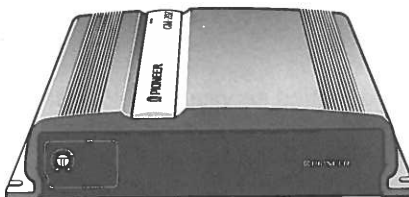


Service Manual

PIONEER
The Art of Entertainment

● GM-202/X1H/UC



1698

ORDER NO.
CRT1643

BRIDGEABLE POWER AMPLIFIER

GM-202

X1H/UC

GM-202

X1H/EW,ES

GM-102

X1H/UC

CONTENTS

1. SAFETY INFORMATION(UC MODEL)	2
2. DISASSEMBLY	2
3. ELECTRICAL PARTS LIST	3
4. CONNECTION DIAGRAM (GM-202/X1H/UC,EW,ES)	5
5. SCHEMATIC CIRCUIT DIAGRAM (GM-202/X1H/UC,EW,ES)	7
6. CONNECTION DIAGRAM(GM-102/X1H/UC)	9
7. SCHEMATIC CIRCUIT DIAGRAM (GM-102/X1H/UC)	11
8. EXPLODED VIEW	13
9. PACKING METHOD	16
10. OPERATIONS AND CONNECTION (GM-202/X1H/UC)	17
11. OPERATIONS AND CONNECTION (GM-102/X1H/UC)	19

SPECIFICATIONS

Power source 14.4V DC (10.8 — 15.6 V allowable)
Grounding system Negative type
Current consumption
..... 12.5 A (at continuous power, 4 Ω)
Average current drawn..... 3.5A (4 Ω for two channels)
6A (4 Ω for one channel)
Fuse 15A
Dimensions 206(W) \times 50(H) \times 175(D)mm
[8-1/8(W) \times 2(H) \times 6-7/8(D)in.]
Weight..... 1.9 kg
(2.2 lbs.) (Leads for wiring not included)
Maximum power output..... 70W \times 2/160W \times 1 (EIAJ)

Continuous power output
..... 35W \times 2 (at 14.4V, 4 Ω , 20 — 20,000 Hz, 0.08% THD)
80W \times 1 (at 14.4V, 2 Ω , 20 — 20,000 Hz, 0.8% THD)
50W \times 2 (at 14.4V, 2 Ω , 20 — 20,000 Hz, 0.8% THD)
25W \times 2 (at 12V, 4 Ω , 20 — 20,000 Hz, 0.08% THD)
55W \times 1 (at 12V, 4 Ω , 20 — 20,000 Hz, 0.8% THD)
35W \times 2 (at 12V, 2 Ω , 20 — 20,000 Hz, 0.8% THD)
Load impedance..... 4 Ω (2 — 8 Ω allowable)
Frequency response..... 10 — 50,000 Hz (+0dB, -1dB)
Signal-to-noise ratio 105 dB (IHF - A network)
Separation 60 dB(1kHz)
Input level/impedance RCA: 0.4 — 2V/22k Ω
Input level/impedance (GM-X102)
..... Speaker: 1.6 — 8 V/40k Ω

PIONEER ELECTRONIC CORPORATION

4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS SERVICE INC. P.O.Box 1760, Long Beach, California 90801 U.S.A.

PIONEER ELECTRONICS OF CANADA, INC. 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada

PIONEER ELECTRONIC (EUROPE) N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium

PIONEER ELECTRONICS AUSTRALIA PTY.LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL:[03]580-9911

© PIONEER ELECTRONIC CORPORATION 1995

PIONEER JAPAN 1995 Printed in Japan

1. 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.

2. DISASSEMBLY

● Removing the Case and Panel

- 1.Remove four screws, and then remove two cases.
- 2.Remove two screws, and then remove panel.

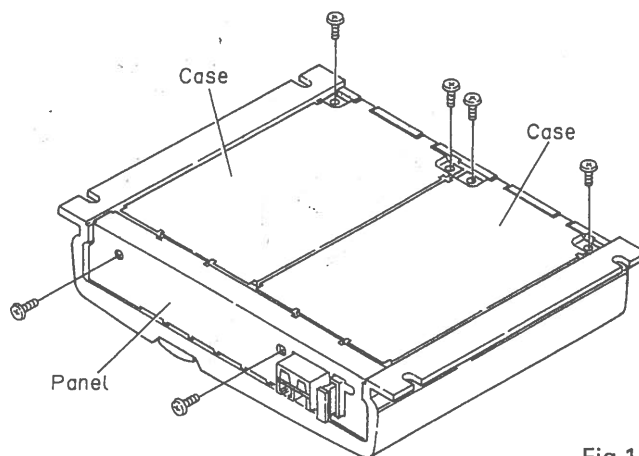


Fig.1

● Removing the Amp Unit

- 1.Remove eight screws.
- 2.Amp unit is unremovable from heat sink if pulled up ordinarily, because silicone compound has been applied between heat sink and subheat sink. To remove amp unit, therefore, follow steps below.
 - a. Unfasten two arbitrary screws securing power transistor.
 - b. Screw them little by little alternately into screw holes A to get amp unit afloat and remove it.
- 3.Once amp unit has been removed, screws with which power transistor has been secured should be returned to thier original position.

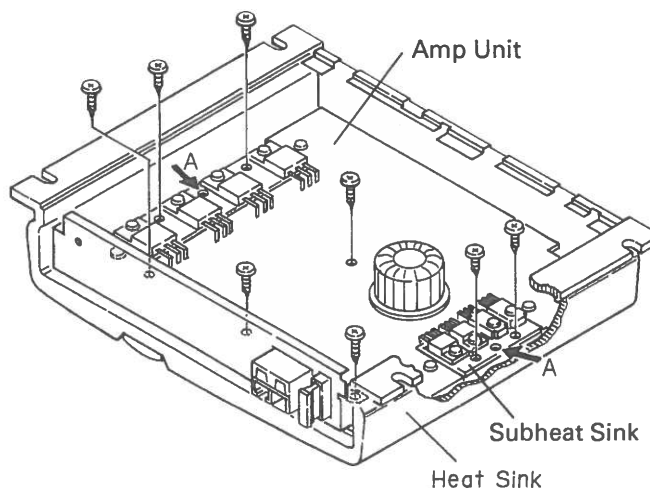


Fig.2

3. 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 & No. Part Name=====	Part No.	====Circuit Symbol & No. Part Name=====	Part No.
GM-202/X1H/UC		R 562 564	RD1/4PS153JL
Unit Number : HWH1191		R 565 566 567 568	RD1/4PS561JL
Unit Name : Amp Unit		R 569 570 571 572 581 582 583 584	RD1/4PS473JL
		R 573 574 575 576	RD1/4PS161JL
		R 577 578	RD1/4PS562JL
MISCELLANEOUS		R 579 580 660 667 676	RD1/4PS222JL
IC 451	UPC4570HA	R 589 590 591 592 0.22Ω	CCN1013
IC 551 851 852	UPC4570C	R 593 594 595 596 0.22Ω	CCN1013
IC 651	TA8194Z	R 597 598	RS1/2P100JL
IC 652	PC817	R 651 652	RD1/4PS393JL
IC 901	UPC494C		
Q 551 552	2SA1145	R 653 654	RD1/4PS564JL
Q 553 554	2SC2705	R 655 656	RD1/4PM473J
Q 555 556	2SD2343	R 657 670	RS1/10S104J
Q 561 562	2SD2438	R 658 661 674 905 913 914 915	RS1/10S472J
Q 563 564	2SB1587	R 659 663 680 681 906	RS1/10S103J
Q 651 652	2SD1768S	R 662 930	RD1/4PS221JL
Q 653 663	2SA1162	R 664	RD1/4PS182JL
Q 654 655 656 658 901	2SC2458	R 665	RD1/4PS103JL
Q 657 659 902 903 904	2SA1048	R 666 903 904	RD1/4PS102JL
Q 660 908	2SB1243	R 668 920 921	RD1/4PS472JL
Q 661 662	2SC2712	R 669 922 923	RD1/4PS101JL
Q 905 906	IRFIZ44G	R 671	RS1/10S221J
Q 907	2SD1864	R 672	RD1/4PS152JL
D 651 652 653 655 657 658 905 906	1SS133	R 673	RD1/4PS472JL
D 654	HZ30P	R 678	RS1/10S103J
D 656	HZS7LA2	R 851 852	RS1/8S471J
D 901	BR4361F	R 853	RS1/10S223J
D 902 903	ERA15-02VH	R 854	RD1/4PS223JL
D 904	HZS18L3	R 855 856 857 858 859 860 861 862	RN1/10SE103D
D 907	ESAC25M-02C	R 864 868	RS1/10S331J
D 908 909	HZS16L1	R 901 927	RS1/2P561JL
D 910	ESAC25M-02N	R 902	RS1/2P220JL
L 851 852	CTF1007	R 907	RS1/10S183J
L 901	CTH1142	R 908 909	RD1/4PS100JL
T 901	CTT1034	R 911	RS1/10S102J
TH 901	CCX1013	R 912	RD1/4PS272JL
S 901	HS1-156	R 916 917	RD1/4PS332JL
VR 453	CCS1241	R 918 919	RD1/4PS220JL
EF 902 903	CCG-081	R 924	RS1/2P560JL
FU1	HEK0015	R 925	RD1/4PS560JL
RESISTORS		R 926	RD1/4PS105JL
R 137 138 551 552 679	RS1/10S222J	R 928	RS1/2P220JL
R 147 148	RS1/8S0R0J		
R 455 456	RS1/10S0R0J	CAPACITORS	
R 465	RS1/8S391J	C 457 458	CKSQYB473K25
R 466	RS1/10S391J	C 551 552	CKSYB104K25
R 501 502	RD1/4PS471JL	C 553 554	CEAS101M10
R 555 556	RS1/10S822J	C 555 556	CCSQCH680J50
R 557 558	RS1/10S471J	C 559 560 565 566	CCSQCH220J50
R 559 560	RS1/10S223J	C 561 562 563 564	CCPSL330J50L
R 561 563 910	RS1/10S153J	C 567 568 569 570	CFTNA224J50
		C 571 572	CFTNA223J50
		C 573 574	CFTNA333J50
		C 651	CCH1036
			220 μF/10V

====Circuit Symbol & No. Part Name=====	Part No.	====Circuit Symbol & No. Part Name=====	Part No.
C 652	CEAS331M16	C 901 904	CEAS010M50
C 653	CEAS470M16	C 902	CEAS221M10
C 654	CEAS220M16	C 903	CEAS2R2M50
C 655	CFTNA103J50	C 905 906	CQMA472J50
C 656	CKSQYB103K50	C 907	CCH1130
		3300 μ F/16V	
C 851 852	CKSQYB471K50	C 908 909	CCH1200
C 853 854	CEAS100M16	C 910 911	CEAS101M35
C 855 856	CKSQYB472K50	C 912 913	CEAS0R1M50
C 857 858 859 860	CCSQCH470J50	C 914 915	CQMA102J50
C 863 864	CKSQYB103K50	C 916	CFTNA224J50
		C 917	CQMA102J50

- The GM-102/X1H/UC, GM-202/X1H/EW and GM-202/X1H/ES Parts Lists enumerate the parts which differ from those for the GM-202/X1H/UC only. The parts other than those enumerated in the GM-102/X1H/UC, GM-202/X1H/EW and GM-202/X1H/ES Parts Lists are identical with those in the GM-202/X1H/UC Parts List, to which you are requested to refer, accordingly. The GM-202/X1H/UC Parts List is given on page 3.

Amp Unit

	GM-202/X1H/UC	GM-102/X1H/UC	GM-202/X1H/EW	GM-202/X1H/ES
Circuit Symbol & No.	Part No.	Part No.	Part No.	Part No.
R869,872	RD1/4PS183JL	.....	.....
R870,871	RD1/4PS104JL	.....	.....
C861,862	CEAS100M16	.....	.....

4. CONNECTION DIAGRAM
(GM-202/X1H/UC,EW,ES)

IC, Q

IC851

Q564 Q556 Q562
Q561 Q555 Q563IC852
IC451

Q652

Q651

Q551 Q553 Q554

Q552

Q663

Q662 IC652

Q657

IC551 Q902 Q901 Q654
Q656 Q655 Q653IC901
Q661

IC651

Q658

Q904 Q659

Q903 Q660

Q906 Q905

Q907

Q908

AMP UNIT

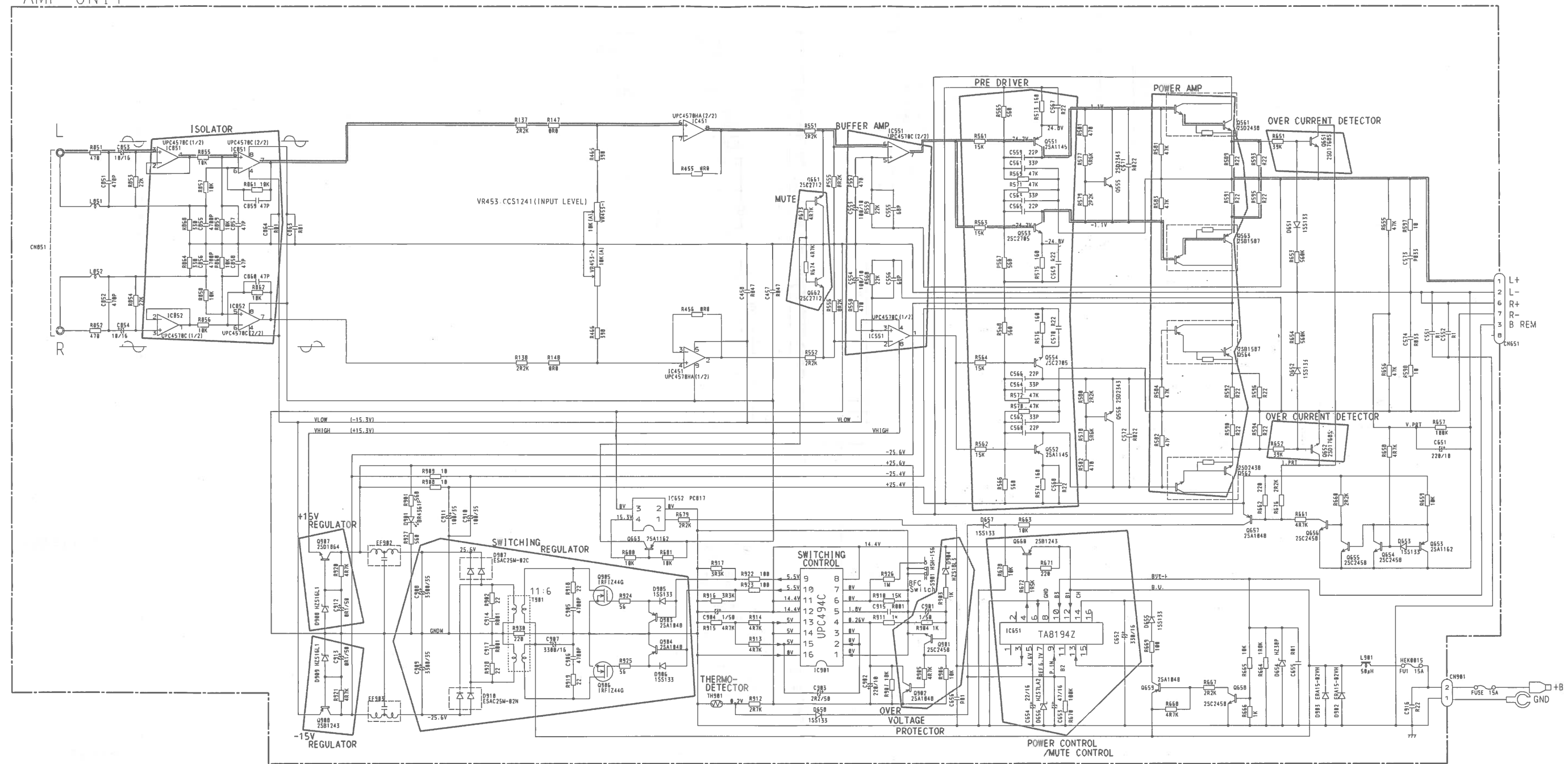
CORD ASSY

CORD ASSY

Fig.3

5. SCHEMATIC CIRCUIT DIAGRAM(GM-202/X1H/UC,EW,ES)

AMP UNIT



SWITCHES:
AMP UNIT
S901: BFC SWITCH.....LOW-HIGH
The underlined indicates the switch position.

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

CN651

8	7	6
3	2	1

Fig.4

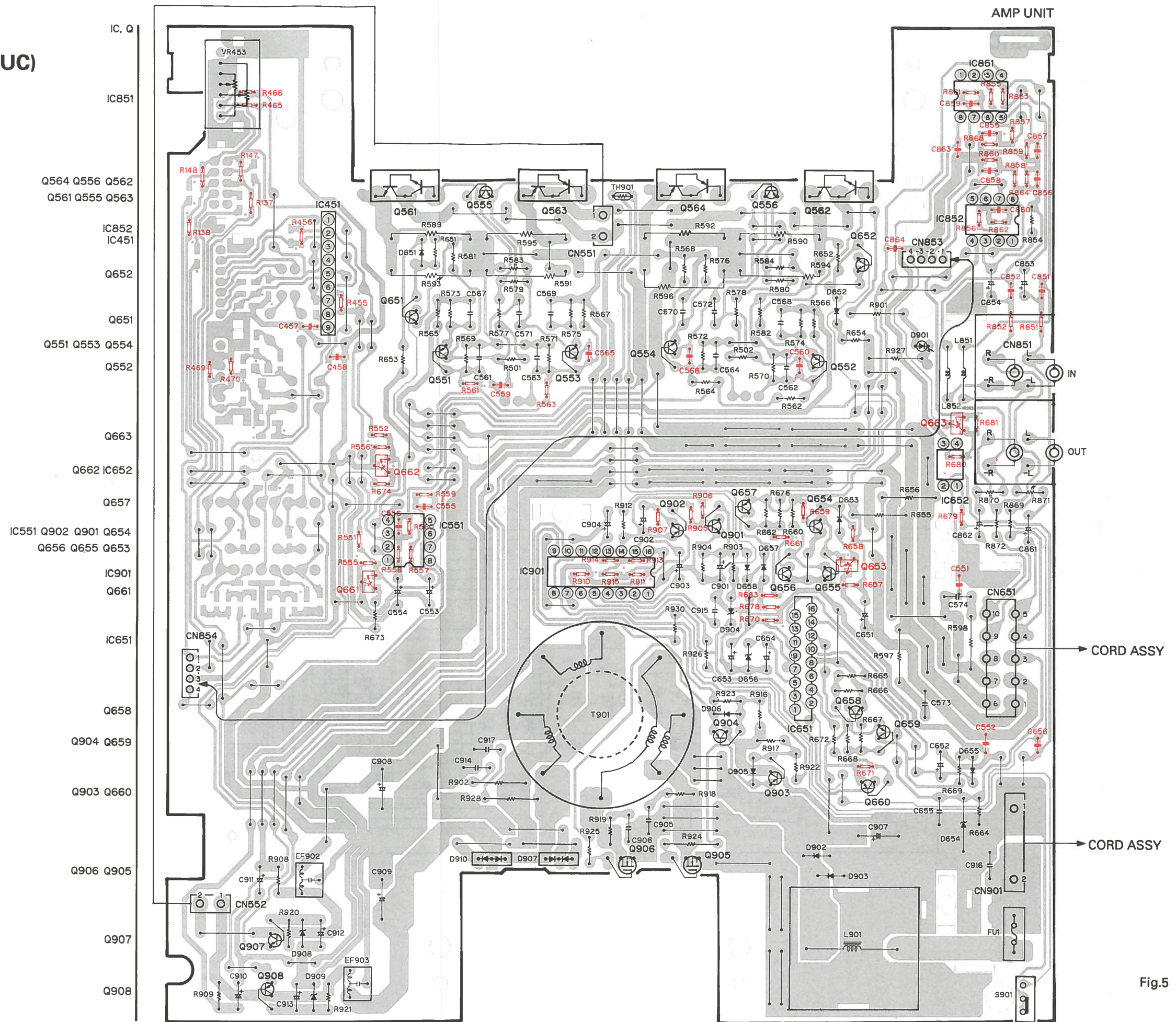
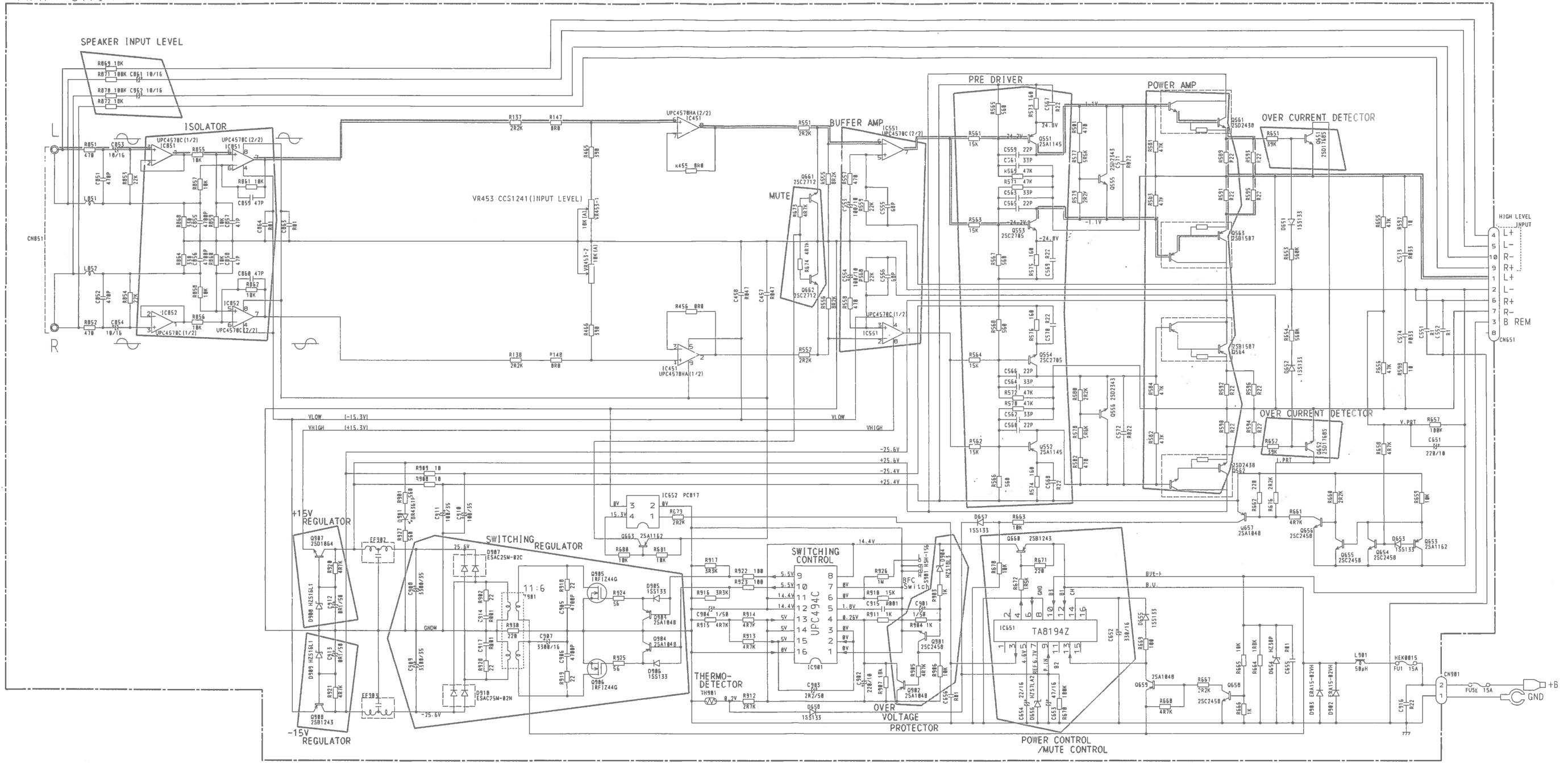


Fig.5

7. SCHEMATIC CIRCUIT DIAGRAM(GM-102/X1H/UC)

AMP UNIT



SWITCHES
AMP UNIT
S901-BFC SWITCH.....LOW-HIGH
The underlined indicates the switch position.

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

CN651

10	9	8	7	6
5	4	3	2	1

Fig.6

8. EXPLODED VIEW

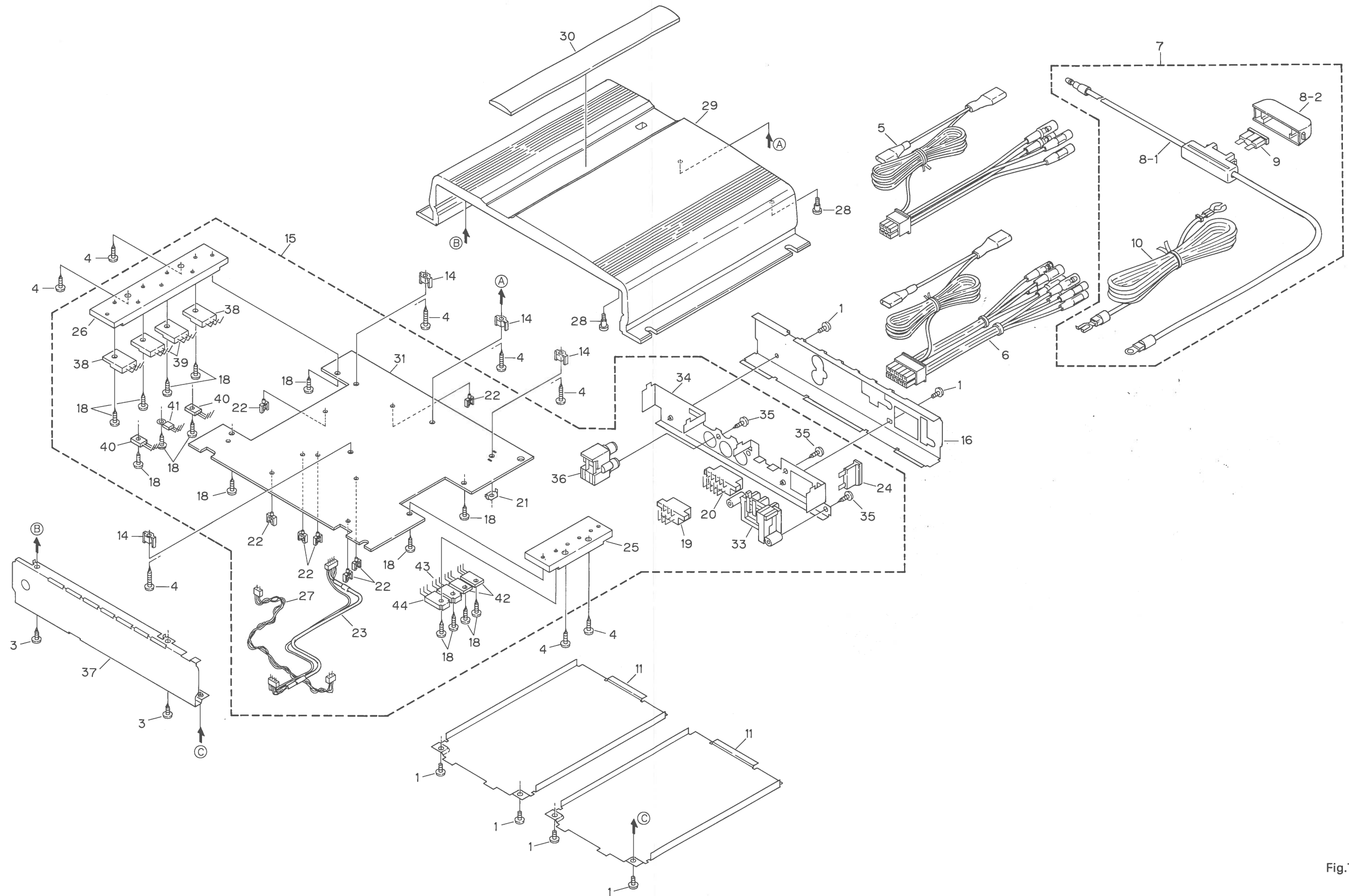


Fig.7

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.

● Parts List(GM-202/X1H/UC)

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Screw	BSZ30P050FZK		26	Heat Sink	HNR1355
	2	.....				(Subheat Sink)	
	3	Screw(M3×6)	CBA1320		27	Cord	CDE4610
	4	Screw(M3×12)	CBA1323		28	Screw(M3×5)	CBA1330
	5	Cord Assy	HDE4416		29	Heat Sink	HNR1344
	6	.....			30	Plate Unit	HXA7369
	7	Cord Assy	HDE4453		31	P.C.Board	CNP3788
	8	Cord	HDE4425		32	.....
	9	Fuse	HEK0015		33	Terminal(CN901)	CKE1035
	10	Cord	HDE4517		34	Holder	HNC5516
	11	Case	HNB1840		35	Screw	PPZ30P060FZK
12,13	.....				36	Pin Jack(CN851)	CKB1011
	14	Spacer	HNV3975		37	Panel	HNB1843
	15	Amp Unit	HWH1191		38	Transistor(Q561,562)	2SD2438
	16	Panel	HNB1844		39	Transistor(Q563,564)	2SB1587
	17	.....			40	Transistor(Q555,556)	2SD2343
	18	Screw(M3×10)	CBA1322		41	Thermister(TH901)	CCX1013
	19	Plug(CN651)	CKM1099		42	Transistor(Q905,906)	IRFIZ44G
	20	.....			43	Diode(D907)	ESAC25M-02C
	21	Holder	CNC2218		44	Diode(D910)	ESAC25M-02N
	22	Clamper	CNV1335				
	23	Connector	HDE4418				
	24	Fuse(FU1)	HEK0015				
	25	Heat Sink	HNR1354				
		(Subheat Sink)					

- The GM-102/X1H/UC, GM-202/X1H/EW and GM-202/X1H/ES Parts Lists enumerate the parts which differ from those for the GM-202/X1H/UC only. The parts other than those enumerated in the GM-102/X1H/UC, GM-202/X1H/EW and GM-202/X1H/ES Parts Lists are identical with those in the GM-202/X1H/UC Parts List, to which you are requested to refer, accordingly.

Mark	No.	Description	GM-202/X1H/UC	GM-102/X1H/UC	GM-202/X1H/EW	GM-202/X1H/ES
			Part No.	Part No.	Part No.	Part No.
	5	Cord Assy	HDE4416	.....	HDE4416	HDE4416
	6	Cord Assy	.....	HDE4414	.....	.....
	15	Amp Unit	HWH1191	HWH1194	HWH1191	HWH1191
	16	Panel	HNB1844	HNB1865	HNB1844	HNB1844
	19	Plug(CN651)	CKM1099	.....	CKM1099	CKM1099
	20	Plug(CN651)	.....	CKM1100	.....	.....
	30	Plate Unit	HXA7369	HXA7373	HXA7372	HXA7371
	34	Holder	HNC5516	HNC5511	HNC5516	HNC5516
	37	Panel	HNB1843	HNB1859	HNB1843	HNB1843

9. PACKING METHOD

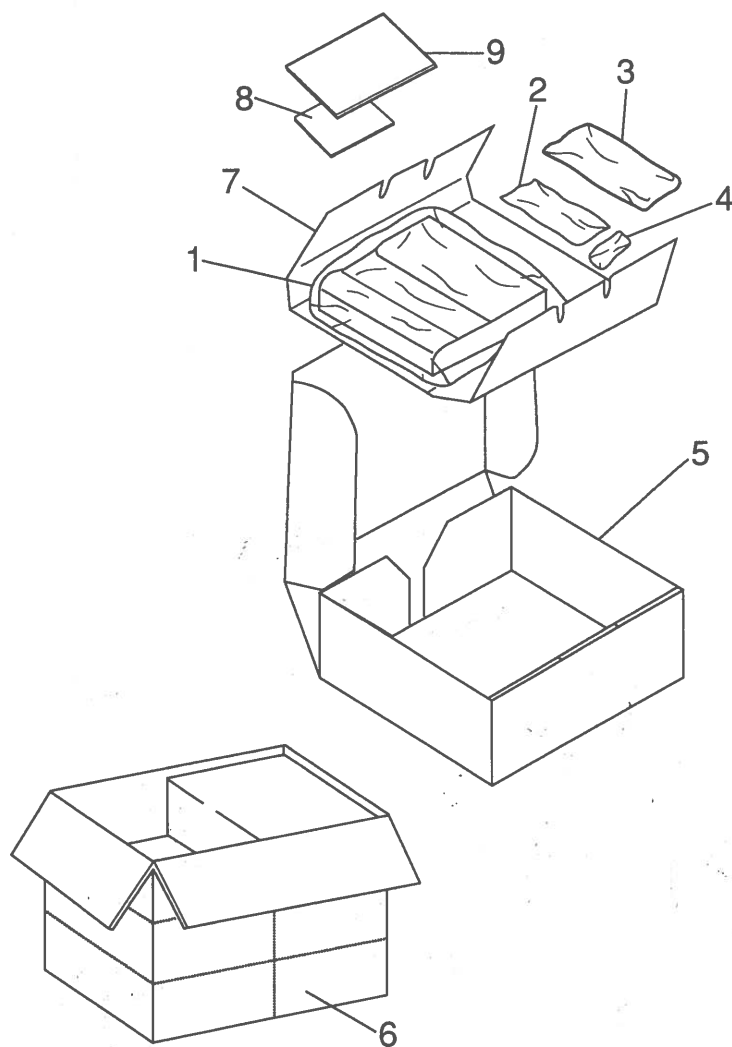


Fig.8

● Parts List(GM-X202/X1H/UC)

Mark No. Description	GM-202/X1H/UC	GM-102/X1H/UC	GM-202/X1H/EW	GM-202/X1H/ES
	Part No.	Part No.	Part No.	Part No.
1 Polyethylene Bag	HEG0010	HEG0010	HEG0010	HEG0010
2 Cord Assy(Output)	HDE4416	HDE4414	HDE4416	HDE4416
3 Cord Assy(Power Supply)	HDE4453	HDE4453	HDE4453	HDE4453
4 Screw Assy	HEA0003	HEA0003	HEA0003	HEA0003
4-1 Screw(×4)	BYC40P180FZK	BYC40P180FZK	BYC40P180FZK	BYC40P180FZK
4-2 Polyethylene Bag	HEG0011	HEG0011	HEG0011	HEG0011
5 Carton	HHG0025	HHG0027	HHG0029	HHG0031
6 Contain Box	HHL0025	HHL0027	HHL0029	HHL0031
7 Protector	HHP0002	HHP0002	HHP0002	HHP0002
* 8 Warranty Card	.....	.....	HRY1071	.....
9 Owner's Manual	HRD0006	HRD0008	HRD0009	HRD0011

Owner's Manual

Part No.	Model	Language
HRD0006	GM-202/X1H/UC	English,French
HRD0008	GM-102/X1H/UC	English,French
HRD0009	GM-202/X1H/EW	English,French,German,Dutch,Spanish,Swedish,Norwegian,Finnish,Italian
HRD0011	GM-202/X1H/ES	English,French,Spanish,Arabic

10. OPERATIONS AND CONNECTION(GM-202/X1H/UC)

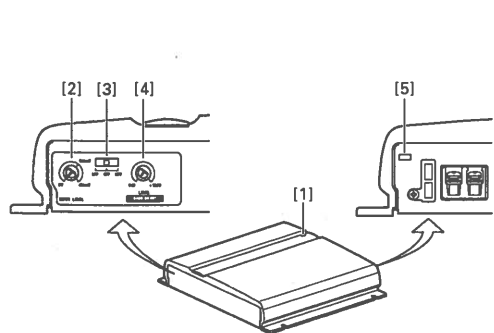


Fig. 9

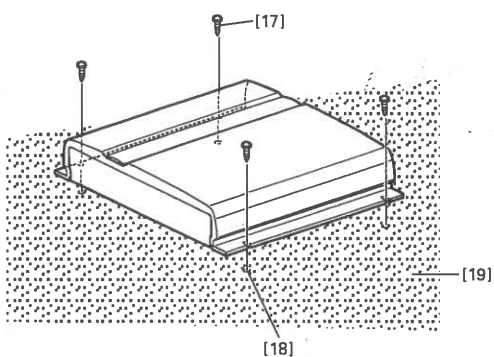


Fig. 10

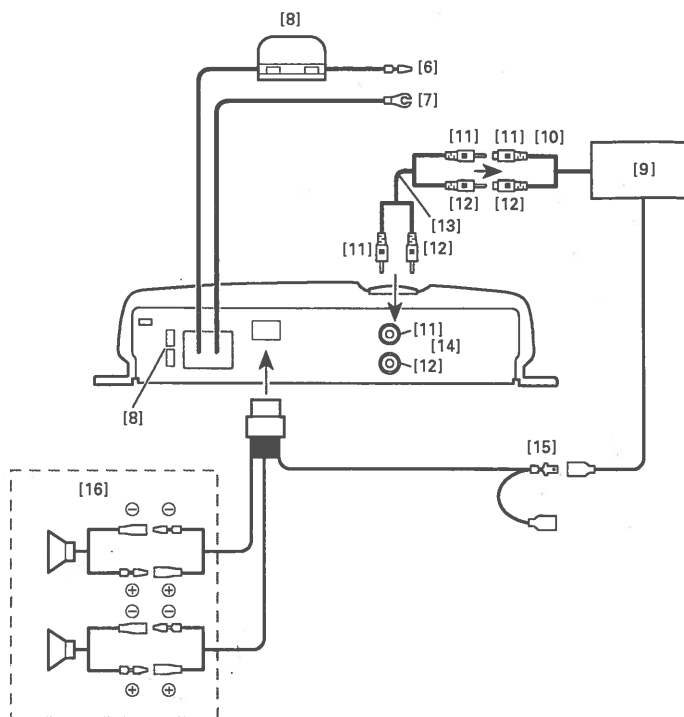


Fig. 11

Setting of This Unit

(Fig. 9)

[1] Power Indicator

The power indicator lights when the power is switched on.

[2] 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.

[3] BFC (Beat Frequency Control) Switch

If you hear a beat while listening to an AM broadcast with your car stereo, change the BFC switch using a small screwdriver.

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.
- If you drill a hole in the engine compartment to directly connect the special red battery lead to the car battery, plug the hole with a rubber bushing to protect the wire. If a rubber bushing is not used, the insulation may be damaged and a short circuit may result due to the vibrations of the car.
- 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 leads. 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.

- Be sure to use the special red battery wire supplied with the amplifier and connect unswitched source greater than 15 A. Use the supplied black ground wire and connect to the vehicle body. (The supplied special red battery and ground wires are designed so that the amplifier can be connected safely.)

⚡ 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 be caused to the speaker. The speaker impedance must be 2 to 8 ohms.

Speaker		Power
Channel	Type	
Two-channel	Sub-woofer	Nominal input: Min. 35 W
	Other than sub-woofer	Max. input: Min. 70 W
One-channel	Sub-woofer	Nominal input: Min. 80 W
	Other than sub-woofer	Max. input: Min. 160 W

(Fig. 11)

- [6] Special red battery wire
Connect to unswitched source greater than 15 A.
- [7] Ground wire (black)
Connect to metal body or chassis.
- [8] Fuse (15 A)
- [9] Car stereo with RCA output pin jacks
- [10] External output
- [11] White
- [12] Red
- [13] Connecting wires with RCA pin plugs. (sold separately)
- [14] RCA input pin jack
- [15] Blue

- Connect the male terminal of this wire to the blue wire of the car stereo (system 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.
- [16] Speaker output terminal
See the "Connecting the Speakers" section for speaker connection instructions.

Connecting the Power Terminal

- Be sure to use the special red battery wire supplied with the amplifier and connect unswitched source greater than 15 A. Use the supplied black ground wire and connect to the vehicle body. (The supplied special red battery and ground wires are designed so that the amplifier can be connected safely.)

Connect the special red battery wire to the POWER terminal (+), and the black ground wire to the GND terminal (-).

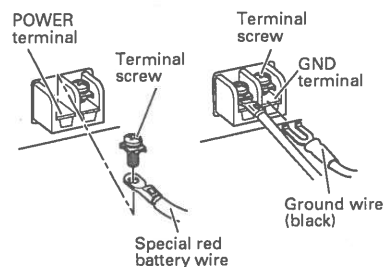


Fig. 12

Fig. 13

- Securely fasten the special red battery wire and the ground wires with terminal screws.

Connecting the Speakers

The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). To connect the speaker wires to suit the mode. Connect the speakers according to the figure below.

Two-channel mode (stereo)

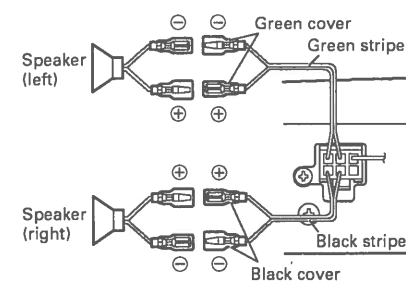


Fig. 14

One-channel mode (mono)

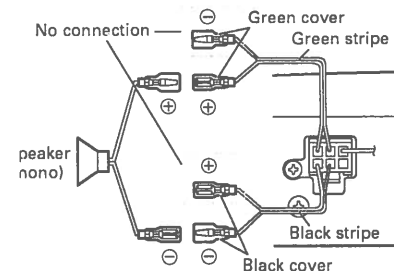


Fig. 15

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. 16 and 17 for details of wiring.

• The following Figs. 16 and 17 require advanced understanding of electronics. If you do not understand the diagram, please have the work done by your nearest authorized Pioneer installation specialist.

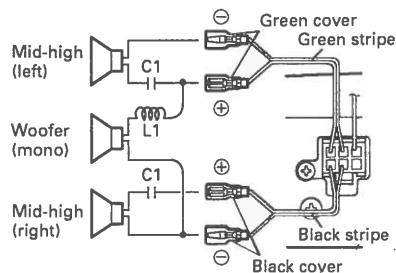
Three-channel mode, two-way system

Fig. 16

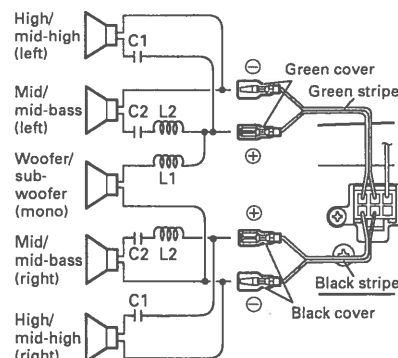
Three-channel mode, three-way system

Fig. 17

- 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 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 on the joints to prevent short circuits.

Setting the Filter Constant

Low-pass filter (for sub-woofer/woofer): 6 dB/octave (Fig. 18)

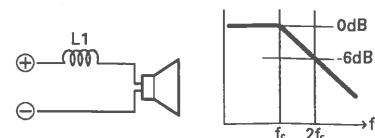


Fig. 18

High-pass filter (for mid/mid-high): 6 dB/octave (Fig. 19)

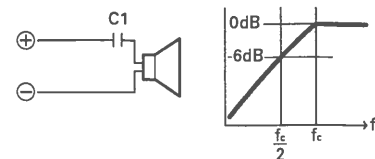


Fig. 19

Band-pass filter (combination of low-pass filter and high-pass filter for mid-bass/mid): 6 dB/octave (Fig. 20)

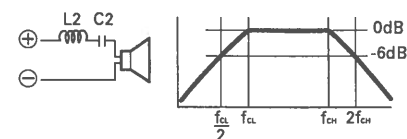


Fig. 20

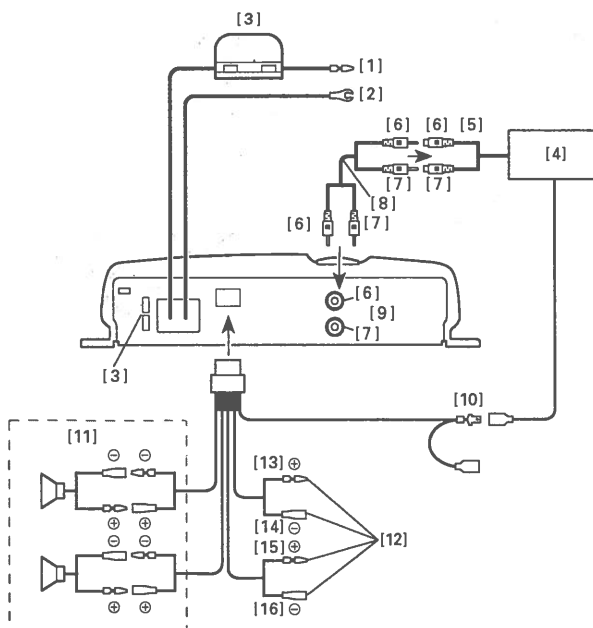
11. OPERATIONS AND CONNECTION (GM-102/X1H/UC)

Fig. 21

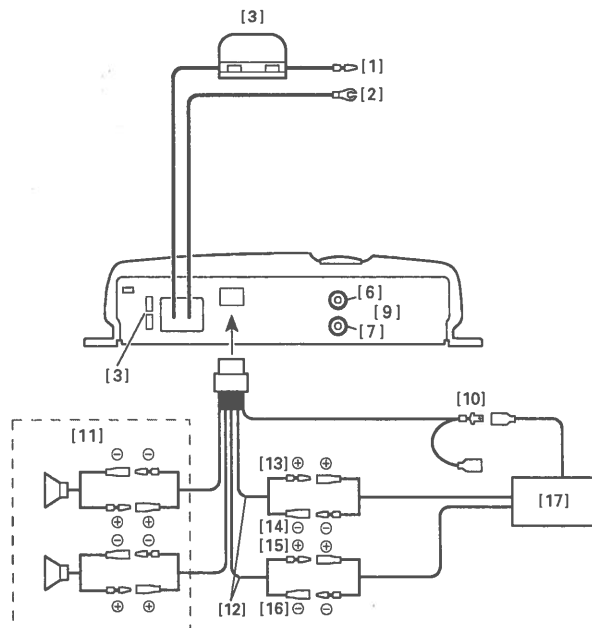


Fig. 22

Setting of This Unit

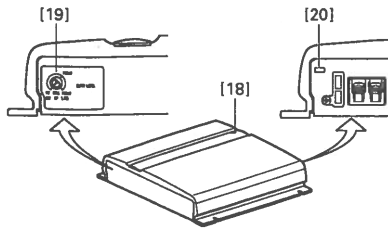


Fig. 23

(Fig. 23)

[18] Power Indicator

The power indicator lights when the power is switched on.

[19] 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.
- If you hear much noise when using the speaker input terminals turn the input level control clockwise.

[20] BFC (Beat Frequency Control) Switch

If you hear a beat while listening to an AM broadcast with your car stereo, change the BFC switch using a small screwdriver.

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.
- If you drill a hole in the engine compartment to directly connect the special red battery lead to the car battery, plug the hole with a rubber bushing to protect the wire. If a rubber bushing is not used, the insulation may be damaged and a short circuit may result due to the vibrations of the car.
- 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 leads. 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.

- Be sure to use the special red battery wire supplied with the amplifier and connect unswitched source greater than 15 A. Use the supplied black ground wire and connect to the vehicle body. (The supplied special red battery and ground wires are designed so that the amplifier can be connected safely.)

⚠ 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 be caused to the speaker. The speaker impedance must be 2 to 8 ohms.

Speaker		Power
Channel	Type	
Two-channel	Sub-woofer	Nominal input: Min. 35 W
	Other than sub-woofer	Max. input: Min. 70 W
One-channel	Sub-woofer	Nominal input: Min. 80 W
	Other than sub-woofer	Max. input: Min. 160 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 special red battery wire supplied with the amplifier as faraway as possible from the speaker wires. Install and route the battery wire, ground wire, speaker wires, and the amplifier as faraway as possible from the antenna, antenna cable and tuner.

If RCA input pin jacks are connected

(Fig. 21)

If the speaker input terminals are connected (Fig. 22)

- [1] Special red battery wire
Connect to unswitched source greater than 15 A.
- [2] Ground wire (black)
Connect to metal body or chassis.
- [3] Fuse (15 A)
- [4] Car stereo with RCA output pin jacks
- [5] External output
- [6] White
- [7] Red
- [8] Connecting wires with RCA pin plugs. (sold separately)
- [9] RCA input pin jack
- [10] Blue
Connect the male terminal of this wire to the blue wire of the car stereo (system 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.
- [11] Speaker output terminal
See the "Connecting the Speakers" section for speaker connection instructions.
- [12] Speaker input terminal
If RCA input pin jacks are used, do not connect the speaker input terminals.
- [13] Green
- [14] Green/black
- [15] Gray
- [16] Gray/black
- [17] Car stereo with speaker output terminals.

Connecting the Power Terminal

- Be sure to use the special red battery wire supplied with the amplifier and connect unswitched source greater than 15 A. Use the supplied black ground wire and connect to the vehicle body. (The supplied special red battery and ground wires are designed so that the amplifier can be connected safely.)

Connect the special red battery wire to the POWER terminal (+), and the black ground wire to the GND terminal (-).

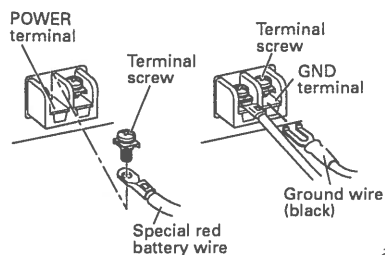


Fig. 24

Fig. 25

- Securely fasten the special red battery wire and the ground wires with terminal screws.

Connecting the Speakers

The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). To connect the speaker wires to suit the mode. Connect the speakers according to the figure below.

Two-channel mode (stereo)

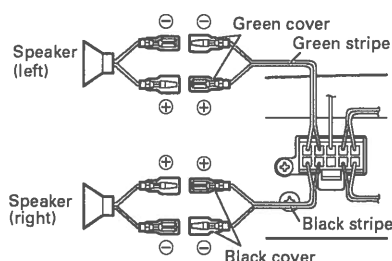


Fig. 26

One-channel mode (mono)

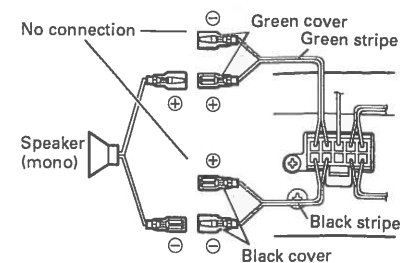


Fig. 27

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. 28 and 29 for details of wiring.

- The following Figs. 28 and 29 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

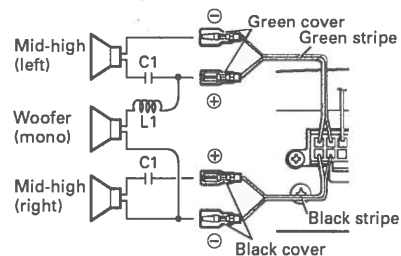


Fig. 28

Three-channel mode, three-way system

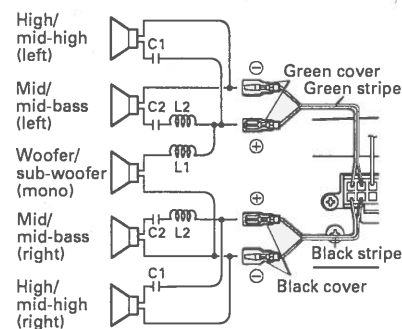


Fig. 29

- 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 that a 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 on the joints to prevent short circuits.

Setting the Filter Constant

Low-pass filter (for sub-woofer/woofer): 6 dB/octave (Fig. 30).

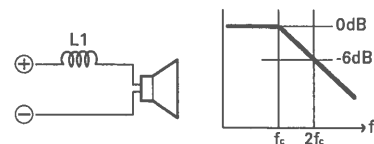


Fig. 30

High-pass filter (for mid/mid-high): 6 dB/octave (Fig. 31).

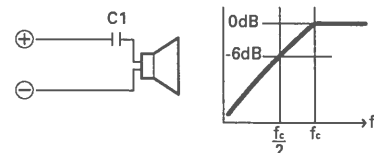


Fig. 31

Band-pass filter (combination of low-pass filter and high-pass filter for mid-bass/mid): 6 dB/octave (Fig. 32).

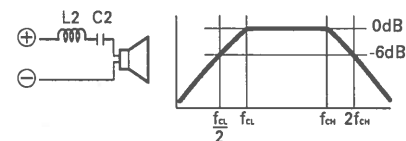


Fig. 32

4. CONNECTION DIAGRAM
(GM-202/X1H/UC,EW,ES)

IC, Q
IC851
Q564 Q556 Q562
Q561 Q555 Q563
IC852
IC451
Q652
Q651
Q551 Q553 Q554
Q552
Q663
Q662 IC652
Q657
IC551 Q902 Q901 Q654
Q656 Q655 Q653
IC901
Q661
IC651
Q658
Q904 Q659
Q903 Q660
Q906 Q905
Q907
Q908

