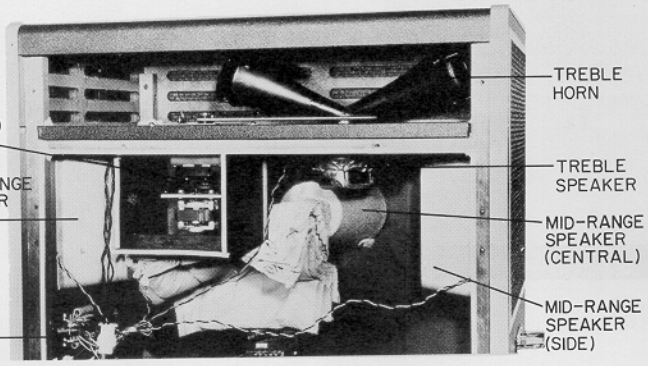
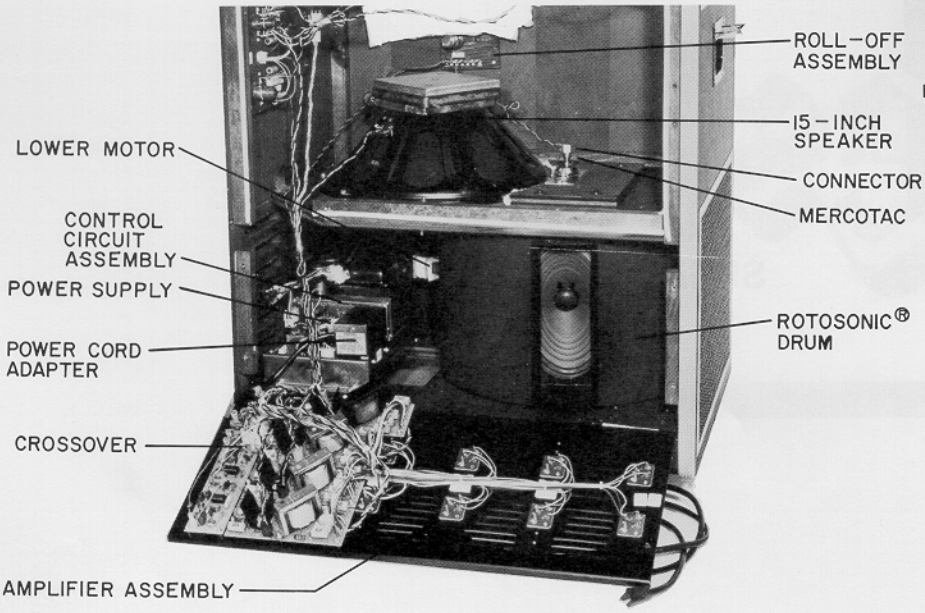
Leslie®
SPEAKERS

models
715 - 815
HL722 - HL822

Service Information
Parts List

140582





Item	Part No.
Power Supply (120V)	141661
Power Supply Board	141448
Motor Control Board	138580
Power Cord Adapter	
Amplifier	140804
Crossover Circuit Board	140805
Circuit Board Assembly (Amplifier)	140562
Rotary Horn Assembly	050807
Rotosonic Drum Assembly	140456
Upper (treble) Motor Assembly	
60Hz	137768
50Hz	137769
Lower (bass) Motor Assembly	
60Hz	140534
50Hz	140535
Treble Response Control Assembly	141121
Treble Response Control Switch	140553
Roll-off Assembly	140574

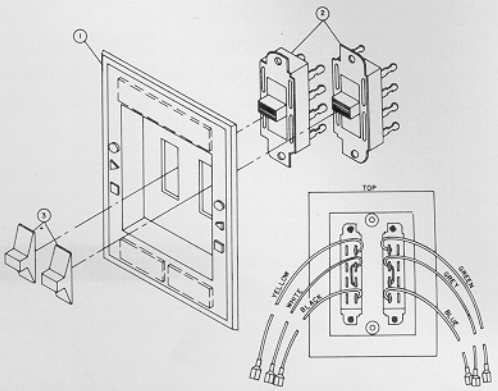
SPECIFICATIONS

Loudspeakers: 8-ohm high-compression driver (140491)
Two 8-ohm (138879) (side) and one 16-ohm (058214) (center) 6x9, midrange/treble
4-ohm, 15" bass (031070)
8-ohm treble driver (Rotosonic drum)

Fuses:

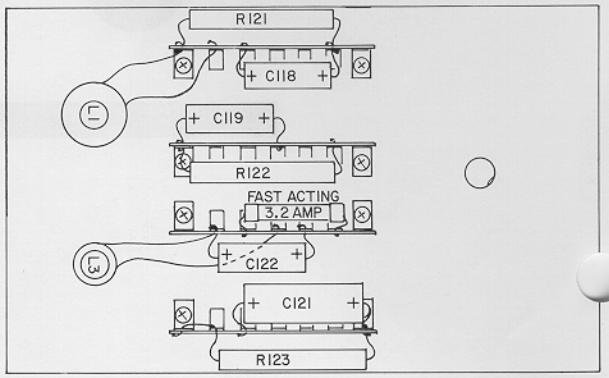
			Part No.	
	100 Volts	6.25 Amps	140586	(Littlefuse #313 6.25)
	120	5	140528	(Littlefuse #313 005)
	200	3.2	140587	(Littlefuse #313 03.2)
	220	3	140584	(Littlefuse #313 003)
	240	2.5	140585	(Littlefuse #313 02.5)
Australia	240	2.5	140588	(Littlefuse #313 02.5)
Scandinavian	220	3.15	140655	(Werner #T3.15A)

Power Requirement 400 Watts 50/60Hz



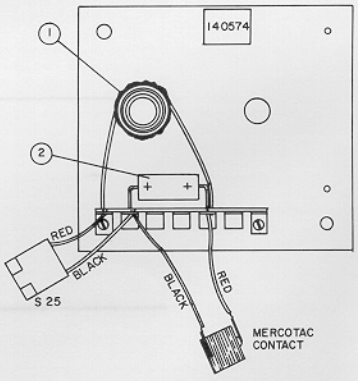
TREBLE RESPONSE CONTROL SWITCH (140553)

Item	Description	Part No.
1	Plate, switch mounting	140497
2	Switch	138945
3	Cap, slide	
	(model HL822, 815)	140558
	(model HL722, 715)	140742



TREBLE RESPONSE CONTROL ASSEMBLY (141121)

Item	Description	Part No.
L1	Inductor, 1.6mH	138599
L3	Inductor, 0.4mH	139004
R121	Resistor, wire-wound, 2.2-ohm, 10W	110160
R122	Resistor, wire-wound, 8-ohm, 10W	010934
R123	Resistor, wire-wound, 2.2 ohm, 10W	110160
C118	Capacitor, non-polar, 12mF	133980
C119	Capacitor, non-polar, 12mF	133980
C121	Capacitor, non-polar, 39mF	134390
C122	Capacitor, non-polar, 12mF	133980
	Fuse, 3.2-amp, Fast Acting	141415



ROLL-OFF ASSEMBLY (140574)

Item	Description	Part No.
1	Inductor Assembly, 2.2 mH (L2)	140520
2	Capacitor, 20 mfd (non-polarized) (C120)	057679

VOLUME ADJUSTMENT FOR LESLIE SPEAKERS 715/815 AND TWO CHANNEL ORGANS WITH BUILT-IN SPEAKERS

Four separate Volume Controls, two each for both the Rotary and Stationary channels, are accessible through the holes at the left side of the lower back panel and can be adjusted with the Leslie Volume Level Adjustment Key or a small screwdriver.

The volume controls of the Models 715 and 815 cabinets have been set at the factory for average expected use. It is important to remember, turning the Level Controls to their maximum position *is not the proper adjustment for the volume of the cabinet.* This will overdrive the loudspeakers and eventually cause a malfunction. If there is distortion (buzz or static), or if a different volume setting may be more suitable, follow this procedure:

All volume adjustments should be made playing the upper keyboard. Place a LEVEL decal over each volume control opening so the #6 is at the top of each hole (Fig. 1) if the amplifier does not already have decals.

1. Set both Treble Response Control switches in the DOT (Bright) position.
2. Turn all volume controls to the 3 position. Set all organ 8′ (and higher) Flute/Tibia tabs in the ON position and depress the organ expression pedal between ½ to ¾ of full volume.
3. Play and hold a full C chord an octave above middle C. While you swtich the Leslie Control Center between Organ and Echo, have someone turn the Upper Range Level Control clockwise until the sound coming from the organ and cabinet is the same. The Level control should then be set one number higher for proper balance.
4. The Lower Range and Keyboard Range Level Controls should be set at the same number.
5. Now play and hold the lowest pedal note. While you switch between Organ and Echo, have them turn the Pedal Range Level Control clockwise until the sound from the cabinet and organ is the same.

When using the Pre-Amp IV, first set the High Frequency Roll-Off controls to 10, set the cabinet volume controls at #7. Play the instrument as described above and set the Pre-Amp Volume Controls to maximum setting without distortion.

When the volume of the cabinet is at the preferred level, try each of the other two settings of the TRC switches and choose those that give the desired treble brightness in each channel. (Note — When using the Pre-Amp IV, the High Frequency Roll-Off controls may also be used to adjust the treble response.)

VOLUME ADJUSTMENT FOR HAMMOND B-3000/HL722 AND B-200/HL822

The volume controls of the HL722 and HL822 cabinets have been set at the factory for average expected use. If there is distortion (buzz or static), or if a different volume setting may be more suitable, follow this procedure:

1. Set both Treble Response Control switches in the DOT (Bright) position.
2. Place a LEVEL decal over each volume control opening so the #6 is at the top of each hole (Fig. 1) if the amplifier does not already have decals.
3. Turn each volume control until the Leslie Key points to #7 (Fig. 2). Now play some chords and pedal notes with a variety of stops. The cabinet should be balanced for average use.

Further adjustment can be made turning the volume controls clockwise to increase and counterclockwise to decrease the volume. When the volume of the cabinet is at the preferred level, try each of the other two settings of the TRC switches and choose those that give the desired treble brightness in each channel.

If a different setting for volume and/or balance is necessary, follow this procedure:

All volume adjustments should be made playing the upper keyboard. On the Hammond B-3000, set *only* the Piano tab in the ON position (on the B-200, also turn the Brilliance and Organ Volume controls to their maximum clockwise position) and depress the organ expression pedal to full volume.

Repeatedly play a C chord one octave above middle C and have someone turn up the KEYBOARD RANGE Volume Control until distortion just begins, then back off about ⅛th turn.

The PEDAL RANGE Volume Control should be set at the same position as the Keyboard Range. *Caution:* Playing the Piano voice with too much volume, causing distortion, can result in damage to the speaker.

Now, turn off the Piano tab and set the organ LESLIE UPPER and CHORUS tabs in the ON position. Pull the 5 1/3′, 8′ and 4′ B Upper Tonebars to their maximum setting and keep the organ expression pedal at full volume.

Play and hold a C chord one octave below middle C and have someone adjust the LOWER RANGE Volume Control until the volume is balanced when the LESLIE UPPER tab is alternately switched between ON and OFF.

Cancel tonebars 5 1/3′, 8′ and 4′ and pull the 2 2/3′, 2′, 1 3/5′, 1 1/3′ and 1′ B Upper Tonebars to their maximum setting.

While you play a C chord at Middle C, have them adjust the UPPER RANGE Volume Control until the volume is balanced when the LESLIE UPPER tab is alternately switched between ON and OFF.

When the volume of the cabinet is at the preferred level, try each of the other two settings of the TRC switches and choose those which give the desired treble brightness in each channel.

Fig. 1

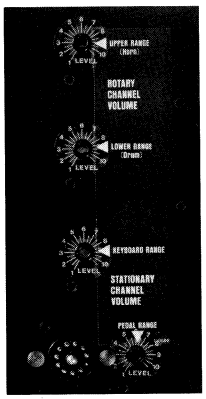
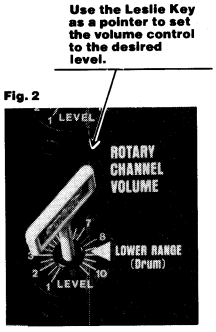
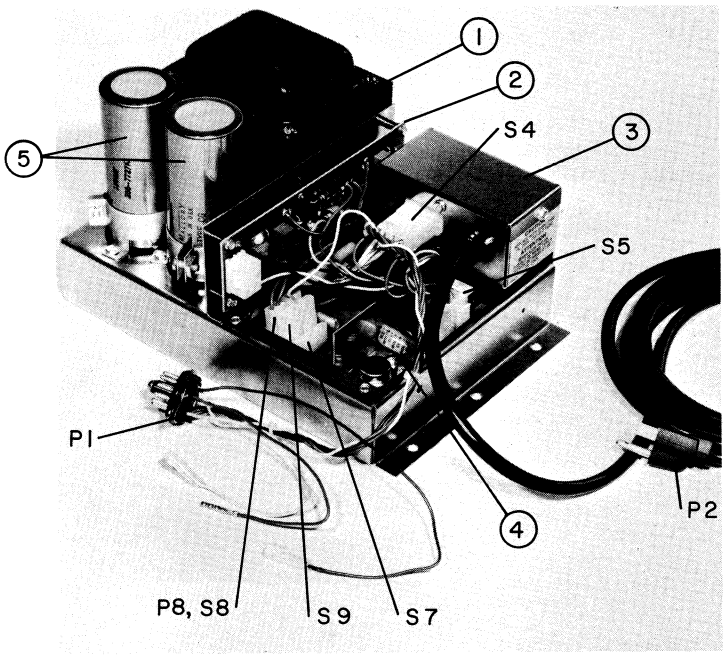


Fig. 2



POWER SUPPLY (120V version) 141661

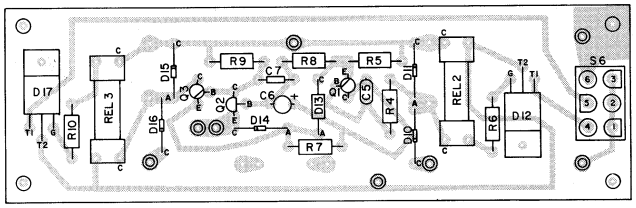


Item	Description	Part No.
	Includes:	
	Power Supply Assembly	140521
2	Motor Control Assembly	138580
3	Power Cord Adapter 120V	140528

(Note: The complete Power Supply consists of the Power Supply Assembly — 140521, Motor Control Assembly — 138580 and a Power Cord Adapter — see Item 3. When ordering other voltages list all assemblies needed.)

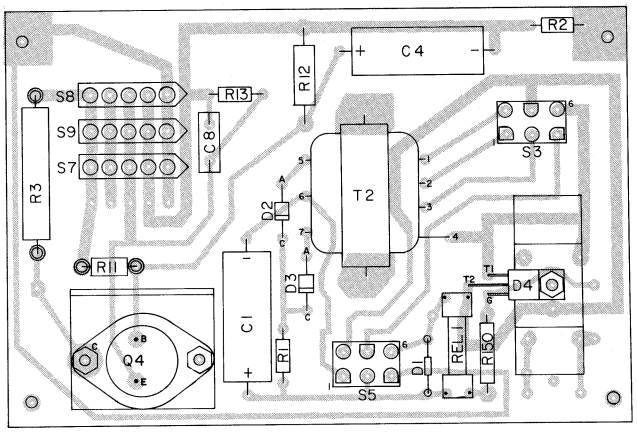
Item	Description	Part No.
1	Transformer Assembly, power, multi-voltage (T1)	140523
2	Motor Control Assembly	138580
	Includes;	
	Circuit Board Assembly (137325)	
	Cable & Plug Assembly (138582)	
3	Power Cord Adapter	
	100V	140586
	120V	140528
	200V	140587
	220V	140584
	240V	140585
	240V Australia	140588
	220V Scandinavia	140655
4	Power Supply Circuit Board Assembly	140522
5	Capacitor, electrolytic, 500mfd 50VDC (C2, C3)	138627
	Rectifier, bridge (mounted beneath) D6	140449

CONTROL CIRCUIT BOARD ASSEMBLY (138580)



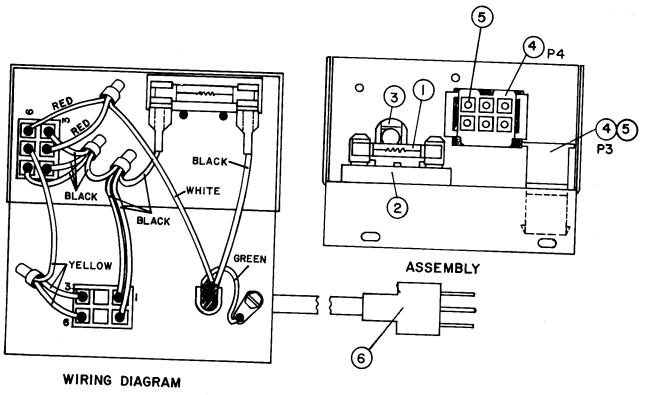
Item	Description	Part No.
C5	Capacitor, disc, 100pF, 1000V	028027
C6	Capacitor, tantalum, 22mfd, 15V	062638
C7	Capacitor, disc, 3300pF, 100V	067546
D10, D11	Diode, silicon, 1-amp	021154
D12	Triac, silicon, 8-amp, 400PIV	067561
D13	Diode, Zener, 6.7V	118870
D14	Diode, silicon, 500mW, 30 PIV	041616
D15, D16	Diode, silicon, 1-amp	021154
D17	Triac, silicon, 8-amp, 400 PIV	067561
Q1	Transistor, PNP, TZ554	033589
Q2	Transistor, NPN, MSPS4382	026237
Q3	Transistor, NPN, 2N3414	030254
R4	Resistor, 47K, 1/2W, 5%	063677
R5	Resistor, 2.2K, 1/2W, 5%	137758
R6	Resistor, 220-ohm, 1/2W, 5%	028381
R7	Resistor, 22K, 1/2W, 5%	028365
R8	Resistor, 470K, 1/2W, 5%	018002
R9	Resistor, 6.8K, 1/2W, 5%	016501
R10	Resistor, 220-ohm, 1/2W, 5%	028381
REL 2,3	Relay, reed & coil, 375V breakdown	137454
S6	Housing, socket, AMP universal, 6-circuit, natural (white)	137258

POWER SUPPLY CIRCUIT BOARD ASSEMBLY (141448)



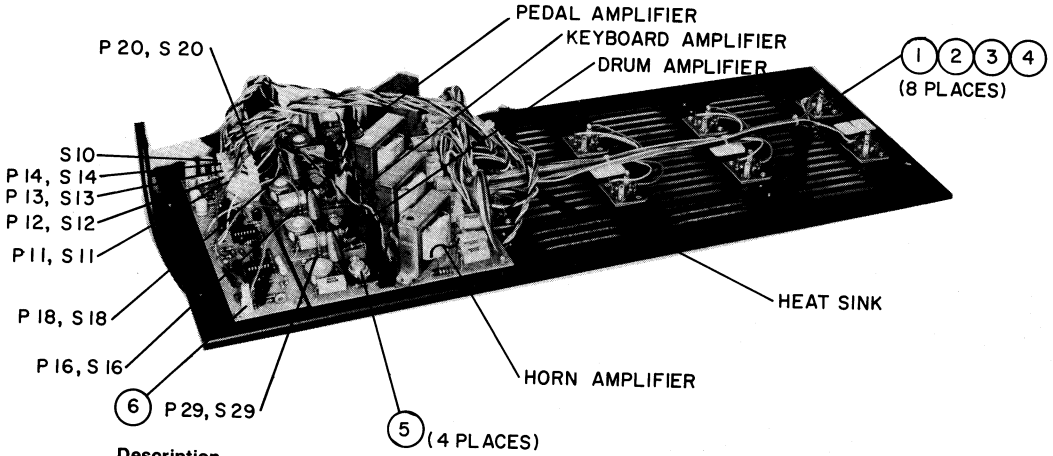
Item	Description	Part No.
	Circuit Board, Etched	140459
T2	Transformer, control	140414
Rel 1	Relay Coil and Switch, 1kV	137456
D4	Triac	067561
Q4	Transistor, 2N3055	023762
D2, D3	Diode, 100 PIV, 1A	021154
D1	Diode, 30PIV 500mW	041616
C1, C4	Capacitor, electrolytic, 250MF, 35V	065086
C8	Capacitor, poly, 0.1MF 200V	022251
R1	Resistor, CF 33ohm, .5W, 5%	137344
R150	Resistor, 220-ohm, 1W	139942
R2	Resistor, 100K .5W, 5%	137765
R13	Resistor, 3.3K, .5W, 5%	024141
R11	Resistor, 330-ohm, .5W, 5% F.P.	141453
R12	Resistor, 1.2K, 2W	137974
R3	Resistor, ww, 8-ohm, 7W, 10%	141432
S3	Housing, Socket, 6CKT, Modified	040514
S5	Housing, Socket, 6CKT, AMP UNIV.	137258
S7	Housing, Socket, 5CKT	106970
S8	Housing, Socket, 5CKT	106970
S9	Housing, Socket, 5CKT	106970

TYPICAL POWER CORD ADAPTER



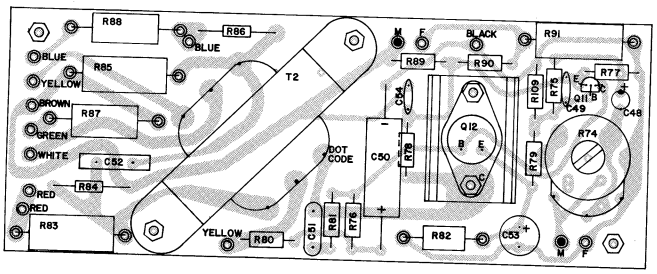
Item	Description	Part No.
1	Fuse	140508
2	Fuseholder, clip type	140490
3	Bushing, strain relief, 6P3-4	037986
4	Housing, plug, Molex, 6-circuit (P3, P4)	140495
5	Contact, insert, Molex, female	023556
6	Cable Assembly, 117VAC (used on 100V, 120V)	039636
	Cable Assembly, 250 VAC (used on 200V, 220V, 240V)	129950
	Cable Assembly, 240 VAC (used on Australian 240V)	129960

AMPLIFIER (140804)

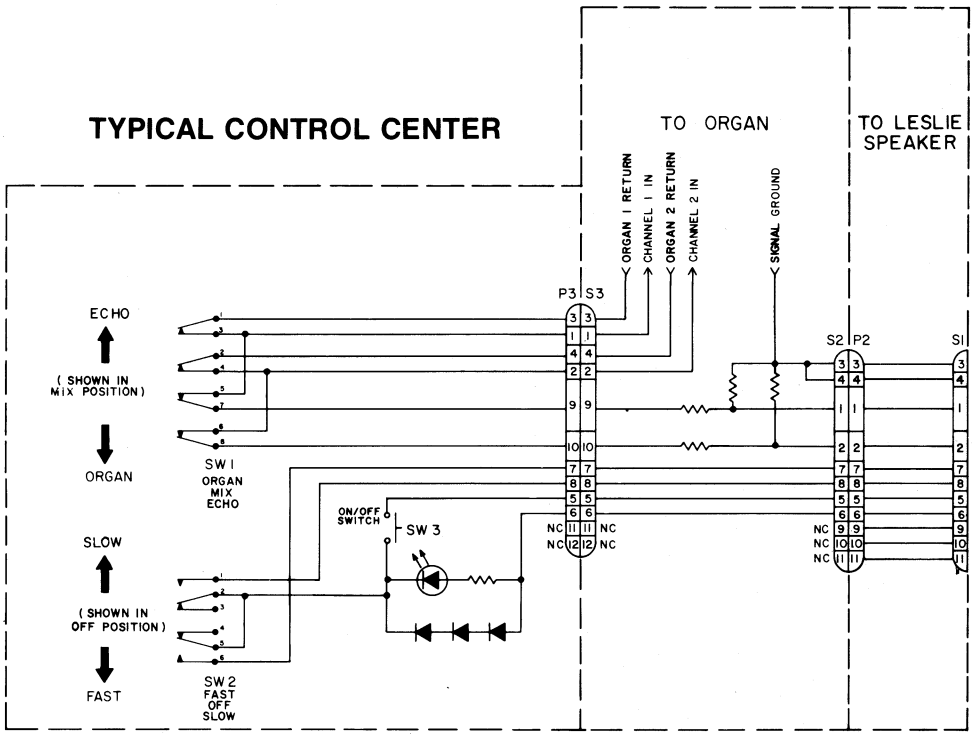


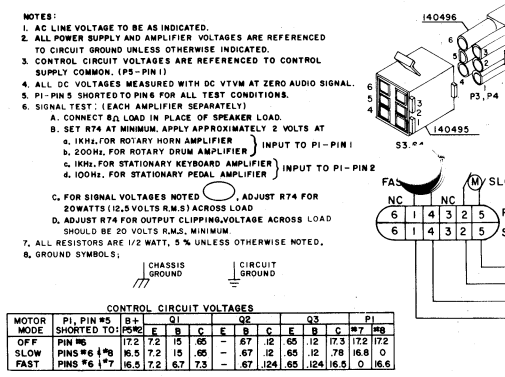
Item	Description	Part No.
1	Transistor, 2N3055 (Q13, Q14) (4 each)	023762
2	Washer, insulating, transistor	023176
3	Socket, Transistor	023168
4	Cover, transistor	023580
5	Circuit Assembly, driver (includes cable assembly 045781 and circuit board assembly 140561)	140562
6	Circuit Assembly, crossover (includes circuit board assembly 140806)	140805

CIRCUIT BOARD ASSEMBLY (140562) for PEDAL, KEYBOARD, DRUM and HORN AMPLIFIERS



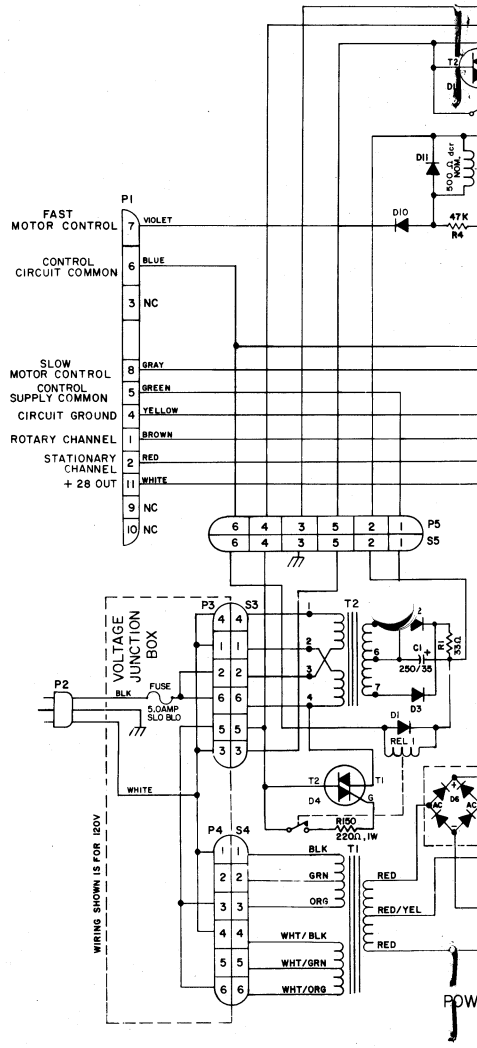
Item	Description	Part No.
C48	Capacitor, tantalum, 22mfd, 15V (white dot is +)	062638
C49, C54	Capacitor, disc, 4700pF, 100VDC	028431
C50	Capacitor, electrolytic, 150mfd, 25VDC	031294
C51	Capacitor, mylar, .033mfd, 100VDC	028654
C52	Capacitor, polyester, 0.1mfd, 200VDC	022251
C53	Capacitor, electrolytic, 500mfd, 6VDC	055483
Q11	Transistor, MSPS 7535	026237
Q12	Transistor, 2N3054	023754
R74	Potentiometer, 20K	037648
R75, R80, R81	Resistor, 1.2K, 1/2W, 5%	018036
R76	Resistor, 470-ohm, 1/2W, 5%	028068
R77, R90	Resistor, 47-ohm, 1/2W, 5%	016311
R78	Resistor, 6.8K, 1/2W, 5%	016501
R79	Resistor, 27K, 1/2W, 5%	021535
R82	Resistor, 15-ohm, 1W 5% N.F.	141455
R83, R85	Resistor, wire-wound, 430-ohm, 5W, 5%	023648
R84, R86	Resistor, 6.8-ohm, 1/4W, 5% N.F.	141454
R87, R88	Resistor, wire-wound, 0.3-ohm, 2W, 5%	141451
R91	Resistor, wire-wound, 0.3-ohm, 5W, 5%	023218
R89	Resistor, 820-ohm, 1/2W, 5%	028373
R109	Resistor, 47K, 1/2W, 5%	063677
T2	Transformer, driver (Early models may have driver transformers #023770 or#023788. Use transformer #140560 when replacing.)	140560
	Circuit Board, Etched	022848





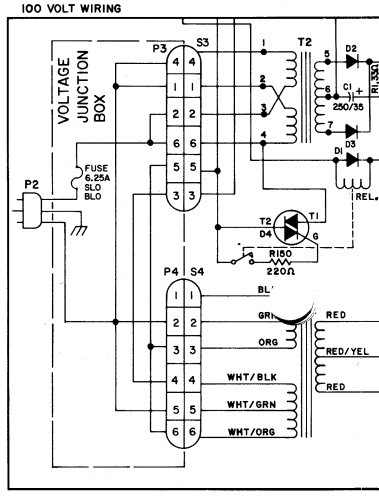
CONTROL CIRCUIT VOLTAGES

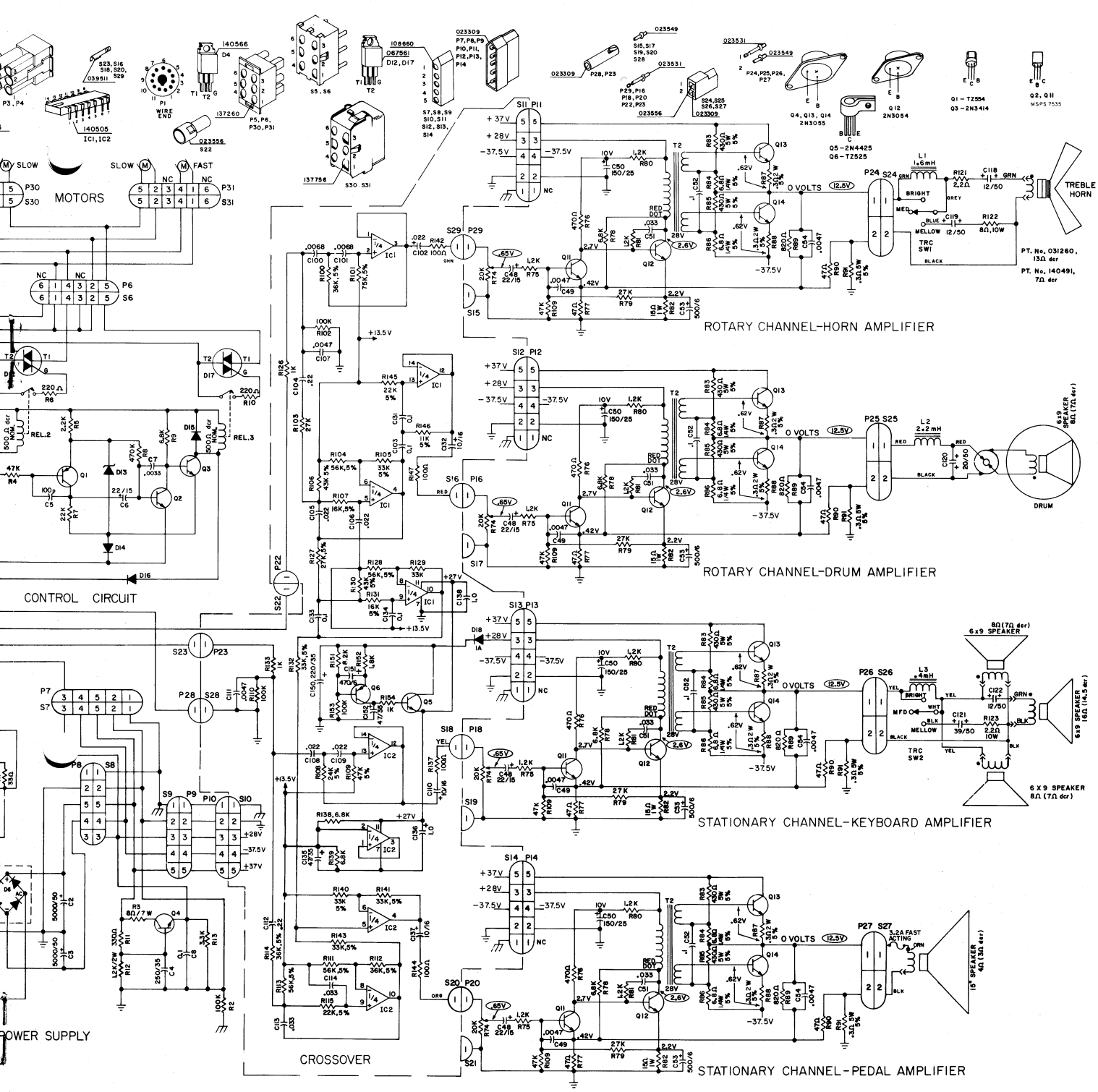
MOTOR MODE	P1, PIN #5 SHORTED TO:	B+ P5#2	Q1 E	Q1 B	Q1 C	Q2 E	Q2 B	Q2 C	Q3 E	Q3 B	Q3 C	P1 #7	P1 #8
OFF	PIN #6	17.2	7.2	1.5	.65	–	.67	.12	.65	.12	17.3	17.2	17.2
SLOW	PINS #6 & #8	16.5	7.2	1.5	.65	–	.67	.12	.65	.12	.78	16.8	0
FAST	PINS #6 & #7	16.5	7.2	6.7	7.3	–	.67	.124	.65	.124	16.5	0	16.6

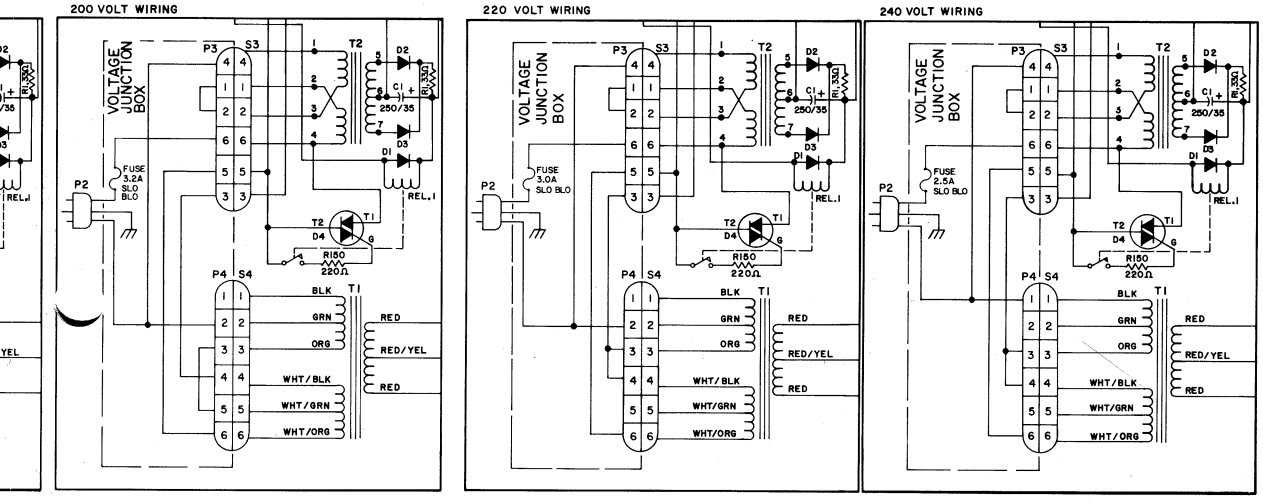


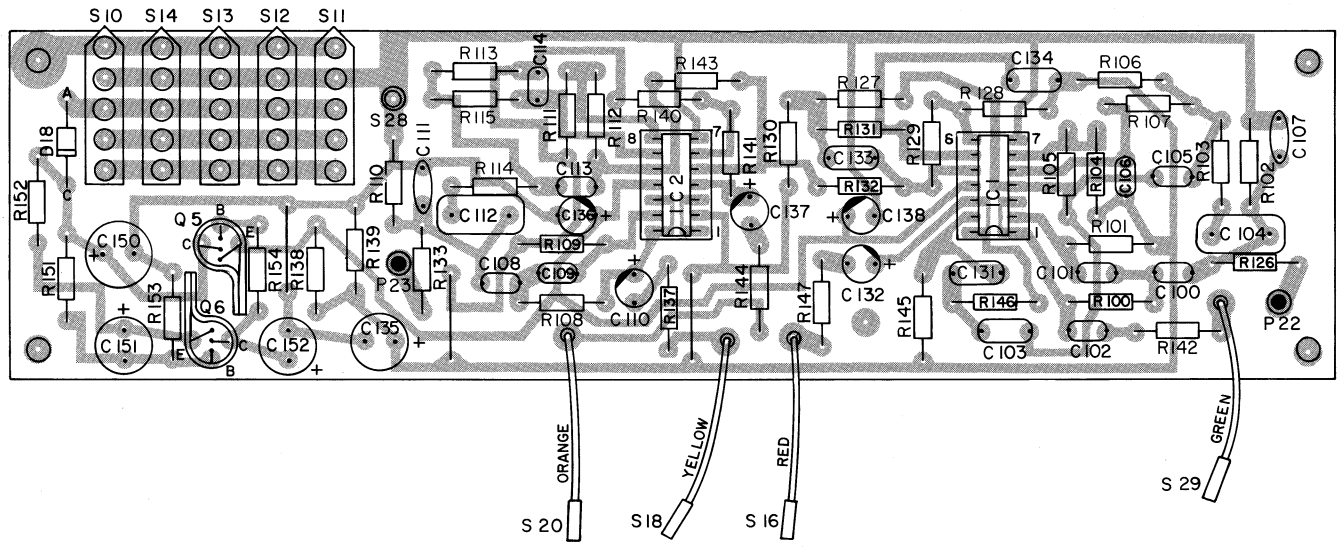
An 11-conductor cable (part of the console connector kit) carries the various signals and voltages to input plug P1 as described here.

Pin No.	Function
1	Rotary channel audio input (flute/tibia.)
2	Stationary channel audio input (pedal/bass).
3	NC
4	Audio ground. Common to all channels.
5	Control supply common.
6	Control circuit common. When circuit to pin 5 is completed the cabinet circuits are turned on.
7	Fast motor control (Circuit completed through pin 5.)
8	Slow motor control (Circuit completed through pin 5.)
9	NC
10	NC
11	B+ out (28 volts)




MOTORS
SLOW
FAST
CONTROL CIRCUIT
ROTARY CHANNEL-HORN AMPLIFIER
ROTARY CHANNEL-DRUM AMPLIFIER
STATIONARY CHANNEL-KEYBOARD AMPLIFIER
STATIONARY CHANNEL-PEDAL AMPLIFIER
CROSSOVER
POWER SUPPLY
TREBLE HORN
DRUM
6 X 9 SPEAKER
15" SPEAKER

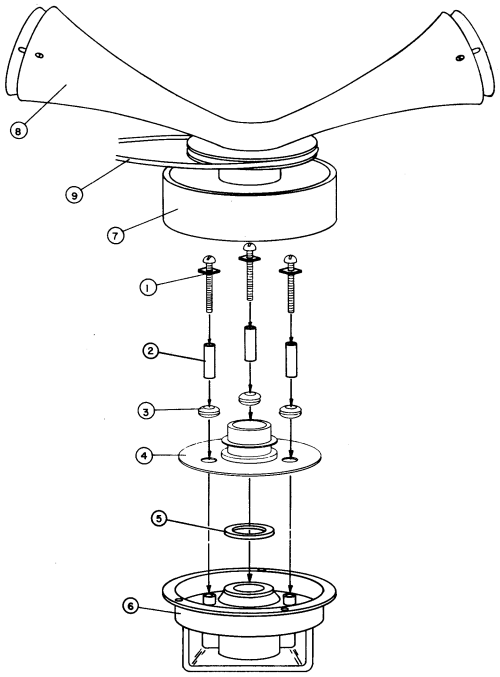

200 VOLT WIRING
220 VOLT WIRING
240 VOLT WIRING
VOLTAGE JUNCTION BOX
FUSE 3.2A SLO BLO
FUSE 3.0A SLO BLO
FUSE 2.5A SLO BLO
BLK
GRN
ORG
RED
RED/YEL
WHT/BLK
WHT/GRN
WHT/ORG



ELECTRONIC CROSSOVER BOARD ASSEMBLY (140805)

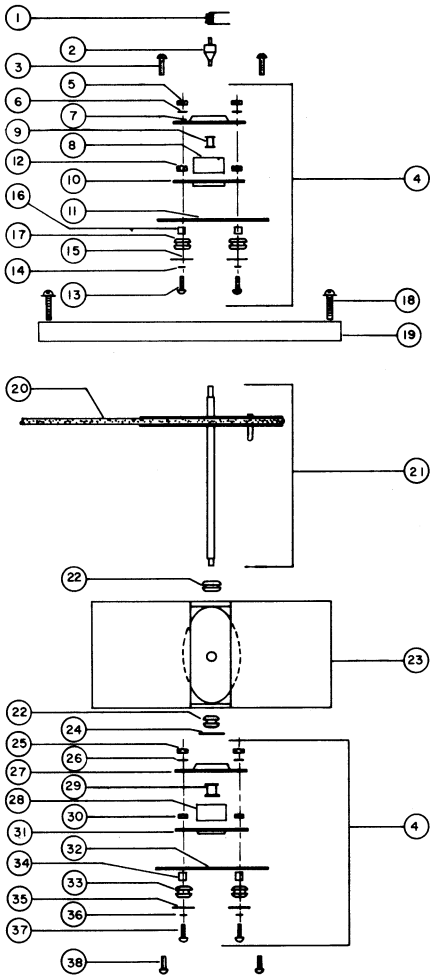
Item	Description	Part No.
	Capacitors	
C100,C101	mylar, .0068mfd, 10%	140451
C102	mylar, .022mfd, 5%	137751
C103	mylar, 0.1mfd, 10%	140504
C104	mylar, 0.22mfd, 10%	140366
C105,C106 C108	mylar, .022mfd, 5%	137751
C109	mylar, .022mfd, 5%	137751
C110	tantalum, 10mfd, 16V	041707
C111,C107	disc, .0047mfd, 100V, 20%	028431
C112	mylar, 0.22mfd, 10%	140366
C113	mylar, .033mfd, 10%	140450
C114	mylar, .033mfd, 10%	140450
C131	mylar, 0.1mfd, 10%	140504
C132	tantalum, 10mfd, 16V	041707
C133,C134	mylar, 0.1mfd, 10%	140504
C135	electrolytic, 47mfd, 35V	140826
C136	tantalum, 1mfd, 35V	067538
C137	tantalum, 10mfd, 16V	041707
C138	tantalum, 1mfd, 35V	067538
C150	electrolytic, 220mfd, 35V	140827
C151	electrolytic, 500mfd, 6V (alternate value 470mfd, 6V)	055483
C152	electrolytic, 47mfd, 35V	140826
D18	DIODE, 1 amp, 100PIV	021154
IC1, IC2	INTEGRATED CIRCUIT, TL075CN	140505
	Resistors	
R100	36K ½W, 5%	140548
R101	75K, ½W, 5%	140550
R102	100K, ½W, 5%	137765
R103	27K, ½W, 5%	021535
R104	56K, ½W, 5%	137766
R105	33K, ½W, 5%	137767
R106	43K, ½W, 5%	140549
R107	16K, ½W, 5%	140546
R108	24K, ½W, 5%	140547
R109	47K, ½W, 5%	063677
R110	100K, ½W, 5%	137765

Item	Description	Part No.
R111	56K, ½W, 5%	137766
R112	36K, ½W, 5%	140548
R113	56K, ½W, 5%	137766
R114	36K, ½W, 5%	140548
R115	22K, ½W, 5%	028365
R126	1K, ½W, 5%	018044
R127	27K, ½W, 5%	021535
R128	56K, ½W, 5%	137766
R129	33K, ½W, 5%	137767
R130	43K, ½W, 5%	140549
R131	16K, ½W, 5%	140546
R132	33K, ½W, 5%	137767
R133	1K, ½W, 5%	018044
R137	100-ohm, ½W, 5%	137762
R138,R139	6.8K, ½W, 5%	016501
R140	33K, ½W, 5%	137767
R141	33K, ½W, 5%	137767
R142	100-ohm, ½W, 5%	137762
R143	33K, ½W, 5%	137767
R144	100-ohm, ½W, 5%	137762
R145	22K, ½W, 5%	028365
R146	11K, ½W, 5%	140544
R147	100-ohm, ½W, 5%	137762
R151	8.2K, ½W, 5%	131220
R152	1.8K, ½W, 5%	049676
R153	100K, ½W, 5%	137765
R154	1K, ½W, 5%	018044
	Transistors	
Q5	NPN, 2N4425	033563
Q6	PNP, TZ554	033589
	Circuit Board, Etched	140807
	Connectors	
S10,S11,S12 S13,S14	Housing, Socket, 5CKT	106970
(not shown)	Contact, Socket Insert, Female	108660
S28	Contact, Female, PCB	023549
P22	Contact, Male, PCB	023531
P23	Contact, Male, PCB	023531



HORN ROTOR ASSEMBLY

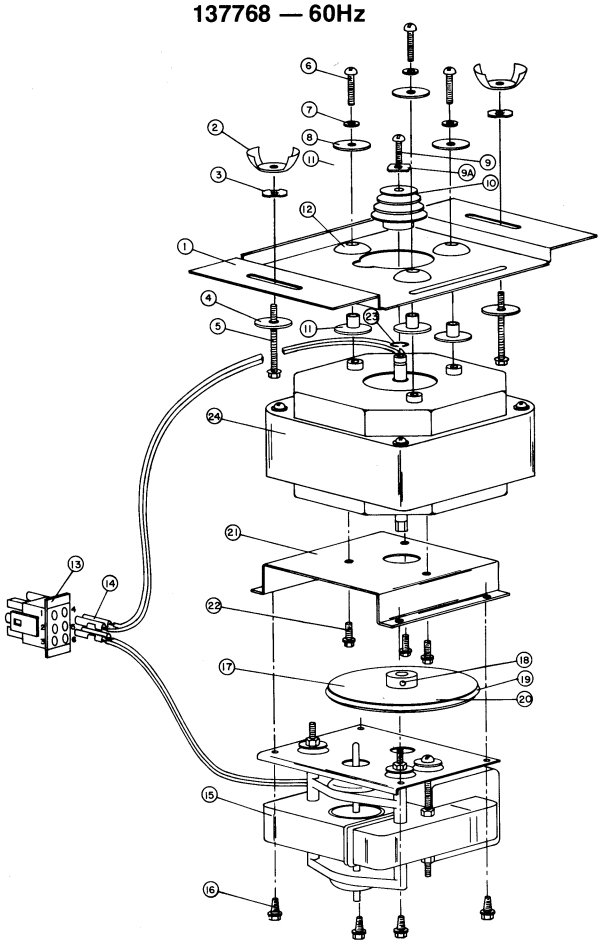
Item	Description	Part No.
	Speaker and Spindle Assembly	140545
1	Screw With Lock Washer, machine, 8-32 x 1-1/8	016832
2	Bushing, aluminum, .144 x .281 x .813	050294
3	Grommet, neoprene	050211
4	Spindle and Plate Assembly	137804
5	Washer, flat, 5/8 x 1-1/2 x 1/8	050286
6	Speaker, treble driver, 8-ohm	140491
7	Ring, spacer, waxed	020313
8	Horn Assembly, treble	050807
9	Belt drive	045468



ROTOSONIC® DRUM ASSEMBLY

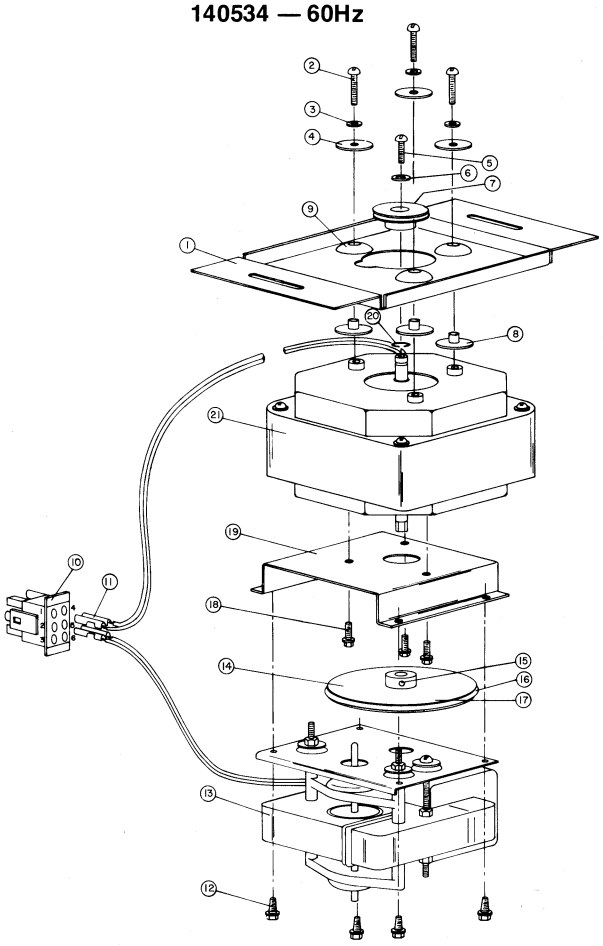
Item	Description	Part No.
1	Mercotac Connector (part of roll-off assembly 140574)	015958
2	Mercotac	015941
3	Screw With Lock Washer, machine, 10-24 x 7/8	026963
4	Bearing Assembly, ball, rotor	051102
5	Nut, hex, 8-32 x 11/32 x 1/8	026773
6	Washer, lock, 8 x 5/16 x .020	026765
7	Retainer, bearing, upper	051029
8	Bearing	051045
9	Grommet, 9/16 x 3/8 x 5/16	051037
10	Retainer, bearing, lower	051052
11	Bearing Plate	051128
12	Nut, hex, 8-32 x 11/32 x 1/8	026773
13	Screw, machine, 8-32 x 13/16	026138
14	Washer, lock, 8 x 5/16 x .020	026765
15	Washer, flat, 10 x 3/4 x 3/64	026518
16	Bushing, .196 x .312 x .325	051060
17	Grommet, 1 x 3/4 x 5/16	050641
18	Screw, machine, 10-24 x 1-5/8, with flat washer	029066
19	Block, bearing	052654
20	Belt, drive	011700 030601
21	Shaft and Pulley Assembly	140537
22	Grommet	051326
23	Drum Assembly, 16-in., (with 6 x 9 speaker)	140456
24	Washer, flat, 3/8 x 7/8 x 5/64	051342
25	Nut, hex, 8-32 x 11/32 x 1/8	026773
26	Washer, lock, 8 x 5/16 x .020	026765
27	Retainer, bearing	051029
28	Bearing, ball	051045
29	Grommet	051037
30	Nut, hex, 8-32 x 11/32 x 1/8	026773
31	Retainer, bearing, lower	051052
32	Bearing plate	051128
33	Grommet	050641
34	Bushing	051060
35	Washer, flat, 10 x 3/4 x 3/64	026518
36	Washer, lock, 8 x 5/16 x .020	026765
37	Screw, machine, 8-32 x 13/16	026138
38	Screw, machine, 10-24 x 3/8	025460

UPPER MOTOR ASSEMBLY
137768 — 60Hz



Item	Description	Part No.
1	Bracket Assembly (including grommets and bushings)	138212
	Bracket only	138211
	— motor attaching parts —	
2	Nut, wing, 10-24	138688
3	Washer, lock, domed, 10 x 9/16 x .030	138689
4	Washer, flat, 10 x 3/4 x 3/64	026518
5	Screw, machine, 10-24 x 1-1/2, hex washer head	110200
	* * *	
6	Screw, machine, 8-32 x 3/4	022574
7	Washer, lock, 8 x 5/16 x .020	026765
8	Washer, flat, 8 x 31/32 x 1/16	026641
9	Screw, machine, 8-32 x 3/4, Phillips head	138078
9A	Washer, lock, domed, 8 x 9/16 x .025	039131
10	Pulley, 60 Hz, 3-step	137817
	Pulley, 50 Hz, 3-step	137821
11	Bushing, shoulder, .169 x .250 (part of bracket assembly)	138016
12	Grommet, neoprene (part of bracket assembly)	137536
13	Housing, plug, Amp universal, 6-circuit, natural (white) (P30)	137259
14	Contact, insert, Amp universal, female	137260
15	Motor Assembly, slow-speed, 117V 50/60 Hz	012534
16	Screw, sheet metal, 6 x 1/4, hex washer head	026666
17	Wheel Assembly rim drive	014027
18	Screw, set, hex socket head, 10-32 x 3/16	025973
19	Ring, O, 2.475 ID	014159
20	Wheel and Hub Assembly	055921
21	Bracket, U	015503
22	Screw, machine, 8-32 x 1/4, hex washer head	107670
23	Ring, C	050666
24	Motor, D6, 117V 50/60 Hz	060269

LOWER MOTOR ASSEMBLY
140534 — 60Hz

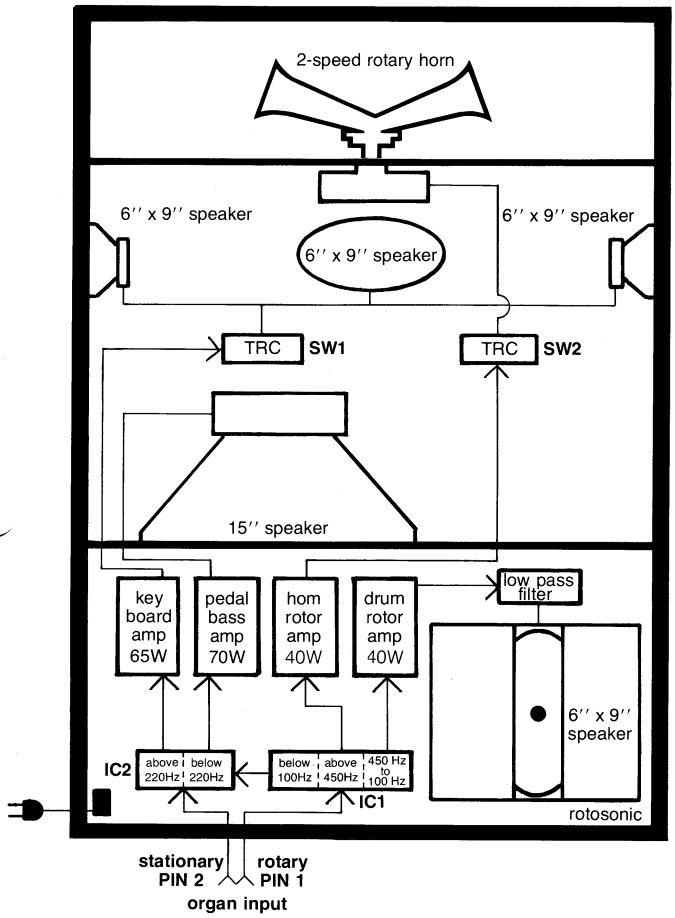


Item	Description	Part No.
1	Bracket Assembly (including grommets and bushings)	138212
	Bracket only	138211
2	Screw, machine, 8-32 x 3/4, Phillips head	138078
3	Washer, lock, 8 x 5/16 x .020	026765
4	Washer, flat, 8 x 31/32 x 1/16	026641
5	Screw, machine, 8-32 x 5/8 (on 60 Hz)	026286
	Screw with Lock Washer, machine, 8-32 x 3/8 (on 50 Hz)	026740
6	Washer, lock, domed, 8 x 9/16 x .025 (on 60 Hz only)	039131
7	Pulley, 60 Hz	140512
	Pulley, 50 Hz	140513
8	Bushing, shoulder, .169 x .250 (part of bracket assembly)	138016
9	Grommet, neoprene (part of bracket assembly)	137536
10	Housing, plug, amp universal, 6-circuit, natural (white) (P12)	137259
11	Contact, insert, Amp, female	137260
12	Screw, sheet metal, 6 x 1/4, hex washer head	026666
13	Motor Assembly, slow speed, 117V 50/60 Hz	012534
14	Wheel Assembly, rim drive	014027
15	Screw, set, hex socket head, 10-32 x 3/16	025973
16	Ring, O, 2.475ID	014159
17	Wheel and Hub Assembly	055921
18	Screw, machine, 8-32 x 1/4, hex washer head	107670
19	Bracket, U	015503
20	Ring, C	050666
21	Motor, D10, 117V 50/60 Hz	014019

CIRCUIT DESCRIPTIONS

AC POWER CONTROL CIRCUIT

The primary of transformer T2 is connected across the power line and is therefore energized whenever the AC plug is connected to a standard power outlet. The DC voltage developed across C1 is applied to relay REL 1 when contacts 5 and 6 of P1 are connected together. This applies AC power to the primary of T1, activating the cabinet power supply to turn the cabinet on.



BRAKE CIRCUIT

Whenever the motor speed control is operated from TREMOLO (fast) to OFF, rotor braking action is accomplished by activating the slow (small) motor for a short period of time after the fast (large) motor has been turned off.

When the fast motor is operating, transistors Q1 and Q2 are conducting, and capacitor C6 builds a charge of approximately 6 volts. Zener diode D13 provides a regulated, ripple-free source of DC for charging the capacitor.

Transistor Q3 is biased to cutoff by the voltage drop across D14 which maintains the base of Q3 approximately 0.6 volts negative with respect to its emitter.

When the fast motor is turned off, transistor Q1 is cut off, which allows capacitor C6 to discharge through resistors R7 and R8. The voltage drop across R8 reverse-biases transistor Q2 well past the cut-off point. With transistor Q2 turned off, current through resistor R9 biases transistor Q3 into conduction, and relay REL 3 closes, activating the slow motor.

Power applied to the slow motor causes its shaft to contact the rim drive wheel on the fast motor shaft, thus acting as a drag, and quickly braking the rotor to slow speed.

After a few seconds, capacitor C6 discharges to the point where the discharge current is insufficient to maintain transistor Q2 in a cut-off condition. Transistor Q2 then conducts, again driving transistor Q3 into cutoff. The contacts on relay REL 3 open, the slow motor is turned off, and the rotor stops.

ON/OFF SW3

Closing the ON/OFF switch completes the circuit through contacts 5 and 6 of S1,P1. Relay REL 1 is energized, turning triac D4 on, applying AC line power to the primary of transformer T1, which activates the cabinet power supply. The current through contacts 5 and 6, P1 also causes the LED in the switch assembly to glow. The three adjacent Diodes maintain essentially constant current through the LED even when several cabinets are operating simultaneously.

MOTOR CONTROL CIRCUIT

FAST/OFF/SLOW SW2

Setting this switch to FAST (Tremolo) closes SW2 contacts 5 and 6, completing the circuit from contacts 7 to 5 of S1,P1. The fast motor is turned on by connecting contacts 7 and 5 of P1 together, thus applying the DC voltage across C1 to relay REL 2 through diode D10. The relay contacts, in turn, apply gating voltage to triac D12, to operate the fast motor.

Setting the switch to SLOW (Chorale) closes contacts 1 and 2, completing the circuit from contacts 8 to 5 of S1, P1. (SW2 contacts 5 and 6 break when the switch passes through the OFF position, de-energizing the fast motor.) The slow motor, like the fast, is similarly operated by connecting contacts 8 and 5 together, which operates REL 3 to energize triac D17.

Setting the switch to the OFF position causes either contact pairs 1 and 2 or 5 and 6 to break, de-energizing the slow or fast motor circuit. When the switch is changed from FAST (Tremolo) to OFF the brake action occurs, as described under BRAKE CIRCUIT.

ECHO/MIX/ORGAN
SW1

With the switch set at MIX (Ensemble), organ signals from the "flute/tibia" channel (designated "channel 1" on the console connector schematic) enter the speaker system through contact 1 of S3,P3 (in the console connector kit), pass through the control switch contacts 2 and 1, and return to the organ "flute/tibia" speaker. (If there is a crossover in the organ system the signal returns to the input of the crossover.) At the same time, the signal is routed through the control switch contacts 5 and 6, and through contact 1 of S1,P1 to the rotary channel amplifier.

With the switch set at ECHO, organ signals from the "flute/tibia" channel enter the system through 1 of S3,P3, pass through control switch contacts 5 and 6, and are routed through contact 1 of S1,P1 to the rotary channel of the LESLIE speaker. Signal to the **organ** speaker is interrupted by the opening of contacts 1 and 2.

Signals from the organ "main" channel are similarly handled.

With the switch set at ORGAN (Main), the opposite condition is created: contact pairs 1,2 and 3,4 make, while contacts 5 and 6 (LESLIE speaker rotary channel) and 7 and 8 (LESLIE speaker stationary channel) break. Thus, only the organ speakers sound.

ANTI-THUMP CIRCUIT

When the speaker system is first turned-on, transistor Q6 starts to conduct. As transistor Q6 starts conducting, capacitor C152 starts charging, delaying the turn-on of transistor Q5. As voltage develops across capacitor C152, transistor Q5 is biased to turn-on, delivering the proper DC voltage to the rest of the crossover board.

When the speaker system is turned-off, capacitor C150 starts to discharge to ground through resistor R151 and resistor R153. The voltage developed across these two resistors biases transistor Q6 on, until the capacitor C150 has discharged. Capacitor C152 is discharged at the same time as capacitor C150, keeping transistor Q5 in conduction. When both capacitors have lost their charge, the transistors Q5 and Q6 turn-off, cutting off the DC voltage to the crossover.

LUBRICATION

Leslie Speaker oil, recommended for use on the bearings of the Motors and on the Treble Spindle Horn, is packed with each speaker cabinet (attached to the skid). Use this oil if possible. Otherwise, use OC (oxidation and corrosion resistant) turbine oil SAE 10 weight, or equivalent.

Use, climate and dust conditions determine the Motor and Treble Horn Spindle lubrication requirements. Generally, they should be lubricated after each 600 hours of operation (1000 hours maximum). Do not use oil in excess of the amount which is recommended. Excessive oil may be harmful to the equipment. Oil Motors where indicated on motor diagram. At the base of the Treble Horn, place 6 to 8 drops of oil in the hole marked OIL HERE.