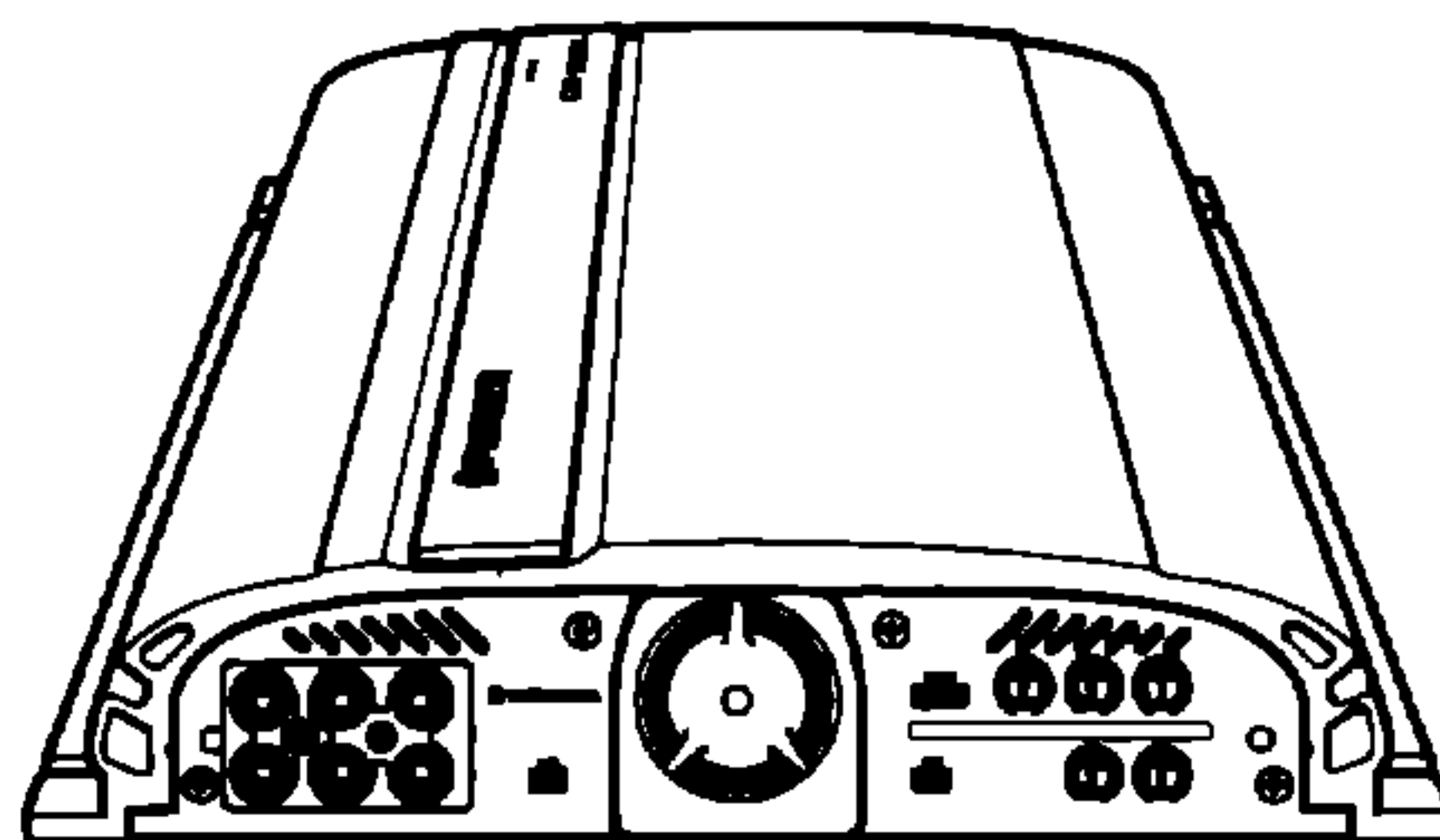


Service Manual

PIONEER
The Art of Entertainment

● GM-X904/X1H/UC



ORDER NO.
CRT1692

BRIDGEABLE FOUR-CHANNEL POWER AMPLIFIER

GM-X904

X1H/UC,EW

- This Service Manual has been written in English and Japanese.
- The 10 pin extension cable (GGD1053) is provided between the amp unit CN451 and the filter unit CN401. Please use as required when testing this model.

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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

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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K-FFD. JUNE 1995 Printed in Japan

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。

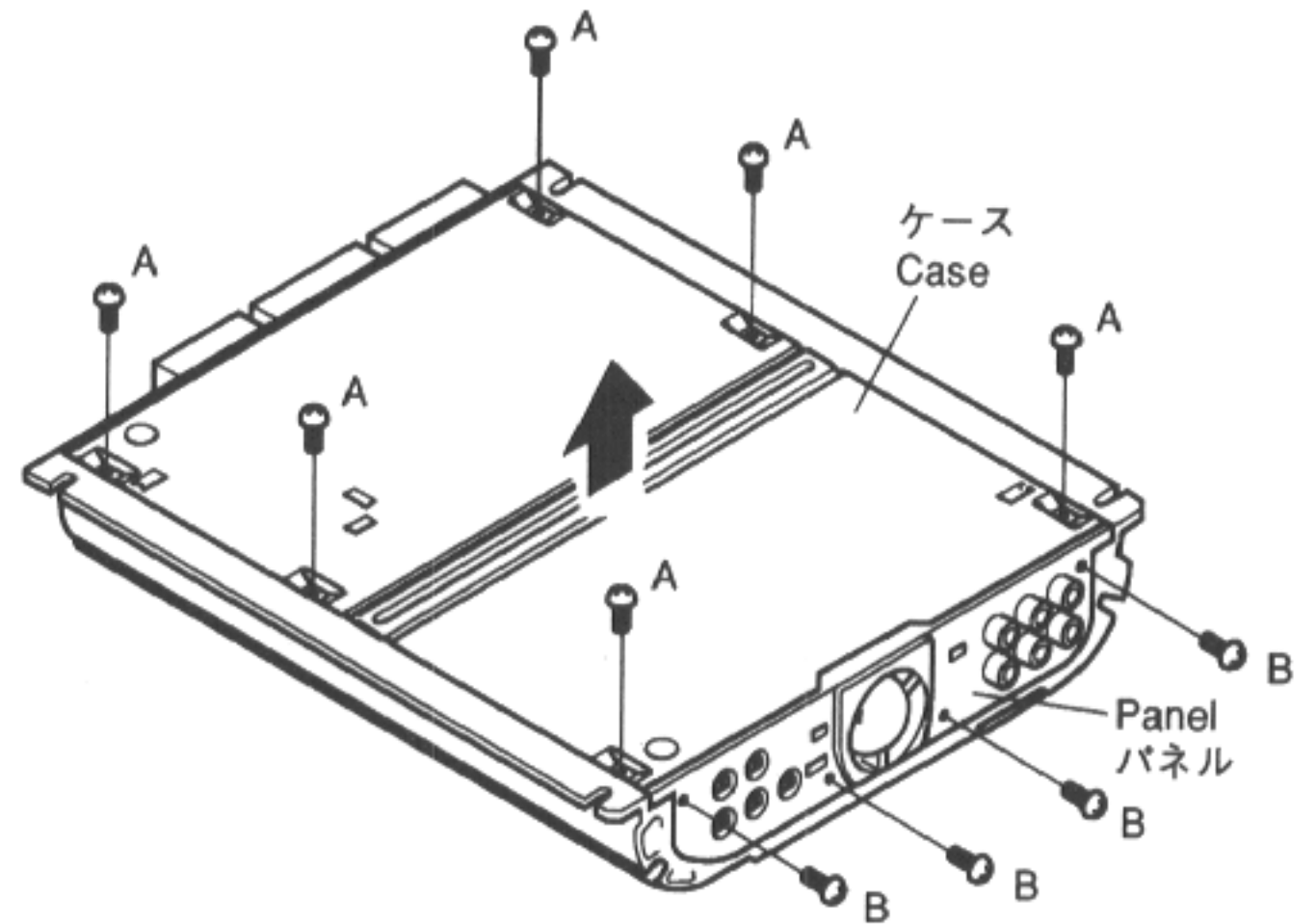


Fig.1

● 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。

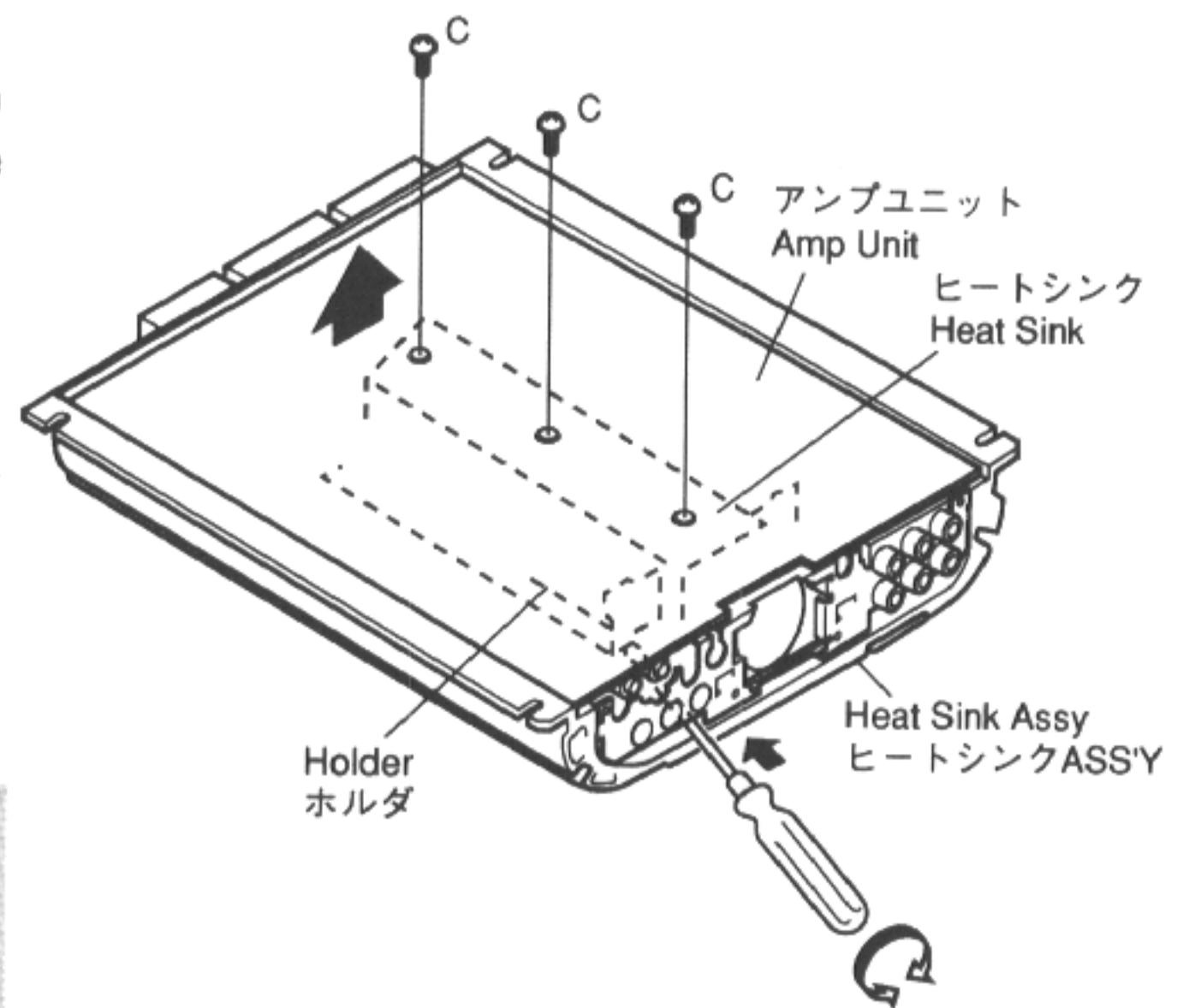


Fig.2

● 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/○○○○○J, RS1/○○○○○J

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

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

● 部品番号中“0”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/□□□□□J、RS1/□□□□□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.	====Circuit Symbol & No. Part Name====	Part No.
Unit Number : HWG1045 Unit Name : Filter Unit (GM-X904/X1H/UC)		Q 206 207	2SA992
		Q 251 252	2SC1845
		Q 253 254	2SA992
		Q 255 259	2SC1845
		Q 256 257	2SA992
MISCELLANEOUS			
IC 401 402 403	UPC4570HA		
S 401	Switch(CHA Filter)	Q 501 502 601 606 654 901 915 916	2SC2458
VR 401 402	Volume 20kΩ (E)X4	Q 602 651 655 705 902 913 914	2SA1048
VR 403	Volume 10kΩ (A)X2	Q 603 605	2SB1243
		Q 604 911	2SD2395
		Q 653	2SC3113
RESISTORS			
R 401 402	RD1/4PS103JL	Q 656 657 658 659	2SD1768S
R 405 407	RD1/4PS183JL	Q 903 904	2SB1277
R 409 410	RD1/4PS222JL	Q 905 906	2SD1919
R 417 418 419 420	RD1/4PS153JL	Q 907 908 909 910 917 918	IRFIZ44G
R 423 424	RD1/4PS391JL	Q 912	2SB1566
CAPACITORS			
C 401 402 405 406	CFTLAH104J50	D 101 151 201 251	HZS6LB1
C 409 410	CFTLAH124J50	D 102 103 104 105 106 107 108 152 153 154	1SS133
C 411 412	CFTLAH683J50	D 155 156 157 158 202 203 204 205 206 207	1SS133
C 413 414 415 416	CEA330M16LS	D 208 252 253 254 255 256 257 258 603 604	1SS133
C 417 418 419 420	CKCYB101K50	D 602	HZS7LB2
		D 605	HZS7LA2
		D 606	HZS12LA3
		D 651 652 653 654 655 903 908 909	1SS133
		D 656	ERA15-02VH
		D 901	RM4Z-LFK5
Unit Number : HWH1215 Unit Name : Amp Unit		D 902	HZS18L3
		D 904	YG902C2
		D 905	YG902N2
		D 906 907	HZS16L1
		D 910 911	ERA92-02VH
MISCELLANEOUS			
IC 451 452 501	UPC4570HA	L 851 852 853 854	Ferri-Inductor
IC 601	TA8194Z	L 901	Choke Coil 50μH
IC 851 852 853 854	NJM2068DD	L 902 903	Choke Coil 100μH
IC 901	UPC494C	T 901	Transformer
Q 101 102	2SC1845	RY 651 652	Relay
Q 103 104	2SA992	TH 601	Thermistor
Q 105 109	2SC1845	TH 901	Thermistor
Q 106 107	2SA992	S 451 851	Switch(Input Select, CHB Filter)
Q 108 158 208 258	2SC1568	IL 601	Lamp 14V 60mA
Q 110 160 210 260	2SC3421	IL 602	Lamp 14V 40mA
Q 111 161 211 261	2SA1358	VR 101 151 201 251	Semi-fixed 470Ω (B)
Q 112 162 212 262	2SC5101	VR 451	Volume 20kΩ (E)X4
Q 113 163 213 263	2SA1909	VR 452	Volume 10kΩ (A)X2
Q 151 152	2SC1845	M 601	Fan Motor
Q 153 154	2SA992	EF 901 902 903 904	
Q 155 159	2SC1845		
Q 156 157	2SA992		
Q 201 202	2SC1845		
Q 203 204	2SA992		
Q 205 209	2SC1845		

====Circuit Symbol & No. Part Name====	Part No.	====Circuit Symbol & No. Part Name====	Part No.
FU 901 902	Fuse 20A	HEK0020	
RESISTORS			
R 101 107 151 157 201 207 251 257	RD1/4PS243JL	R 924 925 926 927 940 941	RD1/4PS820JL
R 102 103 152 153 202 203 252 253 606	RD1/4PS101JL	R 934 936	RD1/4PS182JL
R 104 110 154 160 204 210 254 260 503 504	RD1/4PS821JL	R 938 939	RD1/2PS470JL
R 105 155 205 255 609	RD1/4PS152JL	R 942 943	RD1/2PS330JL
R 106 156 206 256	RD1/4PS561JL	R 944 945	RD1/4PS333JL
		CAPACITORS	
R 108 158 208 258 910 937	RD1/4PS153JL	C 101 151 201 251	CEZA470M10
R 109 159 209 259	RD1/4PS151JL	C 102 152 202 252	CQPA271G2A
R 111 161 211 261	RD1/4PS561JL	C 103 153 203 253	CQPA102G2A
R 112 162 212 262	RD1/4PS272JL	C 104 154 204 254	CEAS100M16
R 113 163 213 263	RD1/4PS560JL	C 105 155 205 255	CEAS101M10
R 114 115 164 165 214 215 264 265	RD1/4PS470JL	C 106 107 156 157 206 207 256 257	CMA150J2H
R 116 166 216 266 608	RD1/4PS221JL	C 108 158 208 258 608	CFTLAH104J50
R 117 119 167 169 0.1Ω(3W)	CCN1083	C 109 159 209 259	CFTLAH333J50
R 121 171 221 271	RD1/4PS100JL	C 110 160 210 260	CQMA102J50
R 122 172 222 272 916 917	RD1/4PS332JL	C 111 112 161 162 211 212 261 262	CMA101J2H
R 123 124 173 174 223 224 273 274	RD1/2PS100JL	C 451 452 453 454	CFTLAH104J50
R 217 219 267 269 0.1Ω(3W)	CCN1083	C 501 502 851 852 853 854	CKPYB471K50L
R 451 452 912	RD1/4PS103JL	C 503 504	CEWAS100M16
R 453 454	RD1/4PS183JL	C 505 863 864 865 866 867 868 869 870 871	CCPSL470J50L
R 455 456 604 615	RD1/4PS222JL	C 603 609 612	CQMA103J50
R 459 460	RD1/4PS391JL	C 604 915 916	CEAS470M16
R 501 502 506 709 710 935	RD1/4PS223JL	C 605	CEAS220M16
R 505 601 602 656 880 882 884 886 906	RD1/4PS103JL	C 606 607	CEAS331M16
R 507 508 509 510 605 614 653 655 905 913	RD1/4PS472JL	C 610 906	CEAS101M16
R 603 660 663 666 669	RD1/4PS473JL	C 651	CCH1036
R 607	RD1/4PS223JL		
R 610	RD1/4PS103JL		
R 611 657 929 930	RD1/4PS104JL		
R 612	RD1/4PS221JL		
R 613	RD1/4PS393JL		
R 616 903 904 911	RD1/4PS102JL		
R 651	RD1/4PS221JL		
R 652	RD1/4PS222JL		
R 658 661 664 667	RD1/4PS393JL		
R 659 662 665 668	RD1/4PS564JL		
R 851 852 853 854	RD1/4PS471JL		
R 855 856 857 858	RD1/4PS333JL		
R 859 860 861 862 863 864 865 866	RN1/4PC1002D		
R 871 872 873 874 875 876 877 878	RN1/4PC5101D		
R 879 881 883 885 933	RD1/4PS123JL		
R 902	RD1/2PS220JL		
R 907	RD1/4PS183JL		
R 914 915 920 921 931 932	RD1/4PS472JL		
R 918 919	RD1/2PS100JL		
R 922 923	RD1/4PS472JL		

● The GM-X904/X1H/EW and GM-X904/X1H/JP Parts Lists enumerate the parts which differ from those enumerated in the GM-X904/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-X904/X1H/UC Parts List is given on page 3.

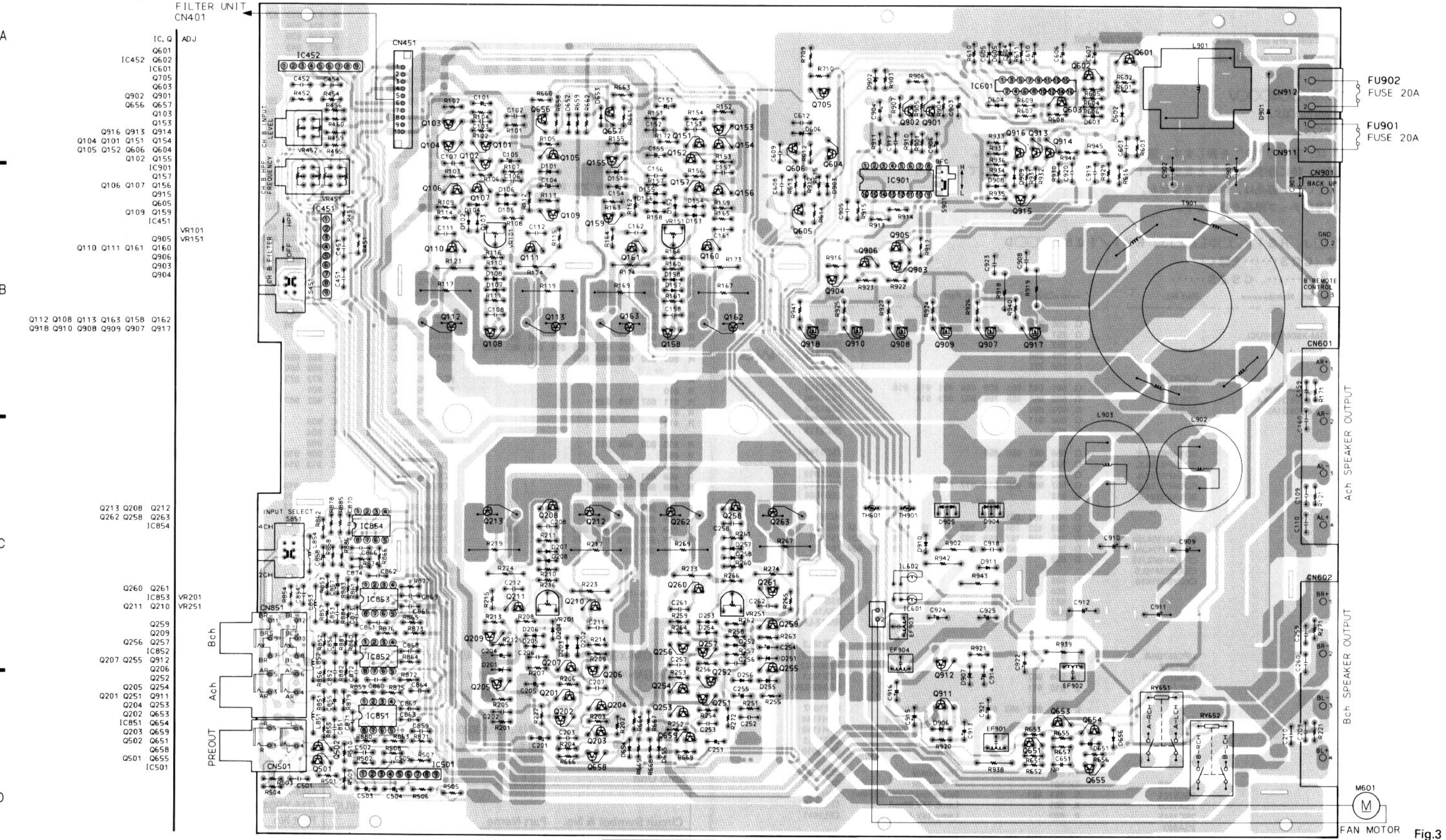
● GM-X904/X1H/JPの部品表は、GM-X904/X1H/UCとの違いのみ表にしています。表以外の部品については同じですので、GM-X904/X1H/UCの部品表を参照してください。部品表は、3ページにあります。

Amp Unit			
Circuit Symbol & No.	Part Name	GM-X904/X1H/UC	GM-X904/X1H/EW
		Part No	Part No
S1	Switch(BFC)	.....	HS1-156
R901		.....	RD1/4PS105JL

3. CIRCUIT DIAGRAM AND PATTERN / 回路図およびパターン図

3.1 AMP UNIT

● Connection Diagram



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.

Fig.3

● Circuit Diagram

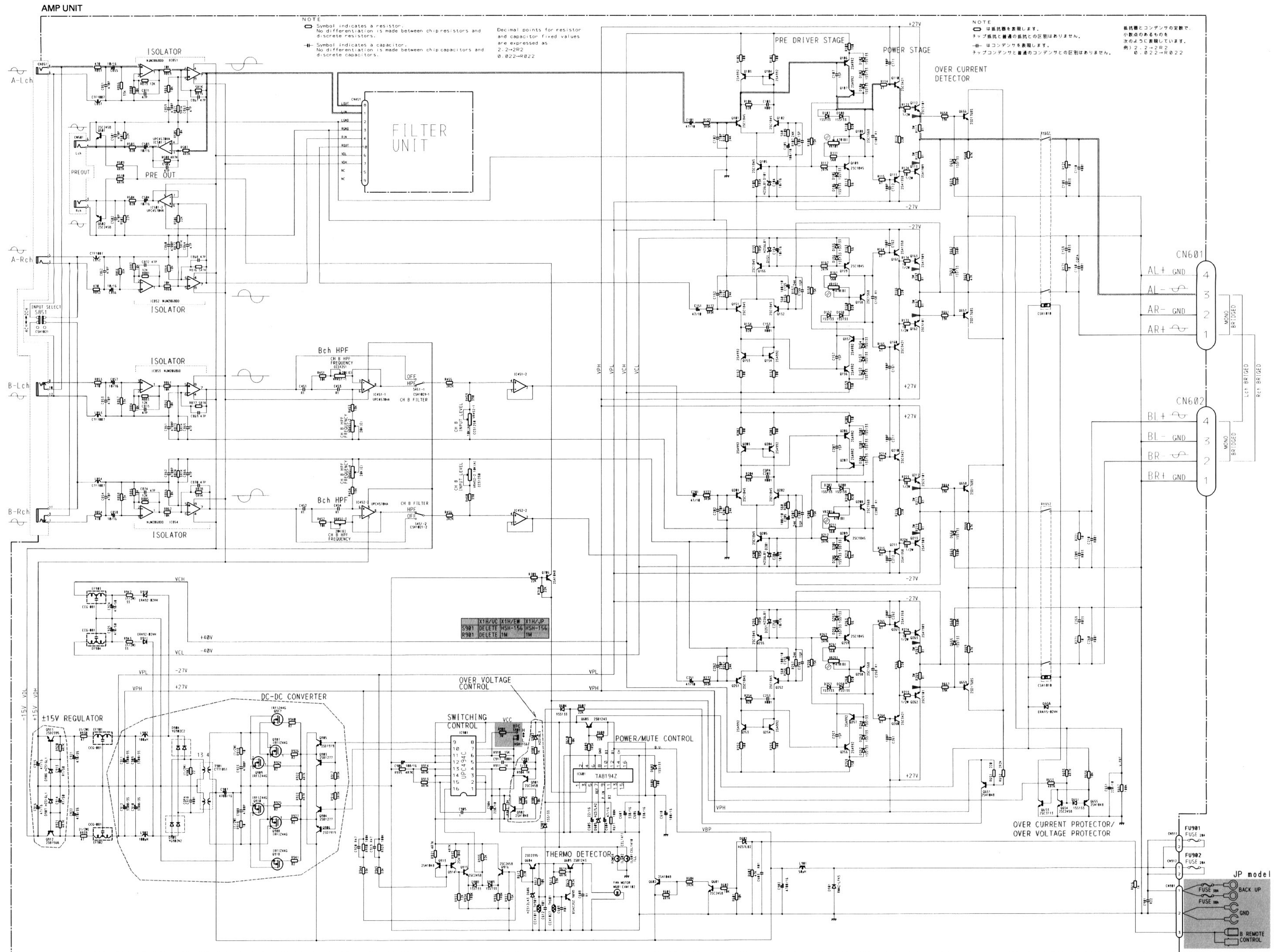


Fig.4

3.2 FILTER UNIT

● Circuit Diagram

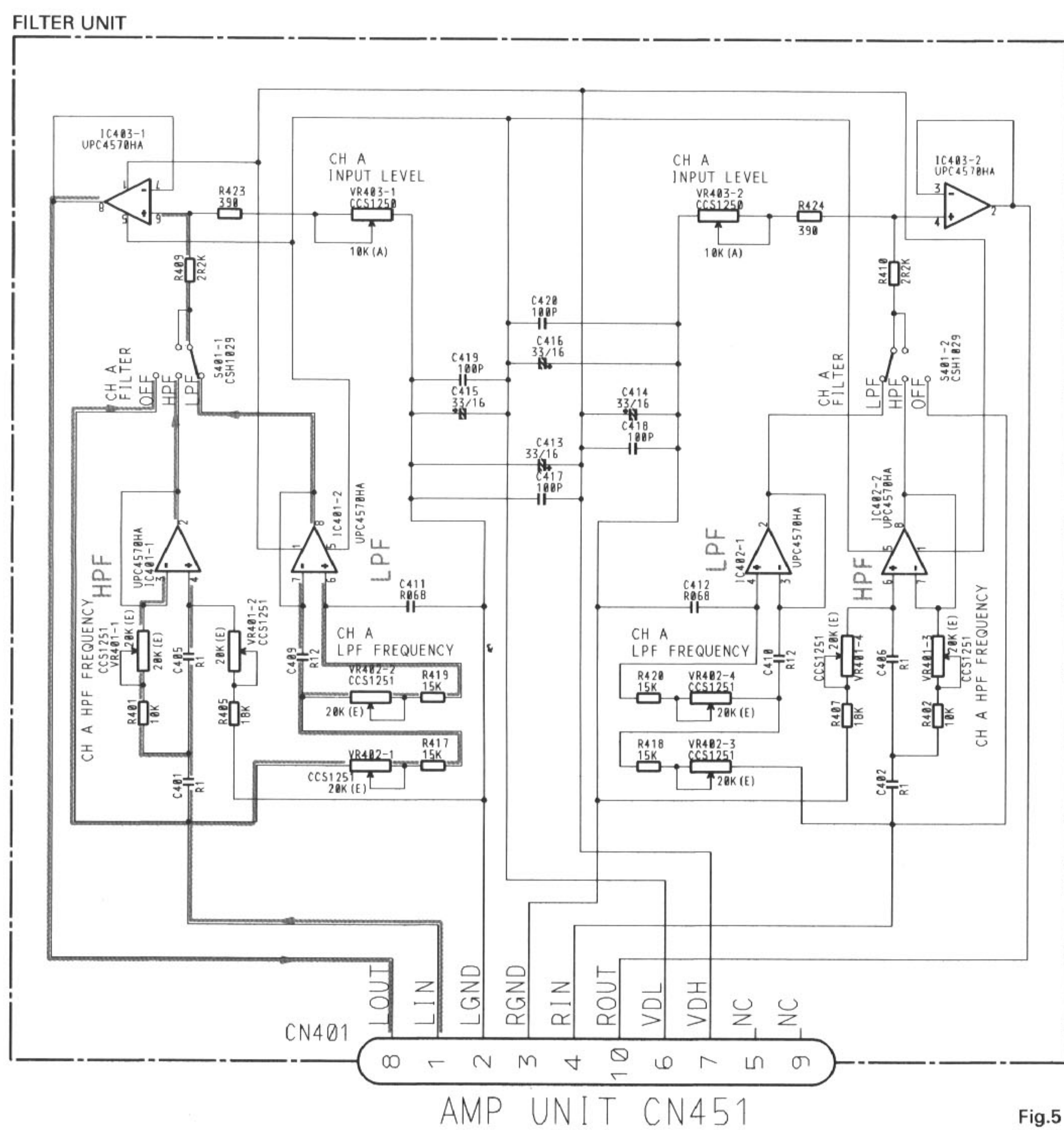


Fig.5

● Connection Diagram

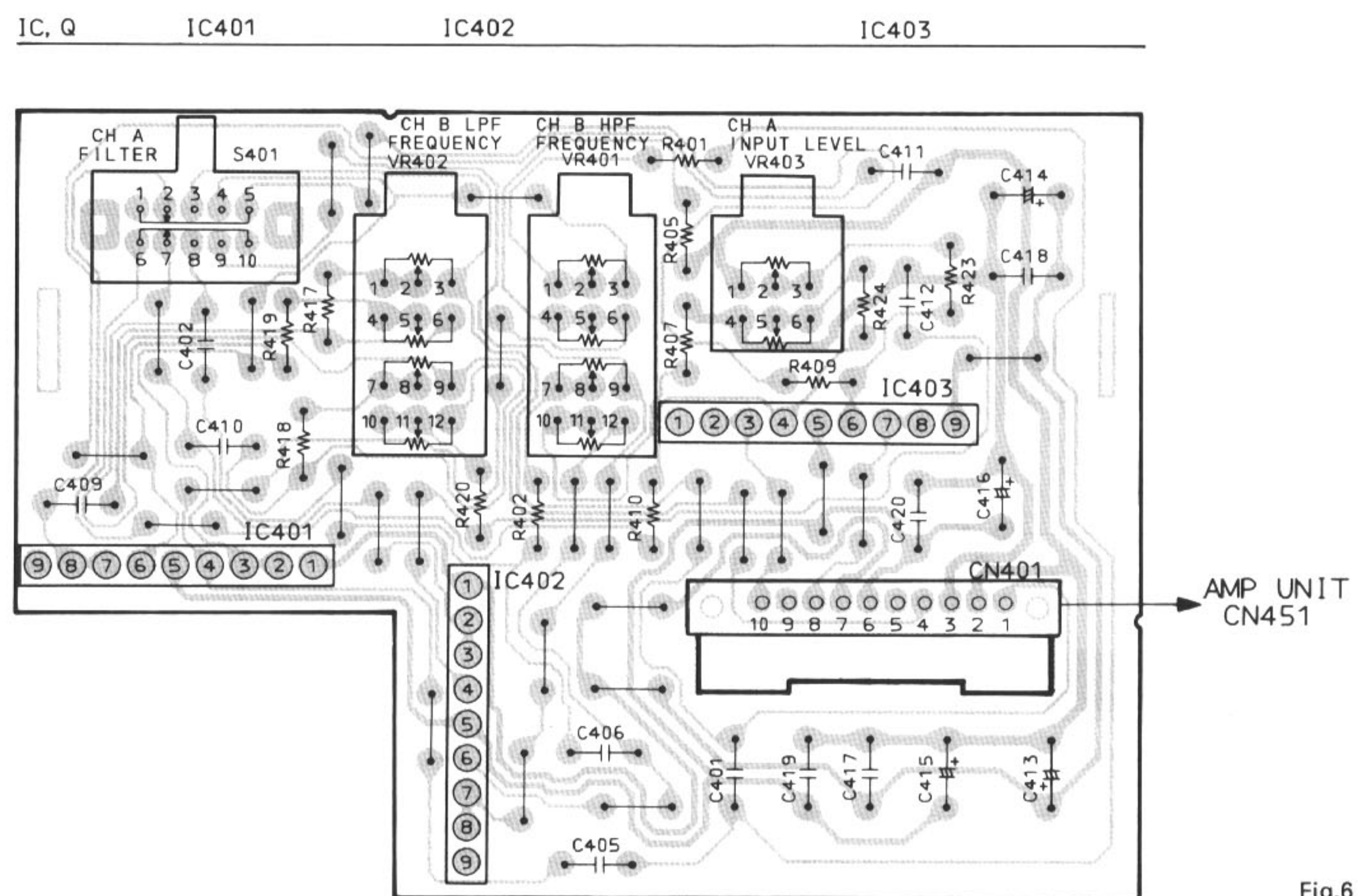


Fig.6

4. 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.	VR101,VR151 VR201,VR251	mV Meter : 22±3mV
2	Idling current (checking)	Input ; check 30 seconds after 1kΩ terminate power is switched on.	————	mV Meter : 22±11mV

No	項目	条件	調整ポイント	規格
1	アイドリング電流 (調整)	入力 ; 1kΩターミネート パワーON30秒後 20秒以内に調整の事	VR101,VR151 VR201,VR251	mV Meter : 22±3mV
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 確認の事	————	mV Meter : 22±11mV

● Connection Diagram

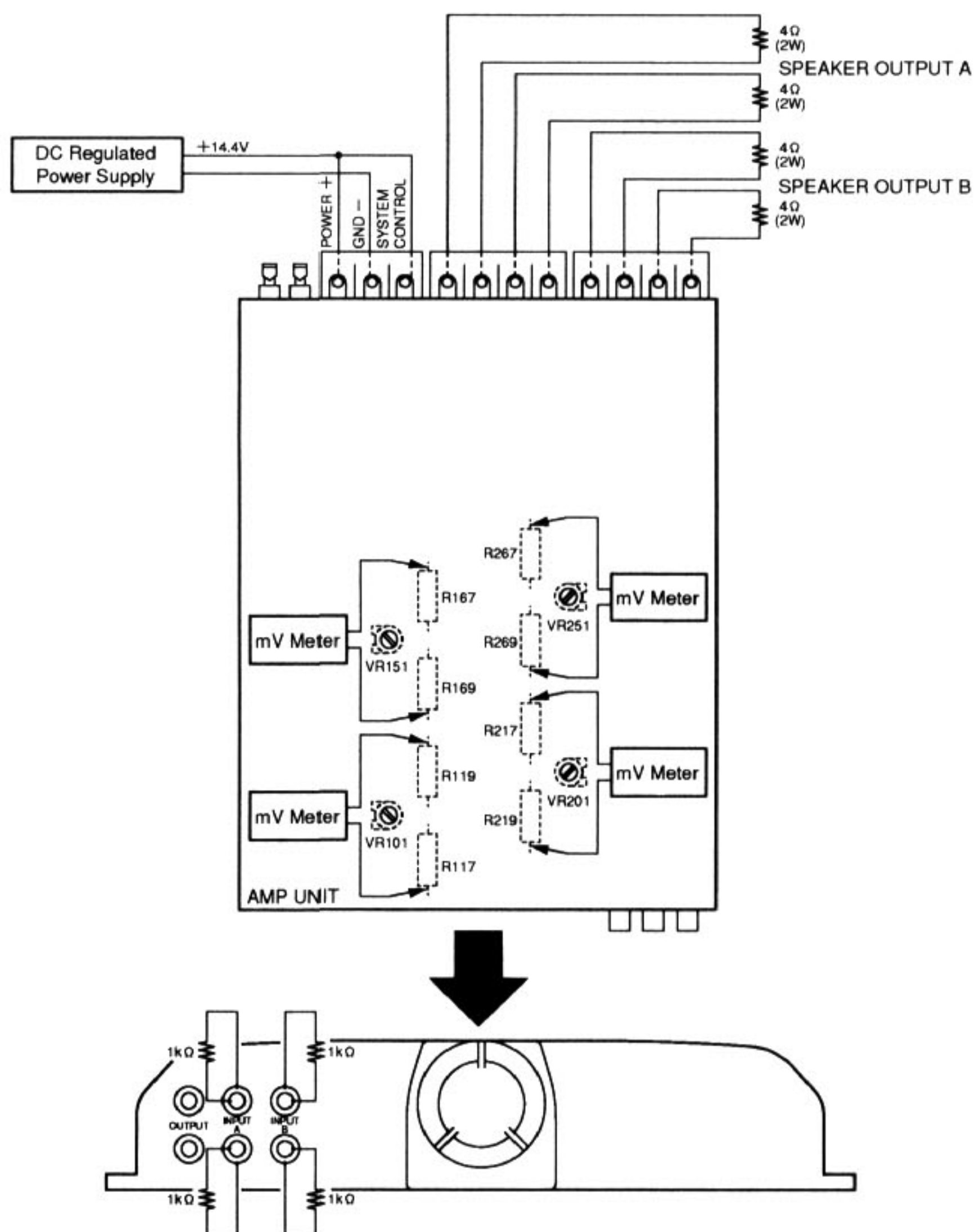


Fig.7

5. EXPLODED VIEW / 分解図および部品表

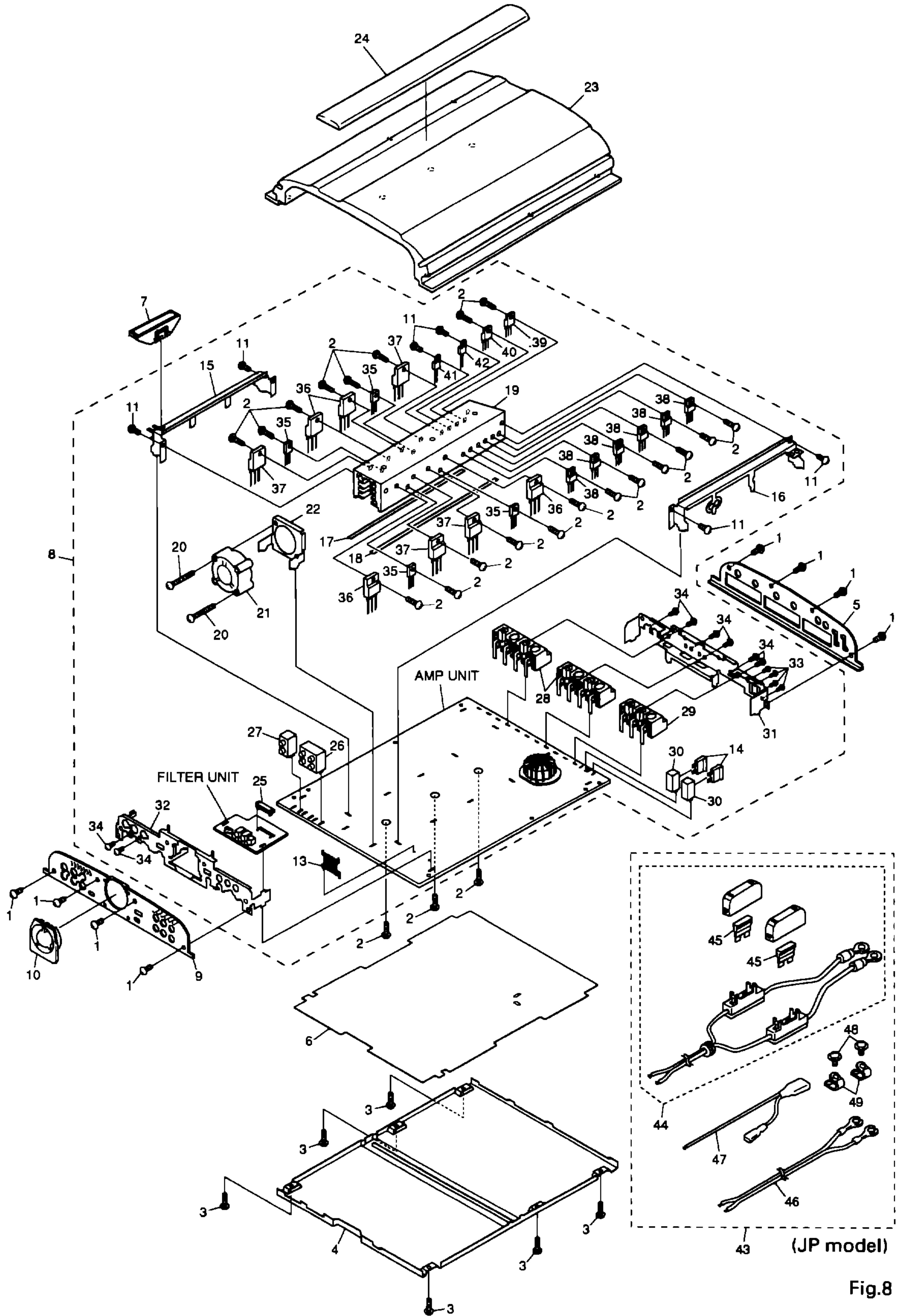


Fig.8

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-X904/X1H/UC)**

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Screw	BSZ30P050FZK	26	Pin Jack	CKB1023
2	Screw	BBZ30P100FMC	27	Pin Jack	CKB1024
3	Screw	BBZ30P100FMC	28	Terminal	CKE1039
4	Case	HNB1920	29	Terminal	CKE1041
5	Panel	HNB1948	30	Fuse Holder	CKR1011
6	Insulator	HNM4278	31	Holder	HNC5792
7	Housing	HNV4180	32	Holder	HNC5793
8	Amp Unit	HWH1215	33	Screw	PPZ20P080FZK
9	Panel	HNB1926	34	Screw	PPZ30P080FZK
10	Plate Unit	HXA0003	35	Transistor(Q108,158,208,258)	2SC1568
11	Screw	BBZ30P060FMC	36	Transistor(Q112,162,212,262)	2SC5101
12	.....		37	Transistor(Q113,163,213,263)	2SA1909
13	Connector(CN451)	CKS3146	38	FET(Q907-910,917,918)	IRFIZ44G
14	Fuse(20A)	HEK0020	39	Diode(D904)	YG902C2
15	Holder	HNC5786	40	Diode(D905)	YG902N2
16	Holder	HNC5853	41	Thermistor(TH601)	CCX1027
17	Insulator	HNM4284	42	Thermistor(TH901)	CCX1013
18	Insulator	HNM4412	43-49	.....
19	Heat Sink	HNR1359			
20	Screw	BMZ30P230FZK			
21	Fan Motor(M601)	CXM1102			
22	Holder	HNC5787			
23	Heat Sink	HNR1358			
24	Plate Unit	HXA7522			
25	Connector(CN401)	CKS3145			

Mark No.	Description	GM-X904/X1H/UC	GM-X904/X1H/EW	GM-X904/X1H/JP
		Part No.	Part No.	Part No.
8	Amp Unit	HWH1215	HWH1202	HWH1202
24	Plate Unit	HXA7522	HXA7522	HXA7521
43	Cord Assy	.....	.....	HDE4722
44	Cord	.....	.....	HDE4723
45	Fuse(30A)	.....	.....	HEK0030
46	Cord	.....	.....	HDE4724
47	Cord	.....	.....	HDE4725
48	Screw	.....	.....	BYC40P180FZK
* 49	Clamp	.....	.....	HNV0001

6. PACKING METHOD / 包装仕様

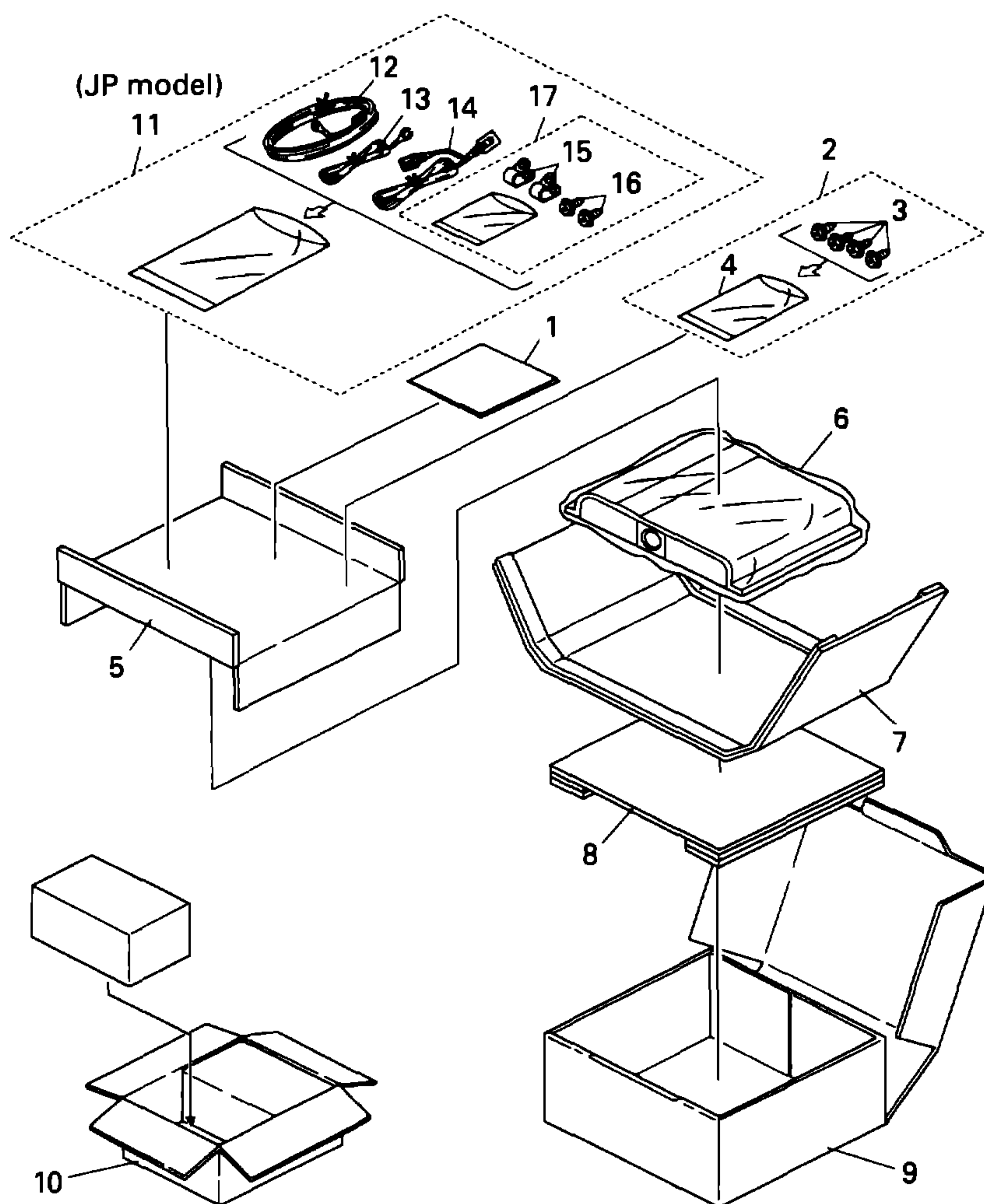


Fig.9

● Parts List(GM-X904/X1H/UC)

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1-1	Owner's Manual	HRD0016	10	Contain Box	HHL0044
1-2	.....		11-17	.....
2	Screw Assy	HEA0003			
3	Screw	BYC40P180FZK			
4	Polyethylene Bag	HEG0011			
*	5	Top Tray	HHP0005		
	6	Polyethylene Bag	HEG0012		
	7	Protector	HHP1728		
*	8	Bottom Spacer	HHW0003		
	9	Carton	HHG0044		

● Owner's Manual

Part No.	Model	Language
HRD0016	GM-X904/X1H/UC	English, French
HRD0015	GM-X904/X1H/EW	English, French, German, Dutch, Spanish, Swedish, Norwegian, Finnish, Italian
HRA0003	GM-X904/X1H/JP	Japanese

Mark No. Description	GM-X904/X1H/UC	GM-X904/X1H/EW	GM-X904/X1H/JP
	Part No.	Part No.	Part No.
1-1 Owner's Manual	HRD0016	HRD0015	HRA0003
* 1-2 Warranty Card	.....	HRV1071	CRY1033
* 1-3 Card	ARY1048	.....	.....
1-4 Polyethylene Bag	.....	.....	E36-618
* 1-5 Service Station Network	.....	.....	CRY-010
9 Carton	HHG0044	HHG0045	HHG0046
10 Contain Box	HHL0044	HHL0045	HHL0046
11 Cord Assy	.....	.....	HDE4722
12 Cord	.....	.....	HDE4723
13 Cord	.....	.....	HDE4724
14 Cord	.....	.....	HDE4725
* 15 Clamp	.....	.....	HNV0001
16 Screw	.....	.....	BYC40P180FZK
17 Clamp Unit	.....	.....	HXA0008

7. SPECIFICATIONS

Power source	14.4 V DC (10.8 — 15.6 V allowable)
Grounding system	Negative type
Current consumption	38 A (at continuous power, 4Ω)
Average current drawn*	10 A (4Ω for four channels) 17 A (4Ω for two channels)
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	3.8 kg (4.3 lbs.)
Maximum power output	100 W × 4 / 300 W × 2 (EIAJ)
Continuous power output	50 W × 4 (at 14.4V, 4Ω, 20 — 20,000 Hz, 0.04% THD) 150 W × 2 (at 14.4V, 4Ω, 20 — 20,000 Hz, 0.4% THD) 75 W × 4 (at 14.4V, 2Ω, 20 — 20,000 Hz, 0.4% THD) 50 W × 4 (at 12V, 4Ω, 20 — 20,000 Hz, 0.04% THD) 120 W × 2 (at 12V, 4Ω, 20 — 20,000 Hz, 0.4% THD) 60 W × 4 (at 12V, 2Ω, 20 — 20,000 Hz, 0.4% THD)
Load impedance	4Ω (2 — 8Ω allowable)
Frequency response	10 — 80,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio	105 dB (IHF - A network)
Distortion	0.003% (10 W, 1 kHz)
Separation	71 dB (1 kHz)
Low pass filter	Cut off frequency: 50 — 120 Hz Cut off slope: -12 dB/oct
High pass filter	Cut off frequency: 50 — 120 Hz Cut off slope: -12 dB/oct
Input level / impedance	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.

8. OPERATIONS AND CONNECTION

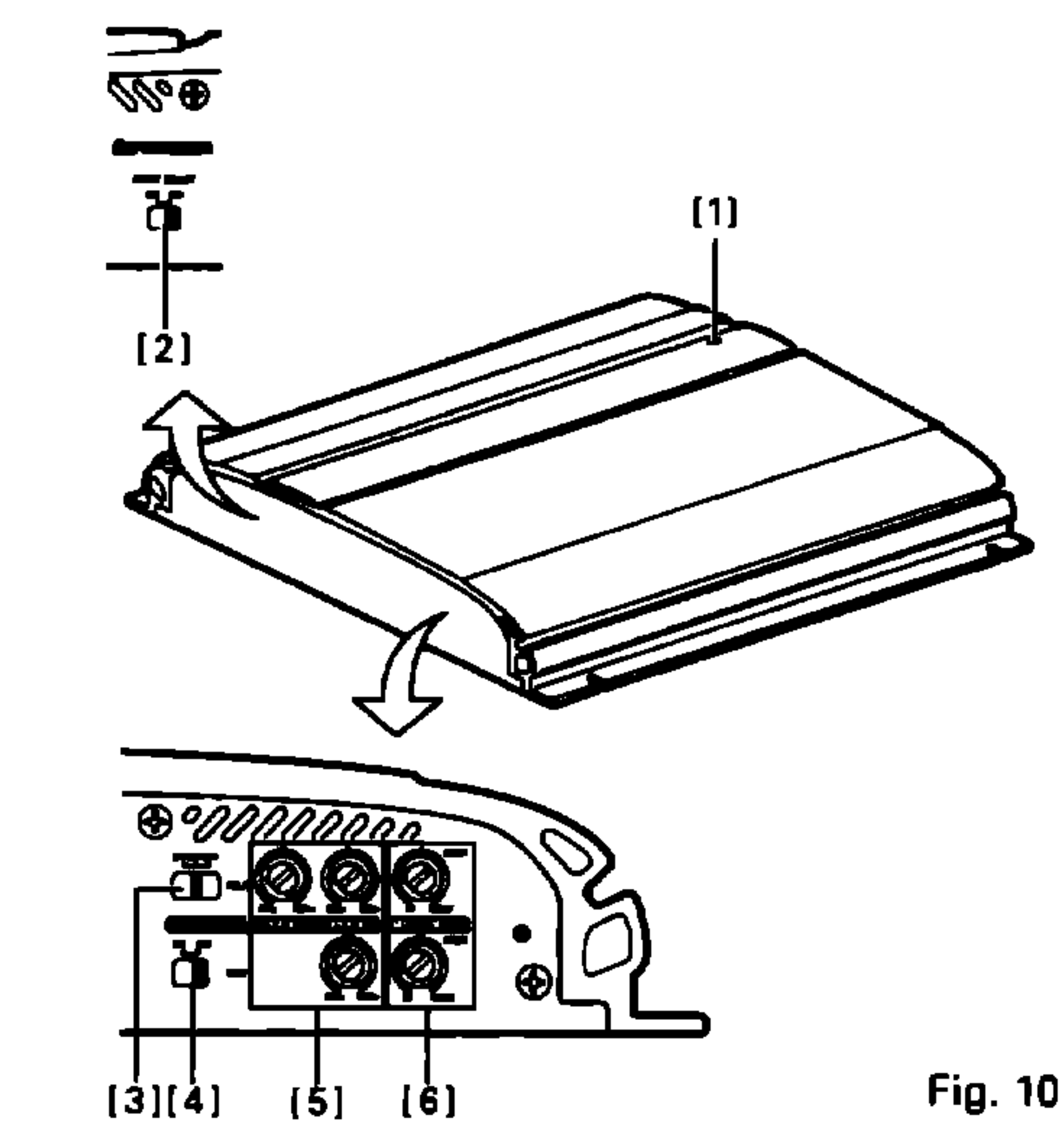


Fig. 10

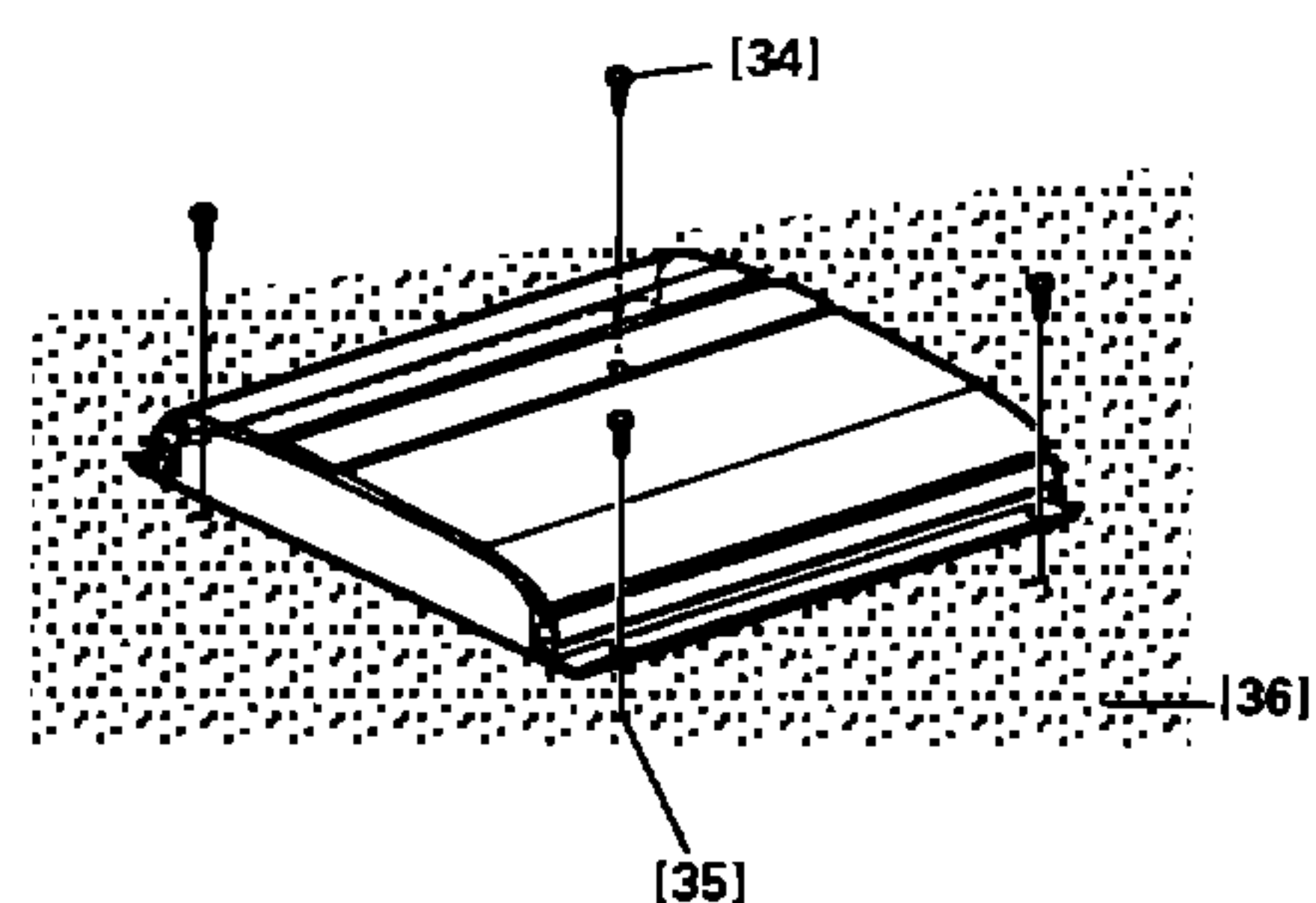


Fig. 12

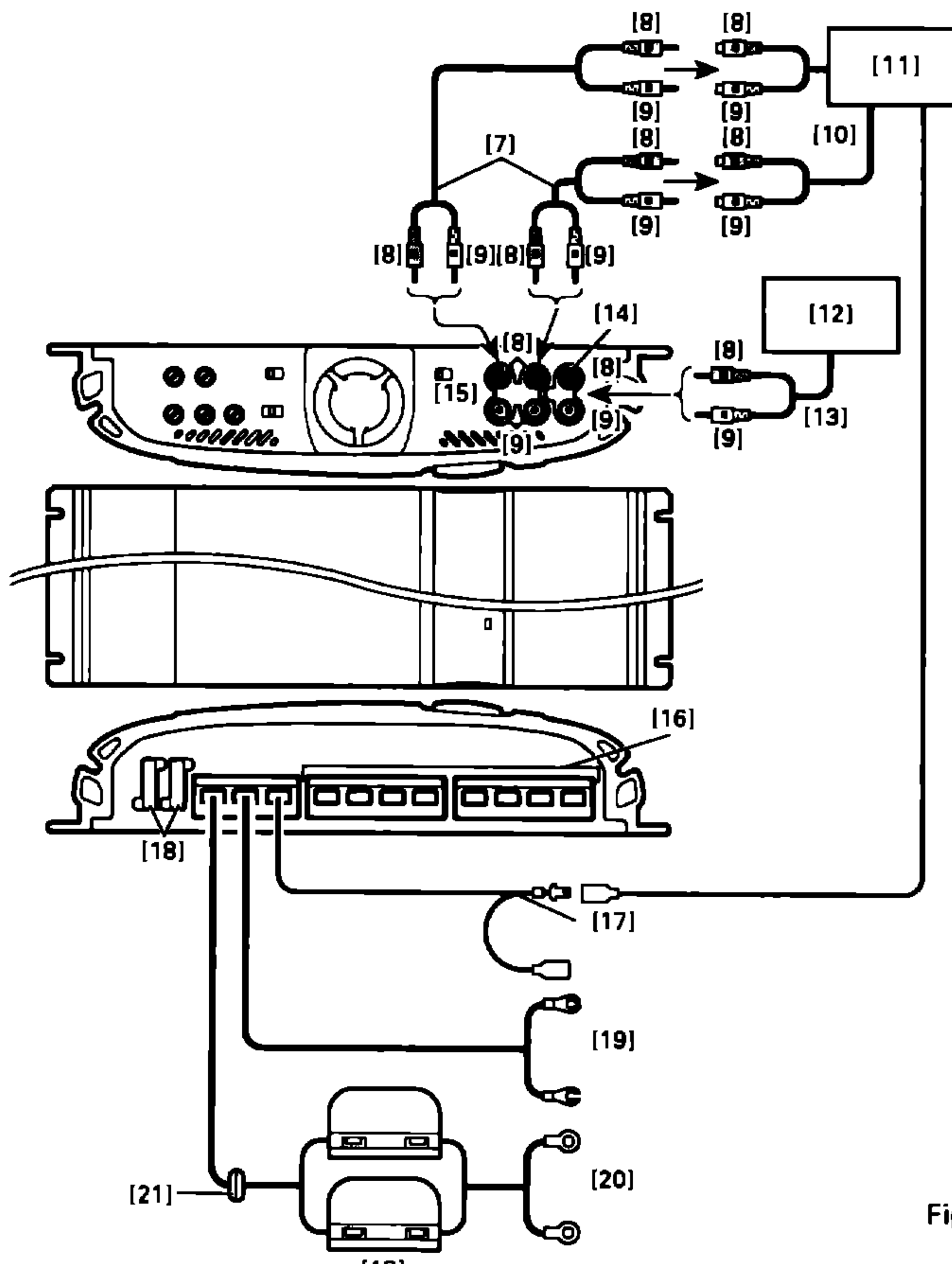


Fig. 11

Setting the Unit

(Fig. 10)

[1] Power Indicator

The power indicator lights when the power is switched on.

[2] RCA Input Select Switch

For two-channel input, slide this switch to the left. For four-channel input, slide this switch to the right.

[3] Speaker Out A: LPF (Low-Pass Filter)/HPF (High-Pass Filter) Select Switch

Set the LPF/HPF 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/HPF Select Switch	Audio frequency range to be output	Speaker Type	Remarks
LPF (left)	Very-low-frequency range*	Sub-woofer	Connect a sub-woofer.
OFF (center)	Very-low-frequency range to high-frequency range	Other than sub-woofer	
HPF (right)	Low-frequency range to high-frequency range*	Other than sub-woofer	If you want to cut the very-low-frequency range* because it is not necessary for the speaker you use.

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

[4] Speaker Out B: HPF (High-Pass Filter) Select Switch

Set the HPF select switch as follows according to the car stereo system and the type of speaker connected to the speaker output:

HPF Select Switch	Audio frequency range to be output	Speaker Type	Remarks
OFF (left)	Very-low-frequency range to high-frequency range	Other than Sub-woofer	
HPF (right)	Low-frequency range to high-frequency range*	Other than sub-woofer	If you want to cut the very-low-frequency range* because it is not necessary for the speaker you use.

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

[5] Cut Off Frequency Control

The amplifier enables you to adjust the cut off frequency in the range 50 to 120 Hz if the LPF/HPF switch for speaker output A and the HPF select switch for speaker output B are set to LPF or HPF.

- If the cut off frequencies of both speaker output A and B are adjusted, they must be set to the same value. If they are different, unnatural sounds may be output.

Speaker Output A: LPF Cut Off Frequency Control

The frequencies equal to and lower than the specified cut off frequency are output. Specify the cut off frequency fit for the speaker and car stereo system.

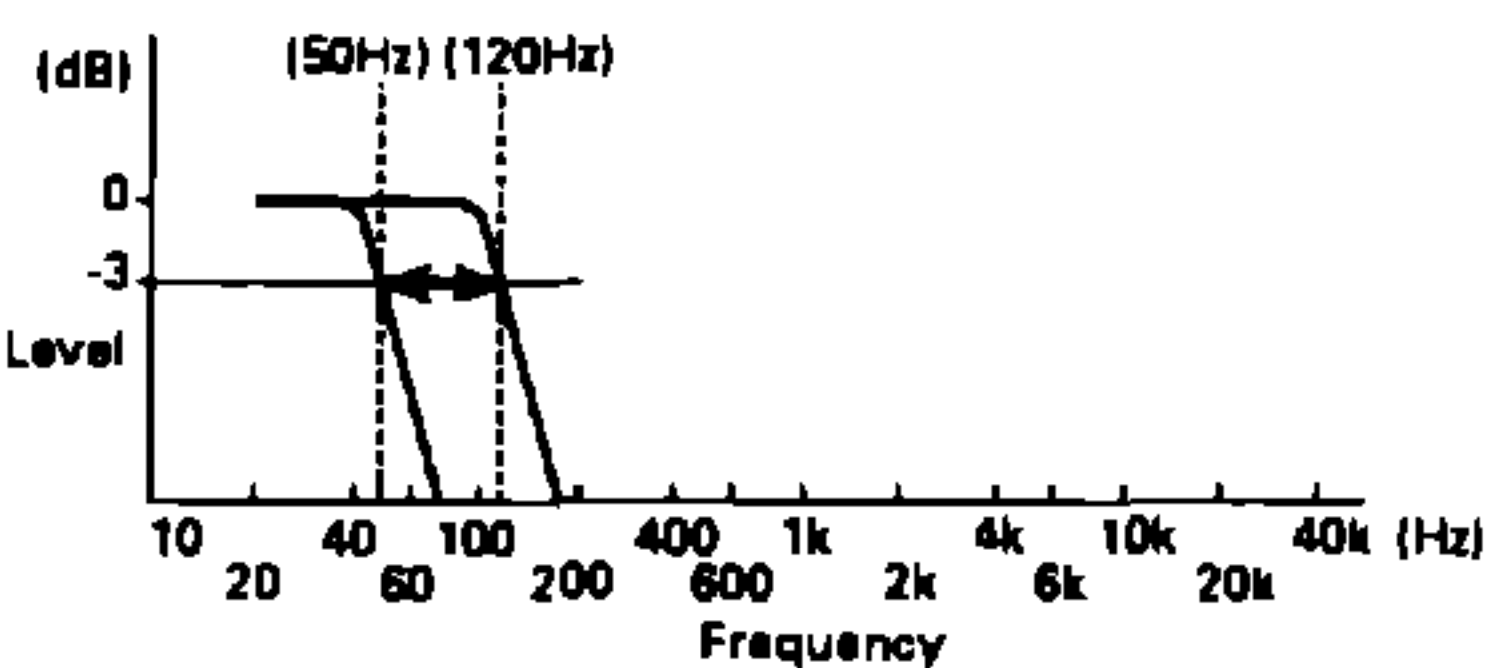


Fig. 13

Speaker Output A and B: HPF Cut Off Frequency Control

The frequencies equal to and higher than the specified cut off frequency are output. Specify the cut off frequency fit for the speaker and car stereo system.

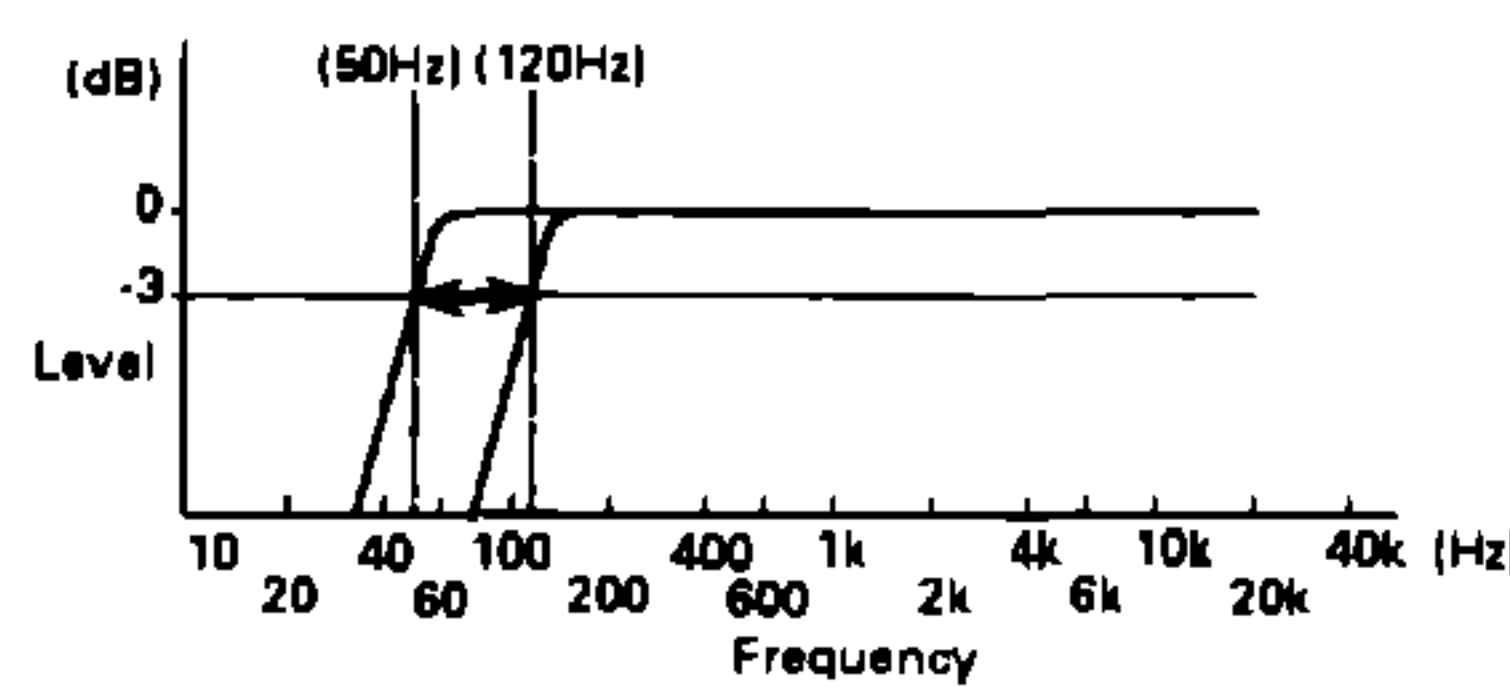


Fig. 14

[6] Input Level Adjustment

Adjusting the input level controls A and B will help match the output of the car stereo to the Pioneer amplifier. Input level control A is used to adjust the volume of speaker output A; Input level control B is used to adjust the volume of speaker output B. Normally, set the switch to the "500 mV" position. If the output is low even when the volume of the car stereo is turned up, turn these controls clockwise. If there is distortion when the volume of the car stereo is turned up, turn these controls counter-clockwise.

- If you only use one input plug, set the input level controls for speaker outputs A and B to the same position.
- 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 (-) lead 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	
Four-channel	Sub-woofer	Nominal input: Min. 50 W
	Other than sub-woofer	Max. input: Min. 100 W
Two-channel	Sub-woofer	Nominal input: Min. 150 W
	Other than sub-woofer	Max. input: Min. 300 W
Three-channel Speaker output A	Sub-woofer	Nominal input: Min. 50 W
	Other than sub-woofer	Max. input: Min. 100 W
Three-channel Speaker output B	Sub-woofer	Nominal input: Min. 150 W
	Other than sub-woofer	Max. input: Min. 300 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 idle.

(Fig. 11)

- [7] Connecting wires with RCA plugs (sold separately)
For details on how to connect to RCA input jacks A and B, see the "Connecting the Speakers and Input wires" section.
- [8] Red
- [9] White
- [10] External Output
- [11] Car stereo with RCA output jacks

- [12] Amplifier with RCA input jack
- [13] RCA input
- [14] RCA output jack
- [15] RCA input jack A, B
- [16] Speaker output terminals
See the "Connecting the Speakers and Input wires" section for speaker connection instructions.
- [17] Blue [RD-223] (sold separately)
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.
- [18] Fuse (Special red battery wire: 30 A x 2, Amplifier: 20 A x 2)
- [19] Ground wire (black) [RD-223] (sold separately)
Connect to metal body or chassis.
- [20] 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.
- [21] 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.

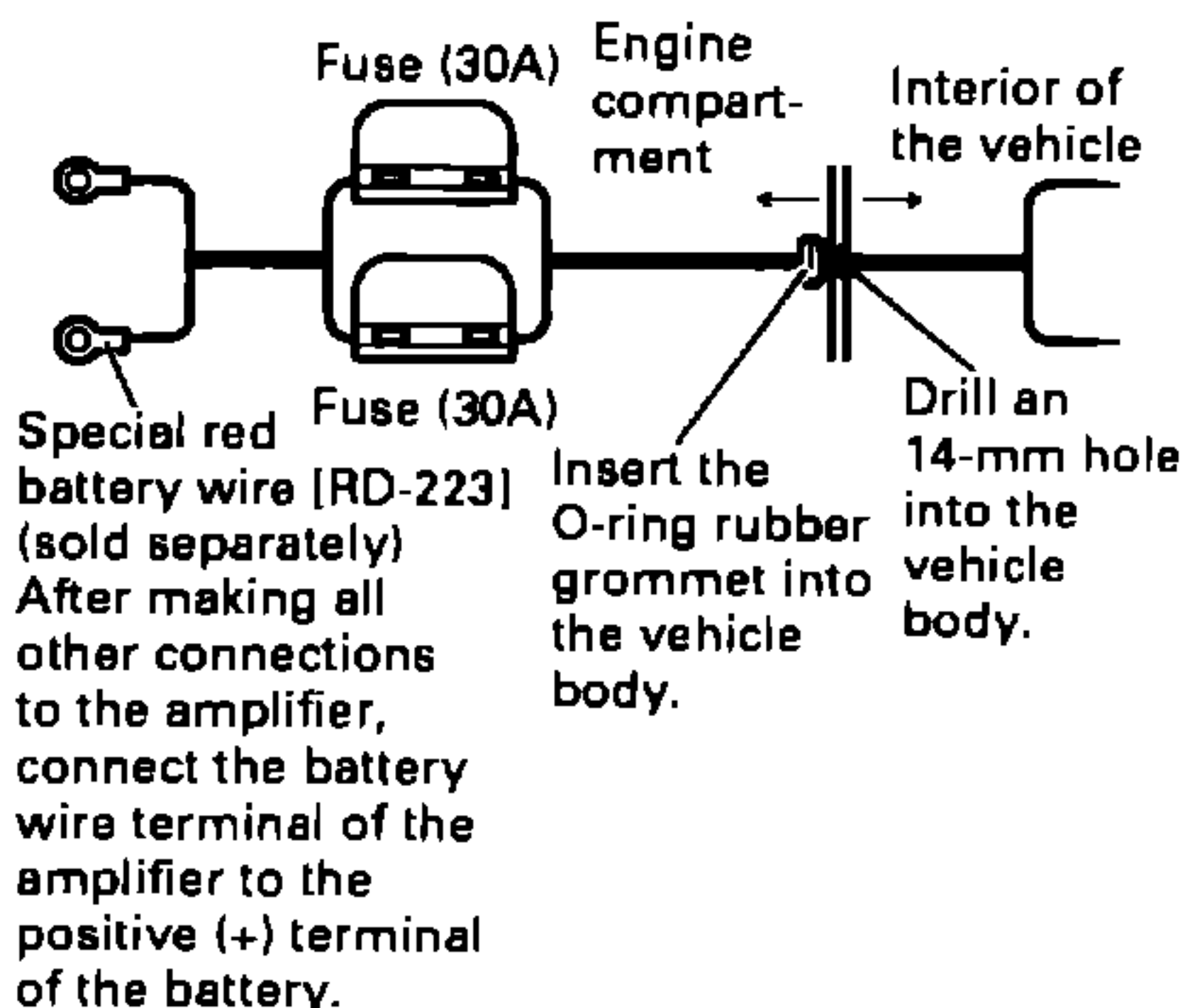


Fig. 15

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

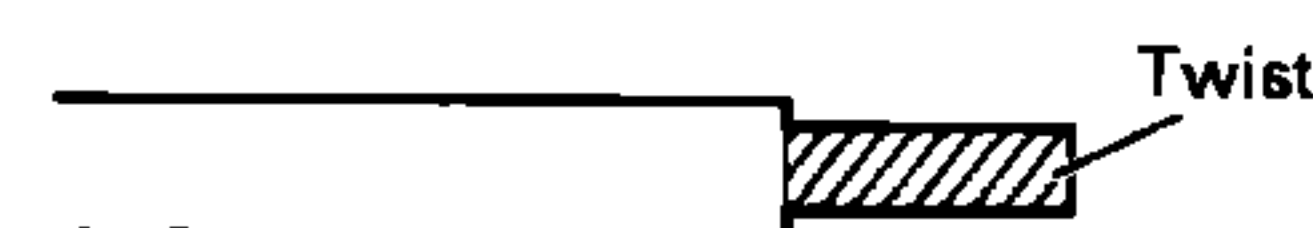


Fig. 16

3. Connect the wires to the terminal.

- Fix the wires securely with the terminal screws.

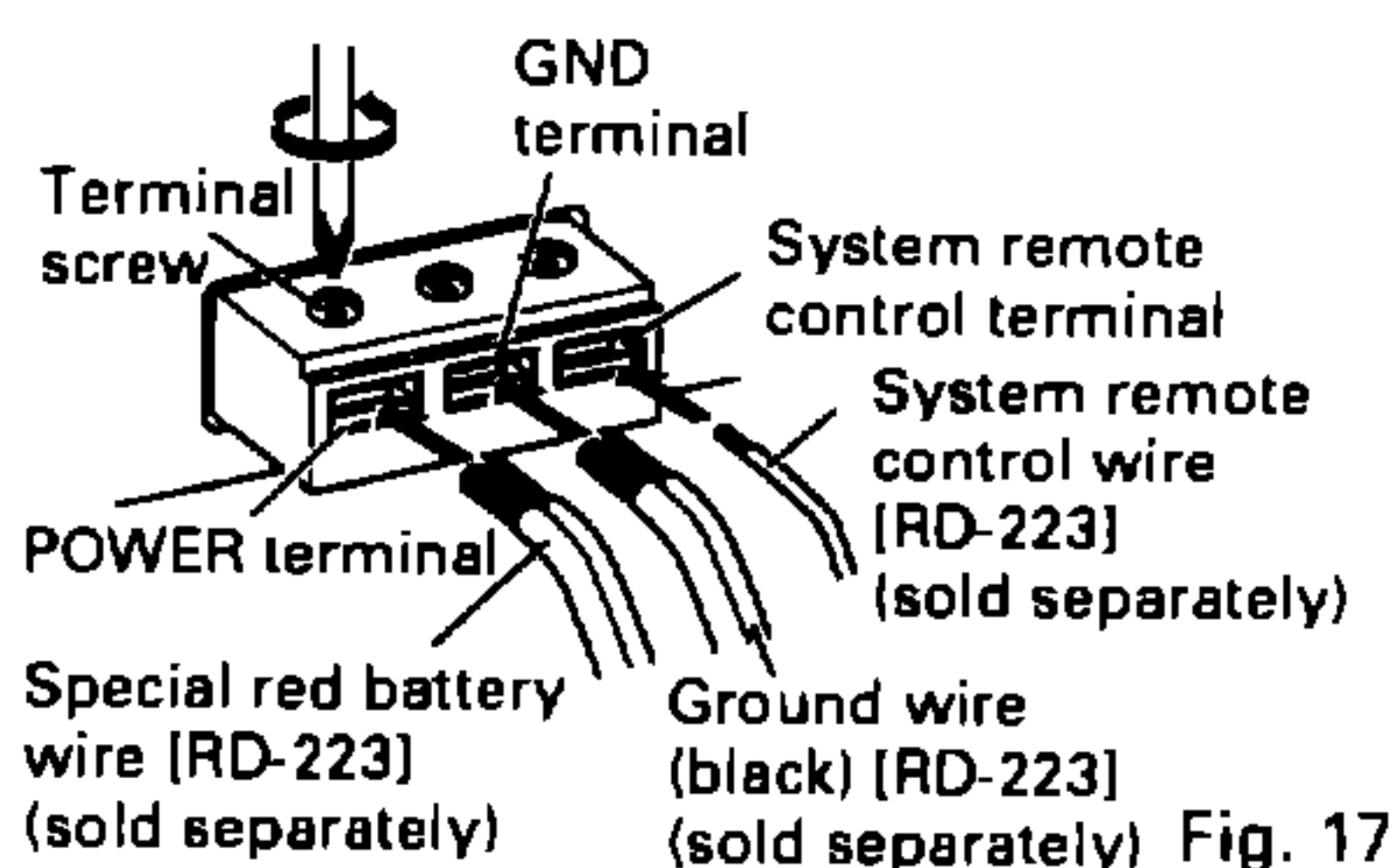


Fig. 17

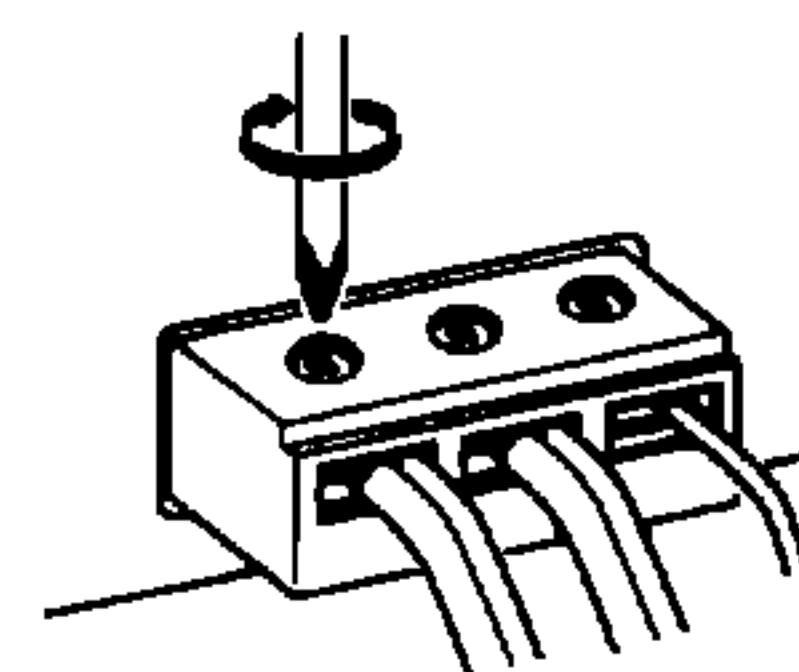


Fig. 18

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

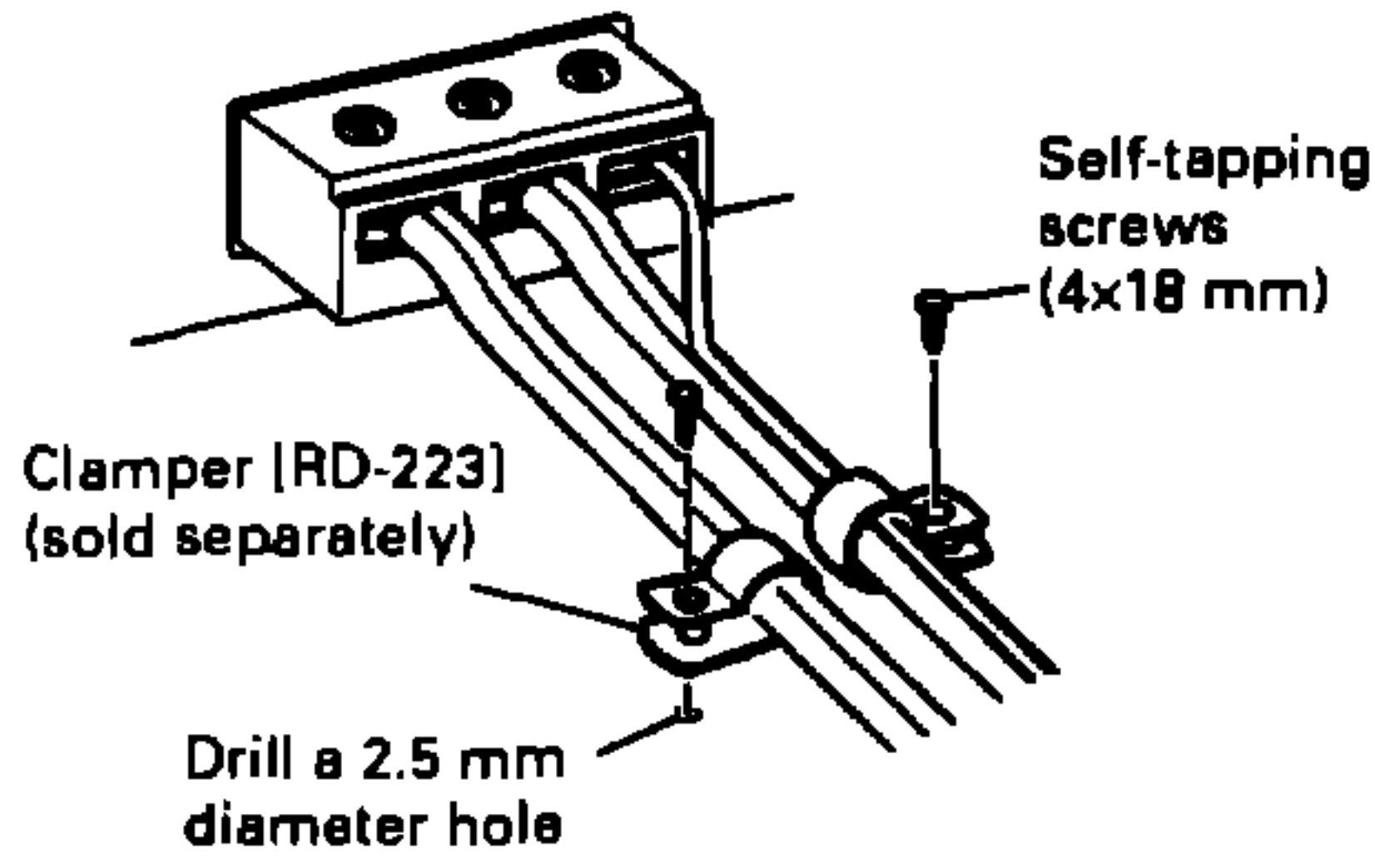


Fig. 19

Connecting the Speakers and Input wires

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

Four-channel mode (RCA terminal side)

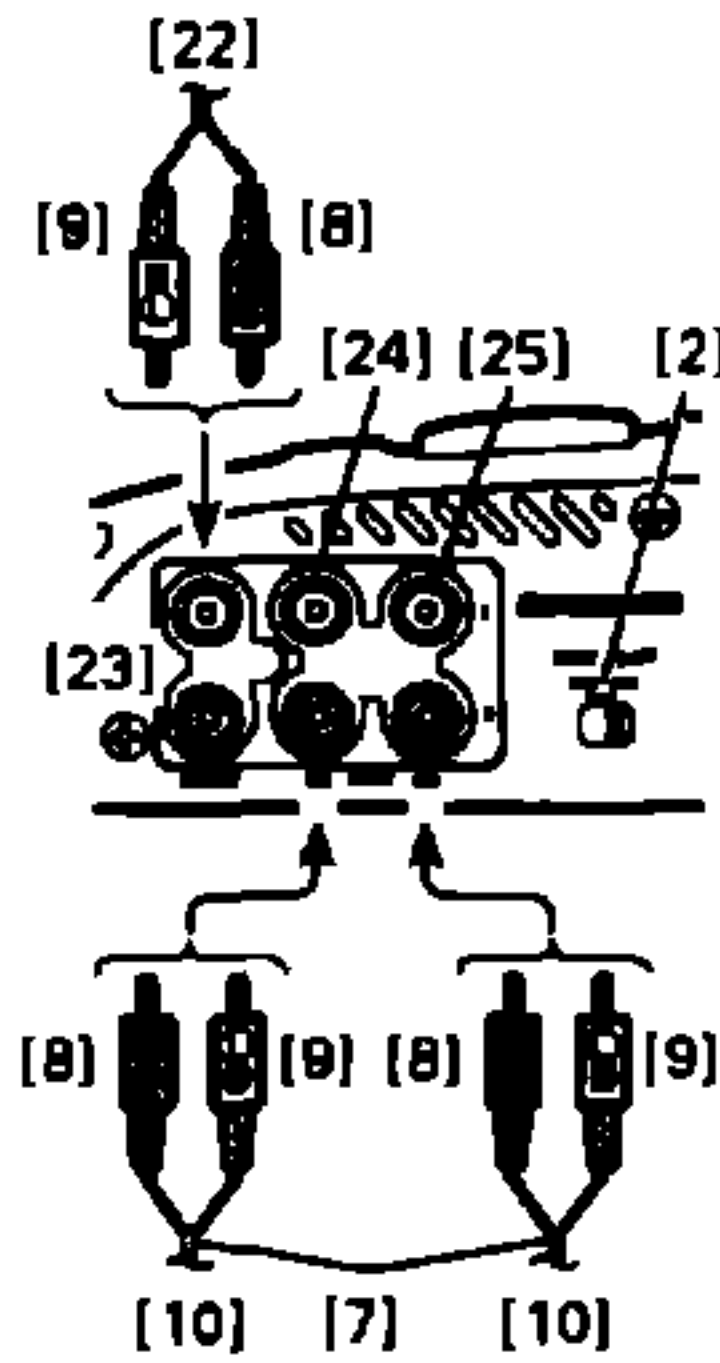


Fig. 20

(Speaker output terminal side)

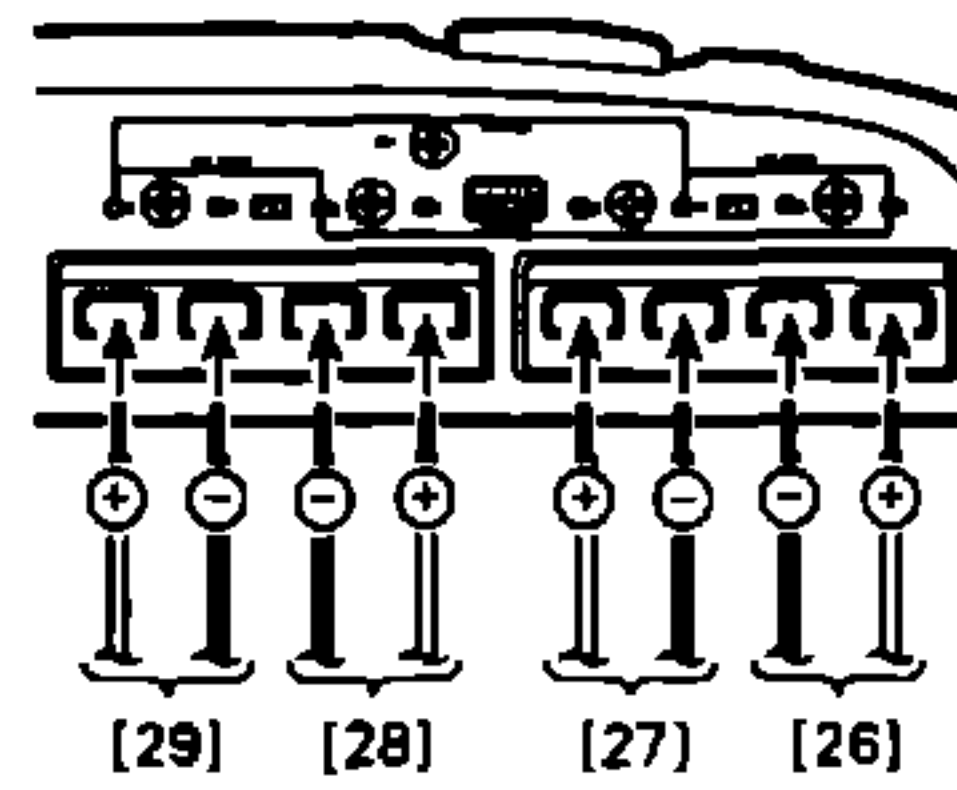


Fig. 21

(Fig. 20, 21)

- [2] RCA Input Select Switch
For two-channel input, slide this switch to the left. For four-channel input, slide this switch to the right.
- [7] Connecting wires with RCA plugs (sold separately)
- [8] Red
- [9] White
- [10] From car stereo (RCA output)
If only one input plug is used, such as when the car stereo has only one output (RCA output), connect the plug to RCA input A, and do not connect any plug to RCA input B.
- [22] To a separate amplifier (RCA input)
- [23] RCA output jack
- [24] RCA input jack A
- [25] RCA input jack B
- Connect the front or rear output plugs to jacks [24] or [25], according to your system.
- [26] Speaker out B: Speaker (left)
- [27] Speaker out B: Speaker (right)
- [28] Speaker out A: Speaker (left)
- [29] Speaker out A: Speaker (right)

Three-channel mode (RCA terminal side)

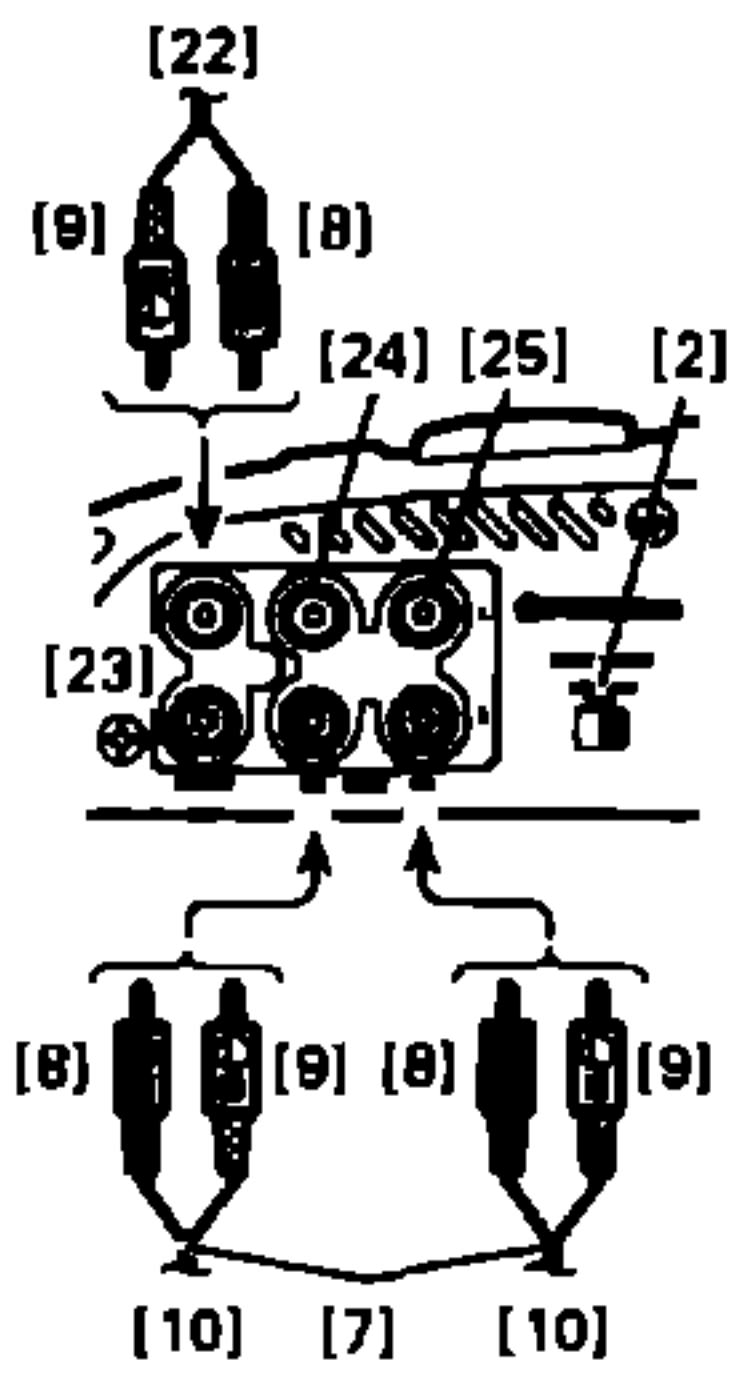


Fig. 22

(Speaker output terminal side)

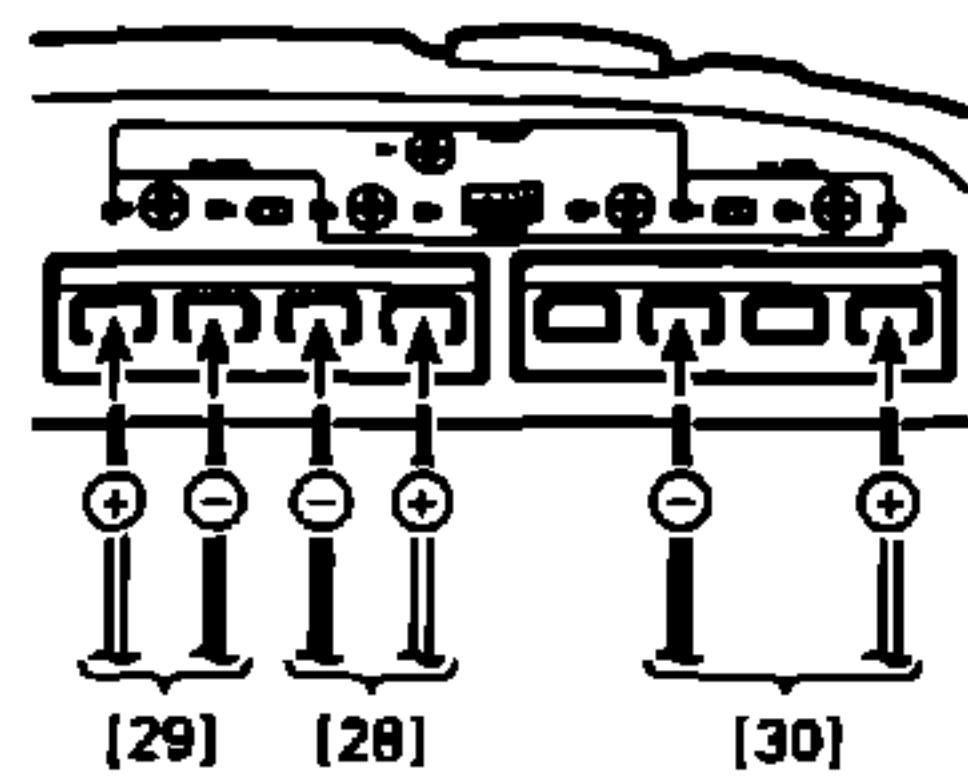


Fig. 23

(Fig. 22, 23)

- [2] RCA Input Select Switch
For two-channel input, slide this switch to the left. For four-channel input, slide this switch to the right.
- [7] Connecting wires with RCA plugs (sold separately)
- [8] Red
- [9] White
- [10] From car stereo (RCA output)
If only one input plug is used, such as when the car stereo has only one output (RCA output), connect the plug to RCA input A, and do not connect any plug to RCA input B.
- [22] To a separate amplifier (RCA input)
- [23] RCA output jack
- [24] RCA input jack A
- [25] RCA input jack B
- Connect the front or rear output plugs to jacks [24] or [25], according to your system.
- [28] Speaker out A: Speaker (left)
- [29] Speaker out A: Speaker (right)
- [30] Speaker out B: Speaker (mono)

**Two-channel mode (stereo)
(RCA terminal side)**

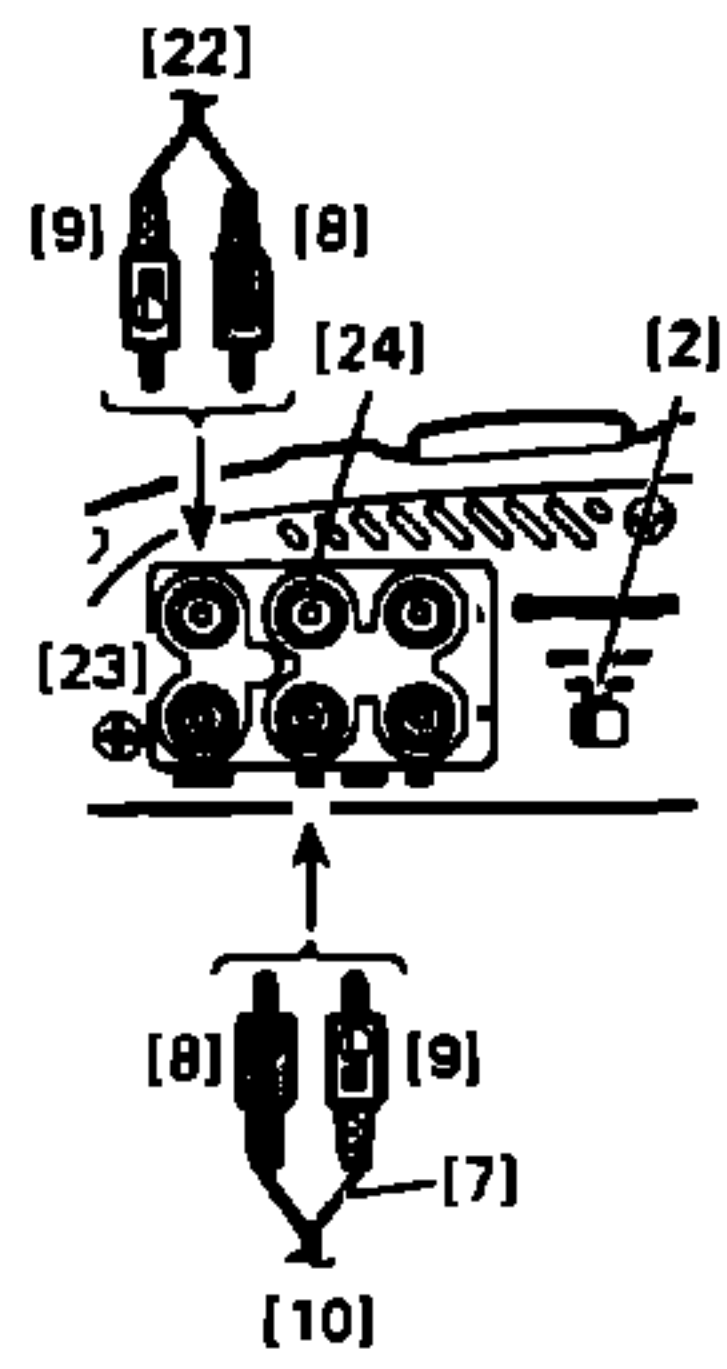


Fig. 24

(Speaker output terminal side)

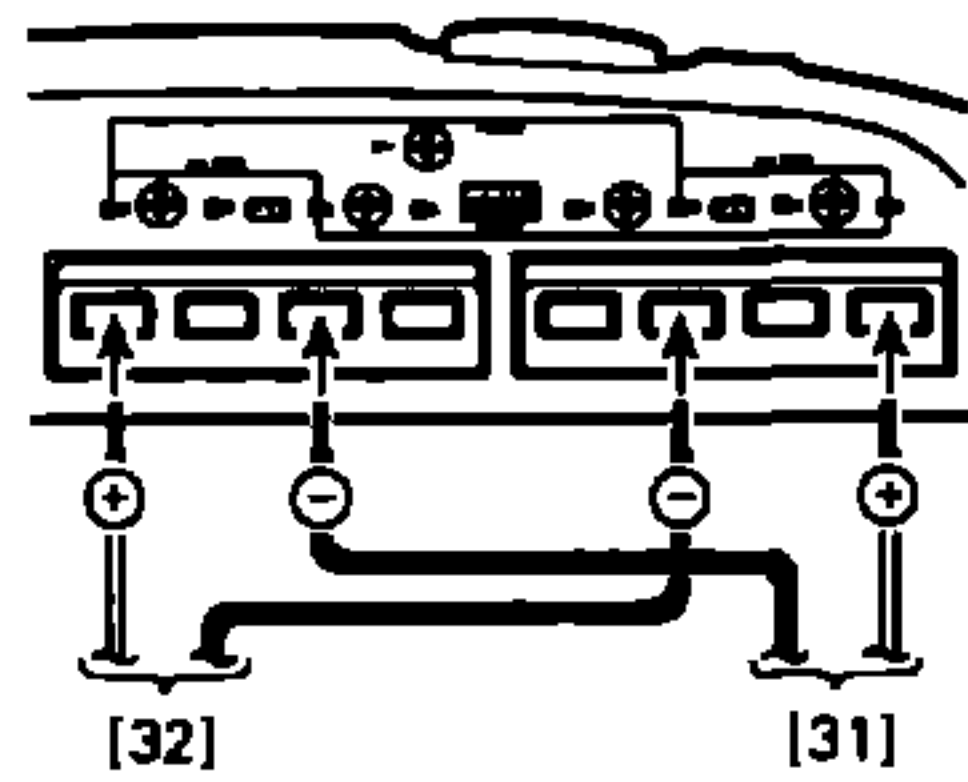


Fig. 25

- (Fig. 24, 25)
- [2] RCA Input Select Switch
Slide this switch to the left.
 - [7] Connecting wire with RCA plug
(sold separately)
 - [8] Red
 - [9] White
 - [10] From car stereo (RCA output)
 - [22] To a separate amplifier (RCA input)
 - [23] RCA output jack
 - [24] RCA input jack A
 - [31] Speaker (left)
 - [32] Speaker (right)

**Two-channel mode (mono)
(RCA terminal side)**

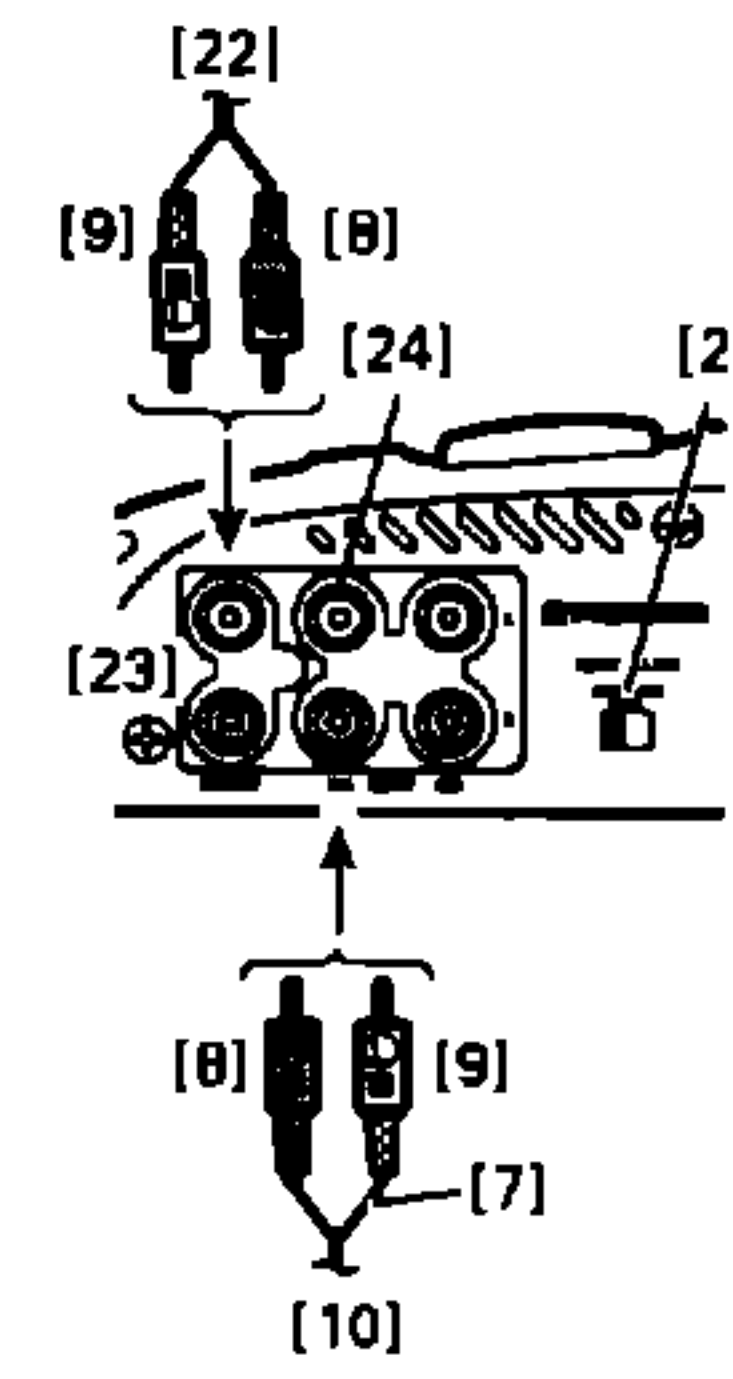


Fig. 26

(Speaker output terminal side)

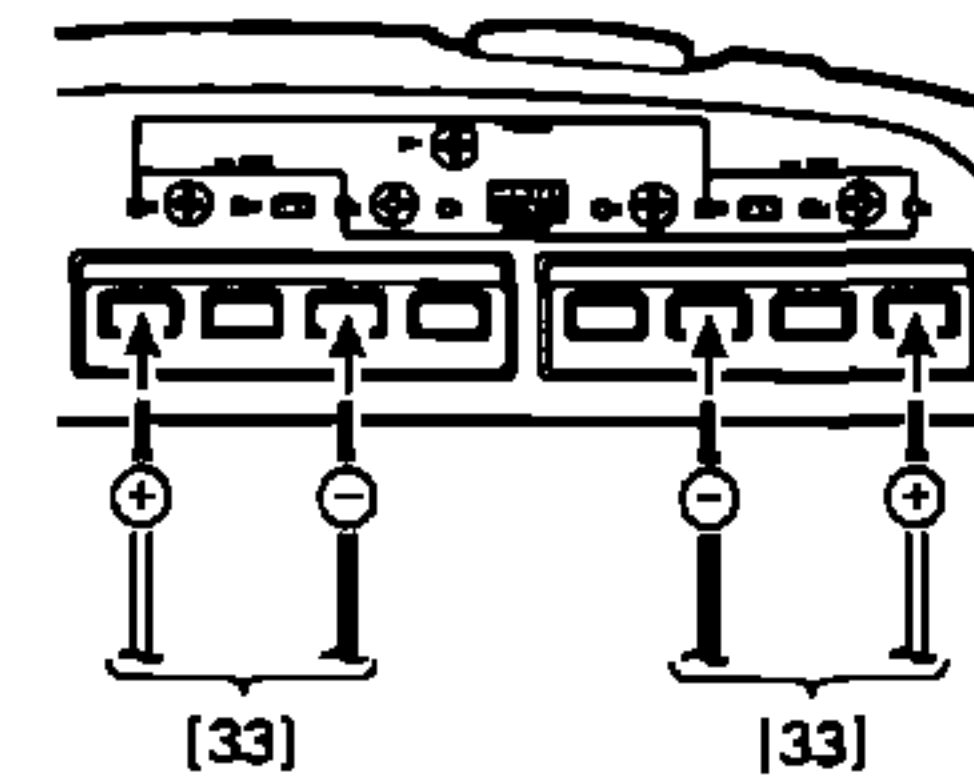


Fig. 27

- (Fig. 26, 27)
- [2] RCA Input Select Switch
Slide this switch to the left.
 - [7] Connecting wire with RCA plug
(sold separately)
 - [8] Red
 - [9] White
 - [10] From car stereo (RCA output)
 - [22] To a separate amplifier (RCA input)
 - [23] RCA output jack
 - [24] RCA input jack A
 - [33] Speaker (mono)

**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.

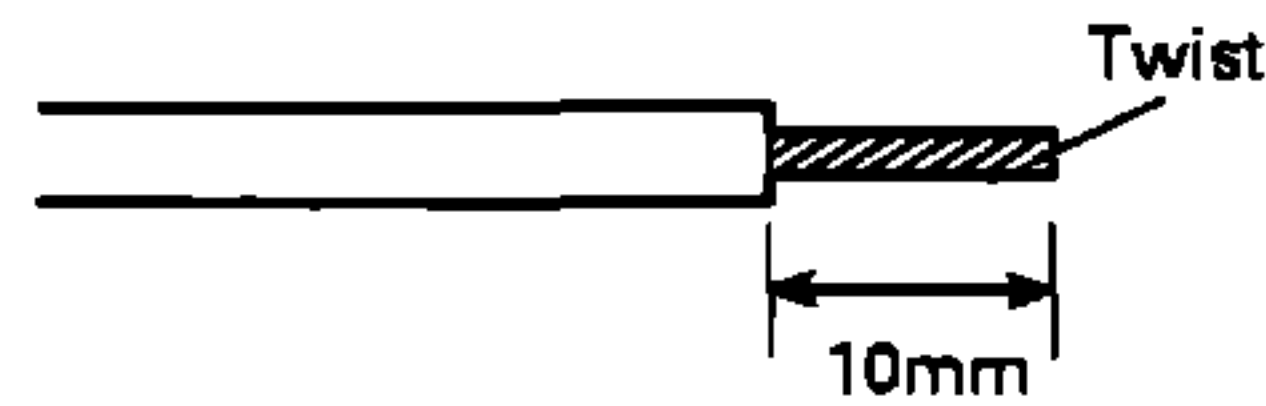


Fig. 28

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

- Fix the speaker wires securely with the terminal screws.

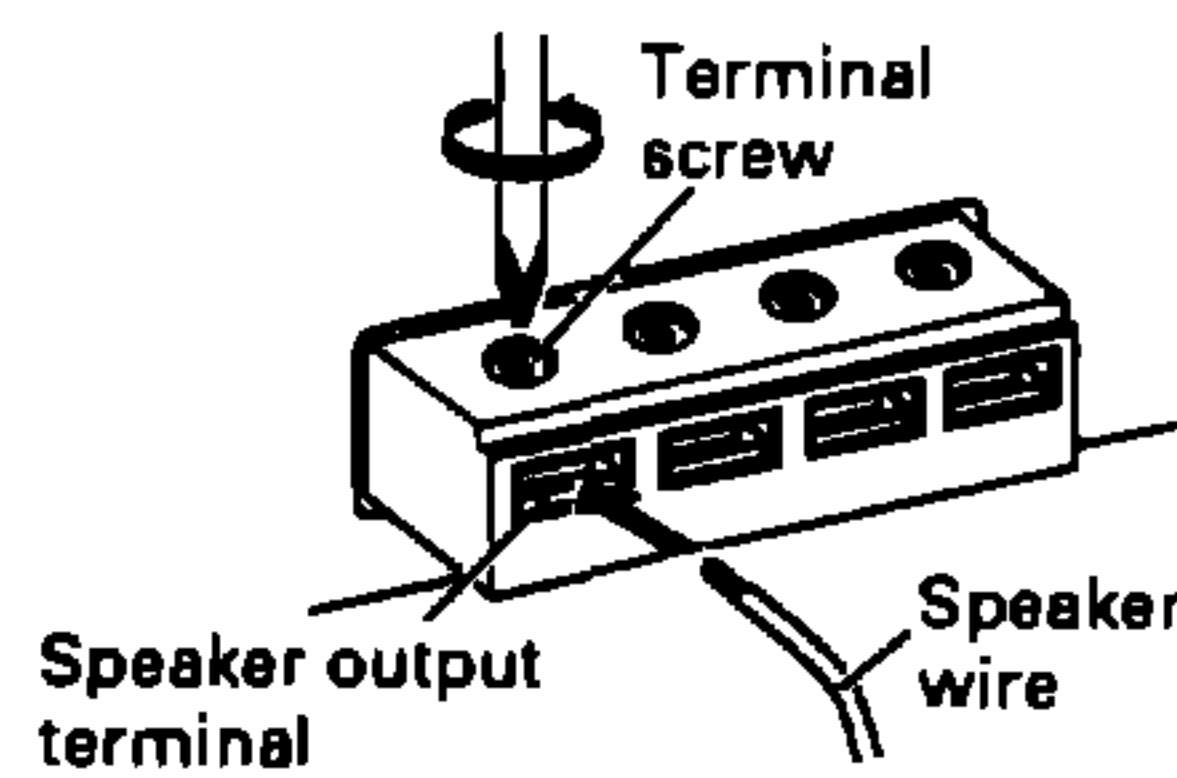


Fig. 29

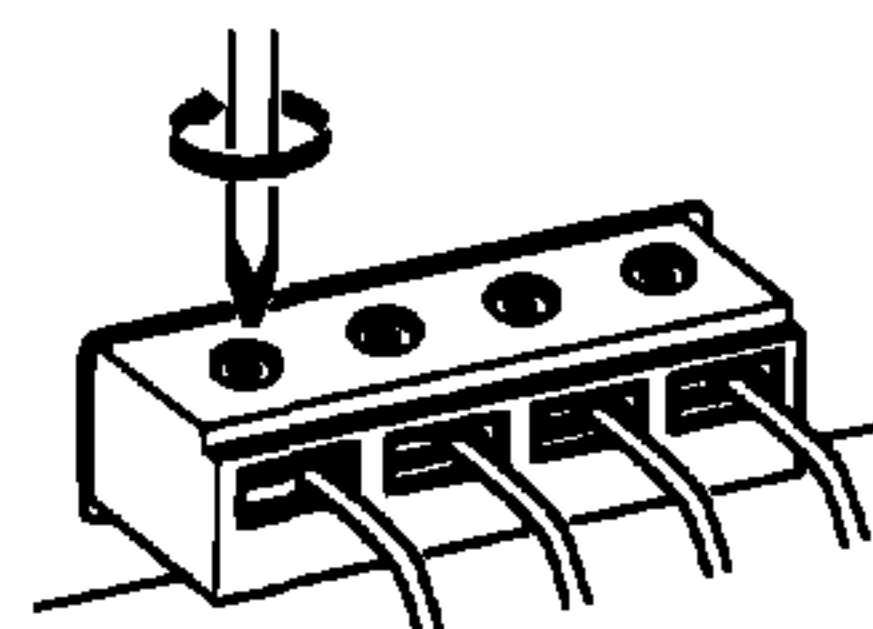


Fig. 30