

Service Manual



GM-5000T/X1R/EW

ORDER NO.
CRT3238

BRIDGEABLE POWER AMPLIFIER

GM-5000T X1R/EW

GM-5000T X1R/UC

GM-5000T X1R/ES



For details, refer to "Important symbols for good services".

SAFETY INFORMATION

UC model

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

● Service Precaution

You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

[Important symbols for good services]

In this manual, the symbols shown-below indicate that adjustments, settings or cleaning should be made securely. When you find the procedures bearing any of the symbols, be sure to fulfill them:

1. Product safety



You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

2. Adjustments



To keep the original performances of the product, optimum adjustments or specification confirmation is indispensable. In accordance with the procedures or instructions described in this manual, adjustments should be performed.

3. Cleaning



For optical pickups, tape-deck heads, lenses and mirrors used in projection monitors, and other parts requiring cleaning, proper cleaning should be performed to restore their performances.

4. Shipping mode and shipping screws



To protect the product from damages or failures that may be caused during transit, the shipping mode should be set or the shipping screws should be installed before shipping out in accordance with this manual, if necessary.

5. Lubricants, glues, and replacement parts



Appropriately applying grease or glue can maintain the product performances. But improper lubrication or applying glue may lead to failures or troubles in the product. By following the instructions in this manual, be sure to apply the prescribed grease or glue to proper portions by the appropriate amount. For replacement parts or tools, the prescribed ones should be used.

■ 5 ■ 6 7 ■ 8 ■

CONTENTS

SAFETY INFORMATION	2	5. ELECTRICAL PARTS LIST	18
1. SPECIFICATIONS	3	6. ADJUSTMENT	20
2. EXPLODED VIEWS AND PARTS LIST	4	7. GENERAL INFORMATION	21
2.1 PACKING	4	7.1 DIAGNOSIS	21
2.2 EXTERIOR	6	7.1.1 DISASSEMBLY	21
3. SCHEMATIC DIAGRAM	8	7.1.2 CONNECTOR FUNCTION DESCRIPTION	22
3.1 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)	8	8. OPERATIONS	23
4. PCB CONNECTION DIAGRAM	14		
4.1 AMP UNIT	14		

1. SPECIFICATIONS

Power source	14.4 V DC (10.8 — 15.1 V allowable)
Grounding system	Negative type
Backup current	5.1 mA or less
Current consumption	25.0 A (at continuous power, 4 Ω)
Average current drawn*	9.6 A (4 Ω for two channels) 17.3 A (4 Ω for one channel)
Fuse	25 A × 2
Dimensions	300 (W) × 61 (H) × 324 (D) mm
Weight	5.5 kg (Leads for wiring not included)
Maximum power output	250 W × 2 / 760 W × 1
Continuous power output	175 W × 2 / 530 W × 1 (DIN45324, +B=14.4 V)
Load impedance	4 Ω (2 — 8 Ω allowable) (Bridge connection: 4 — 8 Ω allowable)
Frequency response	10 — 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio	100 dB (IEC-A network)
Distortion	0.008 % (10 W, 1 kHz)
Separation	65 dB (1 kHz)
Low pass filter	Cut off frequency: 80 Hz Cut off slope: -12 dB/oct
Maximum input level/impedance	RCA: 6.5 V/22 kΩ (0.2 — 6.5 V)

Note:

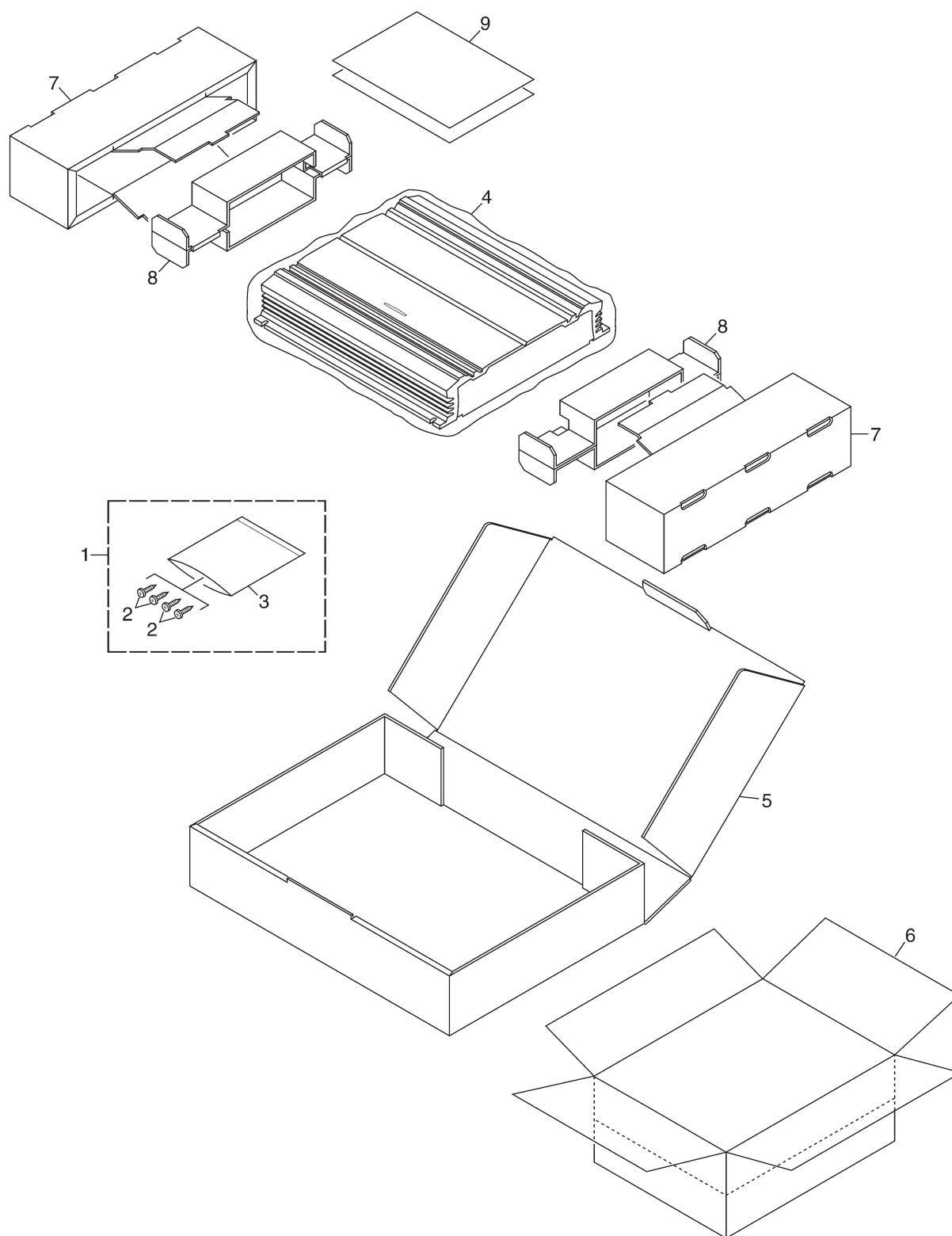
- Specifications and the design are subject to possible modification without notice due to improvements.

***Average current drawn**

- The average current drawn is nearly the maximum current drawn by this unit when an audio signal is input. Use this value when working out total current drawn by multiple power amplifiers.

2. EXPLODED VIEWS AND PARTS LIST

2.1 PACKING



NOTE:

- Parts marked by “*” are generally unavailable because they are not in our Master Spare Parts List.
- Screws adjacent to ∇ mark on the product are used for disassembly.
- For the applying amount of lubricants or glue, follow the instructions in this manual.
(In the case of no amount instructions, apply as you think it appropriate.)

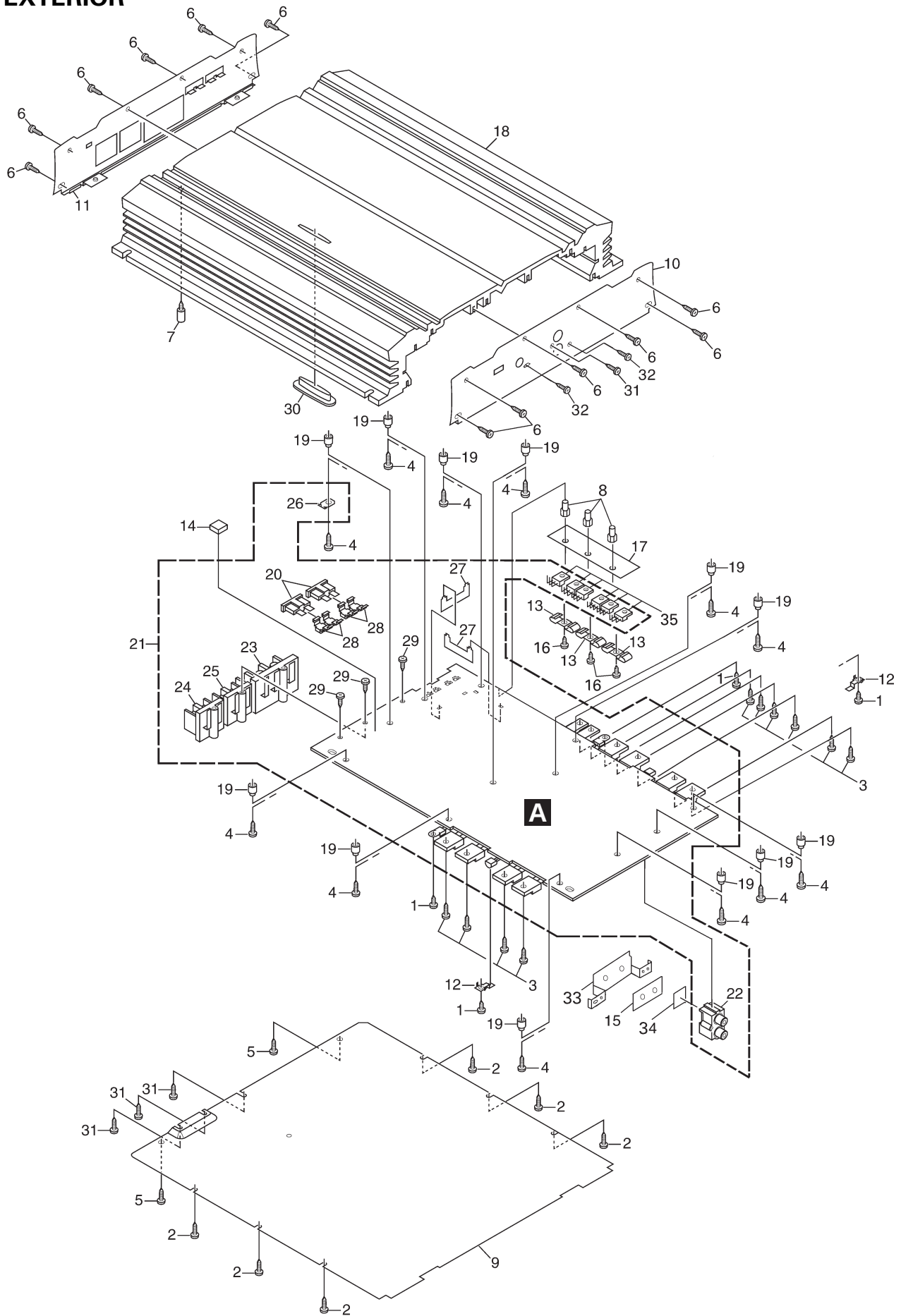
● PACKING SECTION PARTS LIST

Mark No.	Description	Part No.		
		GM-5000T/X1R/EW	GM-5000T/X1R/UC	GM-5000T/X1R/ES
1	Screw Assy	HEA0058	HEA0058	HEA0058
2	Screw	BYC40P180FZK	BYC40P180FZK	BYC40P180FZK
3	Polyethylene Bag	HEG0011	HEG0011	HEG0011
4	Polyethylene Bag	HEG0022	HEG0022	HEG0022
5	Carton	HHG0433	HHG0433	HHG0433
6	Contain Box	HHL0433	HHL0433	HHL0433
7	Protector	HHP0249	HHP0249	HHP0249
8	Protector	HHP0251	HHP0251	HHP0251
9-1	Owner's Manual	HRD0260	HRD0259	HRD0261
9-2	Owner's Manual	Not used	Not used	HRD0262
*	9-3 Warranty Card	HRY1157	ARY1048	Not used

● Owner's Manual

Part No.	Language
HRD0259	English, French
HRD0260	English, Spanish, German, French, Italian, Dutch
HRD0261	English, Spanish
HRD0262	Arabic, Portuguese(B)

2.2 EXTERIOR



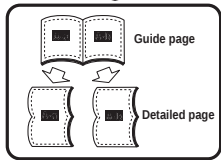
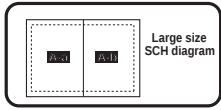
● EXTERIOR SECTION PARTS LIST

Mark No.	Description	Part No.
1	Screw	BBZ30P050FTC
2	Screw	BBZ30P060FTC
3	Screw	BBZ30P080FTC
4	Screw	BBZ30P120FTC
5	Screw	BSZ30P050FTC
6	Screw(M3x8)	HBA0011
7	Screw(M3)	HBA0028
8	Stud	HLA0021
9	Case	HNB0135
10	Panel	HNB0256
11	Panel	HNB0260
12	Holder	HNC0080
13	Clip	HNC0189
14	Spacer	HNM0006
15	Insulator	HNM0193
16	Screw	BMZ30P050FTC
17	Insulator	HNM0195
18	Heat Sink	HNR0279
19	Spacer	HNV0016
20	Fuse(25A)	HEK0025
21	Amp Unit(EW)	HWH0237
	Amp Unit(UC)	HWH0238
	Amp Unit(ES)	HWH0239
22	Pin Jack(CN851)	HKB0002
23	Terminal(CN853)	HKE0020
24	Terminal(CN854)	HKE0021
25	Terminal(CN855)	HKE0021
26	Terminal(CN850)	HKF0001
27	Buss Bar	HNC0043
28	Holder	HNC0082
29	Screw	PPZ30P100SAD
30	Light Pipe Unit	HXA0322
31	Screw	PPZ30P120FZK
32	Screw	BSZ30P050FZK
33	Holder	HNC0202
34	Insulator	HNM0193
35	FET(Q905,Q906,Q911-Q914)	IRF1010N

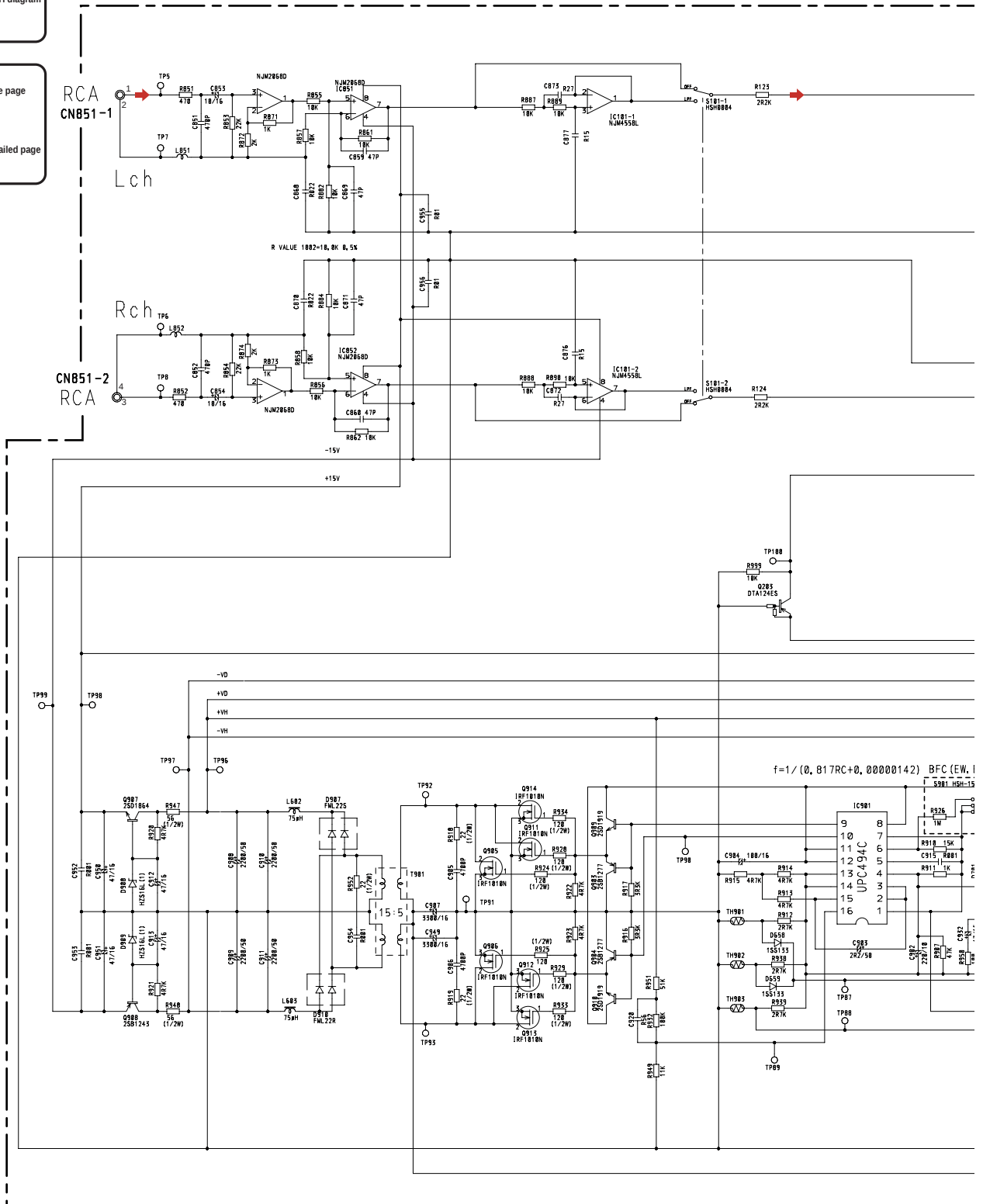
3. SCHEMATIC DIAGRAM

3.1 OVERALL CONNECTION DIAGRAM (GUIDE PAGE)

Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".

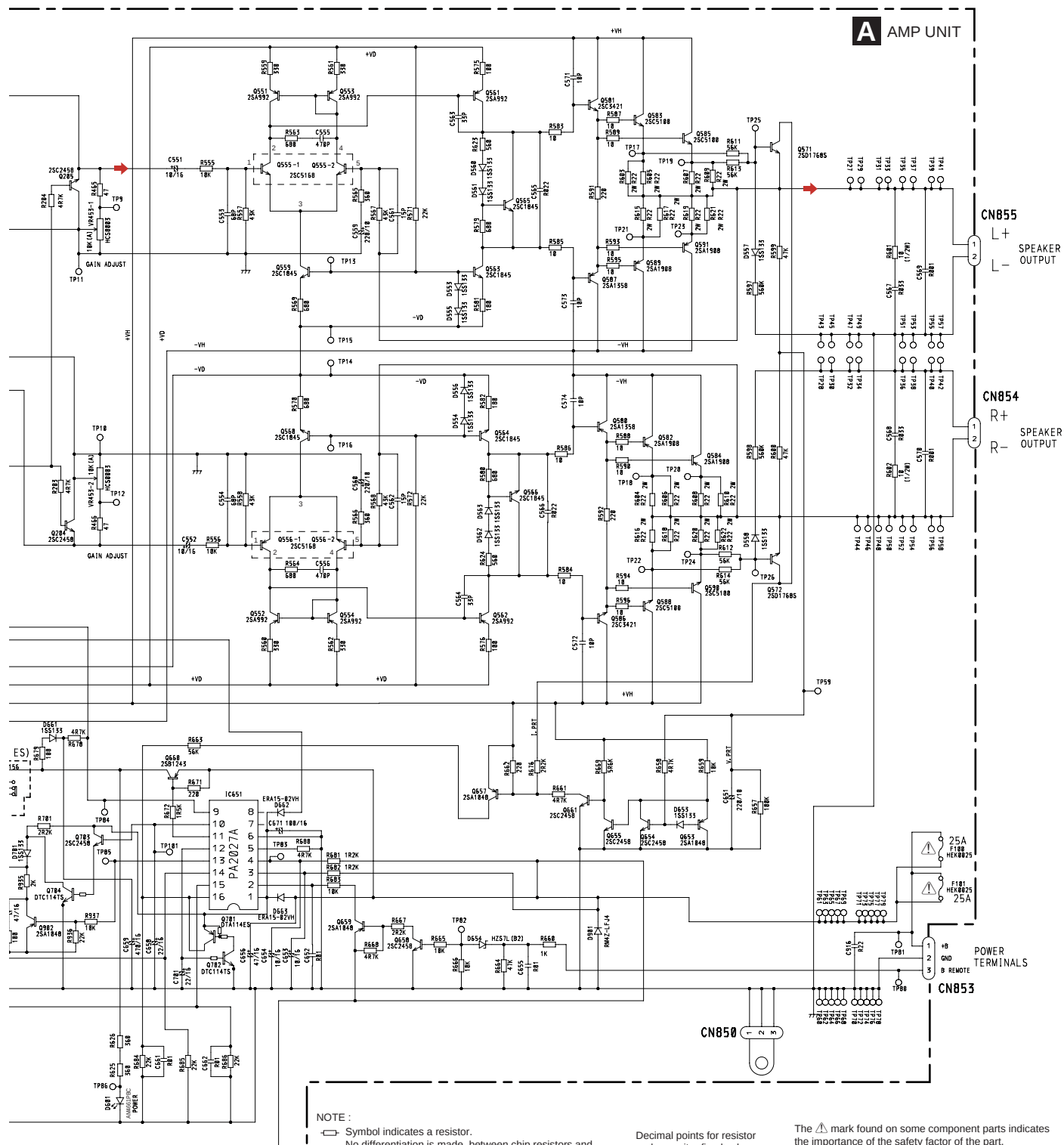


A-a

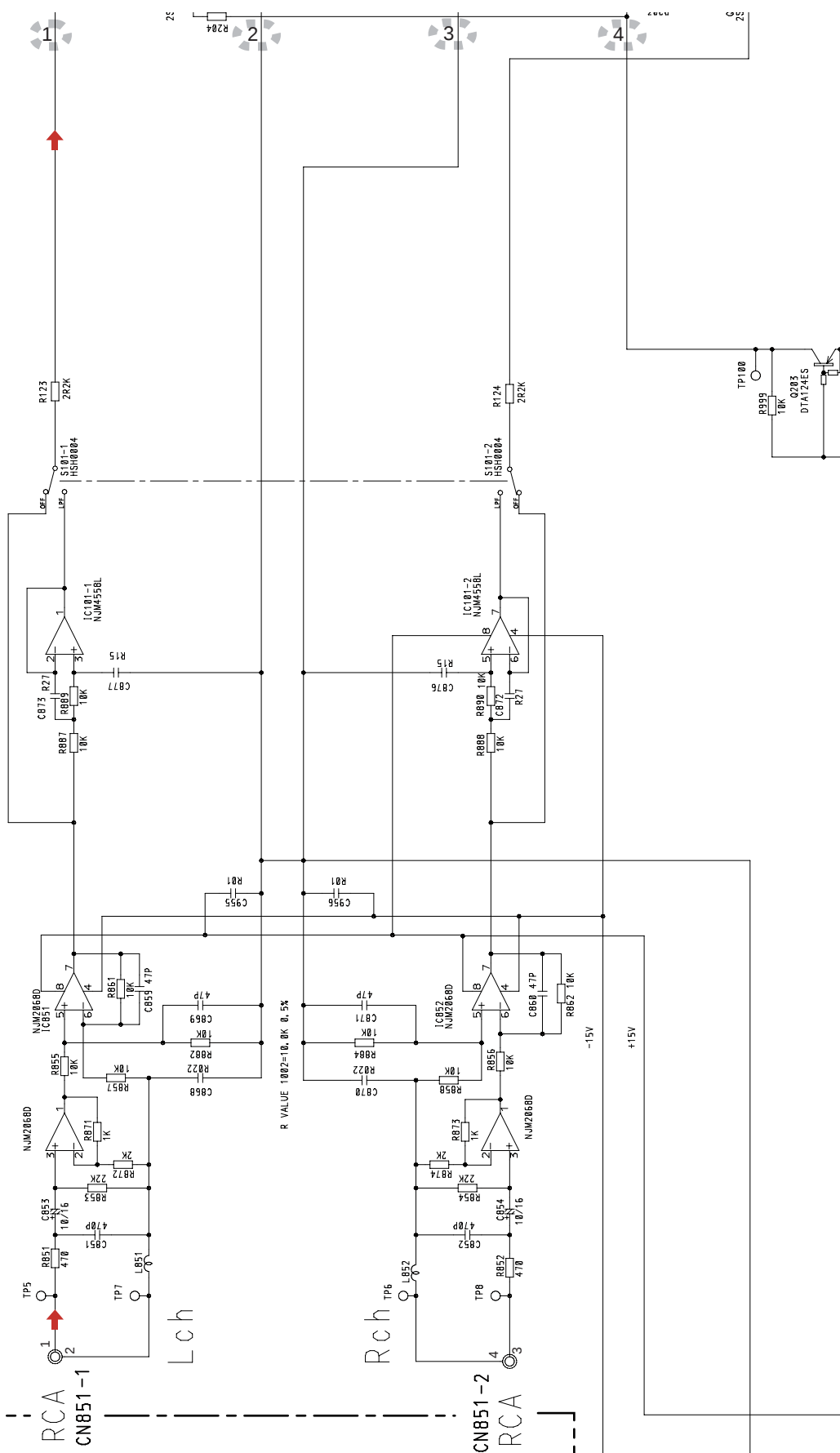


A

A-b



A-a	A-b
-----	-----



A-a

A-b

A

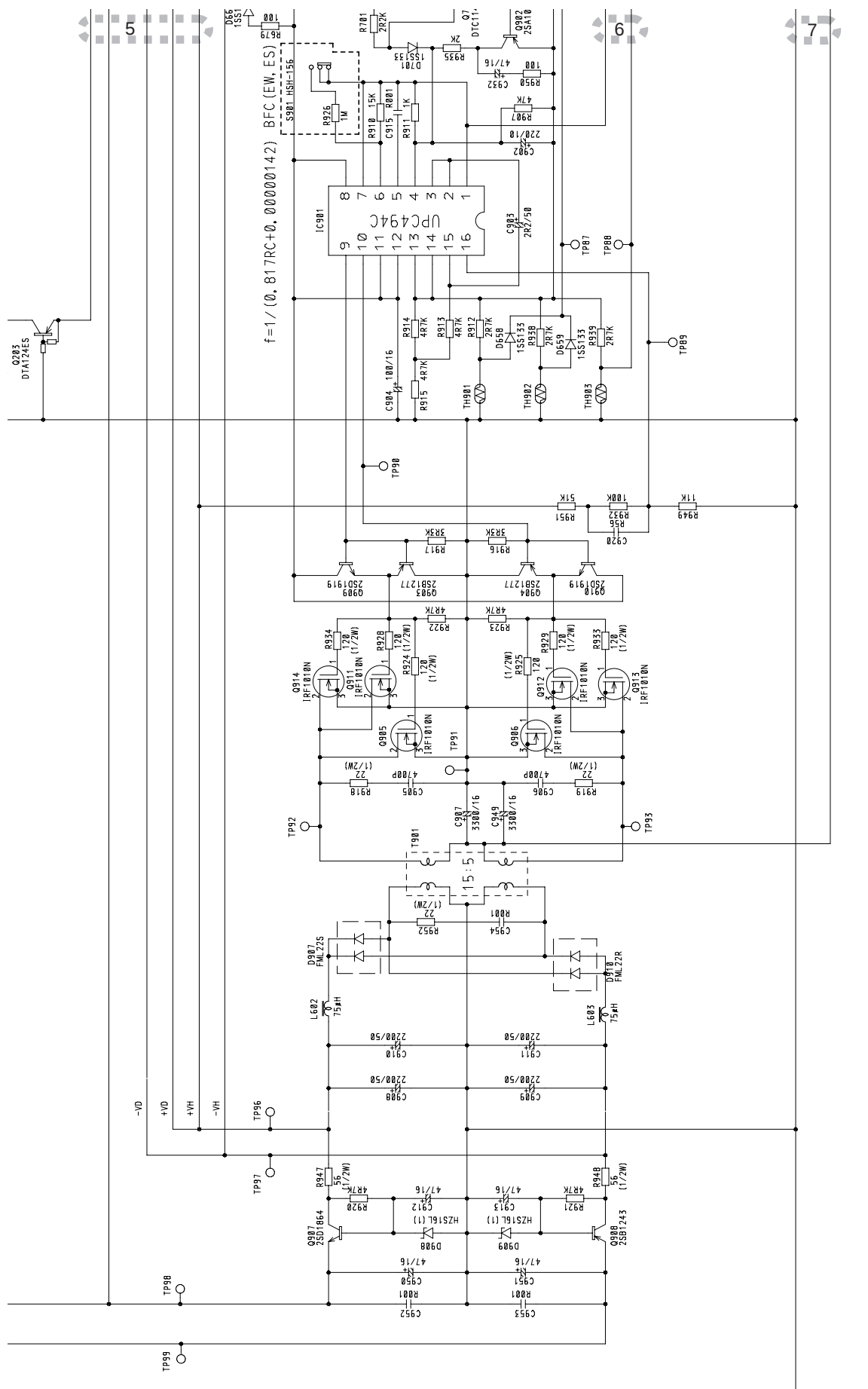
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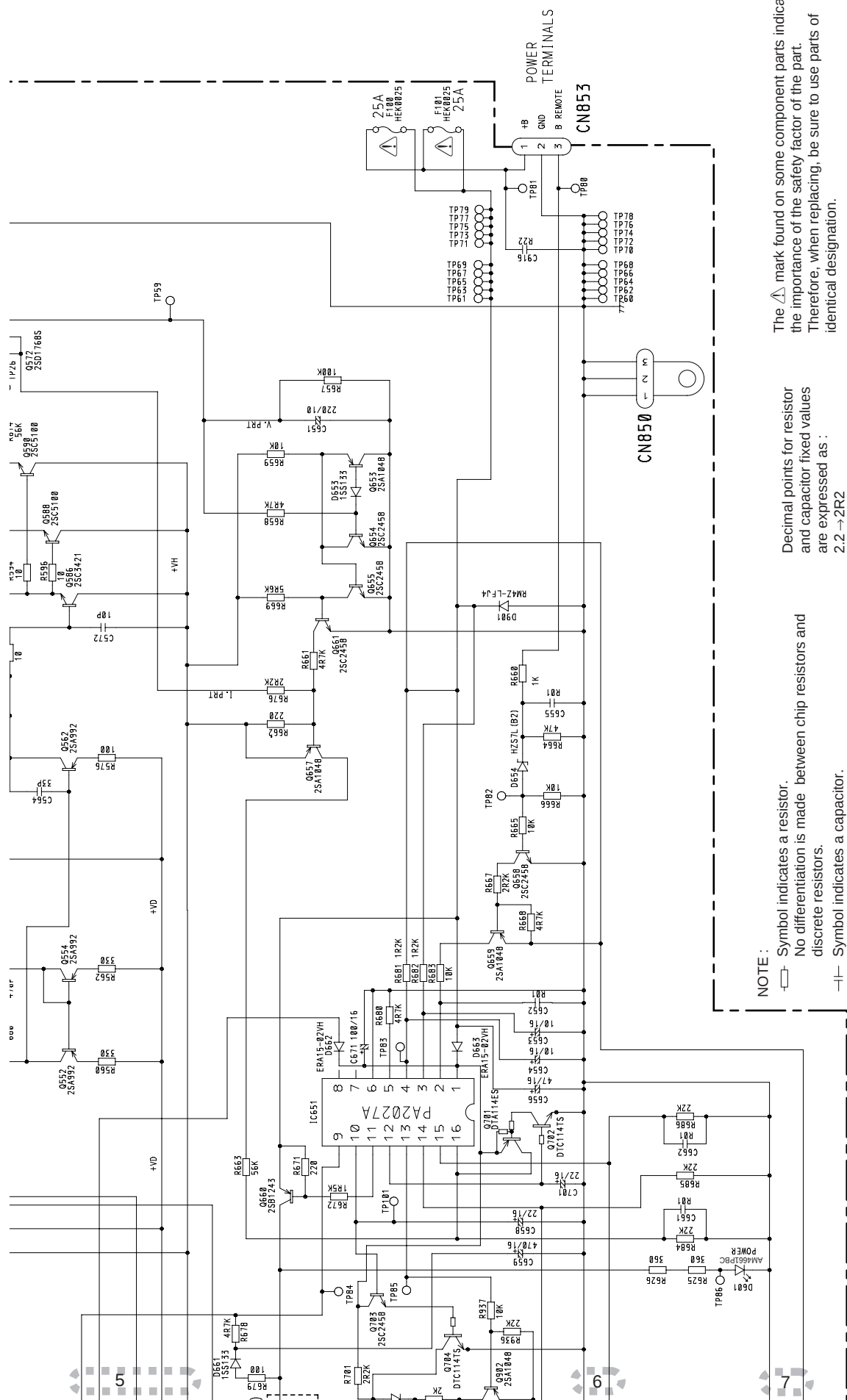
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NOTE:

 Symbol indicates a resistor.

No differentiation is made between chip resistors and discrete resistors.

—||— Symbol indicates a capacitor.

No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as :

2.2 $\rightarrow$ 2R2

 $0.022 \rightarrow R022$

The $\triangle$ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

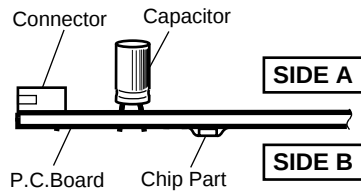
4. PCB CONNECTION DIAGRAM

4.1 AMP UNIT

NOTE FOR PCB DIAGRAMS

1. The parts mounted on this PCB include all necessary parts for several destination.
For further information for respective destinations, be sure to check with the schematic diagram.

2. Viewpoint of PCB diagrams



A AMP UNIT

IC: Q
Q912 Q913
Q914 Q906
Q903 Q911
Q565 Q581
Q587 Q587
Q585 Q585
Q589 Q591

Q561

IC851
Q571

Q563 Q563
Q909 Q909

Q910 Q910
Q559 Q559
Q904 Q904

Q555 Q555
Q551 Q551
Q600 Q600
Q907 Q907

IC901
IC852

IC651
Q658

Q902 Q659

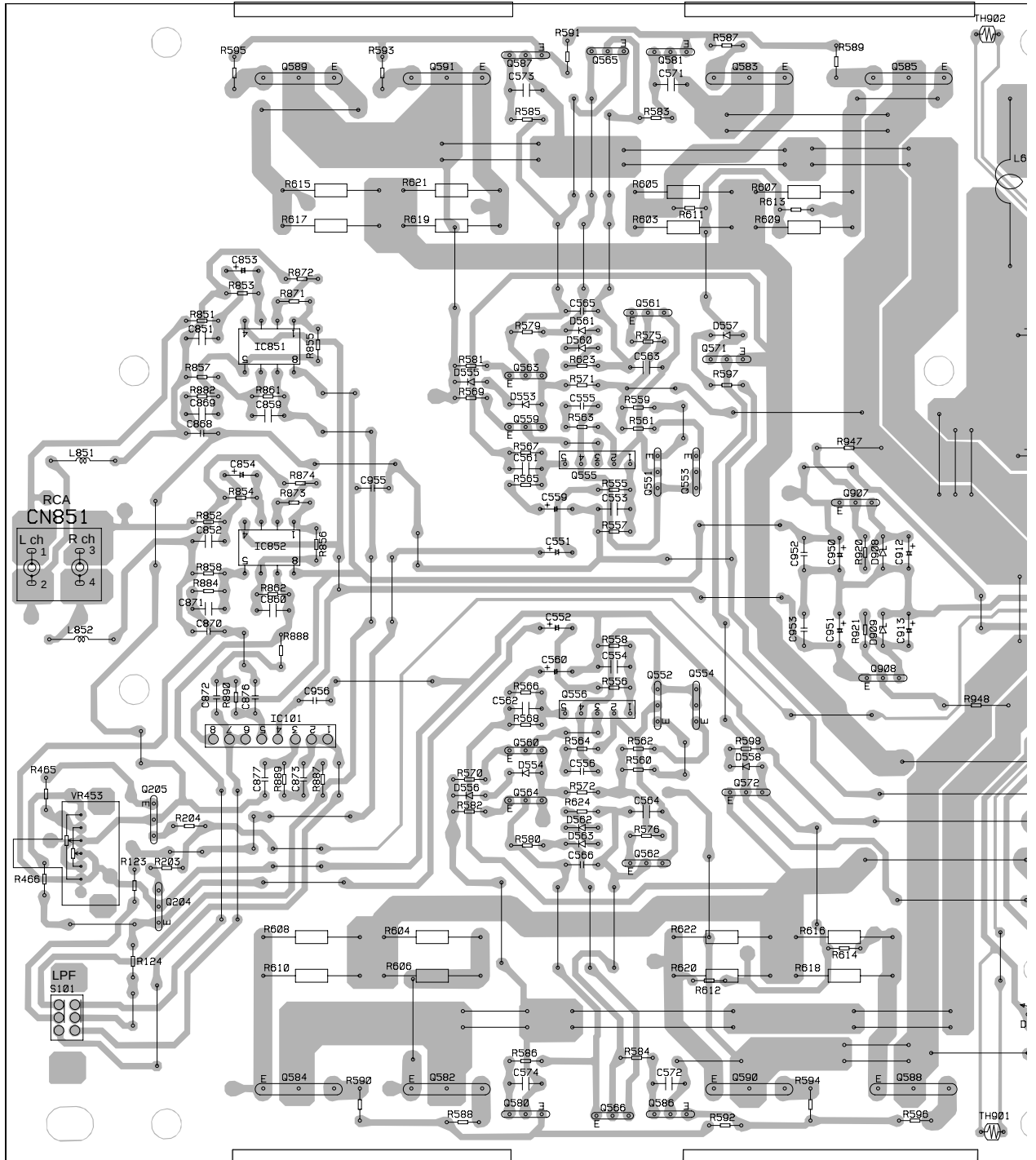
Q908 Q908
Q552 Q554

Q556 Q703
Q203 Q203
IC101 Q704

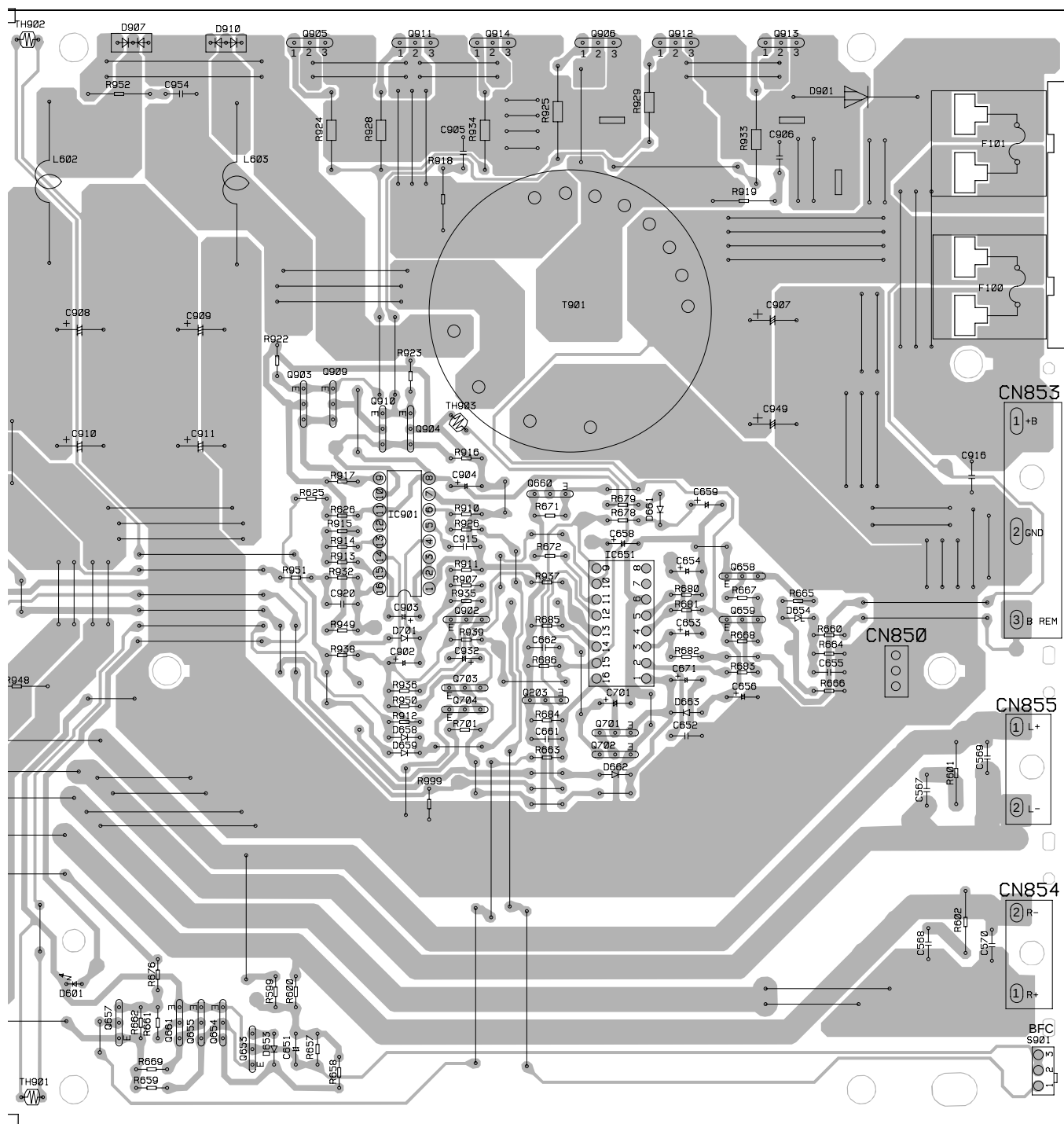
Q560 Q701
Q702 Q702
Q572 Q572
Q205 Q564

Q562 Q562
Q204 Q204

Q653 Q654
Q657 Q661
Q590 Q592
Q584 Q582
Q566 Q586
Q580 Q580



SIDE A



A

A AMP UNIT

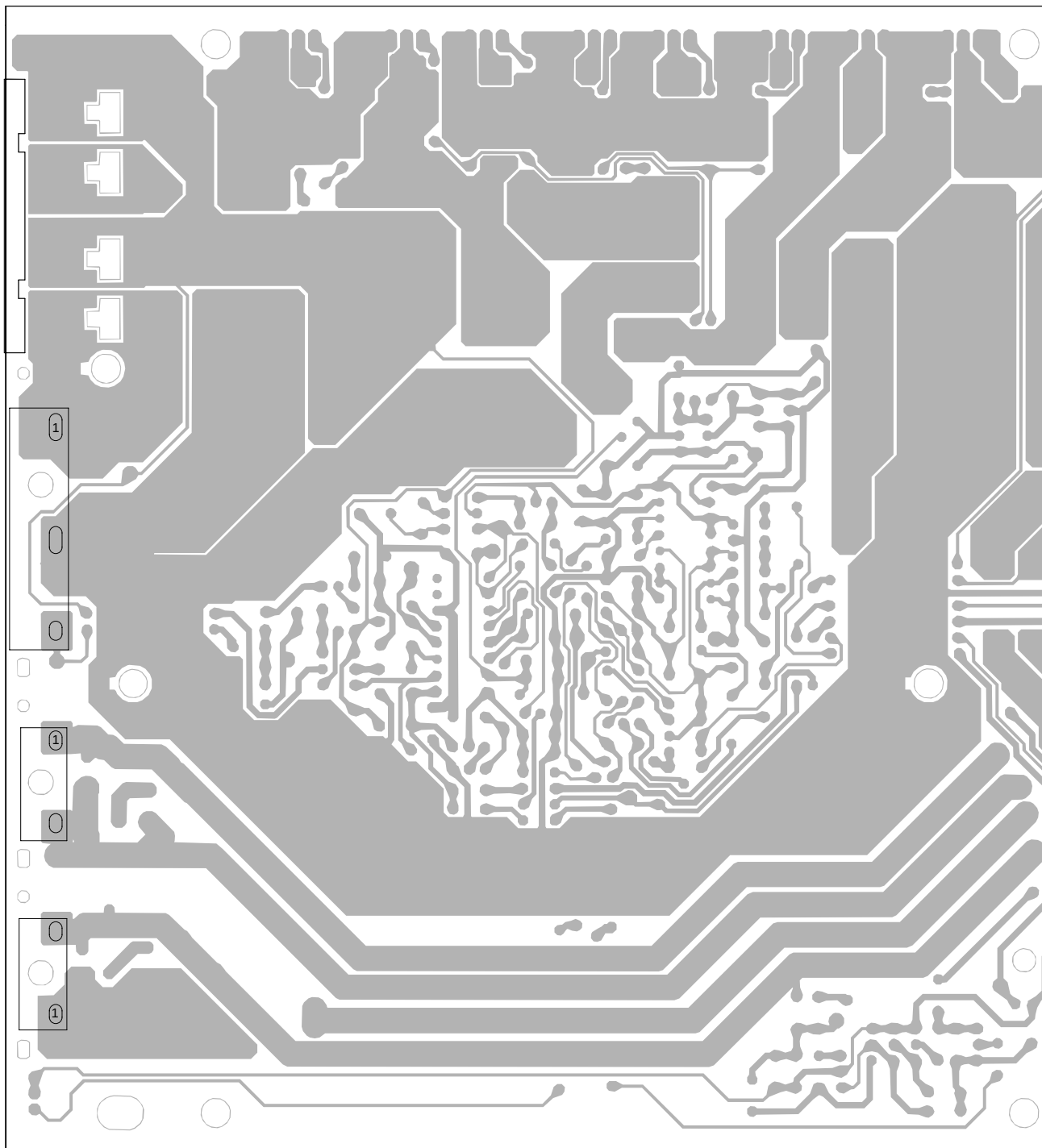
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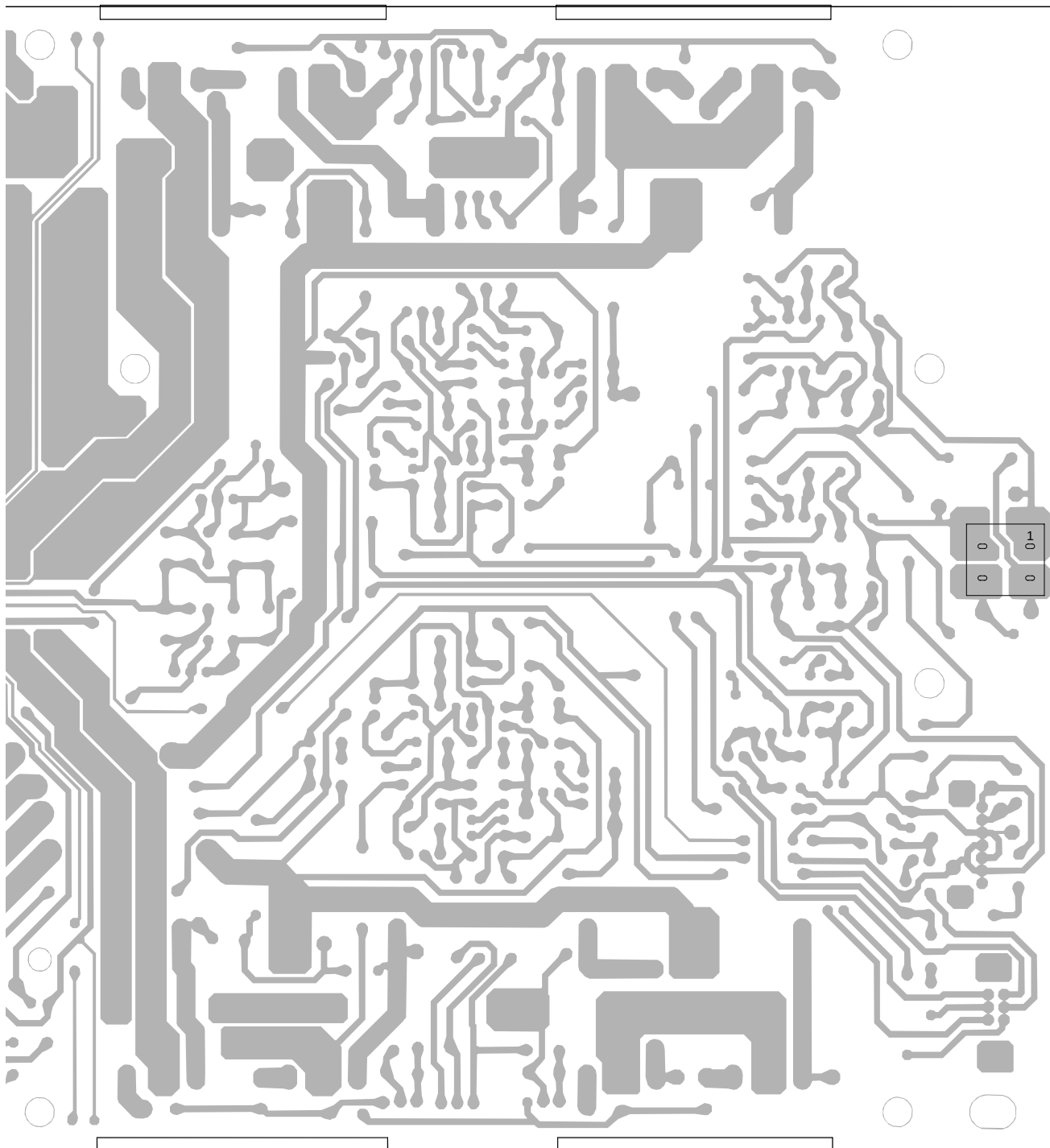
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**A**

SIDE B



5. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○○J,RS1/○○S○○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

====Circuit Symbol and No.====Part Name	Part No.	====Circuit Symbol and No.====Part Name	Part No.
A Unit Number : HWH0237(EW) Unit Number : HWH0238(UC) Unit Number : HWH0239(ES) Unit Name : Amp Unit		Q 702 Transistor	DTC114TS
		Q 703 Transistor	2SC2458
		Q 704 Transistor	DTC114TS
		Q 902 Transistor	2SA1048
		Q 903 Transistor	2SB1277
		Q 904 Transistor	2SB1277
		Q 905 FET	IRF1010N
		Q 906 FET	IRF1010N
		Q 907 Transistor	2SD1864
		Q 908 Transistor	2SB1243
		Q 909 Transistor	2SD1919
		Q 910 Transistor	2SD1919
		Q 911 FET	IRF1010N
		Q 912 FET	IRF1010N
		Q 913 FET	IRF1010N
		Q 914 FET	IRF1010N
		D 553 Diode	1SS133
		D 554 Diode	1SS133
		D 555 Diode	1SS133
		D 556 Diode	1SS133
		D 557 Diode	1SS133
		D 558 Diode	1SS133
		D 560 Diode	1SS133
		D 561 Diode	1SS133
		D 562 Diode	1SS133
		D 563 Diode	1SS133
		D 601 LED	AM4661PBC
		D 653 Diode	1SS133
		D 654 Diode	HZS7L(B2)
		D 658 Diode	1SS133
		D 659 Diode	1SS133
		D 661 Diode	1SS133
		D 662 Diode	ERA15-02VH
		D 663 Diode	ERA15-02VH
		D 701 Diode	1SS133
		D 901 Diode	RM4Z-LFJ4
		D 907 Diode	FML22S
		D 908 Diode	HZS16L(1)
		D 909 Diode	HZS16L(1)
		D 910 Diode	FML22R
		L 602 Choke Coil 75μH	HTH0021
		L 603 Choke Coil 75μH	HTH0021
		L 851 Ferri-Inductor	CTF1007
		L 852 Ferri-Inductor	CTF1007
		T 901 Transformer	HTT0035
		TH 901 Thermistor	HCX0002
		TH 902 Thermistor	HCX0002
		TH 903 Thermistor	HCX0001
		S 101 Switch(LPF)	HSH0004
		S 901 Switch(BFC)(EW,ES)	HSH-156
		VR 453 Volume	HCS0003
		F 100 Fuse (25A)	HEK0025
		F 101 Fuse (25A)	HEK0025

====Circuit Symbol and No.==Part Name

Part No.

====Circuit Symbol and No.==Part Name

Part No.

A

RESISTORS

R 123	RD1/4PU222J
R 124	RD1/4PU222J
R 203	RD1/4PU472J
R 204	RD1/4PU472J
R 465	RD1/4PU470J
R 466	RD1/4PU470J
R 555	RD1/4PU103J
R 556	RD1/4PU103J
R 557	RD1/4PU433J
R 558	RD1/4PU433J
R 559	RD1/4PU331J
R 560	RD1/4PU331J
R 561	RD1/4PU331J
R 562	RD1/4PU331J
R 563	RD1/4PU681J
R 564	RD1/4PU681J
R 565	RD1/4PU361J
R 566	RD1/4PU361J
R 567	RD1/4PU433J
R 568	RD1/4PU433J
R 569	RD1/4PU681J
R 570	RD1/4PU681J
R 571	RD1/4PU223J
R 572	RD1/4PU223J
R 575	RD1/4PU101J
R 576	RD1/4PU101J
R 579	RD1/4PU681J
R 580	RD1/4PU681J
R 581	RD1/4PU181J
R 582	RD1/4PU181J
R 583	RD1/4PU100J
R 584	RD1/4PU100J
R 585	RD1/4PU100J
R 586	RD1/4PU100J
R 587	RD1/4PU100J
R 588	RD1/4PU100J
R 589	RD1/4PU100J
R 590	RD1/4PU100J
R 591	RD1/4PU221J
R 592	RD1/4PU221J
R 593	RD1/4PU100J
R 594	RD1/4PU100J
R 595	RD1/4PU100J
R 596	RD1/4PU100J
R 597	RD1/4PU564J
R 598	RD1/4PU564J
R 599	RD1/4PU473J
R 600	RD1/4PU473J
R 601	RS1/2PMF100J
R 602	RS1/2PMF100J
R 603 0.22Ω	HCN0001
R 604 0.22Ω	HCN0001
R 605 0.22Ω	HCN0001
R 606 0.22Ω	HCN0001
R 607 0.22Ω	HCN0001
R 608 0.22Ω	HCN0001
R 609 0.22Ω	HCN0001
R 610 0.22Ω	HCN0001
R 611	RD1/4PU563J
R 612	RD1/4PU563J
R 613	RD1/4PU563J
R 614	RD1/4PU563J
R 615 0.22Ω	HCN0001
R 616 0.22Ω	HCN0001
R 617 0.22Ω	HCN0001

R 618 0.22Ω	HCN0001
R 619 0.22Ω	HCN0001
R 620 0.22Ω	HCN0001
R 621 0.22Ω	HCN0001
R 622 0.22Ω	HCN0001
R 623	RD1/4PU561J
R 624	RD1/4PU561J
R 625	RD1/4PU361J
R 626	RD1/4PU361J
R 657	RD1/4PU104J
R 658	RD1/4PU472J
R 659	RD1/4PU103J
R 660	RD1/4PU102J
R 661	RD1/4PU472J
R 662	RD1/4PU221J
R 663	RD1/4PU563J
R 664	RD1/4PU473J
R 665	RD1/4PU103J
R 666	RD1/4PU103J
R 667	RD1/4PU222J
R 668	RD1/4PU472J
R 669	RD1/4PU562J
R 671	RD1/4PU221J
R 672	RD1/4PU152J
R 676	RD1/4PU222J
R 678	RD1/4PU472J
R 679	RD1/4PU101J
R 680	RD1/4PU472J
R 681	RD1/4PU122J
R 682	RD1/4PU122J
R 683	RD1/4PU103J
R 684	RD1/4PU223J
R 685	RD1/4PU223J
R 686	RD1/4PU223J
R 701	RD1/4PU222J
R 851	RD1/4PU471J
R 852	RD1/4PU471J
R 853	RD1/4PU223J
R 854	RD1/4PU223J
R 855	RN1/4PC1002D
R 856	RN1/4PC1002D
R 857	RN1/4PC1002D
R 858	RN1/4PC1002D
R 861	RN1/4PC1002D
R 862	RN1/4PC1002D
R 871	RD1/4PU102J
R 872	RD1/4PU202J
R 873	RD1/4PU102J
R 874	RD1/4PU202J
R 882	RN1/4PC1002D
R 884	RN1/4PC1002D
R 887	RD1/4PU103J
R 888	RD1/4PU103J
R 889	RD1/4PU103J
R 890	RD1/4PU103J
R 907	RD1/4PU473J
R 910	RD1/4PU153J
R 911	RD1/4PU102J
R 912	RD1/4PU272J
R 913	RD1/4PU472J
R 914	RD1/4PU472J
R 915	RD1/4PU472J
R 916	RD1/4PU332J
R 917	RD1/4PU332J
R 918	RS1/2PMF220J

B

C

D

E

F

A	====Circuit Symbol and No.==Part Name		Part No.	====Circuit Symbol and No.==Part Name		Part No.
	---	-----		---	-----	
	R	919	RS1/2PMF220J	C	654	CEAT100M16
	R	920	RD1/4PU472J	C	655	CFTNA103J50
	R	921	RD1/4PU472J	C	656	CEAT470M16
	R	922	RD1/4PU472J	C	658	CEAT220M16
	R	923	RD1/4PU472J	C	659	CEAT471M16
	R	924	RS1/2PMF121J	C	661	CFTNA103J50
	R	925	RS1/2PMF121J	C	662	CFTNA103J50
	R	926 (EW,ES)	RD1/4PU105J	C	671	CEAT101M16
	R	928	RS1/2PMF121J	C	701	CEAT220M16
	R	929	RS1/2PMF121J	C	851	CKPUYB471K50
	R	932	RD1/4PU104J	C	852	CKPUYB471K50
	R	933	RS1/2PMF121J	C	853	CEAT100M16
B	R	934	RS1/2PMF121J	C	854	CEAT100M16
	R	935	RD1/4PU202J	C	859	CCPUSL470J50
	R	936	RD1/4PU223J	C	860	CCPUSL470J50
	R	937	RD1/4PU103J	C	868	CFTNA223J50
	R	938	RD1/4PU272J	C	869	CCPUSL470J50
	R	939	RD1/4PU272J	C	870	CFTNA223J50
	R	947	RS1/2PMF560J	C	871	CCPUSL470J50
	R	948	RS1/2PMF560J	C	872	CFTNA274J50
	R	949	RD1/4PU113J	C	873	CFTNA274J50
	R	950	RD1/4PU101J	C	876	CFTNA154J50
	R	951	RD1/4PU513J	C	877	CFTNA154J50
	R	952	RS1/2PMF220J	C	902	CEAT221M10
	R	999	RD1/4PU103J	C	903	CEAT2R2M50
				C	904	CEAT101M16
				C	905	CQMA472J50
				C	906	CQMA472J50
	C	551	CEAT100M16	C	907 3300μF/16V	HCH0005
	C	552	CEAT100M16	C	908 2200μF/50V	HCH0007
	C	553	CCPUSL680J50			
	C	554	CCPUSL680J50	C	909 2200μF/50V	HCH0007
	C	555	CQMA471J50	C	910 2200μF/50V	HCH0007
				C	911 2200μF/50V	HCH0007
	C	556	CQMA471J50	C	912	CEAT470M16
	C	559	CEAT221M10	C	913	CEAT470M16
	C	560	CEAT221M10			
	C	561	CCPUCH150J50	C	915	CQMA102J50
	C	562	CCPUCH150J50	C	916	CFTNA224J50
				C	920	CFTNA564J50
	C	563	CCPUSL330J50	C	932	CEAT470M16
D	C	564	CCPUSL330J50	C	949 3300μF/16V	HCH0005
	C	565	CFTNA223J50			
	C	566	CFTNA223J50	C	950	CEAT470M16
	C	567	CFTNA333J50	C	951	CEAT470M16
				C	952	CQMA102J50
	C	568	CFTNA333J50	C	953	CQMA102J50
	C	569	CQMA102J50	C	954	CQMA102J50
	C	570	CQMA102J50			
	C	571	CCPUCH100J50	C	955	CFTNA103J50
	C	572	CCPUCH100J50	C	956	CFTNA103J50
	C	573	CCPUCH100J50			
	C	574	CCPUCH100J50			
	C	651 220μF/10V	HCH0012			
	C	652	CFTNA103J50			
	C	653	CEAT100M16			
E						

6. ADJUSTMENT

F There is no information to be shown in this chapter.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

● Removing the Case (Fig.1)

- 1** Remove the three screws.
- 2** Remove the eight screws and then remove the Case.

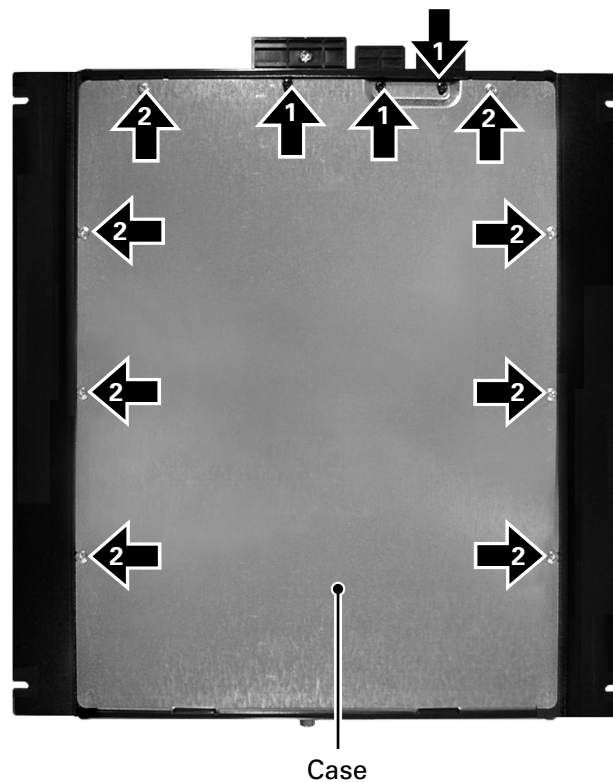


Fig.1

● Removing the Amp Unit (Fig.2)

- 1** Remove the six screws and then remove the Panel.
- 2** Remove the screw.
- 3** Remove the six screws and then remove the Panel.
- 4** Remove the three screws.
- 5** Remove the fourteen screws.
- 6** Remove the twelve screws and then remove the Amp Unit.

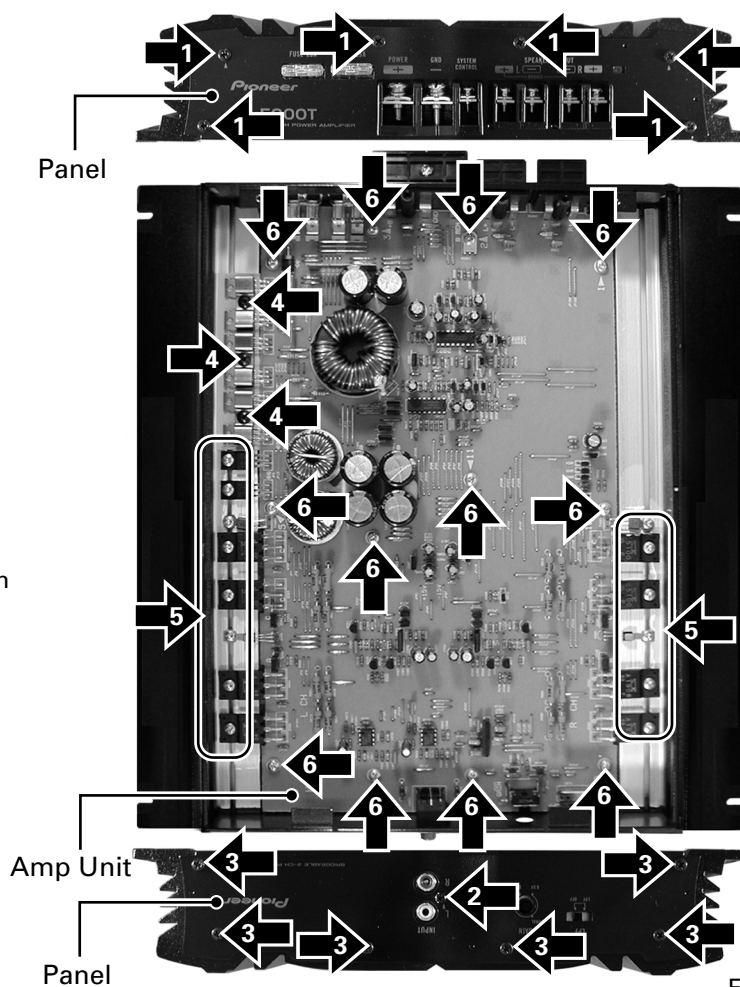


Fig.2

A

7.1.2 CONNECTOR FUNCTION DESCRIPTION

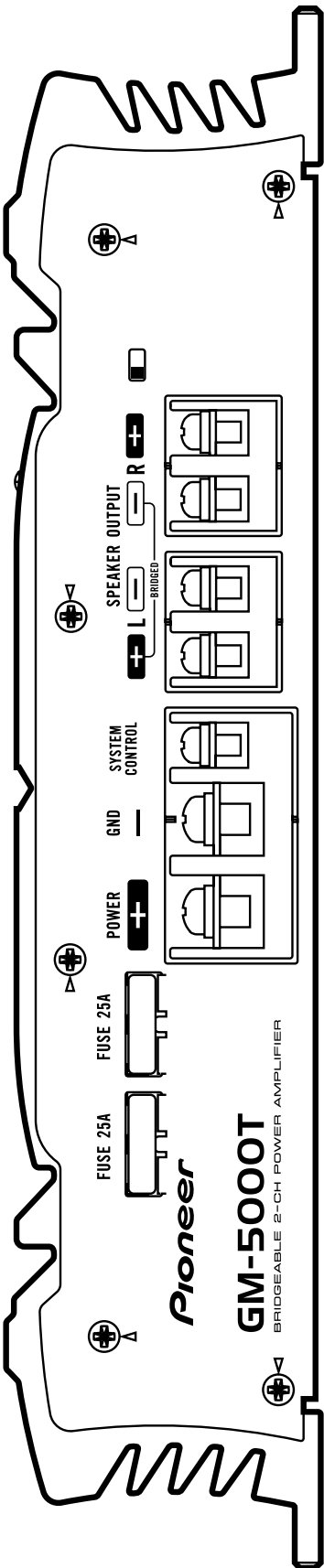
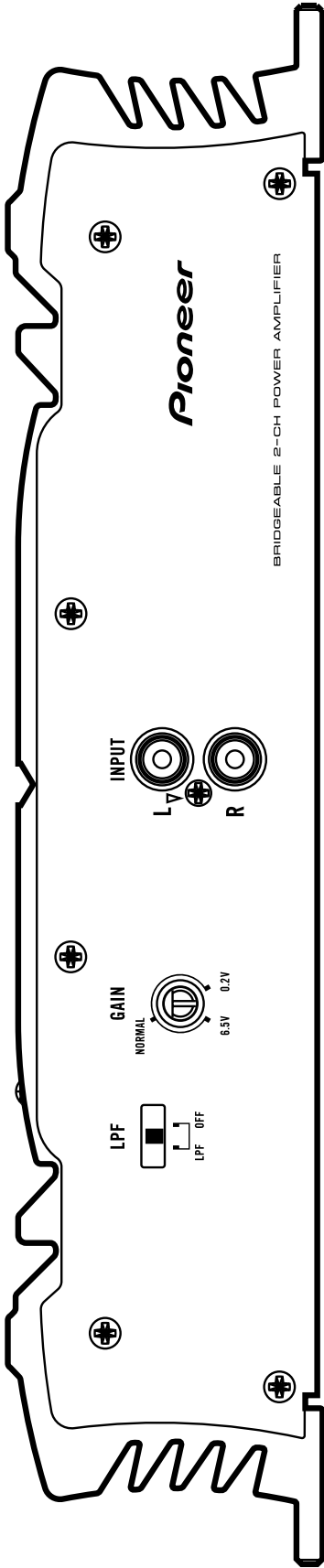
B

C

D

E

F



8. OPERATIONS

Gain Control

If the sound level is too low, even when the volume of the car stereo used along with this power amplifier is turned up, turn gain control on the front of the power amplifier clockwise. If the sound distorts when the volume is turned up, turn the gain control counter-clockwise.

- When using with an RCA equipped car stereo (standard output of 500 mV), set to the NORMAL position. When using with an RCA equipped Pioneer car stereo with max. output of 4 V or more, adjust level to match the car stereo output level.

Power Indicator

The power indicator lights when the power is switched on.

EW, ES models

BFC (Beat Frequency Control) Switch

If you hear a beat while listening to an MW/LW broadcast with your car stereo, change the BFC switch using a small standard tip screwdriver.

LPF (Low-Pass Filter) Select Switch

Set the LPF select switch as follows according to the type of speaker that is connected to the speaker output connector and the car stereo system:

LPF Select Switch	Audio frequency range to be output	Speaker Type	Remarks
LPF (left)	Very Low Frequency range	Subwoofer	Connect a subwoofer.
OFF (right)	Full range	Full range	

