

SERVICE MANUAL

Sound Master (Rhythmer, Mic Echo and Booster)

Model SM-100



ALPINE ELECTRONICS INC.

Contents

Specifications	2
Note	2
Parts Location and Disassembly Instructions	3 to 4
Block Diagram	5
Adjustment Procedures	6 to 7
Printed Circuit Board	8 to 10
Wiring Diagram	11 to 12
Schematic Diagram	13 to 14
Exploded View	15 to 16
Semi-Conductor Lead Identifications	17
Packing Method View	17
Parts List	18 to 23

Specifications

Power Output

PA Out	12 W (Per Channel)
Fader Out (Front)	11 W (Per Channel)

Distortion

PA Out	THD 2% at 5 W
Fader Out	THD 2% at 1W

Voltage Profit	11 dB ±3 dB
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Frequency Response	35 to 20,000 Hz (-3 dB)
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Current Consumption	4.8 A at 12 W
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Input Impedance	150Ω ±50 ohm
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Separation40 dB
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Tone Controls	
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Bass	±7 dB at 100 Hz
Treble	±5 dB at 8 kHz

Mic Input Level	-50 dB/600 ohm
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Line Input Level	-10 dB/150k ohm
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Load Impedance	4 ohm
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Power Source	13.8 V
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Dimensions	190(W) x 50(H) x 165(D) mm
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Weight	1.6 kg
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Note

POWER IC TA7222P PROTECTOR CIRCUIT

The TA7222P contains a current limiter and a thermal shut-down circuit. When an excess current is input, or the load is shortcircuited, the current limiter operates. When abnormal temperature rise occurs, the thermal shut-down circuit operates.

When the above protector circuit operates, the output level goes down, showing a distorted waveform. However, when the cause of abnormality is removed, the protector circuit is reset, and the normal output level is resumed. Among causes of activating the protector circuit, the case where the current limiter operates as a result of input of excess current demanding the output exceeding the capacity, is prevailing.

Note:

It is not a failure. Explain the above reason if the user claims on this respect.

Parts Location and Disassembly Instructions

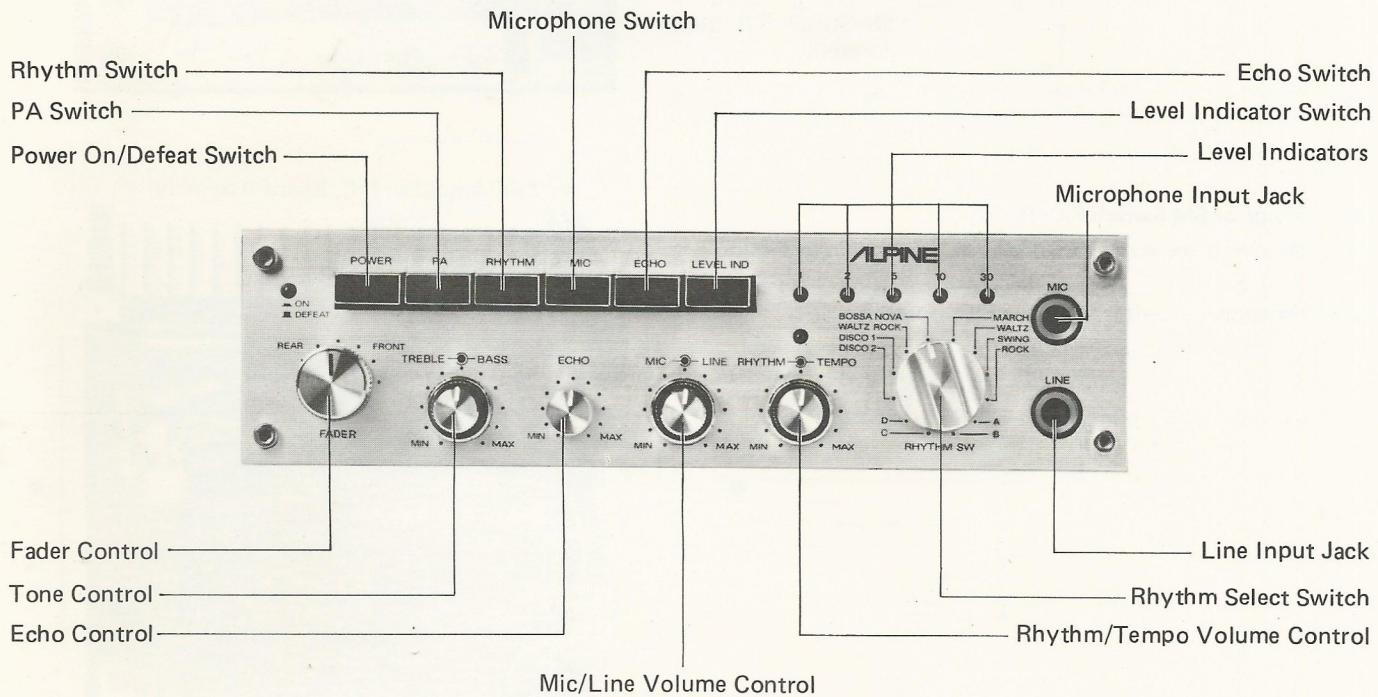


Figure 1

1. Removal of Top Cover

- (1) Remove eight screws marked “○” as shown in Figure 2 and 3.
- (2) Remove the top cover in the direction of the arrow as shown in Figure 3.

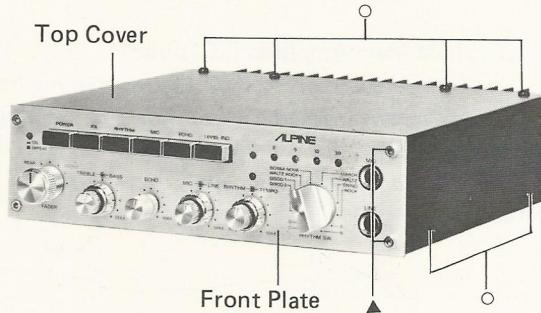


Figure 2

2. Removal of Front Plate

- (1) Remove four hexagon screws marked “▲” as shown in Figure 2 and 3.
- (2) Pull off all the front control knobs.
- (3) Remove the front plate in the direction of the arrow as shown in Figure 3.

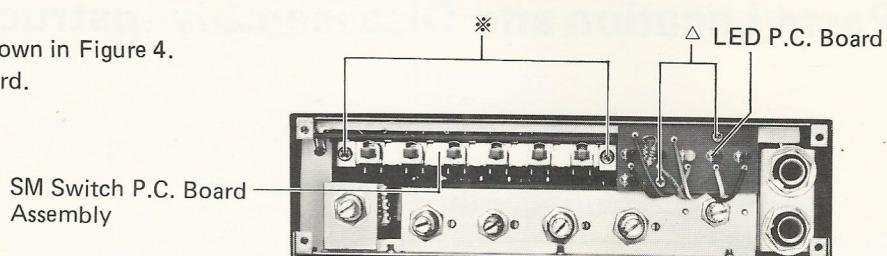
Direction of Top Cover Removal



Figure 3

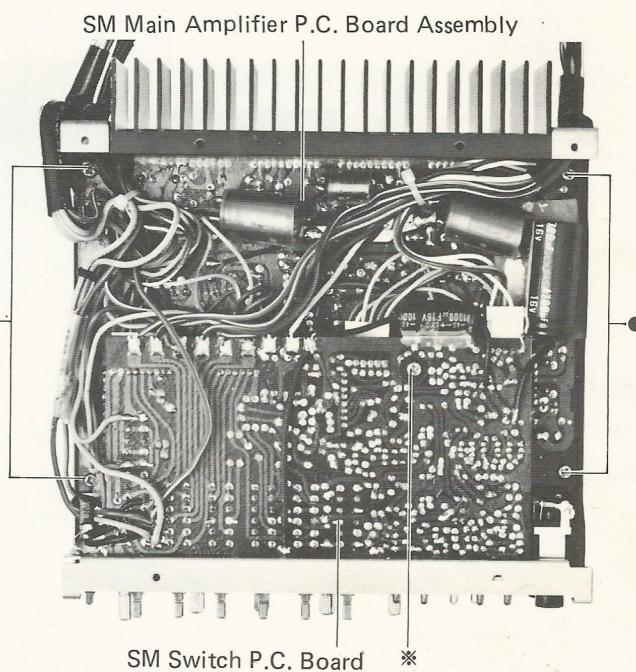
3. Removal of LED P.C. Board

- (1) Remove two screws marked “ \triangle ” as shown in Figure 4.
- (2) Disconnect all wires from the P.C. Board.



4. Removal of SM Switch P.C. Board

- (1) Remove three screws marked “ $*$ ” as shown in Figure 4 and 5.
- (2) Disconnect all wires from the P.C. Board.



5. Removal of SM Main Amplifier P.C. Board

- (1) Remove four screws marked “●” as shown in Figure 5.
- (2) Remove six screws marked “ \triangle ” as shown in Figure 6.
- (3) Disconnect all wires from the P.C. Board.
- (4) The P.C. Board can be completely removed from the bottom cover.

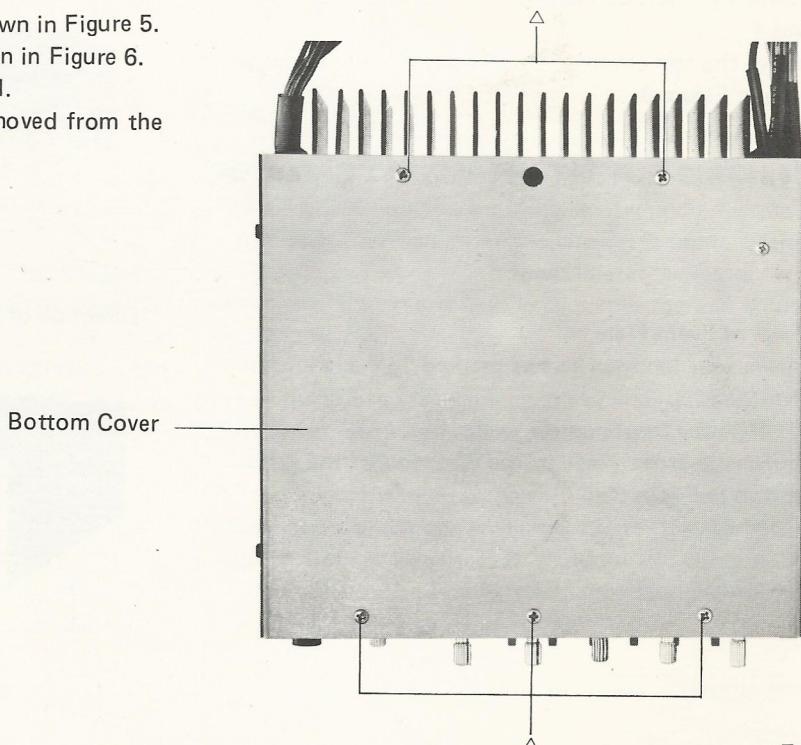
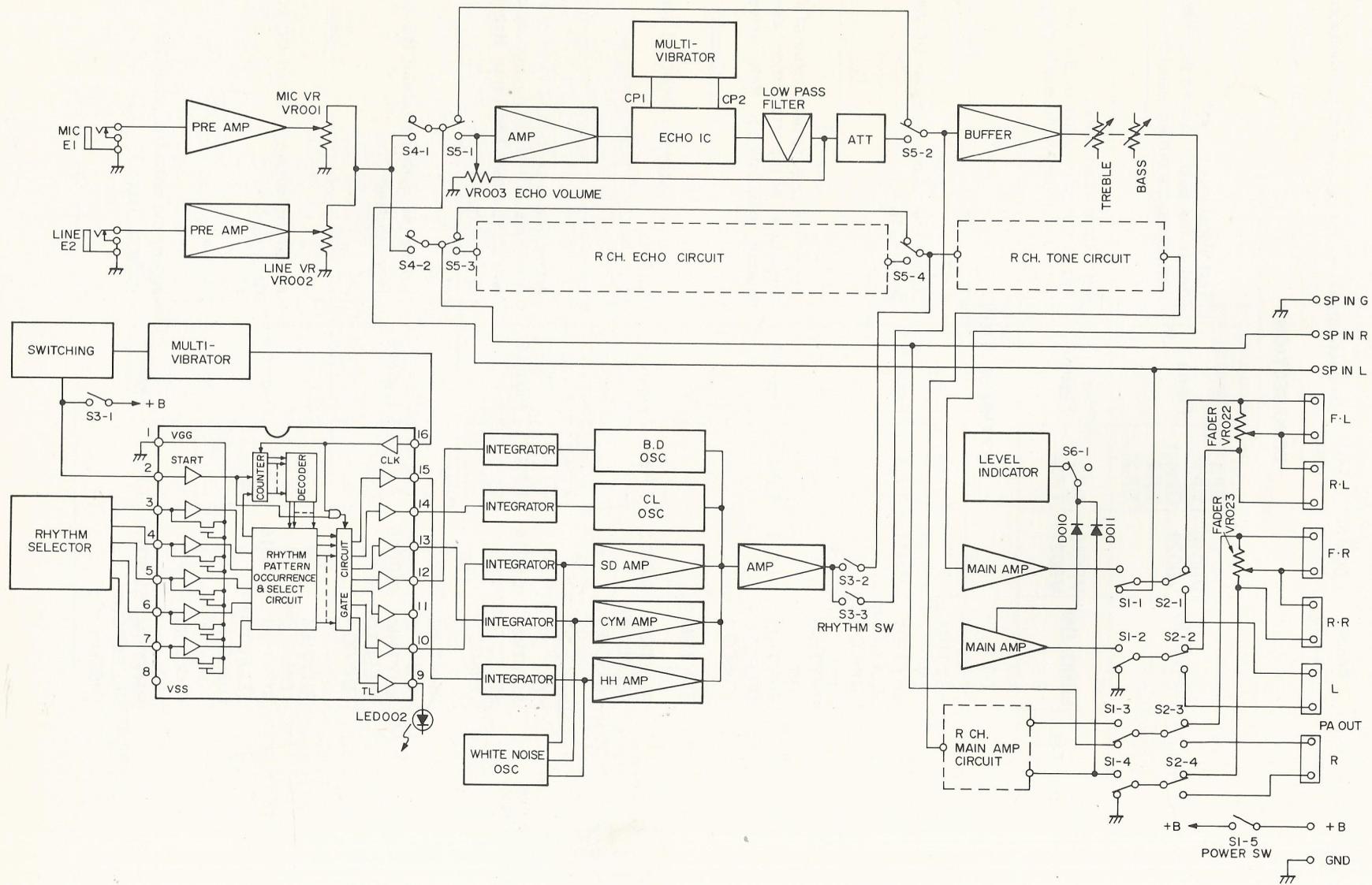


Figure 6

Block Diagram



Adjustment Procedures

Step	Adjustment Items	Mode (Switch)	Adjust. Points	Test Points	Connection	Adjustment & Remarks
ECHO SECTION						
1	BBD Input Bias	ECHO: ON	VR018 VR020	Input T.P.1 T.P.1' Output T.P.2 T.P.2'	Figure 7	Test Signal Input: 1 kHz Adjust the peak value to the maximum, while monitoring the output waveform.
2	BBD Output Bias	ECHO: ON	VR019 VR021	T.P.2 T.P.2'	Figure 8	Test Signal Input: Non. Adjust the peak value of the leak clock signal to the minimum, while monitoring the output.
RHYTHM SECTION						
1	Bass — Drum OSC Bias	RHYTHM : ON RHYTHM SELECTOR : DISCO 1	VR011	T.P.3	Figure 9	Adjust the output to about DC 230mV. Refer to Note 1.
2	Bass — Drum Level	RHYTHM : ON RHYTHM SELECTOR : DISCO 1	VR012	T.P.4	Figure 8	Adjust the peak-to-peak value of the maximum amplitude of the attenuation waveform of the output, to 520mVp-p. Refer to Note 2.
3	Clevis OSC Bias	RHYTHM : ON RHYTHM SELECTOR : DISCO 1	VR013	T.P.5	Figure 9	Adjust the output to about DC 34mV. Refer to Note 1.
4	Clevis level	RHYTHM : ON RHYTHM SELECTOR : DISCO 1	VR014	T.P.6	Figure 8	Adjust the peak-to-peak value of the maximum amplitude of the attenuation waveform of the output, to about 2.5mVp-p. Refer to Note 2.
5	Snare — Drum Level	RHYTHM : ON RHYTHM SELECTOR : DISCO 1	VR015	T.P.7	Figure 9	Adjust the output to about DC 11V. Refer to Note 2.
6	Cymbal Level	RHYTHM : ON RHYTHM SELECTOR DISCO 1	VR016	T.P.8	Figure 9	Adjust the output to about DC 10V. Refer to Note 2.
7	Hi-hat Level	RHYTHM : ON RHYTHM SELECTOR DISCO 1	VR017	T.P.9	Figure 9	Adjust the output to about DC 11.5V. Refer to Note 2.

*Note 1. The level specified in the Adjustment Procedure is not necessarily the best point, because of unevenness in the quality of parts. Therefore, the values specified here should be regarded as a reference. Listen actually, and readjust to the best tone

quality.

Note 2. Listen actually, and readjust so that the output is well balanced with that of the other oscillator. In this time, set the bass and treble controls to their center positions.

• Adjustment Connections

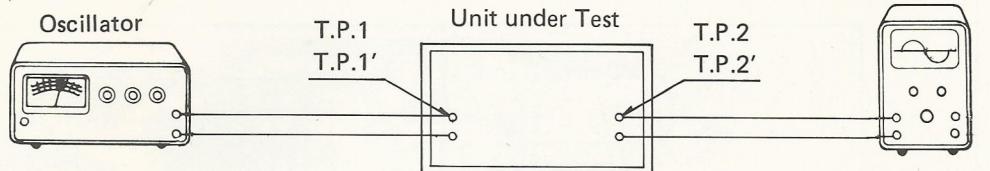


Figure 7

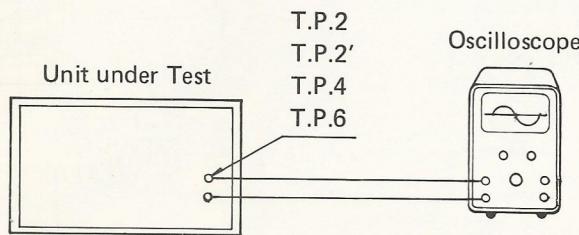


Figure 8

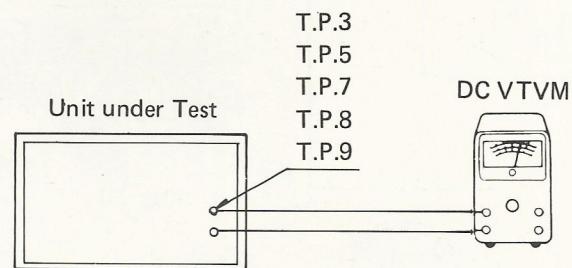
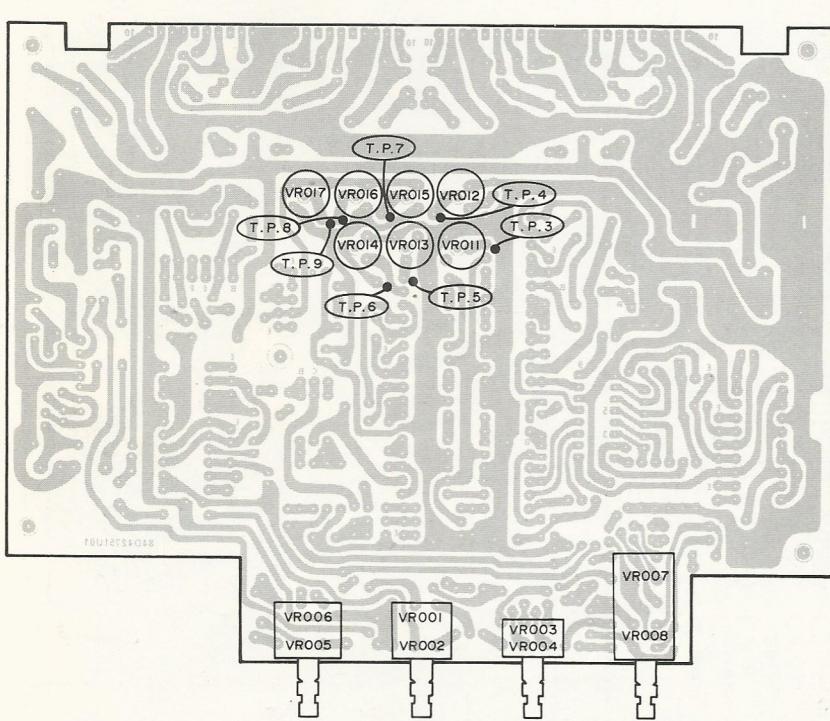
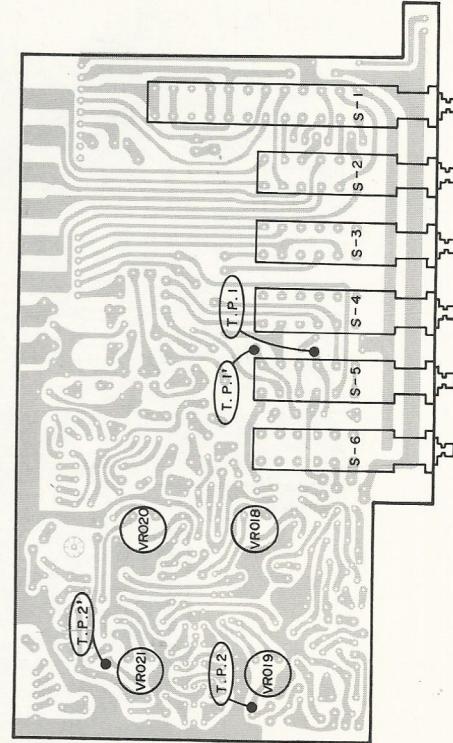


Figure 9

• Adjustment Locations



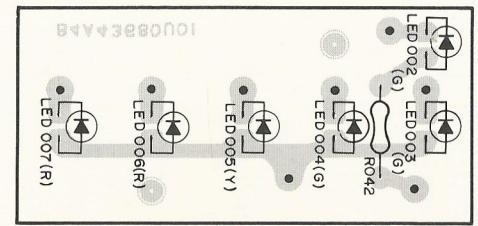
SM Main Amplifier P.C. Board



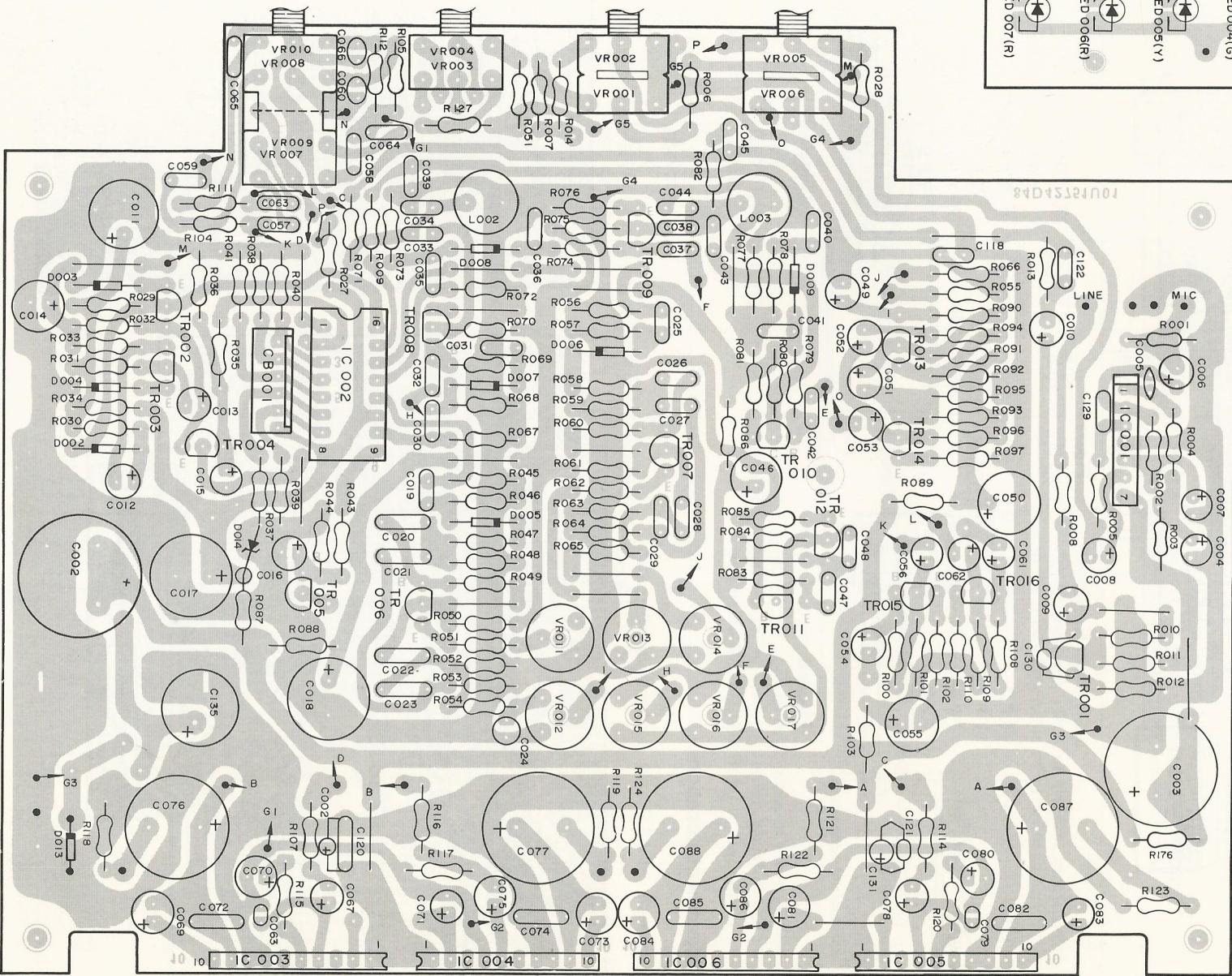
SM Switch P.C. Board

Printed Circuit Boards

LED (Level Indicators) P.C. Board

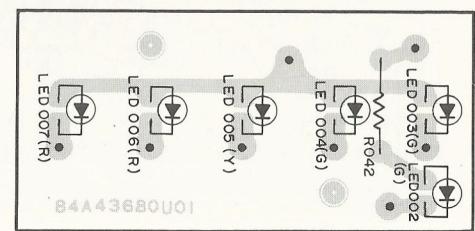
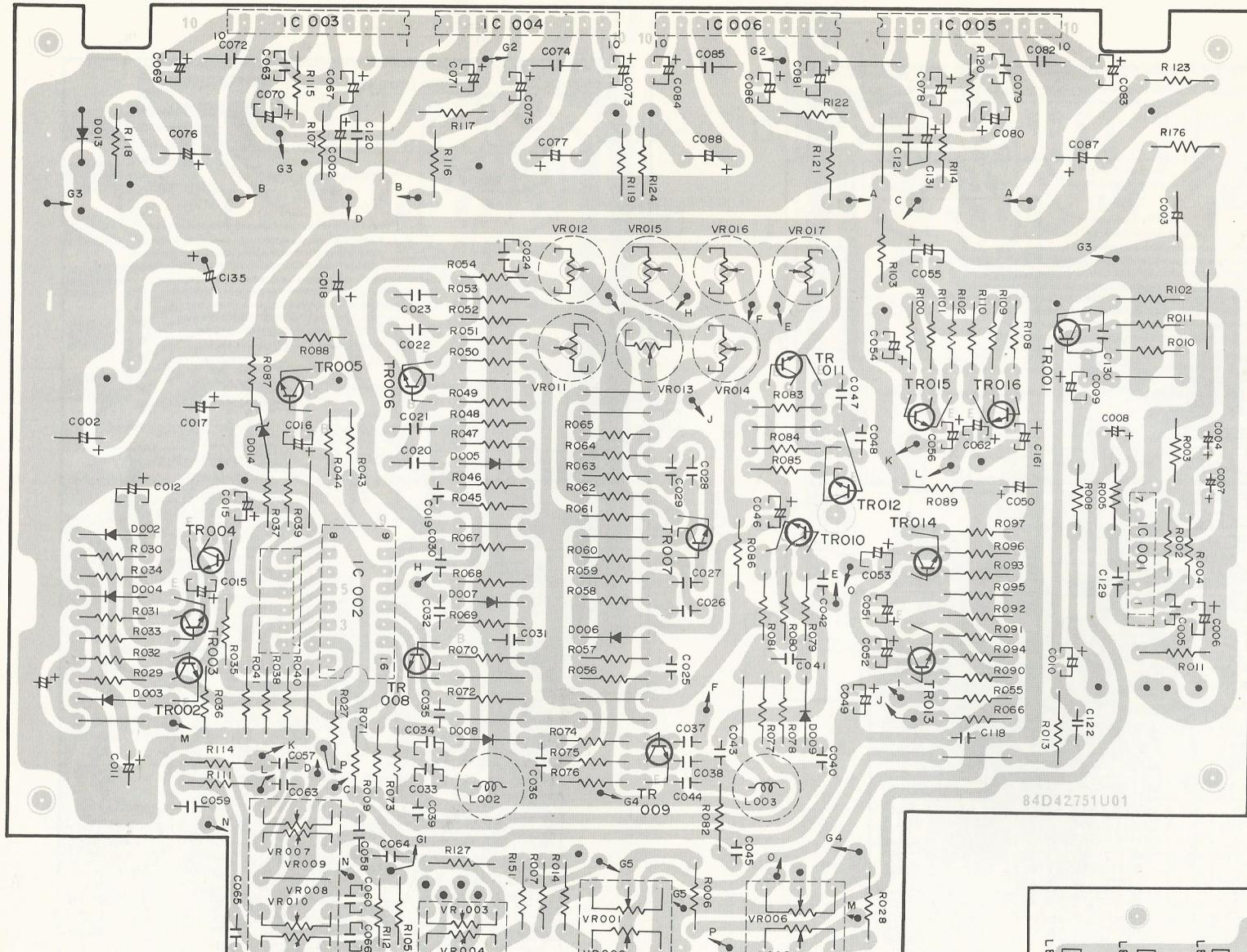


SM Main Amplifier P.C. Board

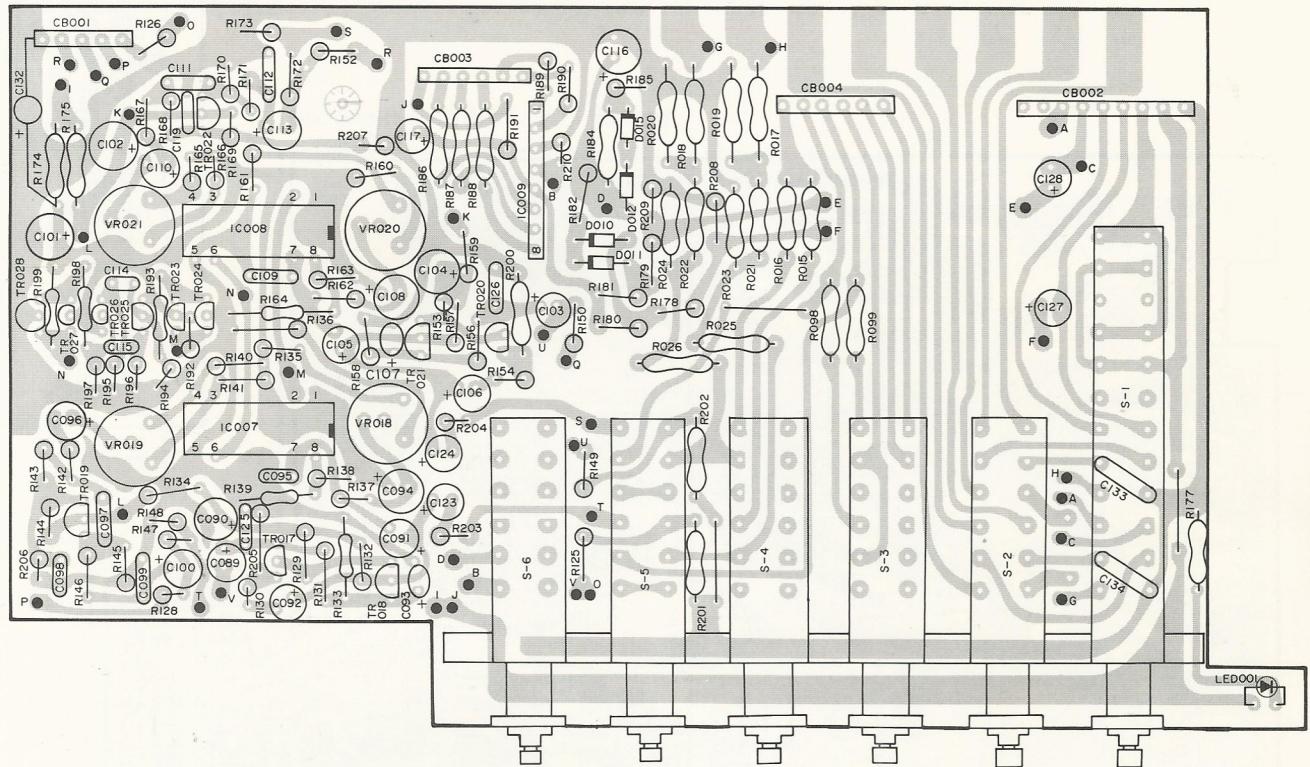


Top View

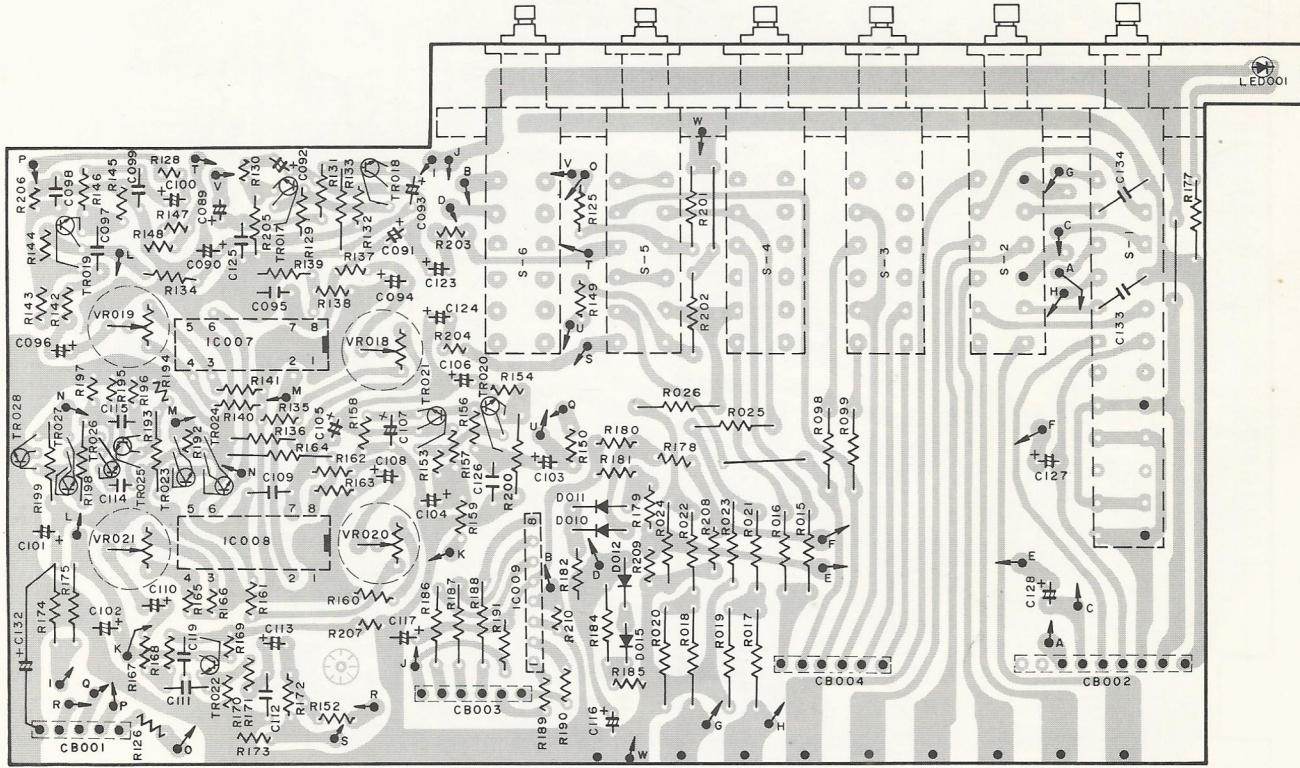
Bottom View



SM Switch P.C. Board

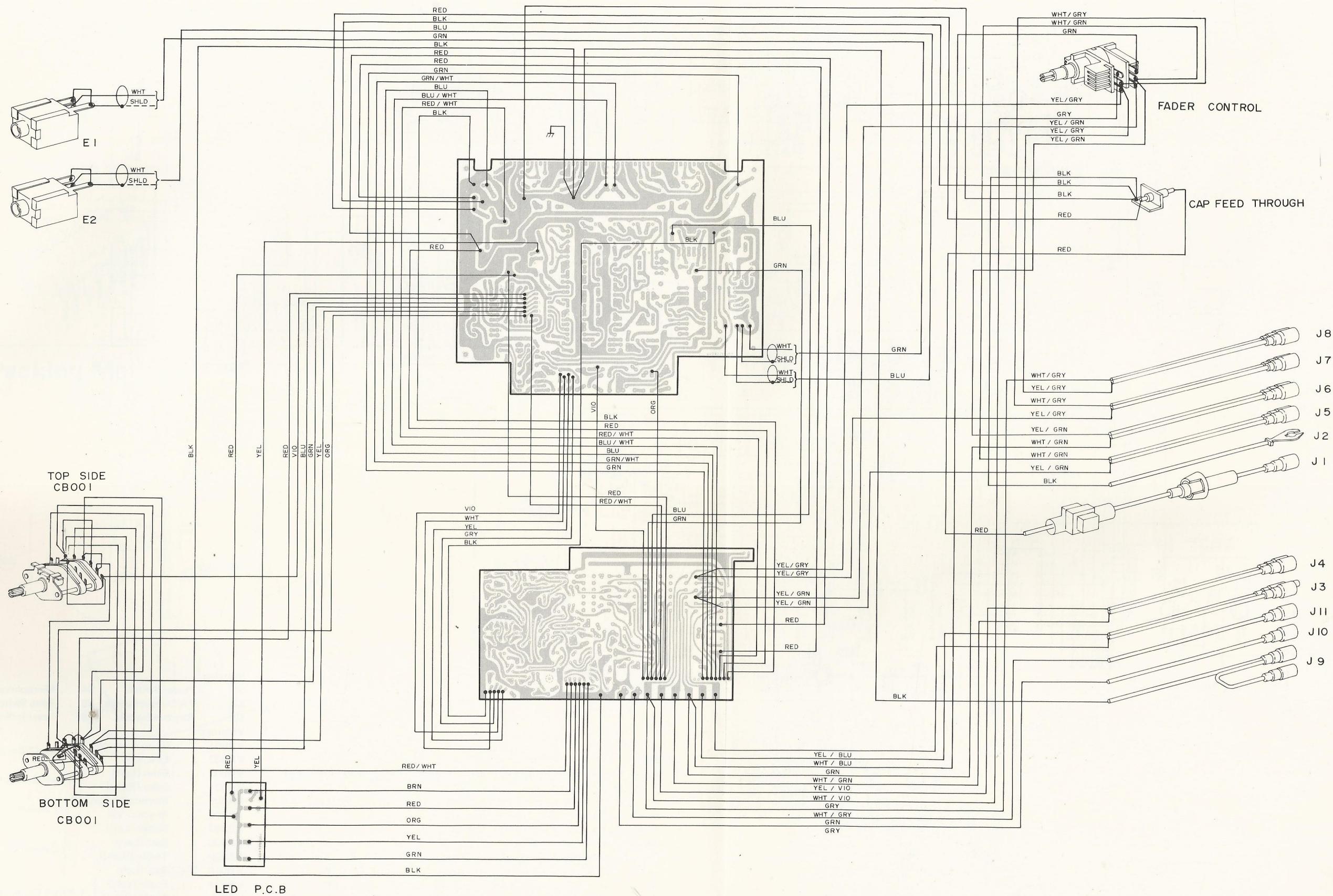


Top View

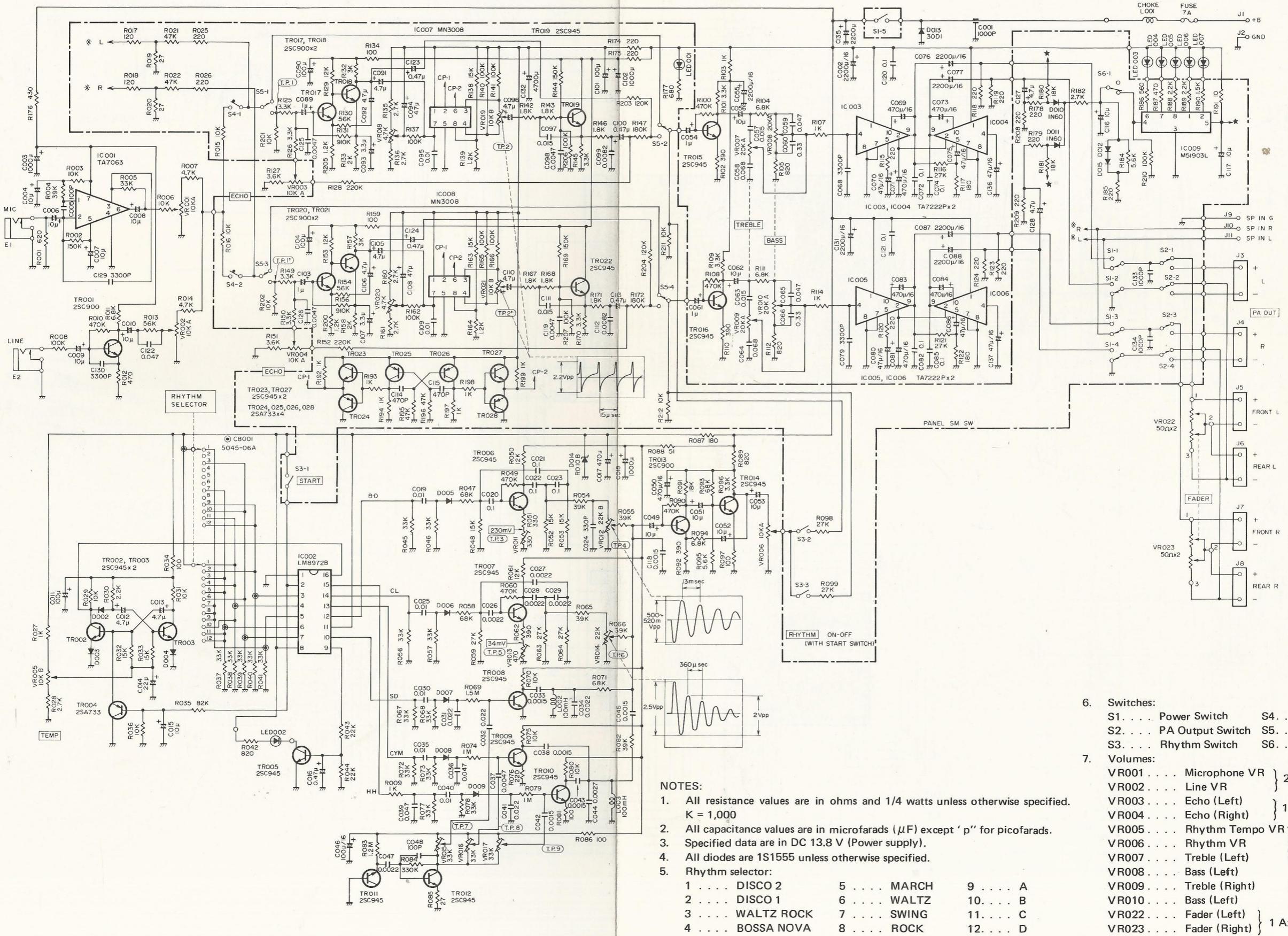


Bottom View

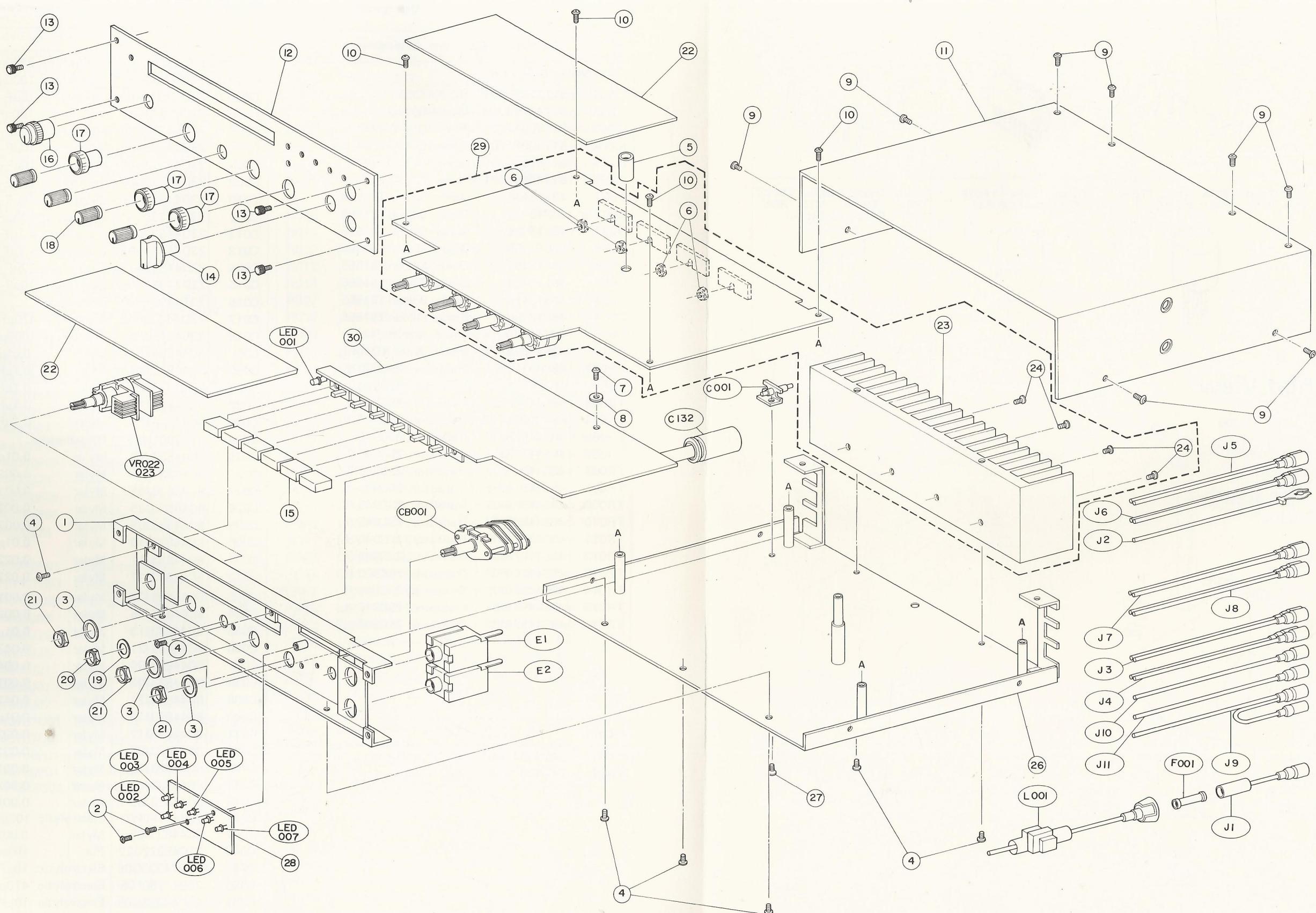
Wiring Diagram



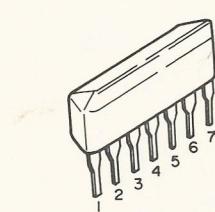
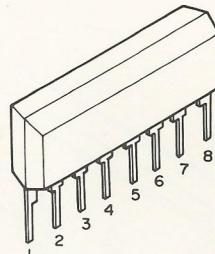
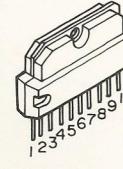
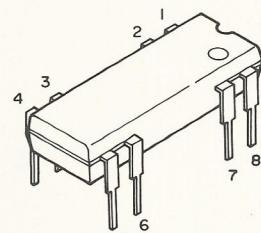
Schematic Diagram

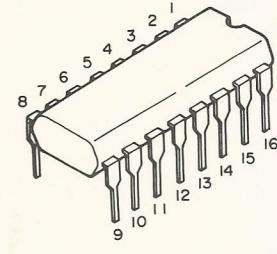
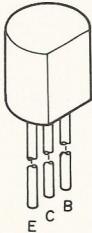
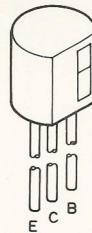


Exploded View

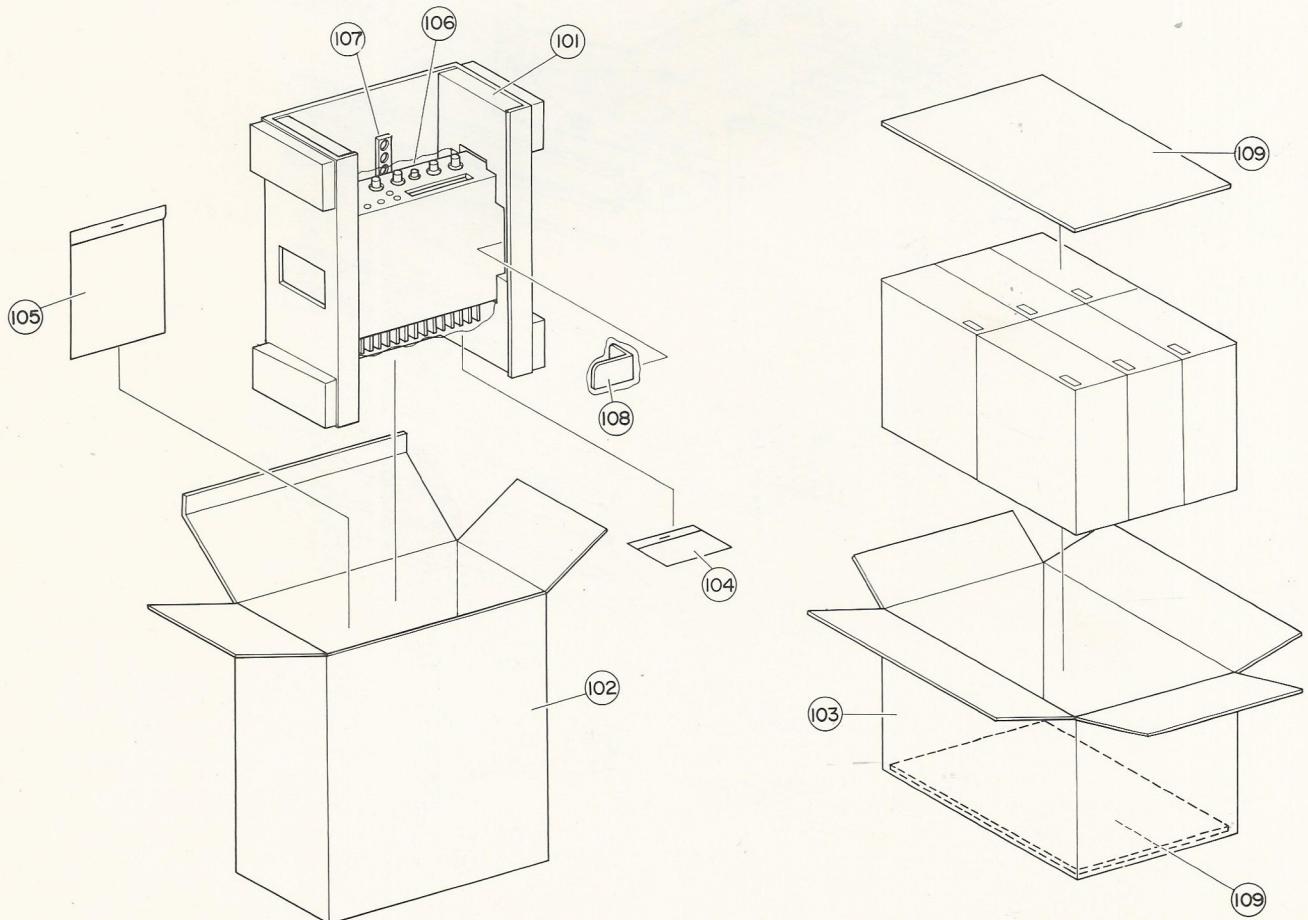


Semi-Conductor Lead Identifications

IC001: TA7063	IC009: M51903L	IC003 – IC006: TA7222P	IC007, IC008: MN3008
			

IC002: LM8972B	TR001, TR013, TR017, TR018 TR020, TR021: 2SC900 (E)	TR004, TR024 – TR026 TR028: 2SA733P (BL)	TR002, TR003, TR005 – TR012, TR014 – TR016, TR019, TR022, TR023, TR027: 2SC945 (L)
			

Packing Method View



Parts List

Symbol No.	Part No.	Description
SM Main P.C. Board Assembly		
ICs, Diodes & Transistors		
IC001	51T42759U01	IC, TA7063
IC002	51T42756U01	IC, LM8972B
IC003	51T40947T01	Power IC, TA7222P
IC004	51T40947T01	Power IC, TA7222P
IC005	51T40947T01	Power IC, TA7222P
IC006	51T40947T01	Power IC, TA7222P
D002	48S13486	Diode, Silicon 1S1555
D003	48S13486	Diode, Silicon 1S1555
D004	48S13486	Diode, Silicon 1S1555
D005	48S13486	Diode, Silicon 1S1555
D006	48S13486	Diode, Silicon 1S1555
D007	48S13486	Diode, Silicon 1S1555
D008	48S13486	Diode, Silicon 1S1555
D009	48S13486	Diode, Silicon 1S1555
D013	48T40870U01	Diode, Silicon
D014	48S42098J07	Diode, Zener RD10FB
TR001	48S40149P01	Transistor, 2SC900 (E)
TR002	48S44578J02	Transistor, 2SC945 (L)
TR003	48S44578J02	Transistor, 2SC945 (L)
TR004	48T40081T03	Transistor, 2SA733(BL)
TR005	48S44578J02	Transistor, 2SC945 (L)
TR006	48S44578J02	Transistor, 2SC945 (L)
TR007	48S44578J02	Transistor, 2SC945 (L)
TR008	48S44578J02	Transistor, 2SC945 (L)
TR009	48S44578J02	Transistor, 2SC945 (L)
TR010	48S44578J02	Transistor, 2SC945 (L)
TR011	48S44578J02	Transistor, 2SC945 (L)
TR012	48S44578J02	Transistor, 2SC945 (L)
TR013	48S40149P01	Transistor, 2SC900 (E)
TR014	48S44578J02	Transistor, 2SC945 (L)
TR015	48S44578J02	Transistor, 2SC945 (L)
TR016	48S44578J02	Transistor, 2SC945 (L)
Coils		
L002	24T43095U01	Coil, 100mH
L003	24T43095U01	Coil, 100mH

Symbol No.	Part No.	Description
Capacitors		
C002	23T43707U01	Electrolytic 2200 μ F-16V (SZ)
C003	23B44780P06	Electrolytic 1000 μ F-16V
C004	23D44333G08	Electrolytic 10 μ F-16V
C005	21C45322G22	Fix 100 μ F-50V-K
C006	23D44333G08	Electrolytic 10 μ F-16V
C007	23D44333G08	Electrolytic 10 μ F-16V
C008	23D44333G08	Electrolytic 10 μ F-16V
C009	23D44333G08	Electrolytic 10 μ F-16V
C010	23D44333G08	Electrolytic 10 μ F-16V
C011	23D44333G31	Electrolytic 100 μ F-16V
C012	23D44333G05	Electrolytic 4.7 μ F-25V
C013	23D44333G05	Electrolytic 4.7 μ F-25V
C014	23D44333G13	Electrolytic 22 μ F-16V
C015	23D44333G08	Electrolytic 10 μ F-16V
C016	23T44501P04	Electrolytic
C017	23D44333G49	Electrolytic 470 μ F-16V
C018	23B44780P06	Electrolytic 1000 μ F-16V
C019	8C44833J13	Mylar 0.01 μ F
C020	8C44833J25	Mylar 0.1 μ F
C021	8C44833J25	Mylar 0.1 μ F
C022	8C44833J25	Mylar 0.1 μ F
C023	8C44833J25	Mylar 0.1 μ F
C024	8T42081U13	Polyethylene
C025	8C44833J13	Mylar 0.01 μ F
C026	8C44833J05	Mylar 0.0022 μ F
C027	8C44833J05	Mylar 0.0022 μ F
C028	8C44833J05	Mylar 0.0022 μ F
C029	8C44833J05	Mylar 0.0022 μ F
C030	8C44833J13	Mylar 0.01 μ F
C031	8C44833J17	Mylar 0.022 μ F
C032	8C44833J17	Mylar 0.022 μ F
C033	8C44833J03	Mylar 0.0015 μ F
C034	8C44833J05	Mylar 0.0022 μ F
C035	8C44833J13	Mylar 0.01 μ F
C036	8C44833J21	Mylar 0.047 μ F
C037	8C44833J09	Mylar 0.0047 μ F
C038	8C44833J03	Mylar 0.0015 μ F
C039	8C44833J21	Mylar 0.047 μ F
C040	8C44833J13	Mylar 0.01 μ F
C041	8C44833J17	Mylar 0.022 μ F
C042	8C44833J03	Mylar 0.0015 μ F
C043	8C44833J03	Mylar 0.0015 μ F
C044	8C44833J06	Mylar 0.0027 μ F
C045	8C44833J03	Mylar 0.0015 μ F
C046	23B44780P02	Electrolytic 100 μ F-16V
C047	8C44833J05	Mylar 0.0022 μ F
C048	21C45322G22	Fix 100 μ F-50V-K
C049	23D44333G08	Electrolytic 10 μ F-16V
C050	23B44780P05	Electrolytic 470 μ F-16V
C051	23D44333G08	Electrolytic 10 μ F-16V

Symbol No.	Part No.	Description
C052	23D44333G08	Electrolytic 10 μ F-16V
C053	23D44333G08	Electrolytic 10 μ F-16V
C054	23D44333G01	Electrolytic 1 μ F-50V
C055	23T43707U01	Electrolytic 2200 μ F-16V (SZ)
C056	23D44333G08	Electrolytic 10 μ F-16V
C057	8C44833J15	Mylar 0.015 μ F
C058	8C44833J23	Mylar 0.068 μ F
C059	8C44833J21	Mylar 0.047 μ F
C060	23S41059P04	Tantalum 0.33 μ F
C062	23D44333G08	Electrolytic 10 μ F-16V
C063	8C44833J15	Mylar 0.015 μ F
C064	8C44833J23	Mylar 0.068 μ F
C065	8C44833J21	Mylar 0.047 μ F
C066	23S41059P04	Tantalum 0.33 μ F
C068	8C44833J07	Mylar 0.0033 μ F
C069	23B44780P05	Electrolytic 470 μ F-16V
C070	23B44780P01	Electrolytic 47 μ F-16V
C071	23B44780P05	Electrolytic 470 μ F-16V
C072	8C44833J25	Mylar 0.1 μ F
C073	23B44780P05	Electrolytic 470 μ F-16V
C074	8C44833J25	Mylar 0.1 μ F
C075	23B44780P01	Electrolytic 47 μ F-16V
C076	23T43707U01	Electrolytic 2200 μ F-16V(SZ)
C077	23T43707U01	Electrolytic 2200 μ F-16V(SZ)
C079	8C44833J07	Mylar 0.0033 μ F
C080	23B44780P01	Electrolytic 47 μ F-16V
C081	23B44780P05	Electrolytic 470 μ F-16V
C082	8C44833J25	Mylar 0.1 μ F
C083	23B44780P05	Electrolytic 470 μ F-16V
C084	23B44780P05	Electrolytic 470 μ F-16V
C085	8C44833J25	Mylar 0.1 μ F
C086	23B44780P01	Electrolytic 47 μ F-16V
C087	23T43707U01	Electrolytic 2200 μ F-16V (SZ)
C088	23T43707U01	Electrolytic 2200 μ F-16V (SZ)
C118	8C44833J03	Mylar 0.0015 μ F
C120	8C44833J25	Mylar 0.1 μ F
C121	8C44833J25	Mylar 0.1 μ F
C122	8C44833J21	Mylar 0.047 μ F
C129	8C44833J07	Mylar 0.0033 μ F
C130	8C44833J07	Mylar 0.0033 μ F
C131	23T43707U01	Electrolytic 2200 μ F-16V(SZ)
C135	23T43707U01	Electrolytic 2200 μ F-16V(SZ)
C136	23B44780P01	Electrolytic 47 μ F-16V
C136	23B44780P01	Electrolytic 47 μ F-16V
C161	23D44333G01	Electrolytic 1 μ F-50V

Symbol No.	Part No.	Description
Resistors		
R001	6S44593P60	Carbon Film 620 ohm 1/4W
R002	6S44594P18	Carbon Film 150K ohm 1/4W
R003	6S44593P89	Carbon Film 10K ohm 1/4W
R004	6S44594P04	Carbon Film 39K ohm 1/4W
R005	6S44594P02	Carbon Film 33K ohm 1/4W
R006	6S44593P89	Carbon Film 10K ohm 1/4W
R007	6S44593P81	Carbon Film 4.7K ohm 1/4W
R008	6S44594P14	Carbon Film 100K ohm 1/4W
R009	6S44593P65	Carbon Film 1k ohm 1/4W
R010	6S44594P30	Carbon Film 470K ohm 1/4W
R011	6S44593P85	Carbon Film 6.8K ohm 1/4W
R012	6S44593P57	Carbon Film 470K ohm 1/4W
R013	6S44594P08	Carbon Film 56K ohm 1/4W
R014	6S44593P81	Carbon Film 4.7K ohm 1/4W
R027	6S44593P65	Carbon Film 1K ohm 1/4W
R028	6S44593P75	Carbon Film 2.7K ohm 1/4W
R029	6S44593P89	Carbon Film 10K ohm 1/4W
R030	6S44593P73	Carbon Film 2.2K ohm 1/4W
R031	6S44593P89	Carbon Film 10K ohm 1/4W
R032	6S44593P93	Carbon Film 15K ohm 1/4W
R033	6S44593P93	Carbon Film 15K ohm 1/4W
R034	6S44593P41	Carbon Film 100 ohm 1/4W
R035	6S44594P12	Carbon Film 82K ohm 1/4W
R036	6S44593P02	Carbon Film 10K ohm 1/4W
R037	6S44594P02	Carbon Film 33K ohm 1/4W
R038	6S44594P02	Carbon Film 33K ohm 1/4W
R039	6S44594P02	Carbon Film 33K ohm 1/4W
R040	6S44594P02	Carbon Film 33K ohm 1/4W
R041	6S44594P02	Carbon Film 33K ohm 1/4W
R043	6S44594P97	Carbon Film 22K ohm 1/4W
R044	6S44594P97	Carbon Film 22K ohm 1/4W
R045	6S44594P02	Carbon Film 33K ohm 1/4W
R046	6S44594P02	Carbon Film 33K ohm 1/4W
R047	6S44594P10	Carbon Film 68K ohm 1/4W
R048	6S44593P93	Carbon Film 15K ohm 1/4W
R049	6S44594P30	Carbon Film 470K ohm 1/4W
R050	6S44593P91	Carbon Film 12K ohm 1/4W
R051	6S44593P53	Carbon Film 330 ohm 1/4W
R052	6S44593P93	Carbon Film 15K ohm 1/4W
R053	6S44593P93	Carbon Film 15K ohm 1/4W
R054	6S44594P04	Carbon Film 39K ohm 1/4W
R055	6S44594P04	Carbon Film 39K ohm 1/4W
R056	6S44594P02	Carbon Film 33K ohm 1/4W
R057	6S44594P02	Carbon Film 33K ohm 1/4W
R058	6S44594P10	Carbon Film 68K ohm 1/4W
R059	6S44593P99	Carbon Film 27K ohm 1/4W
R060	6S44594P30	Carbon Film 470Kohm 1/4W
R061	6S44593P91	Carbon Film 12K ohm 1/4W
R062	6S44593P55	Carbon Film 390 ohm 1/4W
R063	6S44593P99	Carbon Film 27K ohm 1/4W
R064	6S44593P99	Carbon Film 27K ohm 1/4W

Symbol No.	Part No.	Description	Symbol No.	Part No.	Description
R065	6S44594P04	Carbon Film 39K ohm 1/4W	R122	6S44593P47	Carbon Film 180 ohm 1/4W
R066	6S44594P04	Carbon Film 39K ohm 1/4W	R123	6S44593P49	Carbon Film 220 ohm 1/4W
R067	6S44594P02	Carbon Film 33K ohm 1/4W	R124	6S44593P49	Carbon Film 220 ohm 1/4W
R068	6S44594P02	Carbon Film 33K ohm 1/4W	R127	6S44593P78	Carbon Film 3.6K ohm 1/4W
R069	6S44594P42	Carbon Film 1.5M ohm 1/4W	R151	6S44593P78	Carbon Film 3.6K ohm 1/4W
R070	6S44593P89	Carbon Film 10K ohm 1/4W	R176	6S44593P56	Carbon Film 430 ohm 1/4W
R071	6S44594P10	Carbon Film 68K ohm 1/4W			
R072	6S44594P02	Carbon Film 33K ohm 1/4W			
R073	6S44594P02	Carbon Film 33K ohm 1/4W			
R074	6S44594P38	Carbon Film 1M ohm 1/4W			
R075	6S44593P89	Carbon Film 10K ohm 1/4W			
R076	6S44593 P49	Carbon Film 220 ohm 1/4W	VR001	18T43697U01	Variable, 10K-A-2-2
R077	6S44594P02	Carbon Film 33K ohm 1/4W	VR002	18T43697U01	Variable, 10K-A-2-2
R078	6S44594P02	Carbon Film 33K ohm 1/4W	VR003	18T43698U01	Variable, 10K-A-2-2
R079	6S44594P38	Carbon Film 1M ohm 1/4W	VR004	18T43698U01	Variable, 10K-A-2-2
R080	6S44593P89	Carbon Film 10K ohm 1/4W	VR005	18T43696U01	Variable, 10K-A, B-2-2
R081	6S44593P41	Carbon Film 100 ohm 1/4W	VR006	18T43696U01	Variable, 10K-A, B-2-2
R082	6S44594P04	Carbon Film 39K ohm 1/4W	VR007	18T43699U01	Variable, 20K-A-2-4
R083	6S44594P40	Carbon Film 1.2M ohm 1/4W	VR008	18T43699U01	Variable, 20K-A-2-4
R084	6S44594P26	Carbon Film 330Kohm 1/4W	VR009	18T43699U01	Variable, 20K-A-2-4
R085	6S44593P27	Carbon Film 27K ohm 1/4W	VR010		— Not Used —
R086	6S44593P41	Carbon Film 100Kohm 1/4W	VR011	18C41732G14	Solid Variable
R087	6B43205J09	Metal 180 ohm 1/4W	VR012	18C41732G08	Solid Variable 22K-B
R088	6S44593P34	Carbon Film 51 ohm 1/4W	VR013	18C41732G10	ADJ 470
R089	6S44593P63	Carbon Film 820 ohm 1/4W	VR014	18C41732G08	Solid Variable 22K-B
R090	6S44594P30	Carbon Film 470 ohm 1/4W	VR015	18C41732G15	Solid Variable
R091	6S44593P95	Carbon Film 18K ohm 1/4W	VR016	18C41732G15	Solid Variable
R092	6S44593P55	Carbon Film 390 ohm 1/4W	VR017	18C41732G15	Solid Variable
R093	6S44594P10	Carbon Film 68K ohm 1/4W			
R094	6S44593P85	Carbon Film 6.8K ohm 1/4W			
R095	6S44593P83	Carbon Film 5.6K ohm 1/4W			
R096	6S44593P77	Carbon Film 3.3K ohm 1/4W			
R097	6S44593P41	Carbon Film 100 ohm 1/4W			
R100	6S44594P30	Carbon Film 470Kohm 1/4W			
R101	6S44593P77	Carbon Film 3.3K ohm 1/4W			
R102	6S44593P55	Carbon Film 390 ohm 1/4W			
R103	6S44593P65	Carbon Film 1K ohm 1/4W			
R104	6S44593P85	Carbon Film 6.8K ohm 1/4W			
R105	6S44593P63	Carbon Film 820 ohm 1/4W			
R107	6S44593P65	Carbon Film 1K ohm 1/4W			
R108	6S44594P30	Carbon Film 470Kohm 1/4W			
R109	6S44593P77	Carbon Film 3.3K ohm 1/4W			
R110	6S44593P55	Carbon Film 390 ohm 1/4W			
R111	6S44593P85	Carbon Film 6.8K ohm 1/4W			
R112	6S44593P63	Carbon Film 820 ohm 1/4W			
R114	6S44593P65	Carbon Film 1K ohm 1/4W			
R115	6S44593P49	Carbon Film 220 ohm 1/4W	TR017	48S40149P01	Transistor, 2SC900E
R116	6S44593P99	Carbon Film 27K ohm 1/4W	TR018	48S40149P01	Transistor, 2SC900E
R117	6S44593P47	Carbon Film 180 ohm 1/4W	TR019	48S44578J02	Transistor, 2SC945L
R118	6S44593P49	Carbon Film 220 ohm 1/4W	TR020	48S40149P01	Transistor, 2SC900E
R119	6S44593P49	Carbon Film 220 ohm 1/4W	TR021	48S40149P01	Transistor, 2SC900E
R120	6S44593P49	Carbon Film 220 ohm 1/4W	TR022	48S44578J02	Transistor, 2SC945L
R121	6S44593P99	Carbon Film 27K ohm 1/4W	TR023	48S44578J02	Transistor, 2SC945L
			TR024	48T40081T03	Transistor, 2SA733BL

SM Switch P.C. Board

ICs & Transistors

IC007	51T42757U01	IC, MN3008
IC008	51T42757U01	IC, MN3008
IC009	51T43690U01	IC, M51903L
TR017	48S40149P01	Transistor, 2SC900E
TR018	48S40149P01	Transistor, 2SC900E
TR019	48S44578J02	Transistor, 2SC945L
TR020	48S40149P01	Transistor, 2SC900E
TR021	48S40149P01	Transistor, 2SC900E
TR022	48S44578J02	Transistor, 2SC945L
TR023	48S44578J02	Transistor, 2SC945L
TR024	48T40081T03	Transistor, 2SA733BL

Symbol No.	Part No.	Description
TR025	48T40081T03	Transistor, 2SA733BL
TR026	48T40081T03	Transistor, 2SA733BL
TR027	48S44578J02	Transistor, 2SC945L
TR028	48T40081T03	Transistor 2SA733BL
Diodes & LED		
D010	48B41768G01	Diode, 1N60
D011	48S41768G01	Diode, 1N60
D012	48S134816	Diode, Silicon 1S1555
D015	48S134816	Diode, Silicon 1S1555
LED001	48T43818P01	L.E.D.
Capacitors		
C089	23D44333G01	Electrolytic 1 μ F-50V
C090	23B44780P02	Electrolytic 100 μ F-16V
C091	23D44333G05	Electrolytic 4.7 μ F-25V
C092	23D44333G05	Electrolytic 4.7 μ F-25V
C093	23S41059P16	Tantalum 3.3 μ F
C094	23B44780P01	Electrolytic 47 μ F-16V
C095	8C44833J13	Mylar 0.01 μ F
C096	23D44333G05	Electrolytic 4.7 μ F-25V
C097	8C44833J15	Mylar 0.015 μ F
C098	8C44833J09	Mylar 0.0047 μ F
C099	8C44833J12	Mylar 0.0082 μ F
C101	23B44780P02	Electrolytic 100 μ F-16V
C102	23T41603U01	Electrolytic 100 μ F-16V
C103	23D44333G01	Electrolytic 1 μ F-50V
C104	23B44780P02	Electrolytic 100 μ F-16V
C105	23D44333G05	Electrolytic 4.7 μ F-25V
C106	23D44333G05	Electrolytic 4.7 μ F-25V
C107	23S41059P16	Electrolytic Tantel. 3.3 μ F
C108	23B44780P01	Electrolytic 47 μ F-16V
C109	8C44833J13	Mylar 0.01 μ F
C100	23S41198U01	Electrolytic Mini-Size
C110	23D44333G05	Electrolytic 4.7 μ F-25V
C111	8C44833J15	Mylar 0.015 μ F
C112	8C44833J12	Mylar 0.0082 μ F
C113	23S41198U01	Electrolytic Mini-Size
C114	21C45322G27	Fix 470PF-50V-M
C115	21C45322G27	Fix 470PF-50V-M
C116	23D44333G08	Electrolytic 10 μ F-16V
C117	23D44333G08	Electrolytic 10 μ F-16V
C119	8C44833J09	Mylar 0.0047 μ F
C123	23S41198U01	Electrolytic Mini-Size
C124	23S41198U01	Electrolytic Mini-Size
C125	8C44833J09	Mylar 0.0047 μ F
C126	8C44833J09	Mylar 0.0047 μ F

Symbol No.	Part No.	Description
C127	23D44333G05	Electrolytic 4.7 μ F-25V
C128	23D44333G05	Electrolytic 4.7 μ F-25V
C133	8C44833J01	Mylar 0.001 μ F
C134	8C44833J01	Mylar 0.001 μ F
Resistors		
R015	6S44593P89	Carbon Film 10K ohm 1/4W
R016	6S44593P89	Carbon Film 10K ohm 1/4W
R017	6C44652G04	Carbon Film 120 ohm 1W
R018	6C44652G04	Carbon Film 120 ohm 1W
R019	6C44652G03	Metal Film 27 ohm 1W
R020	6C44652G03	Metal Film 27 ohm 1W
R021	6S44594P06	Carbon Film 47K ohm 1/4W
R022	6S44594P06	Carbon Film 47K ohm 1/4W
R023	6S44593P89	Carbon Film 10K ohm 1/4W
R024	6S44593P89	Carbon Film 10K ohm 1/4W
R025	6S44593P49	Carbon Film 220 ohm 1/4W
R026	6S44593P49	Carbon Film 220 ohm 1/4W
R026	6S44593P49	Carbon Film 220 ohm 1/4W
R027	6S44593P99	Carbon Film 27K ohm 1/4W
R098	6S44593P99	Carbon Film 27K ohm 1/4W
R099	6S44593P99	Carbon Film 27K ohm 1/4W
R125	6S41801P38	Carbon Film 3.3K ohm 1/4W
R126	6S41801P38	Carbon Film 3.3K ohm 1/4W
R128	6S41801P60	Carbon Film 220K ohm 1/4W
R129	6S41801P45	Carbon Film 12K ohm 1/4W
R130	6S41801P53	Carbon Film 56K ohm 1/4W
R131	6S40108T37	Carbon Film 910K ohm 1/4W
R132	6S40107T76	Carbon Film 3K ohm 1/4W
R133	6S44593P72	Carbon Film 2K ohm 1/4W
R134	6S41801P20	Carbon Film 100 ohm 1/4W
R135	6S41801P37	Carbon Film 2.7K ohm 1/4W
R136	6S41801P37	Carbon Film 2.7K ohm 1/4W
R137	6S41801P56	Carbon Film 100K ohm 1/4W
R138	6S41801P46	Carbon Film 15K ohm 1/4W
R139	6S44593P67	Carbon Film 1.2K ohm 1/4W
R140	6S41801P56	Carbon Film 100K ohm 1/4W
R141	6S41801P56	Carbon Film 100K ohm 1/4W
R142	6S41801P35	Carbon Film 1.8K ohm 1/4W
R143	6S41801P35	Carbon Film 1.8K ohm 1/4W
R144	6S41801P58	Carbon Film 150K ohm 1/4W
R145	6S41801P38	Carbon Film 3.3K ohm 1/4W
R146	6S41801P35	Carbon Film 1.8K ohm 1/4W
R147	6S41801P59	Carbon Film 180K ohm 1/4W
R148	6S41801P44	Carbon Film 10K ohm 1/4W
R149	6S41801P38	Carbon Film 3.3K ohm 1/4W
R150	6S41801P38	Carbon Film 3.3K ohm 1/4W
R151	6S41801P60	— Not Used —
R152	6S41801P60	Carbon Film 220K ohm 1/4W

Symbol No.	Part No.	Description	Symbol No.	Part No.	Description
R153	6S41801P45	Carbon Film 220K ohm 1/4W	R206	6S41801P56	Carbon Film 100Kohm 1/4W
R154	6S41801P53	Carbon Film 56K ohm 1/4W	R207	6S41801P56	Carbon Film 100Kohm 1/4W
R155	6S41801P53	Carbon Film 56K ohm 1/4W	R208	6S41801P24	Carbon Film 220 ohm 1/4W
R156	6S40108T37	Carbon Film 910K ohm 1/4W	R209	6S41801P24	Carbon Film 220 ohm 1/4W
R157	6S40107T76	Carbon Film 3K ohm 1/4W	R210	6S41801P56	Carbon Film 100Kohm 1/4W
R158	6S40107T72	Carbon Film 2K ohm 1/4W	VR018	18C41732G03	Solid Variable 4.7K-B
R159	6S41801P20	Carbon Film 100 ohm 1/4W	VR019	18C41732G06	Solid Variable 10K-B
R160	6S41801P37	Carbon Film 2.7K ohm 1/4W	VR020	18C41732G03	Solid Variable 4.7K-B
R161	6S41801P37	Carbon Film 2.7K ohm 1/4W	VR021	18C41732G06	Solid Variable 10K-B
R162	6S41801P56	Carbon Film 100K ohm 1/4W	LED P.C. Board		
R163	6S41801P46	Carbon Film 15K ohm 1/4W	R042	6S41802P31	Carbon Film 820 ohm 1/4W
R164	6S44593P67	Carbon Film 1.2K ohm 1/4W	LED002	48T43688P01	LED
R165	6S41801P56	Carbon Film 100K ohm 1/4W	LED003	48T43688P01	LED
R166	6S41801P56	Carbon Film 100K ohm 1/4W	LED004	48T43688P01	LED
R167	6S41801P35	Carbon Film 1.8K ohm 1/4W	LED005	48T40956T01	LED Tly.
R168	6S41801P35	Carbon Film 1.8K ohm 1/4W	LED006	48T43818P01	LED
R169	6S41801P58	Carbon Film 150K ohm 1/4W	LED007	48T43818P01	LED
R170	6S41801P38	Carbon Film 3.3K ohm 1/4W	Miscellaneous Parts		
R171	6S41801P35	Carbon Film 1.8K ohm 1/4W	E1	9T43094U01	Jack, Microphone
R172	6S41801P59	Carbon Film 180Kohm 1/4W	E2	9T43094U01	Jack, Microphone
R173	6S41801P44	Carbon Film 10K ohm 1/4W	CB001	40T42763U01	Switch, Rotary
R174	6S44593P49	Carbon Film 220 ohm 1/4W	VR022	18T40941T02	Fader Control
R175	6S44593P49	Carbon Film 220 ohm 1/4W	VR023	18T40941T02	Fader Control
R176	— Not Used —		J1	1T43751U01	Assembly, Fuse Holder
R177	6S44593P61	Carbon Film 680 ohm 1/4W	J2	30T40438U02	Assembly, Ground Wire
R178	6S41801P24	Carbon Film 220 ohm 1/4W	J3	30T44417U01	Cord, Speaker (PA, Left)
R179	6S41801P24	Carbon Film 220 ohm 1/4W	J4	30T44417U02	Cord, Speaker (PA, Right)
R180	6S41801P47	Carbon Film 18K ohm 1/4W	J5	30T40337U10	Cord, Speaker (Left Front)
R181	6S41801P47	Carbon Film 18K ohm 1/4W	J6	30T40337U12	Cord, Speaker (Left Rear)
R182	6S41801P37	Carbon Film 2.7K ohm 1/4W	J7	30T40337U09	Cord, Speaker (Right Front)
R183	— Not Used —		J8	30T40337U11	Cord, Speaker (Right Rear)
R184	6S44593P83	Carbon Film 5.6K ohm 1/4W	J9	30T40441U02	Assembly, Cable
R185	6S41801P24	Carbon Film 220 ohm 1/4W	J10	30T40439U02	Assembly, Cable (R)
R186	6S44593P59	Carbon Film 560 ohm 1/4W	J11	30T40440U02	Assembly, Cable
R187	6S44593P57	Carbon Film 470 ohm 1/4W	C001	21B41880J04	Cap., 1000PF
R188	6S44593P73	Carbon Film 2.2K ohm 1/4W	C132	23B44780P14	Cap., Electrolytic 4700μF-16V
R189	6S41801P36	Carbon Film 2.2K ohm 1/4W	L001	25T43197U01	Choke, External
R190	6S41801P34	Carbon Film 1.5K ohm 1/4W	F001	65A40348G10	Fuse
R191	6S41801P08	Carbon Film 10 ohm 1/4W			
R192	6S41801P32	Carbon Film 1K ohm 1/4W			
R193	6S44593P65	Carbon Film 1K ohm 1/4W			
R194	6S41801P32	Carbon Film 1K ohm 1/4W			
R195	6S41801P52	Carbon Film 47K ohm 1/4W			
R196	6S41801P52	Carbon Film 47K ohm 1/4W			
R197	6S41801P32	Carbon Film 1K ohm 1/4W			
R198	6S44593P65	Carbon Film 1K ohm 1/4W			
R199	6S44593P65	Carbon Film 1K ohm 1/4W			
R200	6S44593P67	Carbon Film 1.2K ohm 1/4W			
R201	6S44593P89	Carbon Film 10K ohm 1/4W			
R202	6S44593P89	Carbon Film 10K ohm 1/4W			
R203	6S41801P57	Carbon Film 120K ohm 1/4W			
R204	6S41801P57	Carbon Film 120K ohm 1/4W			
R205	6S41801P33	Carbon Film 1.2K ohm 1/4W			

Symbol No.	Part No.	Description	Symbol No.	Part No.	Description
General Assembly					
1	27D42988U01	Chassis, Front	107	42B40994G05	Strap, Receiver Mounting
2	3S40011G31	Screw, Mch. (M2.6 x 0.45 x 4)	108	7B40690T01	Bracket, Mounting
3	4S40070G28	Washer (9.1 x 14 x 0.5)	109	56A43276P06	Pad, Packing
4	3S40011G42	Screw, Mch. (M3 x 0.5 x 5)	110	3S43997P02	Screw, Mch. (M5 x 0.8 x 8)
5	46A43305U01	Stud, Panel			
6	2S40000G12	Nut, Hex. (M3 x 0.5)			
7	3S40011G26	Screw, Mch. (M3 x 0.5 x 8)			
8	4A40067T01	Washer, Fiber			
9	3S40011G17	Screw, Mch. (M3 x 0.5 x 6)			
10	3S44205G02	Screw, Tapping (M3.5x5.5x6)			
11	15C42990U01	Cover, Top			
12	64B42991U01	Plate, Front			
13	3A41584U02	Screw, Panel			
14	36B44567P02	Knob, Select			
15	36A44880G03	Knob, Switch			
16	36A43785P01	Knob, Control			
17	36A40188T02	Knob, Volume			
18	36A42992U01	Knob, Control			
19	4S40070G14	Washer (7.2 x 12 x 0.5)			
20	2S40000G10	Nut, Hex. (M7 x 0.75)			
21	2S40000G15	Nut			
22	14A44511U01	Insulator Fiber			
23	7B42993U01	Heat Sink			
24	3S40011G28	Screw, Mch. (M3 x 0.5 x 16)			
26	15C42989U01	Cover, Bottom			
27	3C40014G18	Screw, Mch. (M2.6 x 0.45)			
28	1V42200U92	Assembly, LED Panel			
29	1V42200U90	Assembly, SM Main Panel			
30	1V42200U91	Assembly, SM Switch Panel			
Packing Assembly					
101	56C43001U01	Assembly, Packing Tray			
102	56C42999U01	Carton, Packing (Individual)			
103	56C42999U02	Carton, Packing (Master)			
104	1V42300U07	Assembly, Kit Installation			
104-1	56B40230G27	Sack Plyethylene			
104-2	4S40072G12	Washer, Tooth Lock			
104-3	3A43315G02	Screw, Mch. (M5 x 0.8 x 10)			
104-4	3S40012G39	Screw, Topping (M5 x 20)			
104-5	3A43315G03	Screw, Mch. (M5 x 0.8 x 20)			
104-6	4S40078G08	Washer (5.5 x 12 x 0.8)			
105	1V42300U08	Assembly, Pamphlet			
105-1	68P44550U11	Owner's Manual			
105-2	56B40230G12	Sack, Polyethylene			
106	56B40990T06	Sack, Polyethylene			