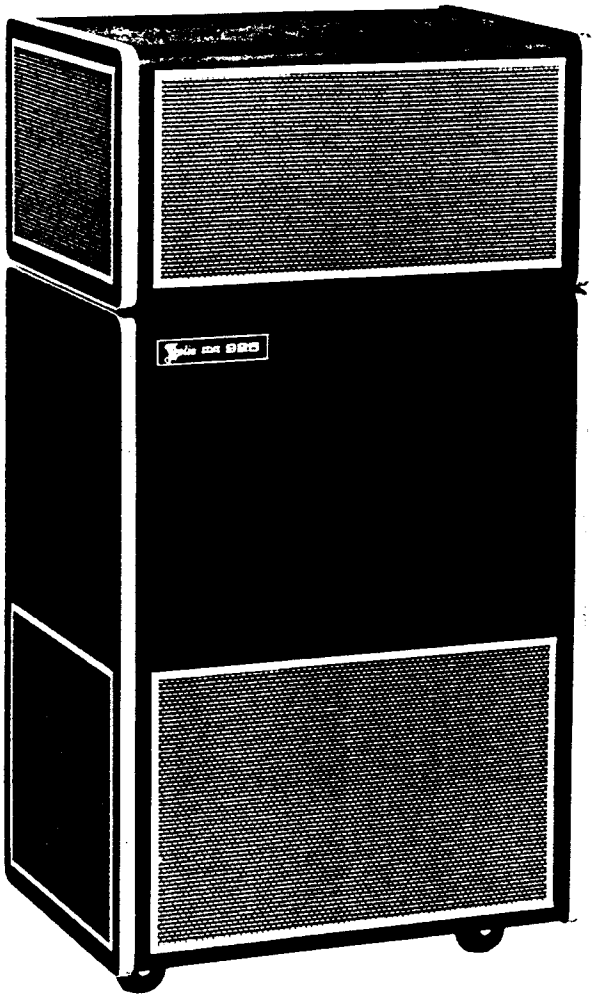
THE LESLIE® SPEAKER
MODEL 925
SERVICE MANUAL



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ELECTRO MUSIC
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INTRODUCTION

THE LESLIE SPEAKER MODEL 925

The Model 925 is a three channel, 140 watt unit incorporating four 6″ x 9″ wide range loudspeakers, a heavy duty 15″ Bass speaker, and a heavy duty Treble Driver.

Model 925 may be connected to the organ with the appropriate Model 900 console connector or a Deluxe Combo Preamp.

Incoming signal is divided into three frequency ranges for supplying the Treble, Auxiliary, and Bass amplifiers. This frequency division is performed by the Preamp Crossover Network on the 925 heat sink.

The highest signal frequencies (800 Hz and above) are channeled through the Treble amplifier to power the treble driver mounted beneath the treble horn.

Higher frequency signal with less bass roll off powers the four 6″ x 9″ Auxiliary channel speakers in the upper cabinet. This channel boosts the midrange substantially, amplifying frequencies 100 Hz and above.

The volume of the four Auxiliary 6″ x 9″ speakers can be switched between off, medium, and full by means of the REV/AUX control provided with the console connector or mounted on the Deluxe Combo Preamp.

The lowest signal frequencies are directed through the Bass amplifier to drive the 15″ bass loudspeaker mounted above the bass rotor.

Both the bass rotor and treble horn can be driven at fast (Tremolo) speed, slow (Chorale) speed or stopped by the two speed motor assemblies and brake circuit incorporated in the Model 925. For an explanation of the brake and motor control circuits, see page 8 of this manual.

BLOCK DIAGRAM: LESLIE SPEAKER MODEL 925

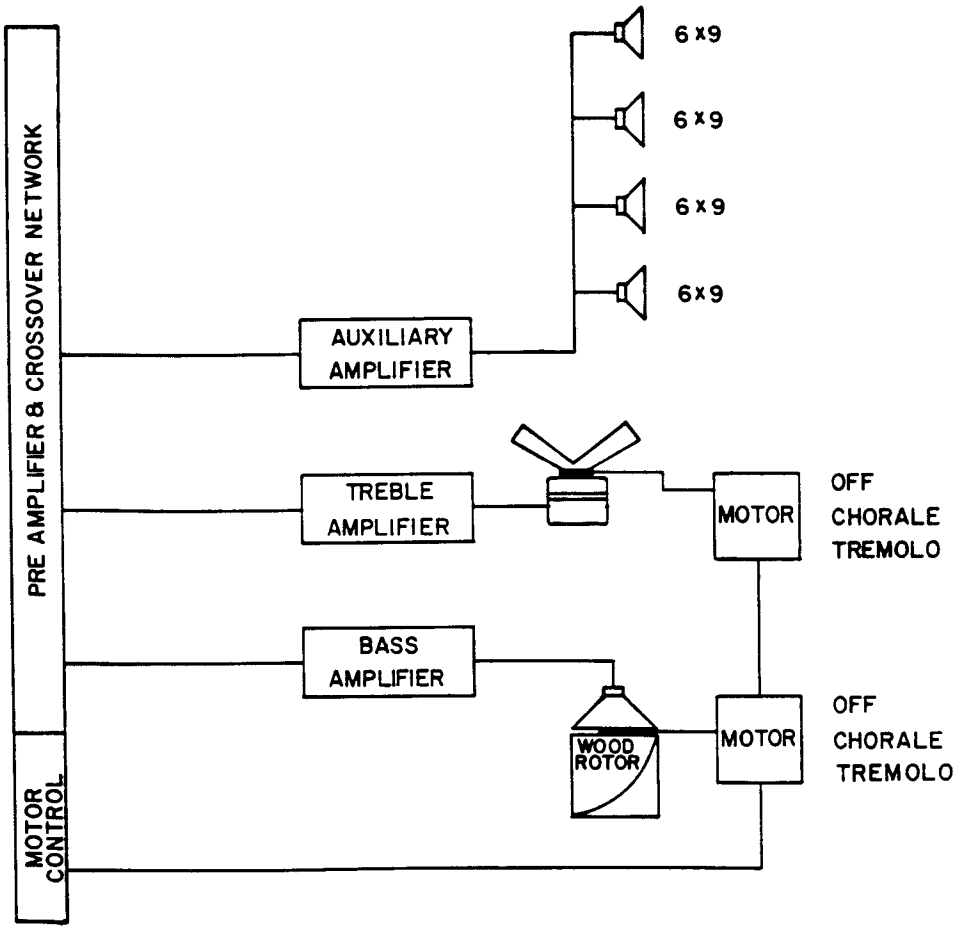


Fig. 1

SPECIFICATIONS

Cabinet Finish:	Upper and lower cabinets are covered with Black Levant Leatherette with black grille cloth over the speaker ports. Edges are trimmed in silver-gray molding.
Cabinet Dimensions:	54½″ high, 28″ wide, 20¼″ deep.
Speakers:	One 15 inch, 4 ohm loudspeaker for the Bass channel. Four heavy-duty, 6 x 9 inch, 16 ohm loudspeakers for the Auxiliary channel. One 16 ohm, compression type treble driver for the Treble channel.
Amplifiers:	Bass channel: 50 watts output Treble channel: 50 watts output Auxiliary channel: 40 watts output.
Power Requirements:	310 Watts, 3.35 Amps @ 117 VAC, 60 Hz 310 Watts, 1.65 Amps @ 234/250 VAC, 50/60 Hz
Fuses:	117V, 60 Hz Models: 2 Amp Slo-Blo 234/250V, 50 Hz Models: 1 Amp Slo-Blo
Bass Rotor:	A wooden unit, 17″ dia. x 9″ high. Rotates at approximately 390 RPM in Tremolo mode; approximately 40 RPM in Chorale mode.
Treble Horn:	A black plastic unit. With belt in middle pulley groove, treble horn rotates at approximately 390 RPM in Tremolo mode; approximately 40 RPM in Chorale mode.
Weight:	Boxed: 232 pounds Unboxed: 214 pounds

GUARANTEE

The speaker is guaranteed against all defects in materials and workmanship for one year from date of purchase. This guarantee does not cover belts or speaker cones, which may wear out sooner due to severe usage.

OPERATION

PREPARING SPEAKER FOR USE

1. After unboxing speaker, remove lower back panel from upper cabinet by undoing its two knurled mounting screws.
2. Pull out the two cables stored within the upper cabinet.
3. Locate cabinet connector chassis mounted in lower left hand corner, lower cabinet. (As seen from rear of the Model 925.) Connect cable plugs to matching cabinet connector sockets.
4. Connect cable sockets to matching cabinet connector plugs in left hand corner of the upper cabinet. Replace upper cabinet back panel.
5. Connect speaker cable to previously installed console connector or the Deluxe Combo Preamp. CAUTION: Turn off the organ or Deluxe Combo Preamp before attaching the speaker cable.

VOLUME CONTROL ADJUSTMENT

Due to variations in speaker-organ combinations and in musical taste, there are no definite volume control settings for the Model 925.

925 volume controls are factory set at maximum volume. If you desire to change the factory volume settings, we recommend backing off the Master Volume Control about halfway. Have someone hold a chord encompassing the organ's entire frequency range, with the expression pedal on full. Set the volume controls of the Auxiliary, Treble, and Bass amplifiers according to your musical preference.

These controls are adjusted through their access holes in the rear of the lower back panel, hereafter referred to as the heat sink.

Finally, turn up the Master Volume Control until distortion is evident. Then back it off until distortion just disappears.

CONTROLS

The Model 925 requires two controls: A REV/AUX control which controls volume of the Auxiliary channel, and a Tremolo control to vary the speed of the Bass rotor and Treble Horn.

These control functions are provided by the two switches included with the console connector or the four foot switches mounted on the Deluxe Combo Preamp.

REV/AUX CONTROL

OFF: Opens circuit between Crossover Preamp and Auxiliary amplifier. No signal to the four Auxiliary 6″ x 9″ speakers.

MEDIUM: LDR (light dependent resistor) becomes moderately conductive, driving the Auxiliary speakers at moderate volume.

FULL: LDR conducts maximum signal to the Auxiliary amplifier and speakers. Auxiliary speakers driven at full volume.

TREMOLO CONTROL

TREMOLO (Fast): Actuates large motors in both two-speed motor assemblies. Bass rotor and treble horn spin at tremolo speed (approximately 390 RPM.)

OFF: Brake circuit within the 925 Power Supply stops bass rotor and treble horn. (See 925 Motor Control and Brake Circuits.)

CHORALE (Slow): Actuates slow motors in both two-speed motor assemblies. Bass rotor and treble horn spin at chorale speed (approximately 40 RPM.)

AUXILIARY/CONTROL CIRCUIT

Signal applied to the Auxiliary amplifier is controlled by an LDR (light dependent resistor) located in the Preamp-Crossover Network.

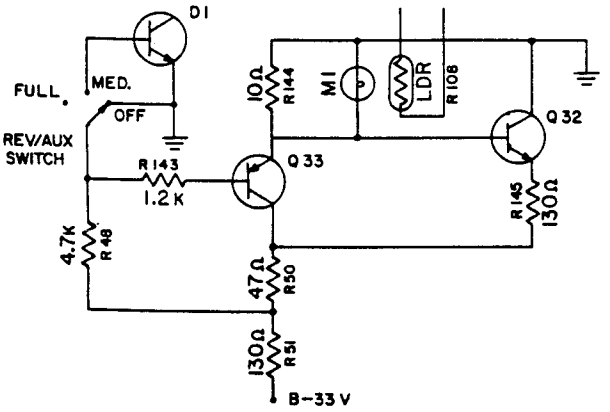
Diode D1 and the Rev/Aux control are part of the console connector or the Deluxe Combo Preamp. Resistors R48, R50, R51, R143, R144, R145 and Transistors Q32 and Q33 are located on the power supply circuit board. Lamp M1 is located on the Preamp/Crossover Network.

When the REV/AUX control is switched to OFF, current is drawn through transistor Q32. Lamp M1 is off and LDR R108 shows maximum resistance to signal flow.

When the REV/AUX control is switched to MEDIUM, D1 conducts, drawing equal current between Q32 and Q33. This causes lamp M1 to glow at medium intensity.

Light dependent resistor R109 becomes moderately conductive, passing some signal.

When the REV/AUX control is switched to ON, only Q33 conducts, causing lamp M1 to glow at maximum intensity. This causes LDR R109 to pass the maximum amount of signal to the auxiliary amplifier.



SPEAKER CABLE 021600

The 9 conductor connecting cable is supplied in a 30 foot length, complete with plug and socket. If the distance between the organ (or Deluxe Combo Preamp) and the Model 925 exceeds 30 feet, two or more 021600 speaker cables may be connected in series.

If a specific cable length other than 30 feet is required, 021618 bulk cable may be ordered in the length needed. Also, order 061879 plug, 028837 socket and two 010322 caps for each length of bulk cable ordered to make up the speaker cable.

Wire the plug and socket according to Fig. 2, following the color code exactly.

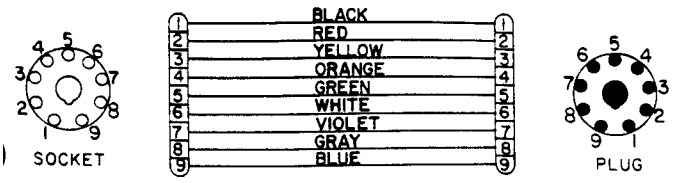


Fig. 2

MULTIPLE SPEAKER INSTALLATION

When requirements of volume and sound distribution exceed what can be obtained from one Model 925, additional speakers should be added to achieve the proper acoustical balance. Each added speaker is connected by means of a 117V (021709) or 234/250V (047738) power relay available through your LESLIE Speaker dealer. The power relay provides a source of AC power independent of the organ for each added speaker. The added speaker is controlled by the On/Off switch at the organ or Deluxe Combo Preamp.

Procedure:

1. Connect speaker cable to the power relay.
2. Connect the power relay pigtail to the speaker.
3. Plug the connecting cable for the additional speaker into the receptacle on the power relay.
4. Attach speaker to the added speaker and the power relay.
5. Plug the line cord from the power relay into the nearest AC outlet.

This procedure should be followed, using an additional power relay, for each speaker added.

SERVICE

CAUTION: A. Extreme care should be taken to keep hands and tools away from the rotors when adjustments are made inside the speaker cabinet. Because of the weight and momentum of the bass rotor, there is some danger of injury to the serviceman or to the speaker components.

B. Attach and detach the speaker cable **only** after the organ or Deluxe Combo Preamp has been turned off.

LINE VOLTAGE

Line voltage lower than 100 volts (200 volts in 234V models) will result in distortion and lack of power. A supply voltage in excess of 130 volts (260 volts in 234 volt models; 275 volts in 250 volt models) will cause overheating and possible component damage. A voltage regulating device should be used if the line voltage varies beyond these limits.

ORDERING PARTS:

Standard hardware, connectors, and electronic components may be obtained locally. Non-standard items should be ordered by EMI Number through your franchised LESLIE Speaker dealership. Speaker model and serial number would be helpful when ordering.

ELECTRONIC SERVICING
AMPLIFIER

The three-channel amplifier in the Model 925 is engineered for long, trouble-free operation. Solid-state circuits are used throughout. Each channel of the amplifier is mounted on a separate circuit board. The circuit boards are mounted on the anodized lower back panel of the speaker cabinet, which serves as a heat sink for the output transistors. Hereafter, this lower back panel will be termed the heat sink.

The amplifier leads are long enough to allow the back panel to be laid flat for servicing. The printed circuit boards can be removed from the heat sink and turned over without being disconnected from the circuit. If a circuit board is defective, it may be easily replaced as a complete unit.

NOTE: Shorting conductors together on an amplifier circuit board may severely damage the circuit board or its components.

CIRCUIT BOARD TROUBLE SHOOTING

As the Treble and Auxiliary amplifiers have identical circuits, it is easy to substitute one for another for testing purposes. Transfer all plugs from the inoperative channel to the other circuit board. If the channel functions properly after the exchange of plugs, its amplifier may be defective, and the circuit board should be checked.

VOLTAGE CHECKS

Remove the circuit board in question from the heat sink (4 nuts) and fasten the black ground wire from the power supply to its ground terminal. Check the voltages on the board against the various test points indicated on the circuit board drawing. The voltages given are approximate, and will vary ±10% under normal "no-signal" operating conditions.

All voltage measurements except base and emitter voltages of Q13, Q14, Q17, and Q18 should be made between test point and ground using a 20K ohm/voltmeter. The bases of output transistors Q13, Q14, Q17, and Q18 should be +.5 volt higher than the emitters. This can be measured by touching the voltmeter probes to the base and emitter of the output transistor being tested.

IMPORTANT: Replacement output transistor(s) for Bass channel should be matching green, blue, violet, or white coded transistors. Use a thin, smooth layer of thermal compound on **both** surfaces of the mica washer separating the transistor(s) from the heat sink. Make certain there are no air bubbles.

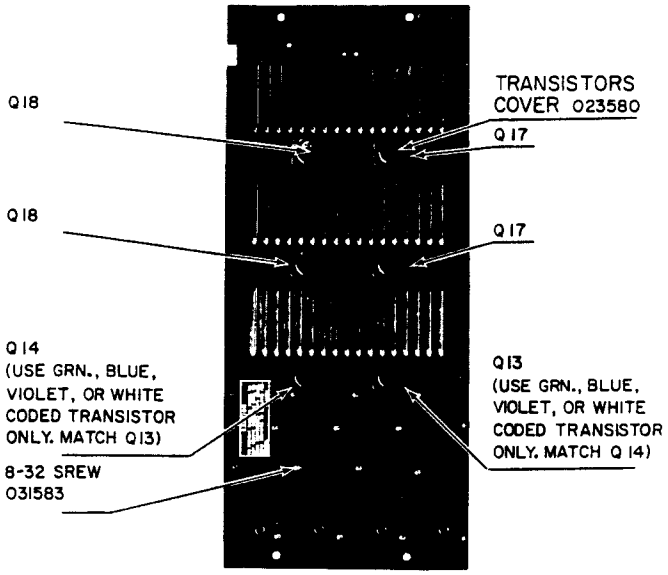


Fig. 3A

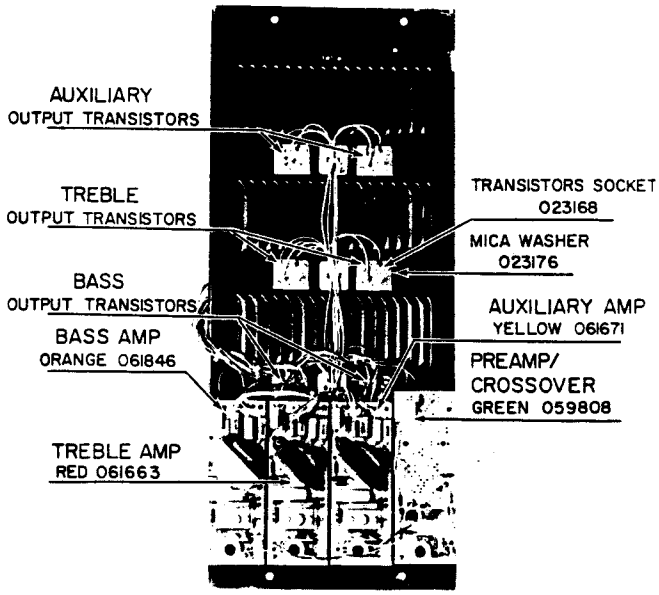


Fig. 3B

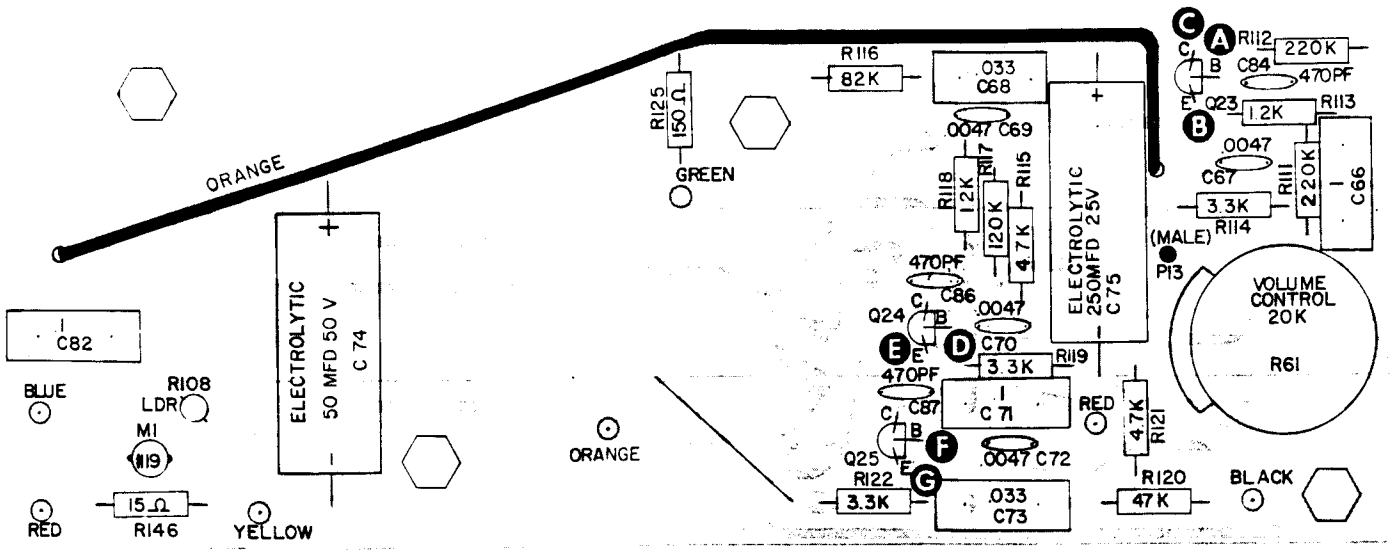


Fig. 4

Preamp-Crossover Network Voltages

A	13
B	12.3
C	26.2
D	16.5
E	16
F	12.1
G	11.4

PREAMP - CROSSOVER NETWORK CIRCUIT ASSEMBLY 059808

Part	Location	Description		EMI No.
R61	B7	20K	Potentiometer	037648
R108	C1	ORP 60	LDR	030379
R111	A7	220K	Resistor	013615
R112	A7	220K	Resistor	013615
R113	A7	1.2K	Resistor	018036
R114	B7	3.3K	Resistor	024141
R115	B6	4.7K	Resistor	028555
R116	A5	82K	Resistor	027102
R117	A6	120K	Resistor	027078
R118	A5	1.2K	Resistor	018036
R119	B6	3.3K	Resistor	024141
R120	C6	47K	Resistor	028506
R121	C6	4.7K	Resistor	028555
R122	C5	3.3K	Resistor	024141
R125	A4	150 ohm	Resistor	024158
R146	C1	15 ohm	Resistor	018051
C66	A7	Poly, 0.1MFD @ 200V, 20%	Capacitor	022251
C67	A7	Ceramic, .0047MFD @ 100V, 10%	Capacitor	028431
C68	A6	Mylar, .033MFD @ 100V, 10%	Capacitor	028654
C69	A6	Ceramic, .0047MFD @ 100V, 10%	Capacitor	028431
C70	B6	Ceramic, .0047MFD @ 100V, 10%	Capacitor	028431
C71	C6	Poly, 0.1MFD @ 200V, 20%	Capacitor	022251
C72	C6	Ceramic, .0047MFD @ 100V, 10%	Capacitor	028431
C73	C6	Mylar, .033MFD @ 100V, 10%	Capacitor	028654
C74	B2	Elect., 50MFD @ 50V	Capacitor	025262
C75	B6	Elect., 250MFD @ 25V	Capacitor	024869
C82	B1	Poly, 0.1MFD @ 200V, 20%	Capacitor	022251
C84	A7	Ceramic, 470PF @ 1KV	Capacitor	028662
C86	B5	Ceramic, 470PF @ 1KV	Capacitor	028662
C87	C5	Ceramic, 470PF @ 1KV	Capacitor	028662
Q23	A7	MSPS 4382	TSTR	026237
Q24	B5	MSPS 4382	TSTR	026237
Q25	C5	MSPS 4382	TSTR	026237

All resistors ½ W, 10% unless noted otherwise.

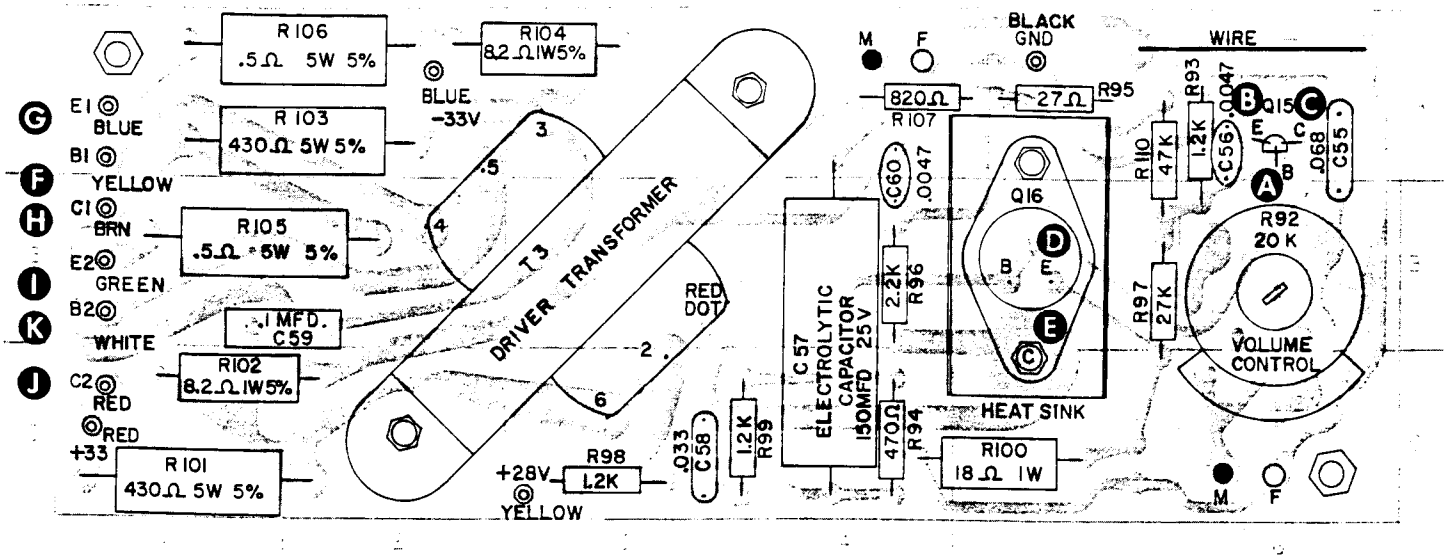


Fig. 5

Treble and Auxiliary Amplifier Voltages

A	+1.3
B	+0.7
C	+3.3
D	+2.9
E	+27
F	Note
G	—33
H	0
I	—.25
J	+33
K	Note

Note: 0.5V difference between F-G, I-K.

AUXILIARY AMPLIFIER CIRCUIT ASSEMBLY 061671
TREBLE AMPLIFIER CIRCUIT ASSEMBLY 061663

Part	Location	Description		EMI No.
R92	B6	20K, Potentiometer	Resistor	037648
R93	A6	1.2K	Resistor	018036
R94	C4	470 ohm	Resistor	028068
R95	A5	27 ohm	Resistor	021253
R96	B4	2.2K	Resistor	028571
R97	B5	27K	Resistor	020834
R98	C3	1.2K	Resistor	018036
R99	C4	1.2K	Resistor	018036
R100	C5	18 ohm, 1W	Resistor	031146
R101	C1	430 ohm, 5W, 5%, Wire Wound	Resistor	023648
R102	C1	8.2 ohm, 1W, 5%	Resistor	031807
R103	A2	430 ohm, 5W, 5%, Wire Wound	Resistor	023648
R104	A3	8.2 ohm, 1W, 5%	Resistor	031807
R105	B1	0.5 ohm, 5W, 5%, Wire Wound	Resistor	023200
R106	A2	0.5 ohm, 5W, 5%, Wire Wound	Resistor	023200
R107	A4	820 ohm	Resistor	028373
R110	A5	47K	Resistor	028506
C55	A6	Poly, .068MFD @ 250V, 20%	Capacitor	031393
C56	A6	Ceramic, .0047MFD @ 100V, 10%	Capacitor	028431
C57	C4	Elect., 150MFD @ 25V	Capacitor	031294
C58	C3	Mylar, .033MFD @ 100V, 10%	Capacitor	028654
C59	B2	Poly, 0.1MFD @ 200V, 20%	Capacitor	022251
C60	B4	Ceramic, .0047MFD @ 100V, 10%	Capacitor	028431
Q15	A6	Transistor, MSPS4382		026237
Q16	B5	Transistor, 2N3054		023754
T3	B3	Transformer, Driver		023788
	B5	Heat Sink, Q16		023663

All resistors ½ W, 10% unless noted otherwise.

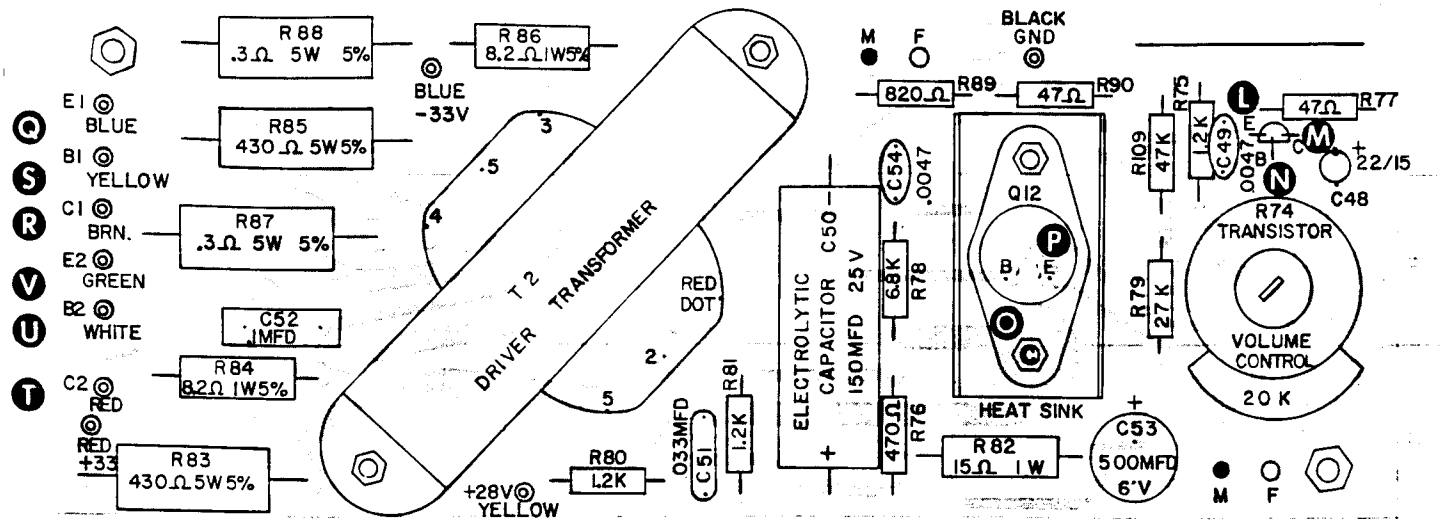


Fig. 6

Bass Amplifier Voltages

L	+0.4
M	+3
N	+1
O	+25
P	+2.4
Q	—33
R	0
S	Note
T	+33
U	0
V	Note

Note: 0.5V difference between Q-S, U-V.

BASS AMPLIFIER CIRCUIT ASSEMBLY 063594

Part	Location	Description		EMI No.
R74	B6	20K Potentiometer	Resistor	037648
R75	A6	1.2K	Resistor	018036
R76	C4	470 ohm	Resistor	028068
R77	A6	47 ohm	Resistor	016311
R78	B4	6.8K	Resistor	016501
R79	B5	27K	Resistor	020834
R80	C3	1.2K	Resistor	018036
R81	C4	1.2K	Resistor	018036
R82	C5	15 ohm, 1W	Resistor	031823
R83	C1	430 ohm, 5W, 5%, Wire Wound	Resistor	023648
R84	C1	8.2 ohm, 1W, 5%	Resistor	031807
R85	A1	430 ohm, 5W, 5%, Wire Wound	Resistor	023648
R86	A3	8.2 ohm, 1W, 5%	Resistor	031807
R87	B1	0.3 ohm, 5W, 5%, Wire Wound	Resistor	023218
R88	A1	0.3 ohm, 5W, 5%, Wire Wound	Resistor	023218
R89	A5	820 ohm	Resistor	028373
R90	A5	47 ohm	Resistor	016311
R109	A5	47K	Resistor	028506
C48	B6	Tantalum, 22MFD @ 15V	Capacitor	062638
C49	A6	Ceramic, .0047MFD @ 100V, 10%	Capacitor	028431
C50	B4	50MFD @ 25V	Capacitor	031294
C51	C3	Elect., .033MFD @ 100V, 10%	Capacitor	028654
C52	B1	Poly, 0.1MFD @ 200V, 20%	Capacitor	022251
C53	C5	Elect., 500MFD @ 6V	Capacitor	055483
C54	A4	Ceramic, .0047MFD @ 100V, 10%	Capacitor	028431
Q11	A6	Transistor MSPS 4382		026237
Q12	B5	Transistor, Driver, 2N3054		023754
T2	B3	Transformer, Driver		023770
	B5	Heat Sink, Q16		023663

All resistors ½ W, 10% unless noted otherwise.

POWER SUPPLY

The power supply is located next to the cabinet connector in the lower speaker cabinet. In addition to supplying power for the various 925 Speaker components, the power supply contains the motor control and braking circuits described later in this section.

POWER SUPPLY CIRCUIT BOARD MAINTENANCE

It is not necessary to remove the circuit board from the power supply to check voltages and replace components. Simply remove the power supply from speaker cabinet. Then remove the circuit board cover from the power supply chassis.

To remove circuit board completely:

1. Turn power supply upside down.
2. Remove all leads attached to the circuit board (Use Fig. 9 as a reference when rewiring.)
3. Remove the four capacitor mounting screws.
4. Remove the six circuit board mounting nuts. Carefully slip the circuit board off its mounting studs.

925 MOTOR AND BRAKE CONTROL CIRCUITS

TREMOLO/CHORALE CONTROL CIRCUIT

When the tremolo control is switched to CHORALE, transistor Q10 conducts. Relay 3 closes, allowing AC current to drive the slow motors. AC current also passes through capacitor C63 to the base of transistor Q34, causing it to conduct. Q34 acts as a switch, preventing the brake circuit functioning by shorting out resistor R60 and maintaining capacitors C64 and C65 in a charged state. No half wave current will flow to the fast motor of the lower two speed motor assembly when Q34 is activated. (See Brake Circuit explanation below.)

When tremolo control is switched to TREMOLO, Q9 conducts. Relays 1 and 2 close, allowing AC current to drive the fast motors.

When tremolo control is switched to OFF, neither Q9 nor Q10 conduct. AC current cannot flow to the motors, and the brake circuit delivers half wave DC voltage to the fast motor of the lower motor assembly for approximately 10 seconds. This stops the spinning Bass rotor.

BRAKE CIRCUIT

Because of the great momentum produced by the heavy, spinning Bass rotor in TREMOLO mode, a brake circuit (within the dotted lines) is utilized to bring the Bass rotor to a stop.

When tremolo control is in the TREMOLO position, both D11 and D13 are alternately forward biased, closing the fast motor circuit.

When the tremolo control is switched to OFF, D13 becomes non-conductive. D11 continues to conduct, however, directing half wave DC current to brake the fast motor of the lower motor assembly. For approximately ten seconds, this half wave DC current continues to flow until C64 and C65 are charged to peak line voltage, which shuts off SCR D11.

MODEL 925 POWER SUPPLY

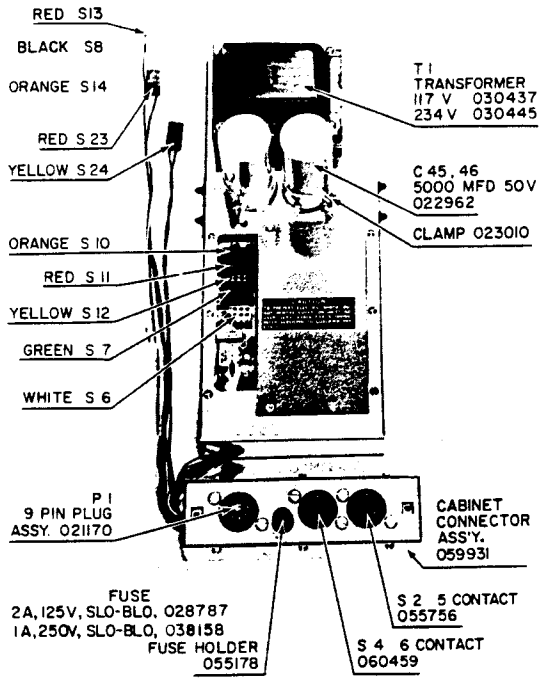


Fig. 7

MODEL 925 CONTROL CIRCUITS

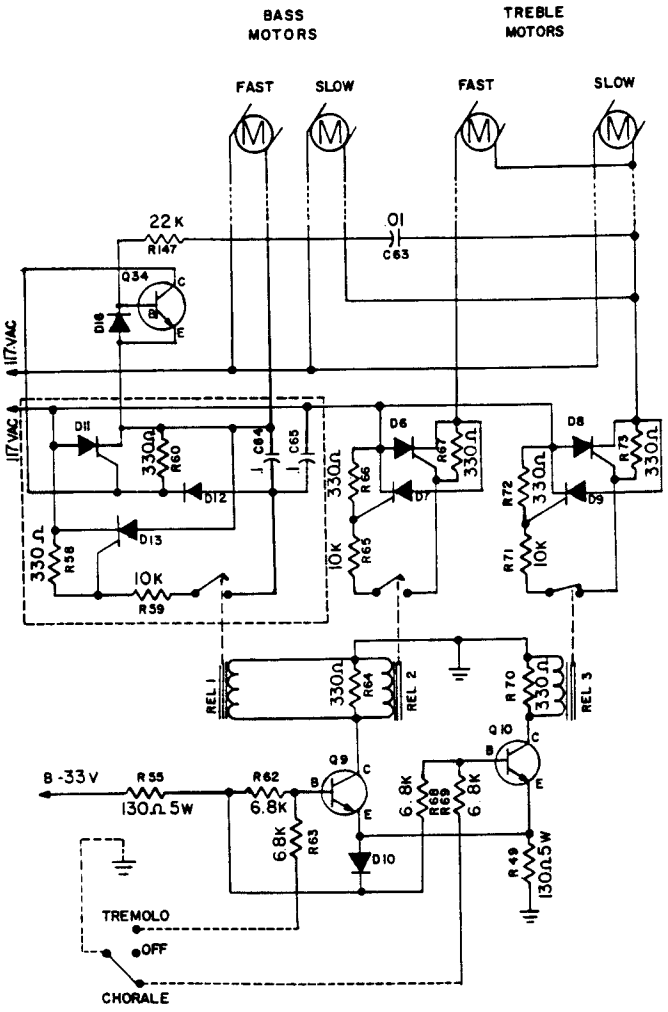


Fig. 8

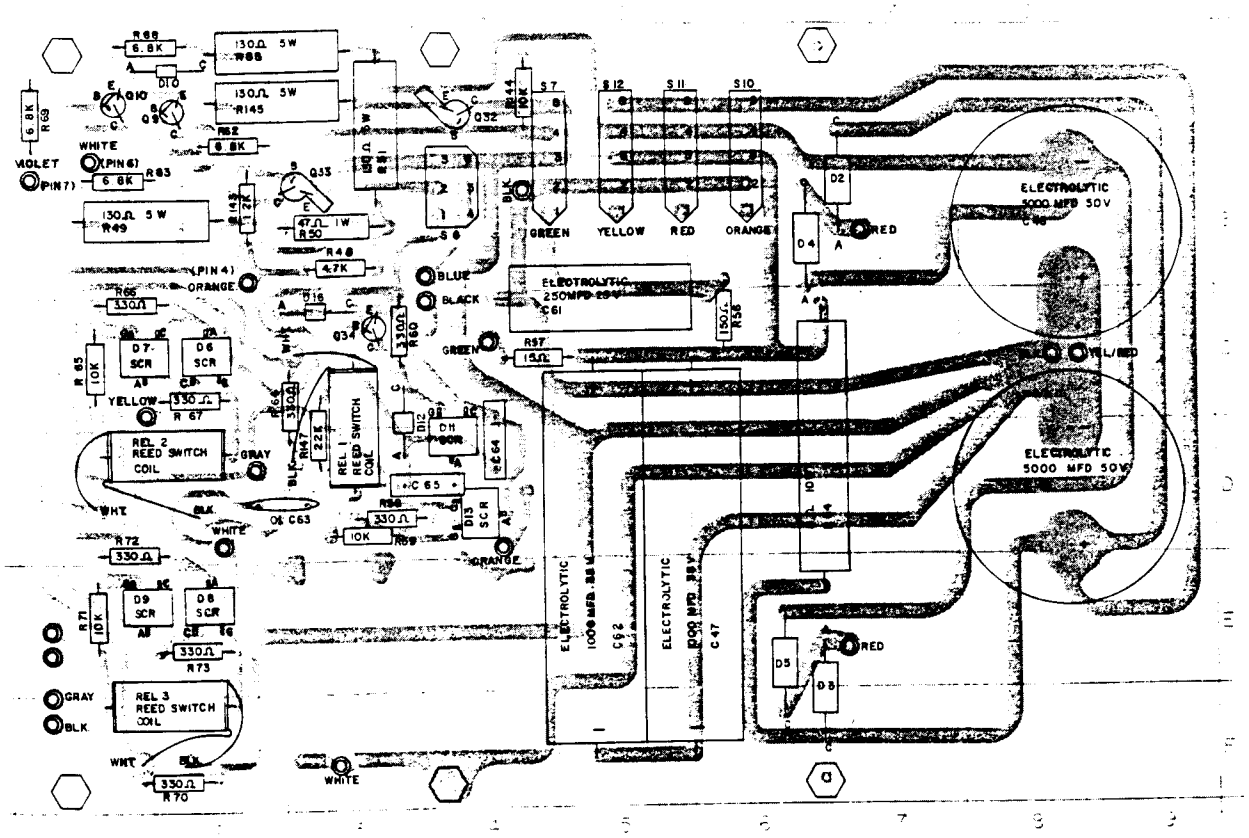


Fig. 9

PARTS LIST: MODEL 925 POWER SUPPLY CIRCUIT BOARD ASSY. 117V, 50/60Hz (059957) — 234/250V, 50Hz (062497)

Part	Location	Description	EMI No.
**C45	D8	5000 MFD @ 50V	Capacitor 022962
**C46	B8	5000 MFD @ 50V	Capacitor 022962
C47	E6	1000 MFD @ 35V	Capacitor 023507
C61	C5	250 MFD @ 25V	Capacitor 024869
C62	E5	1000 MFD @ 35V	Capacitor 023507
C63	D3	.01 MFD @ 1000V, 20%	Capacitor 060467
*C64	D4	.1 MFD @ 200V	Capacitor 022251
*C65	D4	.1 MFD @ 200V	Capacitor 022251
D2	B7	200PIV, 3A	Diode 031450
D3	F6	200PIV, 3A	Diode 031450
D4	B6	200PIV, 3A	Diode 031450
D5	E6	200PIV, 3A	Diode 031450
*D6	C2	200PIV, 4A	SCR 030387
*D7	C1	200PIV, 4A	SCR 030387
*D8	E2	200PIV, 4A	SCR 030387
*D9	E1	200PIV, 4A	SCR 030387
D10	A2	30PIV, 300MW	Diode 041616
*D11	D4	200PIV, 4A	SCR 030387
D12	C3	400PIV, 1A	Diode 025056
*D13	D4	200PIV, 4A	SCR 030387
D16	C3	30PIV, 300MW	Diode 041616
Q9	A2	2N3414, NPN	Transistor 030254
Q10	A1	2N3414, NPN	Transistor 030254
Q32	A4	2N4425, NPN	Transistor 033563
Q33	B3	TZ525, PNP	Transistor 033571
Q34	C3	2N3414, NPN	Transistor 030254
R48	B3	4.7K	Resistor 028555
R49	B1	130 ohm, 5W, 10%	Resistor 023739
R50	B3	47 ohm, 1W, 10%	Resistor 040733
R51	A3	130 ohm, 5W, 10%	Resistor 023739
R54	D6	8 ohm, 10W, 10%	Resistor 010934
R55	A2	130 ohm, 5W, 10%	Resistor 023739
R56	C6	150 ohm	Resistor 024158
R57	C4	15 ohm	Resistor 018051
R58	D3	330 ohm	Resistor 016493
R59	D3	10K	Resistor 028548
R60	C3	330 ohm	Resistor 016493

Part	Location	Description	EMI No.
R62	A2	6.8K	Resistor 016501
R63	B2	6.8K	Resistor 016501
R64	C3	330 ohm	Resistor 016493
R65	C1	10K	Resistor 028548
R66	C1	330 ohm	Resistor 016493
R67	C2	330 ohm	Resistor 016493
R68	A2	6.8K	Resistor 016501
R69	A1	6.8K	Resistor 016501
R70	F2	330 ohm	Resistor 016493
R71	E1	10K	Resistor 028548
R72	D1	330 ohm	Resistor 016493
R73	E2	330 ohm	Resistor 016493
R143	B2	1.2K	Resistor 018036
R144	A4	10K	Resistor 028548
R145	A2	130 ohm, 5W, 10%	Resistor 023739
R147	D3	22K	Resistor 028530
REL 1	D3	Reed Switch	023747
REL 1	D3	Coil	023150
REL 2	D2	Reed Switch	023747
REL 2	D2	Coil	023150
REL 3	F2	Reed Switch	023747
REL 3	F2	Coil	023150

*** NOTE:**

On 234/250 volt Model 925 power supplies, there are slight differences in the circuitry. These are as follows:

* 1. Capacitors C64 and C65 are now 0.1 MFD @ 400V (024067).

* 2. D6, 7, 8, 9, 11, and 13 are now 031997 SCR's rated at 400 PIV, 4A.

3. A 1.5K, ½ W, 10% resistor is connected in series between the cathode of D12 and the gate of D11. (Part No. 022277).

4. A 47 ohm, ½ W, 10% resistor is connected in series with C65 between C65 and the anode of D6. (Part No. 016311).

** C45; C46 not part of circuit board assembly.

234/250 VOLT CONVERSIONS

On high voltage versions of the Model 925 Speaker, the primary of the power transformer is equipped to adapt to either 234 volt or 250 volt line current. The power supply must be removed and turned upside down to make the change. Unsolder the black fuse wire from its present circuit board pad and resolder it to the desired primary voltage terminal as shown in the diagram.

234/250 VOLT CONVERSION

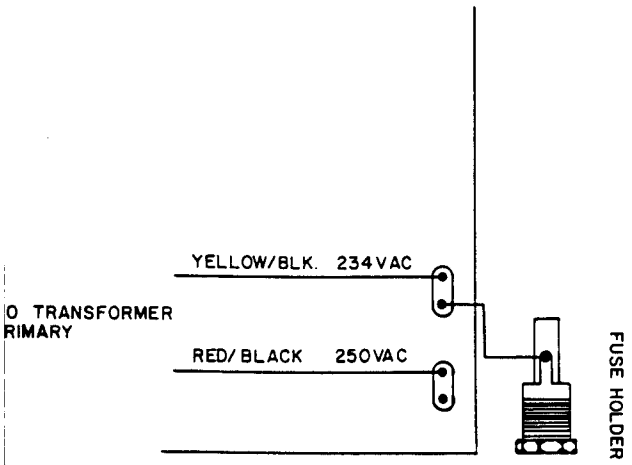


Fig. 10

MECHANICAL SERVICING

MOTOR LUBRICATION AND CLEANING

Usage, climate, and dust conditions determine motor lubrication requirements. In normal service, yearly oiling is sufficient. However, if the speaker is used several hours a day, more frequent lubrication may be necessary. Motors failing to start immediately may have dried up, dirt clogged bearings.

To determine if oiling is necessary, press a clean, dry screwdriver against the felt pads surrounding the oilite bearings (two in each motor). If oil is transferred to the screwdriver, the bearings should not be oiled. Remember, over-oiling is just as detrimental to the motors as underlubrication.

Complete motor disassembly is unnecessary for motor cleaning. A thorough cleaning job can be done with compressed air or a vacuum hose after detaching the small motor from the large motor.

If the motors must be completely disassembled, use Figure 11 as a guide. Use emery paper 3/20 grit or finer to smooth off any burrs or deep scratches on the large motor shaft **before** detaching the large motor and bells. This will prevent damage to the bearings within these end bells.

Also, mark the motor mount brackets and their mounting locations on the end bell before detaching these parts. Marking assures correct positioning of the brackets during reassembly.

TO LUBRICATE AND CLEAN MOTORS:

1. Remove the motor assembly from the cabinet. **CAUTION:** Do not lose the aluminum bushings found in the motor mount brackets.
2. Detach the large motor from the small motor by removing its four mounting bracket screws. (See Fig. 11.)
3. Remove rim drive wheel assembly from large motor with a 3/32 Allen wrench.
4. Saturate bearing felts at either end of the large motor. (See "OIL FELT PAD," Fig. 12.) Use oiler supplied or any good grade of light machine oil. Don't over-lubricate.
5. Remove the shaft adjustment nut from the free end of the shaft adjustment screw. (See "LOWER ADJUSTMENT NUT," Fig. 12.)
6. Remove the two nuts fastening the small motor to its mounting bracket. Detach the small motor.
7. Use compressed air or a vacuum hose to remove any dust lodged in the end bells of the large motor. If necessary clean small motor in the same manner.

TWO SPEED MOTOR ASSY.

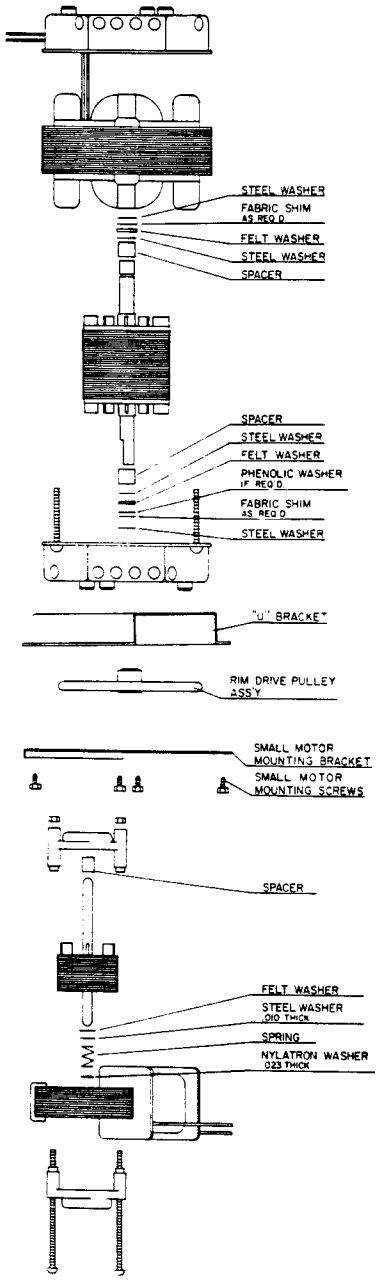


Fig. 11

8. Clean all accessible parts with solvent. Allow motors to dry.
9. Saturate bearing felts at either end of the small motor. (See "OIL HOLE," Fig. 12.)

REASSEMBLING LARGE AND SMALL MOTORS

1. Reverse disassembly procedure, observing the following:
   A. Replace the neoprene "O" ring of the rim drive wheel assembly if it is excessively worn. If rough spots exist, twist "O" ring until the outer edge is smooth. Also wipe any oil off the "O" ring's outer edge.
   B. When installing rim drive wheel assembly on the large motor shaft, push it on as far as it will go; then back it off 1/16th inch.
   C. Be sure to align rim drive wheel's set screw with the FLAT side of the large motor shaft; then tighten wheel in place.
2. Slip drive belt onto the drive pulley. Then adjust tension of the small motor shaft as described next. Finally, adjust drive belt tension. (See page 11.)

SMALL MOTOR SHAFT OPERATION AND ADJUSTMENT

The small motor drives the shaft of the large motor at slow speed by making contact with the rim drive wheel assembly. (See Fig. 12.) The small motor armature is spring loaded, withdrawing from the rim drive wheel assembly when the small motor is not operating.

Switching the Tremolo control to CHORALE activates the small motor by forcing the small motor shaft into contact with the rim drive wheel assembly; thus braking the rotor to the Chorale (slow) speed. Contact between the small motor shaft and the rim drive wheel assembly can be adjusted as follows:

1. With speaker power on, switch the Tremolo control to CHORALE.
2. Loosen the contact adjustment nuts on the small motor until small motor shaft no longer touches the rim drive wheel assembly. (See Fig. 12.)
3. Grasp treble horn or rotor to prevent its turning.
4. Slowly tighten **upper** adjustment nut until the small motor shaft forces the drive pulley to turn under the drive belt. (See Fig. 12.)
5. Tighten the **lower** adjustment nut (see Fig. 12.) against small motor laminations.
6. Switch the Tremolo control between TREMOLO and CHORALE positions to check for proper shaft adjustment. **NOTE:** Make certain the outer edge of the "O" ring on the rim drive wheel is smooth. If unevenness exists, twist the "O" ring until it makes even contact with the small motor shaft when small motor shaft is engaged.

MOTOR NOISES

Excessive motor noises may indicate misaligned large motor bearings. Lightly tap the large motor laminations with a hammer to reseat the bearings.

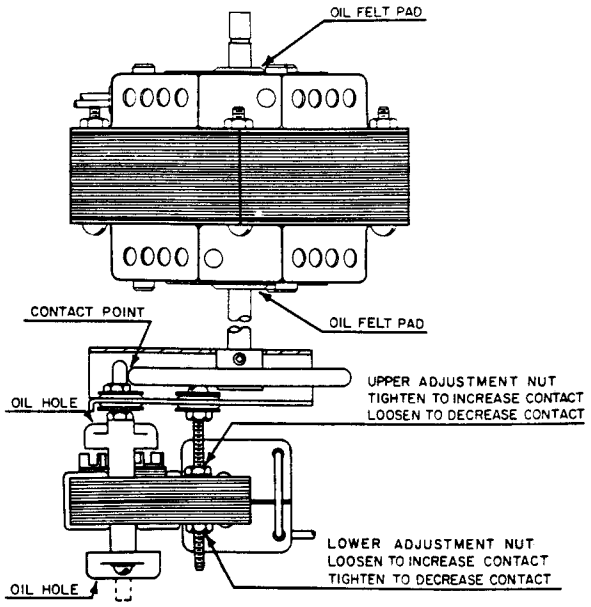


Fig. 12

DRIVE BELTS

There are two drive belts in the Model 925. If either belt becomes worn, noisy speaker operation may result. A worn drive belt should be replaced.

TREBLE DRIVE BELT

Adjustment:

This belt drives the treble horn on the upper shelf, upper cabinet. Should the Treble drive belt become loose, replace it. The speed of the Treble horn may be increased or decreased by shifting the Treble drive belt to the larger or smaller diameter grooves in the three step pulley on the large motor shaft.

Replacement:

1. Slip old belt off the three step pulley and idler pulley.
2. Lift old belt over one Treble horn, then the other.
3. Install the new belt, reversing removal procedure.

BASS DRIVE BELT

Proper drive belt tension is important. An overly tight or loose belt won't usually drive the rotor to full tremolo speed. An over-tightened belt may even cause excessive wear on the motor bearings. With a properly adjusted drive belt, the rotor should reach full tremolo speed in about 7 to 10 seconds, with the belt slipping slightly on the drive pulley during acceleration. Such slippage is actually necessary for attaining full rotor speed. The belt acts like a torque converter. As it slips, the drive pulley gathers momentum and torque. When the belt catches, the torque increase is transferred to the rotor, causing it to rotate faster.

To Check Belt Tension:

Switch tremolo control from CHORALE to TREMOLO, observing time required for the motor to reach full speed. Also, listen for any excessive motor noise. This may indicate an over-tightened drive belt.

To Adjust Belt Tension:

1. Loosen the two motor mounting wingnuts located beneath the bass speaker shelf in the lower cabinet.
2. Twist the motor assembly to loosen or tighten belt as required.
3. Tighten the two motor mount wingnuts.
4. Switch tremolo control between TREMOLO and CHORALE, observing time required for the bass rotor to slow to chorale speed. This should take about seven to ten seconds. If it does not, readjust belt tension.

To Replace Belt:

1. Remove both lower cabinet backs.
2. Disconnect the leads from the 15" bass speaker.
3. Remove the seven screws fastening Bass speaker to the shelf. Lift speaker straight up; then out of the cabinet. **CAUTION: Be careful not to puncture speaker cone with your fingers or the upper rotor support.**
4. Slide the exposed rotor support off the rotor shaft.
5. Slip old belt over its pulleys and remove it from the cabinet.
6. Prestretch replacement belt. You might feel the belt "give." This is normal, indicating the belt has been stretched to operating length.
7. Fit replacement belt onto the motor and rotor pulleys. Belt should slip into belt channel in underside of bass speaker shelf.
8. Replace upper rotor support bracket and the bass speaker. **CAUTION: Be careful not to puncture speaker cone with your fingers or the upper rotor support.**
9. Adjust drive belt tension as previously outlined.

SPEAKER REPLACEMENT

Due to the extremely strong magnetic field in the loudspeakers, it is inadvisable to attempt cone replacements or any other repairs involving loudspeaker disassembly. Repair or replacement of loudspeaker should be arranged through a franchised LESLIE Speaker dealership.

CAUTION: When reinstalling speaker in cabinet, be sure to observe correct polarity of the speaker leads.

TREBLE SPEAKER REPLACEMENT

CAUTION: Treble speaker is heavy, weighing approximately twenty-five pounds.

1. Remove both backs from upper cabinet.
2. Remove treble drive belt.
3. Remove two 1/4" bolts with washers located on either side of the treble horn, upper shelf.
4. Remove idler spring wingnut. Then remove the idler spring mounting screw and washer.
5. Remove the other slot head screw and washer fastening treble speaker mounting board to the shelf's underside.
6. Turn treble horn so its reflectors face cabinet sides.
7. Slide entire treble speaker, mounting board and horn towards cabinet rear until treble speaker clears the board upon which it rests.
8. Turn treble horn so its reflectors face cabinet front and rear.
9. Slide assembly out of the cabinet.
10. Detach treble speaker from mounting board. Remove the four Allen screws with a 3/16" Allen wrench.
11. Reverse removal procedure to install replacement speaker.

BASS SPEAKER REPLACEMENT

Simply disconnect the speaker leads and remove the eight screws fastening speaker to the shelf. Then lift speaker straight up and out of the cabinet.

CAUTION: Be careful not to puncture speaker cone with your fingers or the upper rotor support.

AUXILIARY SPEAKER REPLACEMENT (6" x 9"s)

Disconnect speaker leads (note polarity) and remove the four nuts fastening speaker to cabinet.

BASS ROTOR REPLACEMENT

(See page 15 for exploded view of Bass rotor assembly.)

1. Remove both backs from the lower cabinet.
2. Remove the 15" bass speaker.
3. Remove the upper rotor support bracket.
4. Slip bass drive belt off the rotor shaft.
5. Pull the rotor shaft up and out of the Bass Rotor.
6. Remove bass rotor from the cabinet.
7. Install replacement rotor by reversing the removal procedure.

Note the following:

A. When centering rotor over the lower bearing, lift the rotor slightly and sight through the shaft hole. Align the lower rotor grommet over the grommet in the lower bearing. Be careful not to dislodge lower bearing's metal washer when inserting the rotor shaft.

B. Lubricate lower bearing end of the rotor shaft with oil or Vaseline before inserting it through the rotor. The neoprene grommets are not damaged by these lubricants.

C. The two drive pins in the rotor pulley should straddle one of the wooden divisions between the cutouts in the top of the Bass rotor.

D. Readjust Bass Drive Belt tension (see **Bass Drive Belt** section of this manual.)

BASS ROTOR, UPPER BEARING REPLACEMENT

(See page 15 for exploded view of Bass rotor assembly.)

1. Remove Bass speaker.
2. Remove top half of bearing clamp. The ball bearing can now be lifted out and replaced.

If a newly installed bearing seems slightly loose, remove the upper bearing support assembly from the cabinet. Disassemble and bend the lower half of the bearing clamp so it will apply more pressure on the ball bearing.

BASS ROTOR, LOWER BEARING REPLACEMENT

(See page 15 for exploded view of bass rotor assembly.)

1. Lay cabinet on floor so that bottom is accessible.
2. Remove the two screws that fasten the bearing mounting plate to the cabinet, and remove lower bearing assembly from the shaft. Be sure to save the flat metal washer between the rotor and lower bearing grommets.
3. Remove the top half of bearing clamp to replace the ball bearing assembly.
4. When re-inserting rotor shaft into the bearing holder, make certain the flat washer is placed between the rotor and bearing grommets.

TREBLE HORN

(See page 15 for exploded view of treble horn assembly.)

Lubrication:

It is not necessary to dismantle Treble speaker assembly to oil the spindle. Simply apply a few drops of LESLIE Oil or similar light machine oil to OIL HOLE in the Treble Horn.

TREBLE HORN SPINDLE REMOVAL:

1. Remove the entire Treble Speaker Assembly from the cabinet.
2. Detach the three Phillips screws attaching spindle to the treble speaker mounting plate.

NOTE: When replacing treble horn spindle, be sure to first insert the neoprene washer; then the metal shim, on the spindle. This allows the treble horn to operate at the correct height, with the possibility of thrust bearing noises eliminated.

HORN REFLECTOR REPLACEMENT

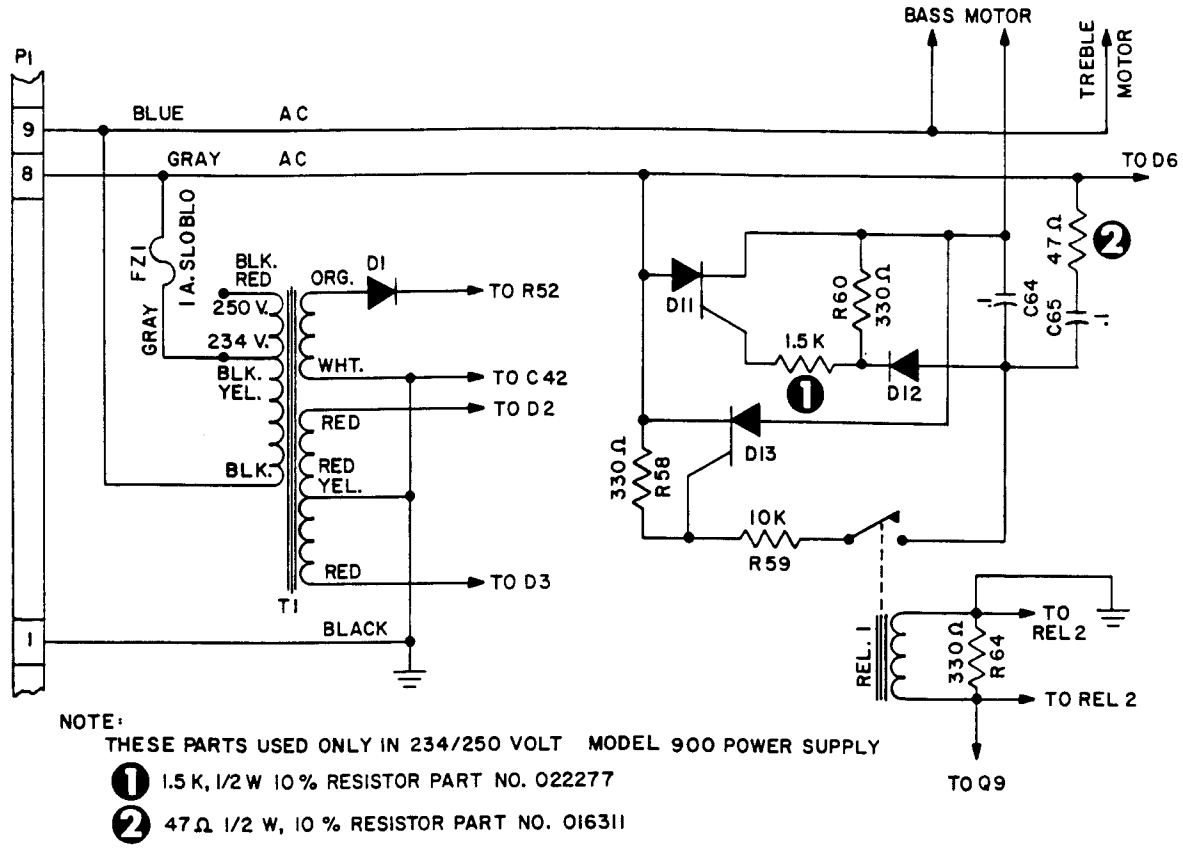
To remove reflector, clip its three stand-off pins. Pull pins out of their horn holes. Install the new reflector with the cut edge facing upward when the horn is in operating position. To hold reflector without ratling, apply 3-M Weatherstrip Cement to the pins prior to insertion. Then, using a soldering iron, melt the ends of the stand-off pins to the outer horn surface to create a sturdy mechanical bond.

MECHANICAL ASSY. PARTS LIST: LESLIE SPEAKER MODEL 925

EMI No.	Description
010298	Cable, 6 Conductor
010322	Cap, w/Clamp
011700	Belt, Drive, 60 Hz
012526	Motor, Small, 117V, 60 Hz
012849	Screw, Machine, 10-24 x 1 1/4"
012930	Nut, Hex, 6-32
013060	Plug, 5 Pin, w/o Mounting Plate
014019	Motor, Large, 117V, 50/60 Hz
014027	Wheel, Rim Drive Assembly
014050	Bushing
014068	Bracket, Small Motor Mounting
014084	Grommet
014159	Ring, "O"
014852	Motor, Small, 117V, 50 Hz
014860	Motor, Small, 234/250V, 50 Hz
016816	Bearing Assembly, Treble Speaker
017012	Bracket, U
019224	Screw, Machine, 6-32 x 5/8", w/Int. Lockwasher
020438	Motor, Large, 234V, 250V, 50/60 Hz
021048	Belt, Drive—Graphited
021600	Speaker Cable, 9 Conductor
021618	Cable, 9 Conductor
023259	Housing, Plug, 6 Ckt—Natural
024307	Pulley, Motor, 50 Hz
024661	Tubing, Neoprene, 1/16" x 2 3/4"
025445	Screw, Machine, 10-24 x 5/8" w/Int. Lockwasher
025460	Screw, Machine, 10-24 x 3/8"
025528	Screw, Machine, 10-24 x 2 1/4"
025544	Screw, Machine, 10-32 x 1/2", Phillips Head
025650	Screw, Sheet Metal "B", #10 x 7/8"
025973	Screw, Set, 10-32 x 3/16" Hex Socket, Cup Pt., Black Oxide
025981	Washer, Flat #6
026138	Screw, Machine, 8-32 x 13/16"
026294	Screw, Machine, 8-32 x 1/4"
026344	Screw, Machine, 10-24 x 1 1/2" w/Int. Lockwasher
026518	Washer, Flat, #10
026666	Screw, Sheet Metal "B", #6 x 1/4", Hex Washer Hd.
026674	Screw, Machine, 6-32 x 2 1/4"
026690	Washer, Flat, #10
026740	Screw, Machine, 8-32 x 3/8" w/Int. Lockwasher
026765	Lockwasher, Internal, #8
026773	Nut, Hex, 8-32
026963	Screw, Machine, 10-24 x 7/8" w/Int. Lockwasher
027953	Nut, Hex, 10-32
028019	Lockwasher, Internal, #10
028787	Fuse, 2 Amp. 125V, Slo-Blo
028837	Socket, 9 Contact, Amphenol
028993	Lockwasher, Internal, #6
029264	Socket, 5 Contact
029546	Socket, 6 Contact, w/o Mounting Plate
030601	Belt, Drive, 50 Hz
031062	Speaker, 6" x 9", 16 ohm
032292	Rotor, Wood, 17" x 9"
038158	Fuse, 1A, 250V, Slo-Blo
040444	Plug, 6 Pin, Modified
040469	Rotor Assembly
040949	Cable Assembly, 6 Conductor
040956	Cable Assembly, 5 Conductor

EMI No.	Description
050161	Filter, Acoustic—Treble Horn
050211	Grommet
050229	Spindle, Treble Driver
050252	Shim Washer
050260	Flat Washer, Neoprene, 1-1/16" x 1 1/2" x 1/8"
050500	Pulley, 3 Step, 60 Hz
050559	Pulley, 3 Step, 50 Hz
050625	Nut, Wing, 10-24
050633	Shoulder Bushing
050641	Grommet
050658	Bracket, Z Motor Mounting
050666	Ring, "C"
050708	Idler Assembly
050716	Idler Pulley and Bearing Assembly
050732	Idler Spring
050740	Bushing
050757	Pad, Neoprene, 1" x 4" x 1/8"
050807	Treble Horn Assembly
050815	Treble Horn Only
050823	Reflector, Treble Horn Assembly
051003	Upper Rotor Support Assembly
051029	Upper Rotor Bearing Retainer
051037	Grommet
051045	Ball Bearing—Rotor
051052	Lower Rotor Bearing Retainer
051060	Bushing
051078	Upper Rotor Support
051102	Lower Rotor Ball Bearing Assembly
051128	Bearing Plate
051201	Plate, Belt Adjusting
051219	Screw & Wing Nut Assembly
051326	Grommet
051342	Flat Washer, 3/8"
051607	Pulley, Motor, 60 Hz
051706	Shaft & Pulley Assembly
051730	Bushing, Rubber
053178	Fuseholder, Buss HKP
057778	Motor Assembly, Two Speed, 117V, 60 Hz
057786	Motor Assembly, Two Speed, 234/250V, 50 Hz
057794	Motor Assembly, Two Speed, 117V, 50 Hz
059973	Speaker, 15", 4 ohm
059981	Speaker, Treble Driver, 16 ohm
060046	Speaker Mounting Plate, Treble Driver
061317	Block, Shelf Key
061721	Plug, 6 Pin
061879	Plug Assembly, w/o Mounting
061937	Speaker Assy., Treble Driver - 925
061945	Flat Washer, 5/16" x 3/4" x 1/16"
061952	Washer, Shim, 5/16" x 3/4" x 1/16"
061986	Screw, Cap, 1/4-20 x 2 3/4 Hex Hd.
062018	Nut, Hex, Coupling, 1/4-20 x 3/8 x 7/8 L
062034	Nut, Hex, 1/4-20 x 7/16 x 7/32
062083	Screw, 1/4-20 x 3/4", Flat Hd.
062281	Mounting Block, Treble Driver
062307	Reducer, Treble Driver
062315	Ring, "O"
062331	Pad, Washer, Acoustic
062364	Motor Assembly, Two Speed, 117V, 60 Hz
062539	Motor Assembly, Two Speed, 117V, 50 Hz
062547	Motor Assembly, Two Speed, 234/250V, 50 Hz
063024	Gasket, Speaker

SCHEMATIC: 234/250 VOLT 925 POWER SUPPLY



NOTE:
THESE PARTS USED ONLY IN 234/250 VOLT MODEL 900 POWER SUPPLY

❶ 1.5 K, 1/2 W 10 % RESISTOR PART NO. 022277

❷ 47 Ω 1/2 W, 10 % RESISTOR PART NO. 016311

Fig. 13

MODEL 925 PLUGS & SOCKETS

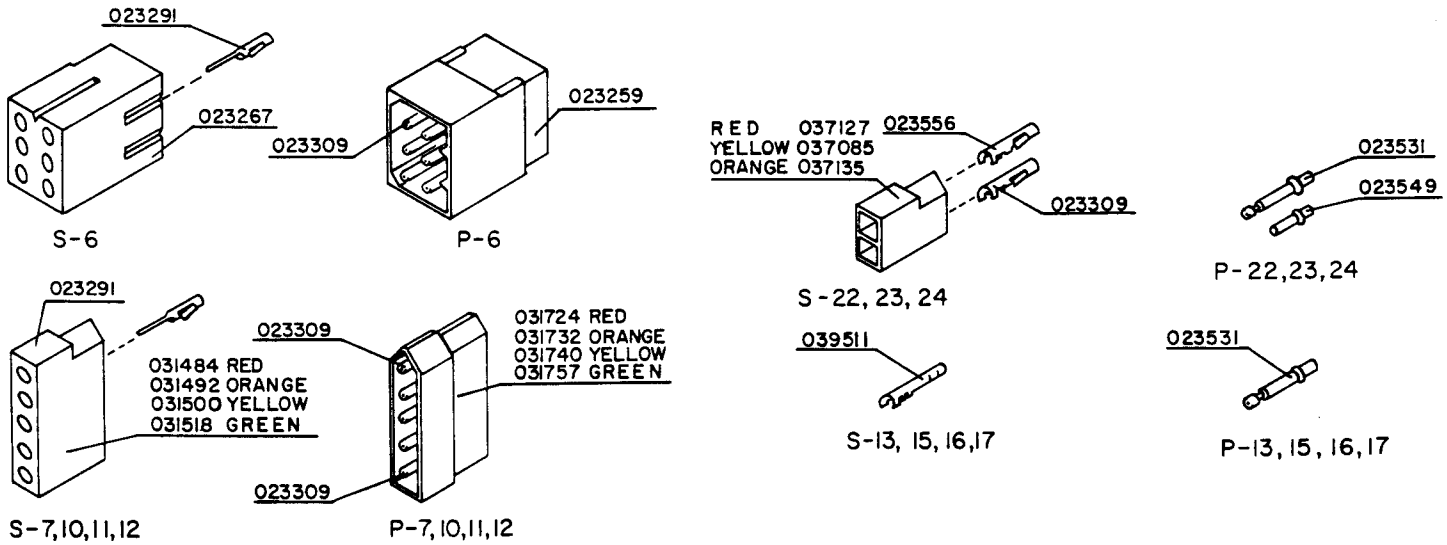
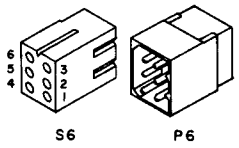
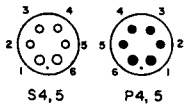
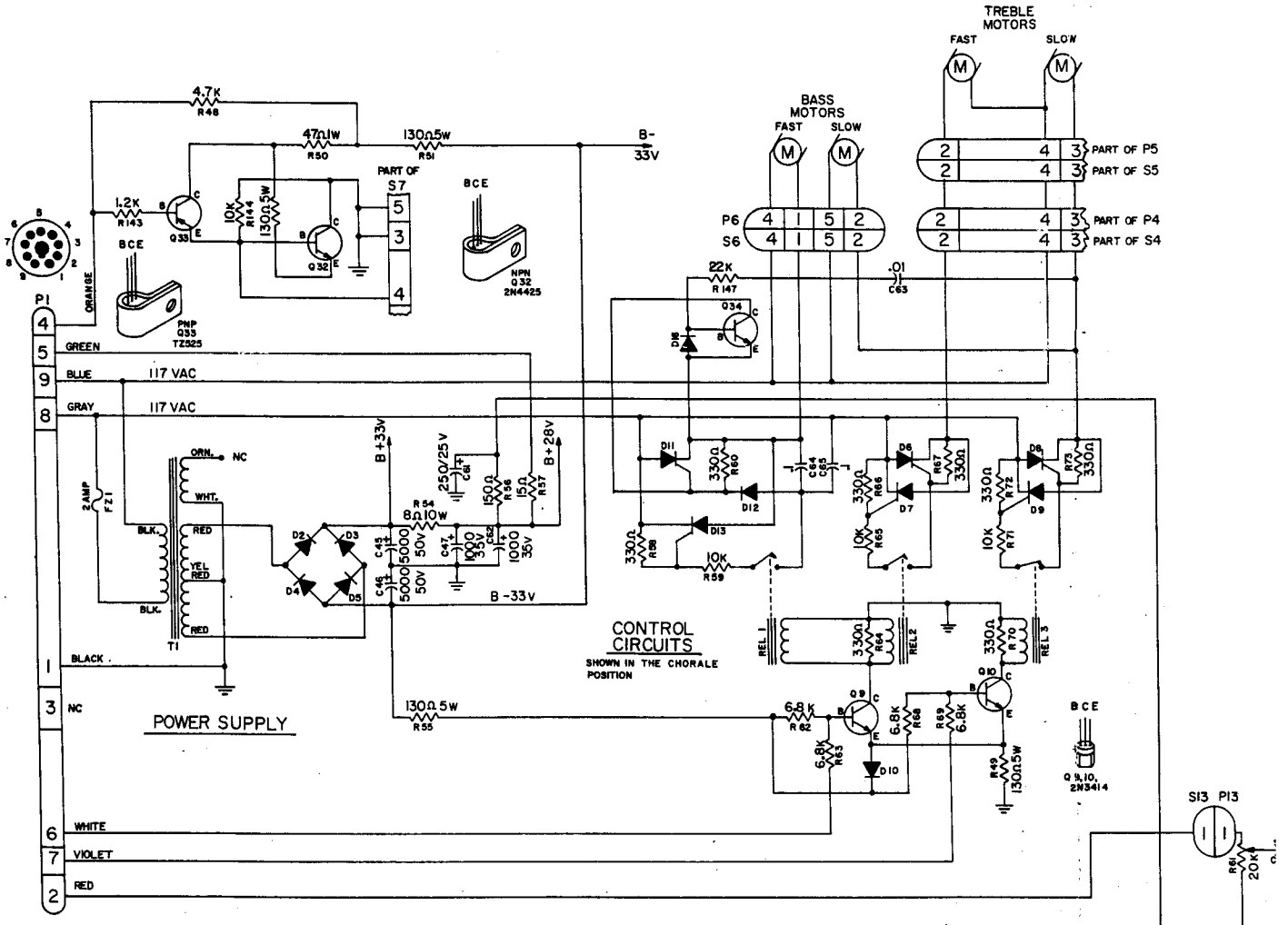


Fig. 14

SCHEMATIC: LESLIE SPEAKER





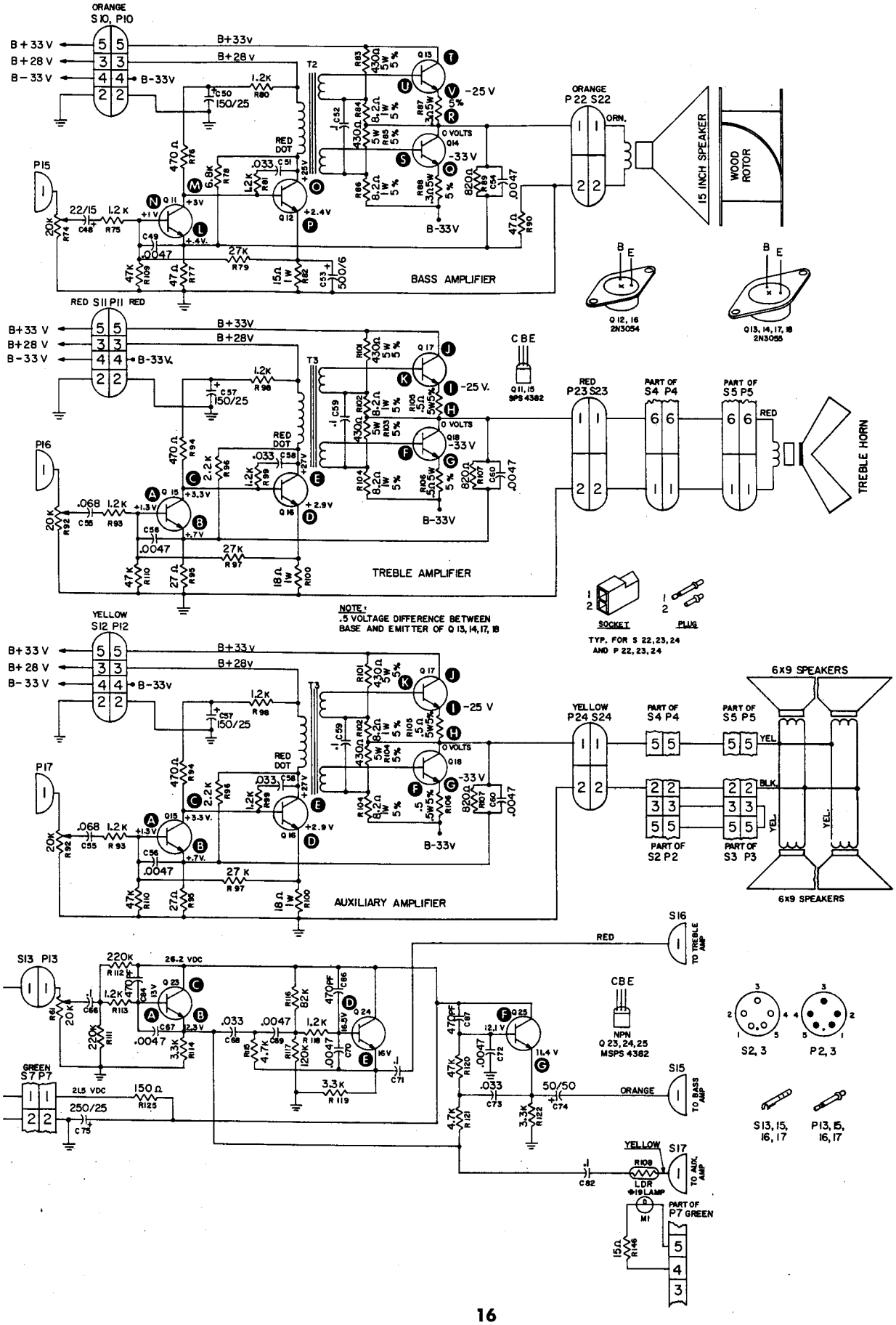


TRANSISTOR VOLTAGES DC

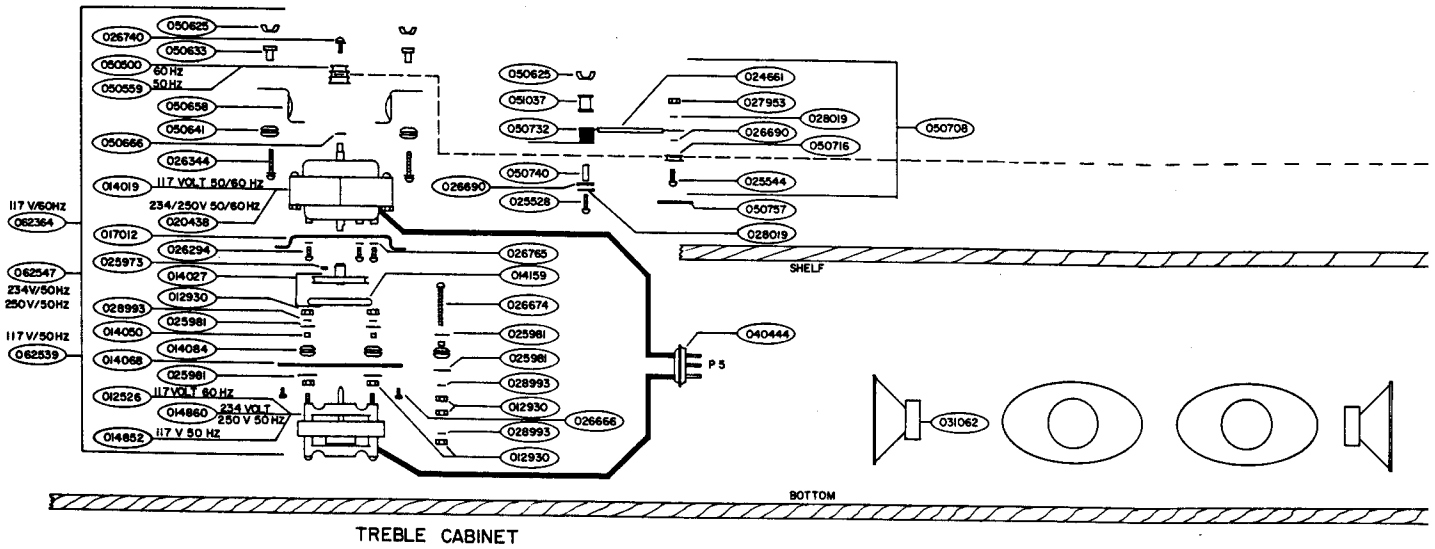
NO.	E	B	C	E	B	C	E	B	C
	OFF			MED.			FULL		
Q32	.8	0	0	-7.0	-7.0	0	-14.0	-13.5	0
Q33	0	0	14.5	-7.0	-7.5	-13.5	-13.5	-14.0	-15.0

NO.	E	B	C	E	B	C	E	B	C
	OFF			TREBLE FAST BASS FAST			TREBLE SLOW BASS SLOW		
Q9	-16.0	-16.0	0	-11	-10	-10	-13	-12	0
Q10	-16.0	-16.0	0	-12	-12	0	-13	-11	-11

MODEL 925

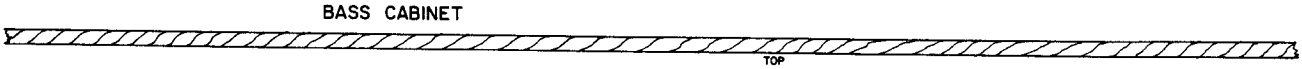

BASS AMPLIFIER
TREBLE AMPLIFIER
AUXILIARY AMPLIFIER
NOTE: .5 VOLTAGE DIFFERENCE BETWEEN BASE AND EMITTER OF Q 13, 14, 17, 18
15 INCH SPEAKER
WOOD ROTOR
TREBLE HORN
6x9 SPEAKERS
SOCKET
PLUG
TYP. FOR S 22, 23, 24 AND P 22, 23, 24
Q 12, 16 2N3054
Q 13, 14, 17, 18 2N3055
Q 11, 15 SPS 4382
NPN Q 23, 24, 25 MSPS 4382
S2, 3
P2, 3
S13, 15, 16, 17
P13, 15, 16, 17

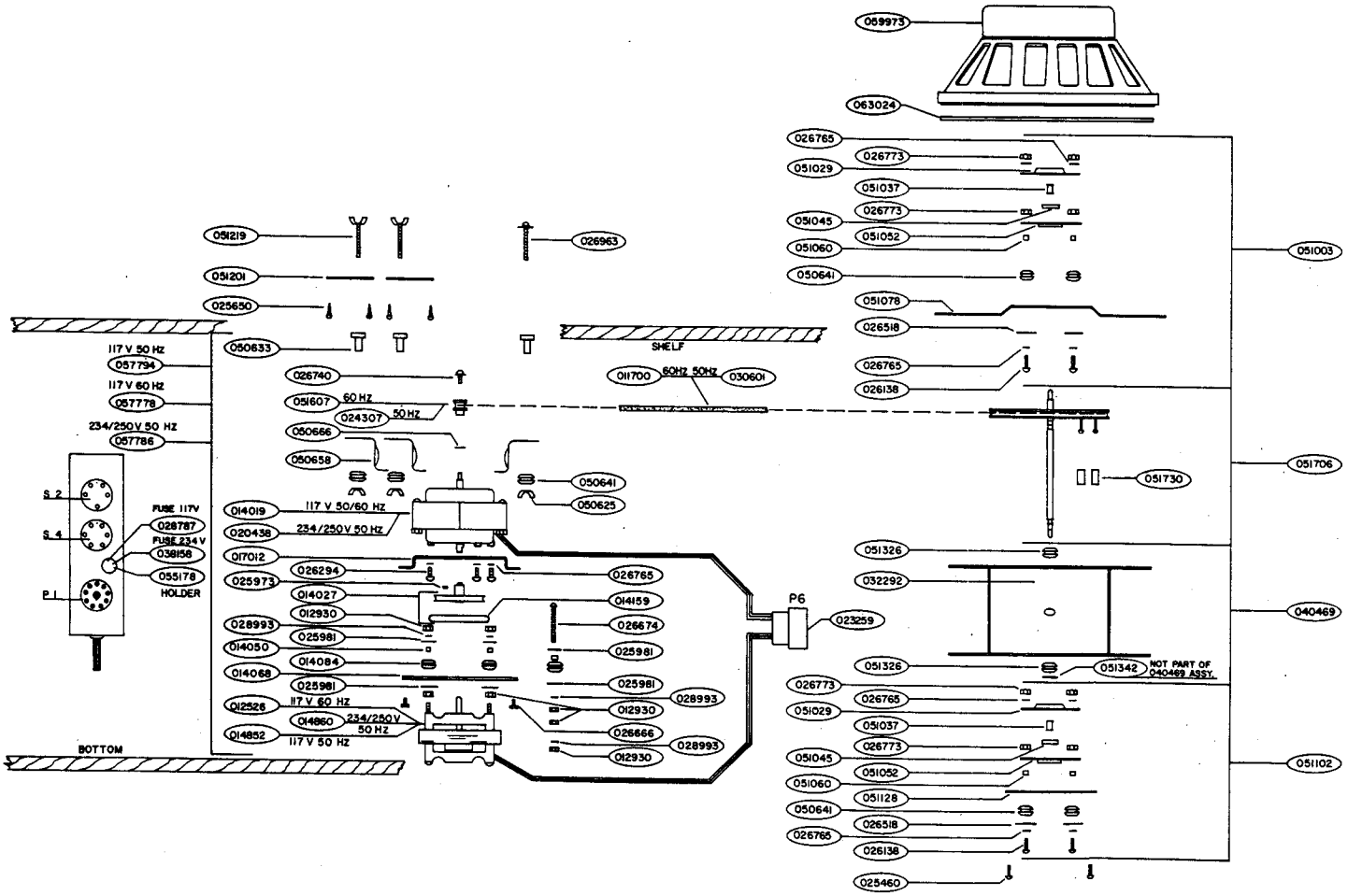
EXPLODED VIEW: LESLIE SPEAKER



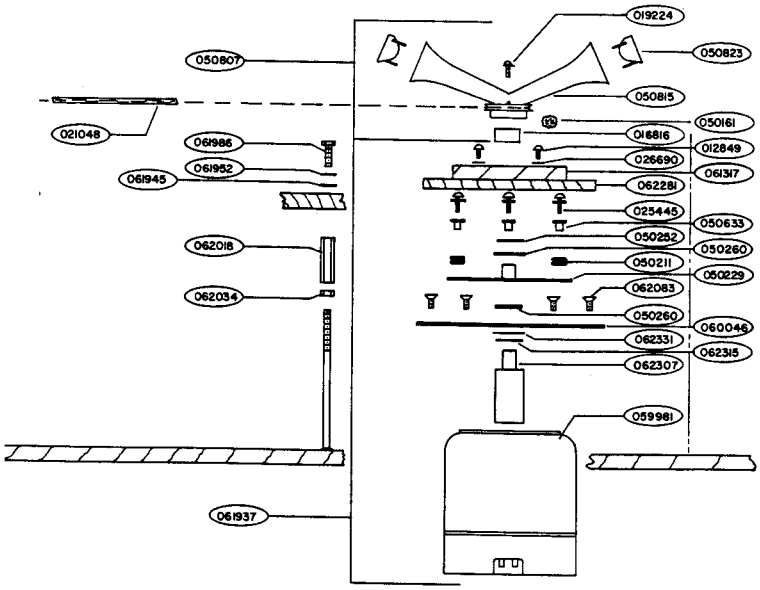
TREBLE CABINET

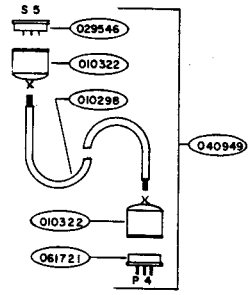
BASS CABINET



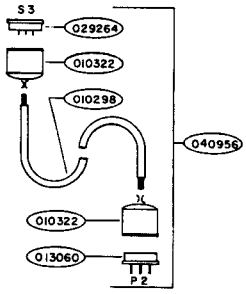


MODEL 925

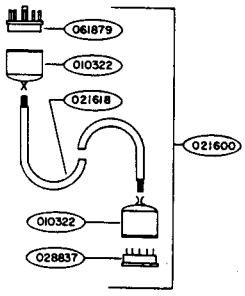




6 CONDUCTOR CABLE
BASS TO TREBLE CABINET



5 CONDUCTOR CABLE
BASS TO TREBLE CABINET



9 CONDUCTOR CABLE