HAMMOND

SERVICE MANUAL

Leslie® 21

Stationary Unit

 # 2121

CAUTION !

see safety notice inside

DEC.2002

SUZUKI MUSICAL INST.MFG.CO.,LTD.

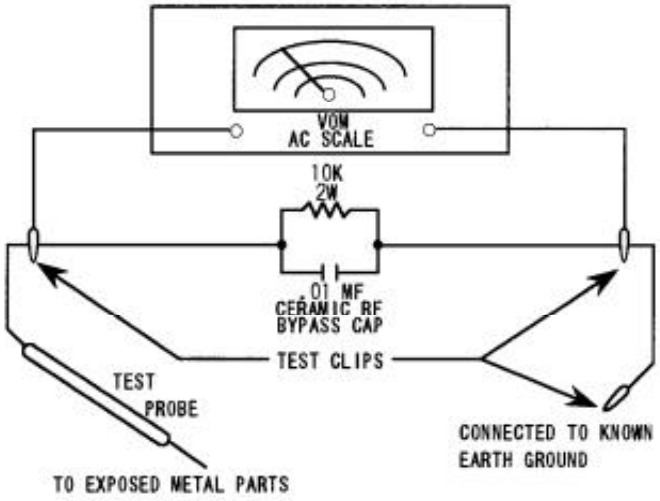
25-12,RYOKE 2-CHOME,HAMAMATSU, JAPAN

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 thet 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 VOM 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. Reveres 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 mad batteri
as samme fabriket og type.
Lebér det brugte batteri tilbage til leverandoren.

Norge: **ADVARSEL**

Ilthiumbatteri-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
tyyppoon, Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.

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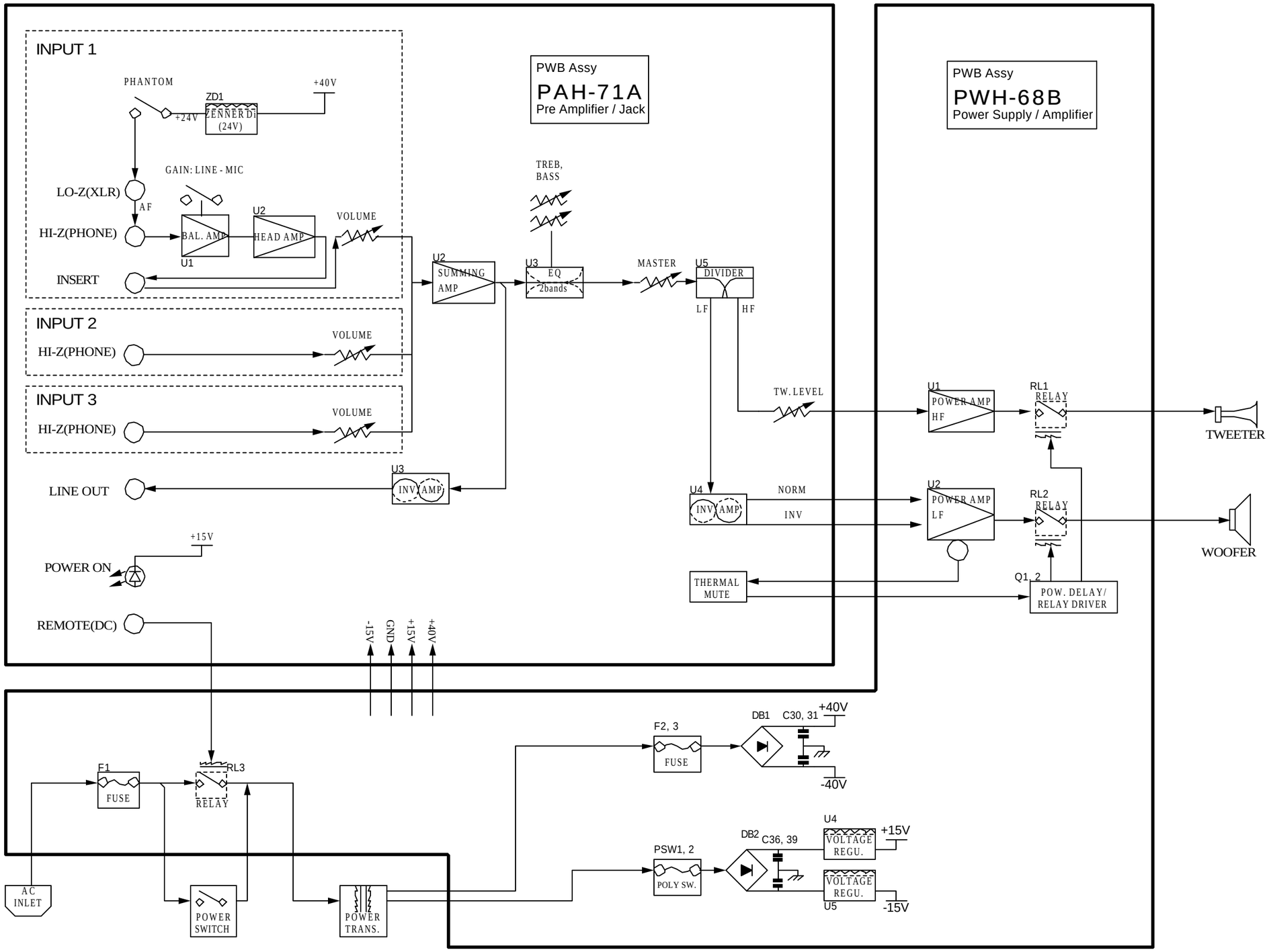
1.SPECIFICATIONS

Stationary Unit #2121 (Black)

POWER OUTPUT	:BASS 150W , HORN 50W
SPEAKER	:38cm WOOFERX1 , HORN TWEETER X1
CONTROL	:VOLUME 1,2,3, MASTER VOLUME TONE CONTROL BASS,TREBLE
TERMINAL	:INPUT 1 (MIC/LINE) XLR TYPE w/PHANTOM plus PHONE JACK INSERT(SEND, RETURN) INPUT 2, 3 (LINE) PHONE JACK LINE OUT, REMOTE POWER INPUT
DIMENSION	:50(W)X50(D)X75(H)cm
WEIGHT	:39kg

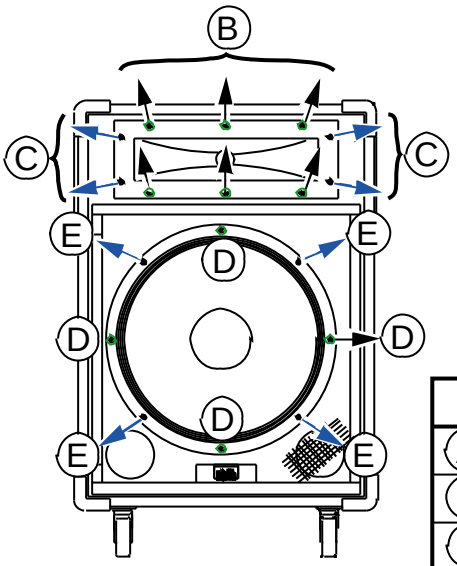


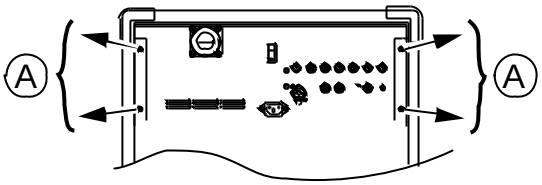
2. #2121 BLOCK DIAGRAM

3.DISASSEMBLING PROCEDURE

CAUTION: Disconnect the line cord from A.C. Source before disassembling any portion of this product.

<FIG.1>





	Screw name	Part No.
A	Machine screws,W sems,M4x30	00703-84030
B	A Tapping,Truss,Ø4x20	00613-64020
C	Machine screws,W sems,M4x20	00703-84030
D	A Tappin,Truss,Ø4x20	00613-64020
E	Machine screws,W sems, M4x20	00703-84030

1.REMOVAL OF TOP REAR PANEL ASSEMBLY:

Unfasten the four (4) machine screws labeled (A) in Figure 1 from the rear panel.

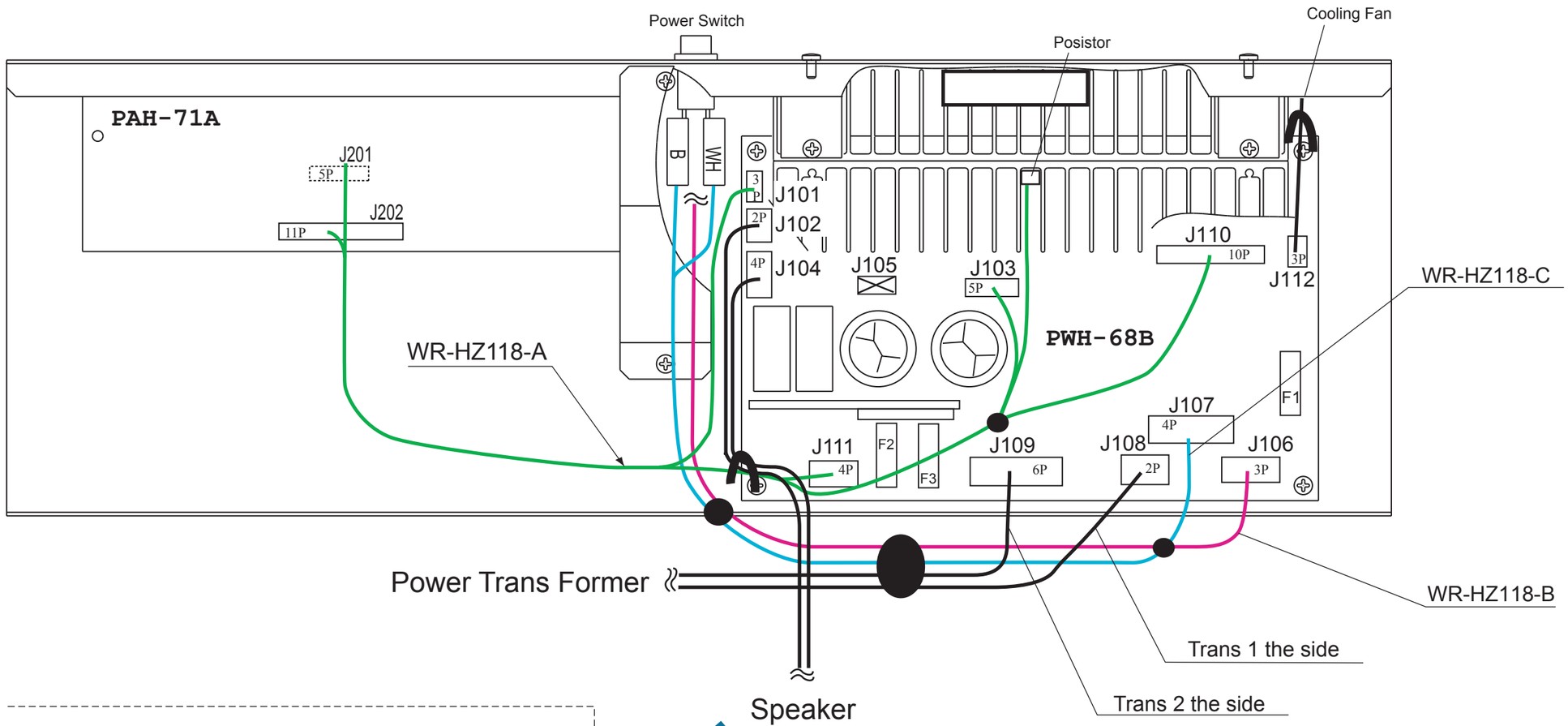
2.REMOVAL OF HORN SPEAKER:

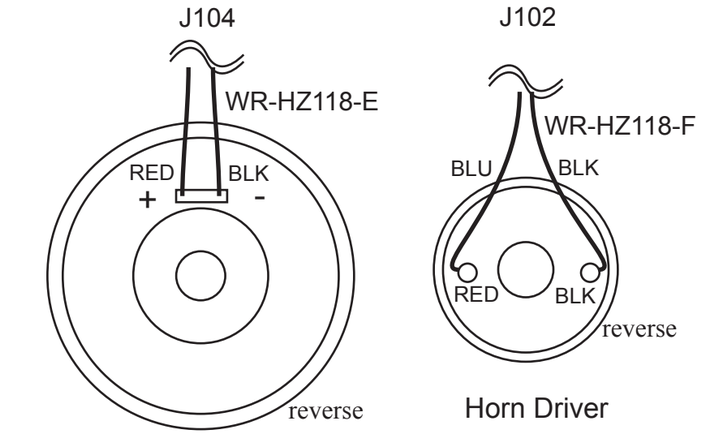
Unfasten the six (6) wood screws labeled (B) and the four (4) Machine screws labeld (C) from the rear panel as shown in figure 1.

3.REMOVAL OF WOOFER SPEAKER:

1. Remove the lower speaker net ass'y by gently pulling on the net ass'y in a outward direction.
2. Unfasten the four (4) wood screws label (D) and the four (4) machine screws labeled (E)

STEP	SUBJECT	SETTING	INPUT	TEST POINT	ADJUSTMENT POINT	SPECIFICATION	NOTE
1 a	DC Power Supply	+15V		PWH-68B J110-5		DC +15V ±0.5V	
b	↓	-15V		PWH-68B J110-1		DC -15V ±0.5V	
c	↓	+12V		PWH-68B J112-3		DC +12V ±1V	non-regurated
d	↓	+24V (Phantom = "On")		PAH-71A JK1-2 or 3		DC +24V ±1V	non-regurated
2 a	Speaker Level Woofer+	Input3: Max, Master: Max, Tone: Center, Tw: Max	Input 3: 400Hz Sine 120mVrms	PWH-68B J104-2		16Vrms ±2V	at 8ohm loaded
b	Speaker Level Woofer-	Same as above	Same as above	PWH-68B J104-4		16Vrms ±2V	at 8ohm loaded
c	Speaker Level Tweeter	Same as above	Input 3: 1kHz Sine 150mVrms	PWH-68B J102-1		17Vrms ±2V	at 8ohm loaded
3 a	Line Out Level	Same as above	Input 3: 400Hz Sine 120mVrms	JK4		1.2Vrms ±0.1V	
4 a	Noise Level Woofer+	Input1-3: Max, Gain:Line, Master: Max, Tone: Center, Tw: Max	Disconnect Input 1 to 3	PWH-68B J104-2		1.0mVrms max (IEC"A"net)	
b	Noise Level Woofer-	Same as above	Same as above	PWH-68B J104-4		1.0mVrms max (IEC"A"net)	
c	Noise Level Tweeter	Same as above	Same as above	PWH-68B J102-1		1.0mVrms max (IEC"A"net)	
5 a	Noise Level Line Out	Input1-3: Max, Gain:Line, Master: Max, Tone: Center, Tw: Max	Disconnect Input 1 to 3	JK4		0.1mVrms max (IEC"A"net)	





5. WIRING CONNECTION

#2121

6.WIRING CHART

POWER AMPLIFIER PWH-68B

PLUG No.	FROM PIN No.	TO PLUG & PIN No.	WIRE COLOR	TO PWB NAME	FUNCTION
J101	1	J202-1	WHT	PAH-71A	HF IN
	2	J202-2	SHIELD	PAH-71A	HF GND
	3	NC			
J102	1	SPEAKER	BLU	SPEAKER	Tweeter
	2	SPEAKER	BLK	SPEAKER	GND
J103	1	J202-3	RED	PAH-71A	LF+IN
	2	NC			
	3	J202-4	SHIELD		LF GND
	4	NC			
	5	J202-5	WHT		LF-IN
J104	1	NC			
	2	SPEAKER	RED	SPEAKER	Woofer+
	3	NC			
	4	SPEAKER	BLK	SPEAKER	Woofer-
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
J108	1	TRANS.		Trans Primary	
	2	TRANS.		Trans Primary	
J109	1	TRANS.		Trans Secondary	
	2				
	3				
	4				
	5				
	6				
J110	1	J202-11	GRN	PAH-71A	-15V OUT
	2	NC			
	3	J202-10	BLK	PAH-71A	Power Gnd
	4	NC			
	5	J202-9	ORG	PAH-71A	+15V OUT
	6	J201-5	ORG	PAH-71A	+15V OUT
	7	NC			
	8	J201-3	BLK	PAH-71A	REM.GND
	9	NC			
	10	J201-4	BLU	PAH-71A	REMOTE
J111	1	NC			
	2	J202-8	PNK	PAH-71A	Mute IN
	3	NC			
	4	J201-1	RED	PAH-71A	+40V Out
J112	1	Cooling Fan	BLK	Cooling Fan	GND
	2	NC			
	3	Cooling Fan	RED	Cooling Fan	+12V

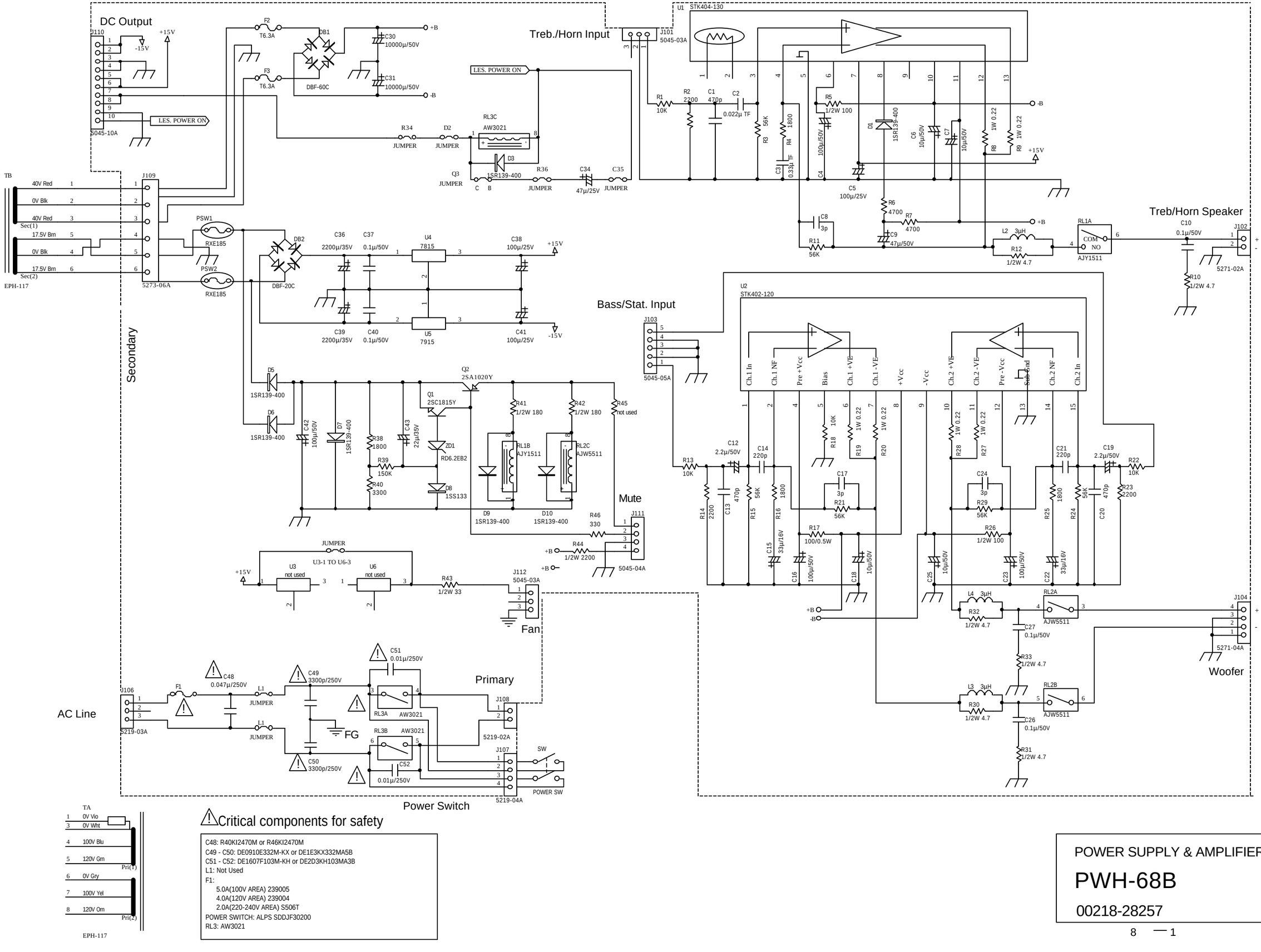
PRE AMPLIFIER PAH-71A

J201	1	J111-4	RED	PWH-68B	+40V IN
	2	NC			
	3	J110-8	BLK		REMOTE
	4	J110-10	BLU		REM.GND
	5	J110-6	ORG		+15V IN
J202	1	J101-1	WHT	PWH-68B	HF OUT
	2	J101-2	SHIELD		HF GND
	3	J103-1	RED		LF+OUT
	4	J103-3	SHIELD		LF GND
	5	J103-5	WHT		LF-OUT
	6	POSISTOR	BLK		TH GND
	7	POSISTOR	VIO		THEM
	8	J111-2	PNK		MUTE
	9	J110-5	ORG		+15V IN
	10	J110-3	BLK		Power Gnd
	11	J110-1	GRN		-15V IN

7.PRINTED WIRING BOARD ASS'Y LIST

FUNCTION	PWB.NAME	PART No.
POWER SUPPLY & AMPLIFIER	PWH-68B	00218-28257
PRE AMP , JACK	PAH-71A	00219-54206

#2121



⚠Critical components for safety

C48: R40KI2470M or R46KI2470M
C49 - C50: DE0910E332M-KX or DE1E3KX332MA5B
C51 - C52: DE1607F103M-KH or DE2D3KH103MA3B
L1: Not Used
F1:
5.0A(100V AREA) 239005
4.0A(120V AREA) 239004
2.0A(220-240V AREA) S506T
POWER SWITCH: ALPS SDDJF30200
RL3: AW3021

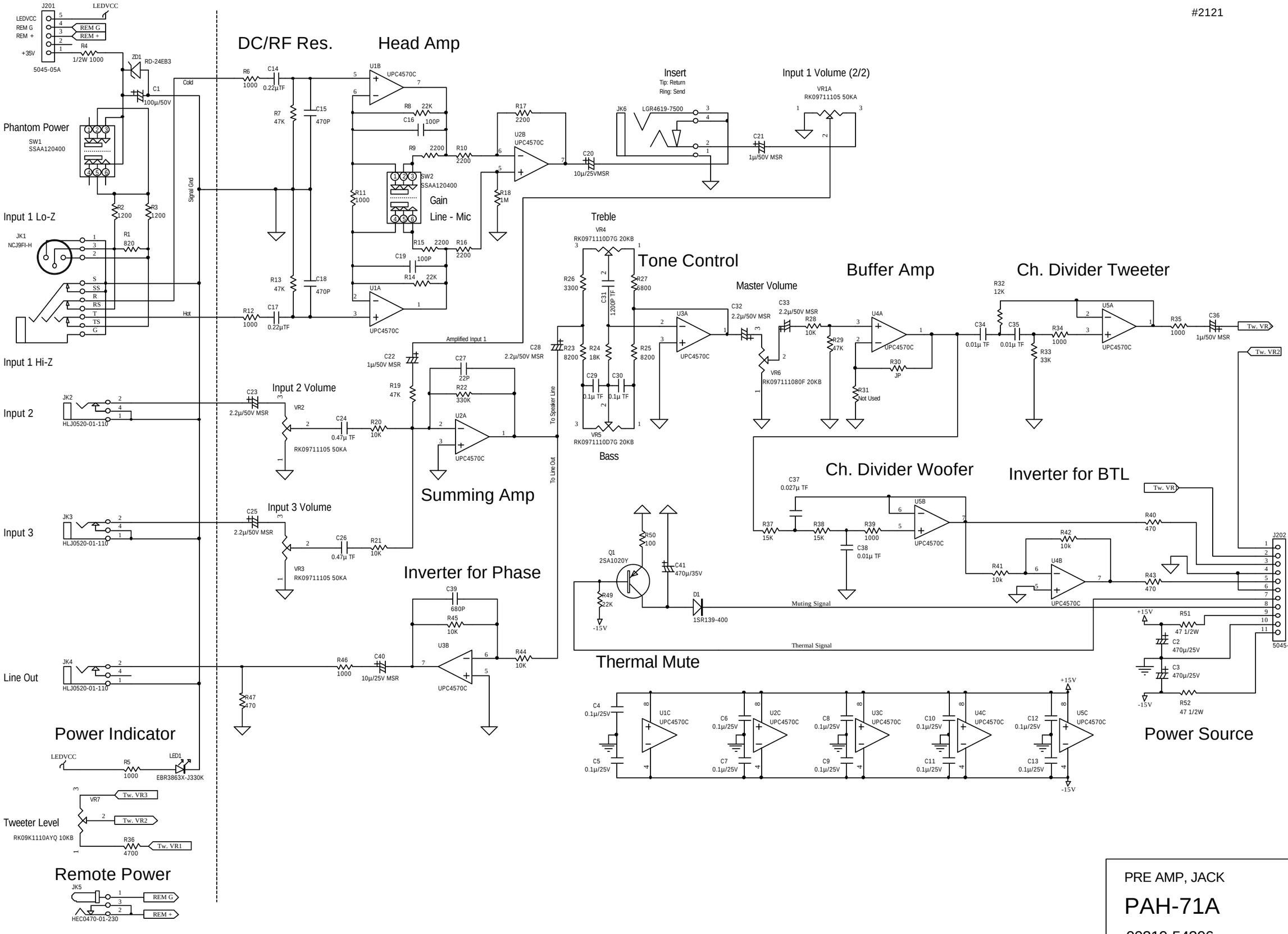
POWER SUPPLY & AMPLIFIER

PWH-68B

00218-28257

8 — 1

#2121



PRE AMP, JACK

PAH-71A

00219-54206

9.TECHNICAL DESCRIPTION

This unit consists of 2 PWB assemblies (PWH-68B, PAH-71A).

A. PWH-68B - Power Supply and Power Amplifier

1. Power supply section

This distributes the AC power for this unit at multiple voltages (100, 120, 220, etc).
AC source through power switch or relay RL3 is sent to power transformer EPH-117.
Fuse F1 on this PWB and the voltage select plug on the power transformer are used to change the voltage specifications for each voltage zone.
Power transformer makes 2 transformed AC power, then +-40V, +-15V are made.
2 fuses (F2/F3 for +-40V lines) and 2 polyswitches (PSW1/PSW2 for +-15V lines) provide protection in case of overloading.
The RL3 circuit is used to enable remote turn-on capability.

2. Power amplifier section

Receives audio signal from PAH-71A pre amplifier and drives the speakers.
There are 2 power amplifier circuits for treble and bass:

1.Treble (horn driver) amplifier circuit, J101 input, U1 on amplified through RL1 relay and output from J102.
2.Bass (woofer) amplifier circuit, J103 input, U2 on amplified through RL2 relay and output from J104. U2 is 2 channel power amplifier. In this model, it operates in BTL with inverted signal into each channel.

The RL1 and RL2 circuits protect the speakers and amplifiers by cutting the electrical signal between amplifiers and speakers if the amplifiers are driven into overheating.(over 100degree at Heat sink)

B. PAH-71A - Pre Amplifier

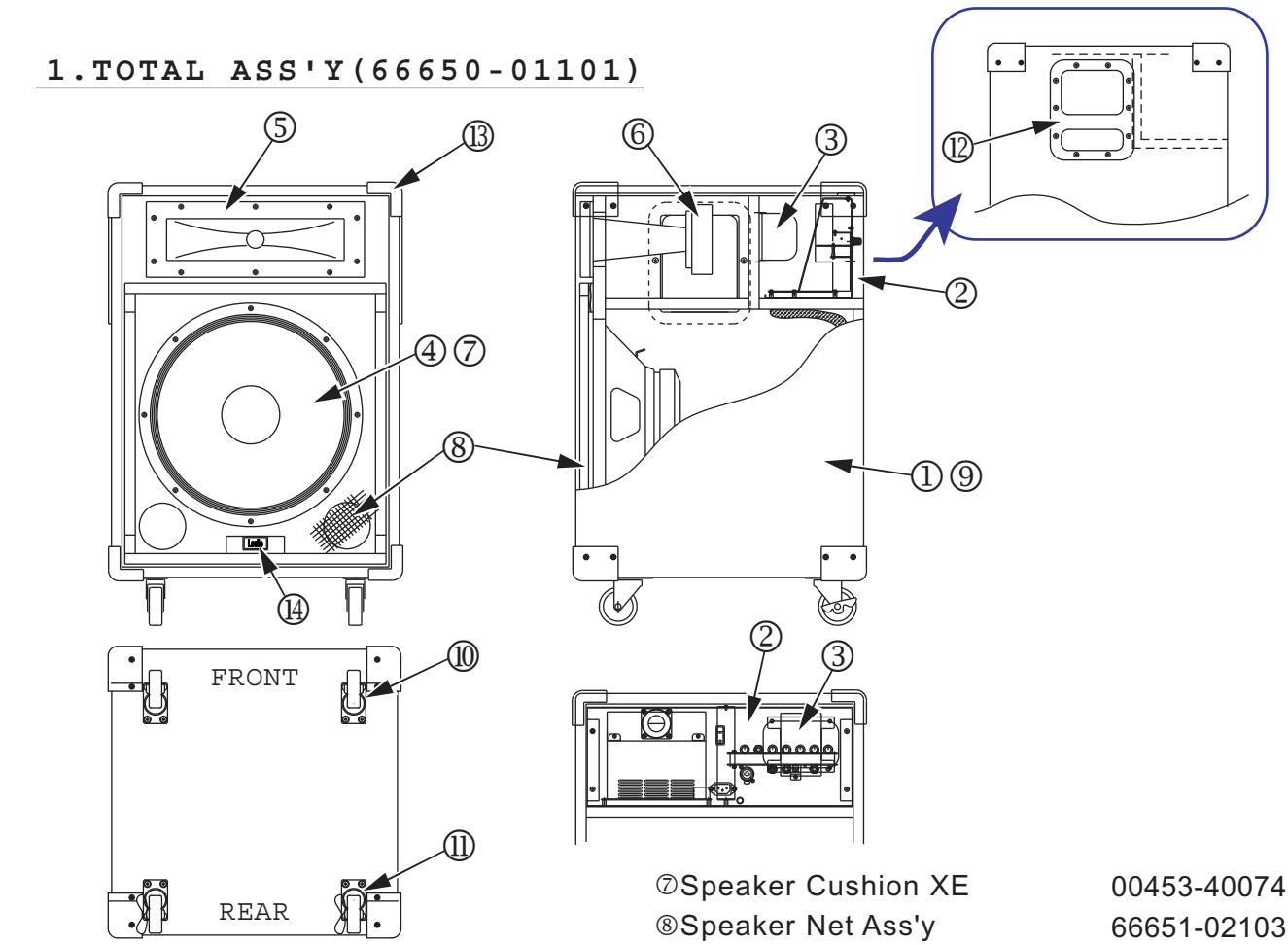
This PWB mixes and adjusts the volume and tone of the input signals, which are then sent to the power amplifier (PWH-68B). It also controls the thermal protection circuit.

INPUT1 signal is amplified in U1, mixed with INPUT2 and 3 in U2, then distributed to U3 tone control circut and LINE OUT circuit. The signal then goes through the tone control circuit into U4 buffer, divided by frequency range in U5 channel divider, and inverts bass for BTL operation in U4 circuit.

The signal into the LINE OUT circuit is inverted in U3 for accuarate phase. The protection circuit switches relay control voltage coming from PWH-68B onto the heat sink.

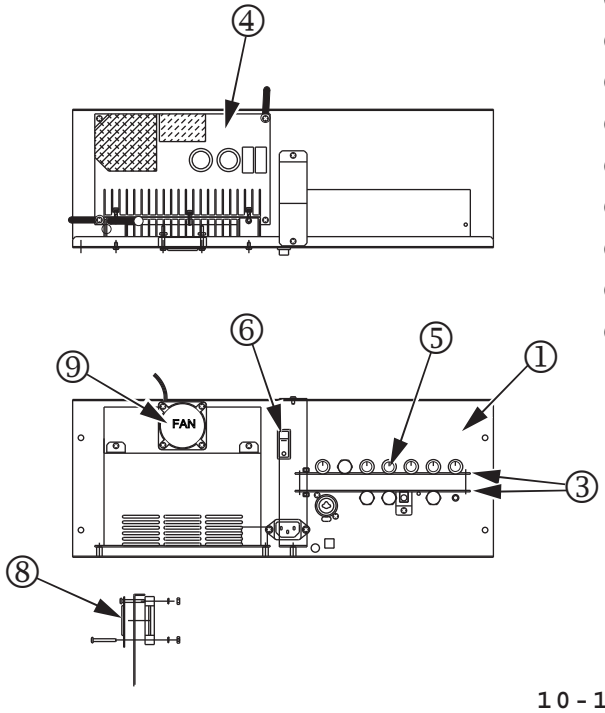
10.PARTS LIST

1.TOTAL ASS'Y(66650-01101)



① Cabinet Total Ass'y	66651-02101	⑦Speaker Cushion XE	00453-40074
② Rear Panel Ass'y	66651-02102	⑧Speaker Net Ass'y	66651-02103
③ Power Transformer(EPH-117)	00307-01317	⑨Cabinet(wooden)Ass'y	66651-02120
④ Woofer 38cm	00315-06016	⑩Caster #65R(420G-R-65)	00453-00124
⑤ Horn(PH-3713)	00315-08009	⑪Caster #65R STP(415E-R-65)	00453-00125
⑥ Horn Driver	00315-08008	⑫Handle(CH-2017P)	00452-40145
		⑬Protector(Leslie)	00452-40153
		⑭Leslie Badge	00452-40147

2.REAR PANEL ASS'Y(66651-02102)



① Rear Panel #2121	00451-40294
② Heat Sink	00401-04117
③ PAH-71A PWB Ass'y	00219-54206
④ PWH-68B PWB Ass'y	00218-28257
⑤ Vol Knob XB	00402-31010
⑥ Power Sw(SDDJF30200)	00301-08029
⑦ PWB Holder(PCB-10L)	00453-40123
⑧ Fan Guard M-5B	00453-40164
⑨ Fan Motor Ass'y(WR-HZ119-G)	00443-05021

AC CORD SET

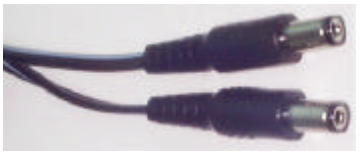
100V 00439-02002

120V 00439-02004

220V CE 00439-01005

240V BS 00439-01033

240V SAA 00439-01006



DCC-2 Cable 00434-05003

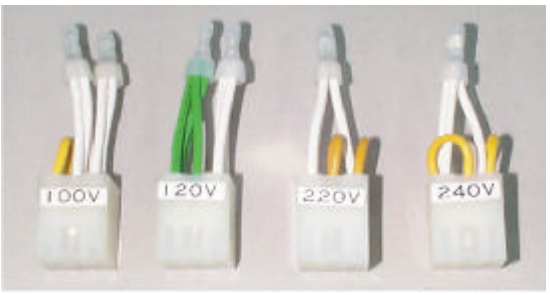
LI-40 Cable 00435-02010

WIRING

①	WR-HZ118-A	00443-05015
②	WR-HZ118-B	00443-05016 (W / AC inlet)
③	WR-HZ118-C	00443-05017
④	WR-HZ118-E	00443-05019
⑤	WR-HZ118-F	00443-05020
⑥	WR-HZ118-G	00443-05021 (Cooling fan ass'y)

VOLTAGE SELECT PLUG

①	100V	00106-00241
②	120V(UL)	00106-00242
③	220V CE	00106-00243
④	240V BS/SAA	00106-00244



FUSE

<PWH-68B F1>

100V	T5A 239005	00302-11045
120V(UL)	T4A 239004	00302-11043
220V CE	T2A S506T	00302-10202
240V BS/SAA	T2A S506T	00302-10202