

BASS AMPLIFIER F-20B

SERVICE MANUAL



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 **YAMAHA**
HAMAMATSU, JAPAN

IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: This presentation or sale of this manual to any individual or firm does not constitute authorization, certification, recognition of any applicable technical capabilities, or establish a principal-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and changes in specification are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical / electronic and / or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and / or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL / ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHAT SO EVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder / flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

IMPORTANT NOTICE FOR THE UNITED KINGDOM

Connecting the Plug and Cord

WARNING: THIS APPARATUS MUST BE EARTHED

IMPORTANT: The wires in this main lead are coloured in accordance with the following code:
 GREEN-AND-YELLOW: EARTH
 BLUE: NEUTRAL
 BROWN: LIVE

As the colours of the wires in the main lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:


The GREEN-and-YELLOW wire must be connected to the terminal in the plug that is marked with the letter E or the safety earth symbol (or coloured GREEN or GREEN-and-YELLOW).

The BLUE wire must be connected to the terminal that is marked with the letter N (or coloured BLACK).

The BROWN wire must be connected to the terminal that is marked with the letter L (or coloured RED).

This applies only to products distributed by Yamaha Kemble Music (U. K.) Ltd.

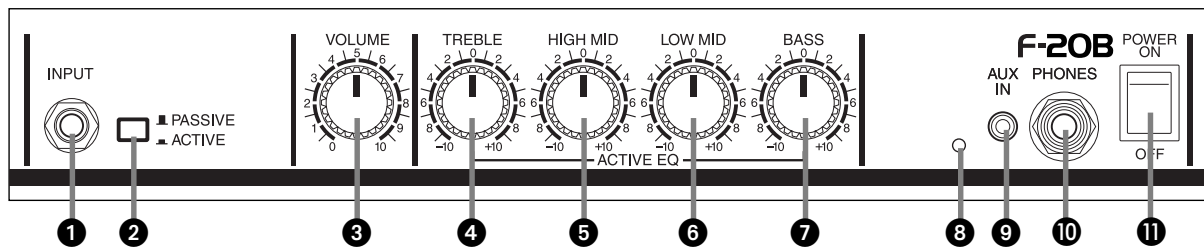
■ WARNING

Components having special characteristics are marked  and must be replaced with parts having specification equal to those originally installed.

■ SPECIFICATIONS

Rated Output Power:	20W
Speaker:	25cm x 1
Controls:	VOLUME, TREBLE, HIGH MID, LOW MID, BASS, Input Level Select Switch (PASSIVE/ACTIVE)
Input/Output Terminals:	INPUT, AUX IN, PHONES
Power Consumption:	25W/120V (UL, CSA) 25W/230V (E, BS)
Power Requirements:	U.S. and Canadian mod- els: 120V, 60Hz General model: 230V, 50Hz
Dimensions (W x H x D) :	357 x 453 x 242mm (14.1" x 17.8" x 9.5")
Weight:	10.5kg (23 lbs 2 oz)

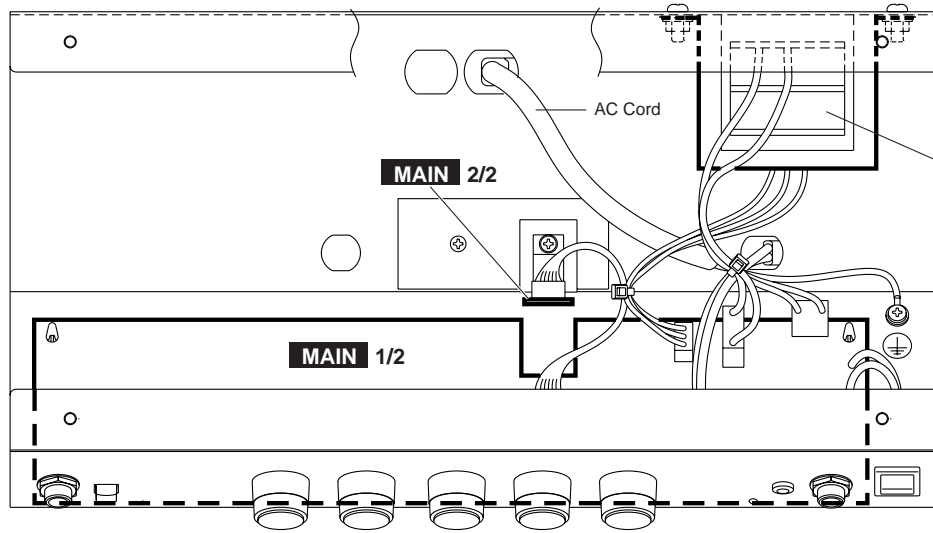
■ PANEL LAYOUT



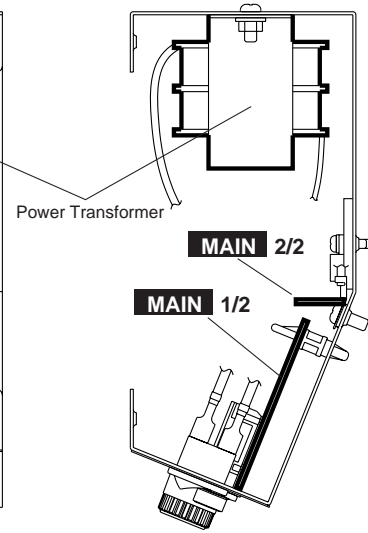
- ① INPUT
- ② PASSIVE/ACTIVE (Input Level Select Switch)
- ③ VOLUME
 - * No sound is produced when the VOLUME knob is set to "0".
- ACTIVE EQUALIZER
- ④ TREBLE
- ⑤ HIGH MID
- ⑥ LOW MID
- ⑦ BASS
- ⑧ POWER INDICATOR
 - * The lamp will light when the amplifier's power switch is ON.
- ⑨ AUX IN
 - * Use the volume control on the audio device to control its volume level.
- ⑩ PHONES
 - * The speaker will produce no sound when a pair of headphones is connected to this jack.
- ⑪ POWER

CIRCUIT BOARD LAYOUT

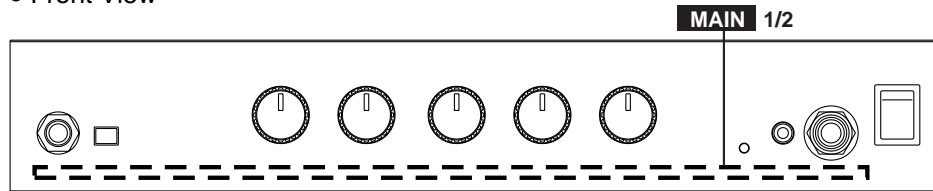
● Top View



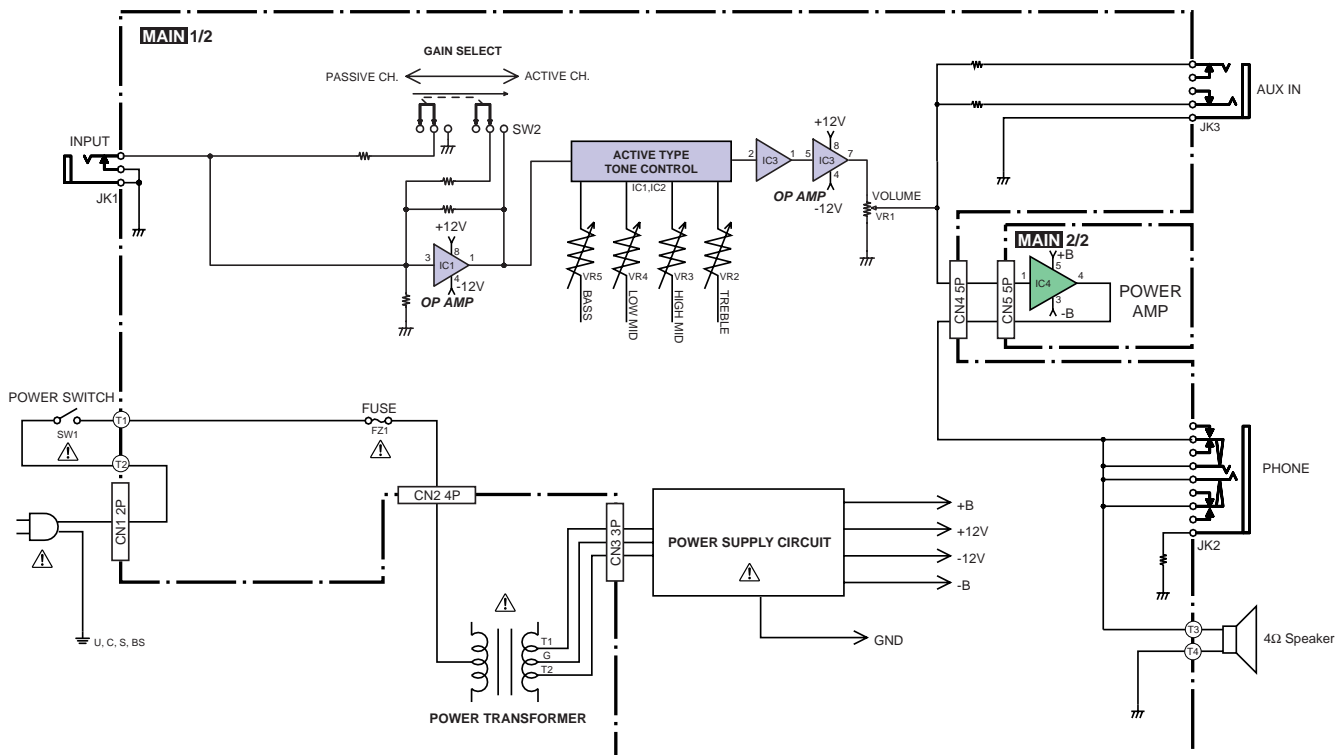
● Side View



● Front View



BLOCK DIAGRAM



■ DISASSEMBLY PROCEDURE

1. Pre-Main Unit (Time required: about 2 min)

- 1-1 Remove the eight (8) screws marked [A]. The back board can then be removed. (Fig.1)
- 1-2 Pull out the speaker wires. (Fig.1)
- 1-3 Remove the four (4) screws marked [30]. The pre-main unit can then be removed by sliding it backward. (Fig.1)

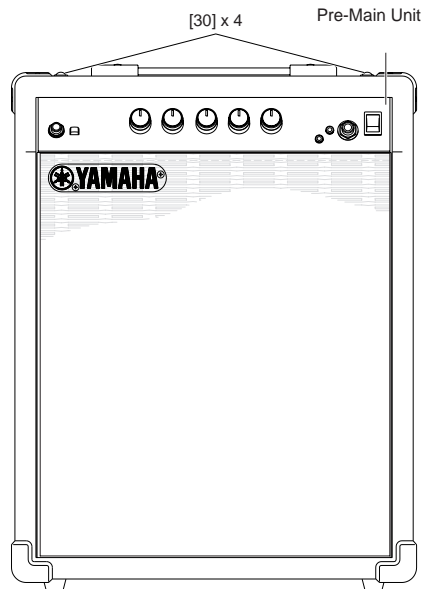
2. Speaker (Time required: about 2 min)

- 2-1 Remove the back board. (See Procedure 1-1)
- 2-2 Pull out the speaker wires. (Fig.1)
- 2-3 Remove the four (4) screws marked [60a]. The speaker can then be removed. (Fig.1)

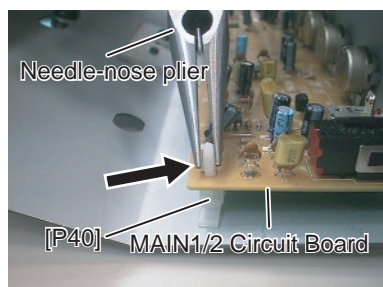
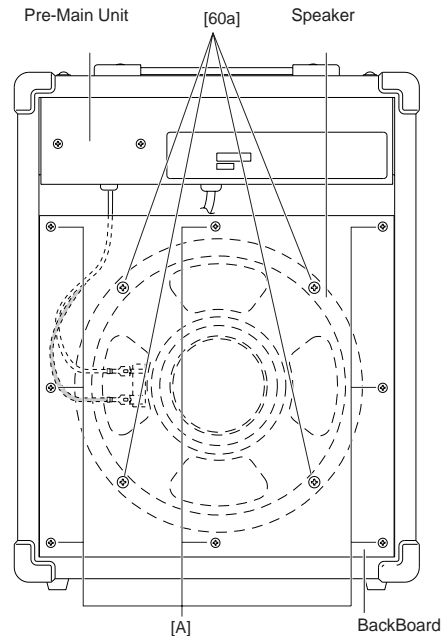
3. MAIN 1/2 Circuit Board (Time required: about 4 min)

- 3-1 Remove the pre-main unit. (See Procedure 1)
- 3-2 Remove the five (5) knobs marked [P100] and the five (5) hexagonal nuts marked [C]. (Fig.5)
- 3-3 Remove the hexagonal nut marked [A120] and the hexagonal nut marked [A140]. (Fig.5)
- 3-4 Push the hooks of the spacer support (at the arrow symbol area of illustration) with a needle-nose plier to unlock.

The MAIN 1/2 circuit board can then be removed. (Fig.2)



(Fig.1)



(Fig. 2)

[30]: Truss Head Screw 4.0X25 MFZN2BL (VN347600)

[A]: Bind Head Tapping Screw 4.0X25 FCRM3-BL (EI340256)

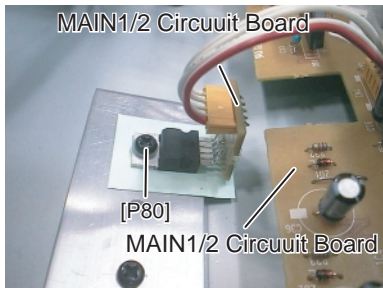
[60a]: Bind Head Screw (VB403600)

**4. MAIN 2/2 Circuit Board
(Time required: about 3 min)**

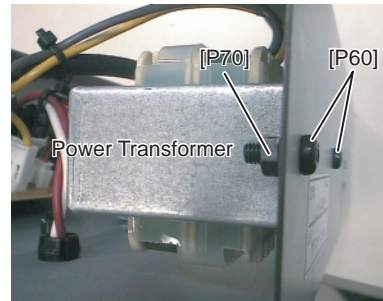
- 4-1 Remove the pre-main unit. (See Procedure 1)
- 4-2 Remove the screw marked [C80]. The MAIN 2/2 circuit board can then be removed. (Fig.3, Fig.5)

5. Power Transformer (Time required: about 4 min)

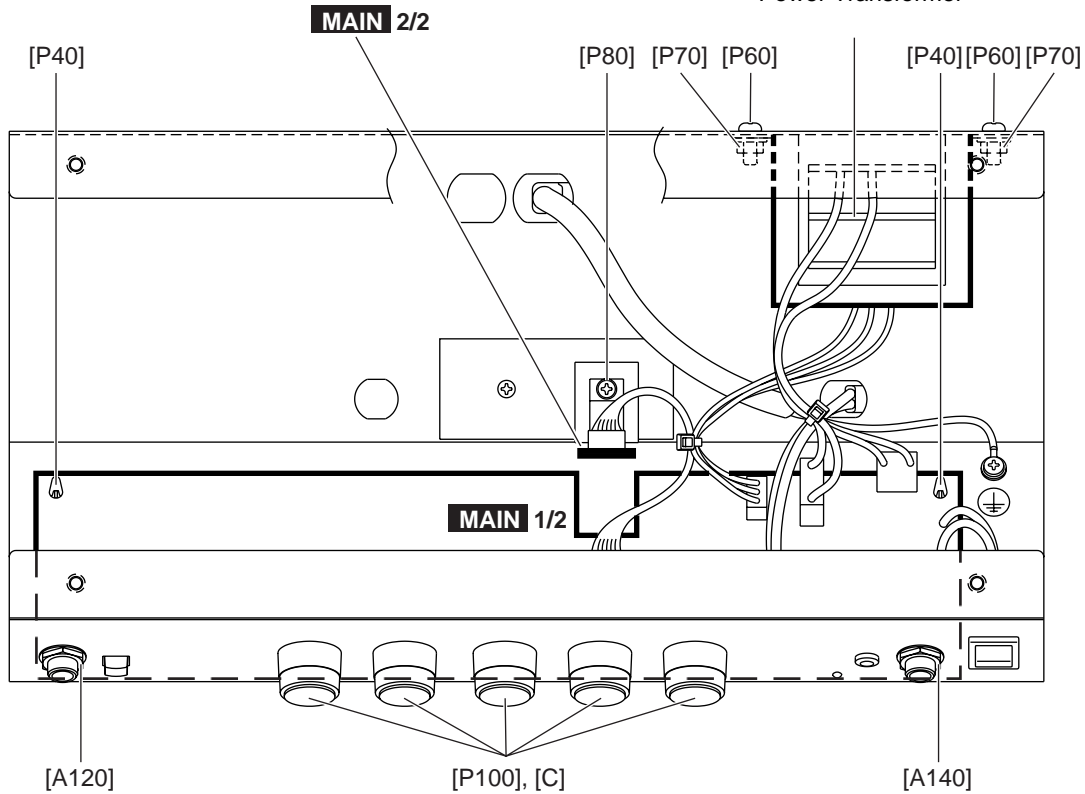
- 5-1 Remove the pre-main unit. (See Procedure 1)
- 5-2 While holding the nuts marked [P70] with a spanner, remove the two (2) screws marked [P60]. The power transformer can then be removed. (Fig.4)



(Fig. 3)



(Fig.4)
Power Transformer

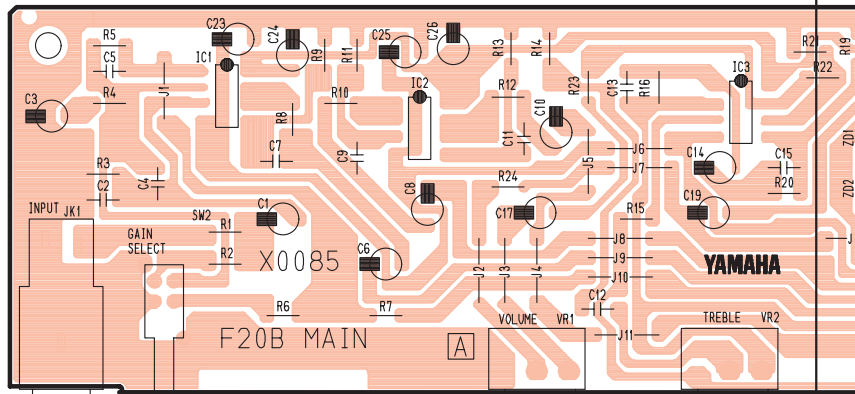


- [A120]: Hexagonal Nut 9.0 12X2 MFNI33 (LX200060)
- [A140]: Hexagonal Nut 12.0 14X2 MFNI33 (ES200210)
- [P60]: Pan Head Screw 4.0X10 MFZN2BL (V7018000)
- [P70]: Hexagonal Nut #1 4.0 MFZN2Y (VB837300)
- [P80]: Bind Head Screw-1 3.0X16 MFZN2BL (V7018100)
- [P100]: Knob (V6955100)

(Fig. 5)

CIRCUIT BOARDS

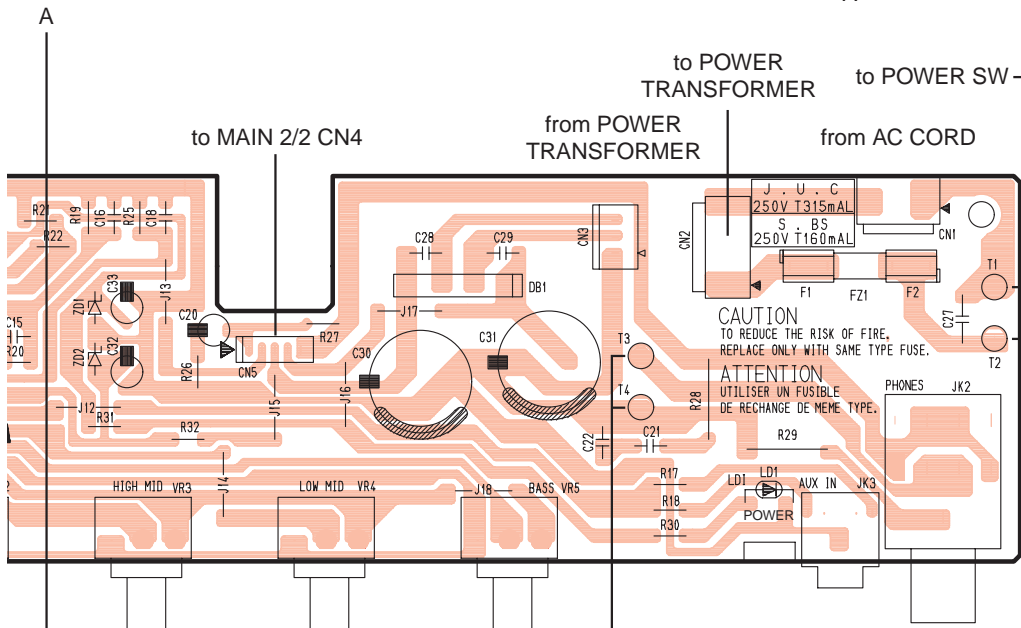
MAIN1/2 CIRCUIT BOARD



INPUT GAIN SELECT

VOLUME

TREBLE



HIGH MID

LOW MID

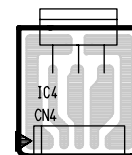
BASS

AUX IN PHONES

to SPEAKER

Component side

MAIN2/2 CIRCUIT BOARD



to MAIN 1/2 CN5

Component side

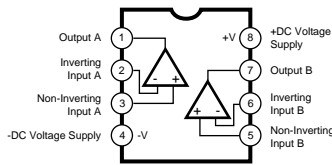
VERSION	FUSE RATE	INDICATION
J, U	250V 315mAL	J . U . C 250V T315mAL Must be erased
E, BS	250V T160mAL	Must be erased S . BS 250V T160mAL

- MAIN 1/2 (J, U, C): CNA-V755470
- MAIN 1/2 (H, B): CNA-V755480
- MAIN 2/2 (J, U, C): CNA-V755470
- MAIN 2/2 (H, B): CNA-V755480

■ IC BLOCK DIAGRAM

- **BA4558** (XO078A00)
Dual Operational Amplifier

MAIN: IC1,IC2,IC3



■ INSPECTIONS

1. Preparation

To inspect the main unit, the following jigs are required.

CD player

Headphones

Before turning the power on, set all the knobs on the panel to "0".

Raise the Input Level Select Switch to select [PASSIVE] position.

2. Power supply

Connect the power cord to the suitable power supply socket for each version.
(UC-120V, E&BS-220V)

3. Inspection procedure

- 3-1 Input the audio signal of CD player to the [AUX IN] jack.
- 3-2 Make sure that rotating the [VOLUME] knob to the right (or left) makes the sound gradually larger (or smaller).
- 3-3 Make sure that rotating the [TREBLE] knob to the right (or left) boosts (or cuts) the high frequency.
- 3-4 Make sure that rotating the [HIGH MID] knob to the right (or left) boosts (or cuts) the upper-middle frequency.
- 3-5 Make sure that rotating the [LOW MID] knob to the right (or left) boosts (or cuts) the lower-middle frequency.
- 3-6 Make sure that rotating the [BASS] knob to the right (or left) boosts (or cuts) the low frequency.
- 3-7 Make sure that the sound becomes smaller when you depress the Input Level Select Switch to select [ACTIVE] position.
- 3-8 Raise the Input Level Select Switch again to select [PASSIVE] position. Make sure that the audio signal sounds over the speaker.
- 3-9 Connect the headphones to the [PHONES] jack. Make sure that the speaker produces no sound and the audio signal sounds over the headphones.
- 3-10 Set all the knobs on the panel to "0" and finish the inspection.

BASS AMPLIFIER F-20B PARTS LIST

■ **CONTENS**

OVERALL ASSEMBLY 2
 PRE-MAIN UNIT 4
 ELECTRICAL PARTS 6

Note) DESTINATION ABBREVIATIONS

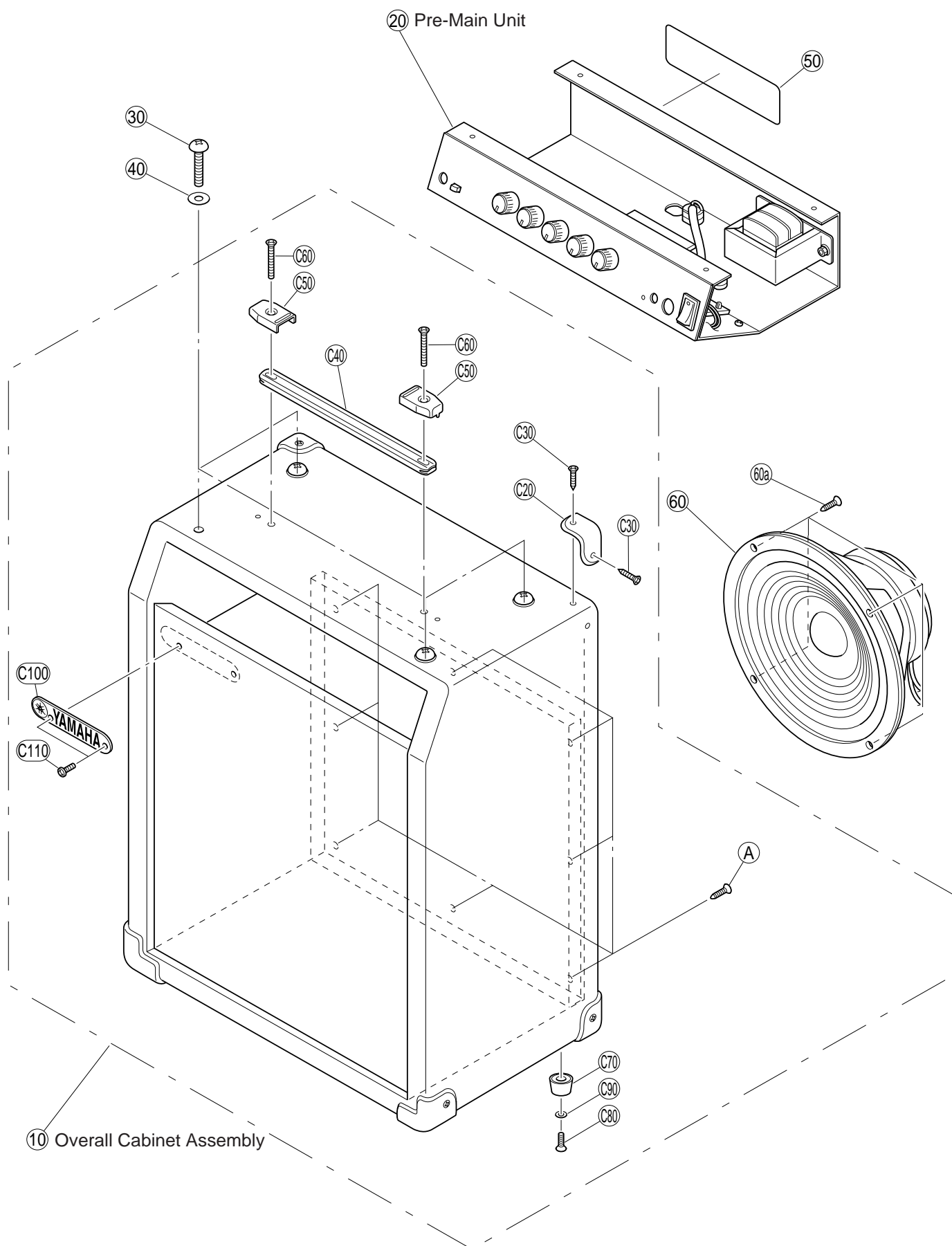
A: Australian model	M: South African model
B: British model	O: Chinese model
C: Canadian model	Q: South-east Asia model
D: German model	T: Taiwan model
E: European model	U: U.S.A. model
F: French model	V: General export model (110V)
H: North European model	W: General export model (220V)
I: Indonesian model	N,X: General export model
J: Japanese model	Y: Export model

■ **WARNING**

Components having special characteristics are marked \triangle and must be replaced with parts having specifications equal to those originally installed.

- The numbers in "QTY" shows quantities for each unit.
- The parts with "--" in "Part No." are not available as spare parts.
- The second letter of the shaded () part number is I, not one.
- The second letter of the shaded () part number is O, not zero.

OVERALL ASSEMBLY

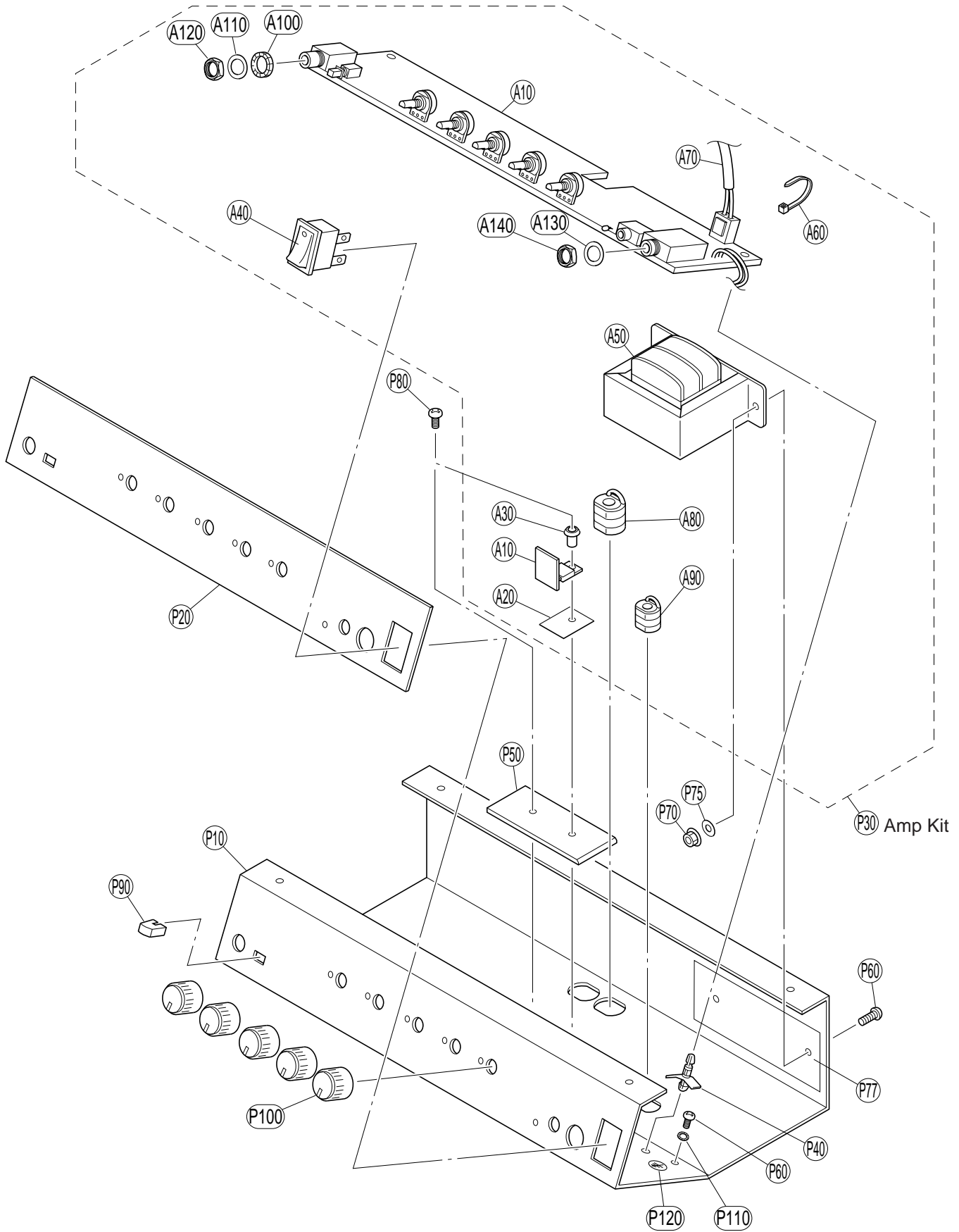


REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
		OVERALL ASSEMBLY		F-20B		
	--	Overall Assembly		J (V745880)		
	--	Overall Assembly		U,C (V745890)		
	--	Overall Assembly		H (V745900)		
	--	Overall Assembly		B (V745910)		
* 10	V7461100	Overall Cabinet Assembly				
20	--	Pre-Main Unit		J (V745930)		
20	--	Pre-Main Unit		U,C (V745940)		
20	--	Pre-Main Unit		H (V745950)		
20	--	Pre-Main Unit		B (V745960)		
30	VN347600	Truss Head Screw	4.0X25 MFZN2BL			4 01
40	ET500040	Flat Washer	4.0X10X0.8 MFZN2BL			4 01
50	--	Label		J (V745970)		
50	--	Label		U,C (V745980)		
50	--	Label		H,B (V745990)		
* 60	XO361A00	Speaker Unit	4ohm 30W			
60a	VB403600	Bind Head Screw				4 01
		OVERALL CABINET ASSEMBLY		F-20B		
* C10	V7461100	Overall Cabinet Assembly				
	--	Cabinet Assembly		(V746050)		
C20	V5969000	Corner Protector				6 01
C30	21770200	Oval Head Screw	3.0X12 MFZN2BL			12 01
C40	V6327200	Handle	KPBO KAH1D-205			
C50	V6327300	Handle Holder	KPBO KAH3D400-A			2
C60	V7017900	Oval Head Screw	4.0X25 MFZN2BL			2
C70	V6327400	Foot	KPBO KRRU19			4 01
C80	EP030310	Bind Head Tapping Screw-1	3.0X16 MFZN2BL			4 01
C90	03765580	Flat Washer	3.0X8X0.5 MFZN2BL			4 01
C100	V7363300	Name Plate				
C110	VN729100	Bind Head Tapping Screw-1	3.0X10 MFZN2BL			2 01
A	EI340256	Bind Head Tapping Screw	4.0X25 FCRM3-BL			8 01

*New parts

RANK: Japan only

PRE-MAIN UNIT



REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
	--	PRE-MAIN UNIT		F-20B		
	--	Pre-Main Unit		J (V745930)		
	--	Pre-Main Unit		U,C (V745940)		
	--	Pre-Main Unit		H (V745950)		
	--	Pre-Main Unit		B (V745960)		
P10	V6954800	Chassis				05
* P20	V7460600	Panel Sheet				
P30	--	Amp Kit		J (V746070)		
P30	--	Amp Kit		U,C (V746080)		
P30	--	Amp Kit		H (V746090)		
P30	--	Amp Kit		B (V746100)		
P40	V7511400	Spacer Support	PINGOOD LCC-10			2
P50	V7017600	Heat Sink				
P60	V7018000	Pan Head Screw	4.0X10 MFZN2BL			2
P70	VB837300	Hexagonal Nut	#1 4.0 MFZN2Y			2
P75	VB501900	Spring Washer	4.0 MFZN2Y			2
P77	V7834000	Vibration-proof Tape				
P80	V7018100	Pan Head Screw	3.0X10 MFZN2BL			2
P90	V7554300	Button	GA-RED	GAIN SELECT		01
P100	V6955100	Knob		VOLUME,TREBLRE,HIGH MID		5 01
				LOW MID,BASS		
P110	ET900050	Toothed Lock Washer-B	4.0 MFZN2BL	U,C,H,B		
P120	--	Earth Mark		U,C,H,B (V777110)		01
	--	Amp Kit		J (V746070)		
	--	Amp Kit		U,C (V746080)		
	--	Amp Kit		H (V746090)		
	--	Amp Kit		B (V746100)		
* A10	V7554700	Circuit Board	MAIN	J,U,C		
* A10	V7554800	Circuit Board	MAIN	H,B		
A20	VV849300	Insulation Sheet	BFG-20AD 19X24			01
A30	V7356900	Sleeve	12SWS0220			
A40	V7054700	Power SW	SDDJE1-A-2	POWER ON/OFF		02
A50	XZ805A00	Transformer	J	J		05
A50	XZ806A00	Transformer	UC	U,C		
A50	XZ807A00	Transformer	E	H,B		
A60	VV104600	Cord Holder	CV-100			2 01
A70	V6286700	Cord	J VCTF	J		04
A70	V6286900	Cord	UC 3 SJT 18/3	U,C		
A70	V6287000	Cord	E 3 HO5VV-F	H		
A70	V6287100	Cord	UK 3 HO5VV-F	B		
A80	V7356700	Cord Strain Relief	KR-61 KITAGAWA			
A90	V7356800	Cord Strain Relief	KF-41 KITAGAWA			
A100	ET800150	Toothed Lock Washer-A	9.0 MFZN2Y			01
A110	VL802300	Flat Washer	9X14 0.5 FNM3			01
A120	LX200060	Hexagonal Nut	9.0 12X2 MFNI33			01
A130	VB508700	Flat Washer	18X12.5 0.6 MFZN2			
A140	ES200210	Hexagonal Nut	12.0 14X2 MFNI33			01

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*New parts

RANK: Japan only

ELECTRICAL PARTS

REF NO.	PART NO.	DESCRIPTION	REMARKS	QTY	RANK	
		ELECTRICAL PARTS	F-20B			
*	V7554700	Circuit Board	J,U,C (X0085A0)			
*	V7554800	Circuit Board	H,B (X0085A0)			
*	V7554700	Circuit Board	J,U,C (X0085A0)			
*	V7554800	Circuit Board	H,B (X0085A0)			
	--	Connector Assembly	#18 2P L 60 (V660880)			
	--	Connector Assembly	B&B #26 5P L 100 (V735970)			
	--	Connector Assembly	#18 2P L 300 (V744980)			
	V6609900	Fuse Holder	WH-007			
	VV291400	Jumper Wire	0.60		01	
C01	UR866100	Electrolytic Cap.	1.00 50.0V		01	
C02	VZ353500	Ceramic Capacitor-SL	100P 50V J		01	
C03	UR847100	Electrolytic Cap.	10.00 25.0V		01	
C04	VZ353500	Ceramic Capacitor-SL	100P 50V J		01	
C05	VZ353500	Ceramic Capacitor-SL	100P 50V J		01	
C06	UR866330	Electrolytic Cap.	3.30 50.0V		01	
C07	VV061200	Mylar Capacitor	6800P 50V J		01	
C08	UR865470	Electrolytic Cap.	0.47 50.0V		01	
C09	VV060600	Mylar Capacitor	3300P 50V J		01	
C10	UR865100	Electrolytic Cap.	0.10 50.0V		01	
C11	VV059800	Mylar Capacitor	1000P 50V J		08	
C12	VV062600	Mylar Capacitor	0.068 50V J		01	
C13	VZ353500	Ceramic Capacitor-SL	100P 50V J		01	
C14	UR866100	Electrolytic Cap.	1.00 50.0V		01	
C15	VV059800	Mylar Capacitor	1000P 50V J		08	
C16	VZ353500	Ceramic Capacitor-SL	100P 50V J		01	
C17	UR866100	Electrolytic Cap.	1.00 50.0V		01	
C18	FG613100	Ceramic Capacitor-B	1000P 50V K		01	
C19	UR866100	Electrolytic Cap.	1.00 50.0V		01	
C20	UR837470	Electrolytic Cap.	47.00 16.0V		01	
C21	VV062800	Mylar Capacitor	0.1 50V J		01	
C22	VV062800	Mylar Capacitor	0.1 50V J		01	
C23	UR847100	Electrolytic Cap.	10.00 25.0V		01	
△	-26	UR847100	Electrolytic Cap.	10.00 25.0V	01	
	C27	V7355000	Capacitor	4700P 250V J.U.C.S	01	
	C28	VZ354600	Monolithic Ceramic Cap.	0.10 50V Z	01	
	C29	VZ354600	Monolithic Ceramic Cap.	0.10 50V Z	01	
	C30	UR749330	Electrolytic Cap.	3300 25.0V	03	
	C31	UR749330	Electrolytic Cap.	3300 25.0V	03	
	C32	UR847100	Electrolytic Cap.	10.00 25.0V	01	
	C33	UR847100	Electrolytic Cap.	10.00 25.0V	01	
	CN1	VG879900	Base Post Connector	VA- 2P TE	01	
	CN2	LB932040	Base Post Connector	VH-4P TE	01	
	CN3	LB918030	Base Post Connector	XH 3P TE	01	
	△	DB1	VP344100	Diode Stack	D2SBA20 1.5A 200V	03
	△	FZ1	V763080	Fuse	315 mA JU	
	△	FZ1	V783570	Fuse	160 mA E	
		IC1	X0078A00	IC	BA4558	J,U,C DIP OPAMP
		-3	X0078A00	IC	BA4558	DIP OPAMP
		IC4	XZ311A00	IC	TDA2030A	HIFI AMP
		JK1	V3633400	Phone Jack	HTJ-064-12I	INPUT
		JK2	V6176500	Phone Jack	HTJ-064-05B	PHONES
		JK3	V7447000	Phone Jack	ST HTJ-035-09ABT	AUX IN
		LD1	VV620800	LED	LT311G-41-C13 RED	power on/off
	R01	HF456220	Carbon Resistor	2.2K 1/4 J	01	
	R02	HF457270	Carbon Resistor	27.0K 1/4 J	01	
	R03	HF459100	Carbon Resistor	1.0M 1/4 J	01	
	R04	HF456100	Carbon Resistor	1.0K 1/4 J	01	
	R05	HF456270	Carbon Resistor	2.7K 1/4 J	01	
	R06	HF456100	Carbon Resistor	1.0K 1/4 J	01	
	R07	HF456330	Carbon Resistor	3.3K 1/4 J	01	
	R08	HF455680	Carbon Resistor	680.0 1/4 J	01	
	R09	HF458100	Carbon Resistor	100.0K 1/4 J	01	
	R10	HF455680	Carbon Resistor	680.0 1/4 J	01	
	R11	HF458100	Carbon Resistor	100.0K 1/4 J	01	
	R12	HF455680	Carbon Resistor	680.0 1/4 J	01	
	R13	HF458100	Carbon Resistor	100.0K 1/4 J	01	
	R14	HF455680	Carbon Resistor	680.0 1/4 J	01	
	R15	HF455220	Carbon Resistor	220.0 1/4 J	01	

*New parts

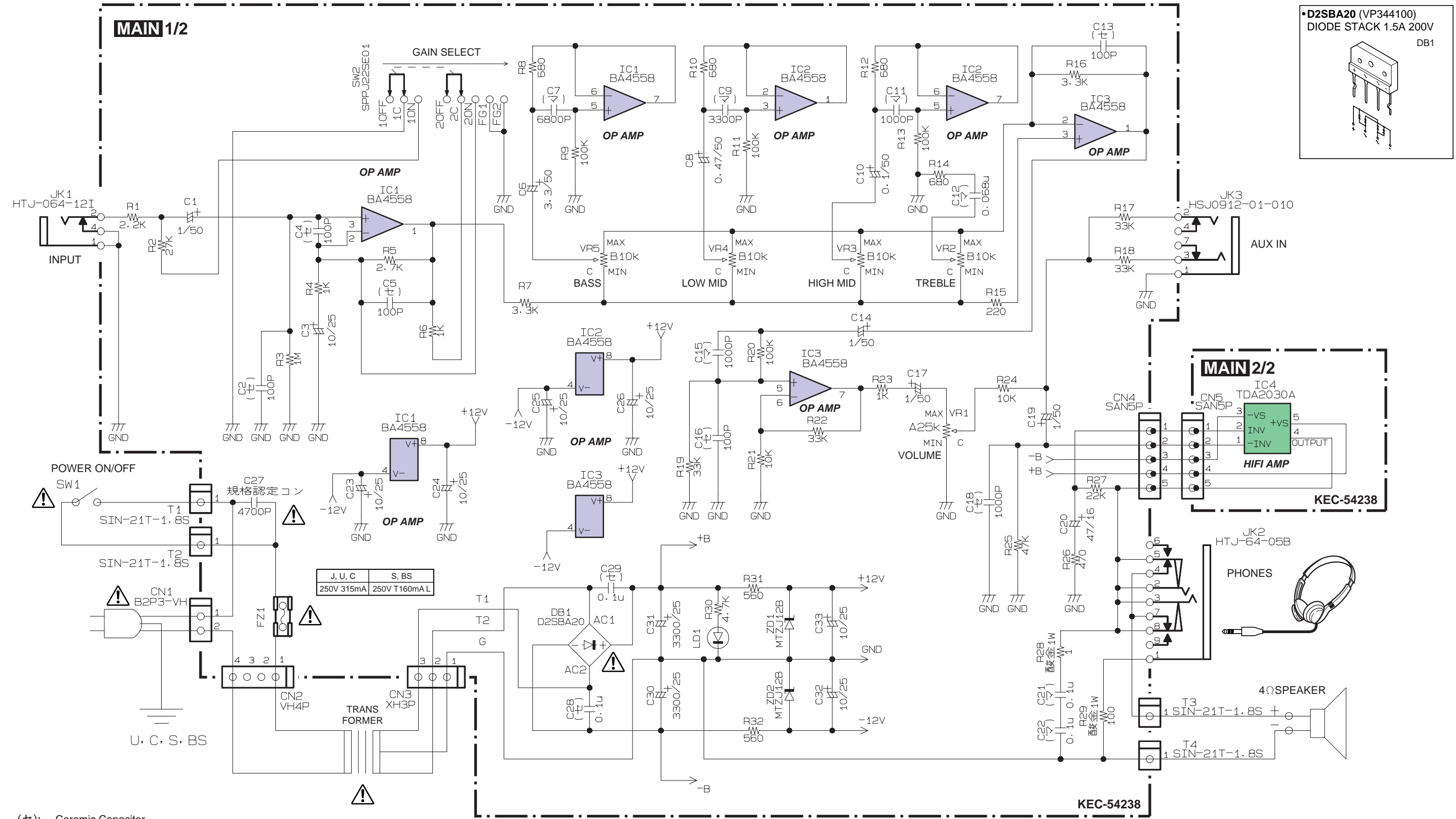
RANK: Japan only

REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
R16	HF456330	Carbon Resistor	3.3K 1/4 J			01
R17	HF457330	Carbon Resistor	33.0K 1/4 J			01
-19	HF457330	Carbon Resistor	33.0K 1/4 J			01
R20	HF458100	Carbon Resistor	100.0K 1/4 J			01
R21	HF457100	Carbon Resistor	10.0K 1/4 J			01
R22	HF457330	Carbon Resistor	33.0K 1/4 J			01
R23	HF456100	Carbon Resistor	1.0K 1/4 J			01
R24	HF457100	Carbon Resistor	10.0K 1/4 J			01
R25	HF457470	Carbon Resistor	47.0K 1/4 J			01
R26	HF455470	Carbon Resistor	470.0 1/4 J			01
R27	HF457220	Carbon Resistor	22.0K 1/4 J			01
R28	VC740100	Metal Oxide Film Resistor	1.0 1W J			01
R29	VC745000	Metal Oxide Film Resistor	100.0 1W J			01
R30	HF456470	Carbon Resistor	4.7K 1/4 J			01
R31	HF455560	Carbon Resistor	560.0 1/4 J			01
R32	HF455560	Carbon Resistor	560.0 1/4 J			01
SW2	VR140800	Push Switch				03
VR1	V6607700	Rotary Variable Resistor	16mm 25KA	VOLUME		04
* VR2	V7649200	Rotary Variable Resistor	16mm 10KW(4B)	TREBLE		
* VR3	V7649200	Rotary Variable Resistor	16mm 10KW(4B)	HIGH MID		
* VR4	V7649200	Rotary Variable Resistor	16mm 10KW(4B)	LOW MID		
* VR5	V7649200	Rotary Variable Resistor	16mm 10KW(4B)	BASS		
ZD1	VG440200	Zener Diode	MTZ J 12.0B 12.0V			01
ZD2	VG440200	Zener Diode	MTZ J 12.0B 12.0V			01
* X	XO361A00	Speaker Unit	4ohm 30W			
△	V7054700	Power SW	SDDJE1-A-2	POWER ON/OFF		02
△	XZ805A00	Transformer	J	J		05
△	XZ806A00	Transformer	UC	U,C		
△	XZ807A00	Transformer	E	H,B		
△	V6286700	Cord	J VCTF	J		04
△	V6286900	Cord	UC 3 SJT 18/3	U,C		
△	V6287000	Cord	E 3 HO5VV-F	H		
△	V6287100	Cord	UK 3 HO5VV-F	B		

*New parts

RANK: Japan only

OVERALL CIRCUIT DIAGRAM



(セ): Ceramic Capacitor
 (マ): Mylar Capacitor
 酸金: Metal Oxide Film Resistor

Note: See parts list for details of circuit board component parts.

WARNING
 Components having special characteristics are marked with a triangle symbol and must be replaced with parts having specifications equal to those originally installed.

•D2SBA20 (VP344100)
 DIODE STACK 1.5A 200V
 DB1

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