Pioneer *sound.vision.soul*

Service Manual

GM-3000T/X1H/EW

ORDER NO.
CRT3239

BRIDGEABLE POWER AMPLIFIER

GM-3000T /X1H/EW
GM-3000T /X1H/UC
GM-3000T /X1H/ES

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

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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.

CONTENTS

1. SPECIFICATIONS

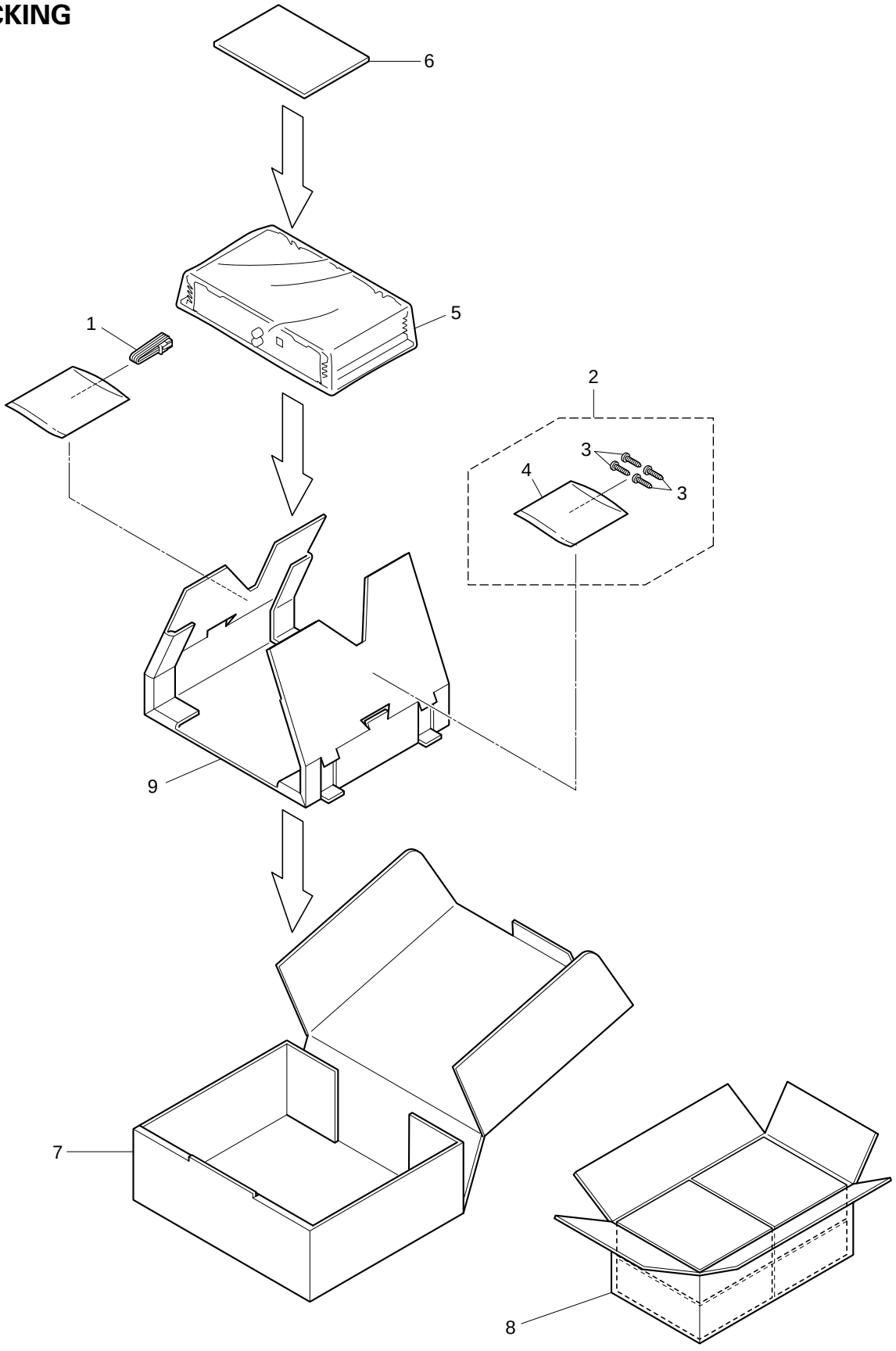
Power source	14.4 V DC (10.8 — 15.1 V allowable)
Grounding system	Negative type
Backup Current	5.1 mA or less
Current consumption	11.3 A (at continuous power, 4 Ω)
Average current drawn*	3.8 A (4 Ω for two channels)
	5.9 A (4 Ω for one channel)
Fuse	20 A
Dimensions	300 (W) × 61 (H) × 157 (D) mm
Weight	2.6 kg (Leads for wiring not included)
Maximum power output	80 W × 2 / 200 W × 1
Continuous power output	60 W × 2 / 150 W × 1 (DIN45324, +B=14.4 V)
Load impedance	4 Ω (2 — 8 Ω allowable)
	(Bridge connection: 4 — 8 Ω allowable)
Frequency response	10 — 45,000 Hz (+0 dB, –1 dB)
Signal-to-noise ratio	100 dB (IEC-A network)
Distortion	0.008 % (10 W, 1 kHz)
Separation	55 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 (0.4 — 6.5 V)
	Speaker: 26 V/40 kΩ (1.6 — 26 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.)

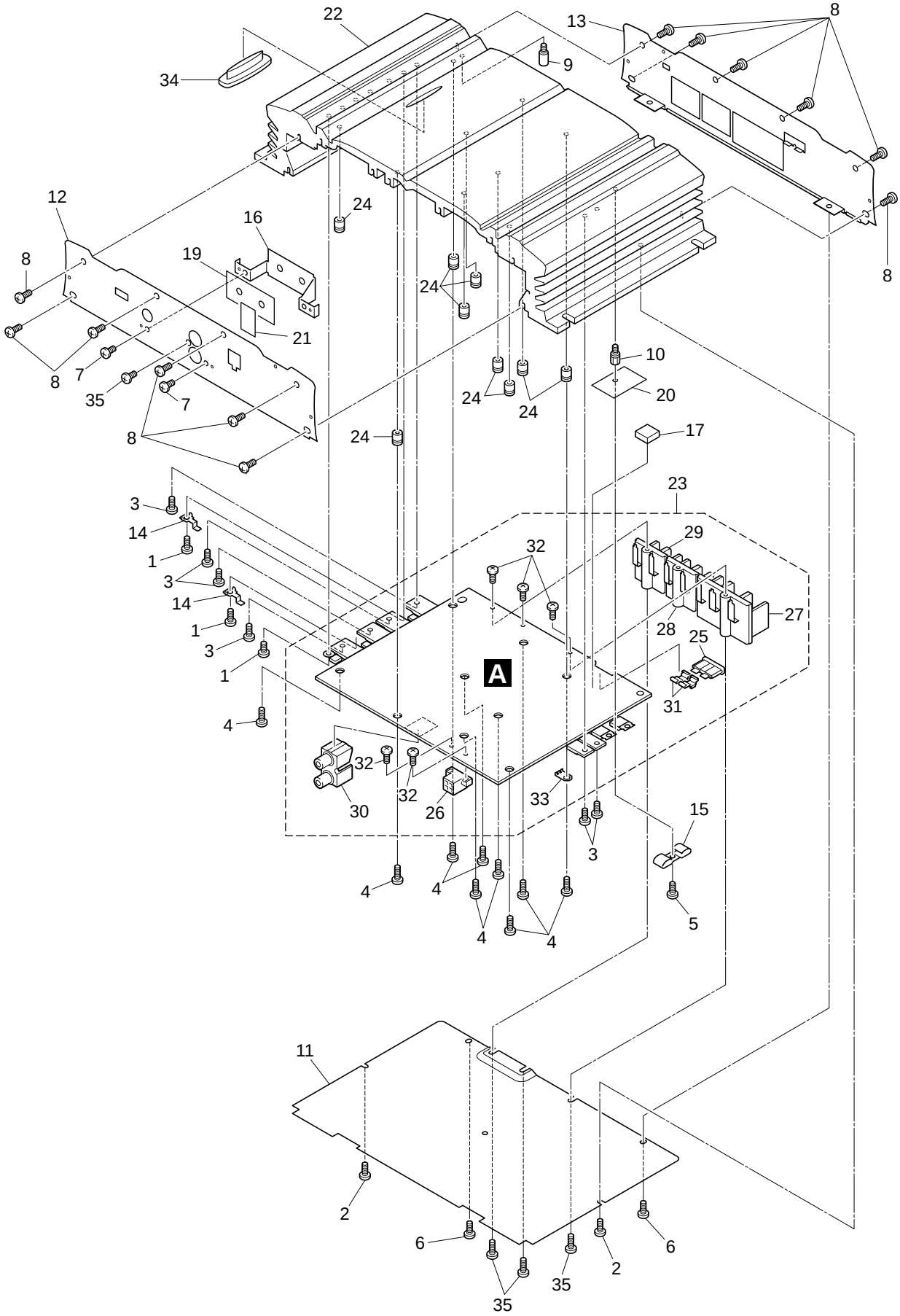
● PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.		
			GM-3000T/X1H/EW	GM-3000T/X1H/UC	GM-3000T/X1H/ES
	1	Cord Assy	HDE0036	HDE0036	HDE0036
	2	Screw Assy	HEA0058	HEA0058	HEA0058
	3	Screw	BYC40P180FZK	BYC40P180FZK	BYC40P180FZK
	4	Polyethylene Bag	HZE0002	HZE0002	HZE0002
	5	Polyethylene Bag	HEG0013	HEG0013	HEG0013
*	6-1	Warranty Card	HRY1157	Not used	HRY1157
*	6-2	Card	Not used	ARY1048	Not used
	6-3	Owner's Manual	HRD0272	HRD0271	HRD0273
	6-4	Owner's Manual	Not used	Not used	HRD0274
	7	Carton	HHG0434	HHG0434	HHG0434
	8	Contain Box	HHL0434	HHL0434	HHL0434
	9	Protector	HHP0250	HHP0250	HHP0250

● Owner's Manual

Part No.	Language
HRD0271	English, French
HRD0272	English, Spanish, German, French, Italian, Dutch
HRD0273	English, Spanish
HRD0274	Arabic, Portuguese(B)

2.2 EXTERIOR


22
34
9
13
8
12
16
19
24
8
21
10
20
17
23
3
14
1
32
29
27
28
25
31
A
30
26
33
15
5
11
2
6
35

● EXTERIOR SECTION PARTS LIST

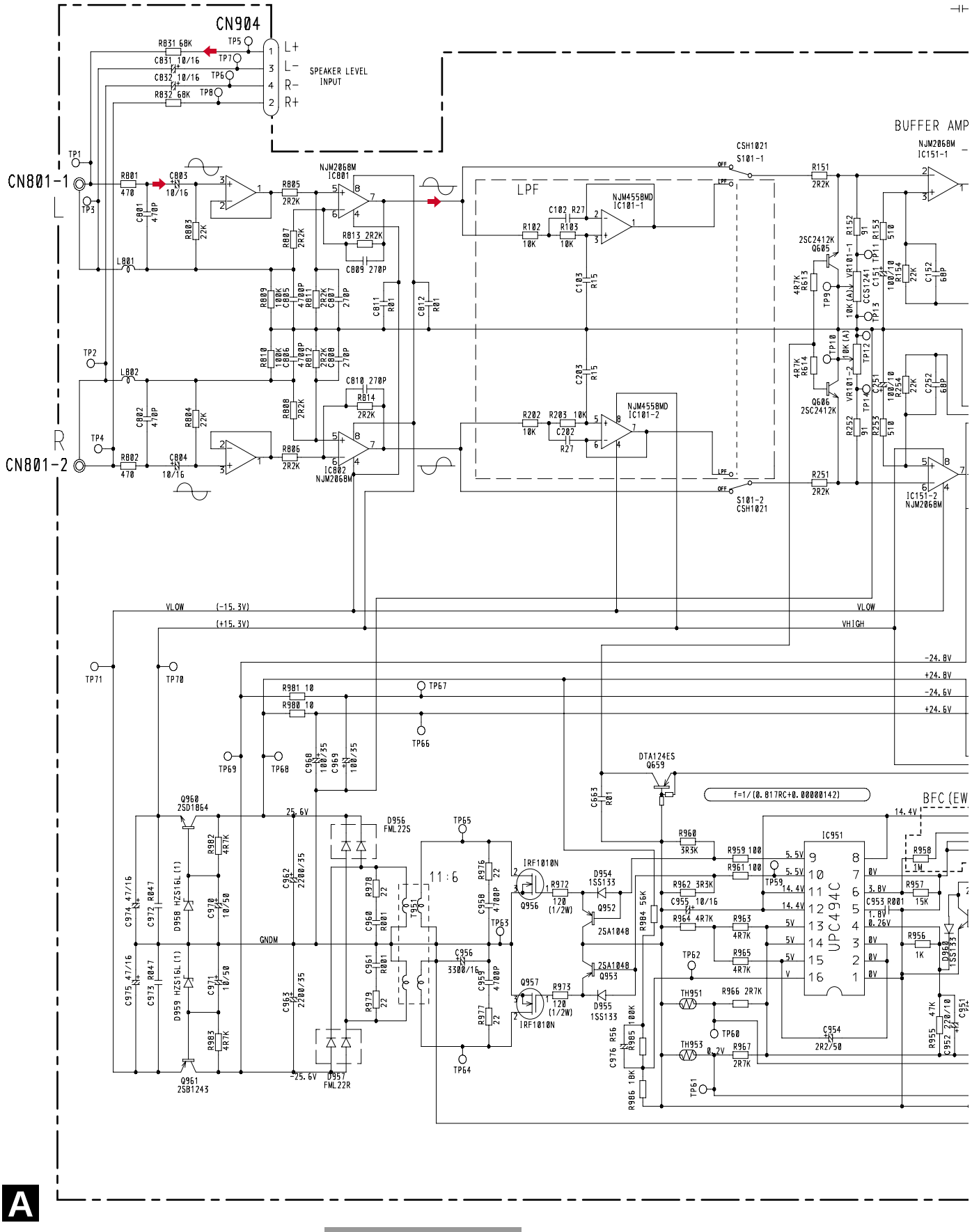
Mark No.	Description	Part No.
1	Screw	BBZ30P050FTC
2	Screw	BBZ30P060FTC
3	Screw	BBZ30P080FTC
4	Screw	BBZ30P120FTC
5	Screw	BMZ30P050FTC
6	Screw	BSZ30P050FTC
7	Screw	BSZ30P050FZK
8	Screw(M3x8)	HBA0011
9	Screw(M3)	HBA0028
10	Stud	HLA0022
11	Case	HNB0131
12	Panel	HNB0257
13	Panel	HNB0261
14	Holder	HNC0080
15	Clip	HNC0189
16	Holder	HNC0202
17	Spacer	HNM0006
18	•••••	
19	Insulator	HNM0193
20	Insulator	HNM0197
21	Insulator	HNM0212
22	Heat Sink	HNR0280
23	Amp Unit (EW)	HWH0240
	Amp Unit (UC)	HWH0241
	Amp Unit (ES)	HWH0242
24	Spacer	HNV0016
25	Fuse (20A)	HEK0020
26	Connector(CN904)	HKM1077
27	Terminal(CN901)	HKE0036
28	Terminal(CN905)	HKE0037
29	Terminal(CN906)	HKE0037
30	Pin Jack(CN801)	HKB0001
31	Holder	HNC0082
32	Screw	PPZ30P100SAD
33	Terminal(CN903)	VNF1084
34	Light Pipe Unit	HXA0322
35	Screw	PPZ30P120FZK

3. SCHEMATIC DIAGRAM

3.1 OVERALL CONNECTION DIAGRAM

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

NOT

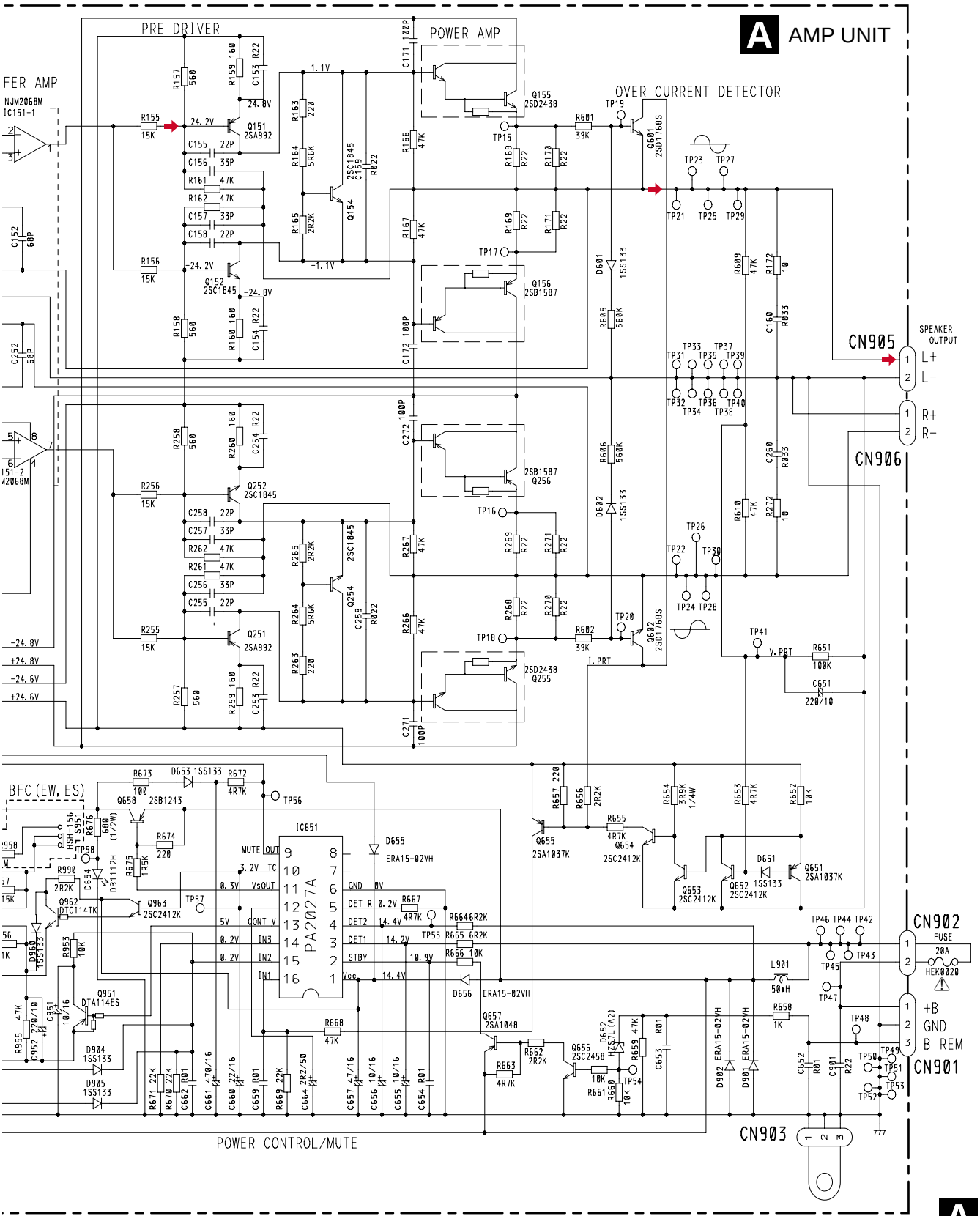


NOTE :

- 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→2R2
0.022→R022

The ⚠ 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.

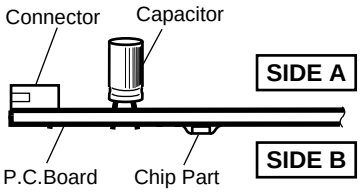


4. PCB CONNECTION DIAGRAM

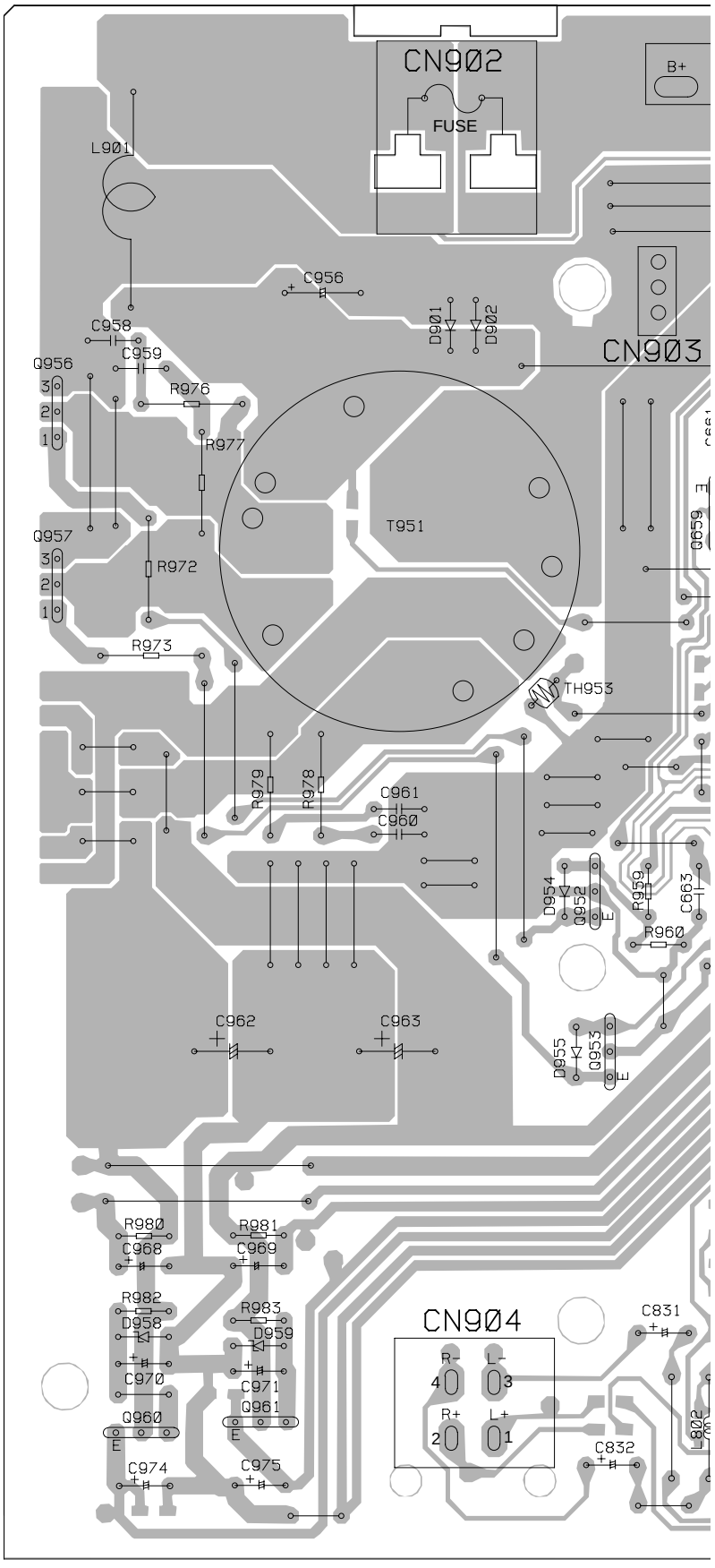
4.1 AMP UNIT

NOTE FOR PCB DIAGRAMS

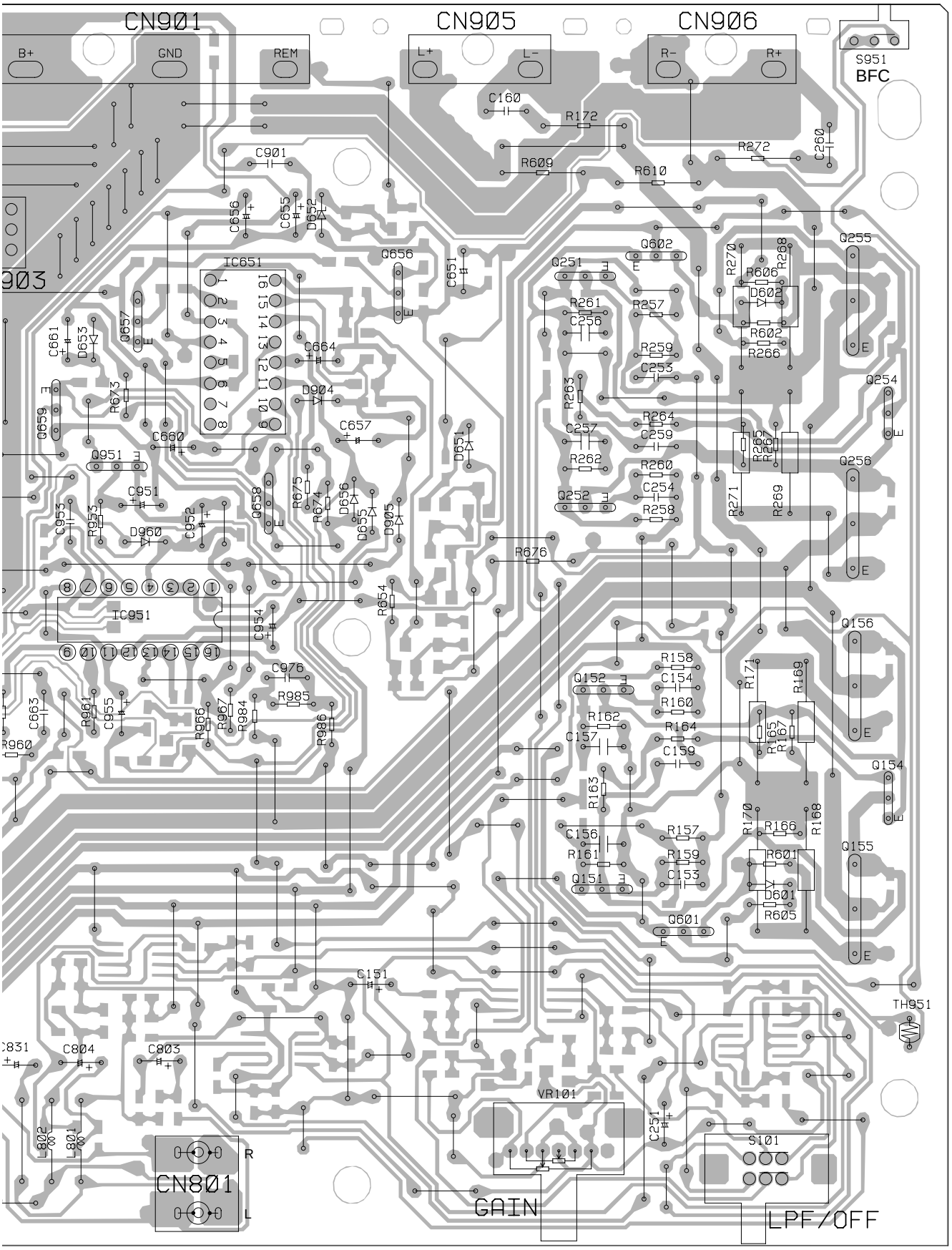
1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



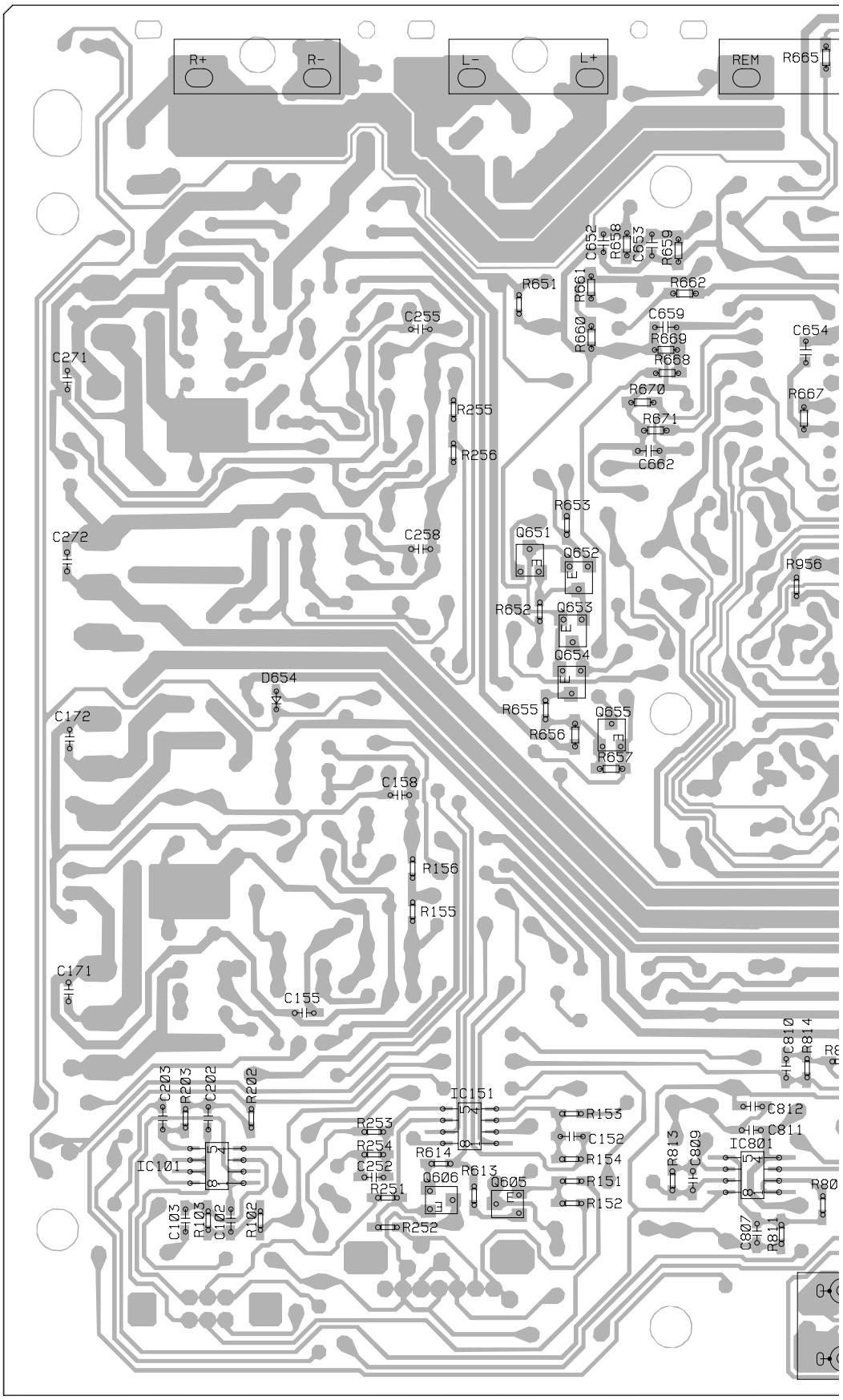
A AMP UNIT



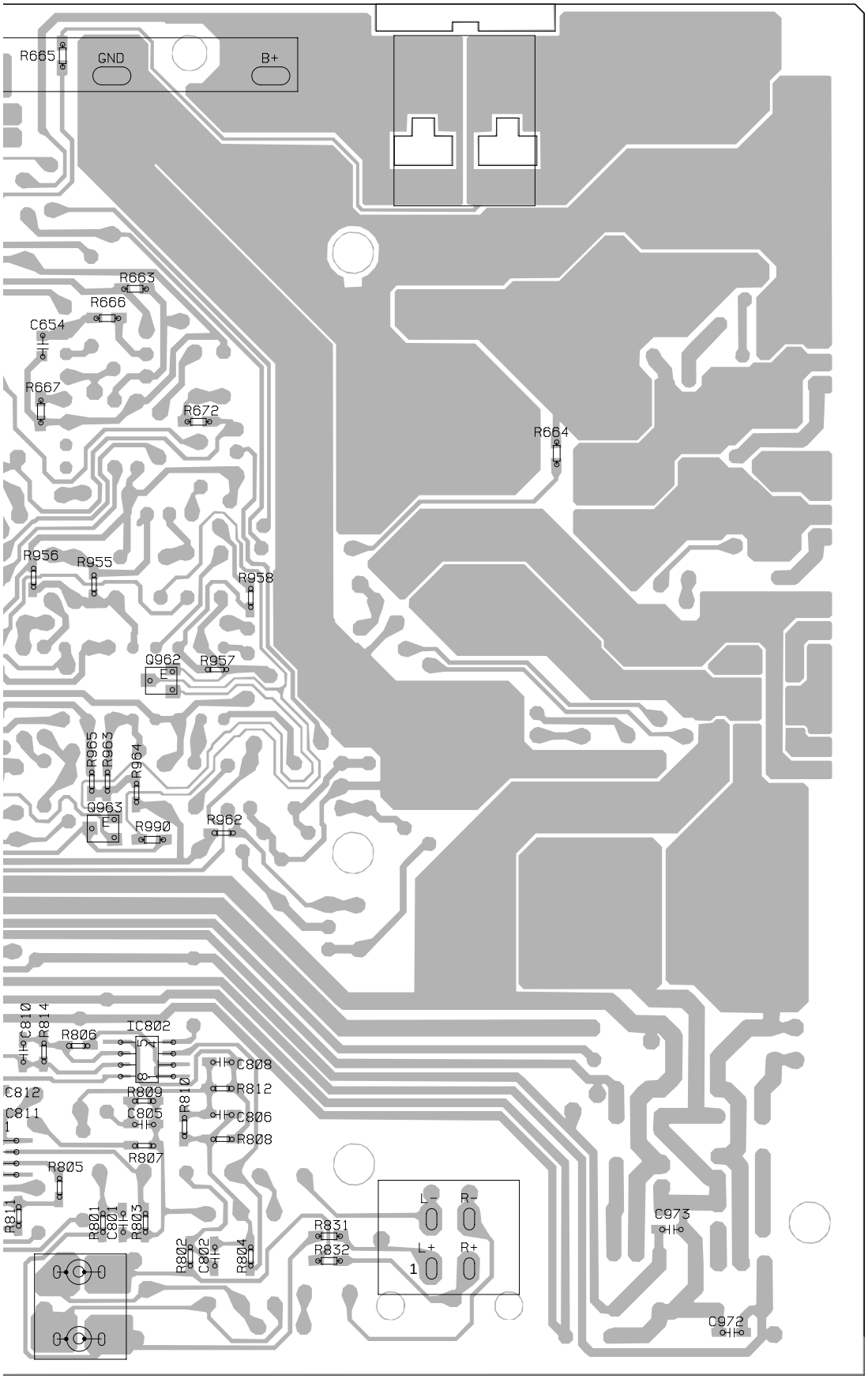
SIDE A


CN901
CN905
CN906
B+
GND
REM
L+
L-
R-
R+
S951
BFC
CN803
CN801
IC651
IC951
VR101
S101
TH951
GAIN
LPF/OFF
CN8Ø1
R
L

A AMP UNIT


R+
R-
L-
L+
REM
R665
C652
R658
C653
R659
R651
R661
R662
C659
R660
R669
C654
R668
C271
C255
R670
R667
R671
R255
C662
R256
R653
C272
C258
Q651
Q652
R956
R652
Q653
Q654
D654
R655
Q655
C172
R656
R657
C158
R156
R155
C171
C155
C810
R814
C812
C811
IC151
R153
C203
R203
C202
R202
R253
C152
IC801
R254
R614
R154
IC101
C252
R613
R813
C809
R151
R251
Q606
Q605
R152
C103
R103
C102
R102
R252
C807
R811

SIDE B



IC, Q

Q651
Q652

Q653

Q654
Q962

Q655

Q963

IC802

IC151

IC801

IC101
Q606 Q605

A

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.....

A Unit Number : HWH0240(EW)
Unit Number : HWH0241(UC)
Unit Number : HWH0242(ES)
Unit Name : Amp Unit

MISCELLANEOUS

=====Circuit Symbol and No.		===Part Name	Part No.
IC	101	IC	NJM4558MD
IC	151	IC	NJM2068M
IC	651	IC	PA2027A
IC	801	IC	NJM2068M
IC	802	IC	NJM2068M
IC	951	IC	UPC494C
Q	151	Transistor	2SA992
Q	152	Transistor	2SC1845
Q	154	Transistor	2SC1845
Q	155	Transistor	2SD2438
Q	156	Transistor	2SB1587
Q	251	Transistor	2SA992
Q	252	Transistor	2SC1845
Q	254	Transistor	2SC1845
Q	255	Transistor	2SD2438
Q	256	Transistor	2SB1587
Q	601	Transistor	2SD1768S
Q	602	Transistor	2SD1768S
Q	605	Transistor	2SC2412K
Q	606	Transistor	2SC2412K
Q	651	Transistor	2SA1037K
Q	652	Transistor	2SC2412K
Q	653	Transistor	2SC2412K
Q	654	Transistor	2SC2412K
Q	655	Transistor	2SA1037K
Q	656	Transistor	2SC2458
Q	657	Transistor	2SA1048
Q	658	Transistor	2SB1243
Q	659	Transistor	DTA124ES
Q	951	Transistor	DTA114ES
Q	952	Transistor	2SA1048
Q	953	Transistor	2SA1048
Q	956	FET	IRF1010N
Q	957	FET	IRF1010N
Q	960	Transistor	2SD1864
Q	961	Transistor	2SB1243
Q	962	Transistor	DTC114TK
Q	963	Transistor	2SC2412K
D	601	Diode	1SS133
D	602	Diode	1SS133
D	651	Diode	1SS133
D	652	Diode	HZS7L(A2)
D	653	Diode	1SS133
D	654	LED	DB1112H
D	655	Diode	ERA15-02VH

=====Circuit Symbol and No.		===Part Name	Part No.
D	656	Diode	ERA15-02VH
D	901	Diode	ERA15-02VH
D	902	Diode	ERA15-02VH
D	904	Diode	1SS133
D	905	Diode	1SS133
D	954	Diode	1SS133
D	955	Diode	1SS133
D	956	Diode	FML22S
D	957	Diode	FML22R
D	958	Diode	HZS16L(1)
D	959	Diode	HZS16L(1)
D	960	Diode	1SS133
L	801	Ferri-Inductor	CTF1007
L	802	Ferri-Inductor	CTF1007
L	901	Choke Coil 50μH	CTH1218
T	951	Transformer	HTT0012
TH	951	Thermistor	CCX1013
TH	953	Thermistor	HCX0001
S	101	Switch	CSH1021
S	951	Switch (BFC)(EW,ES)	HSH-156
VR	101	Volume 10kΩ(A)	CCS1241
		Fuse (20A)	HEK0020

RESISTORS

R	102		RS1/10S103J
R	103		RS1/10S103J
R	151		RS1/10S222J
R	152		RS1/10S910J
R	153		RS1/10S511J
R	154		RS1/10S223J
R	155		RS1/10S153J
R	156		RS1/10S153J
R	157		RD1/4PU561J
R	158		RD1/4PU561J
R	159		RD1/4PU161J
R	160		RD1/4PU161J
R	161		RD1/4PU473J
R	162		RD1/4PU473J
R	163		RD1/4PU221J
R	164		RD1/4PU562J
R	165		RD1/4PU222J
R	166		RD1/4PU473J
R	167		RD1/4PU473J
R	168	0.22Ω	CCN1013
R	169	0.22Ω	CCN1013
R	170	0.22Ω	CCN1013
R	171	0.22Ω	CCN1013
R	172		RD1/2PM100J
R	202		RS1/10S103J
R	203		RS1/10S103J
R	251		RS1/10S222J
R	252		RS1/10S910J
R	253		RS1/10S511J
R	254		RS1/10S223J

=====Circuit Symbol and No.		===Part Name	Part No.
R	255		RS1/10S153J
R	256		RS1/10S153J
R	257		RD1/4PU561J
R	258		RD1/4PU561J
R	259		RD1/4PU161J
R	260		RD1/4PU161J
R	261		RD1/4PU473J
R	262		RD1/4PU473J
R	263		RD1/4PU221J
R	264		RD1/4PU562J
R	265		RD1/4PU222J
R	266		RD1/4PU473J
R	267		RD1/4PU473J
R	268	0.22Ω	CCN1013
R	269	0.22Ω	CCN1013
R	270	0.22Ω	CCN1013
R	271	0.22Ω	CCN1013
R	272		RD1/2PM100J
R	601		RD1/4PU393J
R	602		RD1/4PU393J
R	605		RD1/4PU564J
R	606		RD1/4PU564J
R	609		RD1/2PM473J
R	610		RD1/2PM473J
R	613		RS1/10S472J
R	614		RS1/10S472J
R	651		RS1/10S104J
R	652		RS1/10S103J
R	653		RS1/10S472J
R	654		RD1/4PU392J
R	655		RS1/10S472J
R	656		RS1/10S222J
R	657		RS1/10S221J
R	658		RS1/10S102J
R	659		RS1/10S473J
R	660		RS1/10S103J
R	661		RS1/10S103J
R	662		RS1/10S222J
R	663		RS1/10S472J
R	664		RS1/10S622J
R	665		RS1/10S622J
R	666		RS1/10S103J
R	667		RS1/10S472J
R	668		RS1/10S473J
R	669		RS1/10S223J
R	670		RS1/10S223J
R	671		RS1/10S223J
R	672		RS1/10S472J
R	673		RD1/4PU101J
R	674		RD1/4PU221J
R	675		RD1/4PU152J
R	676		RD1/2PM681J
R	801		RS1/10S471J
R	802		RS1/10S471J
R	803		RS1/10S223J
R	804		RS1/10S223J
R	805		RN1/10SE2201D
R	806		RN1/10SE2201D
R	807		RN1/10SE2201D
R	808		RN1/10SE2201D
R	809		RS1/10S104J
R	810		RS1/10S104J
R	811		RN1/10SE2201D
R	812		RN1/10SE2201D
R	813		RN1/10SE2201D

=====Circuit Symbol and No.		===Part Name	Part No.
R	814		RN1/10SE2201D
R	831		RS1/10S683J
R	832		RS1/10S683J
R	953		RD1/4PU103J
R	955		RS1/10S473J
R	956		RS1/10S102J
R	957		RS1/10S153J
R	958	(EW,ES)	RS1/10S105J
R	959		RD1/4PU101J
R	960		RD1/4PU332J
R	961		RD1/4PU101J
R	962		RS1/10S332J
R	963		RS1/10S472J
R	964		RS1/10S472J
R	965		RS1/10S472J
R	966		RD1/4PU272J
R	967		RD1/4PU272J
R	972		RD1/2PM121J
R	973		RD1/2PM121J
R	976		RD1/2PM220J
R	977		RD1/2PM220J
R	978		RD1/2PM220J
R	979		RD1/2PM220J
R	980		RD1/4PU100J
R	981		RD1/4PU100J
R	982		RD1/4PU472J
R	983		RD1/4PU472J
R	984		RD1/4PU563J
R	985		RD1/4PU104J
R	986		RD1/4PU183J
R	990		RS1/10S223J

CAPACITORS

C	102		CKSQYB274K16
C	103		CKSQYB154K16
C	151		CEAT101M10
C	152		CCSQSL680J50
C	153		CFTNA224J50
C	154		CFTNA224J50
C	155		CCSQCH220J50
C	156		CCPUSL330J50
C	157		CCPUSL330J50
C	158		CCSQCH220J50
C	159		CFTLA223J50
C	160		CFTLA333J50
C	171		CCSQCH101J50
C	172		CCSQCH101J50
C	202		CKSQYB274K16
C	203		CKSQYB154K16
C	251		CEAT101M10
C	252		CCSQSL680J50
C	253		CFTNA224J50
C	254		CFTNA224J50
C	255		CCSQCH220J50
C	256		CCPUSL330J50
C	257		CCPUSL330J50
C	258		CCSQCH220J50
C	259		CFTLA223J50
C	260		CFTLA333J50
C	271		CCSQCH101J50
C	272		CCSQCH101J50
C	651	220µF/10V	CCH1036
C	652		CKSQYB103K50

=====Circuit Symbol and No.	===	Part Name	Part No.
C	653		CKSQYB103K50
C	654		CKSQYB103K50
C	655		CEAT100M16
C	656		CEAT100M16
C	657		CEAT470M16
C	659		CKSQYB103K50
C	660		CEAT220M16
C	661	470µF/16V	CCH1183
C	662		CKSQYB103K50
C	663		CQMA103J50
C	664		CEAT2R2M50
C	801		CKSQYB471K50
C	802		CKSQYB471K50
C	803		CEAT100M16
C	804		CEAT100M16
C	805		CKSQYB472K50
C	806		CKSQYB472K50
C	807		CCSQCH271J50
C	808		CCSQCH271J50
C	809		CCSQCH271J50
C	810		CCSQCH271J50
C	811		CKSQYB103K50
C	812		CKSQYB103K50
C	831		CEAT100M16
C	832		CEAT100M16

=====Circuit Symbol and No.	===	Part Name	Part No.
C	901		CFTNA224J50
C	951		CEAT100M16
C	952		CEAT221M10
C	953		CQMA102J50
C	954		CEAT2R2M50
C	955		CEAT100M16
C	956	3300µF/16V	HCH0005
C	958		CQMA472J50
C	959		CQMA472J50
C	960		CQMA102J50
C	961		CQMA102J50
C	962	2200µF/35V	HCH0003
C	963	2200µF/35V	HCH0003
C	968		CEAT101M35
C	969		CEAT101M35
C	970		CEAT100M50
C	971		CEAT100M50
C	972		CKSQYB473K50
C	973		CKSQYB473K50
C	974		CEAT470M16
C	975		CEAT470M16
C	976		CFTNA564J50

6. ADJUSTMENT

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 four screws and then remove the Case.

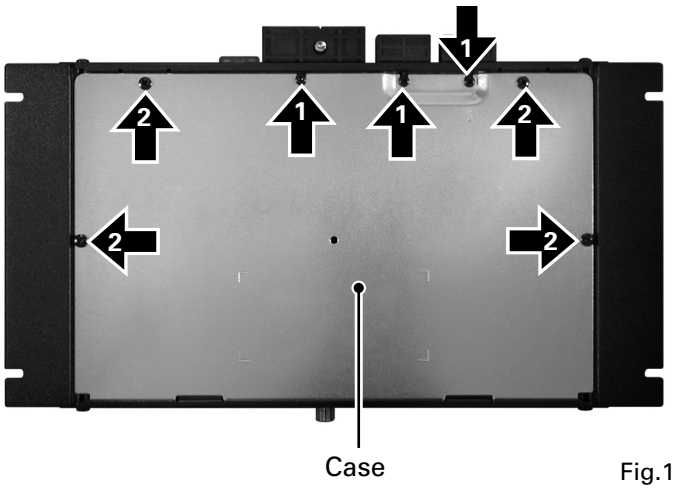


Fig.1

● **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 ten screws.

5 Remove the nine screws and then remove the Amp Unit.

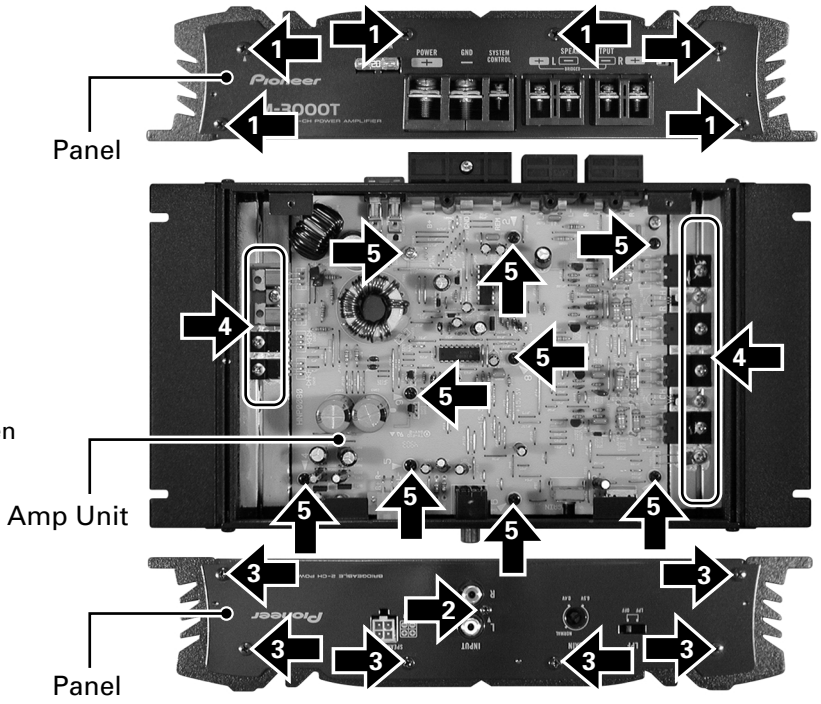
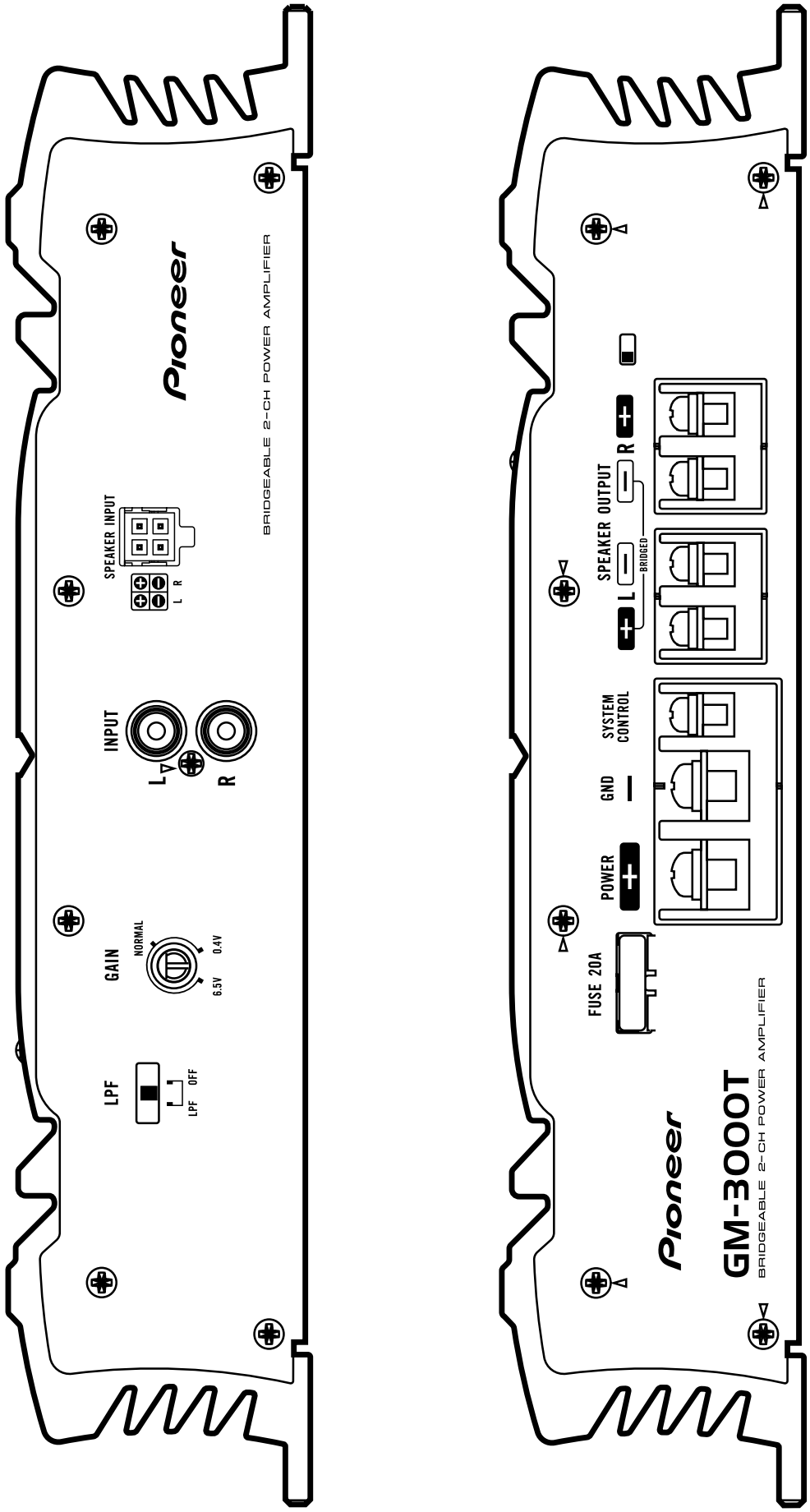


Fig.2

7.1.2 CONNECTOR FUNCTION DESCRIPTION



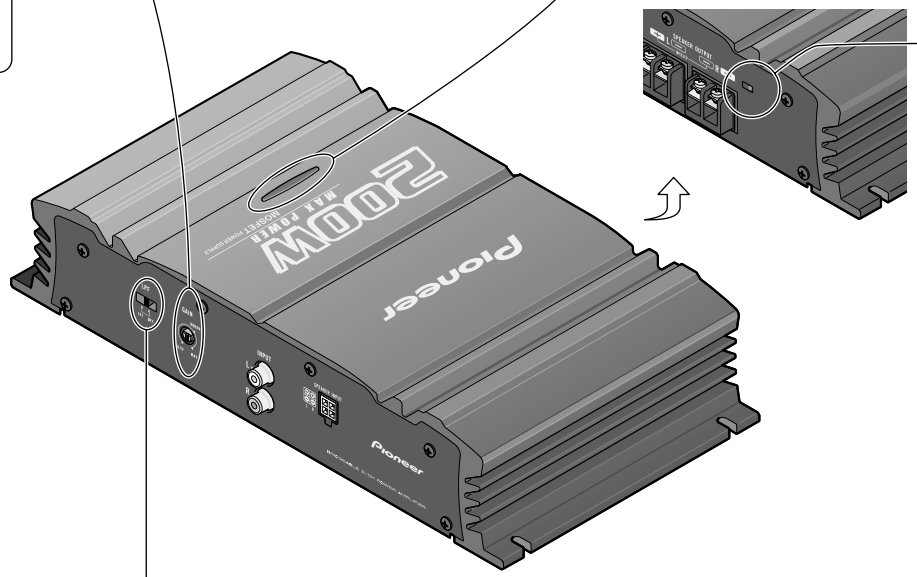
Gain Control

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.
- If you hear too much noise when using the speaker input terminals, turn the gain control counter-clockwise.

Power Indicator

The power indicator lights when the power is switched on.



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	