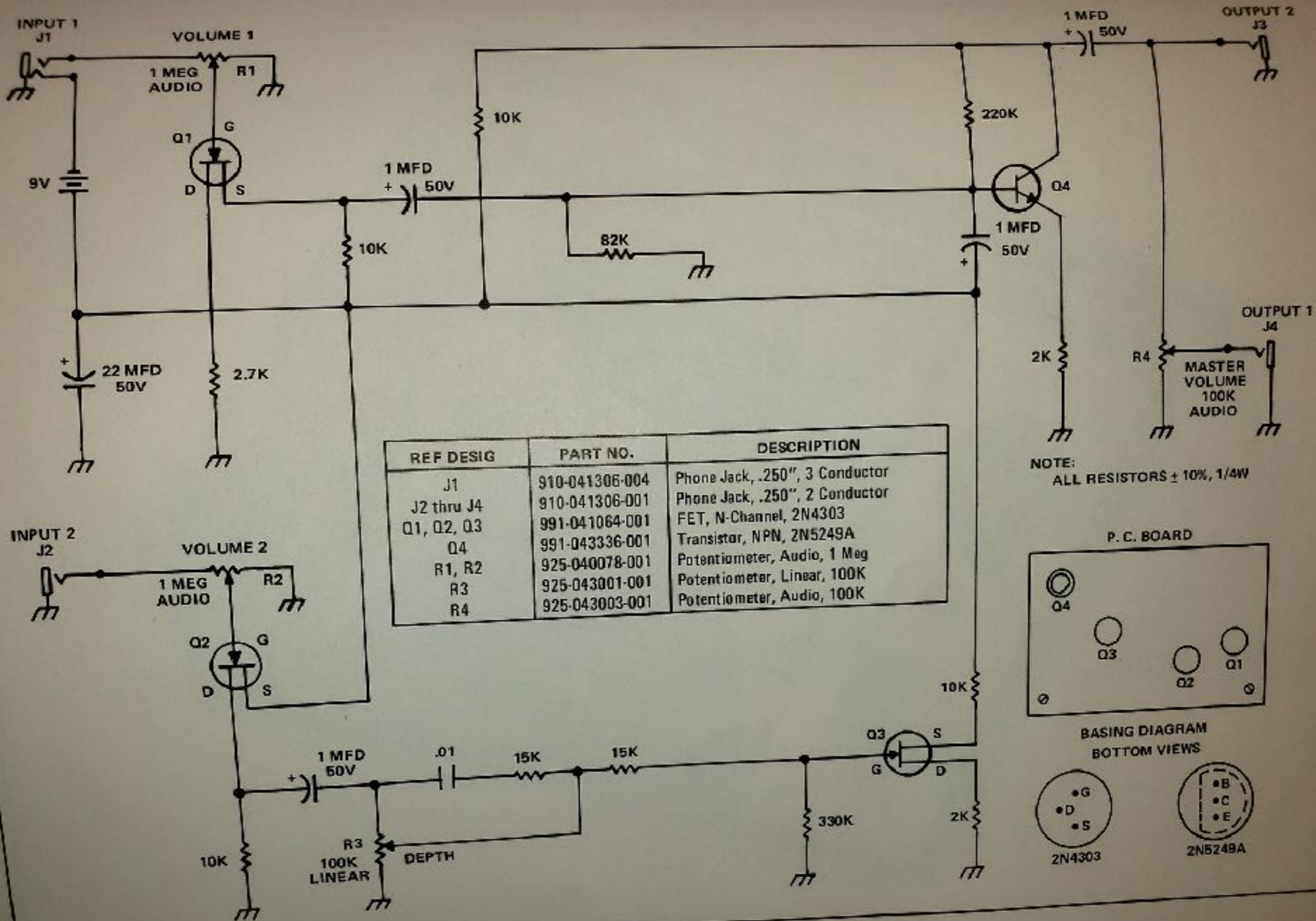
SIGNAL ISOLATOR MODEL SI-G1 (VERSION 1)



SIGNAL ISOLATOR MODEL SI-G1 (VERSION 1)

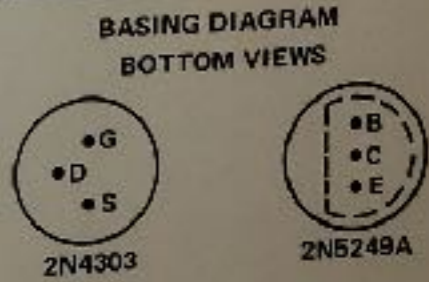
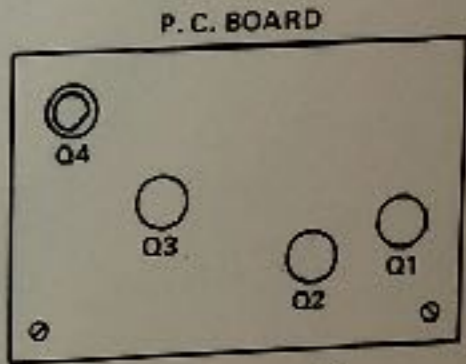


SIGNAL ISOLATOR MODEL SI-G2 (VERSION 2)



REF DESIG	PART NO.	DESCRIPTION
J1	910-041306-004	Phone Jack, .250", 3 Conductor
J2 thru J4	910-041306-001	Phone Jack, .250", 2 Conductor
Q1, Q2, Q3	991-041064-001	FET, N-Channel, 2N4303
Q4	991-043336-001	Transistor, NPN, 2N5249A
R1, R2	925-040078-001	Potentiometer, Audio, 1 Meg
R3	925-043001-001	Potentiometer, Linear, 100K
R4	925-043003-001	Potentiometer, Audio, 100K

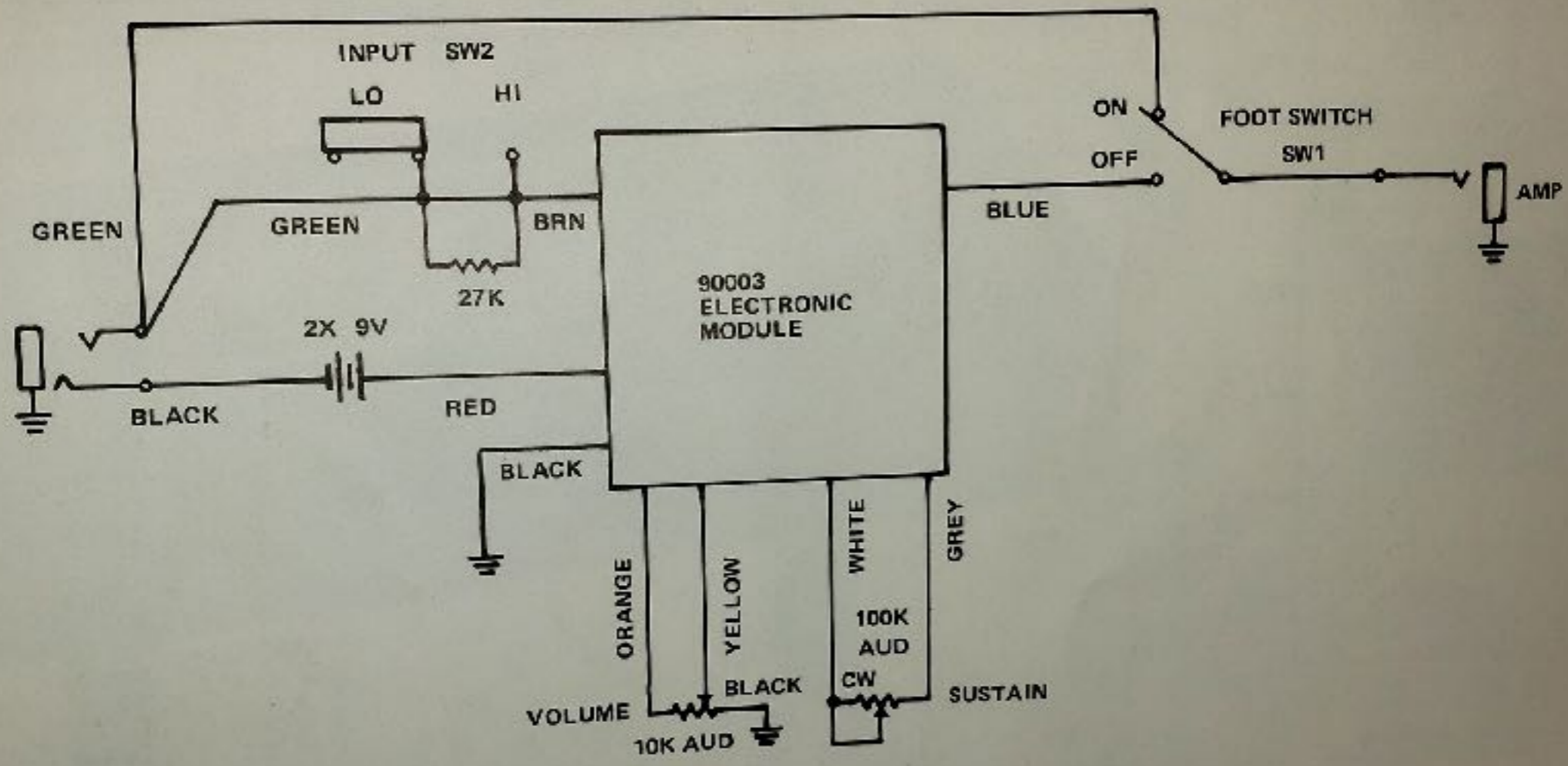
NOTE:
ALL RESISTORS ± 10%, 1/4W



SIGNAL ISOLATOR MODEL SI-G2 (VERSION 2)



SUSTAINER MODEL SS-2



SUSTAINER MODELS SS-1, SS-2 AND SS-3

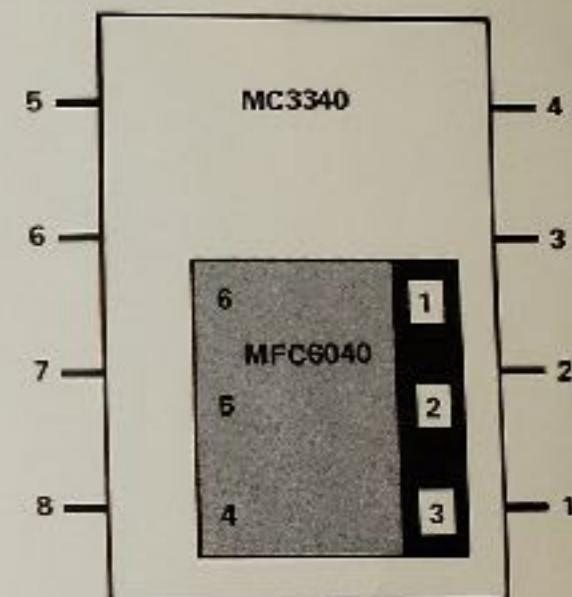
TH-1 Theremin



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS IN OHMS, $\pm 10\%$, 1/2W.
ALL CAPACITORS IN MFD.

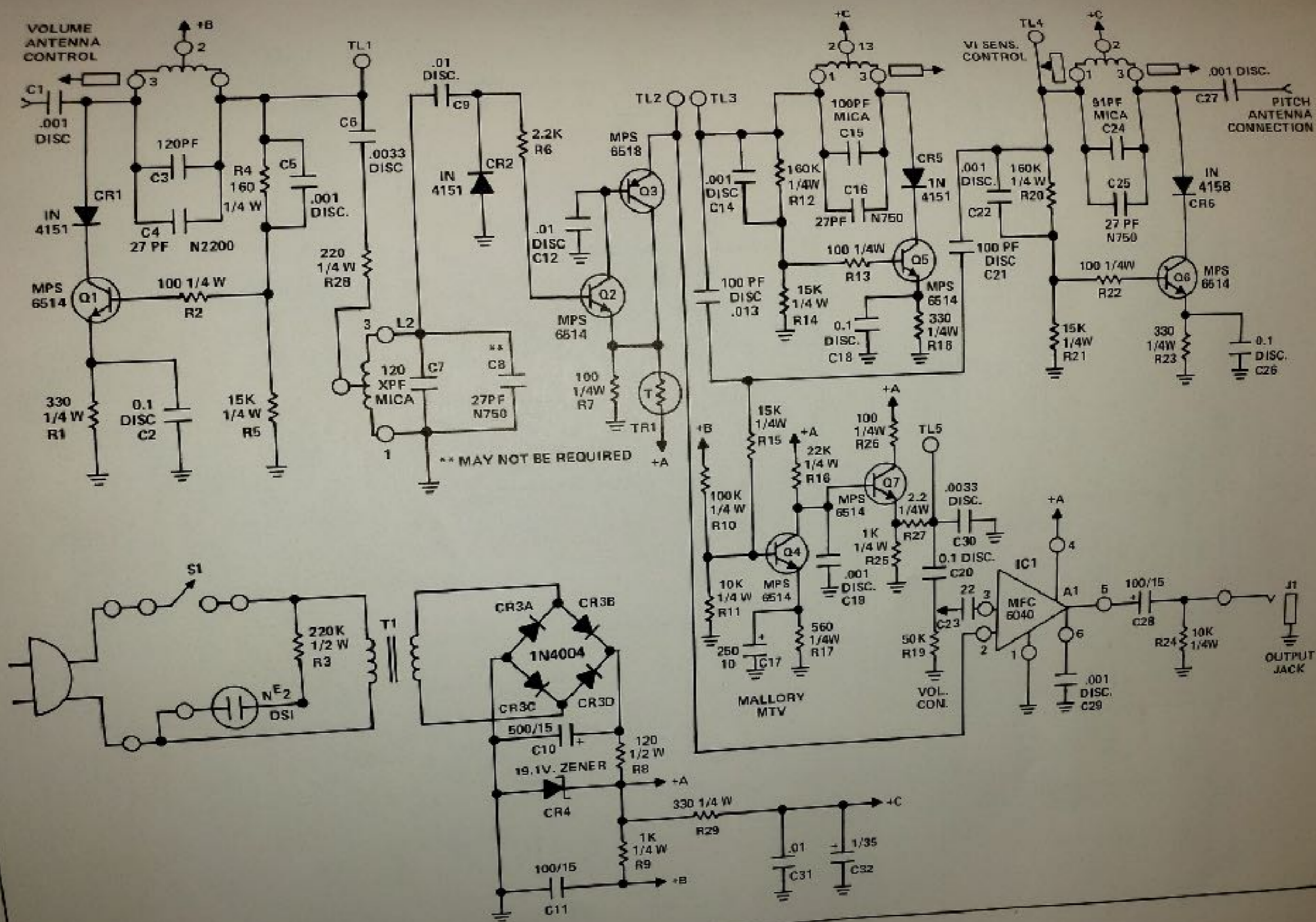
**BASING DIAGRAMS
BOTTOM VIEWS**



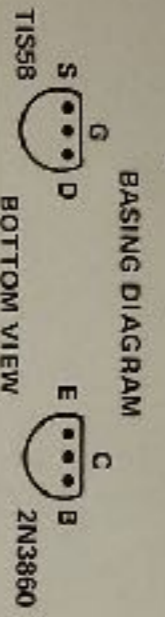
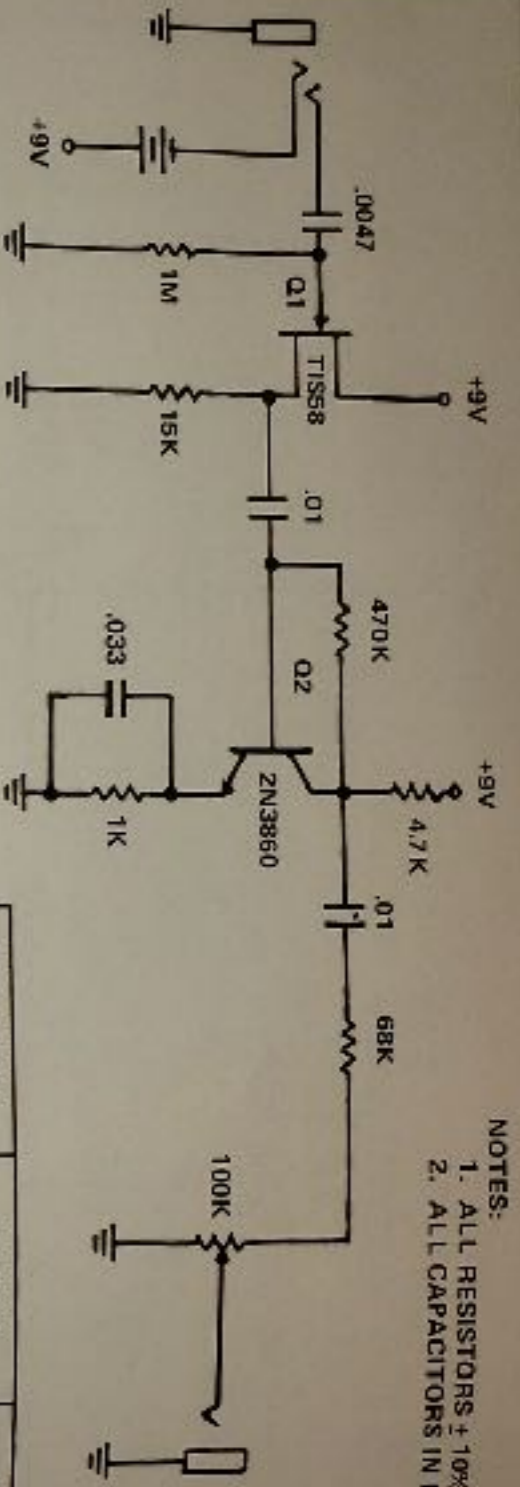
MPS6514
MPS6518



REF DESIG	PART NO.	DESCRIPTION
CR1, CR2, CR5, CR6	919-040075-001	Diode, 1N4151, 1N4158 Substitute
CR3A thru CR3D	919-042019-001	Diode, 1N4004
CR4	919-050216-001	Diode, Zener, 1N5356A
IC1	991-050058-001	Integrated Circuit, MFC6040, MFC3340 Substitute
Q1, Q2, Q4 thru Q7	991-041051-001	Transistor, MPS6514, 2N3904 Substitute
Q3	991-041052-001	Transistor, MPS6518, 2N3906 Substitute



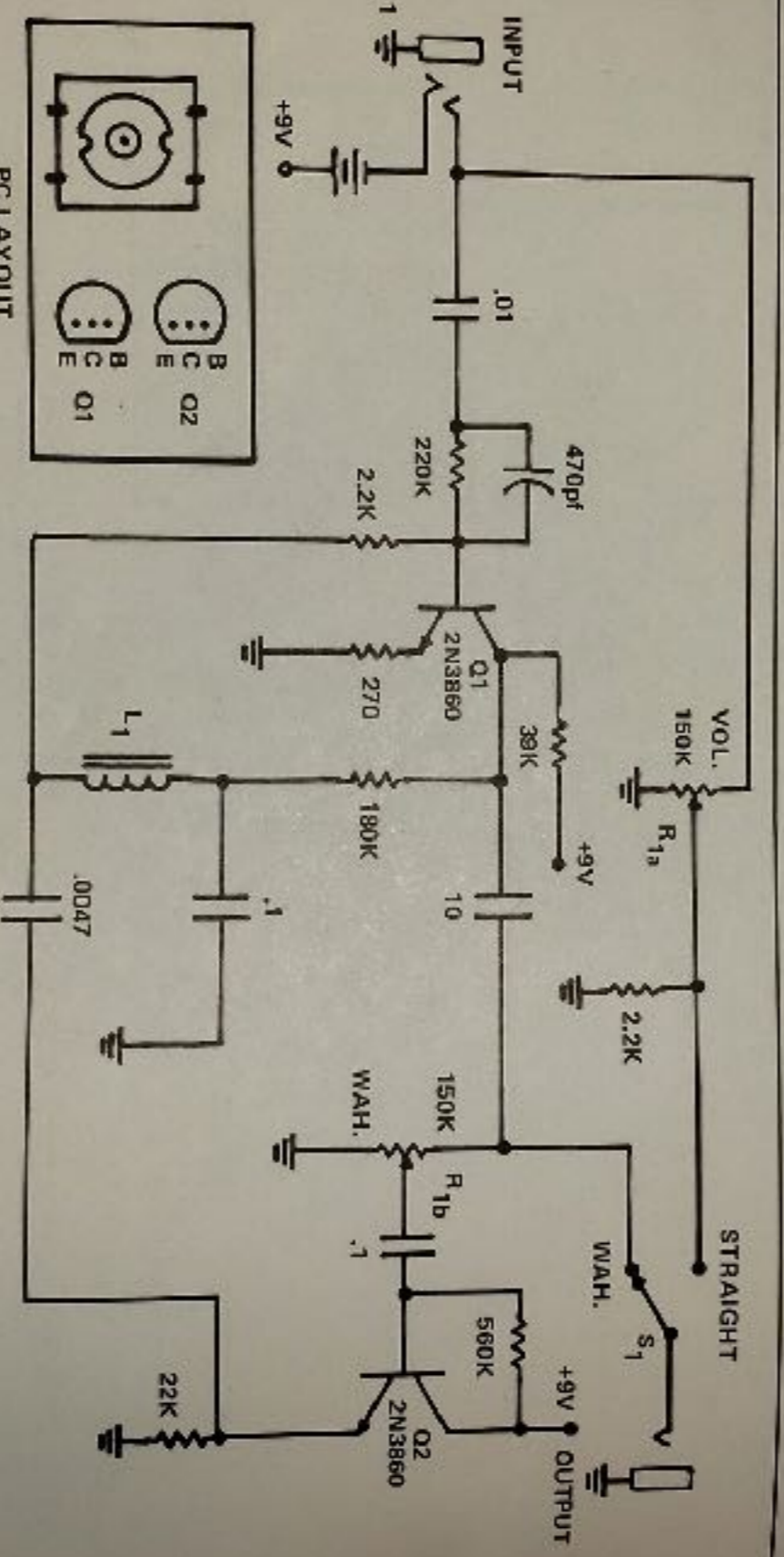
THEREMIN MODEL TH-1



REF DESIG	PART NO.	DESCRIPTION
01	991-041145-001	Transistor, TIS58
02	991-043025-001	Transistor, 2N3860, 2N3566 Substitute

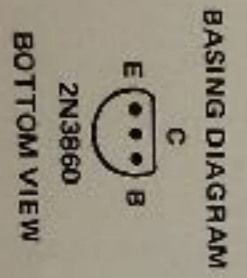
NOTES:
 1. ALL RESISTORS + 10%, 1/2W.
 2. ALL CAPACITORS IN MFD.

VOLUME PEDAL MODEL VP-1



PC LAYOUT

NOTE:
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS IN OHMS + 10%, 1/2W.
 ALL CAPACITORS IN MFD.



BOTTOM VIEW

REF DESIG	PART NO.	DESCRIPTION
01, 02		Transistor, 2N3860, 2N3566 Substitute

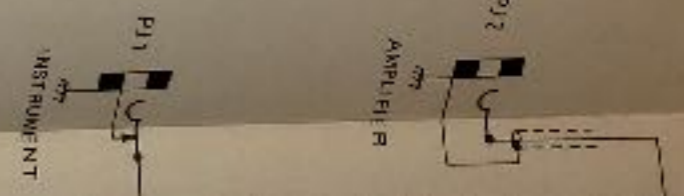
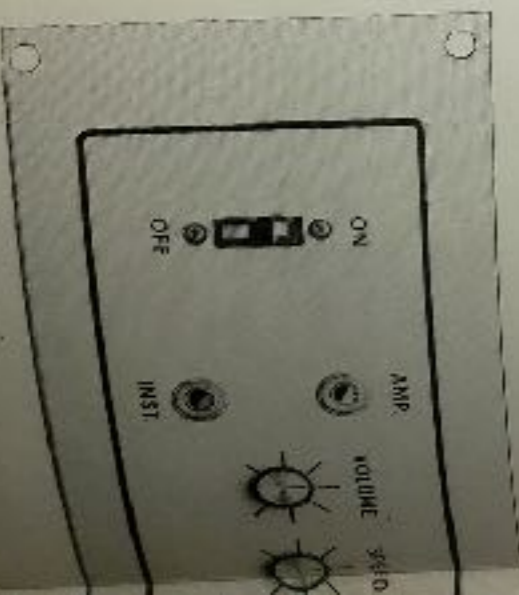
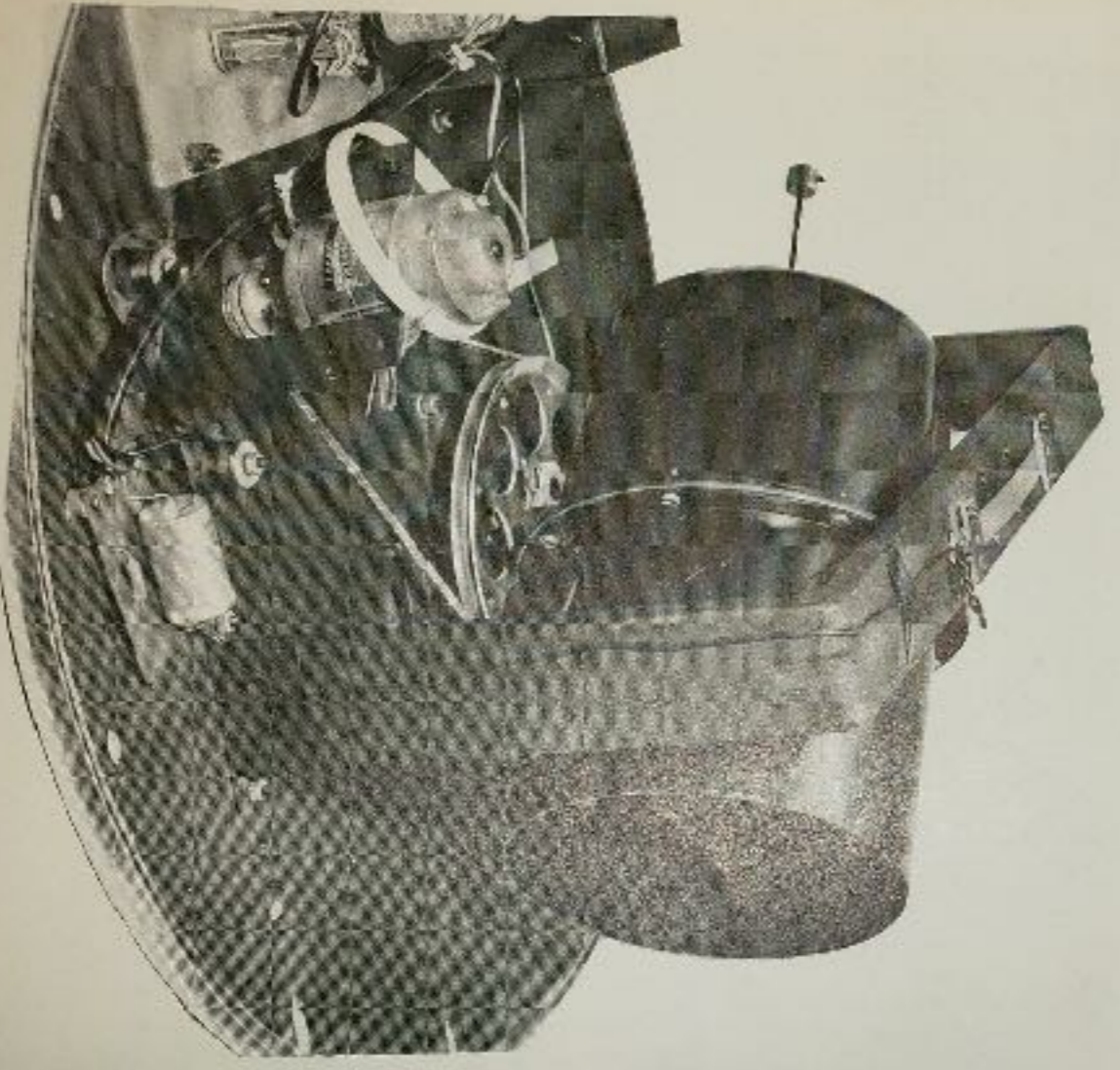
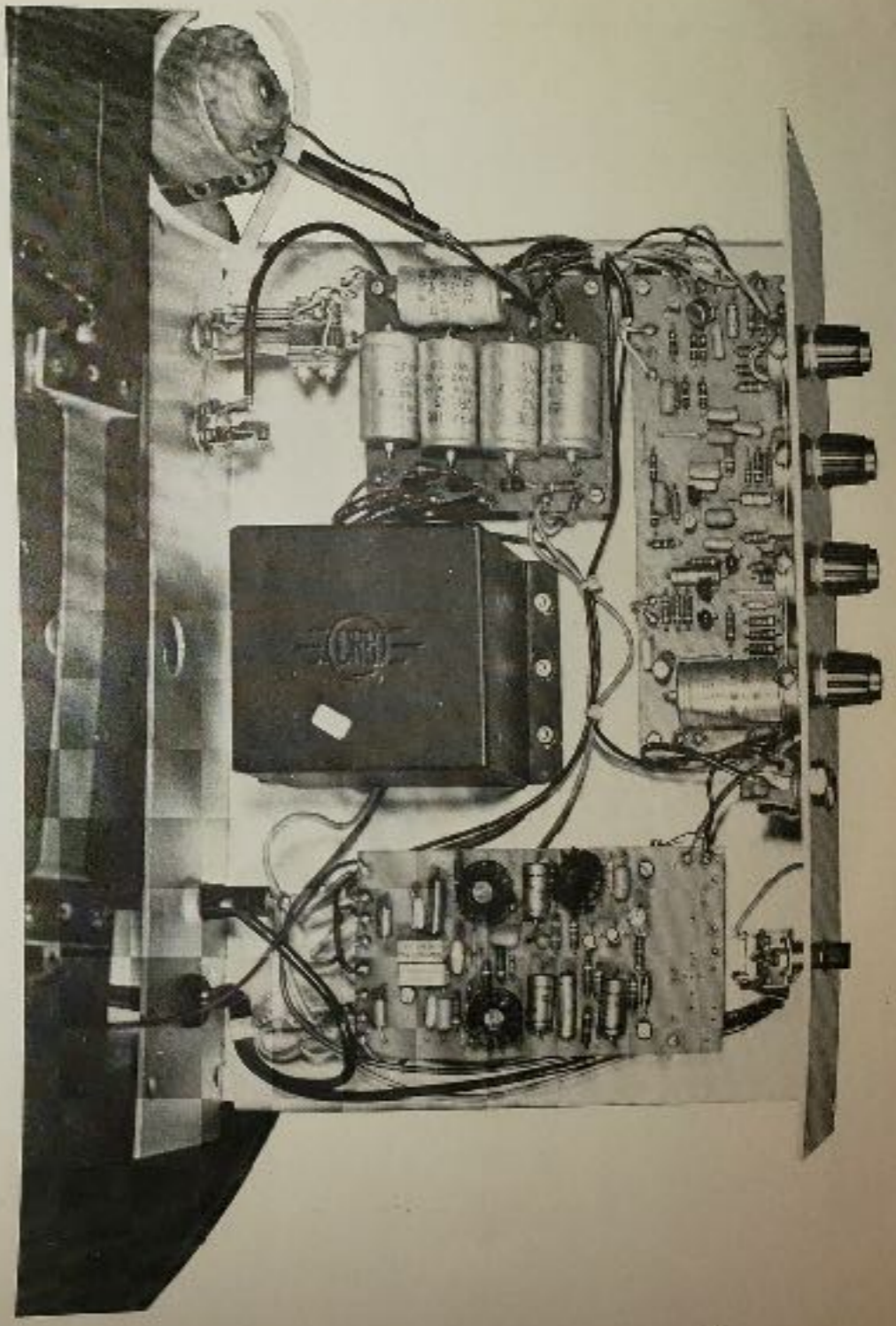


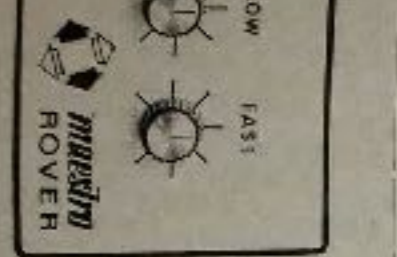
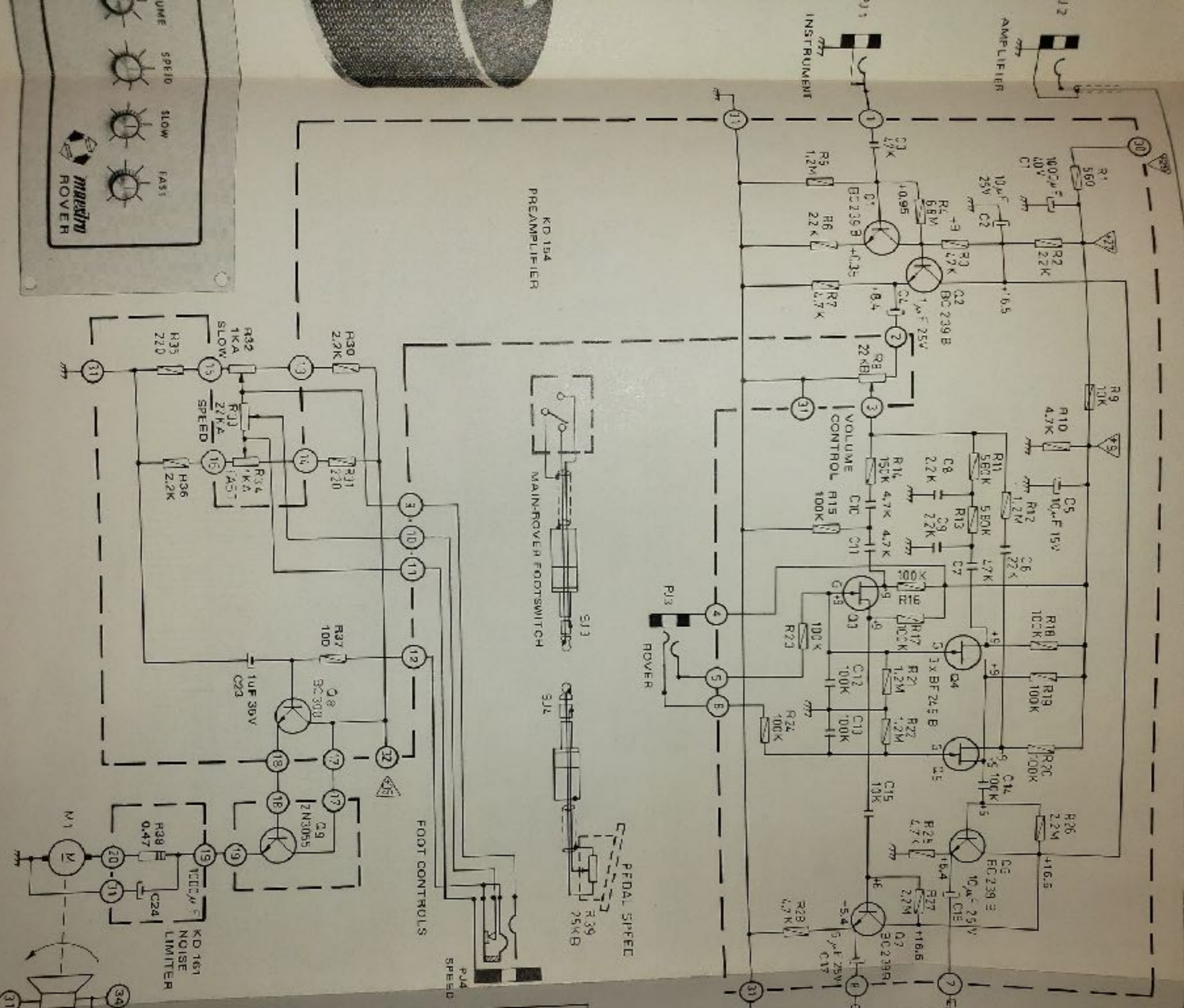
WHA-WHA PEDAL MODEL WW-2

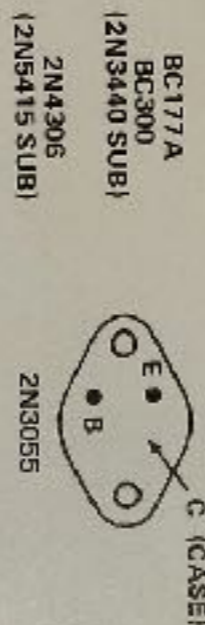
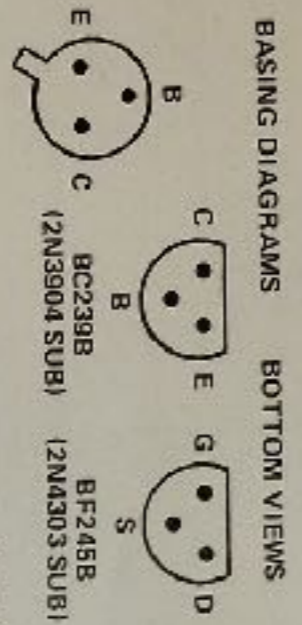
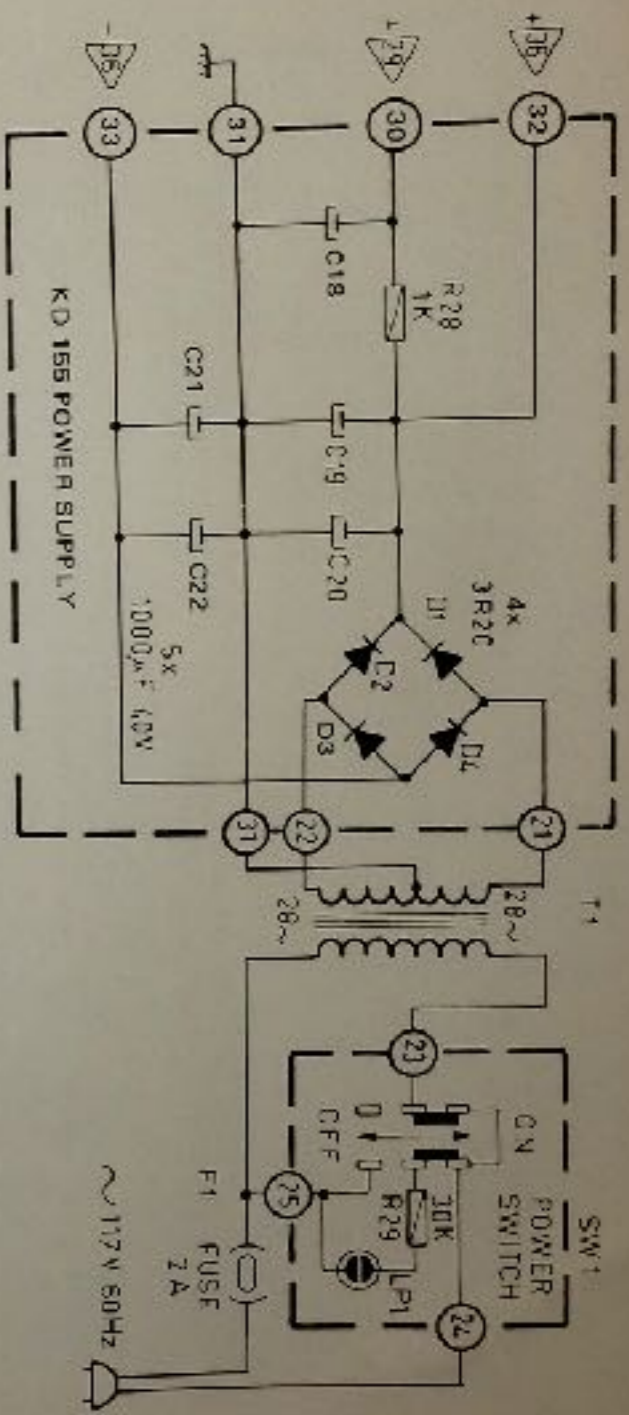
Total: _____
See above

SECTION
58
3860,
stature

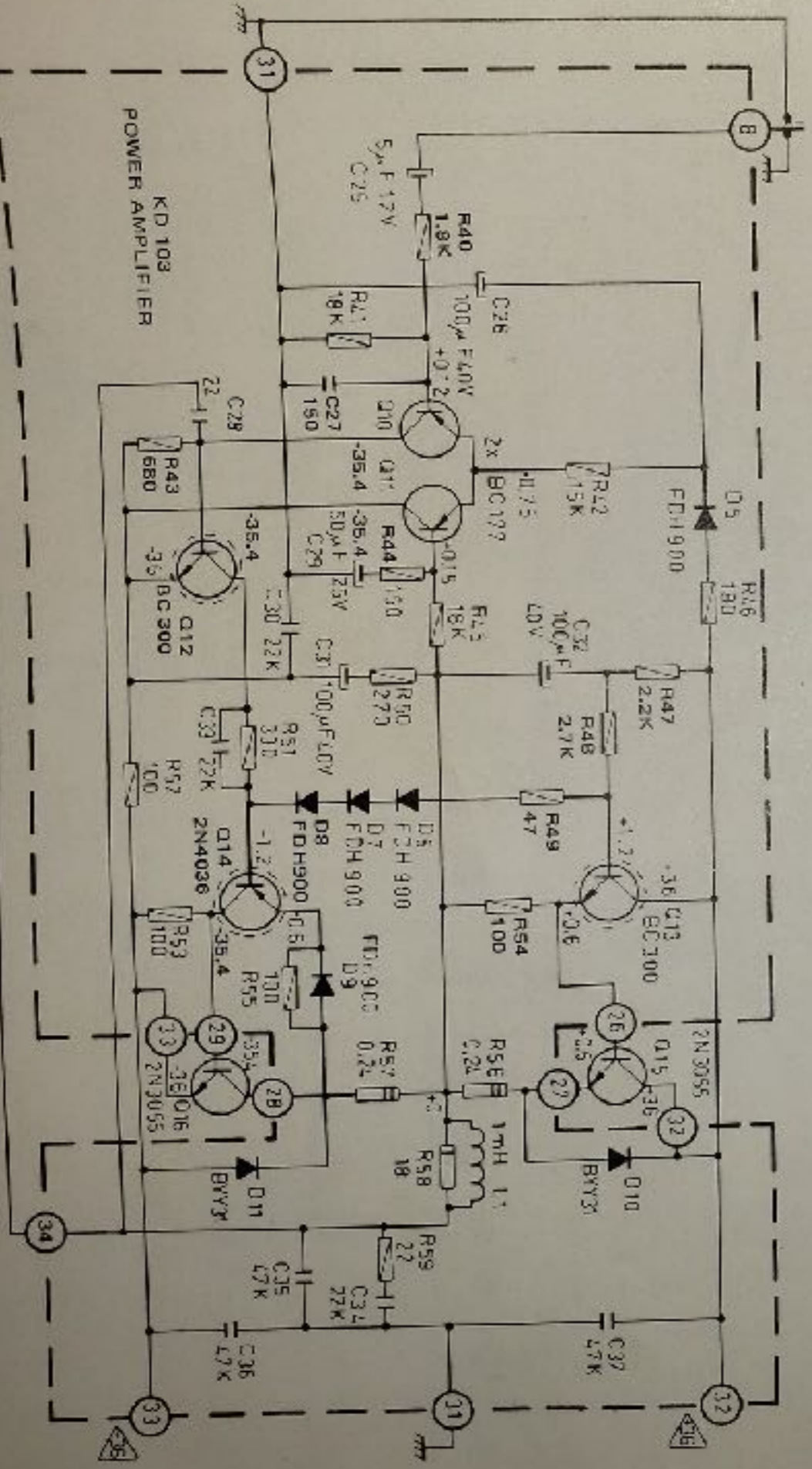
PUT







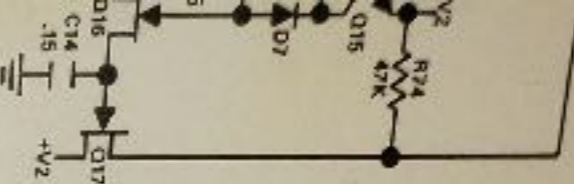
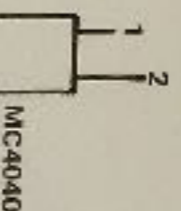
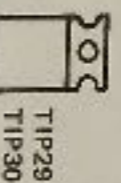
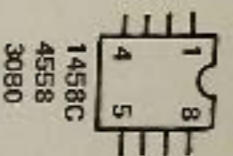
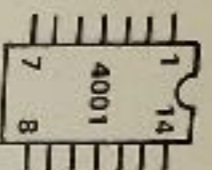
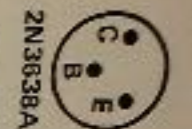
REF DESIG	PART NO.	DESCRIPTION
D1 thru D4	919-043378-001	Diode, 3R20, 1N5400 Substitute
D5 thru D9	919-041075-001	Diode, FDH900, 1N4148 Substitute
D10, D11	919-042019-001	Diode, BYY31, 1N4004 Substitute
Q1, Q2, Q6, Q7	991-041051-001	Transistor, BC239B, 2N3904 Substitute
Q3, Q4, Q5	991-041064-001	Transistor, BF245B, 2N4303 Substitute
Q8, Q12, Q13	991-042453-001	Transistor, BC300, 2N3440 Substitute
Q9, Q15, Q16	992-043083-001	Transistor, 2N3055
Q10, Q11	991-043309-001	Transistor, BC177
Q14	991-041378-001	Transistor, 2N5415 Substitute



NOTES:
 1. UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS IN OHMS, ± 10%, 1/2W.
 ALL CAPACITORS IN MFD.

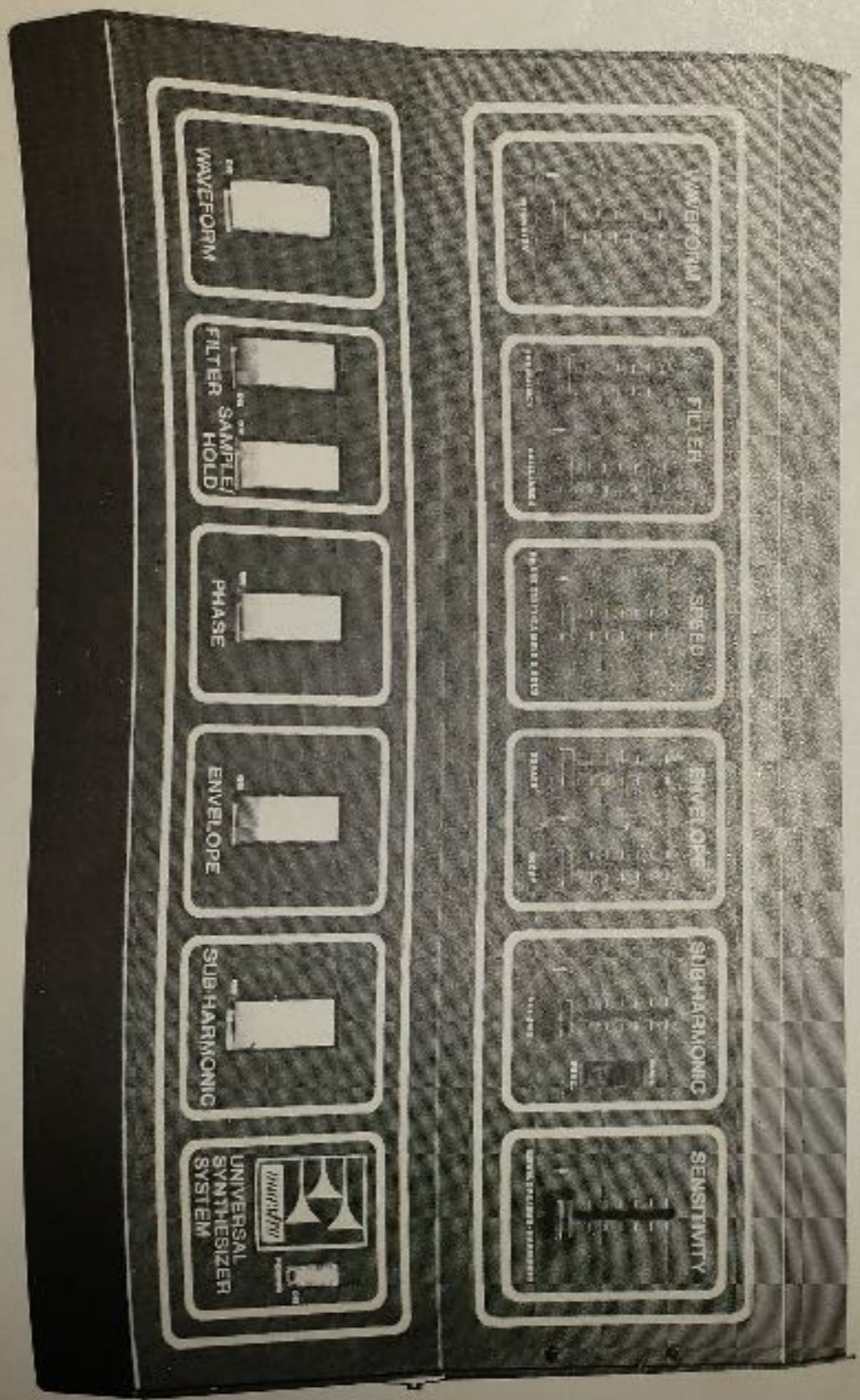
2. ALL VOLTAGES MEASURED WITH
 RESPECT TO CHASSIS GROUND USING
 A 10 MEGOHM VOLTMETER WITH NO
 SIGNAL APPLIED.

BASING DIAGRAMS
BOTTOM VIEWS



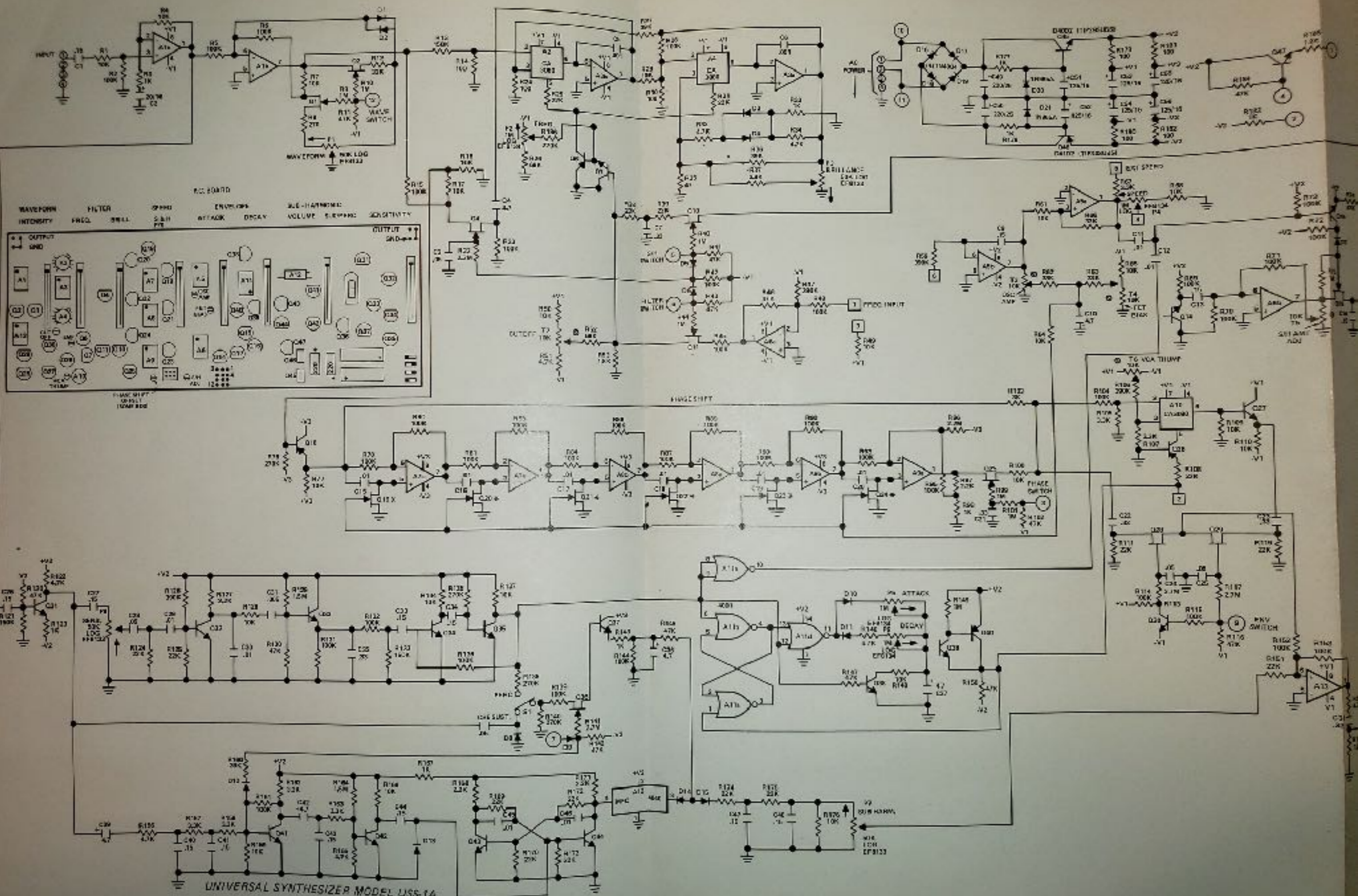
TOP VIEWS

REF DESIG	PART NO.	DESCRIPTION
A1, A3, A5 thru A9, A13 A2, A4, A10 A11 A12	991-041102-001 991-041089-002 991-043032-001 991-043837-002	Integrated Circuit, 1458C, 4558 Substitute Integrated Circuit, 3080 Integrated Circuit, CMOS, 4001 Integrated Circuit, MF-C4040
D1 thru D15 D16 thru D19 D20, D21 P1, P3, P7, P8 P2, P4, P5, P6	919-041075-001 919-042019-001 919-041076-001 925-043838-001 925-043838-002	Diode, 1N4148 Diode, 1N4004 Diode, 1N965A Potentiometer, Slide, 50K, Audio Potentiometer, Slide, 1 Meg, Audio
Q1, Q2, Q4, Q10, Q11, Q16, Q17, Q25, Q28, Q29, Q36 Q6, Q18, Q26, Q40 Q7, Q14, Q15, Q27, Q30 thru Q35, Q37, Q38, Q39, Q41 thru Q44, Q47 Q19 thru Q24	991-041064-001 991-043011-001	FET, N-Channel Junction, 2N4303 Transistor, 2N3638A
Q45 Q46 S1 S2 T1	991-043151-001 991-043005-001 991-041049-001 991-041050-001 960-043839-001 960-043257-001 954-041170-001 915-043258-001 915-043258-002 915-043258-003 915-043258-004 917-043840-001 975-043841-001 915-040922-002	Transistor, MPSS172 FET, N-Channel Junction, Selected Transistor, NPN Power, TIP29 Transistor, PNP Power, TIP30 Switch, Rocker, DPDT Switch, Rocker, DPDT Transformer, Power, 40 VCT Knob, Switch Tab, Orange Knob, Switch Tab, Gold Knob, Switch Tab, Aqua Knob, Switch Tab, White Contact Spring, Tab Switch Spring, Actuator, Tab Switch Knob, Slidepot



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS ARE ± 5%, 1/2W.
ALL CAPACITORS ARE MFD.
ALL CAPACITORS ARE SELECTED.
2. * INDICATES FET TRANSISTORS ARE SELECTED.

3. FREQ AND SPEED PEDAL JACKS MUST BE CONNECTED
BY MEANS OF 6-PIN CONNECTION OR SOME FUNCTIONS
WILL NOT OPERATE.
4. □ DENOTES 6-PIN CONNECTION.
5. ○ DENOTES 12-PIN CONNECTION.



UNIVERSAL SYNTHESIZER MODEL USS-1A