HAMMOND

SERVICE MANUAL

LESLIE3300P
LESLIE3300WP

CAUTION !

see safety notice inside

LESLIE3300P

LESLIE3300WP

SEP.2009

SUZUKI MUSICAL INST.MFG.CO.,LTD.

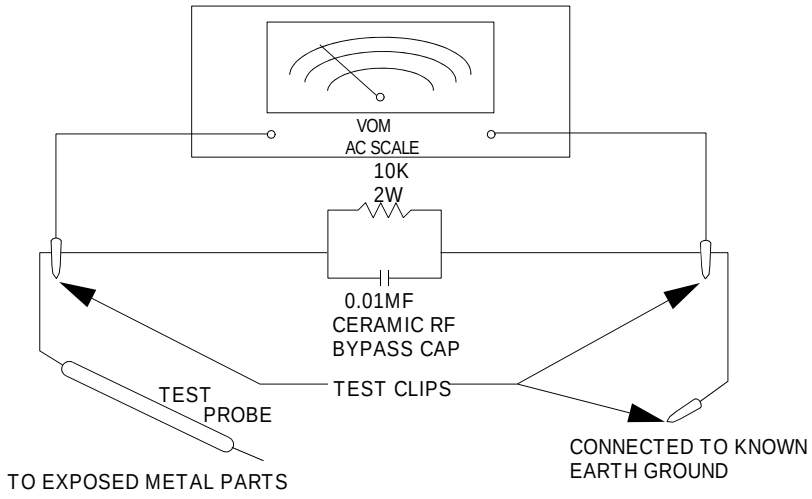
2-25-12, RYOKE, NAKAKU, HAMAMATSU, 430-0852 JAPAN

SAFETY NOTICE

Great care has been taken in the design and manufacture of this product to assure that no shock hazard exists on any exposed metal parts. Internal service operations can expose the technician to hazardous line voltages and accidentally cause these voltages to appear on exposed metal parts during repair or reassembly of product components. To prevent this, work on these products should only be performed by those who are thoroughly familiar with the precautions necessary when working on this type of equipment.

To protect the user, it is required that all enclosure parts and safety interlocks be restored to their original condition and the following tests be performed before returning the product to the owner after any service operation.

Plug the AC line cord directly into a line voltage AC receptacle (do not use an isolation transformer for this test) and turn the product on. Connect the network (as shown below) in series with all exposed metal parts and a known earth ground such as a water pipe or conduit. Use an AC Voltmeter of 5,000 ohms per volt or higher sensitivity to measure the voltage drop across the network. Move the network connection to each exposed metal part (metal chassis, screw heads, knobs and control shafts, escutcheon, etc.) and measure the voltage drop across the network. Reverse the line plug and repeat the measurements. Any reading of 4 volts RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the product to the user.



CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

Advarsell

Lithiumbatteri. Eksplosionsfare ved fejlagtig håndering.
Udskiftning må kun ske med batteri as samme fabriket og type.
Lebér det brugte batteri tilbage til leverandoren.

Norge: **ADVARSEL**

Lithiumbatteri - Eksplosjonsfare.
Ved utskiftning benyttes kun batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandoren.

Sverige: **VARNING**

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller et ekvivalent typ som rekommenderes av apparattillverkaren,
Kassera använt batteri enlig fabrikantens instruktion.

Finland: **VAROITUS**

Paristo voi räjähtää, jos se on virheeliseeti ansennettu
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppoonn, Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

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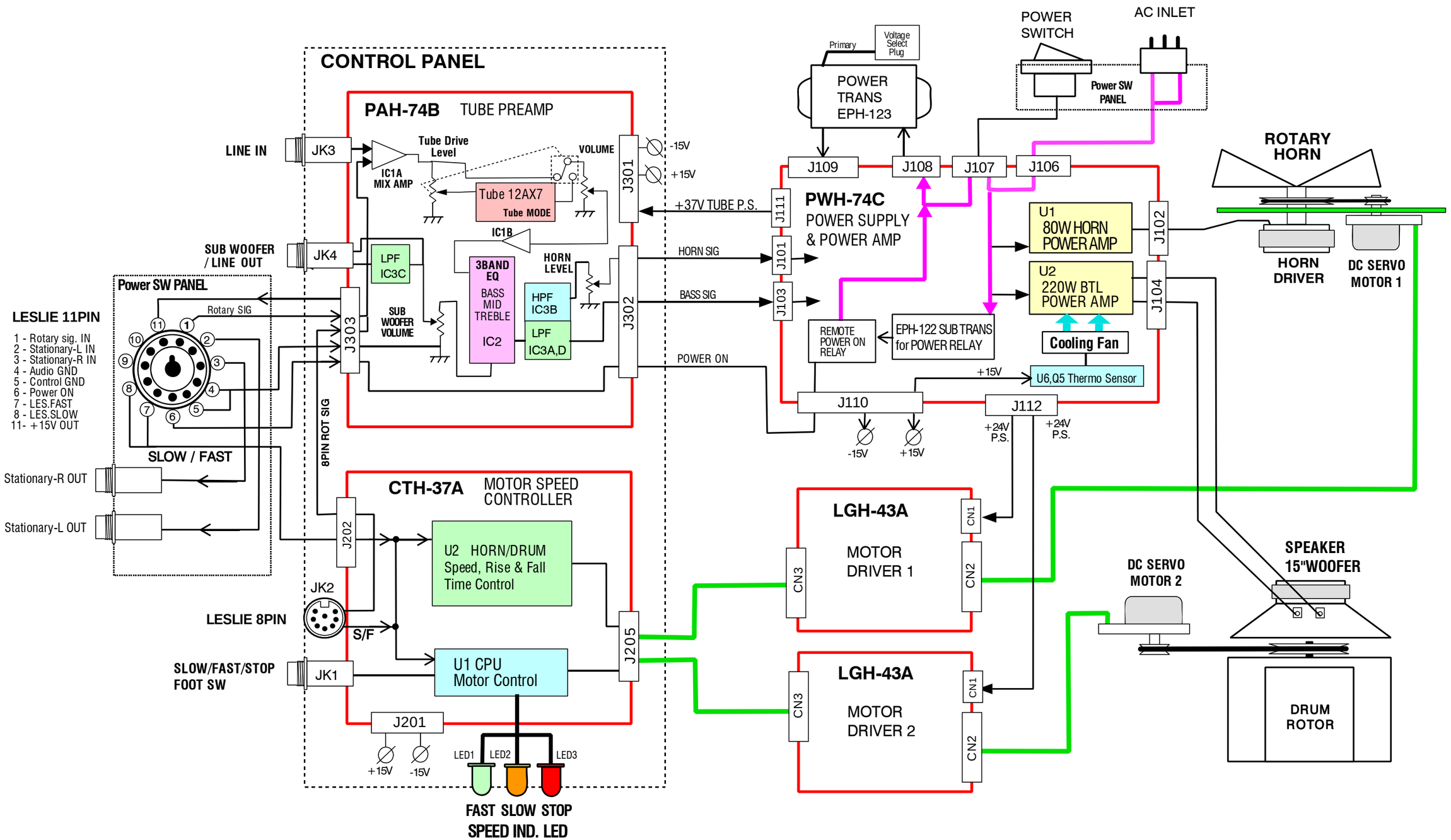
1.SPECIFICATIONS

TYPE	:1-Channel(Rotary Channel Only) REAL 2-Rotor
POWER OUTPUT	:HORN Rotor 80W,DRUM Rotor 220W (TOTAL POWER 300W)
SPEAKER	:ROTARY HORN DRIVER Heavy-Duty 100W, WOOFER 38cm Massive15"(38cm)
OVERDRIVE	:VACUUM TUBE 12AX7X1 TUBE DRIVE LEVEL, TUBE ON/OFF,TUBE MODE
CONTROL	:EQ BASS, MIDDLE,TREBLE VOLUME,HORN LEVEL, SUB WOOFER VOLUME
MOTOR	:BRUSHLESS DC MOTORx2
ROTORADJUST	:HORN RISE TIME,FALL TIME, SLOW SPEED, FAST SPEED DRUM RISE TIME, FALL TIME, SLOW SPEED,FAST SPEED
LED	:FAST,SLOW,STOP
TERMINAL	:LESLIE 11PIN SOCKET with STATIONARY L,R THROUGH OUTPUT, LESLIE 8PIN,LINE INPUT,LINE OUT/ SUB WOOFER OUT FOOT SWITCH(SLOW/FAST/STOP) AC INPUT
POWER CONSUMPTION	:AC 100V,120V,220~240V,230~240V, 210W
DIMENSION	:63(W)x52(D)x90(H)cm
WEIGHT	:57kg
OPTIONAL	:LESLIE CABLE 11PIN(LC11-7M) LESLIE CABLE 8PIN(LC8-7M) FOOT SWITCH FS-9H

*** Changes from Leslie 3300**

1) Horn Driver : Changed to PA-D50Z made by P.AUDIO
2) Power Board : PWH-72A --> Changed to PWH-74C
3) Preamp. Board : PAH-74A --> Changed to PAH-74B
4) SP Spacer ass'y : Changed to SP Spacer P
5) WR-HZ144-A : Sleeve added to the terminal for the driver
6) Upper motor & Bearing ass'y : Pan head machine screw M4x20 fixing the driver mount --> Changed to M4x16



#3300P, #3300WP

2.BLOCK DIAGRAM

3.DISASSEMBLY PROCEDURE

NOTE: Unplug the Power Cable from the unit before disassembling it.

1.Remove the Upper Rear Cover.
Remove the 4 tapping screws(type-1 truss, Ø4x16),then remove the Upper Rear Cover.

2.Remove the Middle Rear Panel.
Remove the 8 tapping screws(type-1 truss,Ø4x30),then remove the Middle Rear Panel.

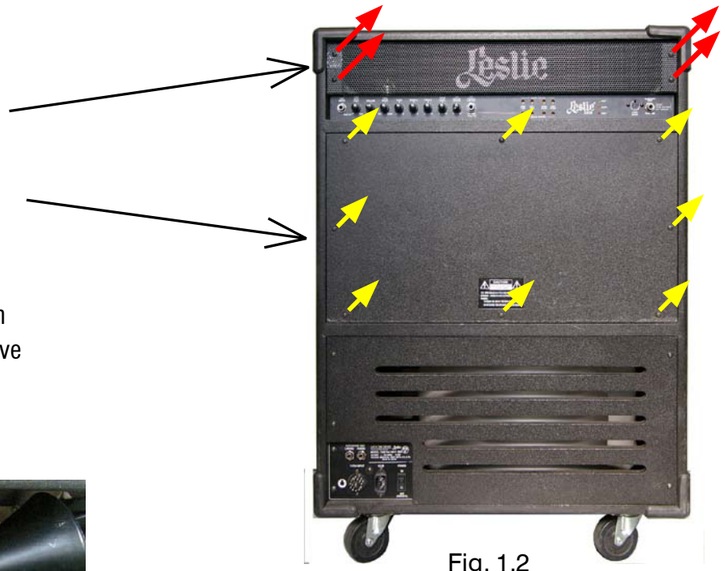


Fig. 1,2

Fig. 6

3. Procedure to change the Horn Rotor Belt..
Locate a small Philips screwdriver (of maximum total length 8.5cm).Drop the Belt by tilting in the Motor. Next remove the 2 small screws (bind M3x16 for fixing the Horn Rotor) and remove the Horn from the Bearing.
Place the new Belt around the Bearing Ass'y and after mounting the Horn Rotor, lift it onto the Motor Pulley and the Horn.

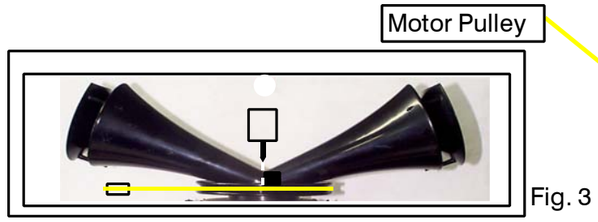
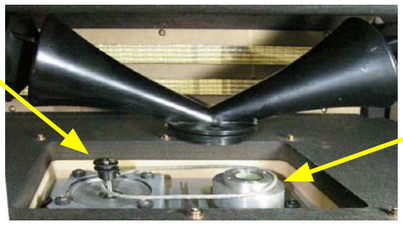


Fig. 3



4. Procedure to replace the Horn Driver:
Pull out the "SP Spacer" (between the Horn Driver and the Woofer Speaker).
Remove the connecting leads from the horn driver.
Rotate the Driver Unit to the left and remove it from the Upper Horn Motor Ass'y.
Be careful not to pinch your fingers between the Woofer Magnet and the Horn Driver.
(as the magnetic pull from the woofer magnet is strong.)

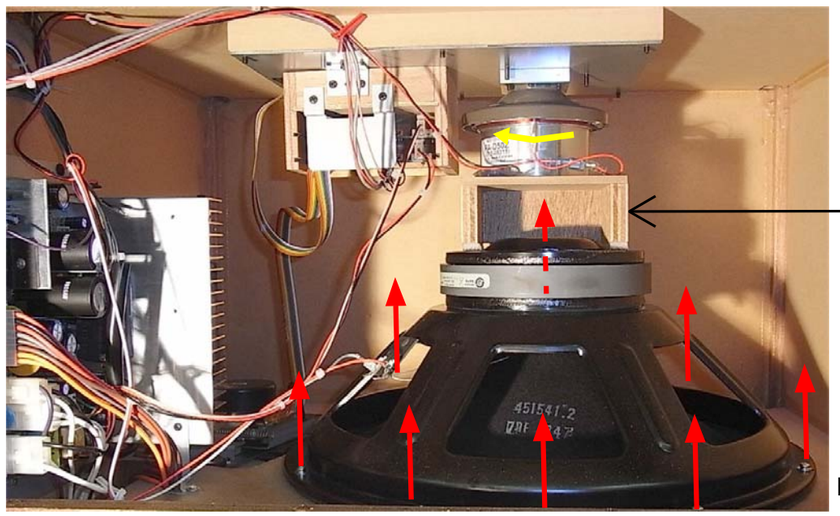


Fig. 4,5

5. Removing the 15" Woofer Speaker.
Remove the 8 screws W Sems (P=3 M4x30).
Place a thick piece of cardboard etc. between the Magnets of the Speaker and the Horn Driver and avoid both Magnets from sticking together.

6. Remove the Motor Drive PWB.
Remove the Cover Bracket of the Motor Cover Ass'y by removing the 2 tapping screws (type-1 bind, Ø3x10).
Slide and remove the PWB with the Connector from the Cover.
Keep track of the wiring for the UP Motor and the Low Motor.
(They are Similar in appearance but not interchangeable.)

7. Remove the PWH-74C.
First remove the wiring(s) from the PWB.
Next remove the 4 tapping screws (type-1 truss, Ø4x16);
(2 are horizontal on the top, 1 is on the bottom,
and another fixes the heat-sink bracket).

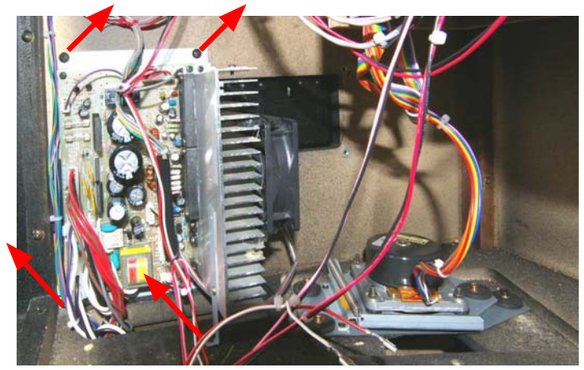


Fig. 7

9. Remove the Bottom Rear panel.
   Pull the panel up from the unit after removing the 4 tapping screws (type-1 truss, Ø4x30). Slide it down when remounting.

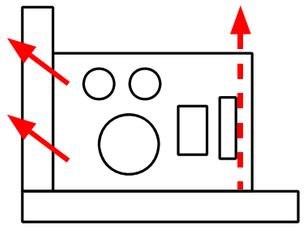


Fig 10-1

Fig 10-2

10. Removing the Power Switch Panel.
    Remove the 3 tapping screws (type-1 truss, Ø4x16) (2 horizontal, 1 vertical).
    If necessary, remove the 2 GND wirings inserted to the Faston terminal.

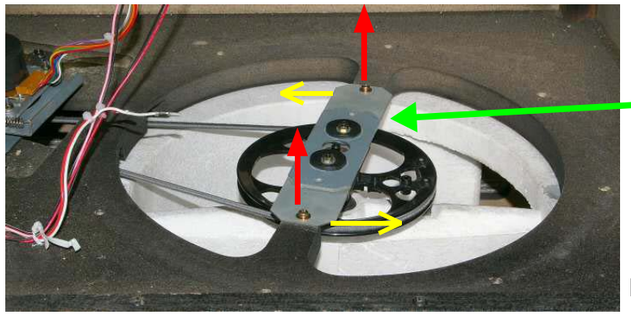


Fig 11

11. How to change the wide Drum Rotor Belt.
    First remove the Belt by tilting in the Lower Motor. After removing the 2 screws W Sems (P=3, M4x30), turn and detach the UP Bearing Ass'y from the Cabinet.
    Take out the Belt from the opening of this Cabinet, and replace it with a new one.
12. Remove the Drum Rotor.
    NOTE: Don't let an unexperienced service staff remove the Drum Rotor. It requires a certain level of technique to put the shaft into the Lower Bearing Ass'y at the assembly.
    A, Remove the 15" Speaker and the Power Switch Panel.
    B, Pull out the UP Bearing Ass'y from the Pulley Ass'y.
    C, Pull out the rubber Link Drive (for conducting the rotation of the pulley to the rotor) from the Rotor Pin,
    D, Slowly take it out from the Drum Rotor by turning the Pulley and the Shaft.
    E, When the Shaft is pulled out from the Lower Bearing Ass'y, move the Drum Rotor to the front.
    F, Then slide it from underneath the Horn Driver, and take out the Shaft from the Rotor. Finally, take out the Drum Rotor from the Cabinet.

Fig. 9

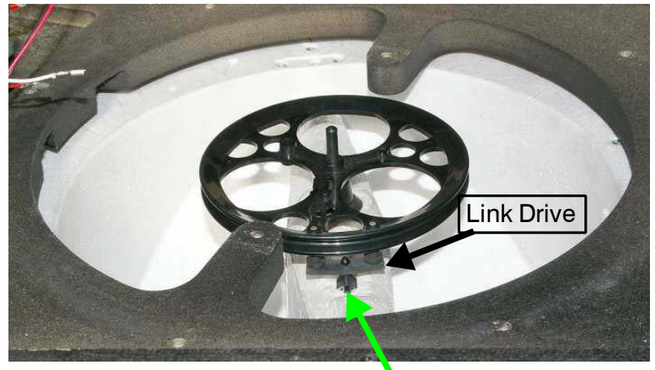


Fig. 12-C

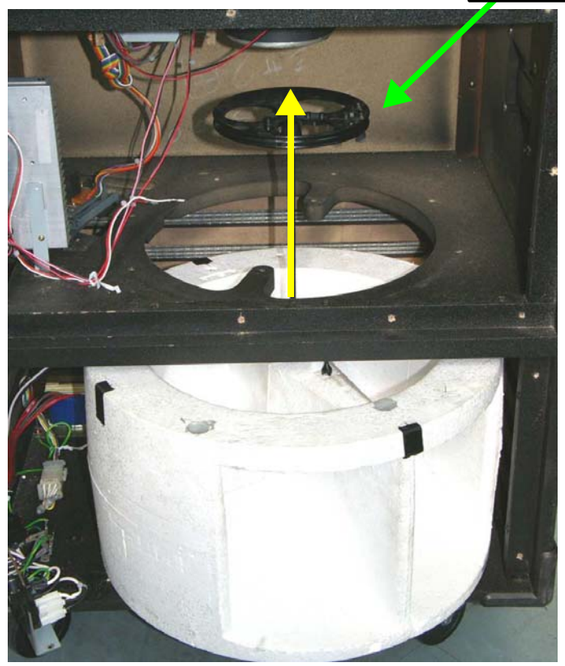


Fig 12-D,E

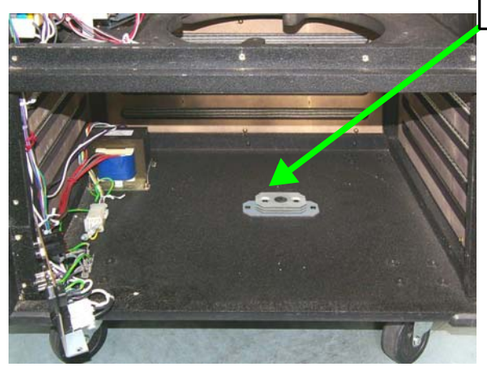
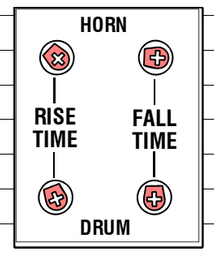


Fig. 12-E

STEP	SUBJECT	SETTING	INPUT	TEST POINT	ADJUSTMENT POINT	SPECIFICATION	NOTE
1. a	DC Power Supply Check	+15V		PWH-74C J110-6		DC +15V ±5%	
b		-15V		J110-1		DC -15V ±5%	
c		+37V MAIN VOLUME 0:		J111-4		DC +40V ±4V	
d		+24V		J112-3,4		DC +24V ±1V	
e	LESLIE 11PIN DC OUT Check			LES11P -PIN11,(GND)		DC +15V ±5%	
f	Remote Power ON Check	Power SW OFF		Short PIN6 -PIN 4		Power ON	
2.	Resetting Rotation Speed to Factory Settings						
		Switch ON the power, pressing the Foot SW, and wait for 5 sec.	Check the STOP LED (RED) slowly flashes and the HORN and the DRUM ROTOR turns at SLOW.				
a	SLOW SPEED Adjustment: Adjust SLOW by the TRIMMER on the panel.		Turn the HORN side, so the FAST (GRN) LED turns on. As the rotation approaches the standard, it flashes.				
			Turn the DRUM side, so the SLOW (ORG) LED turns on. (40±3rpm*)				
	Press on the Foot SW and switch the Motor to FAST, and wait until the Brake LED (RED) turns on.						
b	FAST SPEED Adjustment: Adjust FAST by the TRIMMER on the panel.		Turn the HORN side, so the FAST (GRN) LED turns on. As the rotation approaches the standard, it flashes.				
			Turn the DRUM side, so the SLOW (ORG) LED turns on. (400±10rpm*)				
c	After checking, switch OFF the power and switch it ON again for normal operation.Turn the DRUM side, so the SLOW (ORG) LED turns on.						
3.	Check the RISE TIME and the FALL TIME of the HORN and the DRUM. (See the figure on the right)						
	3-1 HORN RISE TIME (SLOW -> FAST) approx. 2.5 ±0.5 sec. at 10 o'clock position						
	3-2 HORN FALL TIME (FAST -> SLOW) approx. 2.5 ± 0.5 sec. at 9 o'clock position						
	3-3 DRUM RISE TIME (SLOW -> FAST) approx. 8 ± 1.5 sec. at 11 o'clock position						
	3-4 DRUM FALL TIME (FAST -> SLOW) approx. 8 ± 1.5 sec. at the center						
	If not at these tolerances, adjust by the TRIMMER.						
	If the TRIMMER must be turned more than 30 degrees from the standard position A malfunction is present.						
4	CHECK Power AMP .		Set TUBE MODE, BASS, MID, TREBLE, HORN LEVEL at the center. TUBE DRIVE LEVEL is TUBE OFF; SUB WOOFER VOL is MAX				
a	TUBE ON/OFF CHECK	MAIN VOLUME: Grade 2		Adjust the VR9 of the PAH74B so as to not change the output at the TUBE ON/OFF			
b	WOOFER SP	LINE IN 800Hz 80mV	LINE IN	PWH-74C J104-2,4		600mV rms ±30mV	(LINE OUT 15mVrms)
c	HORN SP	LINE IN 8kHz		PWH-74C J102-1		550mV rms ±6mV	
c	SUB WOOFER OUT	LINE IN 80Hz		SUBWOOFER OUT JACK		130mV rms ±12mV	
d	TONE VR Check	LINE IN 80Hz		BASS VR MAX-MIN		+4dB,-17dB	
e		LINE IN 2kHz		MID VR MAX-MIN		+4.5dB,-6.5dB	
f		LINE IN 8kHz		TREBLE VR MAX-MIN		±10dB	
5.	CHECK the Noise	MAIN VOLUME: MAX					
a	Woofer SP- Noise Level			PWH-74C J104-2		1.0mV max (IEC"A"net)	
b	Woofer SP+ Noise Level			PWH-74C J104-4		1.0mV max (IEC"A"net)	
c	HORN SP Noise Level			PWH-74C J102-1		1.5mV max (IEC"A"net)	



REAR COVER
WR-HZ144-D
WR-HZ144-A
WR-HZ144-D
7P J303
5P J301
6P J302
PANEL GND
PAH-74B
Tube PreAmp
CONTROL PANEL
8P J205
CTH-37A
Motor Control
J204
J203
6P J201
5P J202
WR-HZ144-E
3P J111
4P J104
2P J102
3P J101
4P J105
8P J109
PWH-74C
Power
5P J103
5P J113
2P J108
10P J110
J107 4P
3P J106
4P J112
WR-HZ144-A
Horn Driver
RED
BLK
White
Red
Woofer
UPPER MOTOR ASSY
LGH-43A 1
Motor Driver
CN1
CN2
9P
CN3
10P
2P
MOTOR CABLE
Pink
5PIN
Pink
Black
CN3
CAUTION !!
WR-HZ144-A
LOWER MOTOR ASSY
LGH-43A 2
Motor Driver
CN1
CN2
9P
CN3
10P
2P
MOTOR CABLE
Red
5PIN
Red
Black
CN3
CAUTION !!
Secondary
GND TERMINAL
L White
R Red
WR-HZ144-G 1/2
PANEL
Earth
POWER SW PANEL
POWER
SWITCH
WR-HZ144-C
11PIN
WR-HZ144-D
AC INLET
WR-HZ144-B
WR-HZ144-G 2/2
Primary
Voltage Select Plug
POWER
TRANS
EPH-123

Volts	Part No.
100V	00106-00241
120V	00106-00242
220V	00106-00243
240V	00106-00244

#3300P, #3300WP

5.WIRING CONNECTION

6.WIRING CHART

#3300P
#3300WP

POWER AMPLIFIER
PWH-74C

PLUG No.	FROM PIN No.	TO PLUG & PIN No.	WIRE COLOR	TO PWB NAME	FUNCTION
J101	1	J302-5	WHT	PAH-74B	HF IN
	2	J302-4	SHIELD	PAH-74B	HF GND
	3	NC			
J102	1	HORN out	RED	DRIVER	HORN out
	2	HORN out	BLK	DRIVER	HORN GND
J103	1	J302-3	WHT	PAH-74B	LF+IN
	2	NC			
	3	J302-2	SHIELD		LF GND
	4	NC			
	5	J302-1	RED		LF-IN
J104	1	NC			
	2	SPEAKER	WHT	SPEAKER	Woofer-
	3	NC			
	4	SPEAKER	RED	SPEAKER	Woofer+
J105	1	SP HI OUT L		NC	
	2	GND		NC	
	3	SP HI OUT R		NC	
	4	GND		NC	
J106	1	AC INLET L	BLK	AC INLET	AC IN
	2	NC			
	3	AC INLET N	WHT	AC INLET	AC IN
J107	1	POWER SW.	BLK	POWER SW.	P.S. Send L
	2		BLK		P.S. Return L
	3		WHT		P.S. Return N
	4		WHT		P.S. Send N
J109	1	TRANS.	RED	Secondary in	+37VAC
	2		BLK		+37VAC CT
	3		RED		+37VAC
	4		GRY		+20VAC CT
	5		BRN		+20VAC
	6		BRN		+20VAC
	7		ORG		+30VAC
	8		ORG		+30VAC
J110	1	J201-5	GRN	CTH-37A	-15V OUT
	2	NC			-15V OUT
	3	NC			GND
	4	NC			GND
	5	NC			+15V OUT
	6	J201-1	ORG	CTH-37A	+15V OUT
	7	NC			+5V OUT
	8	NC			+5V OUT
	9	NC			GND
	10	J302-6	GRY	PAH-74B	POWER ON
J111	1	NC			
	2	NC			
	3	NC			
	4	J301-5	VIO	PAH-74B	+37V Out
J112	1	CN1-2	BLK	LGH-43A-1	GND
	2	CN1-2	BLK	LGH-43A-2	GND
	3	CN1-1	RED	LGH-43A-1	+24V
	4	CN1-1	RED	LGH-43A-2	+24V
J113	1	J201-3	BLK	CTH-37A	GND
	2	NC			
	3	NC			
	4	NC			
	5	NC			

MOTOR CONTROL
CTH-37A

J201	1	J110-6	ORG	PWH-74C	+15V
	2	J301-1	ORG	PAH-74B	+15V
	3	J111-3	BLK	PWH-74C	GND
	4	J301-2	BLK	PAH-74B	GND
	5	J110-1	GRN	PWH-74C	-15V
	6	J301-3	GRN	PAH-74B	-15V
J202	1	J303-3	WHT	PAH-74B	8PINSIG OUT
	2	J303-2	SHIELD	PAH-74B	AGND
	3	11P-7	VIO	11P PLUG	SLOW
	4	11P-8	GRY		FAST
	5	11P-5	BLK		CONT GND
J203	1	J204-1	BLK	CTH-37A	FOOT SW
JUMPER	2	J204-2	BLK		+15V
	3	J204-3	BLK		SLOW
	4	J204-4	BLK		+5V
	5	J204-5	BLK		GND
	6	J204-6	BLK		FAST
	7	J204-7	BLK		-12V
J205	1	CN3-1	RED	LGH-43A-1	HCLK
	2	CN3-1	RED	LGH-43A-2	DCLK
	3	CN3-5	PNK	LGH-43A-1	HVS
	4	CN3-6	SHIELD	LGH-43A-1	GND
	5	CN3-6	SHIELD	LGH-43A-2	GND
	6	CN3-5	RED	LGH-43A-2	DVS
	7	CN3-9	WHT	LGH-43A-2	DBRK
	8	CN3-9	WHT	LGH-43A-1	HBRK

PRE AMPLIFIER
PAH-74B

J301	1	J201-2	ORG	CTH-37A	+15V IN
	2	J201-4	BLK		Power Gnd
	3	J201-6	GRN		-15V IN
	4	NC			Power Gnd
	5	J111-4	VIO	PWH-74C	+37V IN
J302	1	J103-5	WHT	PWH-74C	LOW-
	2	J103-3	SHIELD		AGND
	3	J103-1	RED		LOW+
	4	J101-2	SHIELD		AGND
	5	J101-1	WHT		HORN OUT
	6	J110-10	GRY		POWERON OUT
J303	1	11P-11	WHT	11P PLUG	LES DET IN
	2	J202-2	SHIELD	CTH-37A	AGND
	3	J202-1	WHT	CTH-37A	8PIN SIG IN
	4	L JACK-1	SHIELD	L JACK	AGND
	5	11P-1	WHT	11P PLUG	11PIN SIG IN
	6	NC			
	7	11P-6	BLU	11P PLUG	POWER ON IN

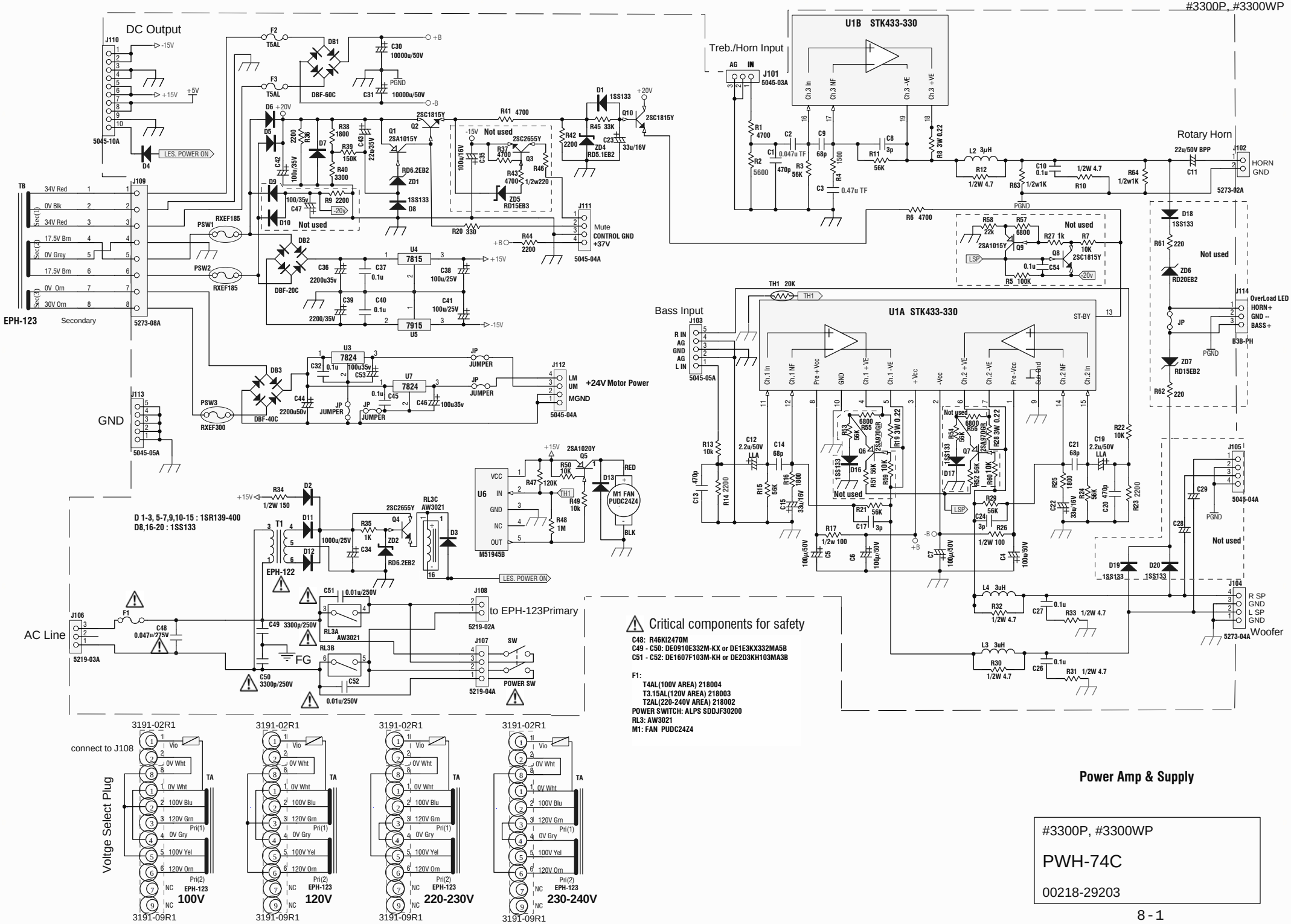
11PIN LESLIE IN PLUG

11PIN	1	J303-5	WHT	PAH-74B	ROT SIG
	2		WHT	out JACK L	STA SIG L
	3		RED	out JACK R	STA SIG R
	4	J303-4	BLK	PAH-74B	AGND
	5	J202-5	BLK	CTH-37A	CONT GND
	6	J202-3	BLU	CTH-37A	Power On
	7	J202-4	VIO	CTH-37A	SLOW
	8	J303-7	GRY	PAH-74B	FAST
	11	J303-1	WTH	PAH-74B	LES DET

MOTOR DRIVER HORN LGH-43A-1					
PLUG No.	FROM PIN No.	TO PLUG & PIN No.	WIRE COLOR	TO PWB NAME	FUNCTION
CN1	1	J112-3	PNK	PWH-74C	+24V
	2	J112-2	BLK	PWH-74C	GND
CN2	1	MOTOR	BRN	MOTOR	MU
	2		RED		MV
	3		ORG		MW
	4		YEL		N.C
	5		GRN		HW
	6		BLU		HV
	7		VIO		HU
	8		GRY		GND
	9		WHT		+12V
CN3	1	J205-1	RED	CTH-37A	HU OUT
	2		NC		HV OUT
	3		NC		ALARM OUT
	4		NC		SPEED VR
	5	J205-3	PNK	CTH-37A	SPEED VIN
	6	J202-4	SHIELD	CTH-37A	GND
	7	CN3-10	BLK	LGH-43A	GND
	8		NC		F/R
	9	J205-8	WHT	CTH-37A	BRAKE
	10	CN3-7	BLK	LGH-43A	RUN
MOTOR DRIVER DRUM LGH-43A-2					
CN1	1	J112-4	RED	PWH-74C	+24V
	2	J112-1	BLK	PWH-74C	GND
CN2	1	MOTOR	BRN	MOTOR	MU
	2		RED		MV
	3		ORG		MW
	4		YEL		N.C
	5		GRN		HW
	6		BLU		HV
	7		VIO		HU
	8		GRY		GND
	9		WHT		+12V
CN3	1	J205-2	RED	CTH-37A	HU OUT
	2		NC		HV OUT
	3		NC		ALARM OUT
	4		NC		SPEED VR
	5	J205-6	RED	CTH-37A	SPEED VIN
	6	J202-5	SHIELD	CTH-37A	GND
	7	CN3-10	BLK	LGH-43A	GND
	8		NC		F/R
	9	J205-7	WHT	CTH-37A	BRAKE
	10	CN3-7	BLK	LGH-43A	RUN
STAITONARY OUT JACK					
L	1	11P-4	BLK	11P PLUG	AGND
		R JACK-1	BLK	R JACK	AGND
		J303-4	BLK	PAH-74B	AGND
	2	11P-2	WHT	11P PLUG	STA SIG L
	4	NC			
R	1	L JACK-1	BLK	L JACK	AGND
	2	11P-3	RED	11P PLUG	STA SIG R
	4	NC			

7.PRINTED WIRING BOARD ASS'Y LIST

FUNCTION	PWB.NAME	PART No.
POWER AMP	PWH-74C	00218-29276
TUBE PRE AMP	PAH-74B	00219-54222
MOTOR CONTROL	CTH-37A	00220-20271
MOTOR DRIVER	LGH-43A	00220-20251



⚠ Critical components for safety

C48: R46KI2470M
C49 - C50: DE0910E332M-KX or DE1E3KX332MA5B
C51 - C52: DE1607F103M-KH or DE2D3KH103MA3B

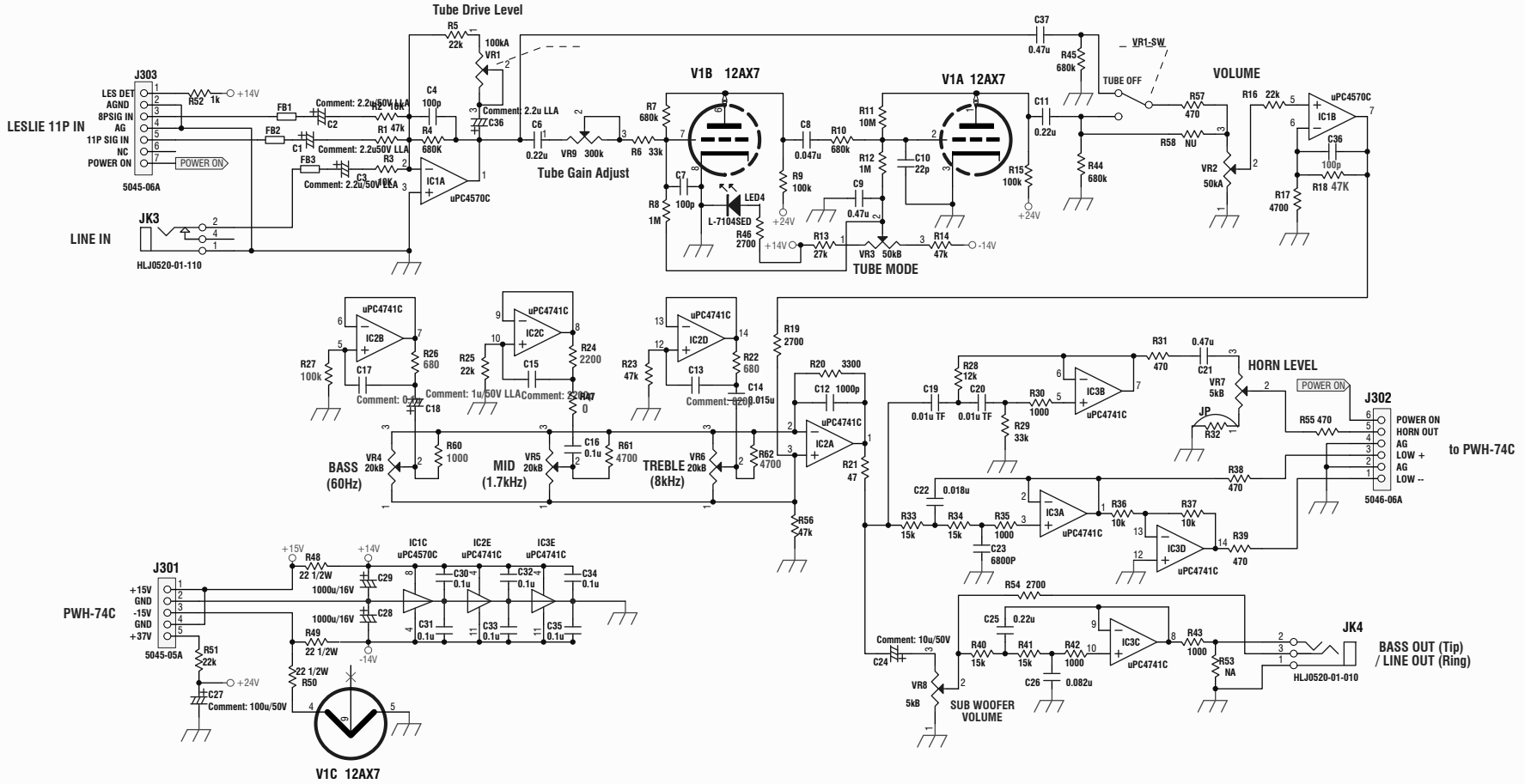
F1:
T4AL(100V AREA) 218004
T3.15AL(120V AREA) 218003
T2AL(220-240V AREA) 218002
POWER SWITCH: ALPS SDDJF30200
RL3: AW3021
M1: FAN PUDC24Z4

Power Amp & Supply

#3300P, #3300WP

PWH-74C

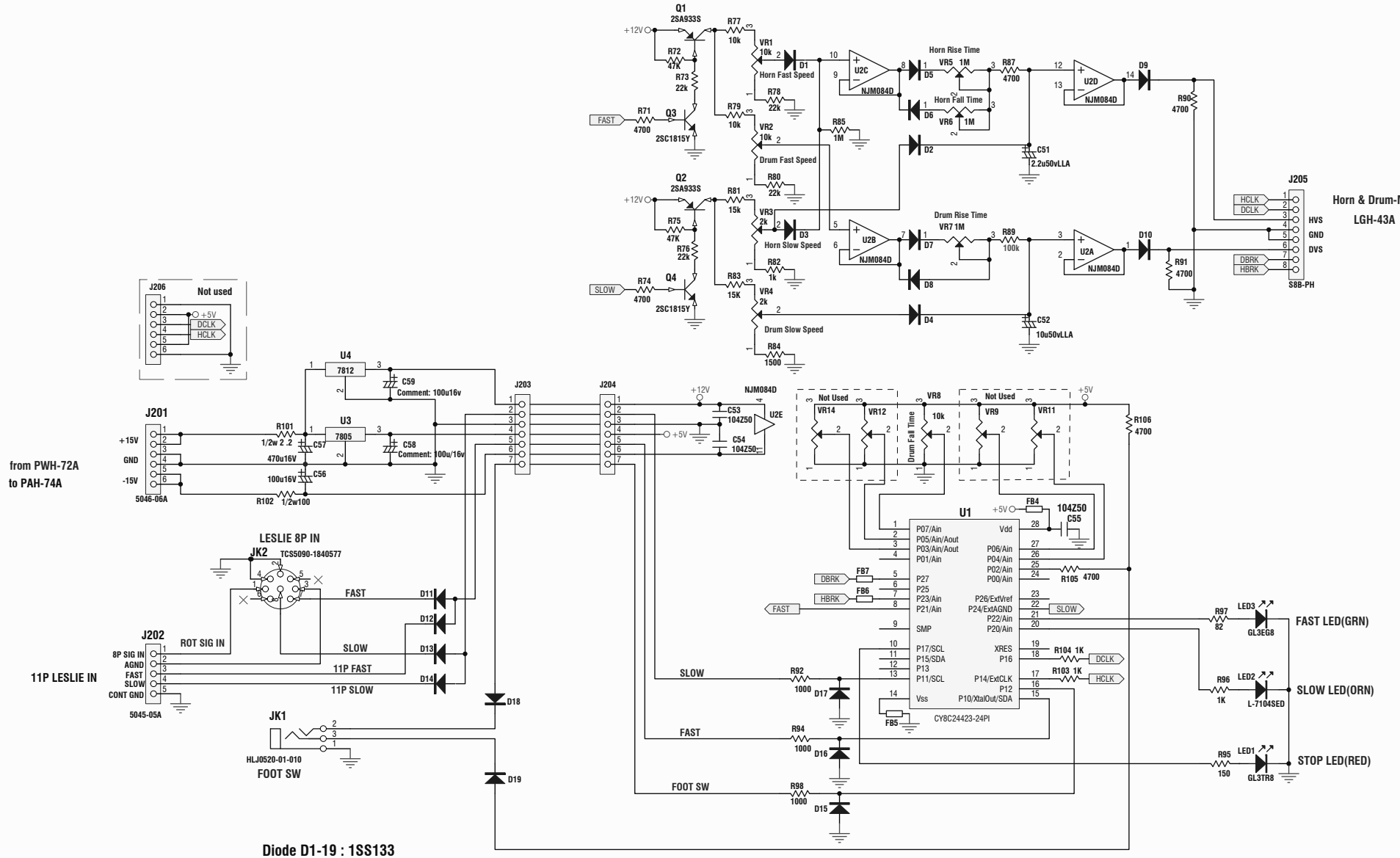
00218-29203



Tube Pre Amp

FB1-FB3 : EXCELDR25V

#3300P, #3300WP
PAH-74B
00219-54222



Diode D1-19 : 1SS133

FB4-FB7 : EXCELDR25V

Motor & Control

#3300P, #3300WP
CTH-37A
00219-54222

9. TECHNICAL DESCRIPTION

1. General

This unit corresponds with the Leslie 11-pin Input, the 8-pin Input and the LINE Input.
It has 1 channel (the Rotary Channel only) and two very powerful Amplifiers (220W + 80W).
The Treble Horn Rotor and the Bass Drum Rotor are driven by the respective DC Servo-Motors, The built-in Tube allows natural distortion/overdrive effects without adding excess Volume similar to the performance of Leslie models 122 and 147.
The Slow/Fast speeds and Rise/Fall times are user-adjustable.

The PWB's consist of:
a. Pre-Amp & Tube Drive PWB (PAH-74B)
b. CPU Motor Control PWB (CTH-37A)
c. Power Amplifier & Power Supply PWB (PWH-74C)
d. Motor Driver PWB (LGH-43A)

2. Operation of Each PWB

A. PREAMP & TUBE DRIVE (PAH-74B)

This PWB consists of the Pre-Amp, the Tube Drive section and the Filter section.

The signals, input from the Leslie 11-pin Connector Pin (1), are sent through J303-5 and are mixed with the input of the Line-In Jack JK-3 and the Leslie 8-pin Connector CTH-37A JK-2 Pin (1), then the gain is adjusted at the Sub-Pre-Amp IC1A and VR1, and are supplied to the input of the V1 through the Tube ON/OFF switch of the VR1.

The V1 is the circuit for the Tube-Overdrive. With this, the user can set the Overdrive to the VR1 Drive Level and the VR3 Tube Mode Volume from softer distortion to hard distortion as required.

The Overdrive can be switched OFF, only by turning the VR1 Drive Lever to the leftmost position, i.e. "Tube OFF", which automatically switches ON the direct input to IC1B.
Next, the signals, sent through the Master VR2, can be controlled by the Bass (60Hz), the MID (1.7kHz) and the Treble (10kHz) by ±10dB Iusing the 3 band Equalizer C2.
Finally, the signals, divided by the HPF and the LPF of the IC3, are sent to the PWH-74C by J302.
Also the signals for the Sub-Woofer (below 125Hz) and those for the Line-Out are sent to the JK4 through the VR8.

B. CPU MOTOR CONTROL (CTH-37A)

This PWB consists of the Voltage Generating circuit for the Motor Control, the CPU circuit for controlling and the Power IC circuit.
The U1 CY8C24423A is a 1-chip CPU, containing the built-in CPU of the Clock circuit, the ROM, RAM, and Analog Interface circuits. This most advanced Controller CPU is operated by the Power Supply of only +5V. It monitors the Rotation Pulses (J205-1, 2) of the Horn side and the Drum side Motors, emits the Brake Pulse to the LGH-43A circuit, and automatically controls the Rise Time.

It also monitors the Slow/Fast Control signals received via the Leslie 11-pin and 8-pin and controls the motor rotation with "Last-Action-Priority" by adding the Foot-Switch operation.

An advanced feature is the Rotation Speed Adjusting-mode. It enters this mode by pressing the Foot-Switch for 5 seconds or longer at Power ON. By using the LED on the panel, the Rotation Speed of Slow and Fast is controlled.

Refer to Page 11 of the Owner's Guide for details.

The function of the U2 is to control the Rise/Fall of the Motor Control Voltage, together with the constant circuit at the time of VR1,2,3,4 and C51,52.

The TR Q1,3 and the TR Q2,4 are driving circuits to switch ON/OFF +12V and convert the Slow/Fast signals, sent from the U1, and send to the Adjusting circuit of the U2 Rise/Fall Time.

Finally, the voltage for controlling the speed is put out from the J205-3PIN and 6PIN to the LGH-43A PWB.

The Power circuit makes +12V and +5V for the U1 from +15V from the PWH-74C by using the U4 (+12V) and the U3 (+5V).

C. POWER SUPPLY & POWERAMP PWB (PWH-74C)

This PWB consists of the Power Supply, the Power Amp, the Power ON Muting circuit and the Remote Power ON circuit.

POWER SUPPLY:

The primary side of the Power-Trans EPH-123 is designed for easily switching 100V, 120V, 220- 230V, and 230 - 240V by changing the combination of wirings of the Voltage-Select Plug.

There are three lines of ±34V, ±17.5V, +30V secondary side of the transformer.

From these the Power Amp's power source, ±15V, +24V Motor's power source are produced.

The devices PSW1, 2, 3, placed between the transformer volume line and the rectifier diodes, are Poly-Switches and function as fuses.
They reset by re-switching ON after removing the reason for the blown fuse.
They do not require replacement in normal use.

The Part No. RXE-185 corresponds to the 1.6A Time lag or Slow Blow Fuse.

POWER AMP:

The Power-Amp consists of 3 channels: 3-Channel Amp IC U1.

The Treble-side amp. and the Bass-side (BTL motion) function as 1 channel.

The output of the U1 Amp is mixed through R8,9 (0.22 ohm) at the Pin 12,13 and is supplied to the Horn Driver through the Choke Coil L2, via J102-1. The U1 has a Muting circuit for preventing a Pop Noise at Power ON and OFF.

The heat-sink is equipped with a DC cooling fan, which detects the temperature by the TH1 Thermistor and the U6 IC. If the temperature approaches 50 deg C, the DC fan automatically turns and prevents excess heating of the heat-sink.

REMOTE POWER ON:

The T1 is a Sub-Power-Transformer for the Remote-Power-ON circuit. It is always connected to the power source, even when the main power is switched OFF. The Power-ON signal of the Leslie 11-pin is connected to the RL3, and, if the terminal goes down to the GND level, the RL3C is switched ON and = the Power is switched ON, and, if the organ and the 11-pin cable are connected, the Power Switches on the organ and the Leslie operate simultaneously.

D. MOTOR DRIVER PWB (LGH-43A)

The LGH-43A is a DC Servo-Motor-Drive circuit-board and controls the motors at the Speed Control Terminal (CN3-5) and the Brake Terminal (CN3-9). It also sends the rotation information by the Rotation Pulse to the CTH-37A from the CN3-1.

The approximate Speed Control Voltages are [0.7VDC] at Slow, and [7.0VDC] at Fast.

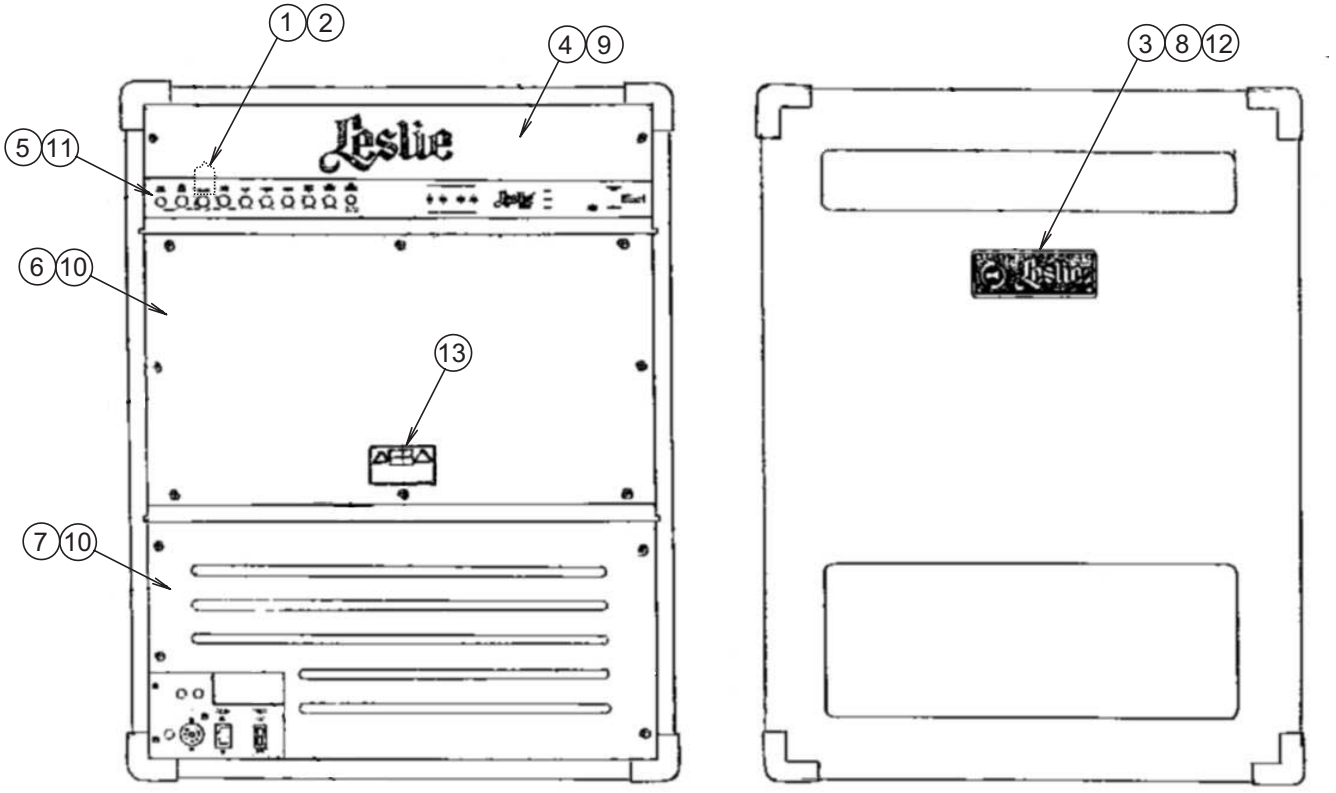
Pay particular attention in making the correct connection of the Horn(UP)Connector (5-pin-PINK) And the Drum (LOW) Connector (5-pin-RED).

If the connection is not correctly made, the control of Rise Time on the drum side is not possible.

On the PWB, the over-current-protective circuit is built-in, which stops the motor rotation in case the load on the motor is abnormal, but it will function normally by re-switching the power ON after removing the excessive load.

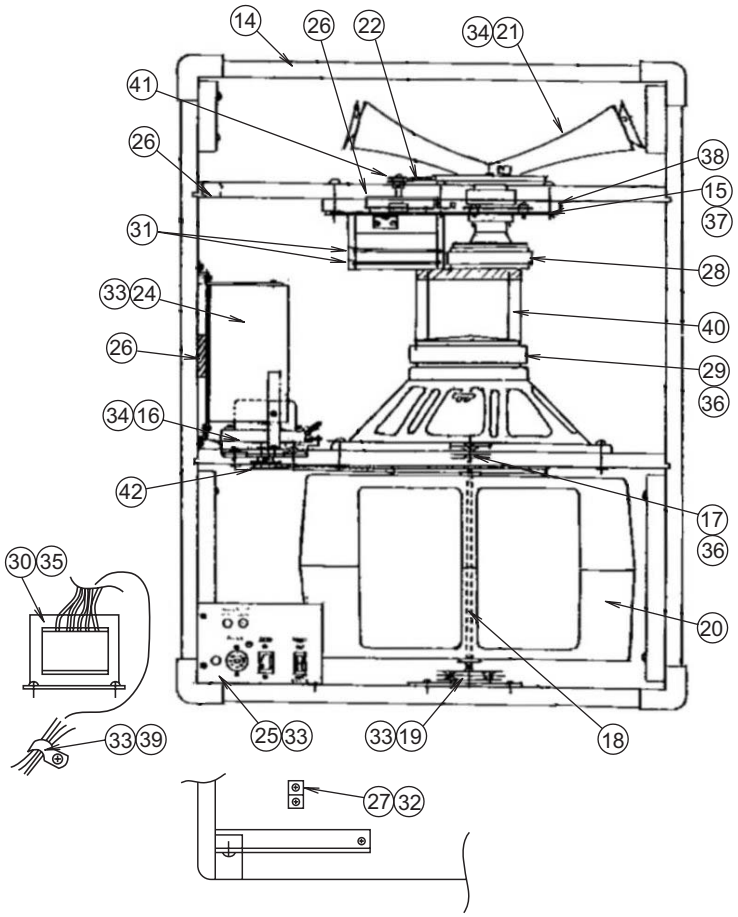
10.PARTS LIST

1.FINAL ASS'Y #3300P (66810-01101)
#3300WP(66820-01101)



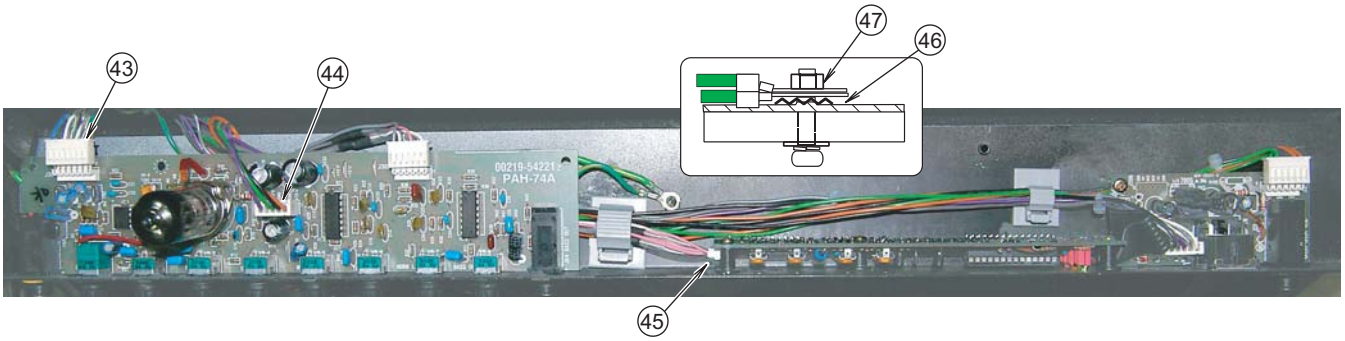
① Tube Retainer Spring	00453-40257
② Vacuum Tube 12AX7	00308-06001
③ Leslie Badge #2	00451-40702
④ Rear Cover	00451-40669
⑤ Control Panel Ass'y	66811-02102
⑥ #3300P : Rear Panel(middle)	00450-40842
⑥ #3300WP : Rear Panel(middle)	00450-40904
⑦ #3300P : Rear Panel(Bottom)	00450-40843
⑦ #3300WP : Rear Panel(Bottom)	00450-40905
⑧ Tapping Screw Type1(Bind,Ø3x10)	01613-53010
⑨ Tapping Screw Type1(Truss,Ø4x16)	01613-64016
⑩ Tapping Screw Type1(Truss,Ø4x30)	01613-64030
⑪ Machine Screw(W sems,P=3,M4x30)	01703-84030
⑫ Polyslider washer(LL-3105-02)	00750-03011
⑬ Caution Label #2	00412-01532

#3300P
#3300WP



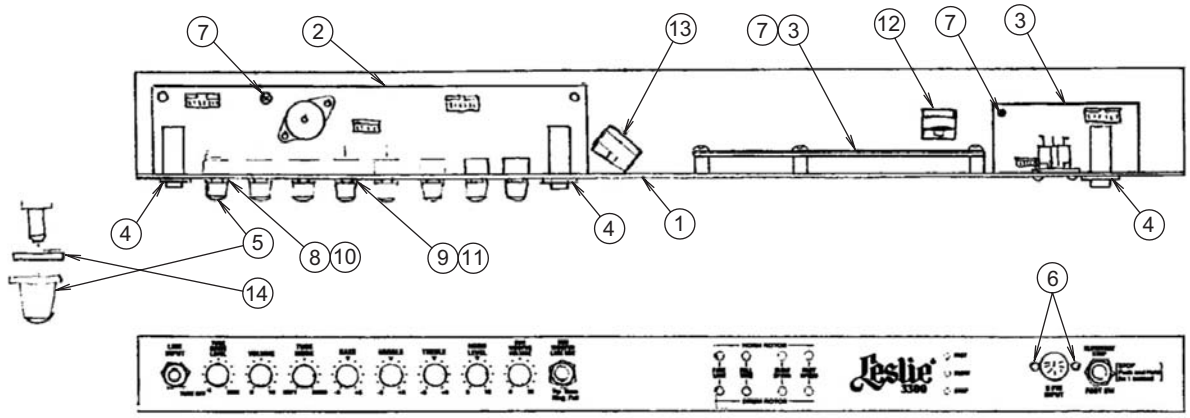
14	#3300P : Cabinet Total Ass'y	66751-02201
14	#3300WP : Cabinet Total Ass'y	66791-02201
15	Upper Motor & Bearing Ass'y	66751-02104
16	Lower Motor Ass'y	66751-02108
17	Upper Bearing Ass'y	66751-02121
18	Rotor Pulley Ass'y	66751-02126
19	Lower Bearing Ass'y	66751-02122
20	Rotor Form 122A BAL	00315-08014
21	Rotary Horn 514-140436	00315-08010
22	Cloth Belt 400x3mm	00453-40128
23	Belt Drive-Treated 522-141182	00453-40331
24	Power Substrate Sub Ass'y	66811-02111
25	Power SW Panel Ass'y	66751-02112
26	PC Board Cushion	00402-06022
27	Faston Tab	00314-09005
28	Horn Driver PA-D50Z	00315-08015

29	Woofer 15" USA514-059587	00315-06017
30	Power Transformer(EPH-123)	00307-01323
31	LGH-43A PWB Ass'y	00220-20251
32	Tapping Screw Type1(Bind,Ø3x10)	01613-53010
33	Tapping Screw Type1(Truss,Ø4x16)	01613-64016
34	Machine Screw(Bind,M6x16)	01703-53016
35	Machine Screw(W sems,P=3,M4x20)	01703-84020
36	Machine Screw(W sems,P=3,M4x30)	01703-84030
37	Machine Screw(W sems,P=3,M4x50)	01703-84050
38	Upper Moter Spacer	00450-40871
39	Nylon Clip NK-9N	00340-02011
40	SP Spacer Ass'y	66811-02208
41	Belt Drive 400x3Ø	00453-40128
42	Belt Drive-Treated USA522-141182	00453-40331



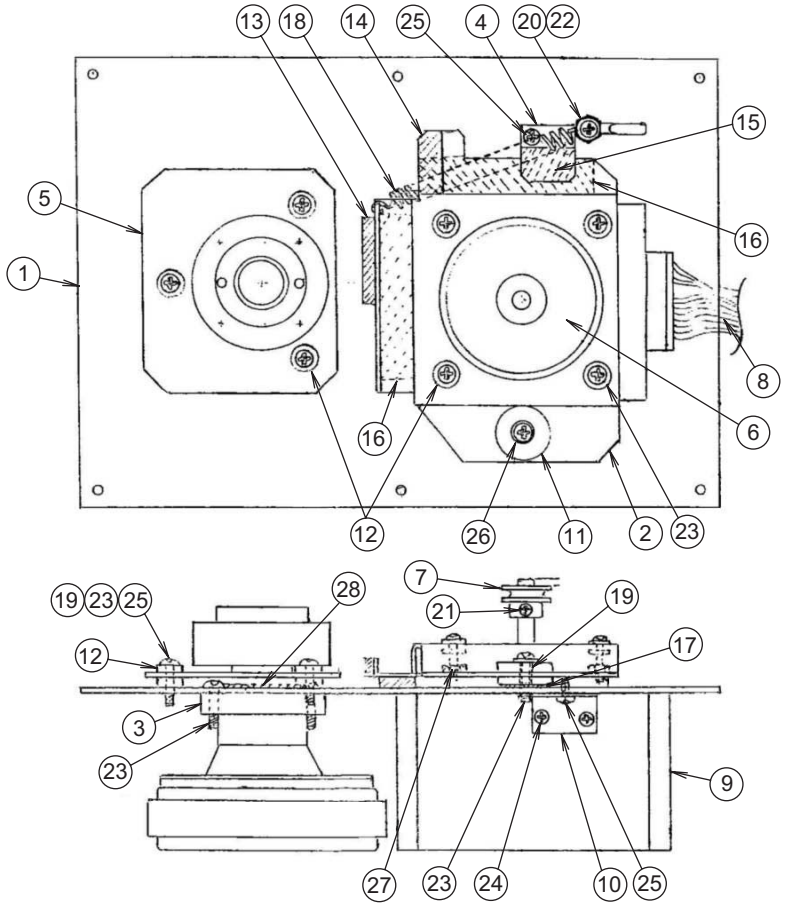
43	Wiring WR-HZ144-A	00443-05035
44	Wiring WR-HZ144-D	00443-05038
45	Wiring WR-HZ144-E	00443-05039
46	Toothed Lock Washer(Ø4)	00755-44000
47	Hexagon Nut(M4)	01725-14000

2.CONTROL PANEL ASS'Y(66811-02102)



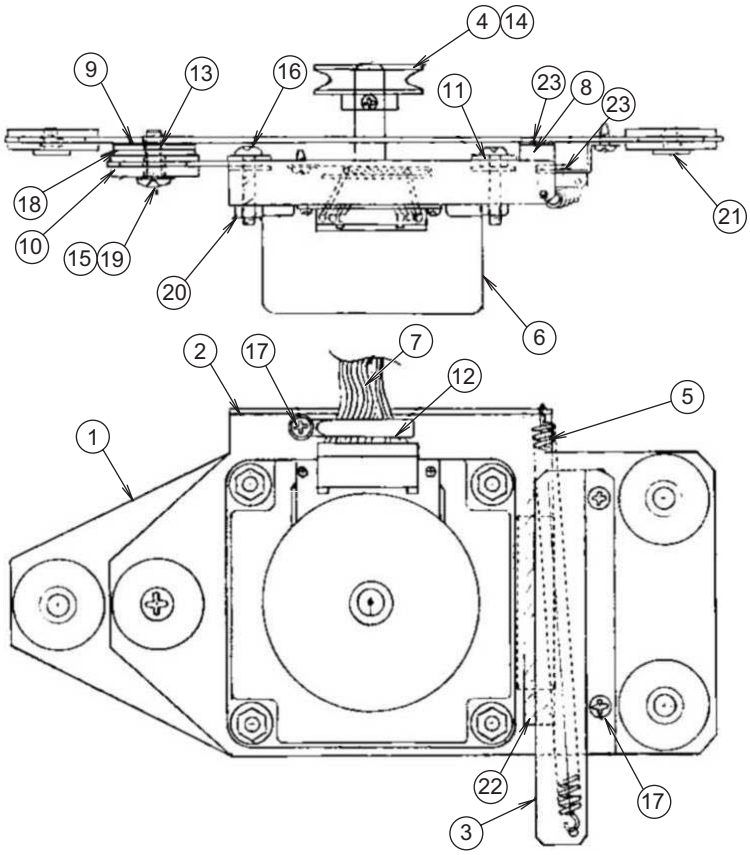
①	Control Panel	00451-40691	⑧	Volume Washer Ø7	00333-14017
②	PAH-74B PWB Ass'y	00219-54222	⑨	Volume Washer Ø9	00333-14019
③	CTH-37A PWB Ass'y	00220-20271	⑩	Volume Nut M7	00332-12017
④	Jack Nut HLJ0999-01-250	00332-12005	⑪	Volume Nut M9	00332-12019
⑤	Volume Knob XB	00402-31010	⑫	DK Clamp DKN-7G	00340-06031
⑥	Nyron Rivet P-3045 BLk	00760-03003	⑬	DK Clamp DKN-10G	00340-06032
⑦	Tapping Screw Type2(Bind,Ø3x5)	01653-53005	⑭	Polyslider Washer(Ø6.2x9.5x0.25t)	00750-06006

3.UPPER MOTER & BEARING ASS'Y(66751-02104)



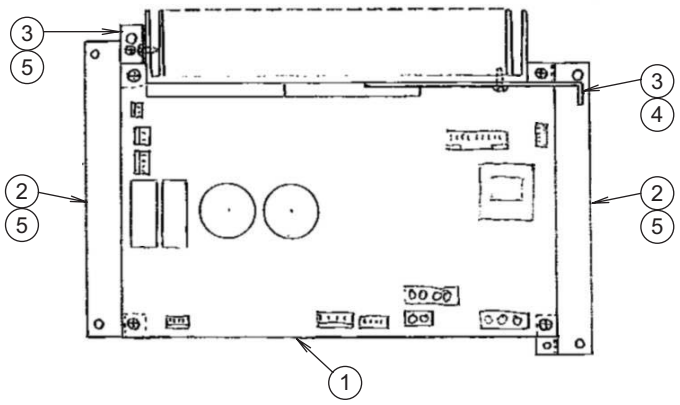
①	Rotary Horn Base	00451-40665
②	Motor BKT	00451-40300
③	Driver Mount BKT	00451-40299
④	Hold BKT	00451-40291
⑤	Spindle Hub Set	66641-02120
⑥	Motor FY8S15D3	00345-01006
⑦	Motor Pulley #22	00451-40301
⑧	Motor Cable	00443-05033
⑨	Motor Cover Ass'y	66751-02207
⑩	Coner Angle	00401-03022
⑪	Rubber Grommet(FVC)	00453-40132
⑫	Rubber Grommet(G-91)	00453-40157
⑬	Damper Rubber	00453-40177
⑭	Damper Sponge	00453-40176
⑮	Up Stop Sheet	00453-40325
⑯	Cushion(Large)	00453-40127
⑰	Pedal Spacer	00453-40023
⑱	Spring	00451-40302
⑲	Spacer Pipe #8	00451-40345
⑳	Hex Head Spacer Nut	00730-04012
㉑	Machine Screw(Pan Head,M3x8)	01703-43008
㉒	Machine Screw(Pan Head,M4x10)	01703-44010
㉓	Machine Screw(Bind,M4x16)	01703-54016
㉔	Tapping Screw Type1(Bind,3x6)	01613-53006
㉕	Tapping Screw Type2(Bind,3x6)	01653-53006
㉖	Plain Washer(M4x8x0.8)	01745-24000
㉗	Hexgon Nut(M4)	01723-14000
㉘	Rubber Ring	00453-40133

4.LOWER MOTOR ASS'Y(66751-02108)



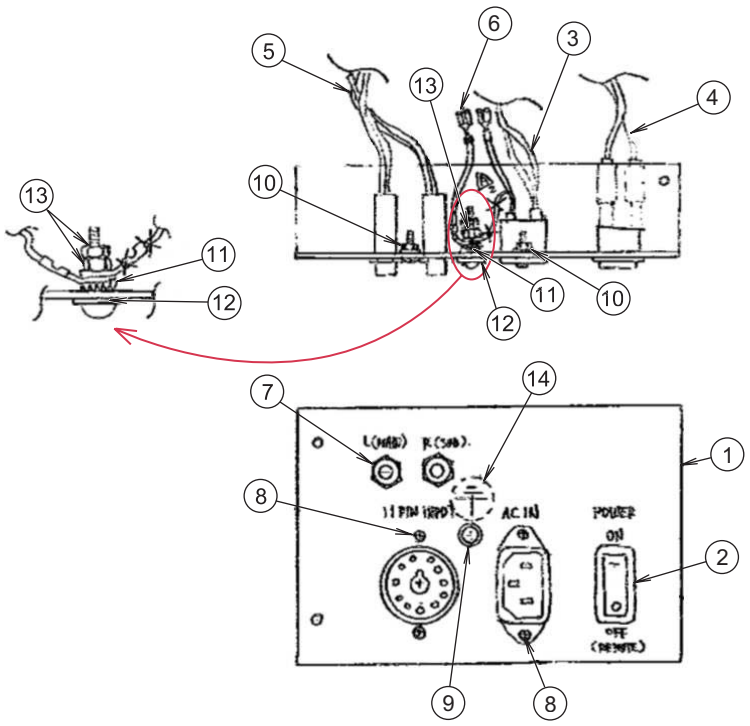
①	Lower Rotary Base	00451-40664
②	Lower Motor BKT	00451-40663
③	Upper Stopper	00451-40666
④	Motor Pulley #30	00451-40694
⑤	Pull Spring 6087	00339-04001
⑥	Motor FY8S15D3	00345-01006
⑦	Motor Cable	00443-05033
⑧	Up Stop Spacer	00450-40879
⑨	Pedal Spacer	00453-40023
⑩	Rubber Grommet	00453-40132
⑪	Rubber Grommet(G-91)	00453-40157
⑫	Coating Clip(CS-7)	00340-07015
⑬	Spacer Pipe #8	00451-40345
⑭	Machine Screw(Pan head,M3x8)	01703-43008
⑮	Machine Screw(Bind,M4x16)	01703-54016
⑯	Machine Screw(truss,M4x25)	01703-64025
⑰	Tapping Screw Type2(Bind,3x5)	01653-53005
⑱	Plain Washer(M4.3xØ24x2t)	01740-04002
⑲	Plain Washer(M4x8x0.8)	01745-24000
⑳	Hexagon Nut(M4)	01723-14000
㉑	Insert Nut TypeB(M4x9.5)	01730-04004
㉒	Lower Motor Felt	00453-40347
㉓	Teflon Tape 10mm	00453-40347

5.Power Substrate Sub ASS'Y(66811-02111)



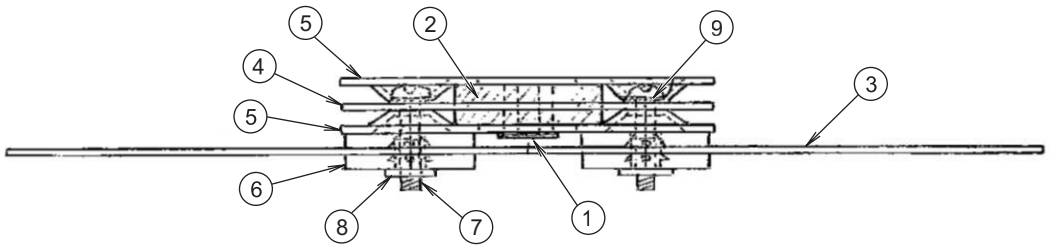
①	PWH-74C PWB Ass'y	00218-29203
②	PWH72BKT #1	00451-40671
③	PWH72BKT #2	00451-40672
④	Machine Screw(Bind,M3x6)	01703-53006
⑤	Tapping Screw Type2(Bind,3x6)	01653-53006

6.Power SW Panel ASS'Y(66751-02112)



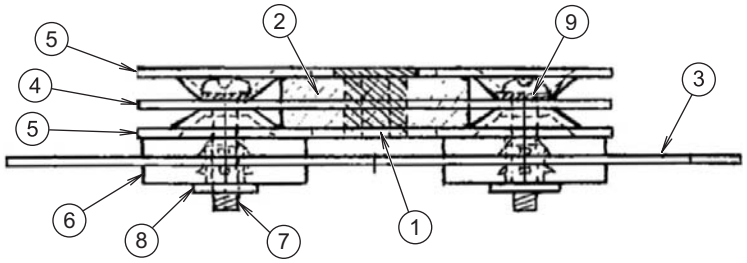
1	Power SW Panel	00451-40668
2	Power SW(SDDJF30200)	00301-08029
3	Wiring WR-HZ144-B	00443-05036
4	Wiring WR-HZ144-C	00443-05037
5	Wiring WR-HZ144-D	00443-05038
6	Wiring WR-HZ144-G	00443-05041
7	Jack Nut(HLJ0990-01-240)	00332-12004
8	Machine Screw(Bind,M3x12)	01703-53012
9	Cap Square Neck Bolt(M4x12A1)	01713-64012
10	Serrated Toothed Flange Nut(M3)	01725-83000
11	Toothed Lock Washer(Ø4)	01755-44000
12	Plain Washer(M5x12x1.0)	01743-25000
13	Hexagon Nut(M4)	01725-14000
14	Earth Label	00454-40019

7.UPPER BEARING ASS'Y(66751-02121)



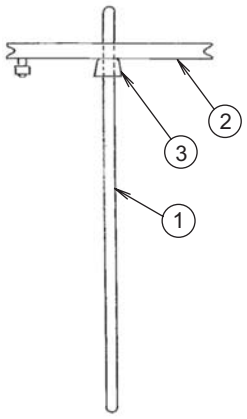
1	Rubber Bushing For Bearing	00453-40332	6	Rubber Bushing	00453-40132
2	Bearing #10 6200LLB	00352-02001	7	Machine Screw(Bind,M4x18)	01703-54018
3	Upper Plate	00451-40696	8	Insert Nut Type B(M4x18)	01730-04005
4	Plate #1	00451-40698	9	Spring Washer(Ø4)	01753-14000
5	Plate #2	00451-40699			

8.LOWER BEARING ASS'Y(66751-02122)



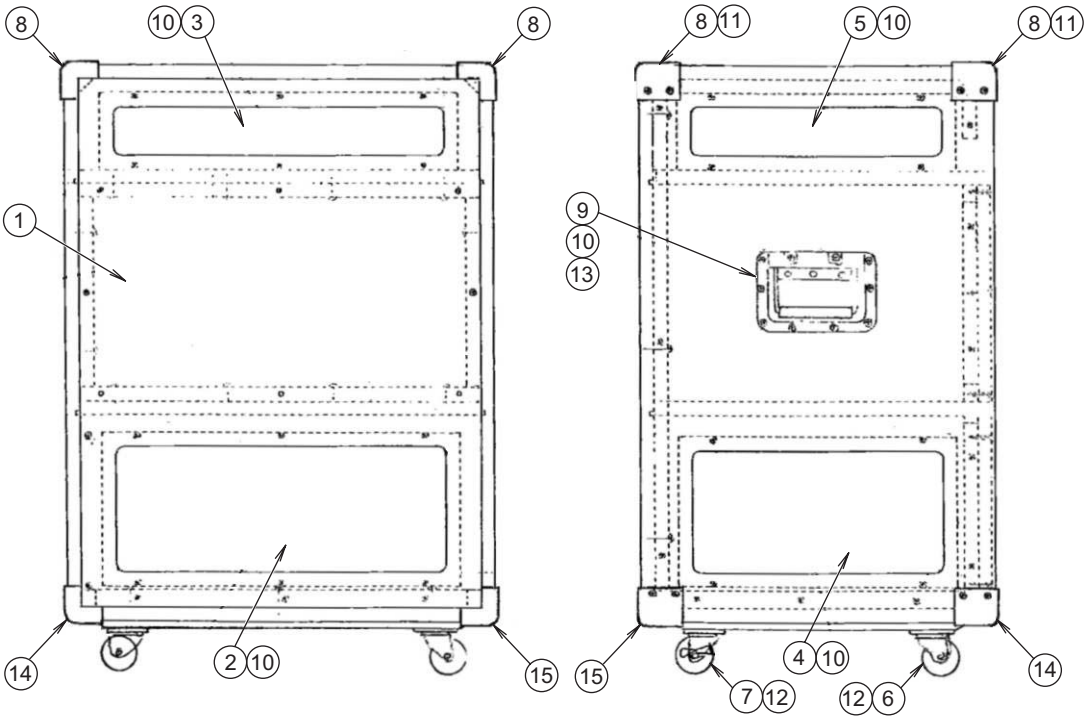
1	Lower Bushing For Bearing	00453-40332	6	Rubber Bushing	00453-40132
2	Bearing #10 6200LLB	00352-02001	7	Machine Screw(Bind,M4x18)	01703-54018
3	Lower Plate	00451-40697	8	Insert Nut Type B(M4x11.5)	01730-04005
4	Plate #1	00451-40698	9	Spring Washer(Ø4)	01753-14000
5	Plate #2	00451-40699			

9.ROTOR PULLY ASS'Y(66751-02126)



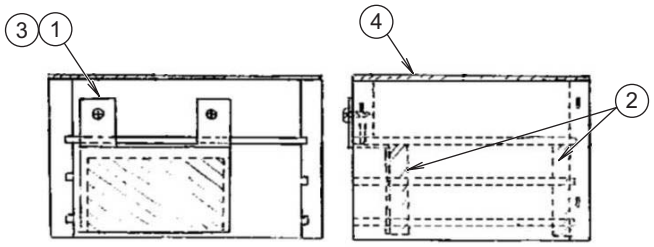
①	Rotor Shaft	00451-40700
②	Rotor Pully	00452-40235
③	Rubber Bushing BU-4850-B	00452-40239

10.CABINET TOTAL ASS'Y(66751-0202201) *Leslie 3300P MODEL ONLY*



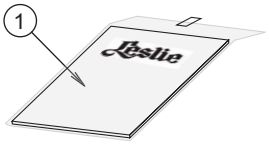
①	Cabinet Sub Ass'y	66751-02202	⑨	Handle SH-4050	00451-40701
②	Louver 4PL Ass'y	66751-02210	⑩	Tapping Screw Type1(Truss,Ø4x16)	01615-64016
③	Louver 2PL Ass'y	66751-02211	⑪	Tapping Screw Type1(Flat,Ø5x20)	01613-35020
④	Louver 4PS Ass'y	66751-02212	⑫	Machine Screw(W sems,P=3,M6x35)	01705-86035
⑤	Louver 2PS Ass'y	66751-02213	⑬	Machine Screw(Truss,M4x25)	01703-64025
⑥	Caster 420G-R75	00450-40844	⑭	Protector L(PFC-1642 cut off)	00452-40237
⑦	Caster 415E-R75	00453-40334	⑮	Protector R(PFC-1642 cut off)	00452-40238
⑧	Protector PFC-1642	00452-40236			

11.MOTOR COVER ASS'Y(66751-02207)



①	Cover BKT	00451-40695
②	PC Board Cushion	00402-06022
③	Tapping Screw Type1(Bind,Ø3x10)	01613-53010
④	Speaker Cushion XE	00453-40074

12.ACCESSORY



① User's Manual 00457-40146

AC CORD SET

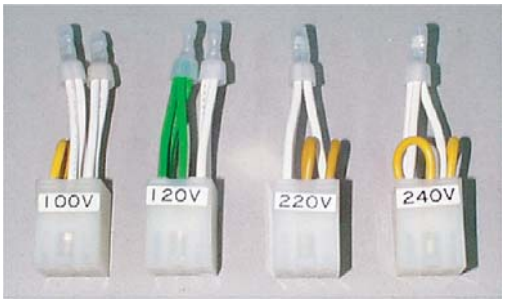
100V 00439-02002

120V 00439-02004

220V CE 00439-01005

240V BS 00439-01033

240V SAA 00439-01006



Voltage Select Plug

VOLTAGE SELECT PLUG and Fuse

Area	F1 fuse at PWH-74C		Voltage Select Plug
100V	T5A 218005	00302-33502	100V 00106-00241
120V(UL)	T4A 218004	00302-33402	120V 00106-00242
220-230V CE	T2A 218002	00302-33202	220V 00106-00243
230-240V BS/SAA	T2A 218002	00302-33202	240V 00106-00244