Service Manual

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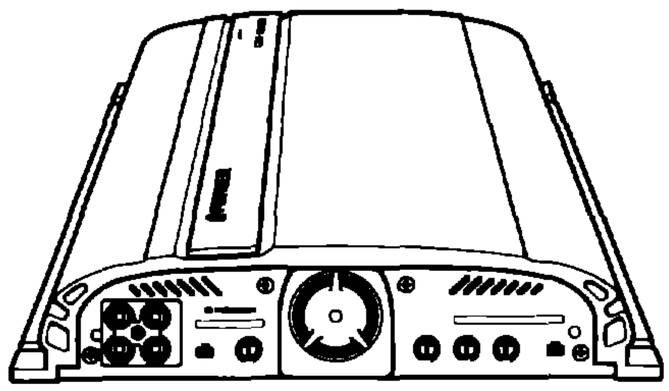
● GM-X802/X1H/UC



ORDER NO.
CRT1696

BRIDGEABLE POWER AMPLIFIER

GM-X802 X1H/UC, EW

● **This Service Manual has been written in English and Japanese.**

CONTENTS

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

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

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1. DISASSEMBLY / 分解のしかた

● Removing the Case and Panel

1.Remove the six screws A, and then remove the case.
2.Remove the four screws B, and then remove the panel.

● ケース,パネルのはずしかた

1.ネジAを6本はずし、ケースをはずす。
2.ネジBを4本はずし、パネルをはずす。

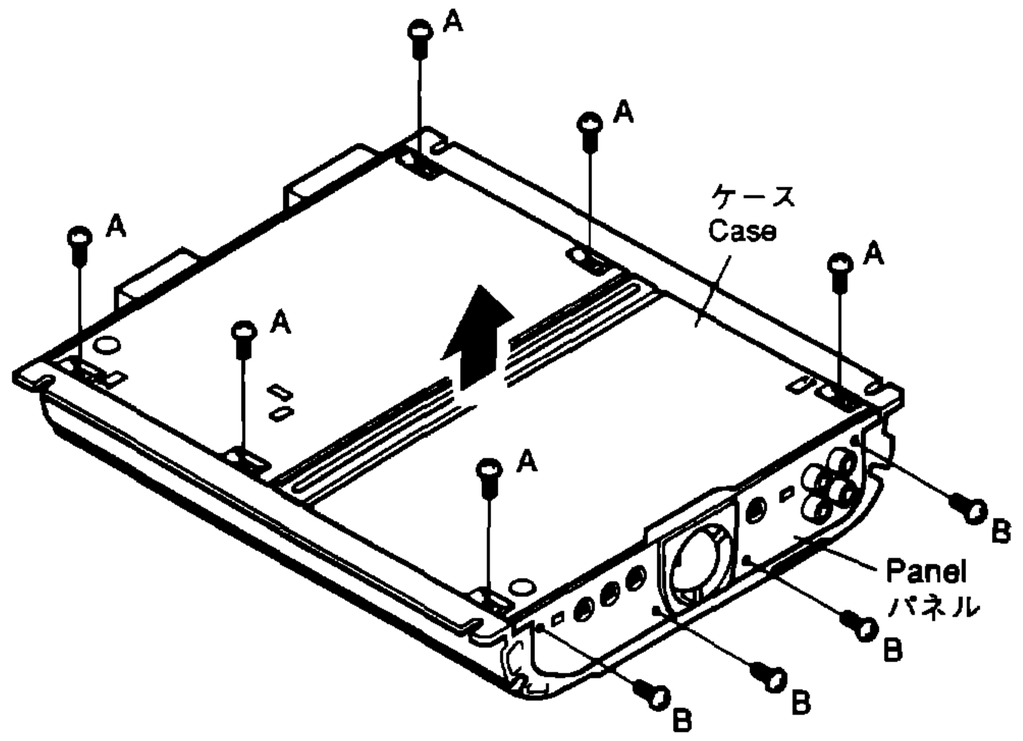


Fig.1

● Removing the Heat Sink Assy

1.Remove the three screws C.
2.The heat sink assy is closely fit in the heat sink with silicon grease. Insert a screwdriver between the holder and the heat sink assy to remove the heat sink assy.

● ヒートシンクASS'Yのはずしかた

1.ネジCを3本はずす。
2.シリコングリスにより、ヒートシンクとヒートシンクASS'Yが密着しているため、マイナスドライバーをホルダとヒートシンクASS'Yの間へ差し込み、こじってヒートシンクASS'Yをはずす。

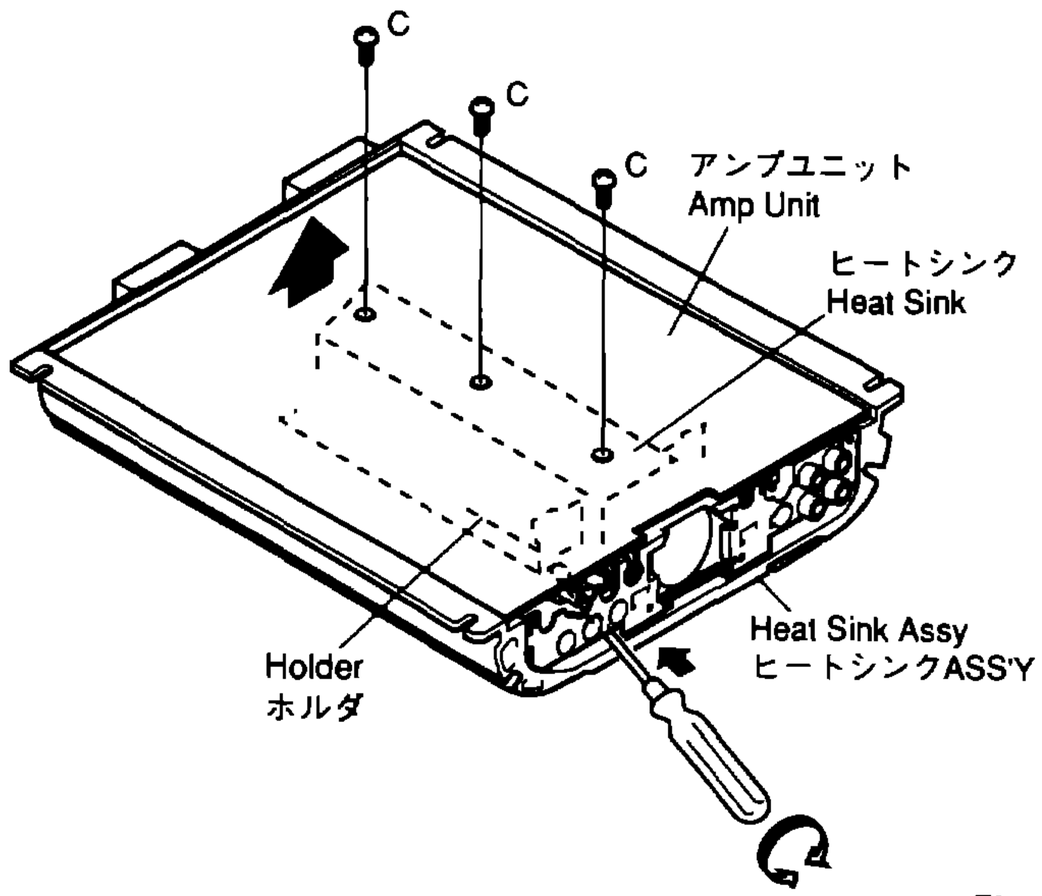


Fig.2

● Precautions when assembling the Heat Sink Assy

Place the amp unit on the heat sink assy and tighten the three screws C. In order to prevent the screws from loosening, after about five minutes, re-tighten to make sure there is no looseness.

● ヒートシンクASS'Yを組み立てるときの注意点

ヒートシンクASS'Yにアンプユニットをのせて、ネジCを3本締める。ネジC3本のゆるみを防止するために、5分程度経過した後にネジC3本を再度締めてゆるみの無いことを確認する。

2. ELECTRICAL PARTS LIST / 電気部品表

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.....

- 部品番号中“Θ”は、英字の“O”を表します。部品発注の際は注意してください。
- 部品を発注する際は、特に数字の“1”と英字の“l”との区別をはっきり記入してください。
- 部品番号を表示していない部品は、供給できません。
- 下記に示す部品番号はチップ部品を表します。

  チップ抵抗器

  ＲＳ１／□Ｓ□□□Ｊ、ＲＳ１／□□Ｓ□□□Ｊ、ＲＮ１／１０ＳＥ□□□Ｄ

  チップコンデンサ（ＣＱＳ……を除く）

  ＣＫＳ……、ＣＣＳ……、ＣＳＺＳ……

Circuit Symbol & No.	Part Name	Part No.
Unit Number : HWH1216		
Unit Name : Amp Unit (GM-X802/X1H/UC) (Serial No.1—1300)		
MISCELLANEOUS		
IC 301 451 551		UPC4570HA
IC 351 352		NJM2068DD
IC 651		TA8194Z
IC 951		UPC494C
Q 151 251		2SC2459
Q 152 252		2SA1049
Q 153 155 160 161 253 255 260 261		2SA992
Q 154 156 158 163 254 256 258 263		2SC1845
Q 157 257		2SK389
Q 162 262		2SC1568
Q 164 264		2SC3421
Q 165 166 265 266		2SC4388
Q 167 267		2SA1358
Q 168 169 268 269		2SA1673
Q 301 302 551 552 655 658 661 662 951 954		2SC2458
Q 651 652		2SD1768S
Q 653 657 659 663 952 956 957		2SA1048
Q 654		2SC3113
Q 660 968		2SB1243
Q 953		2SD1864
Q 955 969		2SC2458
Q 958 959		2SD1919
Q 960 961		2SB1277
Q 962 963 964 965 970 971		IRFIZ44G
Q 966		2SD2395
Q 967		2SB1566
D 151 154 251 254		PR3432S
D 152 153 252 253 651 652 653 655 657 952		1SS133
D 155 255		HZS6LB1
D 654		HZS7LB2
D 656		HZS7LA2
D 658		ERA15-02VH
D 901		RM4Z-LFK5
D 951		HZS12LA3
D 953 955		1SS133
D 954		HZS18JB3
D 957		YG902C2
D 958		YG902N2
D 959 960		HZS16L1
D 961 962		ERA92-02VH

Circuit Symbol & No.	Part Name	Part No.
L 351 352	Ferri-Inductor	CTF1007
L 901		CTH1144
L 951 952		CTH1150
L 953 954	Coil	CTH1121
T 951	Transformer	CTT1041
RY 601		CSR1015
TH 951	Thermistor	CCX1013
TH 952	Thermistor	CCX1027
S 451	Switch(LPF)	CSH1021
S 550	Switch(BASS/BOOST)	CSH1021
IL 901	Lamp14V/60mA	CEL1410
IL 902	Lamp14V/40mA	CEL1411
VR 151 251	Semi-fixed	VRTB6VS471
VR 451	Volume 20kΩ(A)	CCS1252
VR 452	Volume 10kΩ(A)	CCS1241
VR 551	Volume 10kΩ(C)	CCS1240
VR 552	Volume 50kΩ(C)	CCS1242
VR 951	Semi-fixed 100kΩ(B)	VRTB6VS104
FU 901 902		HEK0020
その他		CXM1102
RESISTORS		
R 150 250		RS1/2P100JL
R 151 152 251 252 660 668 676 957 960 961		RD1/4PS472JL
R 153 158 253 258 301 305 306 307 308 353		RD1/4PS223JL
R 154 156 254 256		RD1/4PS101JL
R 155 255 657 670		RD1/4PS104JL
R 157 257 351 352		RD1/4PS471JL
R 159 259 573 574 664 951 952 955		RD1/4PS102JL
R 160 260		RD1/4PS621JL
R 161 261 658		RD1/4PS472JL
R 162 262		RD1/4PS561JL
R 163 165 263 265		RD1/4PS333JL
R 164 264		RD1/4PS390JL
R 166 266 303 304		RD1/4PS821JL
R 167 267		RD1/4PS681JL
R 168 268 971		RD1/4PS221JL
R 169 170 269 270 977 980 987 988 991 992		RD1/4PS470JL
R 171 271		RD1/4PM221J
R 172 173 174 175 272 273 274 275		RD1/4PM100J
R 176 177 276 277	0.22Ω(5W)	CCN1071
R 302 665 666 678 956 962		RD1/4PS103JL

Circuit Symbol & No.	Part Name	Part No.
R 309 310 673 674		RD1/4PS103JL
R 354 663 675 677 966		RD1/4PS223JL
R 355 356 357 358 451 452 453 454 463 464		RN1/4PC1002D
R 359 360 361 362		RN1/4PC3601D
R 363 364		RD1/4PS222JL
R 365 366		RD1/4PS392JL
R 455 456 563 564 569 570 575 576 662 667		RD1/4PS222JL
R 461 462		RD1/4PS391JL
R 551 552 653 654 681		RD1/4PS473JL
R 555 556 968 969		RD1/4PS182JL
R 557 558 561 562 671		RD1/4PS221JL
R 559 560 659		RD1/4PS822JL
R 651 652 679 680		RD1/4PS124JL
R 655 656		RD1/4PM473J
R 669		RD1/4PS101JL
R 672		RD1/4PS152JL
R 954 970		RD1/4PS153JL
R 958		RD1/4PS183JL
R 959		RD1/4PS512JL
R 963 974 975		RD1/4PS332JL
R 964 965 978 979 985 986 989		RD1/4PS472JL
R 967		RD1/4PS123JL
R 972 973		RD1/4PS124JL
R 982 983		RS1/2P220JL
R 990		RD1/4PS222JL
R 993 994		RS1/2P101JL
R 995		RD1/4PS333JL
CAPACITORS		
C 150 250		CFTNA333J50
C 151 152 153 154 251 252 253 254		CEKA470M50
C 155 255		CEKA100M16
C 156 256		CQPA221J2A
C 157 257		CQPA102J2A
C 158 258		CEKA101M16
C 159 259		CMA150J2H
C 160 260		CMA330J2H
C 161 162 166 167 261 262 266 267 968		CFTNA104J50
C 163 164 263 264		CMA390J2H

Circuit Symbol & No.	Part Name	Part No.
C 165 265 965		CQPA102J2A
C 301 302 353 354		CEAS100M16
C 303 304 351 352		CQMA471J50
C 355 356		CFTNA223J50
C 357 358 359 360		CCPSL470J50L
C 451 452		CFTNA474J50
C 453 454 955 956		CFTNA273J50
C 455 456		CFTNA184J50
C 551 552		CCPSL330J50L
C 553 554		CEAS3R3M50
C 555 556		CFTNA334J50
C 557 558		CFTNA473J50
C 563 564		CCCSL101J50
C 651	220μF/10V	CCH1036
C 652		CEAS102M16
C 653 962 986		CEAS470M16
C 654		CEAS220M16
C 655		CFTNA103J50
C 901 957	4700μF/16V	CCH1206
C 902		CFTNA224J50
C 951		CEAS010M50
C 952		CEAS221M10
C 953		CFTNA105J50
C 954 989 990		CEAS101M16
C 958 959	4700μF/35V	CCH1207
C 960 961 971 972		CEKA331M50
C 966 967		CFTNA564J50
C 969		CEAS221M16
C 987 988	4700μF/35V	CCH1207

- The GM-X802/X1H/EW and GM-X802/X1H/JP Parts Lists enumerate the parts which differ from those enumerated in the GM-X802/X1H/UC Parts List only. The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly. The GM-X802/X1H/UC Parts List is given on page 3.

- GM-X802/X1H/JPの部品表は、GM-X802/X1H/UCとの違いのみ表にしています。表以外の部品については同じですので、GM-X802/X1H/UCの部品表を参照してください。部品表は、3ページにあります。

Amp Unit

Circuit Symbol & No.	X1H/UC Model Serial No.1—1300	X1H/UC Model Serial No.1301—	X1H/EW Model Serial No.1—	X1H/JP Model Serial No.1—700	X1H/JP Model Serial No.701—
Q953	2SD2395	2SD1864	2SD1864	2SD2395	2SD1864
S951	•••••	•••••	*HSH-156	HSH-156	HSH-156
R953	•••••	•••••	RD1/4PS105JL	RD1/4PS105JL	RD1/4PS105JL
R972,973	RD1/4PS104JL	RD1/4PS124JL	RD1/4PS124JL	RD1/4PS104JL	RD1/4PS124JL
R984	RS1/2P220JL	•••••	•••••	RS1/2P220JL	•••••
C355,356	CQMA472J50	CFTNA223J50	CFTNA223J50	CQMA472J50	CFTNA223J50
C964	CQPA102J2A	•••••	•••••	CQPA102J2A	•••••
C973,974	•••••	CFTNA474J50	CFTNA474J50	•••••	CFTNA474J50

3. CONNECTION DIAGRAM / 総合パターン図

AMP UNIT

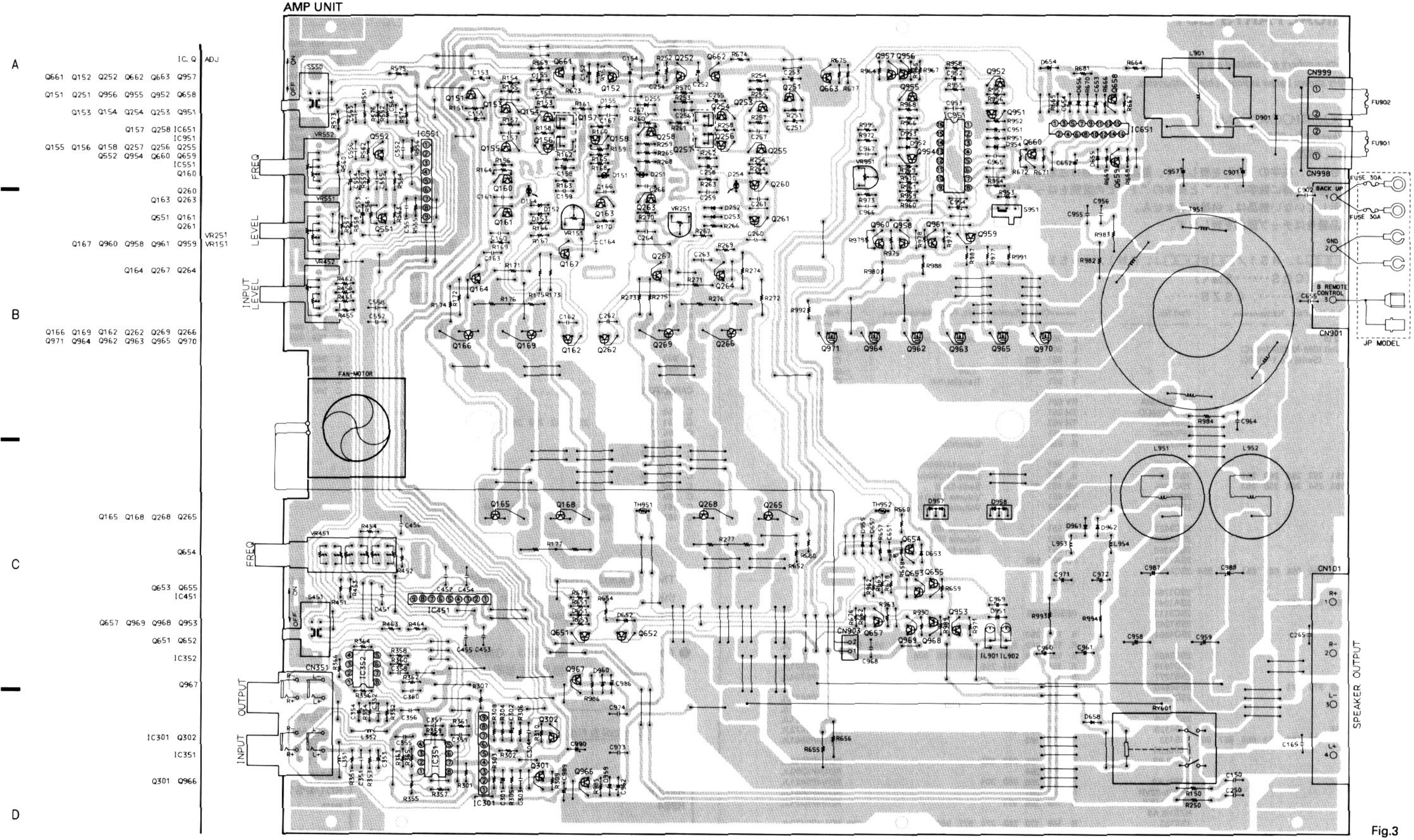
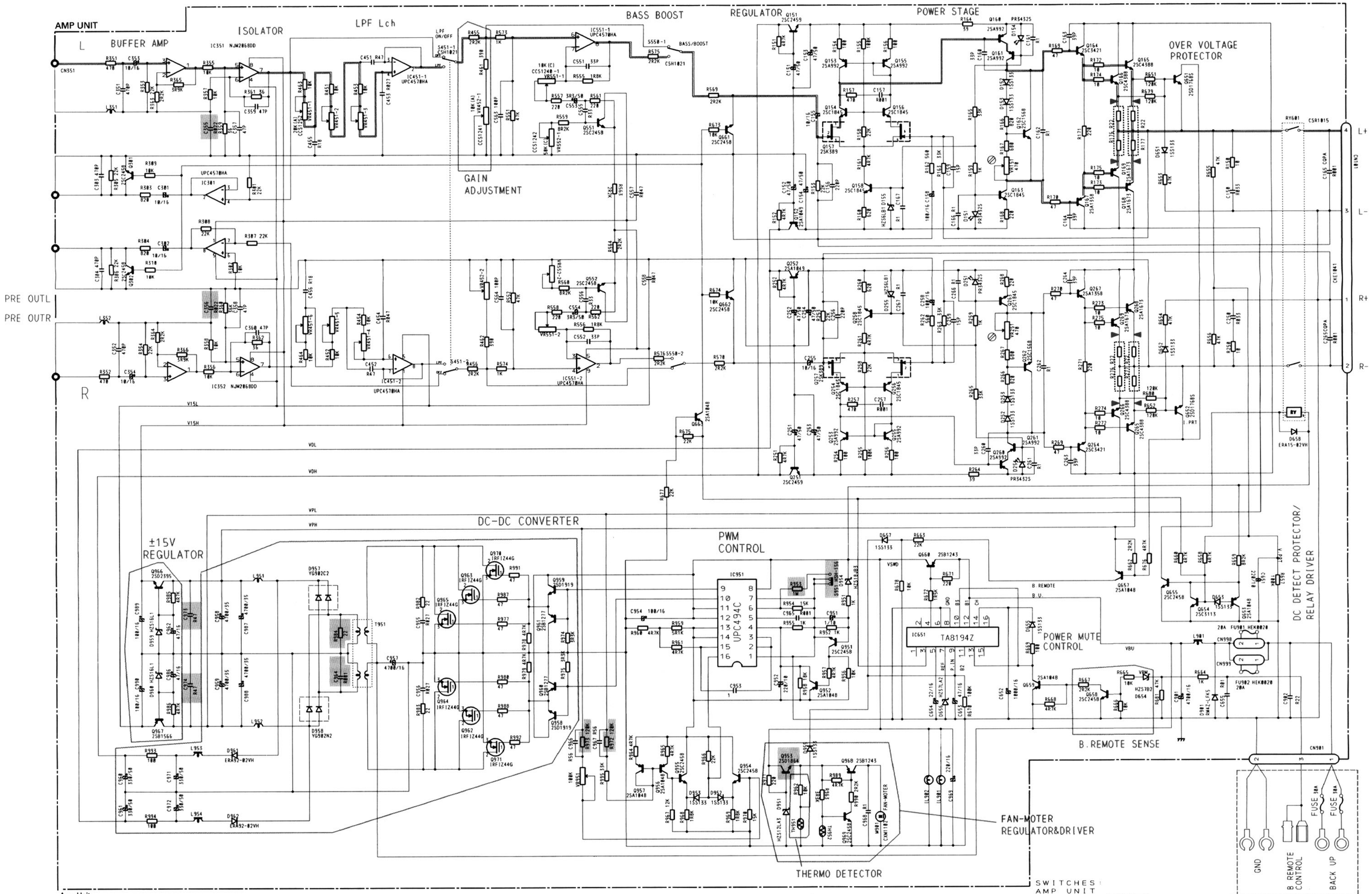


Fig.3

このPCB図にマウントしている部品は複数のモデルの部品を含んでいます。
各モデルの情報は、回路図で確認するようにしてください。

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

4. SCHEMATIC CIRCUIT DIAGRAM / 総合回路図



Amp Unit

Circuit Symbol & No.	X1H/UC Model Serial No.1-1300	X1H/UC Model Serial No.1301-	X1H/EW Model Serial No.1-	X1H/JP Model Serial No.1-700	X1H/JP Model Serial No.701-
Q953	2SD2395	2SD1864	2SD1864	2SD2395	2SD1864
S951	*****	*****	HSH-156	HSH-156	HSH-156
R953	*****	*****	RD1/4PS105JL	RD1/4PS105JL	RD1/4PS105JL
R972,973	RD1/4PS104JL	RD1/4PS124JL	RD1/4PS124JL	RD1/4PS104JL	RD1/4PS124JL
R984	RS1/2P220JL	*****	*****	RS1/2P220JL	*****
C355,356	CQMA472J50	CFTNA223J50	CFTNA223J50	CQMA472J50	CFTNA223J50
C964	CQPA102J2A	*****	*****	CQPA102J2A	*****
C973,974	*****	CFTNA474J50	CFTNA474J50	*****	CFTNA474J50

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

NOTE
- は抵抗器を表現します。
チップ抵抗と普通の抵抗との区別はありません。
- はコンデンサを表現します。
チップコンデンサと普通のコンデンサとの区別はありません。

抵抗器とコンデンサの定数で、小数点のあるものを次のように表現しています。
例）2.2→2R2 , 0.022→R022

SWITCHES:
AMP UNIT
S451:LPF SWITCH ..... ON/OFF
S550:BSS/BOOST SWITCH ..... ON/OFF
S951:BFC SWITCH ..... H/L
The underlined indicates the switch position.

スイッチ:
アンプユニット
S451:LPF スイッチ ..... ON/OFF
S550:BSS/BOOST スイッチ ..... ON/OFF
S951:BFC スイッチ ..... H/L
アンダーラインはスイッチポジションを示す。

Fig.4

5. ADJUSTMENT / 調整法

No	Item	Conditions	Adjustment point	Specifications
1	Idling current (adjustment)	Input ; adjust 30 seconds after 1kΩ terminate power is switched on, and within 20 seconds.	VR251 VR151	mV Meter(1) : 100±5mV
2	Idling current (checking)	Input ; check 30 seconds after 1kΩ terminate power is switched on.	———	mV Meter(2) : 100±50mV

No	項　目	条　件	調整ポイント	規　格
1	アイドリング電流（調整値）	入力；1kΩ ターミネート　パワーON30秒後 20秒以内に調整のこと	VR251 VR151	mV Meter(1) : 100±5mV
2	アイドリング電流（確認）	入力；1kΩ ターミネート　パワーON30秒後 確認のこと	———	mV Meter(2) : 100±50mV

● Connection Diagram

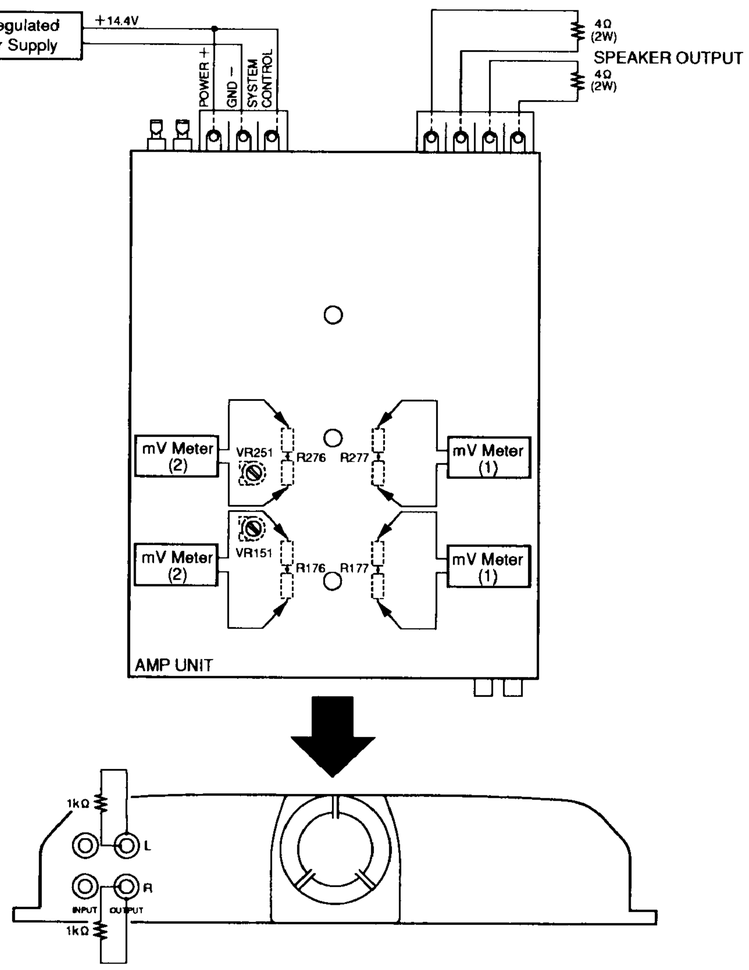


Fig.5

6. EXPLODED VIEW / 分解図および部品表

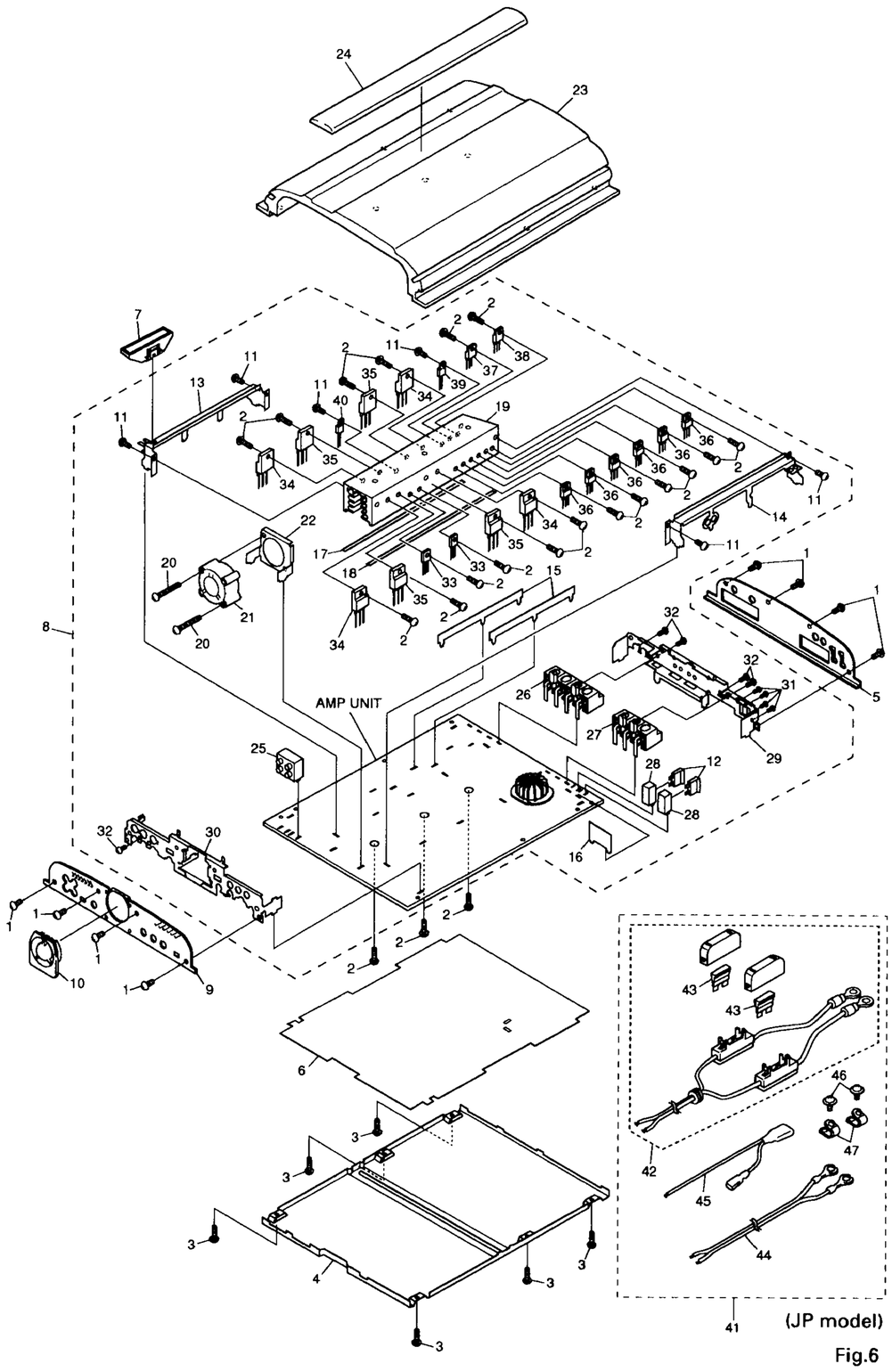


Fig.6

NOTE:

- Parts marked by "✱"are generally unavailable because they are not in our Master Spare Parts List.
- Parts marked by "◉"are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- ✱印の部品は、サービス用部品ではありません。従って原則として供給できません。
- ◉印の部品は、供給に時間を要するか、場合によっては供給をお断りすることがあります。
- **Parts List**(GM-X802/X1H/UC)

Mark	No.	Description	Part No.
	1	Screw	BSZ30P050FZK
	2	Screw	BBZ30P100FMC
	3	Screw	BBZ30P100FMC
	4	Case	HNB1920
	5	Panel	HNB1949
	6	Insulator	HNM4278
	7	Housing	HNV4180
	8	Amp Unit	HWH1216
	9	Panel	HNB1927
	10	Plate Unit	HXA0003
	11	Screw	BBZ30P060FMC
	12	Fuse(FU901,902)	HEK0020
	13	Holder	HNC5786
	14	Holder	HNC5853
	15	Holder	HNC5856
	16	Holder	HNC5911
	17	Insulator	HNM4284
	18	Insulator	HNM4412
	19	Heat Sink	HNR1373
	20	Screw	BMZ30P230FZK
	21	Fan Motor	CXM1102
	22	Holder	HNC5787
	23	Heat Sink	HNR1358
	24	Plate Unit	HXA7525
	25	Pin Jack(CN351)	CKB1025
	26	Terminal(CN901)	CKE1039
	27	Terminal(CN101)	CKE1041
	28	Fuse Holder(CN998,999)	CKR1011
	29	Holder	HNC5792
	30	Holder	HNC5793
	31	Screw	PPZ20P080FZK
	32	Screw	PPZ30P080FZK
	33	Transistor(Q162,262)	2SC1568
	34	Transistor (Q165,166,265,266)	2SC4388
	35	Transistor (Q168,169,268,269)	2SA1673
	36	FET(Q962-965,970,971)	IRFIZ44G
	37	Diode(D957)	YG902C2
	38	Diode(D958)	YG902N2
	39	Thermistor(TH952)	CCX1027
	40	Thermistor(TH951)	CCX1013
	41-47	•••••	

Mark	No.	Description	GM-X802/X1H/UC Part No.	GM-X802/X1H/EW Part No.	GM-X802/X1H/JP Part No.
	8	Amp Unit	HWH1216	HWH1203	HWH1203
	24	Plate Unit	HXA7525	HXA7525	HXA7524
	41	Cord Assy	•••••	•••••	HDE4722
	42	Cord	•••••	•••••	HDE4723
	43	Fuse(30A)	•••••	•••••	HEK0030
	44	Cord	•••••	•••••	HDE4724
	45	Cord	•••••	•••••	HDE4725
	46	Screw	•••••	•••••	BYC40P180FZK
✱	47	Clamp	•••••	•••••	HNV0001

7. PACKING METHOD / 包装仕様

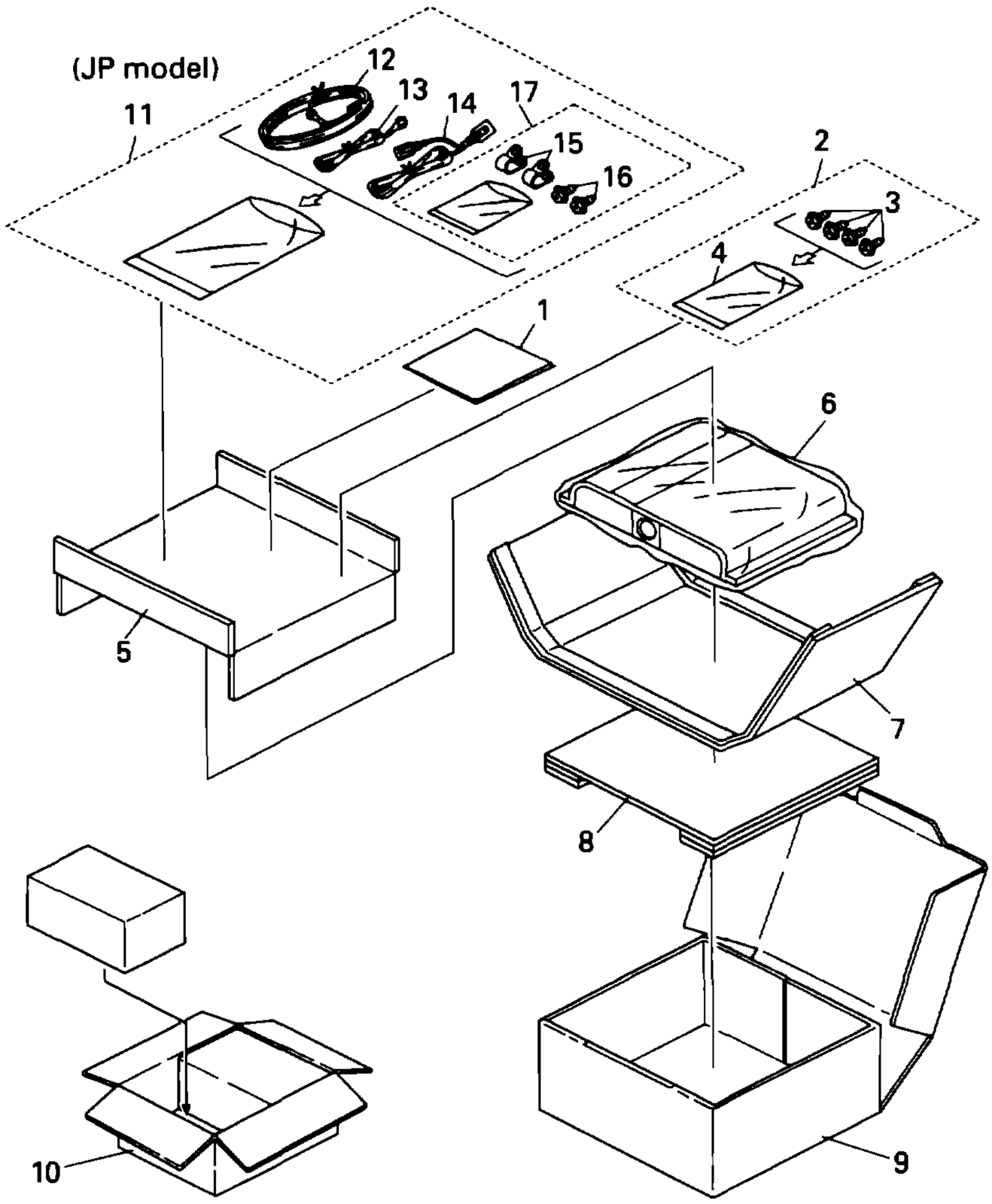


Fig.7

● **Parts List**(GM-X802/X1H/UC)

Mark	No.	Description	Part No.
	1-1	Owner's Manual	HRD0020
*	1-2	Card	ARY1048
	2	Screw Assy	CEA2031
*	3	Screw	BNC40P180FZK
*	4	Polyethylene Bag	E36-613
*	5	Top Tray	HHP0005
	6	Polyethylene Bag	HEG0012
	7	Protector	HHP1728
*	8	Bottom Spacer	HHW0003
	9	Carton	HHG0055
	10	Contain Box	HHL0055
	11-17	•••••	

● **Owner's Manual**

Part No.	Model	Language
HRD0020	GM-X802/X1H/UC	English,French
HRD0021	GM-X802/X1H/EW	English,French,German,Dutch,Spanish,Swedish,Norwegian,Finnish,Italian
HRA0005	GM-X802/X1H/JP	Japanese

Mark	No.	Description	GM-X802/X1H/UC Part No.	GM-X802/X1H/EW Part No.	GM-X802/X1H/JP Part No.
	1-1	Owner's Manual	HRD0020	HRD0021	HRA0005
*	1-2	Card	ARY1048	·····	·····
*	1-3	Warranty Card	·····	HRY1071	CRY1033
	1-4	Polyethylene Bag	·····	·····	E36-618
*	1-5	Service Station Network	·····	·····	CRY-010
	9	Carton	HHG0055	HHG0056	HHG0057
	10	Contain Box	HHL0055	HHL0056	HHL0057
	11	Cord Assy	·····	·····	HDE4722
	12	Cord	·····	·····	HDE4723
	13	Cord	·····	·····	HDE4724
	14	Cord	·····	·····	HDE4725
*	15	Clamp	·····	·····	HNV0001
	16	Screw	·····	·····	BYC40P180FZK
	17	Clamp Unit	·····	·····	HXA0008

8. SPECIFICATIONS

Power source	14.4 V DC (10.8 — 15.6 V allowable)
Grounding system	Negative type
Current consumption	40 A (at continuous power, 4Ω)
Average current drawn*	8 A (4Ω for two channels)
	14 A (4Ω for one channel)
Fuse	40 A
Dimensions	250 (W) × 57.5 (H) × 310 (D) mm
	[9-7/8 (W) × 2-1/4 (H) × 12-1/4 (D) in.]
Weight	3.6 kg (4.1 lbs.)
Maximum power output	200 W × 2 / 600 W × 1 (EIAJ)
Continuous power output	100 W × 2 (at 14.4V, 4Ω, 20 — 20,000 Hz, 0.04% THD)
	300 W × 1 (at 14.4V, 4Ω, 20 — 20,000 Hz, 0.4% THD)
	150 W × 2 (at 14.4V, 2Ω, 20 — 20,000 Hz, 0.4% THD)
	100 W × 2 (at 12V, 4Ω, 20 — 20,000 Hz, 0.04% THD)
	240 W × 1 (at 12V, 4Ω, 20 — 20,000 Hz, 0.4% THD)
	120 W × 2 (at 12V, 2Ω, 20 — 20,000 Hz, 0.4% THD)
Load impedance	4Ω (2 — 8Ω allowable)
Frequency response	10 — 65,000 Hz (+0 dB, –1 dB)
Signal-to-noise ratio	107 dB (IHF – A network)
Distortion	0.003% (10W, 1 kHz)
Separation	73 dB (1 kHz)
Low pass filter	Cut off frequency: 50 ~ 120 Hz
	Cut off slope: –18 dB/oct
Bass boost	Frequency: 40 — 120 Hz
	Gain:0 — 12 dB
Input level/ inpedance	0.4 — 2 V/22 kΩ

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

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.

9. OPERATIONS AND CONNECTION

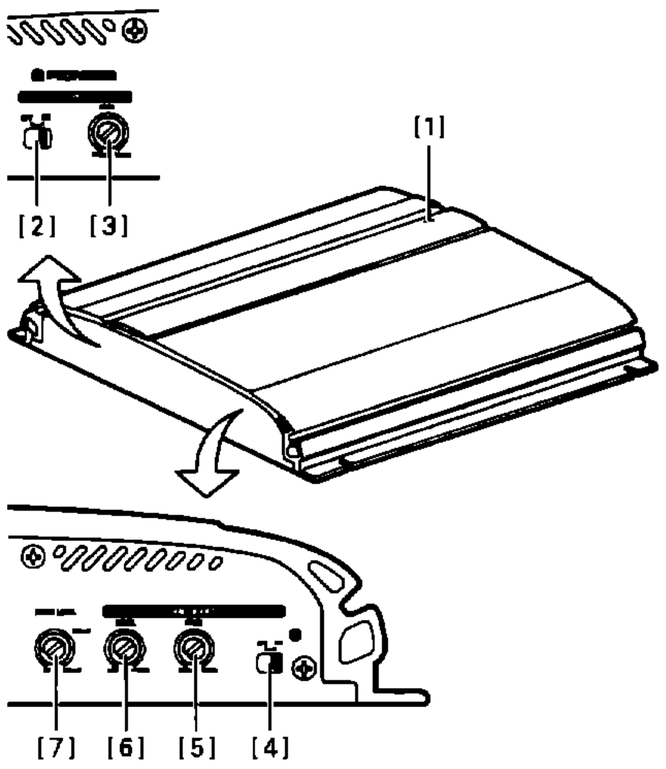


Fig. 8

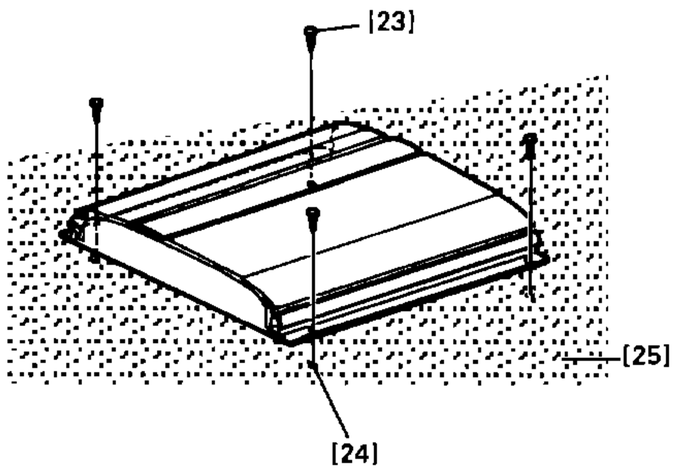


Fig. 10

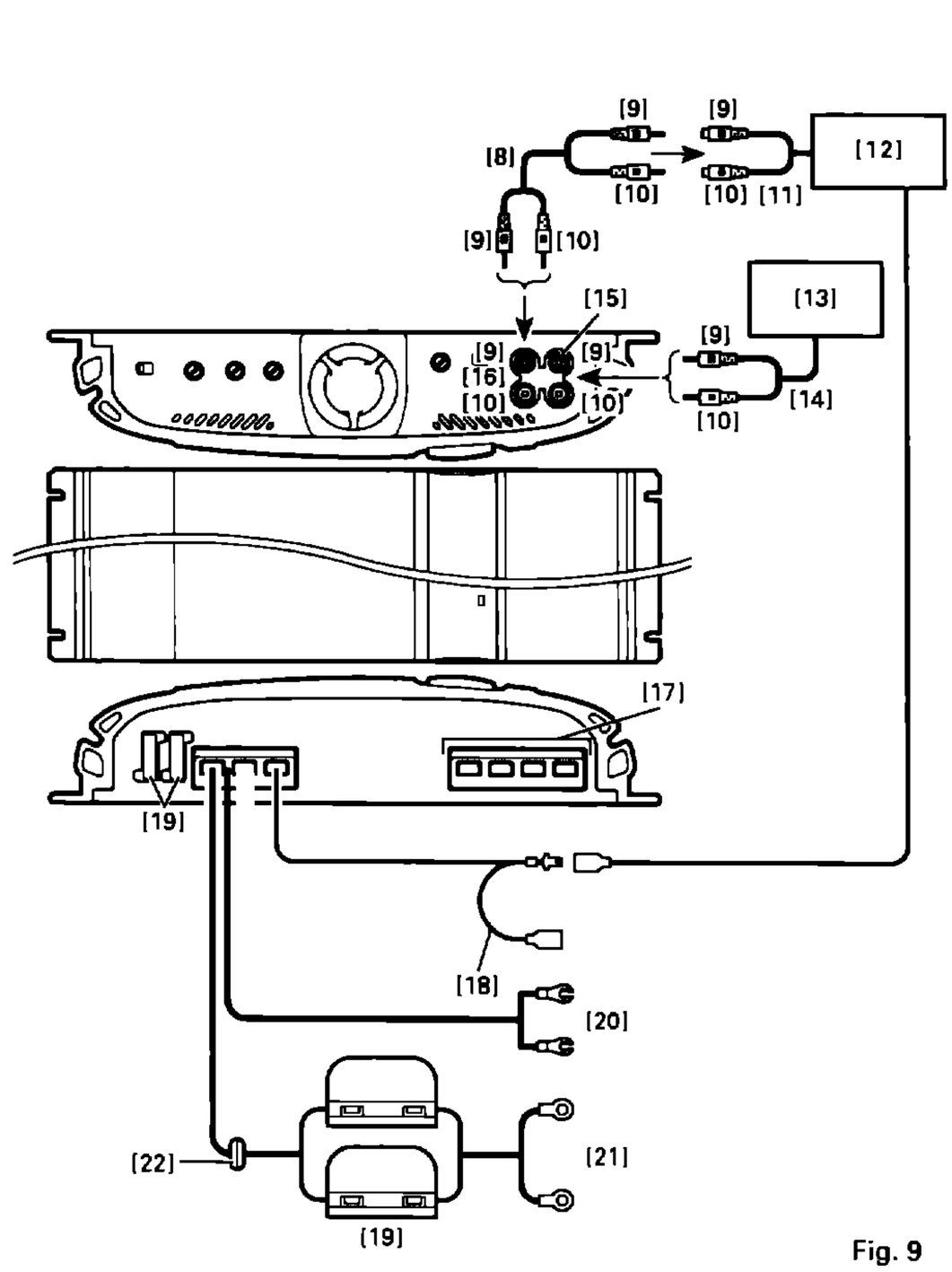


Fig. 9

Setting The Unit

(Fig. 8)

[1] Power Indicator
The power indicator lights when the power is switched on.

[2] LPF (Low-Pass Filter) Select Switch
Set the LPF select switch as follows according to the type of the 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
OFF (left)	Very-low-frequency range to high-frequency range	Other than sub-woofer
ON (right)	Very-low-frequency*	Sub-woofer

* The cut off frequencies of the LPF can be adjusted in the range 50 to 120 Hz. See the "LPF Cut Off Frequency Control" section for details of the cut off frequency adjustment.

[3] LPF Cut Off Frequency Control
When the LPF Select Switch is ON, the cut off frequency can be adjusted in the range 50 Hz to 120 Hz and the selected frequency and lower frequencies are output. Adjust the frequency according to your speakers and car stereo system.

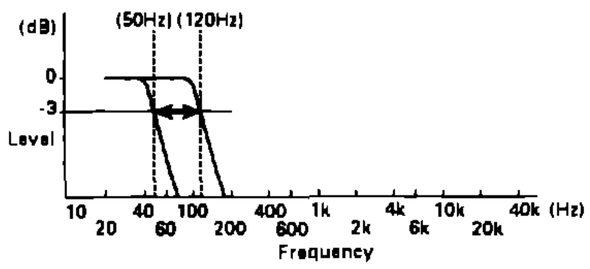


Fig. 11

[4] Bass Boost Select Switch
If you turn the Bass Boost Select Switch on, you can adjust the bass using the bass boost frequency control and bass boost level control. If you do not adjust the bass, set this switch to OFF.

[5] Bass Boost Frequency Control
You can select a bass boost frequency from 40 to 120 Hz with the bass boost control.
- The speaker output may not change when the level is increased according to the cut off frequency selected with the cut off frequency select switch and the frequency selected with the bass boost frequency control.

[6] Bass Boost Level Control
Bass boost level control can boost the level around the frequency selected by the bass boost frequency control from 0 to 12 dB.

[7] Input Level Adjustment
If the sound is too low, even when the volume of the car stereo used along with this power amplifier is turned up, turn input level control on the back of the power amplifier clockwise. If the sound distorts when the volume is turned up, turn the input level control counterclockwise.
- Set the input level control to 500 mV when this amplifier is connected to a Pioneer car stereo with RCA output jacks. If the sound is too low or distorts, adjust the input level control.

Connecting The Unit

⚠ CAUTION

- *Remove the negative (–) terminal of the battery to avoid the risk of short-circuit and damage to the unit.*
- *Secure the wiring with cable clamps or adhesive tape. To protect the wiring, wrap adhesive tape around them where they lie against metal parts.*
- *Do not route wires where they will get hot, for example where the heater will blow over them. If the insulation heats up, it may become damaged, resulting in a short-circuit through the vehicle body.*
- *Make sure that wires will not interfere with moving parts of the vehicle, such as the gearshift, handbrake or seat sliding mechanism.*
- *Do not shorten any wires. Otherwise the protection circuit may fail to work when it should.*
- *Never feed power to other equipment by cutting the insulation of the power supply wire to tap from the wire. The current capacity of the wire will be exceeded, causing overheating.*
- *Always use the special red battery and ground wire [RD-223], which is sold separately. Connect the special red battery wire directly to the car battery positive terminal (+) and the black ground wire to the car body. (The special red battery and ground wire [RD-223] are designed so that the amplifier can be safely connected.)*

⊘ To prevent damage

- *Do not ground the speaker wire directly or connect a negative (–) wire for several speakers.*
- *Speakers to be connected to the amplifier should conform with the standards listed below. Otherwise damage will occur to the speaker. The speaker impedance must be 2 to 8 ohms.*

Speaker		Power
Channel	Type	
Two-channel	Sub-woofer	Nominal input: Min. 100 W
	Other than sub-woofer	Max. input: Min. 200 W
One-channel	Sub-woofer	Nominal input: Min. 300 W
	Other than sub-woofer	Max. input: Min. 600 W

- This unit is for vehicles with a 12-volt battery and negative grounding. Before installing it in a recreational vehicle, truck, or bus, check the battery voltage.
- Install and route the sold separately special red battery wire [RD-223] as faraway as possible from the speaker wires. Install and route the sold separately special red battery wire and, ground wire [RD-223], speaker wires, and the amplifier as faraway as possible from the antenna, antenna cable and tuner.

⊘ If many units are connected

- *If the car stereo is kept on for a long time while the engine is at rest or idling, the battery may go dead. Turn the car stereo off when the engine is at rest or idling.*
- *If the blue wire of the amplifier is connected to the power terminal through the ignition switch (12 VDC), the amplifier will always be on when the ignition is on—regardless of whether the car stereo is on or off. Because of this, the battery could go dead if the engine is at rest or idling.*

(Fig. 9)

[8] Connecting wire with RCA plug. (sold separately)
[9] Red
[10] White
[11] External output
[12] Car stereo with RCA output jack
[13] Amplifier with RCA input jack
[14] RCA input
[15] RCA output jack
[16] RCA input jack
[17] Speaker output terminals
See the "Connecting the Speakers" section for speaker connection instructions.
[18] Blue
Connect the male terminal of this wire to the blue wire of the car stereo (system remote control terminal). The female terminal can be connected to the auto-antenna relay control terminal.
If the car stereo does not have a system remote control terminal, connect the male terminal to the power terminal through the ignition switch.
[19] Fuse (Special red battery wire: 30 × 2 A, Amplifier: 20 A × 2)
[20] Ground wire (black) [RD-223] (sold separately)
Connect to metal body or chassis.
[21] Special red battery wire [RD-223] (sold separately)
After making all other connections to the amplifier, connect the battery wire terminal of the amplifier to the positive (+) terminal of the battery.
[22] Grommet

Connecting the Power Terminal

- *Always use the special red battery and ground wire [RD-223], which is sold separately. Connect the special red battery wire directly to the car battery positive terminal (+) and the black ground wire to the car body. (The special red battery and ground wire [RD-223] are designed so that the amplifier can be safely connected.)*

1. Pass the special red battery wire from the engine compartment to the interior of the vehicle.

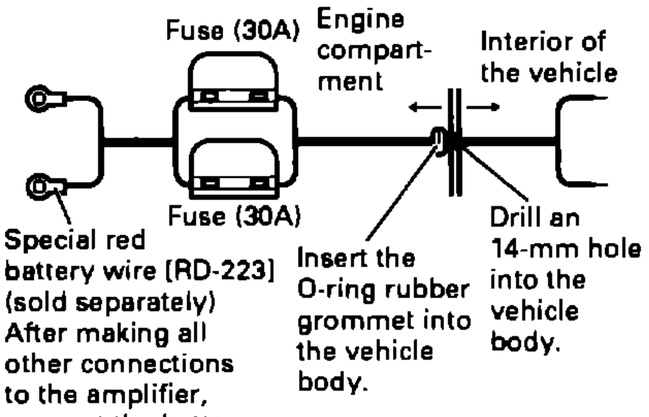


Fig. 12

2. Twist the sold separately special red battery wire , ground wire, and system remote control wire [RD-223].

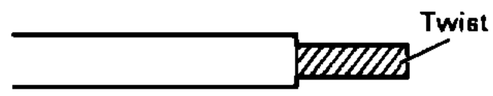


Fig. 13

3. Connect the wires to the terminal.

- Fix the wires securely with the terminal screws.

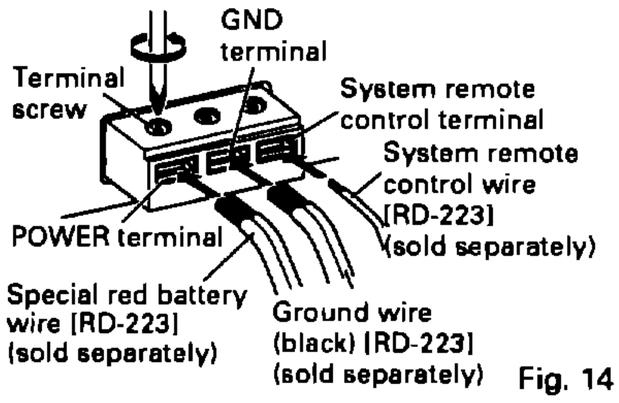


Fig. 14

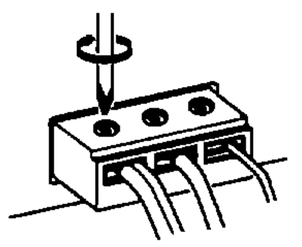


Fig. 15

4. Bundle the wires at a point about 100 mm away from the terminal with a clamper [RD-223].

- Be sure to fix the wires securely with the clamper.

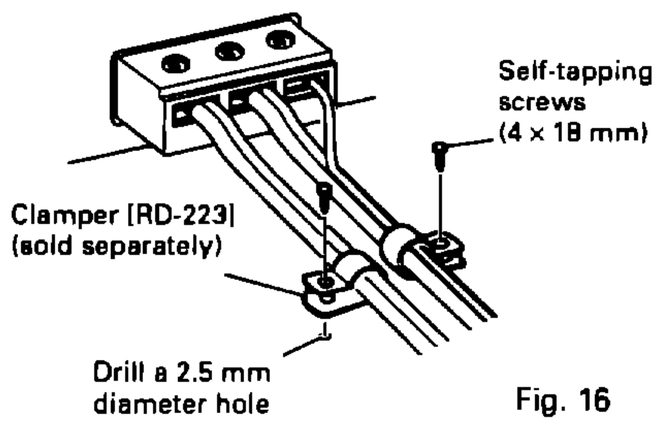


Fig. 16

Connecting the Speakers

The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). Connect the speaker leads to suit the mode. Connect the speakers according to the figure on the following pages.

Two-channel mode (stereo)

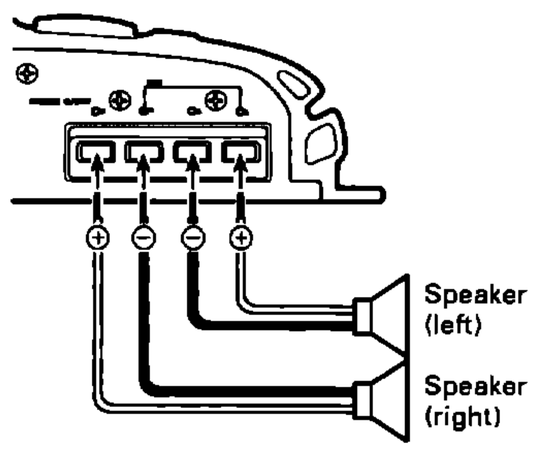


Fig. 17

One-channel mode (mono)

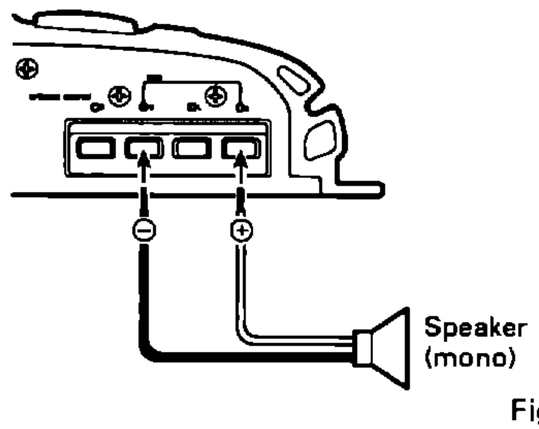


Fig. 18

Three-channel mode (stereo + mono)

The power amplifier is basically a two-channel/one-channel bridgeable amplifier, but three channels can be achieved by combining the stereo and mono modes using inductors and capacitors. See Figs. 19 and 20 for details of wiring.

- *The following Figs. 19 and 20 require advanced understanding of electronics. If you do not understand the diagram, please have the work done by your nearest authorized Pioneer installation specialist.*

Three-channel mode, two-way system

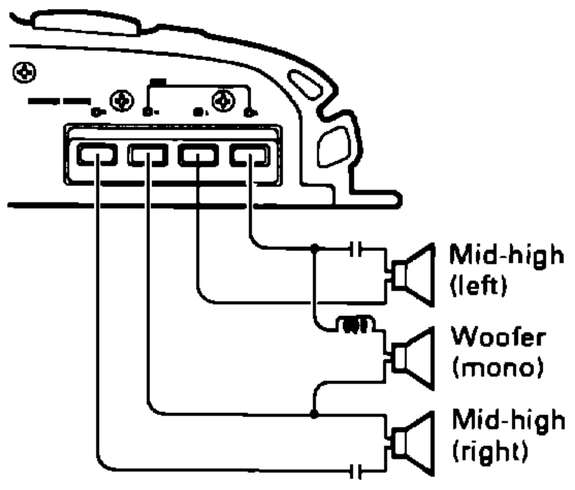


Fig. 19

Three-channel mode, three-way system

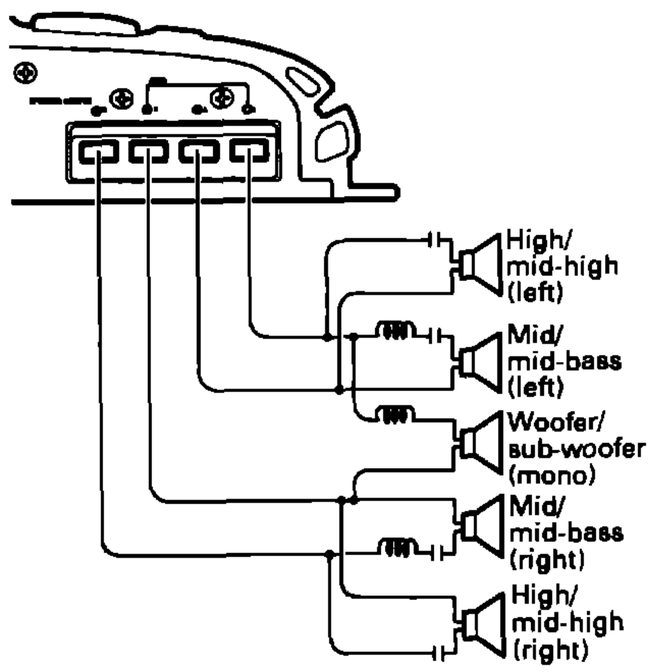


Fig. 20

- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter. The inductor (L) shall be used on the woofer/sub-woofer, and the capacitor (C) shall be used on the high/mid-high.
- *Remember when bridging an amplifier it will see only half of the original speaker impedance. Therefore, you must use speakers that have ratings of 4 ohms or higher. If you use speakers that have lower impedance ratings it may cause damage to the amplifier.*
- *When the inductors and capacitors are connected to the speaker wires, secure or solder them so they cannot be pulled loose. Tape or use heat shrink tubing on the joints to prevent short circuits.*

Setting the Filter Constant

Low-pass filter (for sub-woofer/ woofer): 6 dB/octave (Fig. 21)

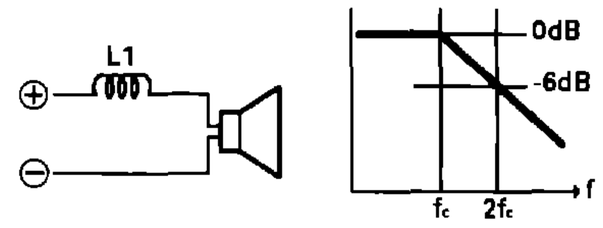


Fig. 21

High-pass filter (for mid/mid-high): 6 dB/octave (Fig. 22)

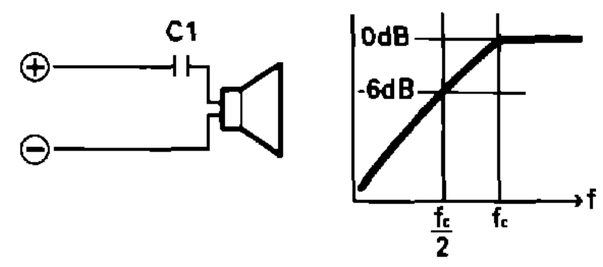


Fig. 22

Band-pass filter (combination of low-pass filter and high-pass filter for mid-bass/mid): 6 dB/octave (Fig. 23)

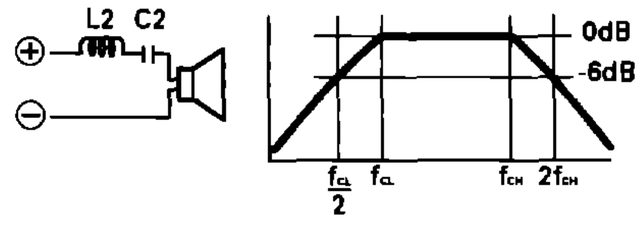


Fig. 23

- A multi-channel system can be set up using a combination of filters Figs. 21, 22, and 23. The inductance (L) and capacitance (C) will determine the frequency (fc) that the speaker will reproduce. Refer to the previous charts to determine the components required.
- *Use the capacitors specified. Non-polarized capacitors rated at over ±25 V should be used for C1 and C2 in the diagram. Because of the voltage output of the amplifier, it is very important to use non-polarized capacitors rated at or over 25 V. This will prevent a safety hazard.*

Component Guide

Speaker load impedance	2Ω		4Ω		8Ω	
fc (Hz)	L (mH)	C (μF)	L (mH)	C (μF)	L (mH)	C (μF)
50	6.4	1,600	12.7	800	25.5	400
80	4.0	1,000	8.0	500	16	250
125	2.5	640	5.1	300	10	160
200	1.6	400	3.2	200	6.4	100
320	1.0	250	2.0	125	4	62
500	0.64	160	1.3	80	2.6	40
800	0.4	100	0.8	50	1.6	25
1,250	0.25	64	0.5	30	1.0	16
2,000	0.16	40	0.3	20	0.64	10
3,200	0.1	25	0.2	12.5	0.4	6.2
5,000	0.06	16	0.13	8	0.26	4
8,000	0.04	10	0.08	5	0.16	2.5
10,000	0.03	8	0.06	4	0.13	2

Connecting the Speaker Output Terminals

1. Expose the end of the speaker wires by about 10 mm and twist it using nippers or a cutter.

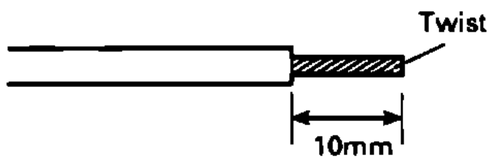


Fig. 24

2. Connect the speaker wires to the speaker output terminals.

- Fix the speaker wire securely with the terminal screws.

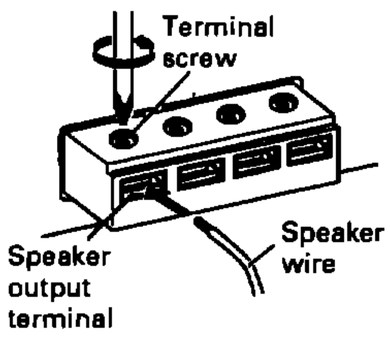


Fig. 25

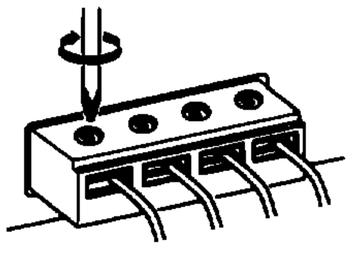


Fig. 26