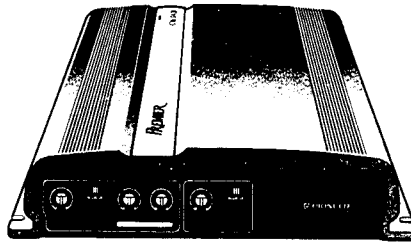


Service Manual

PIONEER
The Art of Entertainment

● GM-X404/X1H/UC



ORDER NO.
CRT1642

BRIDGEABLE FOUR-CHANNEL POWER AMPLIFIER

GM-X404

X1H/UC

GM-X404

X1H/EW,ES

GM-X304

X1H/UC

CONTENTS

1. SAFETY INFORMATION(UC MODEL)	2
2. DISASSEMBLY	2
3. ELECTRICAL PARTS LIST	3
4. CONNECTION DIAGRAM (GM-X404/X1H/UC,EW,ES)	5
5. SCHEMATIC CIRCUIT DIAGRAM (GM-X404/X1H/UC,EW,ES)	7
6. CONNECTION DIAGRAM(GM-X304/X1H/UC)	9
7. SCHEMATIC CIRCUIT DIAGRAM (GM-X304/X1H/UC)	11
8. EXPLODED VIEW	13
9. PACKING METHOD	17
10. OPERATIONS AND CONNECTION (GM-X404/X1H/UC)	18
11. OPERATIONS AND CONNECTION (GM-X304/X1H/UC)	21

SPECIFICATIONS

Power source 14.4 V DC (10.8 — 15.6 V allowable)
 Grounding system Negative type
 Current consumption 18 A (at continuous power, 4Ω)
 Average current drawn* 5.5 A (4Ω for four channels)
 10 A (4Ω for two channel)
 Fuse 25 A
 Dimensions 206 (W) × 50 (H) × 270 (D) mm
 [8-1/8 (W) × 2 (H) × 10-5/8 (D) in.]
 Weight 2.9 kg (3.3 lbs.) (Leads for wiring not included)
 Maximum power output 60 W × 4/140 W × 2 (EIAJ)
 Continuous power output
 30 W × 4 (at 14.4V, 4Ω, 20 — 20,000 Hz, 0.08% THD)
 70 W × 2 (at 14.4V, 4Ω, 20 — 20,000 Hz, 0.8% THD)
 35 W × 4 (at 14.4V, 2Ω, 20 — 20,000 Hz, 0.8% THD)
 20 W × 4 (at 12V, 4Ω, 20 — 20,000 Hz, 0.08% THD)
 50 W × 2 (at 12V, 4Ω, 20 — 20,000 Hz, 0.8% THD)
 25 W × 4 (at 12V, 2Ω, 20 — 20,000 Hz, 0.8% THD)
 Load impedance 4Ω (2 — 8Ω allowable)
 Frequency response 10 — 50,000 Hz (+0 dB, -1 dB)
 Signal-to-noise ratio 108 dB (IHF - A network)
 Separation 65 dB (1 kHz)

Low pass filter Cut off frequency: 80Hz
 Cut off slope: -18 dB/oct
 High pass filter Cut off frequency: 80 Hz
 Cut off slope: -12 dB/oct
 Bass boost(GM-X404/X1H/UC,EW,ES) .. Frequency: 40 — 120 Hz
 (GM-X304/X1H/UC) Frequency: 60 Hz
 Gain: 0 — 12 dB
 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.

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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.

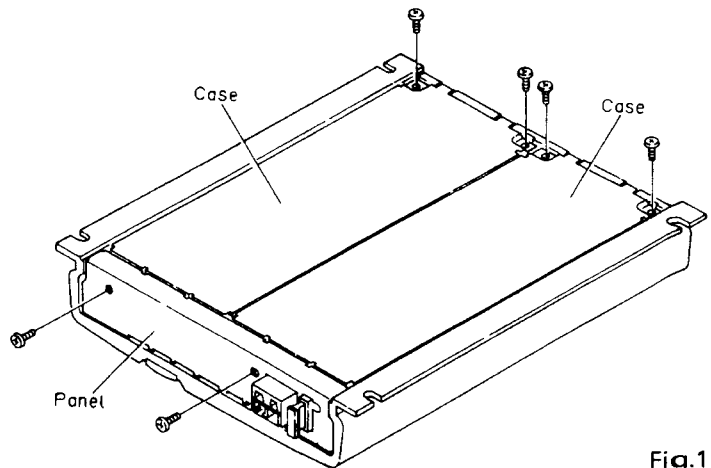


Fig.1

● Removing the Amp Unit

1. Remove thirteen 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 their original position.

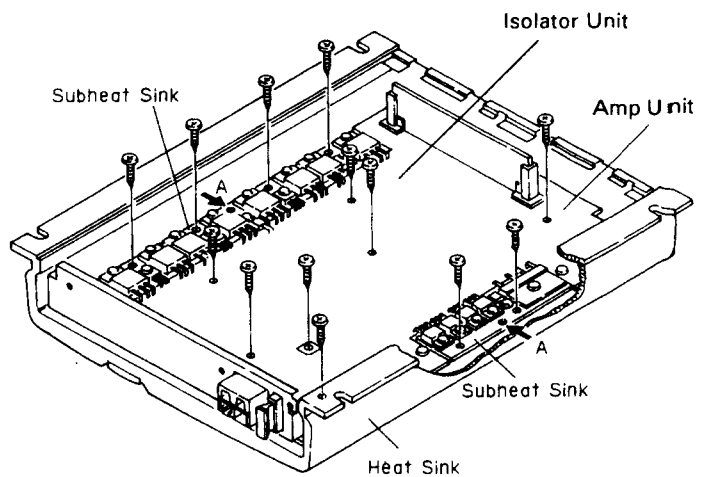


Fig.2

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/○○○○○J,RS1/○○○○○J

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

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

====Circuit Symbol & No. Part Name==== Part No. ====Circuit Symbol & No. Part Name==== Part No.

GM-X404/X1H/UC

Unit Number : HWH1184
Unit Name : Amp Assy

Amp Assy
Consists of
• Amp Unit
• Isolator Unit

MISCELLANEOUS

IC 101 102 121 122 123 151 152 851 852 853	UPC4570HA
IC 301 302	UPC4570C
IC 601	TA8194Z
IC 602	UPC494C
IC 854	UPC4570HA
Q 151 152	2SC2712
Q 201 202 203 204 207 208 209 210 601 605	2SC2458
Q 205 602 604 905 909	2SA1048
Q 301 302 303 304	2SK330
Q 305 306 307 308	2SA1145
Q 309 310 311 312	2SC2705
Q 313 314 315 316	2SD2343
Q 325 326 327 328	2SD2438
Q 329 330 331 332	2SB1587
Q 603	2SB1243
Q 606 607	2SD1919
Q 608 609	2SB1277
Q 610 611 612 613 FET	IRFIZ44G
Q 614	2SD2395
Q 615	2SB1566
Q 851 852 853 854	2SC1740S
Q 855	2SD1859
Q 901 902 903 904	2SD1768S
Q 906 907 908	2SC2458
D 601	RM4Z
D 602	HZ30P
D 603 606 608 901 902 903 904 909 910	1SS133
D 604	HZS7LA2
D 605 852	HZS18L3
D 609	RBV-602L
D 611 612	HZS16L1
D 851	HZS11LB2
D 912	LED
L 601	BR4361F
L 851 852 853 854	Ferri-Inductor
	CTH1142
	CTF1007
T 601	Transformer
TH 601	Thermister
TH 603	Thermister
S 101	Switch(LPF/HPF Select)
S 102	Switch(HPF Select)
	CTT1035
	CCX1009
	CCX1013
	CSH1029
	CSH1021

S 601	Switch(BFC)	HSH-156
S 851	Switch(Input Select)	CSH1021
VR 151	Volume 10kΩ(C)	CCS1240
VR 153	Volume 50kΩ(C)	CCS1242
VR 201 202	Volume 10kΩ(A)	CCS1241

RESISTORS

R 101 104 207 208 209 210 612	RS1/10S103J
R 102 103 167 168	RS1/10S822J
R 105 108	RS1/10S123J
R 106 107	RS1/10S103J
R 109 110 111 112	RS1/10S563J
R 121 122 125 126 131 132	RS1/10S153J
R 123 124 129 130	RS1/10S123J
R 127 128 135 136 205 206 883 884 885 886	RS1/10S223J
R 137 138 139 140 141 142 143 144 145 146	RS1/10S102J
R 151 152 153 154 909 910 911 912	RS1/10S473J
R 155 156	RS1/10S432J
R 159 160 171 172	RS1/10S221J
R 163 164	RS1/10S182J
R 175 176 301 302 303 304 875 876 877 878	RS1/10S222J
R 191 892 894	RS1/8S0R0J
R 201 202 203 204 611 626 627	RS1/10S472J
R 211 212 213 214	RS1/10S151J
R 215 216 217 218	RS1/10S681J
R 219	RS1/10S0R0J
R 309 310 311 312	RS1/10S561J
R 313 314 315 316	RS1/10S333J
R 317 318 319 320 321 322 323 324 616	RD1/4PS153JL
R 325 326 327 328 329 330 331 332	RD1/4PS331JL
R 333 334 335 336 337 338 339 340	RD1/4PS161JL
R 341 342 343 344 345 346 347 348 357 358	RD1/4PS473JL
R 349 350 351 352	RD1/4PS562JL
R 353 354 355 356 604 920 923	RD1/4PS222JL
R 359 360 361 362 363 364	RD1/4PS473JL
R 365 366 367 368	RD1/4PS151JL
R 377 378 379 380 0.22Ω	CCN1013
R 381 382 383 384 0.22Ω	CCN1013
R 385 386 387 388 0.22Ω	CCN1013
R 389 390 391 392 0.22Ω	CCN1013
R 393 394 395 396	RS1/2P100JL
R 601	RD1/4PS182JL
R 602 608 613 614 638 639	RD1/4PS102JL
R 603 919 924	RD1/4PS103JL
R 605 619 620 621 918 921	RD1/4PS472JL
R 606	RD1/4PS101JL
R 607	RS1/10S104J
R 609 922	RD1/4PS221JL
R 610	RS1/10S183J
R 615 871 872 873 874	RS1/10S102J
R 617 618	RD1/4PS332JL
R 622 640	RD1/4PS272JL

R 624 625 628 629	RS1/2S560J	C 337 338 339 340 341 342 343 344	CCCSL101J50	
R 630 631 632	RS1/2P220JL	C 345 346 347 348	CFTNA333J50	
R 636 637	RD1/4PS100JL	C 349 350 351 352	CKSQYB102K50	
R 641	RD1/4PS105JL	C 602	CFTNA105J50	
R 851 852 853 854 879 880 881 882	RS1/10S471J	C 603	CFTNA103J50	
R 859 860 861 862	RS1/10S184J	C 604 632	470 μF/16V	CCH1183
R 863 864 865 866	RS1/10S333J	C 605 611 630 631		CEAS470M16
R 867 868 869 870	RS1/10S274J	C 606		CEAS220M16
R 888 896	RS1/10S222J	C 607		CEAS221M10
R 895	RD1/4PS221JL	C 608		CEAS2R2M50
R 897	RS1/10S0R0J	C 609		CQMA102J50
R 901 902 903 904	RS1/10S393J	C 610		CEAS010M50
R 905 906 907 908	RS1/10S564J	C 612 613	3300 μF/16V	CCH1130
R 917	RD1/4PS104JL	C 615 616		CQMA332J50
R 934 935	RD1/4PS472JL	C 617		CQMA102J50
R 936	RD1/4PS103JL	C 618 619 620 621	3300 μF/35V	CCH1200
R 937 938	RD1/4PS472JL	C 626 627		CEAS221M35
CAPACITORS				
C 101 102 103 104	CCSQCH150J50	C 637		CKSQYB473K16
C 121 122	CKSYB474K16	C 851 852 853 854 855 856 857 858		CEA010M50LS2
C 123 124 127 128 135 136 137 138	CFTNA124J50	C 859 862		CEA1R5M50LS2
C 125 126	CKSYB273K25	C 860 861		CEA6R8M35LS
C 131 132	CKSYB184K16	C 863		CEAS102M16
C 151	CEA4R7M35LL	C 867 868 869 870		CKSQYB103K25
C 152	CEAS4R7M35	C 873		CEAS471M35
C 155 156	CKSYB224K16	C 874		CEAS331M25
C 159 160	CCSQCH330J50	C 875 876 877 878		CKSQYB471K50
C 163 164	CKSQYB473K25	C 901	220 μF/10V	CCH1036
C 301 302 303 304	CEAS471M10			
C 305 306 307 308	CCSQCH330J50			
C 309 310 311 312 313 314 315 316	CFTNA224J50			
C 317 318 319 320 321 322 323 324	CCSQCH390J50			
C 325 326 327 328 329 330 331 332	CCCSL330J50			

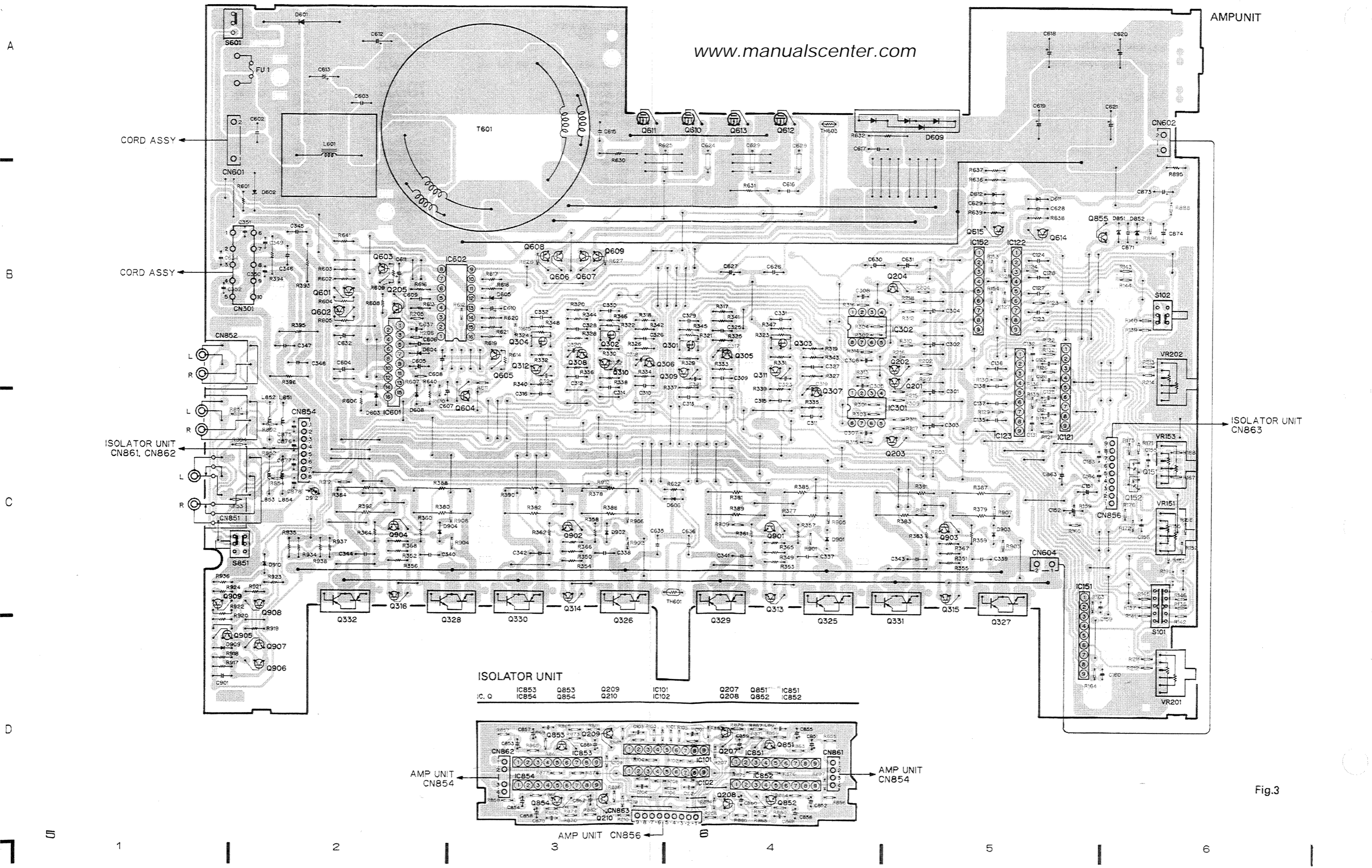
• The GM-X304/X1H/UC, GM-X404/X1H/EW and GM-X404/X1H/ES Parts Lists enumerate the parts which differ from those for the GM-X404/X1H/UC only. The parts other than those enumerated in the GM-X304/X1H/UC, GM-X404/X1H/EW and GM-X404/X1H/ES Parts Lists are identical with those in the GM-X404/X1H/UC Parts List, to which you are requested to refer, accordingly. The GM-X404/X1H/UC Parts List is given on page 3.

Amp Unit

Circuit Symbol & No.	GM-X404/X1H/UC	GM-X304/X1H/UC	GM-X404/X1H/EW	GM-X404/X1H/ES
	Part No.	Part No.	Part No.	Part No.
VR153 Volume 50kΩ(C)	CCS1242	.....	CCS1242	CCS1242
R179,180	.....	RS1/10S223J	.....	.....

4. CONNECTION DIAGRAM(GM-X404/X1H/UC,EW,ES)

Q908	Q601	Q205	IC602	Q608	Q607 Q609	Q510	Q613	Q612	Q204	IC122	Q855
Q909 Q907	Q602	IC601	Q604	Q312	Q308 Q302 Q902	Q301	Q305	Q311	Q202	IC123	Q151
IC, Q Q905 Q906	Q332	Q603 Q316	Q904 Q328	Q605	Q330 Q606 Q314 Q310	Q306 Q309	Q329	Q313	Q307	IC302	Q152
								Q901 Q325	IC301	Q203 Q331	Q315
										Q615 IC152	Q903
										Q327	Q614 IC121
										Q614	IC151



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IC, Q	IC853	Q853	Q209	IC101	Q207	Q851	IC851
	IC854	Q854	Q210	IC102	Q208	Q852	IC852

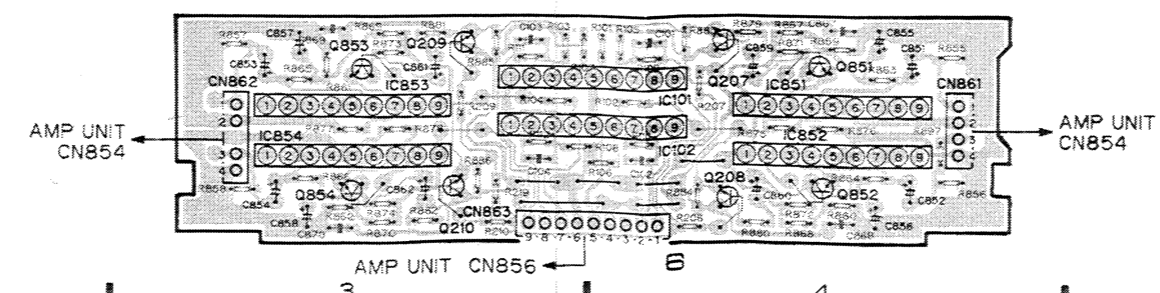


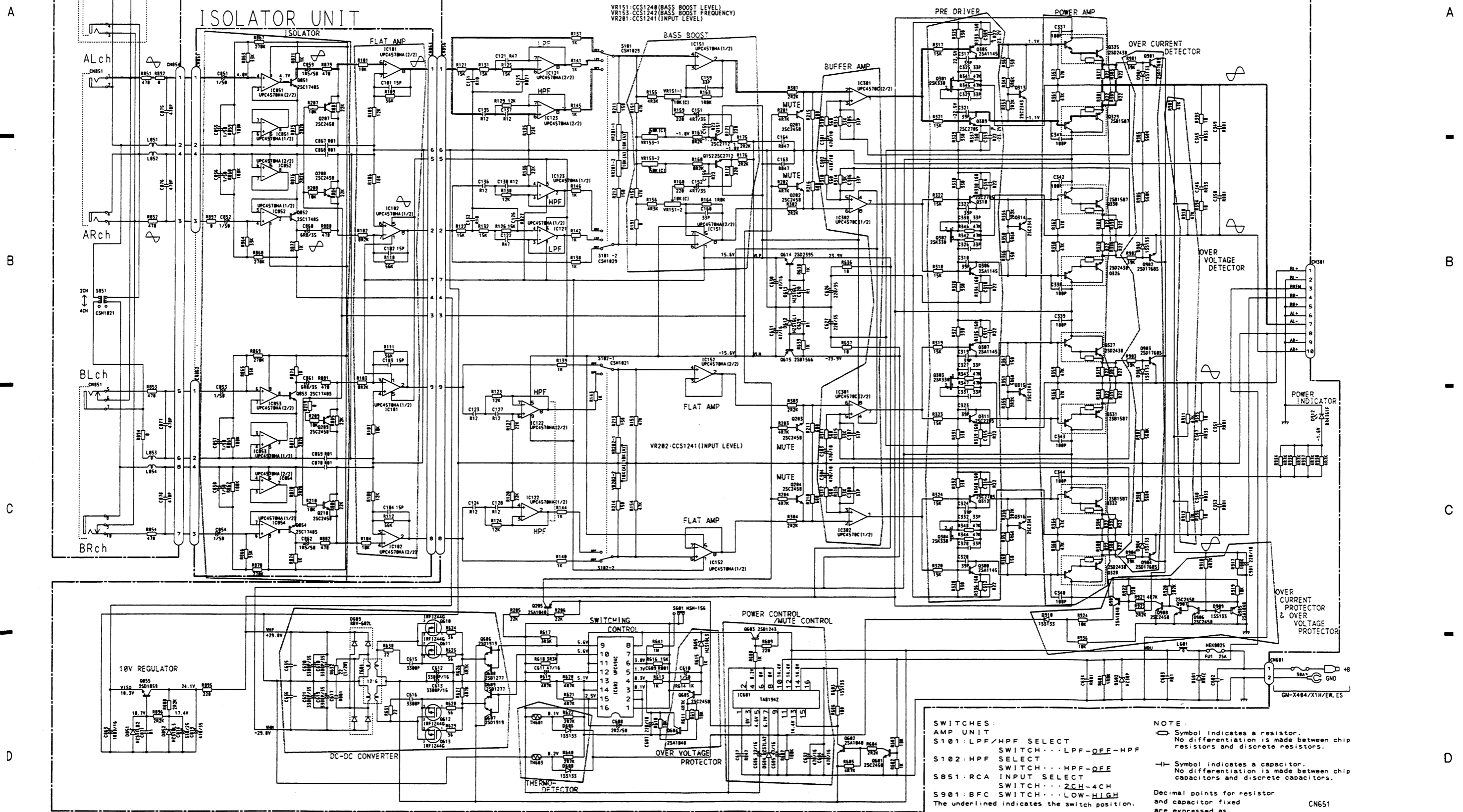
Fig.3

5. SCHEMATIC CIRCUIT DIAGRAM(GM-X404/X1H/UC,EW,ES)

AMP UNIT

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Amp Assy
Consists of
• Amp Unit
• Isolator Unit



SWITCHES:
AMP UNIT
S101: LPF/HPF SELECT SWITCH... LPF-OFF-HPF
S102: HPF SELECT SWITCH... HPF-OFF
S851: RCA INPUT SELECT SWITCH... 2CH-4CH
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 are expressed as:
2.2-2R2
0.022-R022

CN651
10 9 8 7 6
5 4 3 2 1

Fig.4

6. CONNECTION DIAGRAM(GM-X304/X1H/UC)

Q908	Q601	Q205	IC602	Q608	Q607	Q609	Q610	Q613	Q612	Q204	IC122	Q855
Q909	Q602	IC601	Q604	Q304	Q308	Q302	Q301	Q305	Q303	Q202	IC123	Q151
Q905	Q332	Q603	Q904	Q605	Q330	Q606	Q314	Q310	Q326	Q611	Q306	Q152
Q906							Q309	Q329	Q313	Q307	IC302	
									Q313	Q325	IC301	
									Q315	IC152	Q903	
										Q615	Q327	Q614
										IC121	IC151	

A

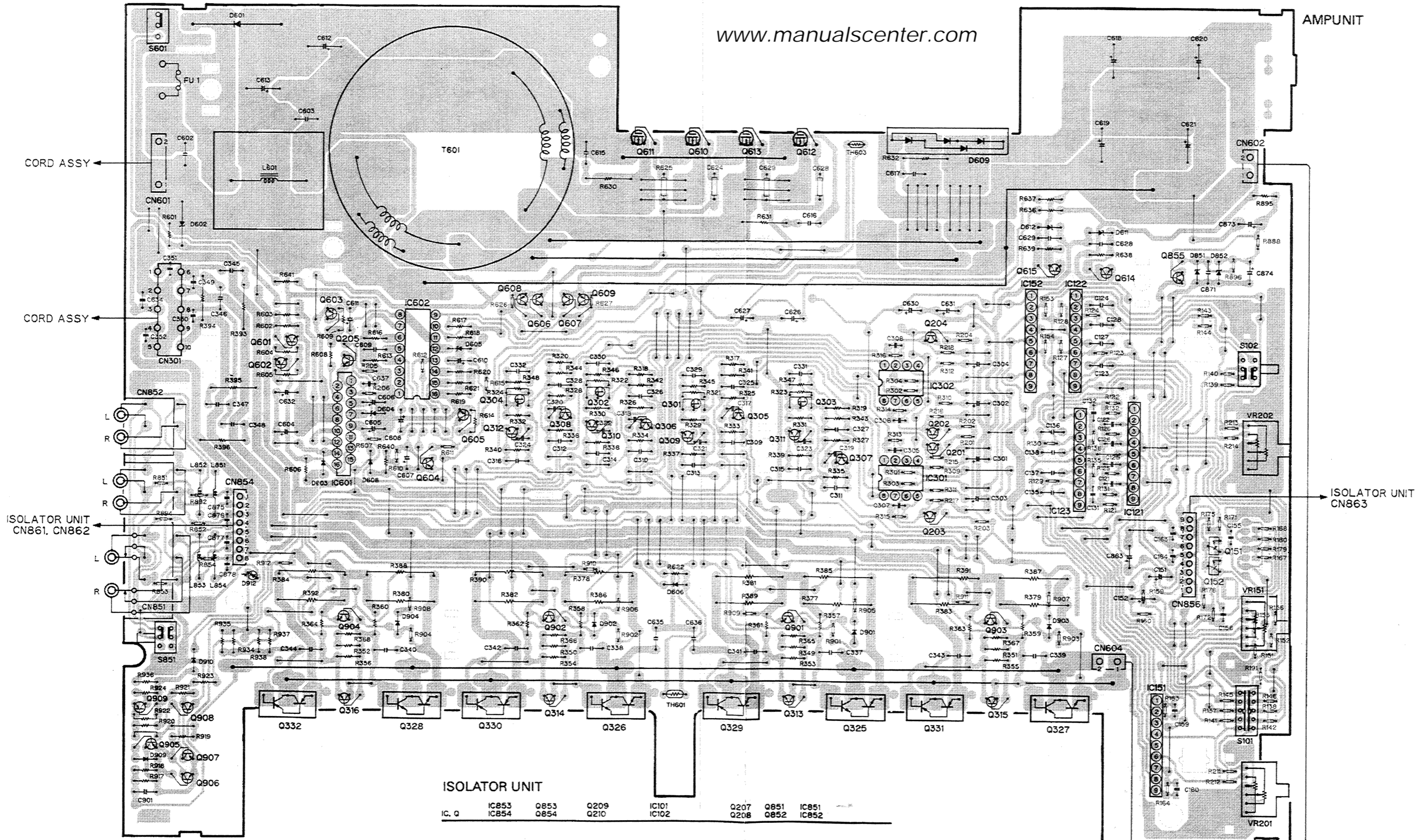
B

C

D

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AMPUNIT



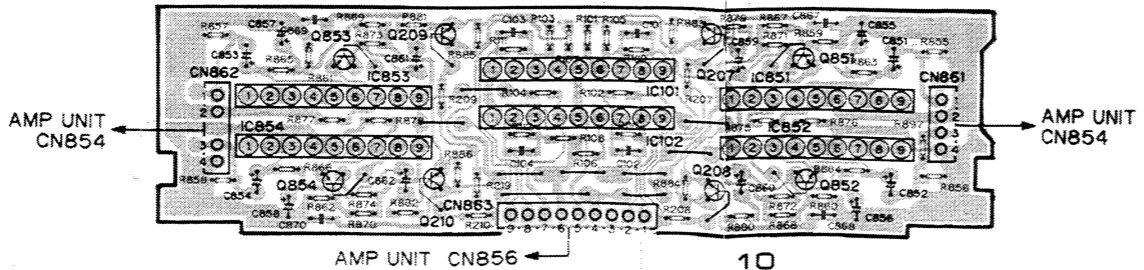
CORD ASSY

CORD ASSY

ISOLATOR UNIT
CN861, CN862

ISOLATOR UNIT
CN863

IC, Q	IC853	Q853	Q209	IC101	Q207	Q851	IC851
	IC854	Q854	Q210	IC102	Q208	Q852	IC852



AMP UNIT
CN854

AMP UNIT
CN854

AMP UNIT
CN856

Fig.5

7. SCHEMATIC CIRCUIT DIAGRAM(GM-X304/X1H/UC)

AMP UNIT

Amp Assy
Consists of
• Amp Unit
• Isolator Unit

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A

A

B

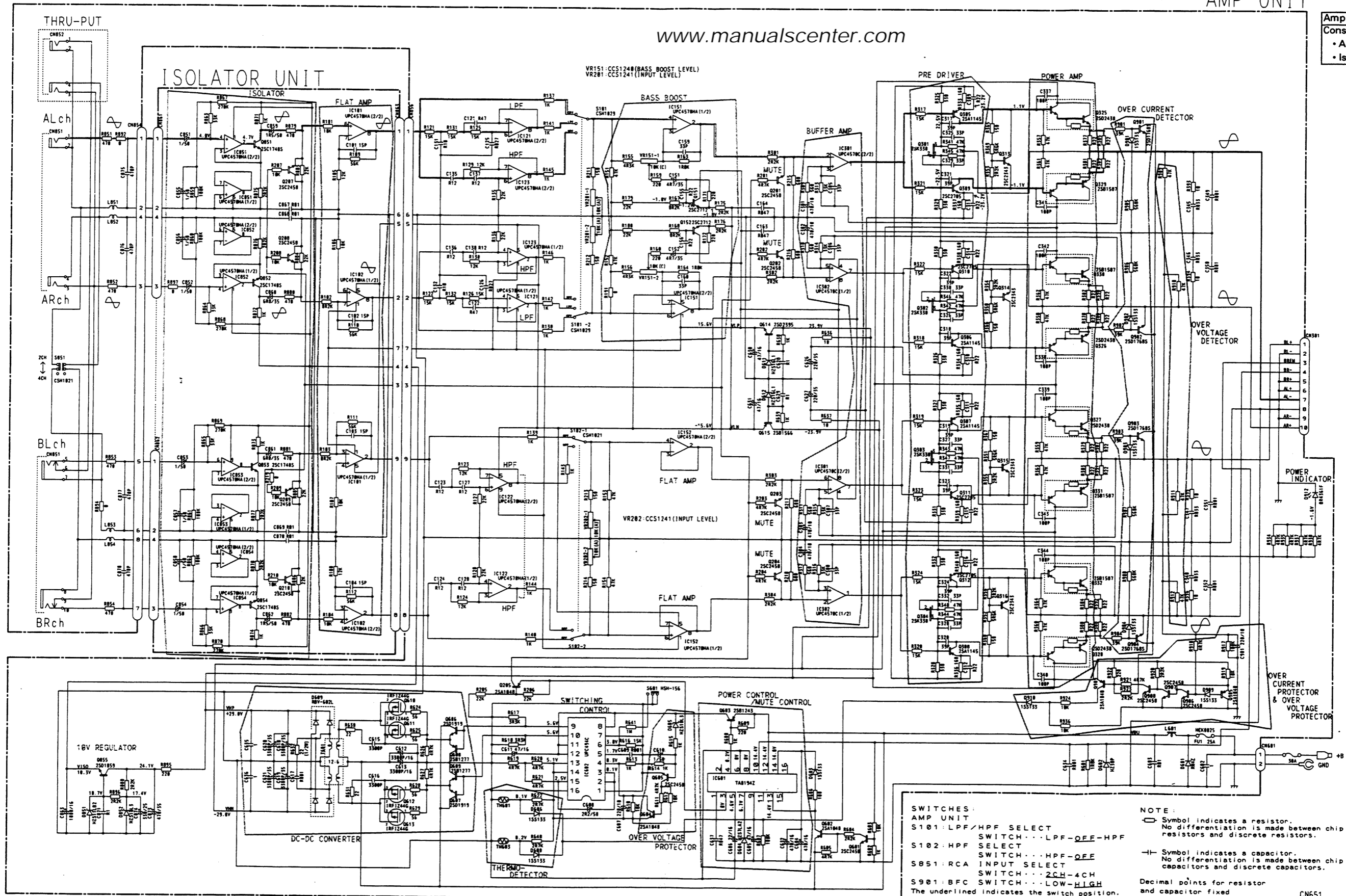
B

C

C

D

D



10	9	8	7	6
5	4	3	2	1

Fig.6

8. EXPLODED VIEW

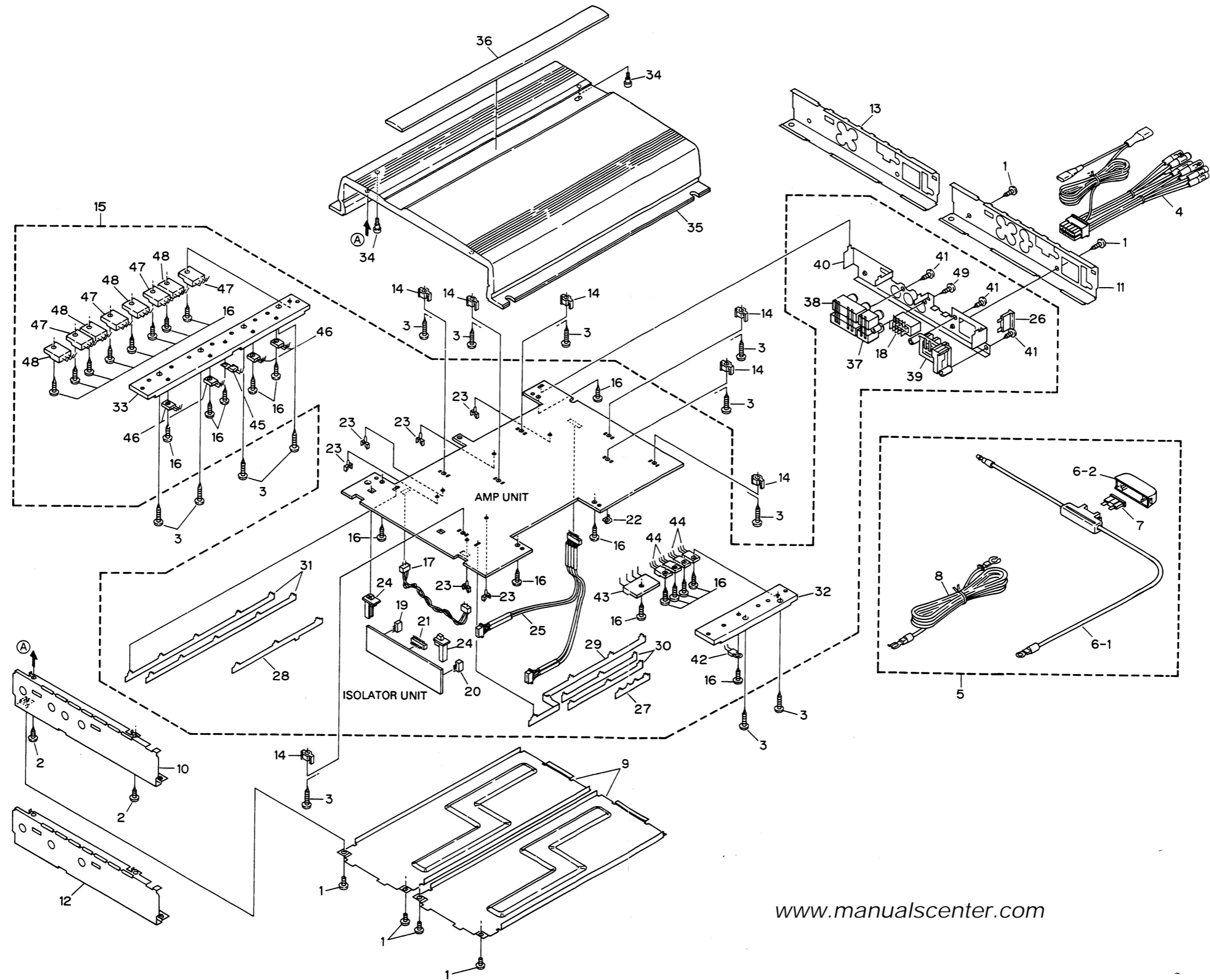


Fig.7

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-X404/X1H/UC)

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Screw	BSZ30P050FZK	30	Holder	HNC5541	
	2	Screw(M3×6)	CBA1320	31	Holder	HNC5841	
	3	Screw(M3×12)	CBA1323	32	Heat Sink(Subheat Sink)	HNR1352	
	4	Cord Assy	HDE4427	33	Heat Sink(Subheat Sink)	HNR1353	
	5-8	.....		34	Screw(M3×5)	CBA1330
	9	Case	HNB1837	35	Heat Sink	HNR1339	
	10	Panel	HNB1838	36	Plate Unit	HXA7359	
	11	Panel	HNB1839	37	Pin Jack(CN852)	CKB1013	
	12,13	.....		38	Pin Jack(CN851)	CKB1022
	14	Spacer	HNV3975	39	Terminal(CN601)	CKE1036	
	15	Amp Assy	HWH1184	40	Holder	HNC5511	
	16	Screw(M3×10)	CBA1322	41	Screw	PPZ30P060FZK	
	17	Cord	CDE4610	42	Thermister(TH603)	CCX1013	
	18	Plug(CN301)	CKM1100	43	Diode(D609)	RBV-602L	
	19	Plug(CN861)	CKS1037	44	FET(Q610-613)	IRFIZ44G	
	20	Plug(CN862)	CKS1038	45	Thermister(TH601)	CCX1009	
	21	Plug(CN863)	CKS1618	46	Transistor(Q313-316)	2SD2343	
	22	Holder	CNC2218	47	Transistor(Q329-332)	2SB1587	
	23	Clamper	CNV1335	48	Transistor(Q325-328)	2SD2438	
	24	Holder	CNV4017	49	Screw	PPZ30P060FZK	
	25	Connector	HDE4428				
*	26	Fuse(FU1)	HEK0025				
	27	Holder	HNC5538				
	28	Holder	HNC5539				
	29	Holder	HNC5540				

- The GM-X304/X1H/UC, GM-X404/X1H/EW and GM-X404/X1H/ES Parts Lists enumerate the parts which differ from those for the GM-X404/X1H/UC only. The parts other than those enumerated in the GM-X304/X1H/UC, GM-X404/X1H/EW and GM-X404/X1H/ES Parts Lists are identical with those in the GM-X404/X1H/UC Parts List, to which you are requested to refer, accordingly. The GM-X404/X1H/UC Parts List is given on page 15.

Mark No.	Description	GM-X404/X1H/UC Part No.	GM-X304/X1H/UC Part No.	GM-X404/X1H/EW Part No.	GM-X404/X1H/ES Part No.
	5 Cord Assy	.....	HDE4419	HDE4419	HDE4419
*	6 Cord	.....	HDE4423	HDE4423	HDE4423
	7 Fuse	.....	HEK0030	HEK0030	HEK0030
	8 Cord	.....	HDE4455	HDE4455	HDE4455
	10 Panel	HNB1838	.....	HNB1838	HNB1838
	11 Panel	HNB1839	.....	HNB1839	HNB1839
	12 Panel	.....	HNB1870	.....	.....
	13 Panel	.....	HNB1871	.....	.....
	15 Amp Assy	HWH1184	HWH1186	HWH1185	HWH1185
	35 Heat Sink	HNR1339	HNR1377	HNR1345	HNR1377
	36 Plate Unit	HXA7359	HXA7363	HXA7361	HXA7361
	37 Pin Jack(CN852)	CKB1013	.....	CKB1011	CKB1011
	38 Pin Jack(CN851)	CKB1022	CKB1021	CKB1021	CKB1021
	39 Terminal(CN601)	CKE1036	CKE1035	CKE1035	CKE1035
	49 Screw	PPZ30P060FZK	.....	PPZ30P060FZK	PPZ30P060FZK

9. PACKING METHOD

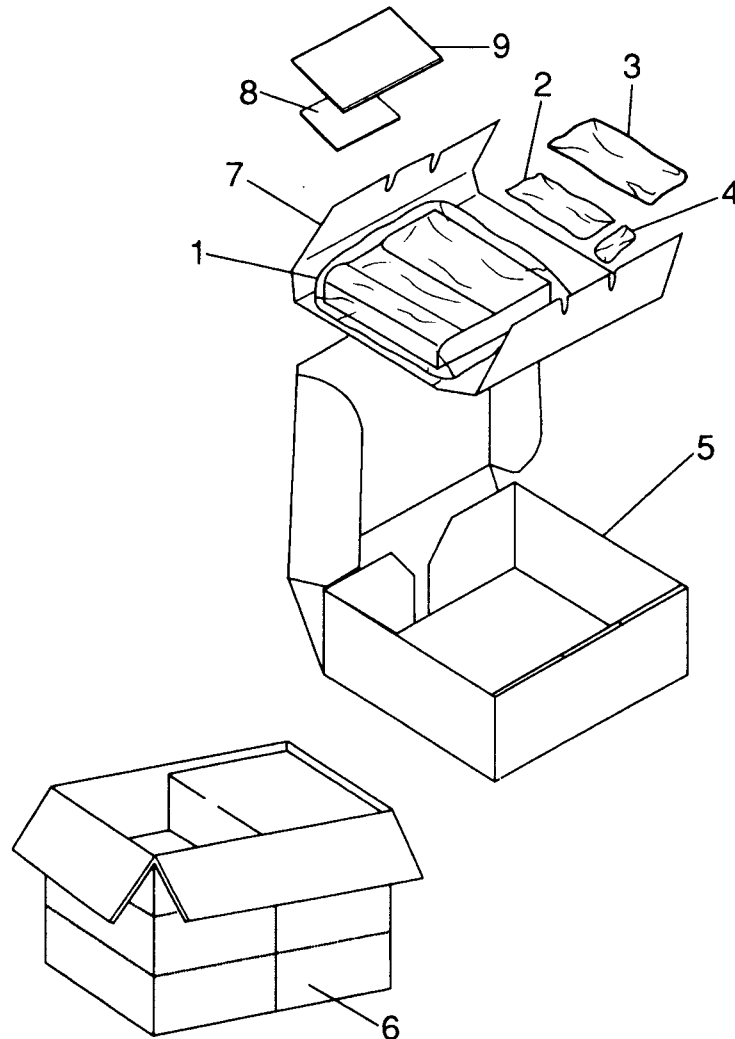


Fig.8

● Parts List(GM-X404/X1H/UC)

Mark No. Description	GM-X404/X1H/UC	GM-X304/X1H/UC	GM-X404/X1H/EW	GM-X404/X1H/ES
	Part No.	Part No.	Part No.	Part No.
1 Polyethylene Bag	HEG0009	HEG0009	HEG0009	HEG0009
2 Cord Assy(Output)	HDE4427	HDE4427	HDE4427	HDE4427
3 Cord Assy(Power Supply)	.....	HDE4419	HDE4419	HDE4419
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	HHG0020	HHG0019	HHG0021	HHG0022
6 Contain Box	HHL0020	HHL0019	HHL0021	HHL0022
7 Protector	HHP0001	HHP0001	HHP0001	HHP0001
* 8 Warranty Card	HRY1070	.....	HRY1071	.....
9 Owner's Manual	HRD0002	HRD0001	HRD0003	HRD0005

Owner's Manual

Part No.	Model	Language
HRD0001	GM-X304/X1H/UC	English, French
HRD0002	GM-X404/X1H/UC	English, French
HRD0003	GM-X404/X1H/EW	English, French, German, Dutch, Spanish, Swedish, Norwegian, Finnish, Italian
HRD0005	GM-X404/X1H/ES	English, French, Spanish, Arabic

10. OPERATIONS AND CONNECTION(GM-X404/X1H/UC)

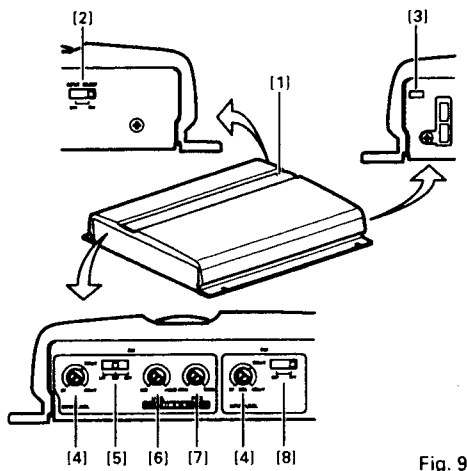


Fig. 9

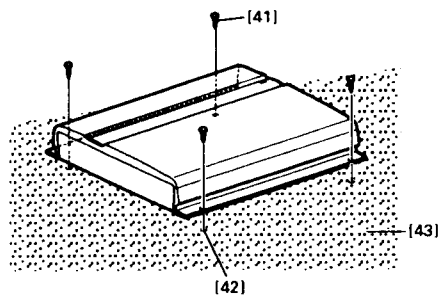


Fig. 11

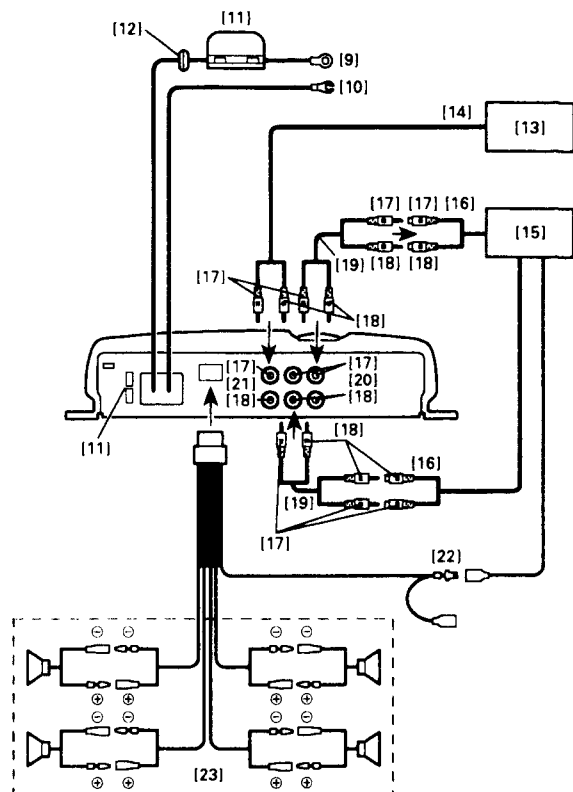


Fig. 10

Setting of this Unit

(Fig. 9)

[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] 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.

[4] 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 clockwise.

- If you only use one input pin 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.

[5] 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
LPF (left)	Very-low-frequency range	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

- Set the LPF/HPF select switch to the HPF (right) position if you want to cut the very-low-frequency range because it is not necessary for the speaker you use.

[6] Speaker Out A: Bass Boost Level Control

Bass boost level control can boost the level around the frequency selected by the bass boost frequency control to 0 to 12 dB.

[7] Speaker Out A: Bass Boost Frequency Control

You can select a bass boost frequency from 40 to 120 Hz with the bass boost control.

- [6] [7] can be adjusted only when the LPF/HPF select switch is set to a position other than HPF.

[8] 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
OFF (left)	Very-low-frequency range to high-frequency range	Sub-woofer
HPF (right)	Low-frequency range to high-frequency range	Other than sub-woofer

- Set the LPF/HPF select switch to the HPF (right) position if you want to cut the very-low-frequency range because it is not necessary for the speaker you use.

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 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.
- Always use the special red battery power and ground wire [RD-222], which is sold separately. Connect the special red battery power cord directly to the car battery and the black ground wire to the car body. (The special red battery power and ground wire [RD-222] 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	
Four-channel	Sub-woofer	Nominal input: Min. 30 W
	Other than sub-woofer	Max. input: Min. 60 W
Two-channel	Sub-woofer	Nominal input: Min. 70 W
	Other than sub-woofer	Max. input: Min. 140 W
Three-channel Speaker output A	Sub-woofer	Nominal input: Min. 30 W
	Other than sub-woofer	Max. input: Min. 60 W
Three-channel Speaker output B	Sub-woofer	Nominal input: Min. 70 W
	Other than sub-woofer	Max. input: Min. 140 W

⊗ If many units are connected

- If you let the car engine idle for a long time with the car stereo on, the battery may go dead. Turn the car stereo off when the engine is idling.
- If the blue lead 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 you let the engine idle.
- 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 separately sold special red battery wire [RD-222] as faraway as possible from the speaker wires. Install and route the separately sold special red battery wire and ground wire [RD-222], speaker wires, and the amplifier as faraway as possible from the antenna, antenna cable and tuner.

(Fig. 10)

- [9] Special red battery wire [RD-222] (sold separately)
After making all other connections at the amplifier, connect the battery lead terminal of the amplifier to the positive (+) terminal of the battery.
- [10] Ground wire (black) [RD-222] (sold separately)
Connect to metal body or chassis.
- [11] Fuse (Special red battery power wire: 30 A, Amplifier: 25 A)

- [12] Grommet
- [13] Amplifier with RCA input pin jacks
- [14] RCA input
- [15] Car stereo with RCA output pin jacks
- [16] External Output
For details on how to connect to RCA input jacks A and B, see the "Connecting the Speakers and Input wires" section.
If only input pin plug, do not connect anything to RCA input jack B.
- [17] White
- [18] Red
- [19] Connecting wires with RCA pin plugs (sold separately)
- [20] RCA input pin jack A, B
- [21] RCA output pin jacks
- [22] 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.
- [23] Speaker output terminal
See the "Connecting the Speakers and Input wires" section for speaker connection instructions.

Connecting the Power Terminal

- Always use the special red battery power and ground wire [RD-222], which is sold separately. Connect the special red battery power cord directly to the car battery and the black ground wire to the car body. (The special red battery power and ground wire [RD-222] are designed so that the amplifier can be connected safely.)

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

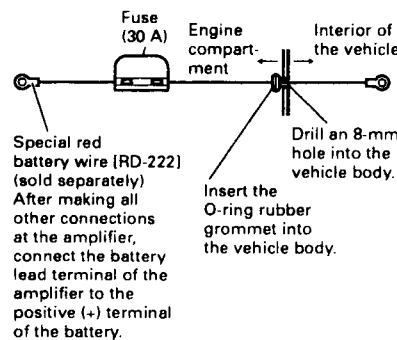


Fig. 12

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

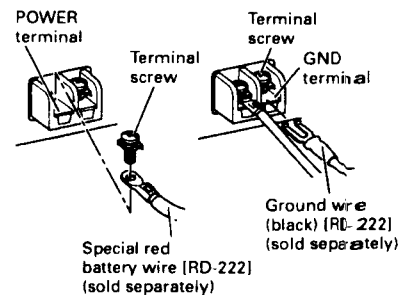


Fig. 13

Fig. 14

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

Connecting the Speakers and Input wires

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

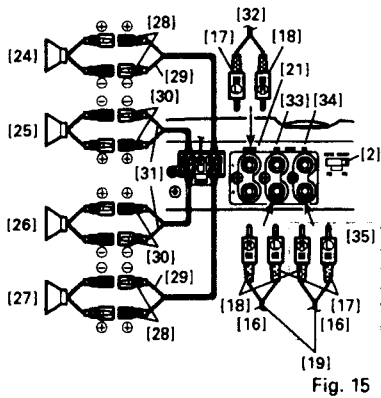


Fig. 15

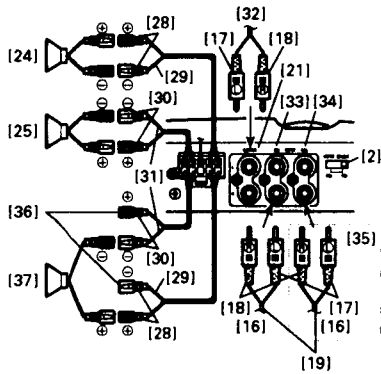


Fig. 16

Four-channel mode (Fig. 15)

- [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.
- [16] Output (Front/Rear)
If only one input pin plug is used, do not connect anything to RCA input jack B.
- [17] White
- [18] Red
- [19] Connecting wires with RCA pin plugs (sold separately)
- [21] RCA output pin jacks
- [24] Speaker out B: Speaker (right)
- [25] Speaker out B: Speaker (left)
- [26] Speaker out A: Speaker (left)
- [27] Speaker out A: Speaker (right)
- [28] Black cover
- [29] Black stripe
- [30] Green cover
- [31] Green stripe
- [32] To RCA input pin jacks
- [33] RCA input pin jack A
- [34] RCA input pin jack B
- Connect the front or rear output pin plugs to jacks [33] or [34], according to your system.
- [35] If only one input pin plug is used, do not connect anything to RCA input jack B.

Three-channel mode (Fig. 16)

- [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.
- [16] Output (Front/Rear)
If only one input pin plug is used, do not connect anything to RCA input jack B.
- [17] White
- [18] Red
- [19] Connecting wires with RCA pin plugs (sold separately)
- [24] Speaker out B: Speaker (right)
- [25] Speaker out B: Speaker (left)
- [28] Black cover
- [29] Black stripe
- [30] Green cover
- [31] Green stripe
- [32] To RCA input pin jacks
- [33] RCA input pin jack A
- [34] RCA input pin jack B
- Connect the front or rear output pin plugs to jacks [33] or [34], according to your system.
- [35] If only one input pin plug is used, do not connect anything to RCA input jack B.
- [36] No connection
- [37] Speaker out A: Speaker (mono)

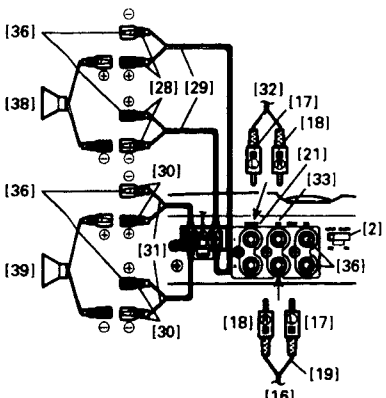


Fig. 17

Two-channel mode (stereo) (Fig. 17)

- [2] RCA Input Select Switch
Slide this switch to the left.
- [16] Output
- [17] White
- [18] Red
- [19] Connecting wires with RCA pin plugs (sold separately)
- [21] RCA output pin jacks
- [28] Black cover
- [29] Black stripe
- [30] Green cover
- [31] Green stripe
- [32] To RCA input pin jacks
- [33] RCA input pin jack A
- [36] No connection
- [38] Speaker (right)
- [39] Speaker (left)

Two-channel mode (mono) (Fig. 18)

- [2] RCA Input Select Switch
Slide this switch to the left.
- [16] Output
- [17] White
- [18] Red
- [19] Connecting wires with RCA pin plugs (sold separately)
- [21] RCA output pin jacks
- [28] Black cover
- [29] Black stripe
- [30] Green cover
- [31] Green stripe
- [32] To RCA input pin jacks
- [33] RCA input pin jack A
- [36] No connection
- [40] Speaker (mono)

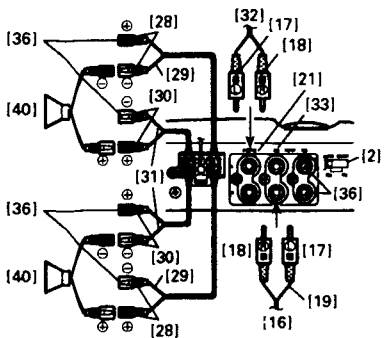


Fig. 18

Installation

CAUTION

- Do not install in:
 - Places where it could injure the driver or passengers if the vehicle stops suddenly.
 - Places where it may interfere with the driver, such as on the floor in front of the driver's seat.
- Make sure that wires are not caught in the sliding mechanism of the seats, resulting in a short-circuit.
- Confirm that no parts are behind the panel when drilling a hole for installation of the amplifier. Protect all cables and important equipment such as fuel lines, brake lines and the electrical wiring from damage.
- Install tapping screws in such a way that the screw tip does not touch any wire. This is important to prevent wires from being cut by vibration of the car, which can result in fire.
- To ensure proper installation, use the supplied parts in the manner specified. If any parts other than the supplied ones are used, they may damage internal parts of the amplifier, or they may become loose and the amplifier may shut down.

11. OPERATIONS AND CONNECTION(GM-X304/X1H/UC)

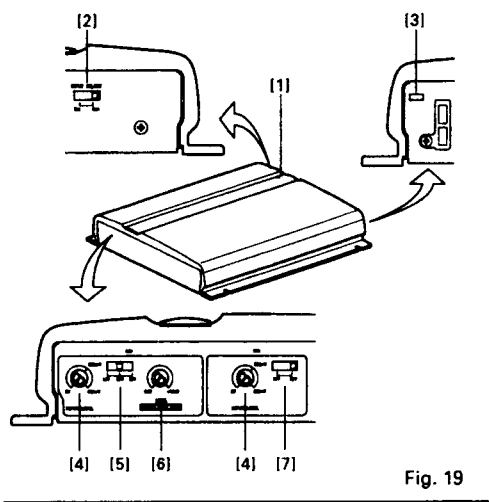


Fig. 19

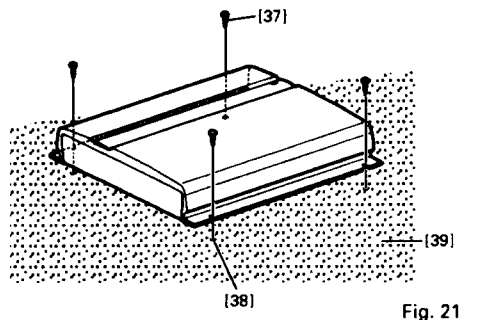


Fig. 21

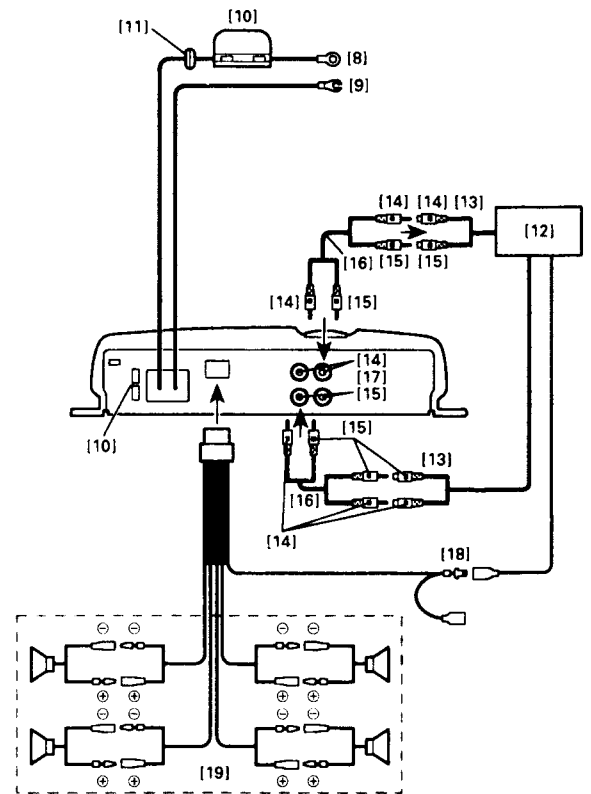


Fig. 20

Setting of this Unit

(Fig. 19)

[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] BFC (Best 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.

[4] 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 clockwise.

• If you only use one input pin 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.

[5] 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
LPF (left)	Very-low-frequency range	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

* Set the LPF/HPF select switch to the HPF (right) position if you want to cut the very-low-frequency range because it is not necessary for the speaker you use.

[6] Speaker Out A: Bass Boost Level Control

Bass boost level control can boost the level around 60 Hz to 0 to 12 dB.

• Bass boost level control can be adjusted only when the LPF/HPF select switch is set to a position other than HPF.

[7] 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

HPF Select Switch	Audio frequency range to be output	Speaker Type
OFF (left)	Very-low-frequency range to high-frequency range	Other than subwoofer
HPF (right)	Low-frequency range to high-frequency range	Other than subwoofer

* Set the HPF select switch to the HPF (right) position if you want to cut the very-low-frequency range because it is not necessary for the speaker you use.

speaker output:

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.
- Be sure to use the special red battery wire supplied with the amplifier and connect directly to the battery. 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 lead 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 be caused to the speaker. The speaker impedance must be 2 to 8 ohms.

Speaker		Power
Channel	Type	
Four-channel	Sub-woofer	Nominal input: Min. 30 W
	Other than sub-woofer	Max. input: Min. 60 W
Two-channel	Sub-woofer	Nominal input: Min. 70 W
	Other than sub-woofer	Max. input: Min. 140 W
Three-channel Speaker output A	Sub-woofer	Nominal input: Min. 30 W
	Other than sub-woofer	Max. input: Min. 60 W
Three-channel Speaker output B	Sub-woofer	Nominal input: Min. 70 W
	Other than sub-woofer	Max. input: Min. 140 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 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.

(Fig. 20)

- [8] Special red battery wire
After making all other connections at the amplifier, connect the battery lead terminal of the amplifier to the positive (+) terminal of the battery.
- [9] Ground wire (black)
Connect to metal body or chassis.
- [10] Fuse (Special red battery power wire: 30 A, Amplifier: 25 A)
- [11] Grommet
- [12] Car stereo with RCA output pin jacks
- [13] External Output
For details on how to connect to RCA input jacks A and B, see the "Connecting the Speakers and Input wires" section.
If only one input pin plug, do not connect anything to RCA input jack B.
- [14] White
- [15] Red
- [16] Connecting wires with RCA pin plugs (sold separately)
- [17] RCA input pin jack A, B

[18] 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.

[19] Speaker output terminals

See the "Connecting the Speakers and Input wires" section for speaker connection instructions.

Connecting the Power Terminal

- Be sure to use the special red battery wire supplied with the amplifier and connect directly to the battery. 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.)

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

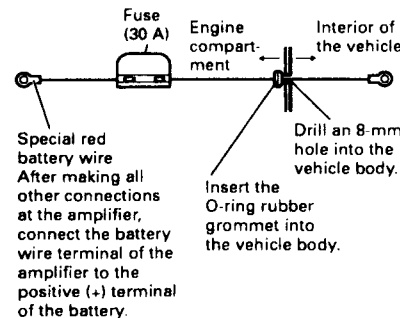


Fig. 22

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

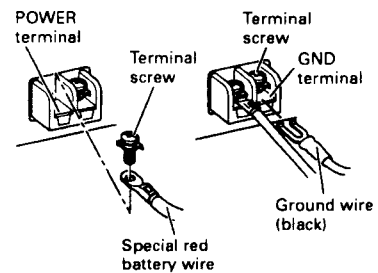


Fig. 23

Fig. 24

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

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 following pages.

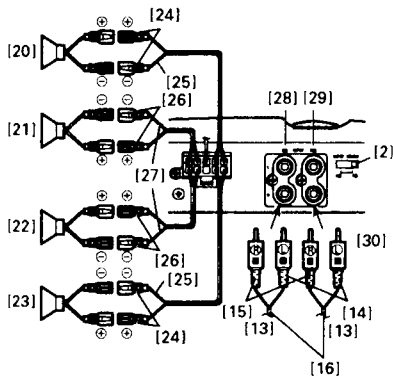


Fig. 25

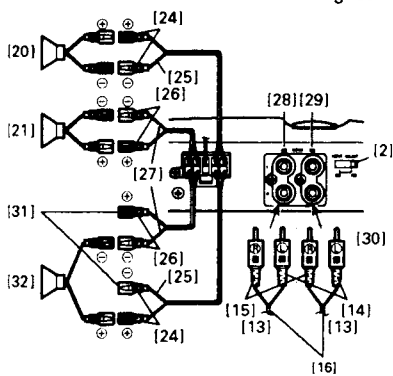


Fig. 26

Four-channel mode (Fig. 25)

- [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.
- [13] Output (Front/Rear)
If only one input pin plug is used, do not connect anything to RCA input jack B.
- [14] White
- [15] Red
- [16] Connecting wires with RCA pin plugs (sold separately)
- [20] Speaker out B: Speaker (right)
- [21] Speaker out B: Speaker (left)
- [22] Speaker out A: Speaker (left)
- [23] Speaker out A: Speaker (right)
- [24] Black cover
- [25] Black stripe
- [26] Green cover
- [27] Green stripe
- [28] RCA input pin jack A
- [29] RCA input pin jack B
- Connect the front or rear output pin plugs to jacks [28] or [29], according to your system.
- [30] If only one input pin plug is used, do not connect anything to RCA input jack B.

Three-channel mode (Fig. 26)

- [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.
- [13] Output (Front/Rear)
If only one input pin plug is used, do not connect anything to RCA input jack B.
- [14] White
- [15] Red
- [16] Connecting wires with RCA pin plugs (sold separately)
- [20] Speaker out B: Speaker (right)
- [21] Speaker out B: Speaker (left)
- [24] Black cover
- [25] Black stripe
- [26] Green cover
- [27] Green stripe
- [28] RCA input pin jack A
- [29] RCA input pin jack B
- Connect the front or rear output pin plugs to jacks [28] or [29], according to your system.
- [30] If only one input pin plug is used, do not connect anything to RCA input jack B.
- [31] No connection
- [32] Speaker out A: Speaker (mono)

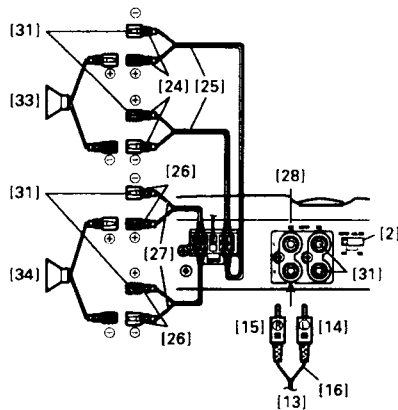


Fig. 27

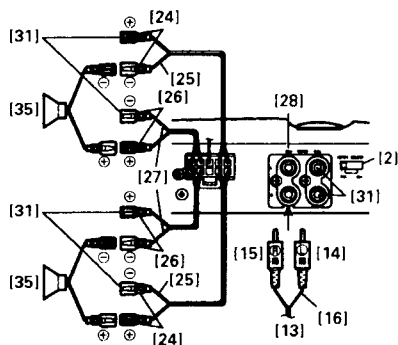


Fig. 28

Two-channel mode (stereo) (Fig. 27)

- [2] RCA Input Select Switch
Slide this switch to the left.
- [13] Output
- [14] White
- [15] Red
- [16] Connecting wires with RCA pin plugs (sold separately)
- [24] Black cover
- [25] Black stripe
- [26] Green cover
- [27] Green stripe
- [28] RCA input pin jack A
- [31] No connection
- [33] Speaker (right)
- [34] Speaker (left)

Two-channel mode (mono) (Fig. 28)

- [2] RCA Input Select Switch
Slide this switch to the left.
- [13] Output
- [14] White
- [15] Red
- [16] Connecting wires with RCA pin plugs (sold separately)
- [24] Black cover
- [25] Black stripe
- [26] Green cover
- [27] Green stripe
- [28] RCA input pin jack A
- [31] No connection
- [35] Speaker (mono)

Installation

⚠ CAUTION

- Do not install in:
 - Places where it could injure the driver or passengers if the vehicle stops suddenly.
 - Places where it may interfere with the driver, such as on the floor in front of the driver's seat.
- Make sure that wires are not caught in the sliding mechanism of the seats, resulting in a short-circuit.
- Confirm that no parts are behind the panel when drilling a hole for installation of the amplifier. Protect all cables and important equipment such as fuel lines, brake lines and the electrical wiring from damage.
- Install tapping screws in such a way that the screw tip does not touch any wire. This is important to prevent wires from being cut by vibration of the car, which can result in fire.
- To ensure proper installation, use the supplied parts in the manner specified. If any parts other than the supplied ones are used, they may damage internal parts of the amplifier, or they may become loose causing the amplifier to fall down.