

Service Manual

Active Subwoofer System



SB-WA870EB
SB-WA870EG

Colour

(S)...Silver Type

Specification

n Active subwoofer

Type	1 way, 1 speaker system (Bass reflex)
Speaker unit	Impedance 4 Ω
Woofer	20 cm Cone type
Output sound pressure	84 dB/W (1.0 m)
Frequency range	34 Hz-220 Hz (-16 dB) 38 Hz-190 Hz (-10 dB)
Dimensions (W x H x D)	248 x 417 x 476.6 mm
Mass	16.4 kg

n General

Power consumption	390W
Power supply	
Continental Europe and Russia	AC 230V, 50Hz
The United Kingdom, Australia and N.Z.	AC 230V-240V, 50Hz
Power consumption in standby mode	0.7 W

Notes :

1. Specifications are subject to change without notice.
2. Mass and dimensions are approximate.

SB-HT870P-S consists of :

SB-PF921P-S x 2, SB-PS921P-S x 2 and SB-PC920P-S x 1

n System : SC-HT870 (E)

Music Center: SA-HT870 (E)

Satellite Speakers: SB-HT870 (P)

Active Subwoofer: SB-WA870 (EG)

n System : SC-HT870 (EB)

Music Center: SA-HT870 (EB)

Satellite Speakers: SB-HT870 (P)

Active Subwoofer: SB-WA870 (EB)

n System : SC-HT870 (EG)

Music Center: SA-HT870 (EG)

Satellite Speakers: SB-HT870 (P)

Active Subwoofer: SB-WA870 (EG)

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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1 Safety Precautions

1.1. GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1M\Omega$ and 5.2Ω .
When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

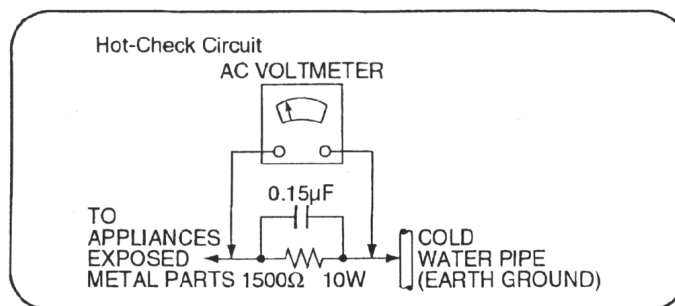


Fig. 1

1.1.2. LEAKAGE CURRENT HOT CHECK (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a $1.5k\Omega$, 10 watts resistor, in parallel with a $0.15\mu F$ capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

2 Handling the Lead-free Solder

2.1. About lead free solder (PbF)

Distinction of PbF P.C.B. :

P.C.B.s (manufactured) using lead free solder will have a PbF stamp on the P.C.B.

Caution:

- Pb free solder has a higher melting point than standard solder; Typically the melting point is 50 - 70°F (30 - 40°C) higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C).
- Pb free solder will tend to splash when heated too high (about 1100°F/600°C).
- When soldering or unsoldering, please completely remove all of the solder on the pins or solder area, and be sure to heat the soldering points with the Pb free solder until it melts enough.

3 Before Repair and Adjustment

Disconnect AC power, discharge Power Supply Capacitors C601, C602, C603, C604 through a 10 Ω, 1 W resistor to ground.

DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices.

After repairs are completed, restore power gradually using a variac, to avoid overcurrent.

Current consumption at AC 230V, 50Hz in NO SIGNAL mode should be ~1000 mA (EG ONLY).

Current consumption at AC 240V, 50Hz in NO SIGNAL mode should be ~1000 mA (EB ONLY).

4 Protection Circuitry

The protection circuitry may have operated if either of the following conditions are noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlines below:

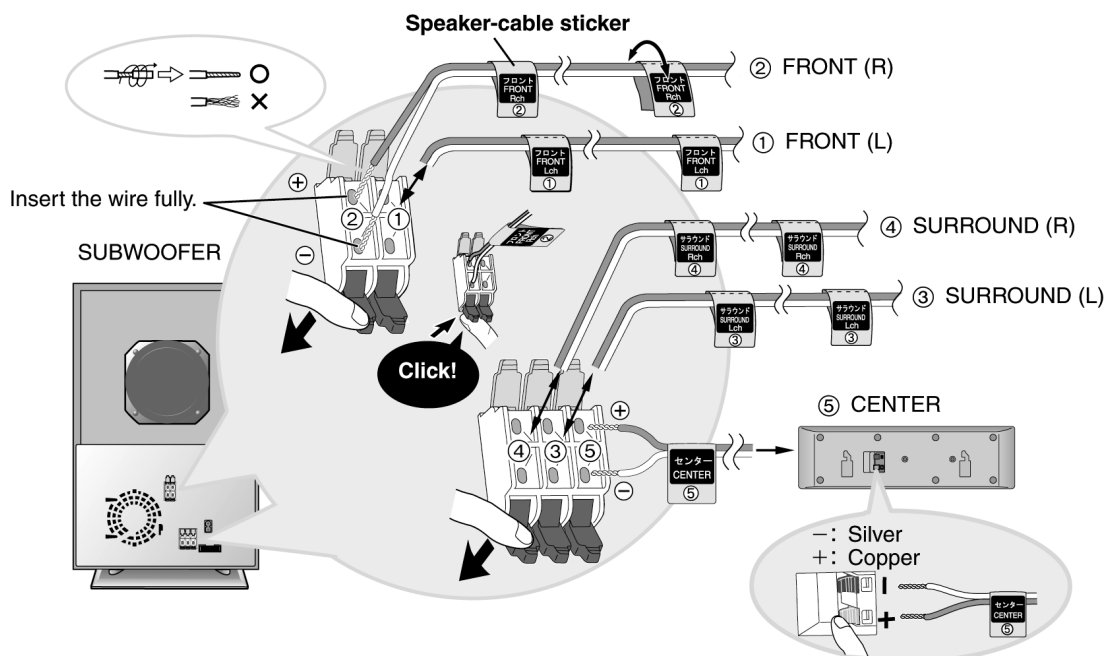
1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note :

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

5 Connection of the Speaker Cables

- Be sure to connect speaker cables before connecting the AC power supply cord.
 - The load impedance of any speaker used with this unit must be 4Ω .
 - Be sure to connect the cable from the right speaker to the right terminal and the cable from the left speaker to the left terminal.
1. Strip off the outer covering, and twist the center conductor. Make sure the bare ends of the wires are not unravelled. (If they are, twist them tight again.)
 2. Insert the wire to the rear panel of the unit and close the lever.



Notes :

- To prevent damage to circuitry, never short-circuit positive (+) and negative (-) speaker wires.
- Be sure to connect only positive (Copper) wires to positive (+) terminals and negative (Silver) wires to negative (-) terminals.

6 Disassembly Procedure

“ATTENTION SERVICER”

Some chassis components may have sharp edges.

Be careful when disassembling and servicing.

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures.
Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.

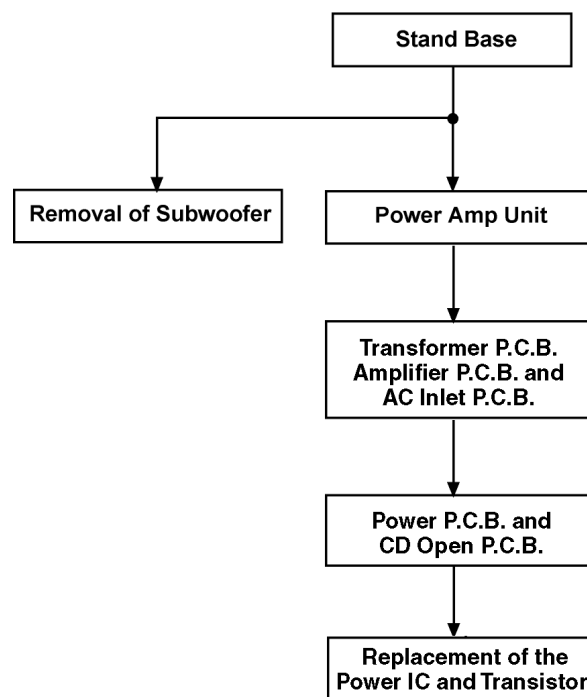
Contents

- Disassembly of the Speaker Unit
- Main Component Replacement Procedures

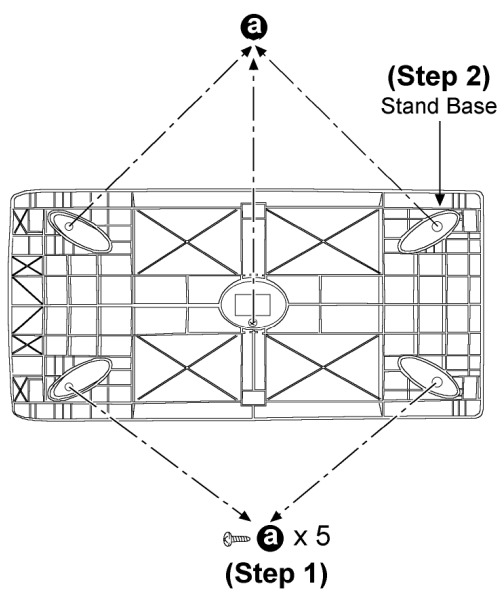
6.1. Disassembly flow chart

The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the chart below.

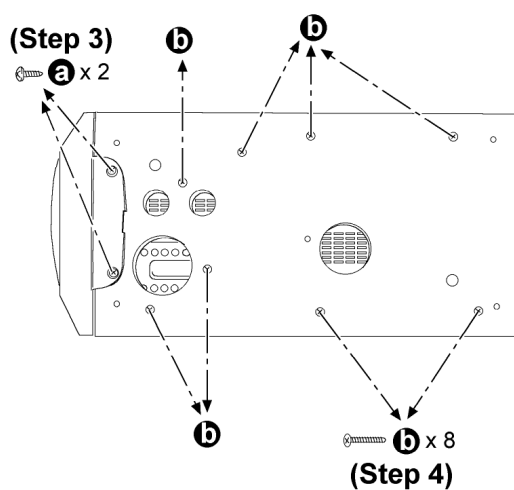


6.2. Disassembly of the Speaker Unit and Checking of the P.C.B.

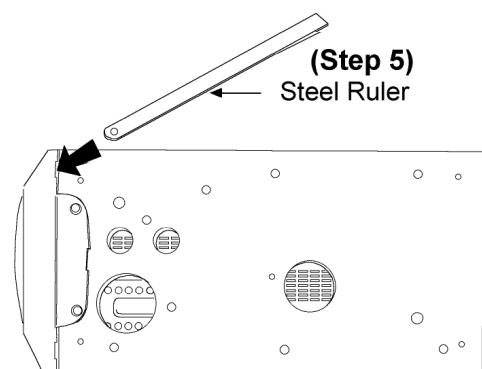


Step 1: Remove all the screws.

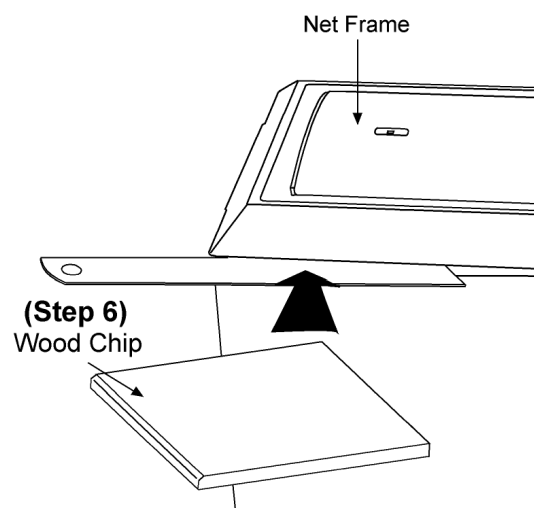
Step 2: Remove the stand base.



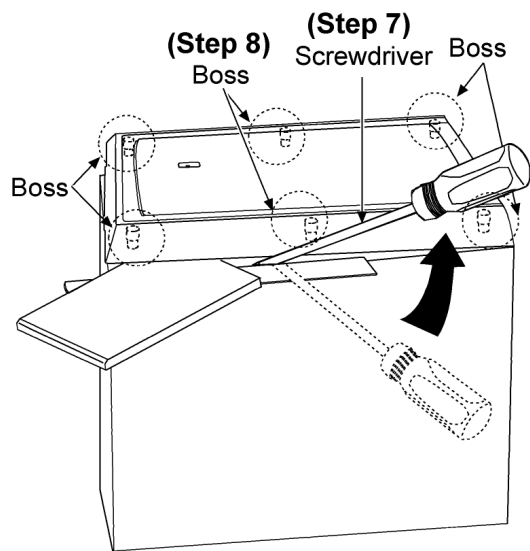
Steps 3 & 4: Remove all the screws from the bottom of the speaker unit.



Step 5: Use the Steel Ruler to slot into the hole of the bottom cabinet of speaker.



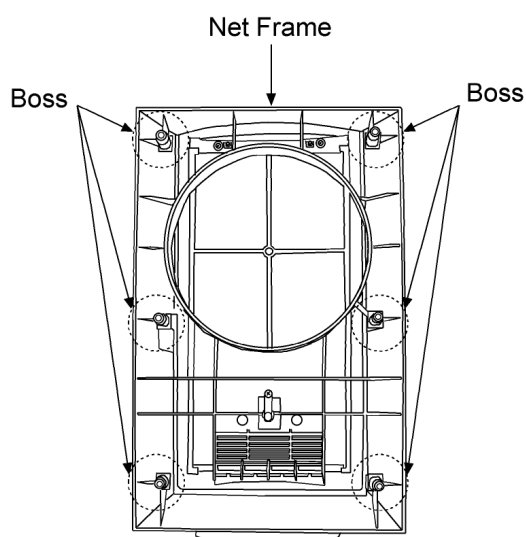
Step 6: Use the Wood Chip to slot between the Net Frame and the Steel Ruler as arrow shown.



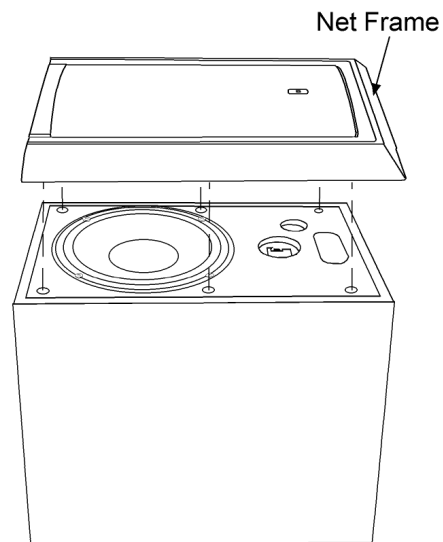
Step 7: Use the Screwdriver slightly lift up the Net Frame as arrow shown.

Step 8: Take note of the bosses which glued to the unit .

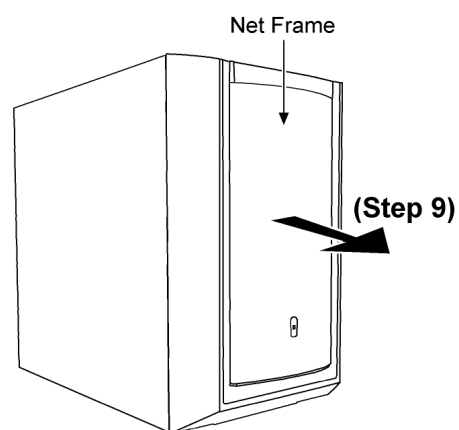
· Assembly of Net Frame.



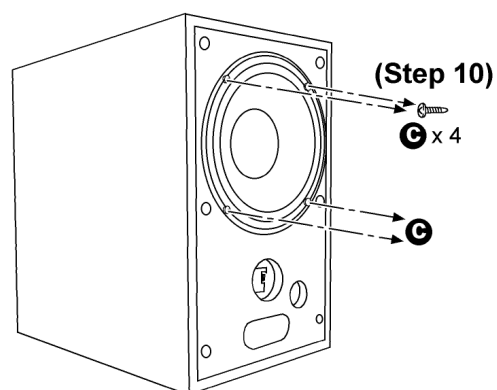
Clean up all the glue at the 6 Boss points and replace with the normal glue.



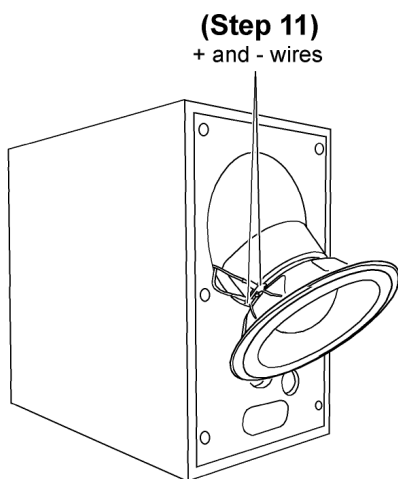
Replace the Net Frame firmly back into the cabinet.



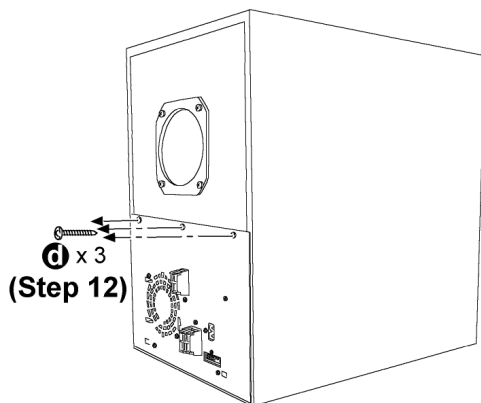
Step 9: Remove the Net Frame from the cabinet of speaker.



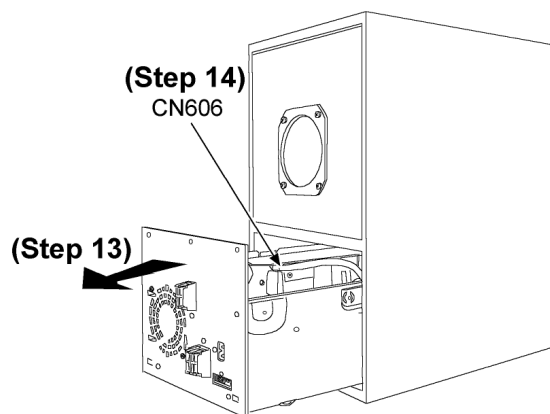
Step 10: Remove all the screws from the subwoofer.



Step 11: Remove the subwoofer by detach the 2 wires.



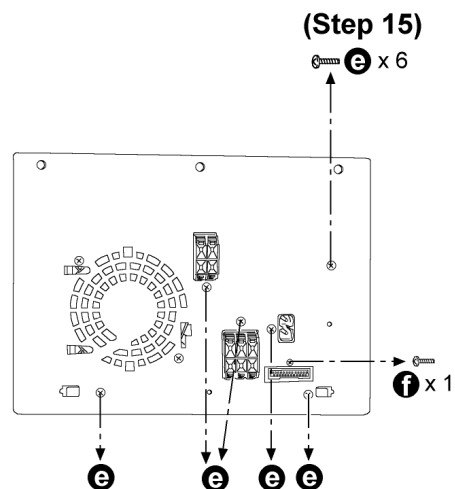
Step 12: Remove the screws.



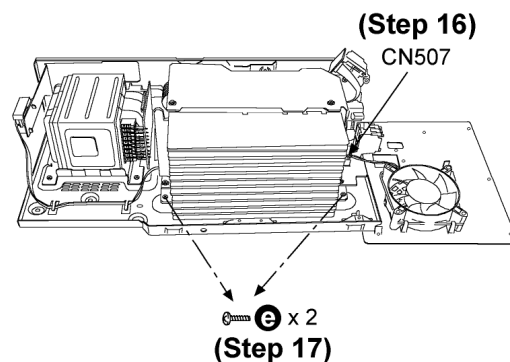
Step 13: Pull out the Power Amp unit slightly as shown.

Note: Be careful of attach wire at CN606.

Step 14: Release the connector CN606 then pull out the entire Power Amp unit.

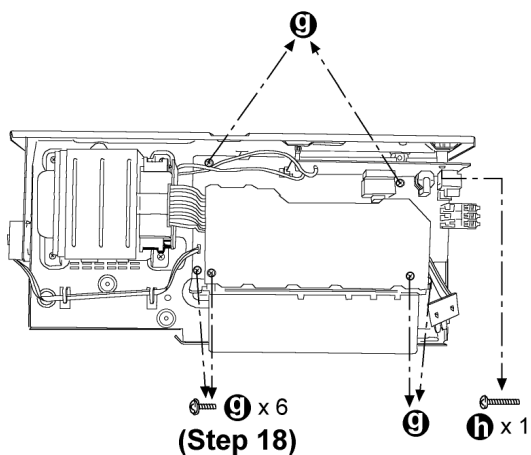


Step 15: Remove all the screws.

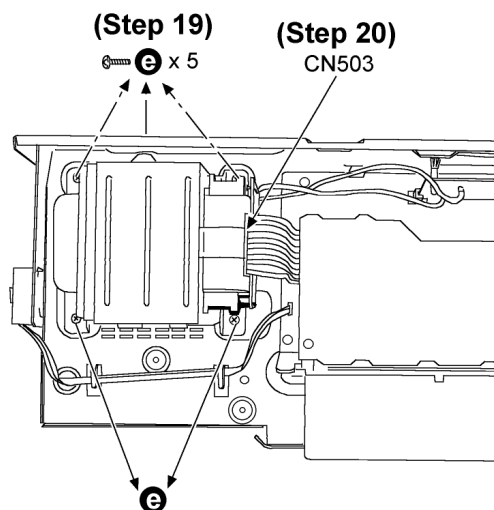


Step 16: Release the connector CN507 to remove the rear panel.

Step 17: Remove all the screws.

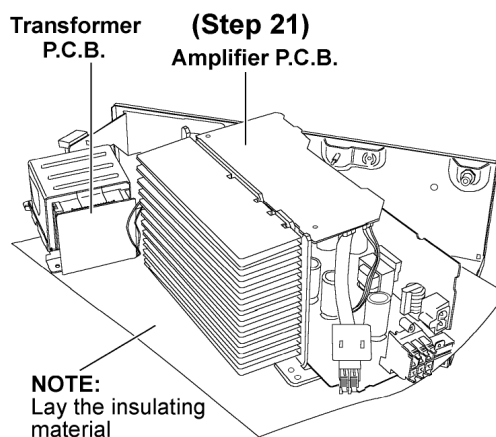


Step 18: Remove all the screws.

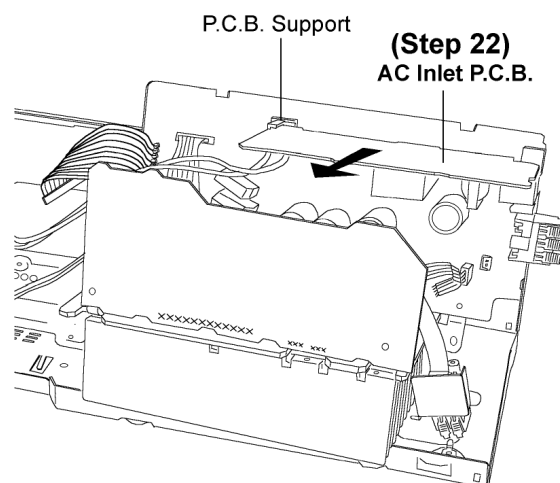


Step 19: Remove all the screws.

Step 20: Detach the connector CN503 and remove the transformer.



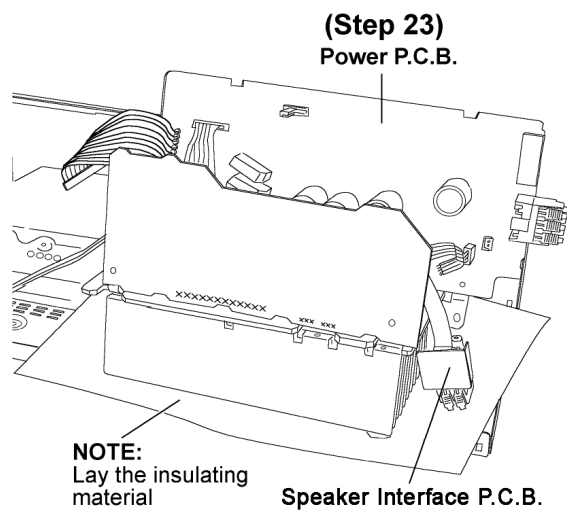
Step 21: Place the Transformer P.C.B., Amplifier P.C.B. and the AC Inlet P.C.B. as shown for checking.



Steps 22: Release the AC Inlet P.C.B. as arrow shown.

• Checking for the Power and Speaker Interface P.C.B.

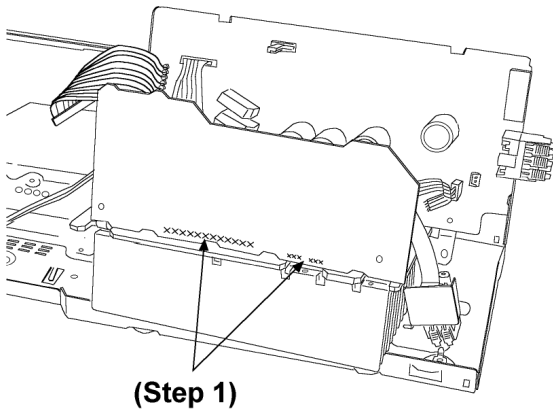
• Checking for the Transformer, Amplifier and AC Inlet P.C.B.



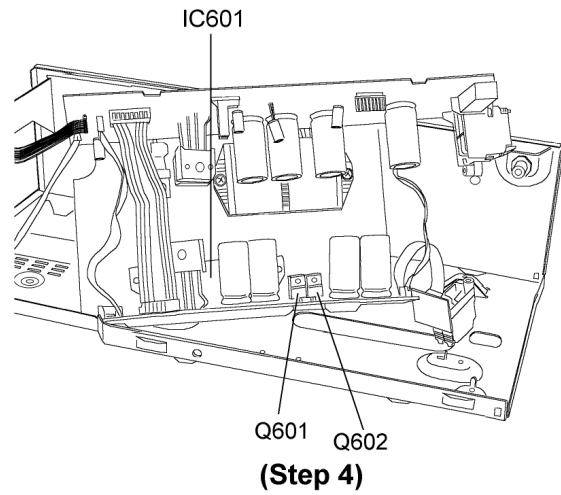
Step 23: Place the Power P.C.B. and the Speaker Interface P.C.B. as shown for checking.

6.3. Main Component Replacement Procedures

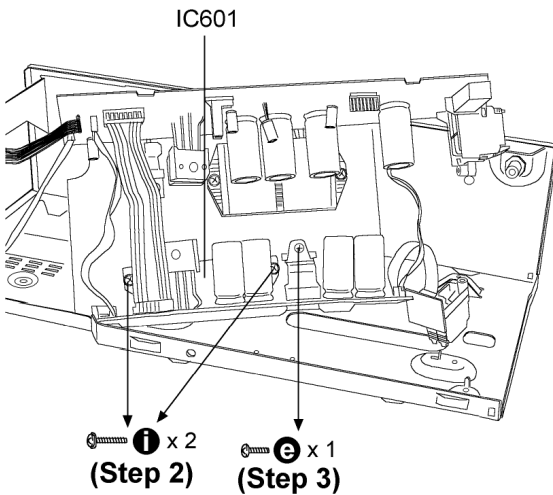
6.3.1. Replacement of the Power ICs and Transistors



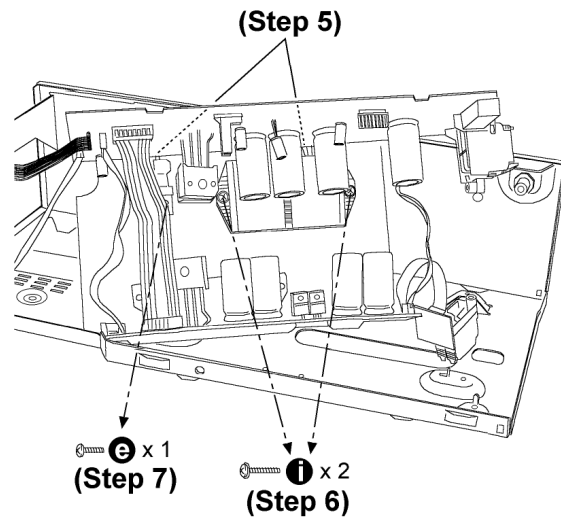
Step 1: Desolder the Power IC and Transistor terminals.



Step 4: Replacement of the Power IC (IC601) and Transistors (Q601 & Q602).

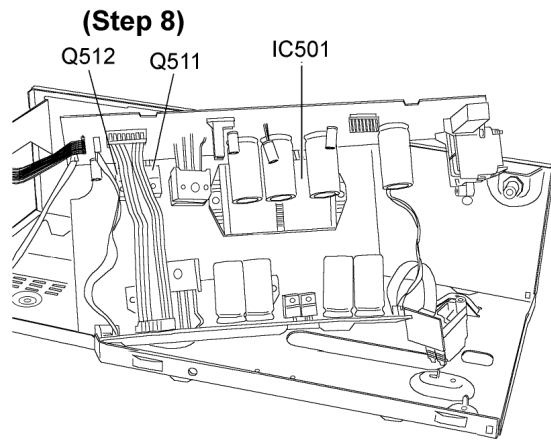


Steps 2 & 3: Remove the screws.



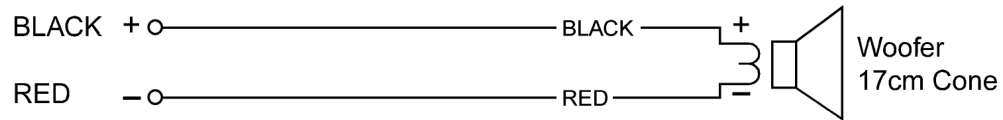
Steps 5: Desolder the Power IC and Transistor terminals.

Steps 6 & 7: Remove the screws.

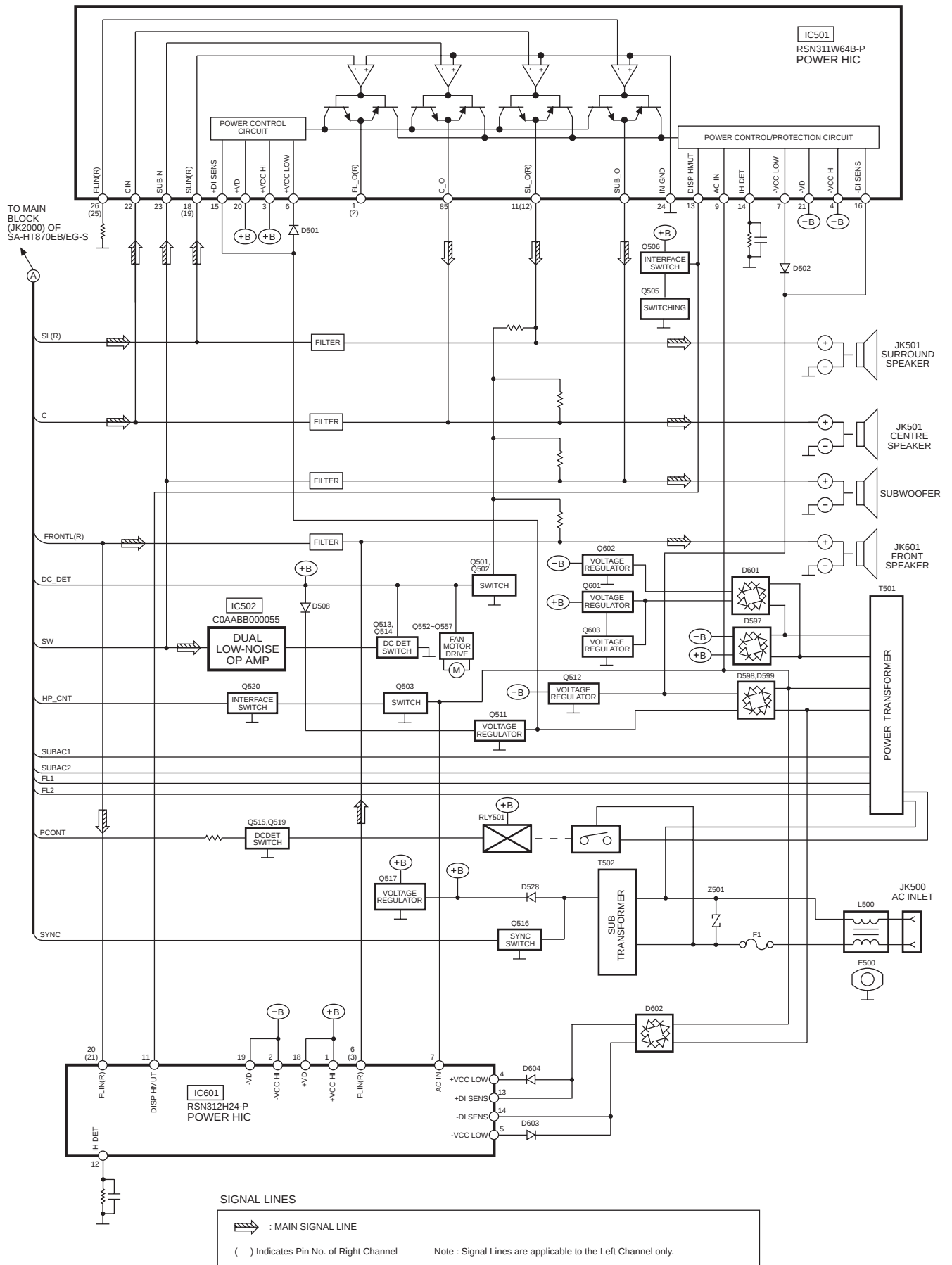


Step 8: Replacement of the Power IC (IC501) and Transistors (Q511 & Q512).

7 Connection of the Speaker Wiring



8 Block Diagram



9 Schematic Diagram

(All schematic diagrams may be modified at any time with the development of the new technology)

Note:

- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
- **Importance safety notice :**
Components identified by  mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-

quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

Caution !

IC, LSI and VLSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

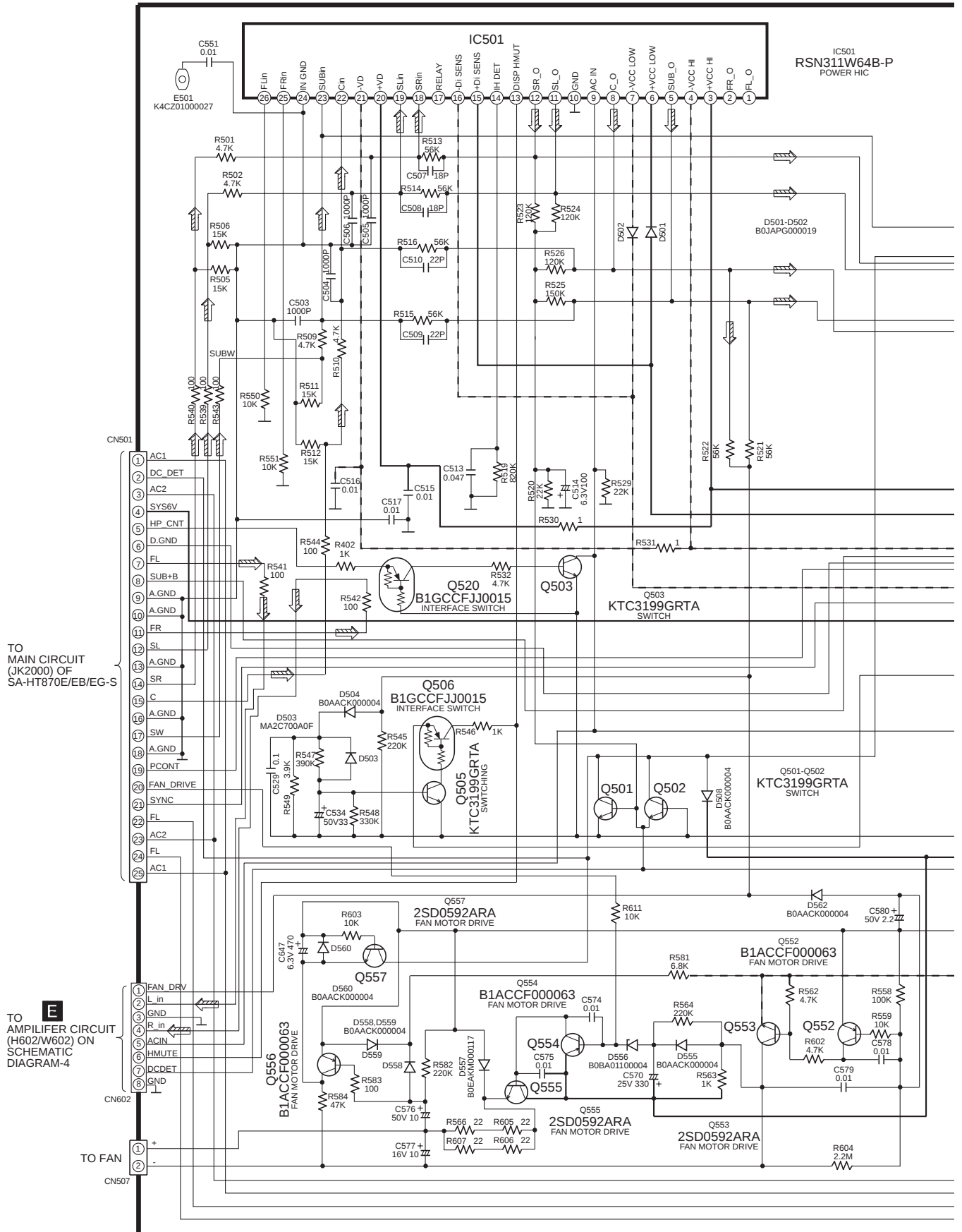
- Cover the parts boxes made of plastics with aluminium foil.
- Put a conductive mat on the work table.
- Ground the soldering iron.
- Do not touch the pins of IC, LSI or VLSI with fingers directly.

SCHEMATIC DIAGRAM-1

A**POWER CIRCUIT**

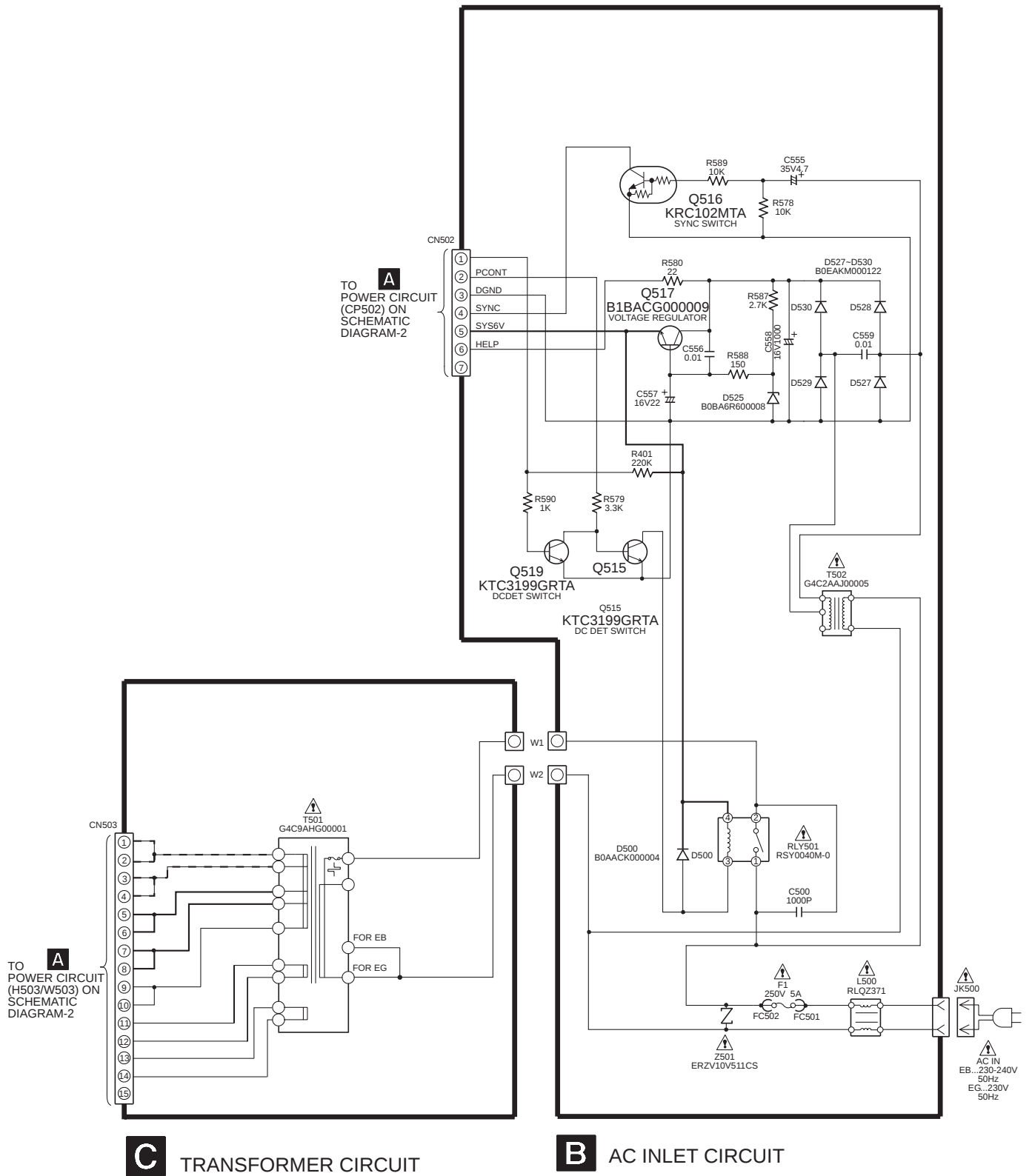
--- : -B SIGNAL LINE
 --- : +B SIGNAL LINE

⇒ : MAIN SIGNAL LINE



SCHEMATIC DIAGRAM-3

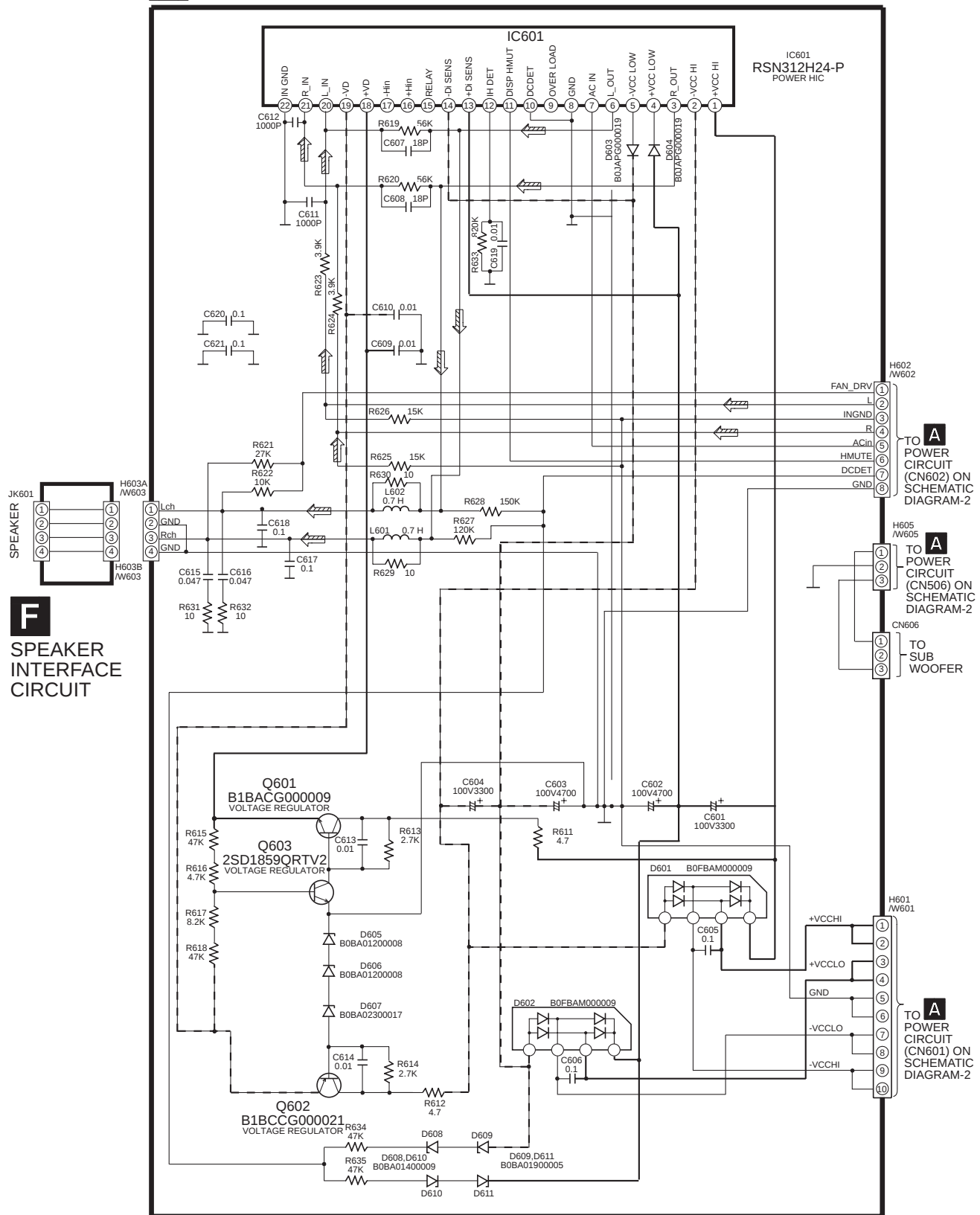
--- : -B SIGNAL LINE
 — : +B SIGNAL LINE



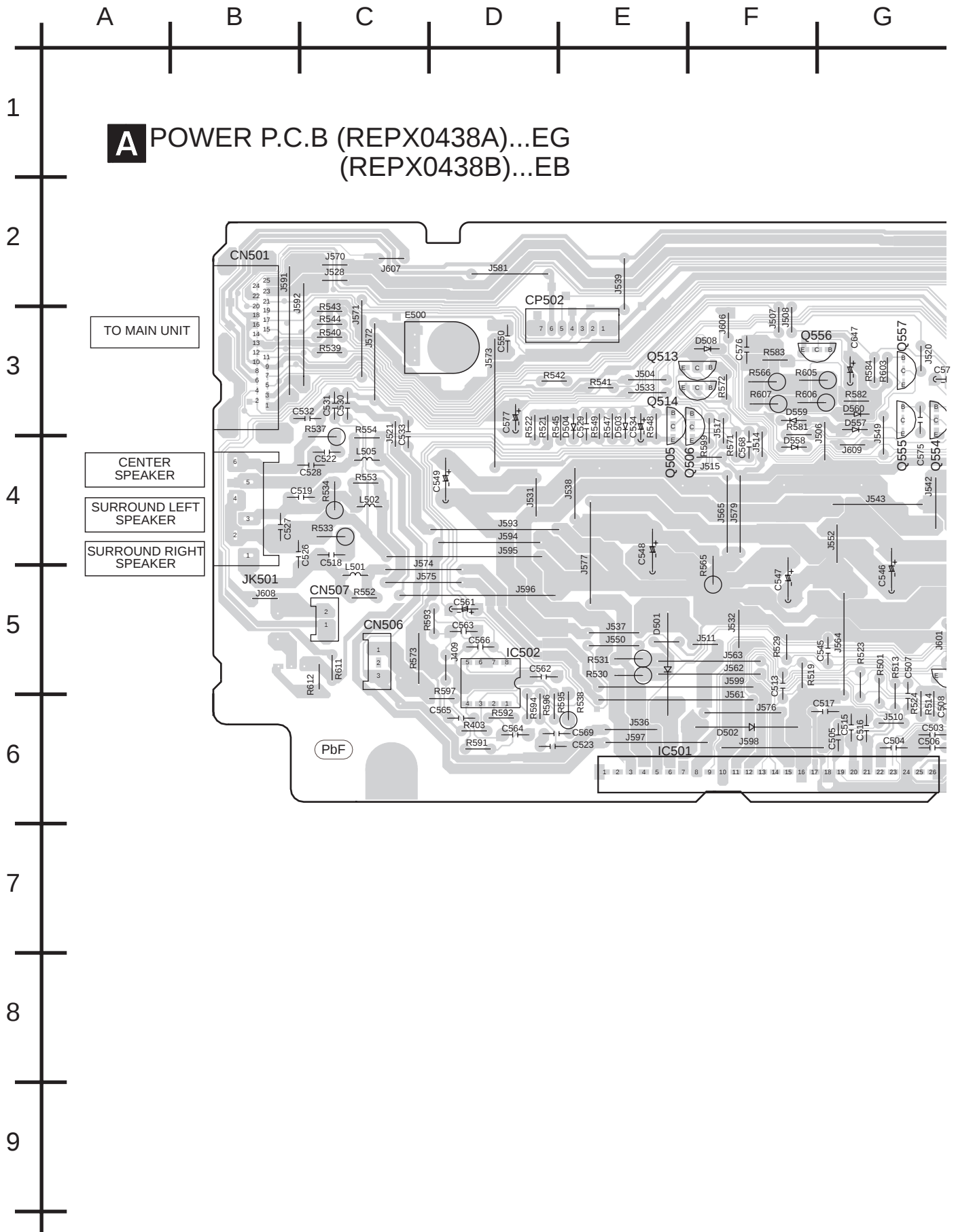
SCHEMATIC DIAGRAM-4

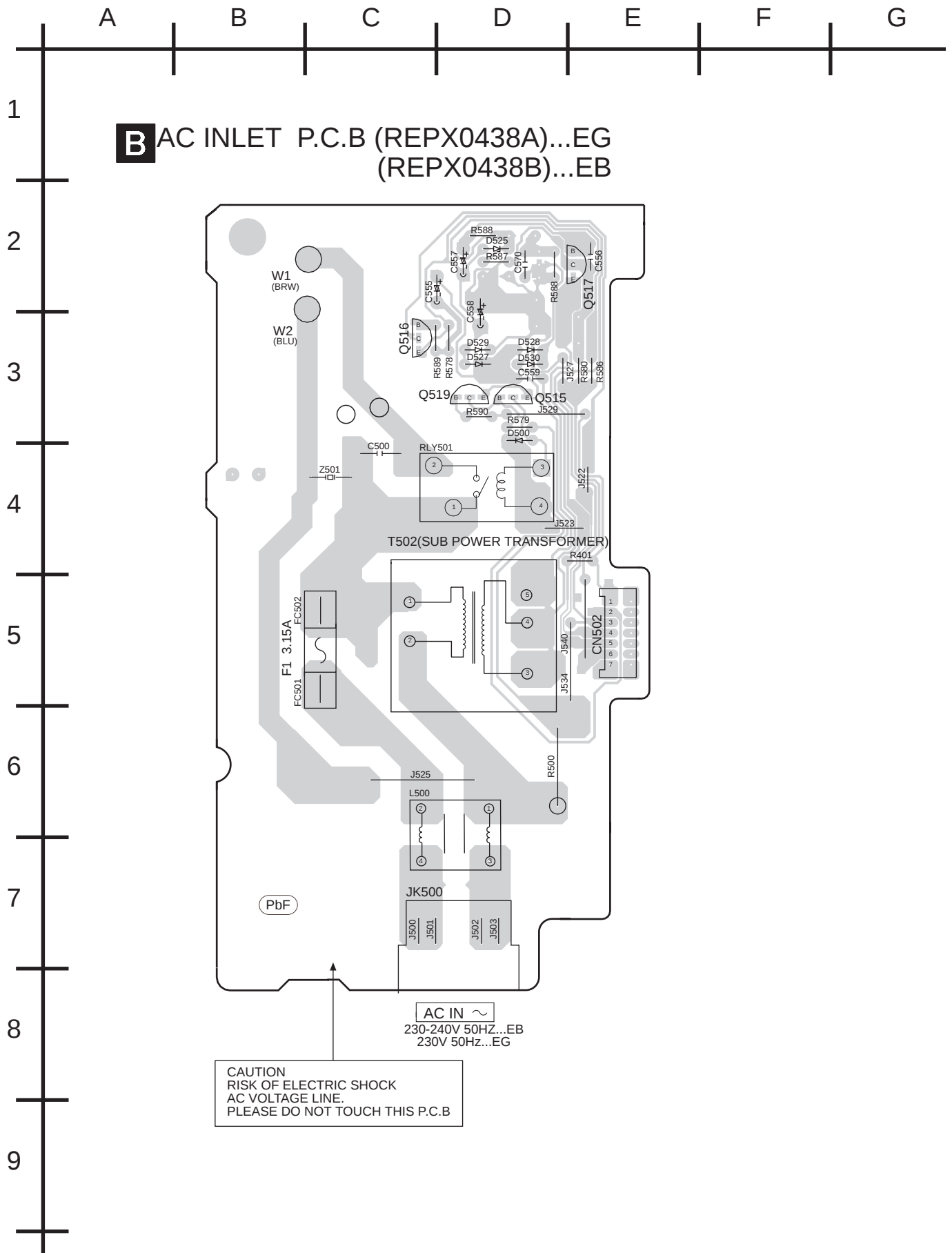
E AMPLIFIER CIRCUIT

--- : -B SIGNAL LINE $\Rightarrow$: MAIN SIGNAL LINE
 --- : +B SIGNAL LINE



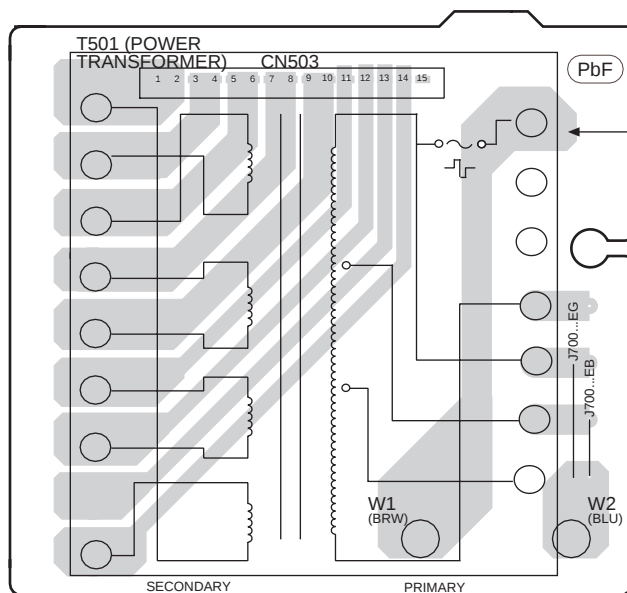
10 Printed Circuit Board





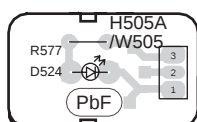
A B C D E F G

1 **C** TRANSFORMER P.C.B (REPX0438A)...EG
(REPX0438B)...EB



CAUTION
RISK OF ELECTRIC SHOCK
AC VOLTAGE LINE. PLEASE DO NOT
TOUCH THIS P.C.B

6 **D** LED P.C.B (REPX0438A)...EG
(REPX0438B)...EB



A B C D E F G

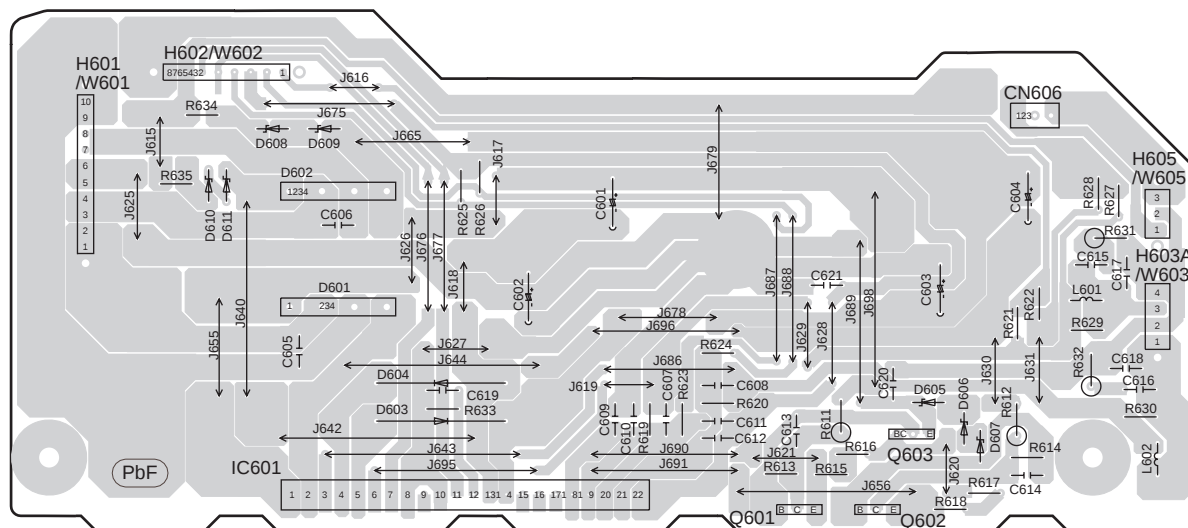
1

E AMPLIFIER P.C.B. (REPX0435B)

2

3

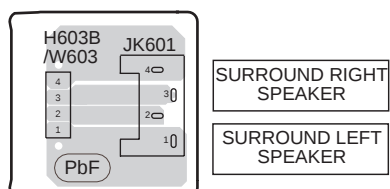
4



5

F SPEAKER INTERFACE P.C.B. (REPX0435B)

6

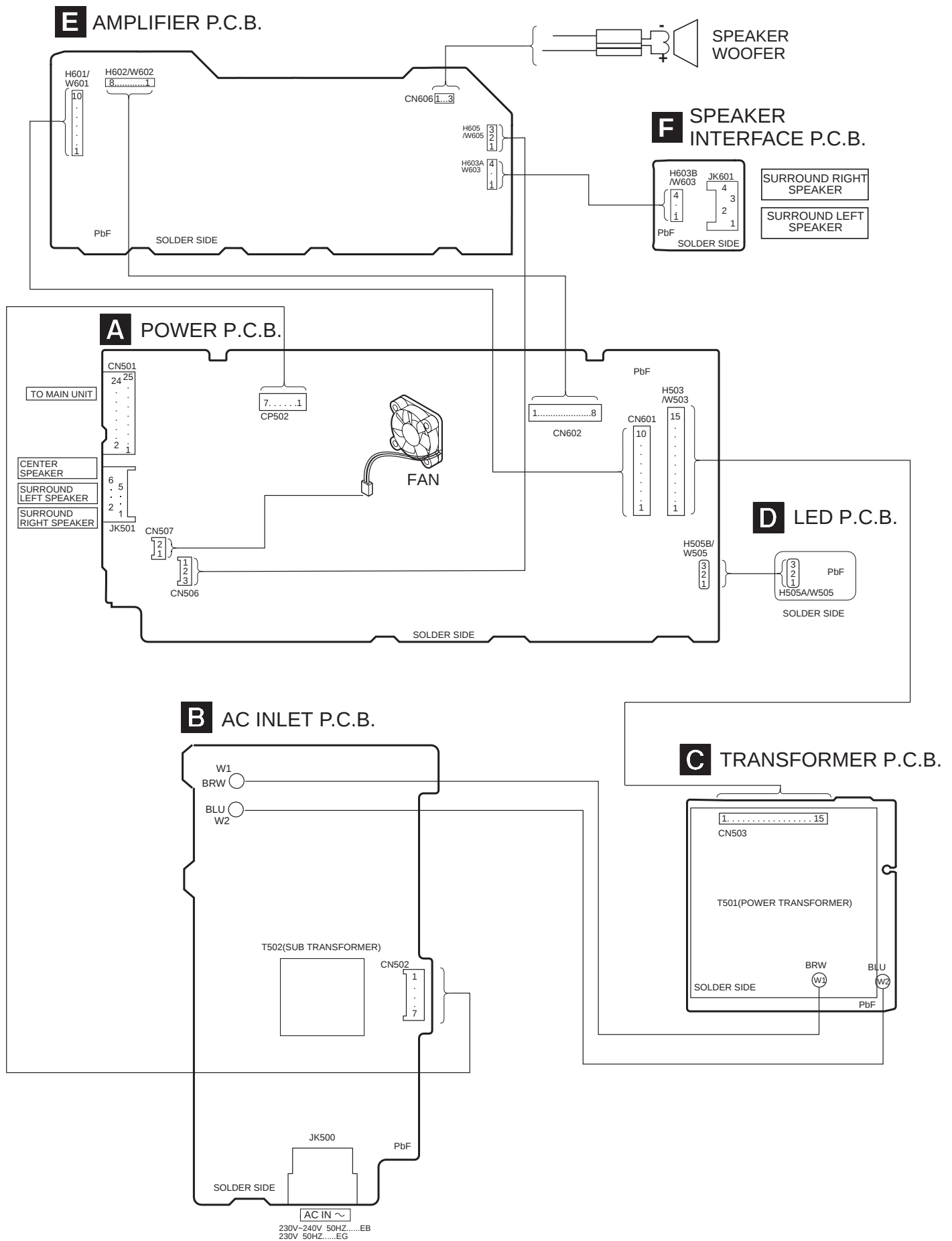


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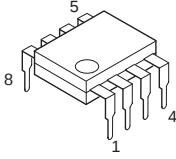
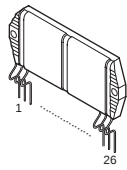
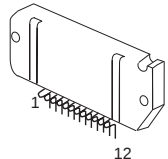
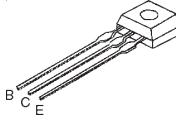
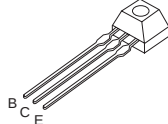
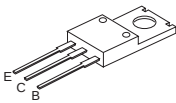
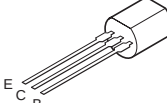
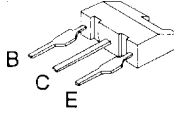
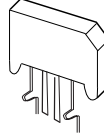
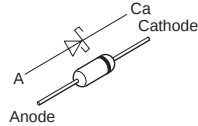
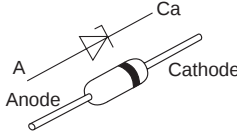
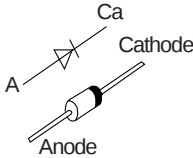
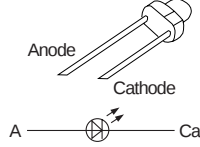
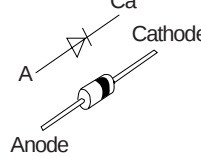
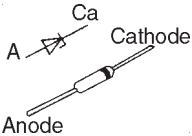
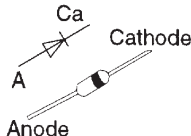
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9

11 Wiring Connection Diagram



12 Illustration of IC's, Transistors and Diodes

C0AABB000055	RSN311W64B-P	RSN312H24-P	KTC3199GRTA	B1GCCFJJ0015 KRC102MTA
				
B1BACG000009 B1BCCG000021	B1ACCF000063 2SD0592ARA	2SD1859QRTV2	B0FBAM000009	MA2C700A0F
				
B0JAPG000019 B0EAKM000117	B0BA6R600008 B0BA5R100013 B0BA01200008 B0BA5R700008 B0BA02300017 B0BA01100004 B0BA01400009			SLI325URCT31
				B0EAKM000122
B0BA01900005	B0AACK000004			
				

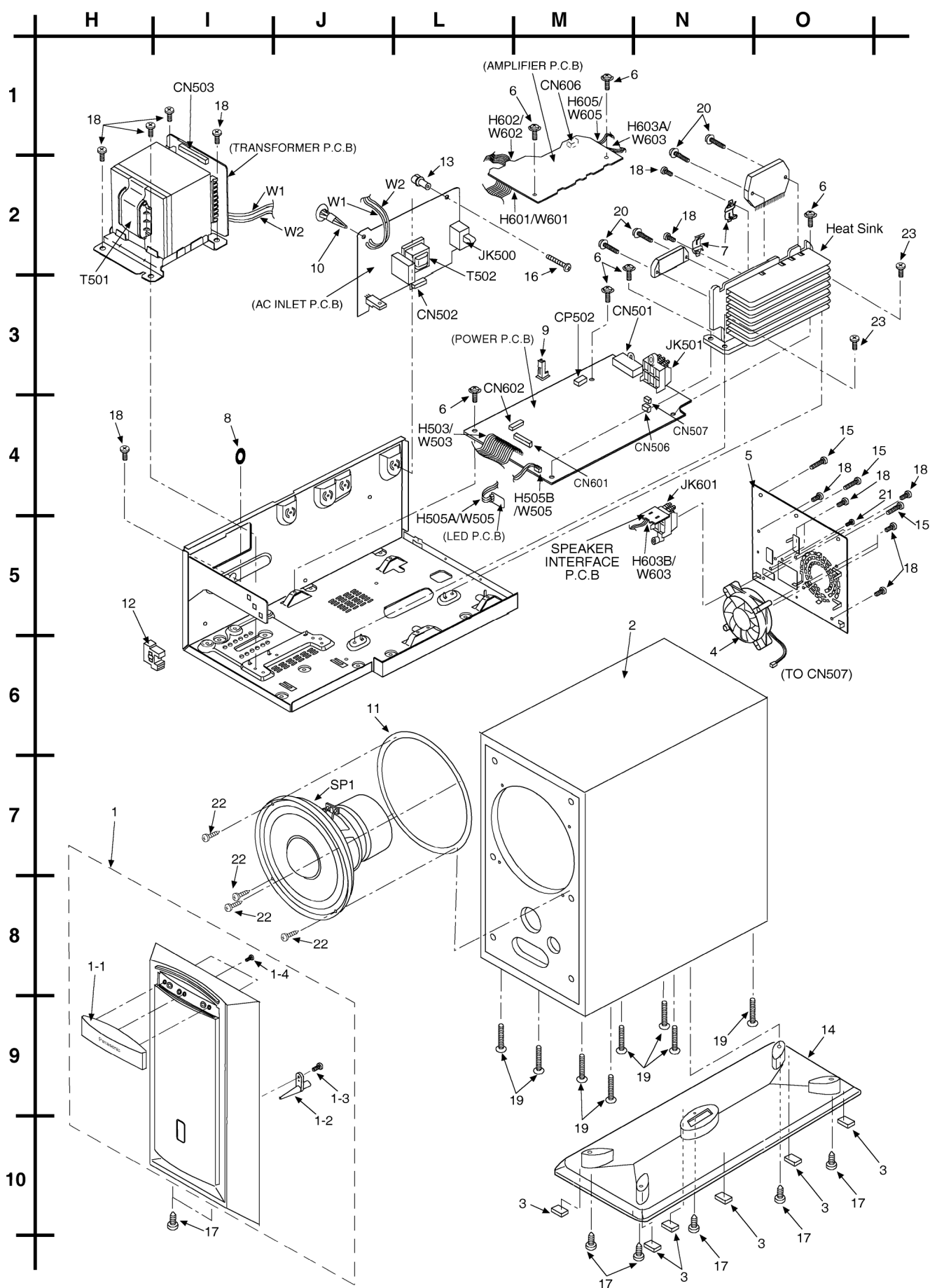
13 Parts Location and Replacement Parts List

Notes:

- Important safety notice:
Components identified by $\triangle$ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardent (resistors), high-quality sound (capacitors), low noise (resistors), etc are used.
When replacing any of these components, be sure to use only manufacturer's specified parts shown in the parts list.
- The parenthesized indications in the Remarks columns specify the areas or colour. (Refer to the cover page for area or colour)
Parts without these indications can be used for all areas.
- Capacitor values are in microfarads (μF) unless specified otherwise, P= Pico-farads (pF), F= Farads.
- Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM).
- The marking (RTL) indicates that the Retention Time is limited for this items. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of a availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
- [M] Markings in the Remarks columns indicates parts supplied by **PAVCSG**.
- The "(SF)" mark denotes the standard part.

13.1. Cabinet

13.1.1. Cabinet Parts Location



13.1.2. Cabinet Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RYQX0142-S	FRONT PANEL ASS'Y	[M]
1-1	RGKX0282	TOP ORNAMENT	[M]
1-2	RGLX0098-Q	LIGHTING CHIP	[M]
1-3	XTB3+12JFZ	SCREW	[M]
1-4	XTB26+8JFZ	SCREW	[M]
2	RFKHBWA870EG	SUB WOOFER ASS'Y	[M]
3	RKAX0018-K	LEG CUSHION	[M]
4	REM0072-3	FAN	[M]
5	RGRX0039AA1A	REAR PANEL	[M] EG
5	RGRX0039AB1A	REAR PANEL	[M] EB
6	RHD30092	SCREW	[M]
7	RMC0158-S	TR-FIXTURE	[M]
8	RMGX0039-KJ	TRANS RUBBER	[M]
9	RMN0203	PCB HOLDER	[M]
10	RMNX0135	SPACER	[M]
11	RMQX0091	EVA PACKING (WOOFER)	[M]
12	RMRX0047-2	LED HOLDER	[M]
13	SHE187-6J	PCB SUPPORT	[M]
14	RGKX0255-S	STAND ORNAMENT	[M]
15	XTB3+16AFZ	SCREW	[M]
16	XTB3+20JFZ	SCREW	[M]
17	XTB4+12AFZ	SCREW	[M]
18	XTBS3+8JFZ1	SCREW	[M]
19	XTS4+20JFZ	SCREW	[M]
20	XTW3+15T	SCREW	[M]
21	XYC26+CJ6FZ	SCREW	[M]
22	XTB4+16AFZ	SCREW	[M]
23	XTB3+10JFZ	SCREW	[M]

13.2. Electrical Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
		PRINTED CIRCUIT BOARD	
	REPX0438A	POWER P.C.B./ AC INLET P.C.B./ TRANSFORMER P.C.B./ LED P.C.B.	[M] (RTL) EG
	REPX0438B	POWER P.C.B./ AC INLET P.C.B./ TRANSFORMER P.C.B./ LED P.C.B.	[M] (RTL) EB
	REPX0435B	AMPLIFIER P.C.B./ SPEAKER INTERFACE P.C.B.	[M] (RTL)
		INTEGRATED CIRCUITS	
IC501	RSN311W64B-P	IC HIC	[M]
IC502	C0AABB000055	IC AMP	[M]
IC601	RSN312H24-P	IC	[M]
		TRANSISTORS	
Q501	KTC3199GRTA	TRANSISTOR	[M]
Q502	KTC3199GRTA	TRANSISTOR	[M]
Q503	KTC3199GRTA	TRANSISTOR	[M]
Q505	KTC3199GRTA	TRANSISTOR	[M]
Q506	B1GCCFJJ0015	TRANSISTOR	[M]
Q511	B1BACG000009	TRANSISTOR	[M]
Q512	B1BCCG000021	TRANSISTOR	[M]
Q513	KTC3199GRTA	TRANSISTOR	[M]
Q514	KTC3199GRTA	TRANSISTOR	[M]
Q515	KTC3199GRTA	TRANSISTOR	[M]
Q516	KRC102MTA	TRANSISTOR	[M]
Q517	B1BACG000009	TRANSISTOR	[M]
Q519	KTC3199GRTA	TRANSISTOR	[M]
Q520	B1GCCFJJ0015	TRANSISTOR	[M]
Q552	B1ACCF000063	TRANSISTOR	[M]
Q553	2SD0592ARA	TRANSISTOR	[M]
Q554	B1ACCF000063	TRANSISTOR	[M]
Q555	2SD0592ARA	TRANSISTOR	[M]
Q556	B1ACCF000063	TRANSISTOR	[M]
Q557	2SD0592ARA	TRANSISTOR	[M]
Q601	B1BACG000009	TRANSISTOR	[M]
Q602	B1BCCG000021	TRANSISTOR	[M]
Q603	2SD1859QRTV2	TRANSISTOR	[M]
		DIODES	
D500	B0AACK000004	DIODE	[M]
D501	B0JAPG000019	DIODE	[M]
D502	B0JAPG000019	DIODE	[M]
D503	MA2C700A0F	DIODE	[M]
D504	B0AACK000004	DIODE	[M]
D508	B0AACK000004	DIODE	[M]
D509	B0BA5R100013	DIODE	[M]
D510	B0BA5R700008	DIODE	[M]
D524	SLI325URCT31	DIODE	[M]
D525	B0BA6R600008	DIODE	[M]
D527	B0EAKM000122	DIODE	[M]
D528	B0EAKM000122	DIODE	[M]
D529	B0EAKM000122	DIODE	[M]
D530	B0EAKM000122	DIODE	[M]
D533	B0BA5R100013	DIODE	[M]
D555	B0AACK000004	DIODE	[M]
D556	B0BA01100004	DIODE	[M]
D557	B0EAKM000117	DIODE	[M]
D558	B0AACK000004	DIODE	[M]
D559	B0AACK000004	DIODE	[M]
D560	B0AACK000004	DIODE	[M]
D561	B0BA01100004	DIODE	[M]
D562	B0AACK000004	DIODE	[M]
D563	B0BA01900005	DIODE	[M]
D564	B0BA01900005	DIODE	[M]
D565	B0BA01900005	DIODE	[M]
D566	B0BA01900005	DIODE	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
D597	B0FBAM000009	DIODE	[M]
D598	B0FBAM000009	DIODE	[M]
D599	B0FBAM000009	DIODE	[M]
D601	B0FBAM000009	DIODE	[M]
D602	B0FBAM000009	DIODE	[M]
D603	B0JAPG000019	DIODE	[M]
D604	B0JAPG000019	DIODE	[M]
D605	B0BA01200008	DIODE	[M]
D606	B0BA01200008	DIODE	[M]
D607	B0BA02300017	DIODE	[M]
D608	B0BA01400009	DIODE	[M]
D609	B0BA01900005	DIODE	[M]
D610	B0BA01400009	DIODE	[M]
D611	B0BA01900005	DIODE	[M]
		CONNECTORS	
CN501	K1FB125B0095	SYSTEM CONNECTOR	[M]
CN502	K1KB07B00020	2P CONNECTOR	[M]
CN503	K1KA15B00016	15P CONNECTOR	[M]
CN506	K1KA03A00006	3P CONNECTOR	[M]
CN507	K1KA02A00008	2P CONNECTOR	[M]
CN601	RJT119W10V	10P CONNECTOR	[M]
CN602	RJT119W08V	8P CONNECTOR	[M]
CN606	K1KA03B00047	3P CONNECTOR	[M]
CP502	K1KA07A00123	2P CONNECTOR	[M]
		COILS & TRANSFORMERS	
L500	RLQZ371	LINE FILTER	[M] △
L501	G0AR76Y00001	CHOKE COIL	[M]
L502	G0AR76Y00001	CHOKE COIL	[M]
L505	G0AR76Y00001	CHOKE COIL	[M]
L601	G0AR76Y00001	CHOKE COIL	[M]
L602	G0AR76Y00001	CHOKE COIL	[M]
T501	G4C9AHG00001	POWER TRANSFORMER	[M] △
T502	G4C2AAJ00005	BACK-UP TRANSFORMER	[M] △
		COMPONENT COMBINATION	
Z501	ERZV10V511CS	ZENER	[M] △
		SPEAKER	
SP1	L0AA20A00004	WOOFER	[M]
		RELAY	
RLY501	RSY0040M-0	PRIMARY RELAY	[M] △
		FUSE	
F1	K5D502BK0006	5A CURRENT FUSE	[M] △
		FUSE HOLDERS	
FC501	EYF52BC	FUSE HOLDER	[M]
FC502	EYF52BC	FUSE HOLDER	[M]
		FUSE PROTECTOR	
FP1	K5G502AA0002	5A FUSE PROTECTOR	[M] △
		HOLDERS	
H503	RJS1A5515	15P WIRE HOLDER	[M]
H505A	K1YZ03000010	3P CABLE HOLDER	[M]
H505B	K1YZ03000010	3P CABLE HOLDER	[M]
H601	K1YF10000006	10P WIRE HOLDER	[M]
H602	RJS1A5508	WIRE HOLDER	[M]
H603A	K1YF04000001	CABLE HOLDER	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
H603B	K1YF04000001	CABLE HOLDER	[M]
H605	RJS1A5503	CABLE HOLDER	[M]
		JACKS	
JK500	K2AA2B000004	JK AC INLET	[M] △
JK501	K4BC06B00043	JK	[M]
JK601	K4BC04B00079	JK SPEAKER TERMINAL	[M]
		WIRES	
W1	REEX0365	PRI WIRE (BROWN)	[M]
W2	REEX0364	PRI WIRE (BLUE)	[M]
W500	REXX0425	15P STRAND TYPE WIRE	[M]
W505	RWJ1103280XX	3P STRAND TYPE WIRE	[M]
W601	REXX0421	10P STRAND TYPE WIRE	[M]
W602	REXX0422	8P STRAND TYPE WIRE	[M]
W603	RWJ4904100XX	4P STRAND TYPE WIRE	[M]
W605	REXX0424	3P STRAND TYPE WIRE	[M]
		RESISTORS	
R401	ERDS2TJ224T	220K 1/4W	[M]
R402	ERDS2TJ102T	1K 1/4W	[M]
R403	ERDS2TJ104T	100K 1/4W	[M]
R501	ERDS2TJ472T	4.7K 1/4W	[M]
R502	ERDS2TJ472T	4.7K 1/4W	[M]
R505	ERDS2TJ153T	15K 1/4W	[M]
R506	ERDS2TJ153T	15K 1/4W	[M]
R509	ERDS2TJ472T	4.7K 1/4W	[M]
R510	ERDS2TJ472T	4.7K 1/4W	[M]
R511	ERDS2TJ153T	15K 1/4W	[M]
R512	ERDS2TJ153T	15K 1/4W	[M]
R513	ERDS2TJ563T	56K 1/4W	[M]
R514	ERDS2TJ563T	56K 1/4W	[M]
R515	ERDS2TJ563T	56K 1/4W	[M]
R516	ERDS2TJ563T	56K 1/4W	[M]
R519	ERDS2TJ824T	820K 1/4W	[M]
R520	ERDS2TJ223T	22K 1/4W	[M]
R521	ERDS2TJ563T	56K 1/4W	[M]
R522	ERDS2TJ563T	56K 1/4W	[M]
R523	ERDS2TJ124T	120K 1/4W	[M]
R524	ERDS2TJ124T	120K 1/4W	[M]
R525	ERDS2TJ154T	150K 1/4W	[M]
R526	ERDS2TJ124T	120K 1/4W	[M]
R529	ERDS2TJ223T	22K 1/4W	[M]
R530	ERD25FVJ1R0T	1 1/4W	[M]
R531	ERD25FVJ1R0T	1 1/4W	[M]
R532	ERDS2TJ472T	4.7K 1/4W	[M]
R533	ERDS1FVJ100T	10 1/2W	[M]
R534	ERDS1FVJ100T	10 1/2W	[M]
R537	ERDS1FVJ100T	10 1/2W	[M]
R538	ERDS1FVJ100T	10 1/2W	[M]
R539	ERDS2TJ101T	100 1/4W	[M]
R540	ERDS2TJ101T	100 1/4W	[M]
R541	ERDS2TJ101T	100 1/4W	[M]
R542	ERDS2TJ101T	100 1/4W	[M]
R543	ERDS2TJ101T	100 1/4W	[M]
R544	ERDS2TJ101T	100 1/4W	[M]
R545	ERDS2TJ224T	220K 1/4W	[M]
R546	ERDS2TJ102T	1K 1/4W	[M]
R547	ERDS2TJ394T	390K 1/4W	[M]
R548	ERDS2TJ334T	330K 1/4W	[M]
R549	ERDS2TJ392T	3.9K 1/4W	[M]
R550	ERDS2TJ103T	10K 1/4W	[M]
R551	ERDS2TJ103T	10K 1/4W	[M]
R552	ERDS2TJ100T	10 1/4W	[M]
R553	ERDS2TJ100T	10 1/4W	[M]
R554	ERDS2TJ100T	10 1/4W	[M]
R558	ERDS2TJ104T	100K 1/4W	[M]
R559	ERDS2TJ103T	10K 1/4W	[M]
R560	ERDS2TJ151T	150 1/4W	[M]
R561	ERDS1FVJ392T	3.9K 1/2W	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
R562	ERDS2TJ472T	4.7K 1/4W	[M]
R563	ERDS1FVJ102T	1K 1/2W	[M]
R564	ERDS2TJ224T	220K 1/4W	[M]
R565	ERDS1FVJ392T	3.9K 1/2W	[M]
R566	ERG2SJ220E	22 2W	[M]
R567	ERDS1FVJ152T	1.5K 1/2W	[M]
R568	ERDS2TJ151T	150 1/4W	[M]
R569	ERDS1FVJ392T	3.9K 1/2W	[M]
R570	ERDS2TJ103T	10K 1/4W	[M]
R571	ERDS2TJ332T	3.3K 1/4W	[M]
R572	ERDS2TJ223T	22K 1/4W	[M]
R573	D0XGR10JA005	0.GR 1/10W	[M]
R575	ERDS2TJ682T	6.8K 1/4W	[M]
R577	ERDS2TJ152T	1.5K 1/4W	[M]
R578	ERDS2TJ103T	10K 1/4W	[M]
R579	ERDS2TJ332T	3.3K 1/4W	[M]
R580	ERDS2TJ220T	22 1/4W	[M]
R581	ERDS2TJ682T	6.8K 1/4W	[M]
R582	ERDS2TJ224T	220K 1/4W	[M]
R583	ERDS2TJ101T	100 1/4W	[M]
R584	ERDS2TJ473T	47K 1/4W	[M]
R587	ERDS2TJ272T	2.7K 1/4W	[M]
R588	ERDS2TJ151T	150 1/4W	[M]
R589	ERDS2TJ103T	10K 1/4W	[M]
R590	ERDS2TJ102T	1K 1/4W	[M]
R591	ERDS2TJ682T	6.8K 1/4W	[M]
R592	ERDS2TJ683T	68K 1/4W	[M]
R593	ERDS2TJ474T	470K 1/4W	[M]
R594	ERDS2TJ103T	10K 1/4W	[M]
R595	ERDS2TJ101T	100 1/4W	[M]
R596	ERDS2TJ473T	47K 1/4W	[M]
R597	ERDS2TJ103T	10K 1/4W	[M]
R598	ERDS1FVJ152T	1.5K 1/2W	[M]
R599	ERDS2TJ223T	22K 1/4W	[M]
R600	ERDS2TJ473T	47K 1/4W	[M]
R601	ERDS2TJ473T	47K 1/4W	[M]
R602	ERDS2TJ472T	4.7K 1/4W	[M]
R603	ERDS2TJ103T	10K 1/4W	[M]
R604	ERDS2TJ225T	2.2M 1/4W	[M]
R605	ERG2SJ220E	22 2W	[M]
R606	ERG2SJ220E	22 2W	[M]
R607	ERG2SJ220E	22 2W	[M]
R608	ERDS1FVJ152T	1.5K 1/2W	[M]
R609	ERDS1FVJ152T	1.5K 1/2W	[M]
R610	ERD2FCVJ4R7T	4.7 1/4W	[M]
R611	ERD2FCVJ4R7T	4.7 1/4W	[M]
R611	ERDS2TJ103T	10K 1/4W	[M]
R612	ERD2FCVJ4R7T	4.7 1/4W	[M]
R613	ERDS2TJ272T	2.7K 1/4W	[M]
R614	ERDS2TJ272T	2.7K 1/4W	[M]
R615	ERDS2TJ473T	47K 1/4W	[M]
R616	ERDS2TJ472T	4.7K 1/4W	[M]
R617	ERDS2TJ822T	8.2K 1/4W	[M]
R618	ERDS2TJ473T	47K 1/4W	[M]
R619	ERDS2TJ563T	56K 1/4W	[M]
R620	ERDS2TJ563T	56K 1/4W	[M]
R621	ERDS2TJ273T	27K 1/4W	[M]
R622	ERDS2TJ103T	10K 1/4W	[M]
R623	ERDS2TJ392T	3.9K 1/4W	[M]
R624	ERDS2TJ392T	3.9K 1/4W	[M]
R625	ERDS2TJ153T	15K 1/4W	[M]
R626	ERDS2TJ153T	15K 1/4W	[M]
R627	ERDS2TJ124T	120K 1/4W	[M]
R628	ERDS2TJ154T	150K 1/4W	[M]
R629	ERDS2TJ100T	10 1/4W	[M]
R630	ERDS2TJ100T	10 1/4W	[M]
R631	ERDS1FVJ100T	10 1/2W	[M]
R632	ERDS1FVJ100T	10 1/2W	[M]
R633	ERDS2TJ824T	820K 1/4W	[M]
R634	ERDS2TJ473T	47K 1/4W	[M]
R635	ERDS2TJ473T	47K 1/4W	[M]
		CAPACITORS	

Ref. No.	Part No.	Part Name & Description	Remarks
C500	ECKWRS102MBC	1000P 400V	[M]
C503	ECBT1H102KB5	1000P 50V	[M]
C504	ECBT1H102KB5	1000P 50V	[M]
C505	ECBT1H102KB5	1000P 50V	[M]
C506	ECBT1H102KB5	1000P 50V	[M]
C507	ECBT1H180JC5	18P 50V	[M]
C508	ECBT1H180JC5	18P 50V	[M]
C509	ECBT1H220JC5	22P 50V	[M]
C510	ECBT1H220JC5	22P 50V	[M]
C513	F1D1H473A012	0.047 50V	[M]
C514	ECEA0JKA101B	100 6.3V	[M]
C515	ECKR2H103ZF5	0.01 500V	[M]
C516	ECKR2H103ZF5	0.01 500V	[M]
C517	ECBT1C103NS5	0.01 16V	[M]
C518	F1D1H473A012	0.047 50V	[M]
C519	F1D1H473A012	0.047 50V	[M]
C522	F1D1H473A012	0.047 50V	[M]
C523	F1D1H473A012	0.047 50V	[M]
C526	F1D1H1040002	0.1 50V	[M]
C527	F1D1H1040002	0.1 50V	[M]
C528	F1D1H473A012	0.047 50V	[M]
C529	F1D1H1040002	0.1 50V	[M]
C530	ECBT1H102KB5	1000P 50V	[M]
C531	ECBT1H102KB5	1000P 50V	[M]
C532	ECBT1H102KB5	1000P 50V	[M]
C533	ECBT1H102KB5	1000P 50V	[M]
C534	ECA1HM330B	33 50V	[M]
C543	ECBT1H102KB5	1000P 50V	[M]
C544	ECA1HM101B	100 50V	[M]
C545	F1D1H1040002	0.1 50V	[M]
C546	ECA1SM332B	3300 100V	[M]
C547	ECA1SM472B	4700 100V	[M]
C548	ECA1SM472B	4700 100V	[M]
C549	ECA1SM332B	3300 100V	[M]
C550	ECBT1C103NS5	0.01 16V	[M]
C551	ECBT1H103KB5	0.01 50V	[M]
C553	ECQE1104KF3	0.1 100V	[M]
C554	ECQE1104KF3	0.1 100V	[M]
C555	ECEA1VKA4R7B	4.7 35V	[M]
C556	ECBT1H103KB5	0.01 50V	[M]
C557	ECEA1CKA220B	22 16V	[M]
C558	ECA1CM102B	1000 16V	[M]
C559	ECBT1H103KB5	0.01 50V	[M]
C560	ECA1HM100B	10 50V	[M]
C561	ECEA1HKA2R2B	2.2 50V	[M]
C562	ECQB1H103JF3	0.01 50V	[M]
C563	ECQV1H154JL3	0.15 50V	[M]
C564	ECBT1C122KR5	1200P 16V	[M]
C565	F1D1H1040002	0.1 50V	[M]
C566	F1D1H1040002	0.1 50V	[M]
C567	ECA1HM100B	10 50V	[M]
C568	ECBT1C103NS5	0.01 16V	[M]
C569	F1D1H473A012	0.047 50V	[M]
C570	ECA1EM331B	330 25V	[M]
C572	ECA1HM101B	100 50V	[M]
C573	ECBT1H102KB5	1000P 50V	[M]
C574	ECBT1H103KB5	0.01 50V	[M]
C575	ECBT1H103KB5	0.01 50V	[M]
C576	RCE1HKN100BG	10P 50V	[M]
C577	ECEA1CKA100B	10 16V	[M]
C578	ECBT1H103KB5	0.01 50V	[M]
C579	ECBT1H103KB5	0.01 50V	[M]
C580	ECEA1HKA2R2B	2.2 50V	[M]
C601	ECA1SM332B	3300 100V	[M]
C602	ECA1SM472B	4700 100V	[M]
C603	ECA1SM472B	4700 100V	[M]
C604	ECA1SM332B	3300 100V	[M]
C605	ECQE1104KF3	0.1 100V	[M]
C606	ECQE1104KF3	0.1 100V	[M]
C607	ECBT1H180JC5	18P 50V	[M]
C608	ECBT1H180JC5	18P 50V	[M]
C609	ECKR2H103ZF5	0.01 500V	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
C610	ECKR2H103ZF5	0.01 500V	[M]
C611	ECBT1H102KB5	1000P 50V	[M]
C612	ECBT1H102KB5	1000P 50V	[M]
C613	ECKR1H103ZF5	0.01 50V	[M]
C614	ECKR1H103ZF5	0.01 50V	[M]
C615	F1D1H473A012	0.047 50V	[M]
C616	F1D1H473A012	0.047 50V	[M]
C617	F1D1H1040002	0.1 50V	[M]
C618	F1D1H1040002	0.1 50V	[M]
C619	F1D1H473A012	0.047 50V	[M]
C620	F1D1H1040002	0.1 50V	[M]
C621	F1D1H1040002	0.1 50V	[M]
C647	ECA0JM471B	470 6.3V	[M]

13.3. Packing Materials & Accessories Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIALS	

Ref. No.	Part No.	Part Name & Description	Remarks
P1	RPNX0248	POLYFOAM	[M]
P2	RPFx0087	MIRAMAT BAG	[M]

13.4. Packaging

