

GUITAR AMPLIFIER

DG60-112

SERVICE MANUAL



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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 bus in the unit. (Heavy gauge black wires connect to this bus.)

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 colored 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

Digital Section

Complete Digital Signal Processing
 Amplification Type: Internal 8 Channel Preset
 Digital Reverb (SPRING)
 Speaker Simulator (LINE OUT)

Analog Section

60 W Solid State Power Amp
 30 cm Speaker (EMINENCE) x 1

Controller/Switch

Front Panel: GAIN, MASTER, TREBLE, HIGH MID, LOW MID, BASS, PRESENCE, REVERB, AMP select switch, for each channel (A/B), Channel select switch (A/B)

Rear Panel: EFFECT BLEND, SP MUTE switch, for each channel (A/B), EFFECT SEND/RETURN level switch

Indicator

Peak Level Display LED (Red)

Connection Jacks

INPUT HIGH/LOW, EFFECT SEND/RETURN, LINE OUT/PHONES, FOOT SW (CH SELECT, REVERB): All Standard Phone Mono Jack

A/D Converter 20 bit + 3 bit floating

D/A Converter 20 bit

Sampling Frequency 48 kHz

Input Level/Impedance

INPUT HIGH: -20 dBm (THRU)/1 MΩ
 INPUT LOW: -10 dBm (THRU)/1 MΩ
 EFFECT RETURN: 0 dBm/120 kΩ

Output Level/Impedance

SPEAKER: 60 W RMS/8 Ω
 LINE OUT: +2 dBm/47 Ω
 EFFECT SEND: -2 dBm/1 kΩ

Power Requirements

U.S. and Canadian models : 120 V, 60 Hz
 General model : 230 V, 50 Hz

Power Consumption

70 W

Dimensions (W x H x D)

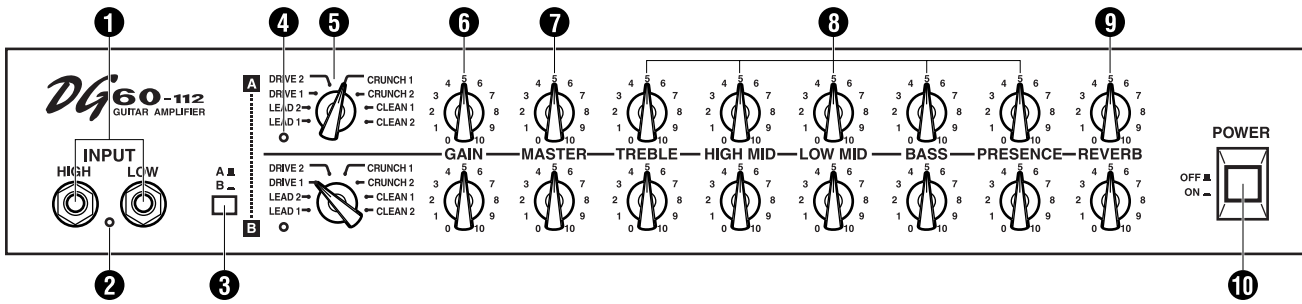
540 x 504 x 276 mm (21.3" x 19.8" x 10.9")

Weight

18.0 kg (39 lbs 11 oz)

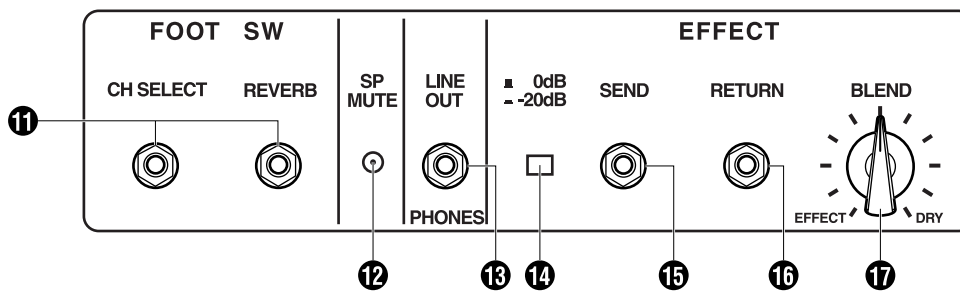
■ PANEL LAYOUT

● Front Panel



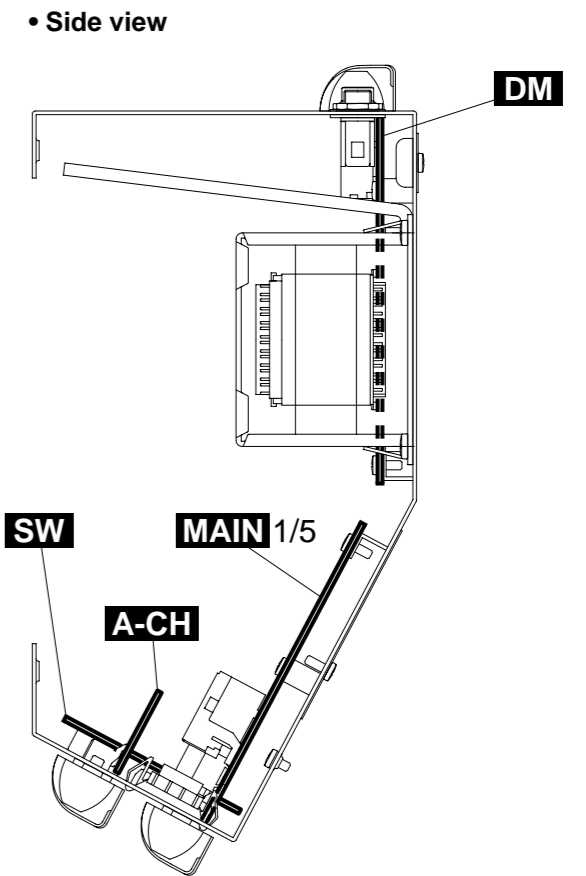
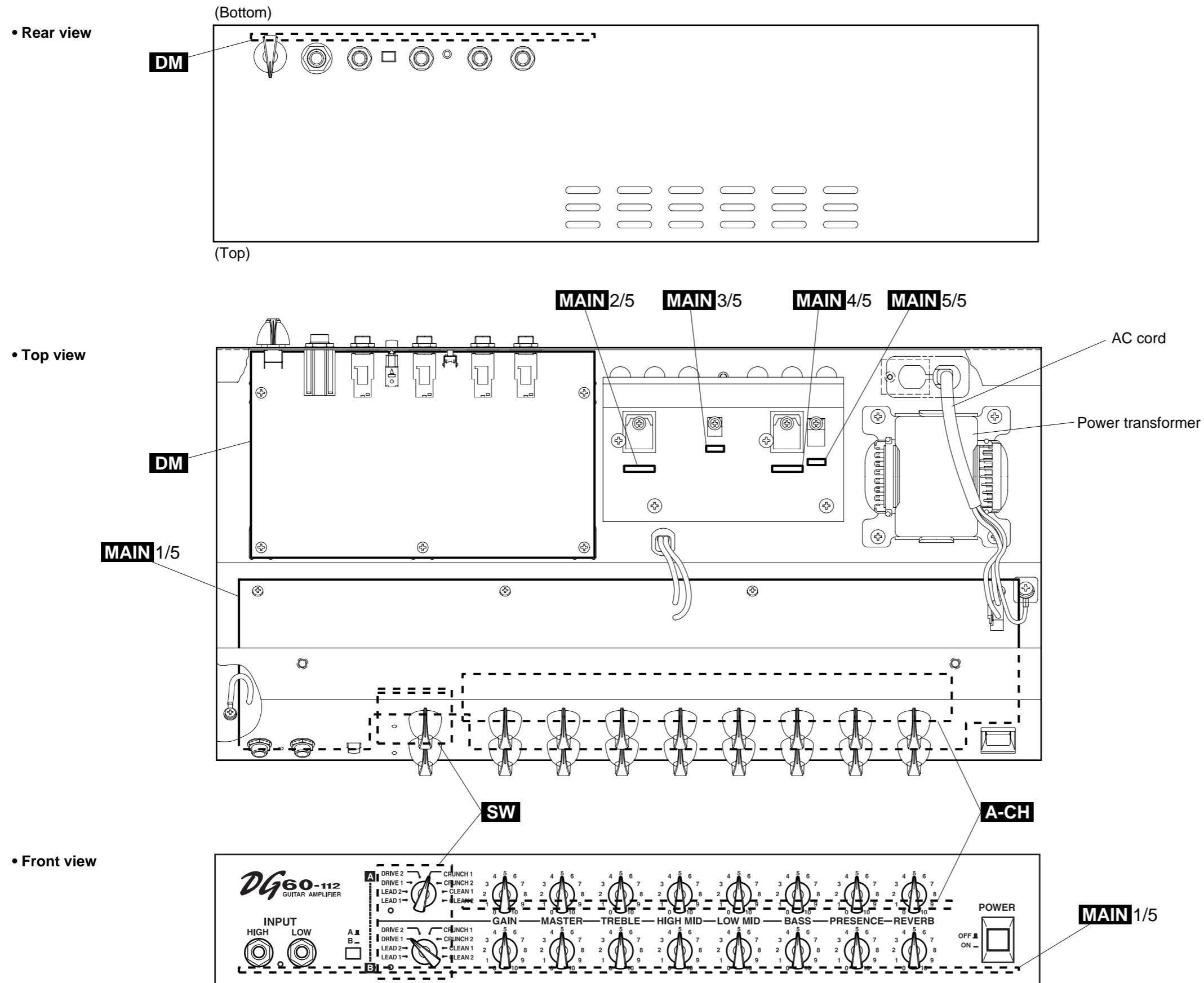
- 1 Input Jack (INPUT HIGH, LOW)
- 2 Peak Indicator
- 3 Channel Select Switch
- 4 Channel Indicator
- 5 Amp Select Switch
- 6 Gain Volume (GAIN)
- 7 Master Volume (MASTER)
- 8 Tone Controls
(TREBLE, HIGH MID, LOW MID, BASS, PRESENCE)
- 9 Reverb Volume (REVERB)
- 10 Power Switch (POWER)

● Rear Panel

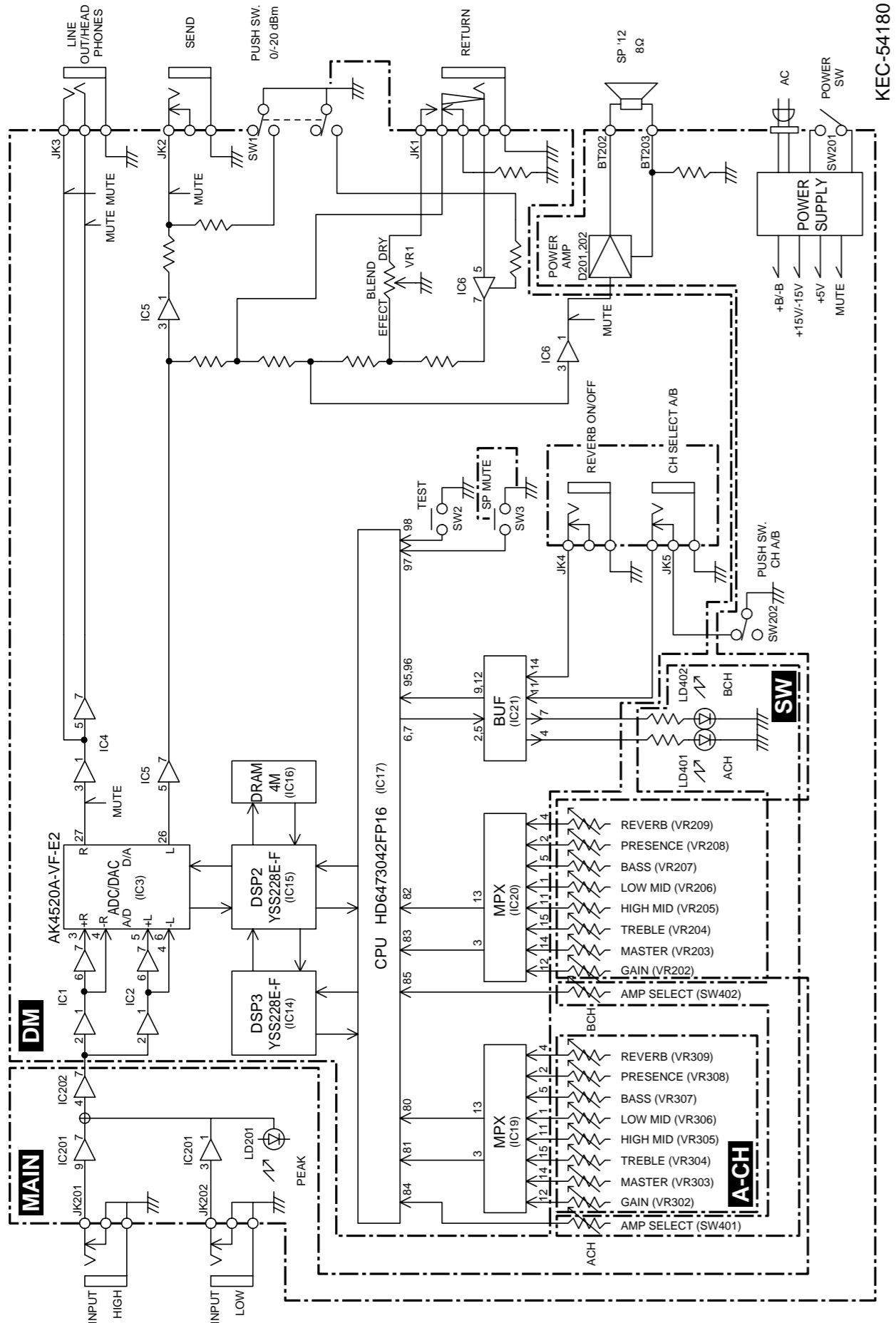


- 11 Foot Switch (FOOT SW)
- 12 Speaker Mute Switch (SP MUTE)
- 13 Line Out/Head Phone Jack
(LINE OUT/PHONES)
- 14 Effect Send/Return Level Switch
(0 dB/-20 dB)
- 15 Effect Send Jack (EFFECT SEND)
- 16 Effect Return Jack (RETURN)
- 17 Blend Knob (BLEND)

■ CIRCUIT BOARD LAYOUT



■ BLOCK DIAGRAM



KEC-54180

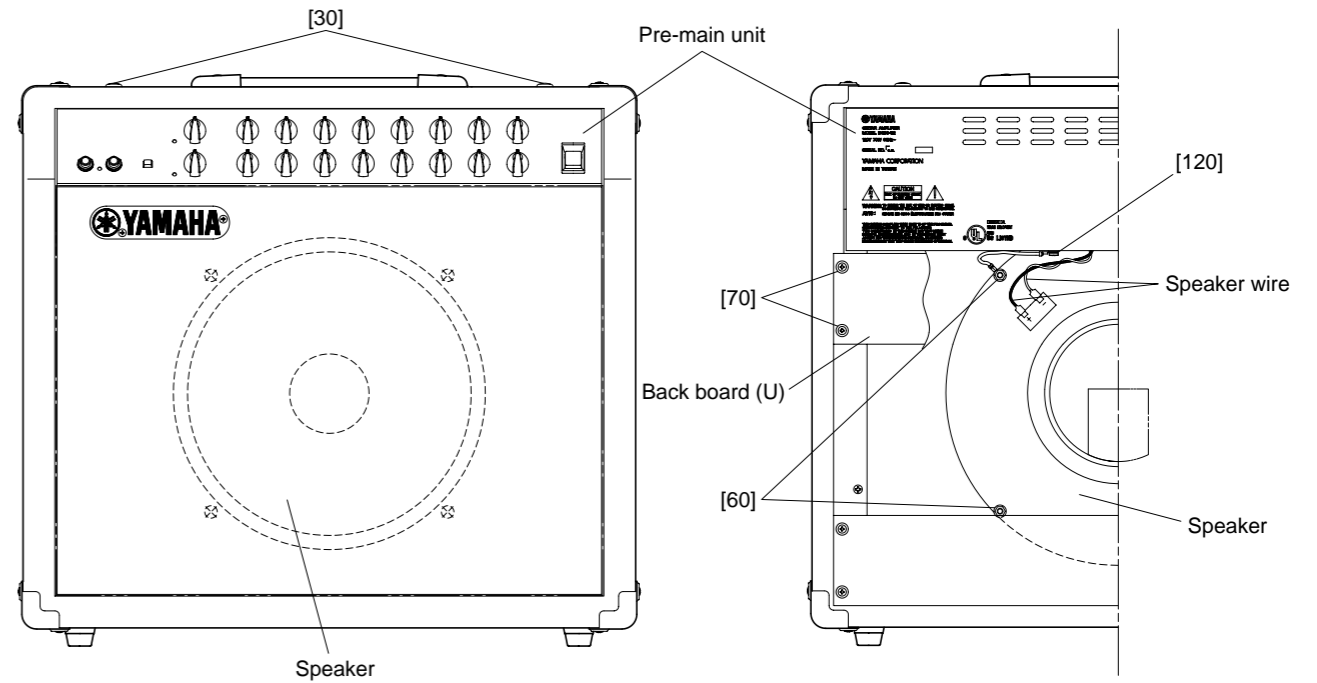
■ DISASSEMBLY PROCEDURE

1. Pre-Main Unit

- 1-1 Remove the four (4) screws marked [70]. The back board (U) can then be removed. (Fig. 1)
- 1-2 Remove the speaker wires and the screw marked [120]. (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

- 2-1 Remove the four (4) screws marked [70]. The back board (U) can then be removed. (Fig. 1)
- 2-2 Remove the four (4) hexagonal nuts marked [60]. The speaker can then be removed. (Fig. 1)



[30]: Oval Head Screw 5.0X35 MFC2BL (VP104600)
 [60]: Hexagonal Nut 4.0 MFZN2Y (03760900)
 [70]: Oval Head Yapping Screw-1 4.0X30 MFC2BL (EN240090)

(Fig. 1)

3. DM Circuit Board

- 3-1 Remove the pre-main unit. (See Procedure 1.)
- 3-2 Remove the BLEND knob marked [90A], the four (4) hexagonal nuts marked [130A], the hexagonal nut marked [190] and the hexagonal nut marked [210].
- 3-3 Remove the five (5) screws marked [80A]. The DM circuit board can then be removed. (Fig. 2)
- 3-4 Remove the button marked [100A] form the DM circuit board. (Fig. 2)

4. MAIN (1/5-5/5), A-CH and SW Circuit Boards

- 4-1 Remove the pre-main unit. (See Procedure 1.)
- 4-2 Each circuit board can then be removed in its manner as below. (Fig. 2)

MAIN 1/5 Circuit Board

Remove the eight (8) knobs marked [90B], the eight (8) hexagonal nuts marked [A], the two (2) hexagonal nuts marked [130B] and the five (5) screws marked [80B]. Remove the knob marked [100B] and the knob marked [110] from the MAIN 1/5 circuit board. (Fig. 2)

MAIN 2/5 Circuit Board

Remove the screw marked [290A]. (Fig. 2)

MAIN 3/5 Circuit Board

Remove the screw marked [290B]. (Fig. 2)

MAIN 4/5 Circuit Board

Remove the screw marked [290C]. (Fig. 2)

MAIN 5/5 Circuit Board

Remove the screw marked [290D]. (Fig. 2)

A-CH Circuit Board

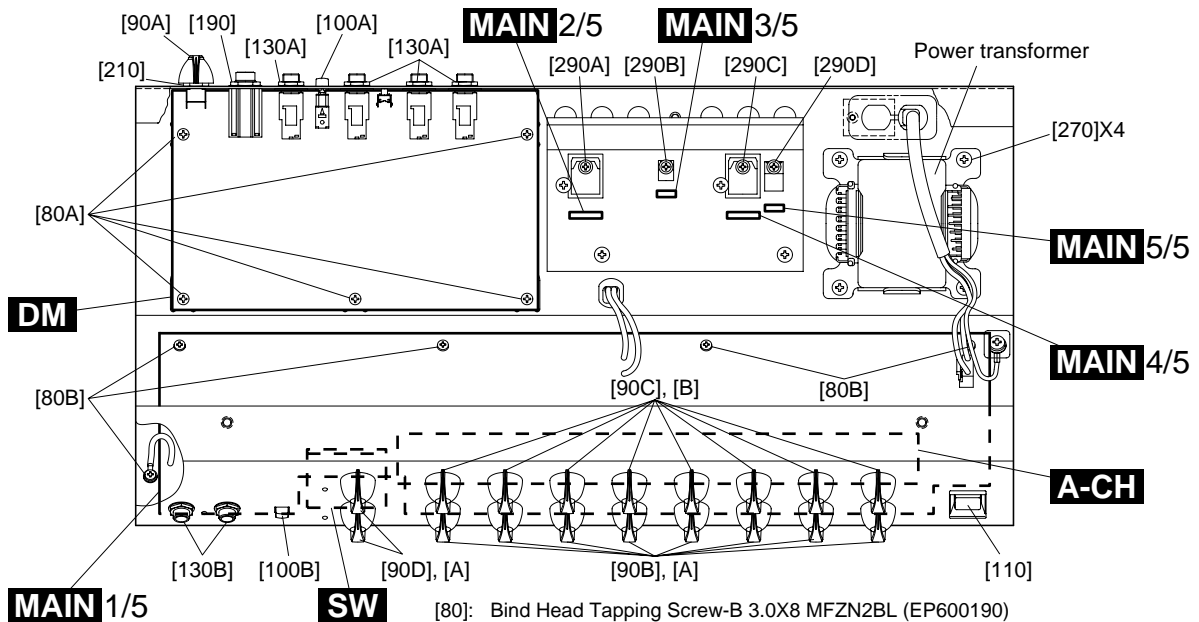
Remove the eight (8) knobs marked [90C] and the eight (8) hexagonal nuts marked [B]. (Fig. 2)

SW Circuit Board

Remove the two (2) knobs marked [90D] and the two (2) hexagonal nuts marked [C]. (Fig. 2)

5. Power Transformer

- 5-1 Remove the pre-main unit. (See Procedure 1.)
- 5-2 Remove the four (4) screws marked [270]. The power transformer can then be removed. (Fig. 2)



- [80]: Bind Head Tapping Screw-B 3.0X8 MFZN2BL (EP600190)
- [130]: Hexagonal Nut 9.0 12X2 MFNI33 (LX200060)
- [190]: Hexagonal Nut 12.0 14X2 MFC2BL (VD794100)
- [210]: Hexagonal Nut 9.0 11X2 MFZN2BL (VJ388000)
- [270]: Bind Head Tapping Screw-C A4.0X8 MFZN2BL (VC688900)
- [290]: Bind Head Screw SP 3.0X12 MFZN2Y (VB763800)

(Fig. 2)

LSI PIN DESCRIPTION

• HD6433042SC10FP (XW325100) CPU

DM: IC17

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION	
1	PA6	O	Port A	51	A12	O	Address bus	
2	PA7	O	Address bus	52	A13	O		
3	VCC		Power supply	53	A14	O		
4	PB0	I	Port B	54	A15	O		
5	PB1	I						
6	PB2	I						
7	PB3	I						
8	PB4	I						
9	PB5	I						
10	PB6//DREQ0	I	Reset	59	VSS		Ground	
11	PB7//DREQ1	I		Port 6	60	P60//WAIT	I	
12	/RESO	O				61	P61//BREQ	I
13	VSS		Ground	62	P62//BACK	I	Ø out	
14	P90/TXD0	O	Transmit data (MIDI OUT)	63	Ø	O		
15	P91/TXD1	O	KSN-ACK	64	/STBY	I	Stand-by mode signal	
16	P92/RXD0	I	Receive data (MIDI IN)	65	/RES	I	Reset	
17	P93/RXD1	I	KSN-RX	66	NMI	I	Non-maskable interrupt	
18	P94/SCK0	O	Port 9	67	VSS		Ground	
19	P95/SCK1	I	Port 9	68	EXTAL	I	Clock	
20	P40/D0	I/O	Data bus	69	XTAL	O	Clock	
21	P41/D1	I/O						
22	P42/D2	I/O						
23	P43/D3	I/O						
24	VSS			(Ground)	70	VCC		Power supply
25	P44/D4	I/O						
26	P45/D5	I/O						
27	P46/D6	I/O						
28	P47/D7	I/O						
29	D8	I/O						
30	D9	I/O						
31	D10	I/O						
32	D11	I/O						
33	D12	I/O						
34	D13	I/O						
35	D14	I/O						
36	D15	I/O						
37	VCC		Power supply	71	/AS	O	Address strobe	
38	A0	O	Address bus	72	/RD	O	Read strobe	
39	A1	O						
40	A2	O						
41	A3	O						
42	A4	O						
43	A5	O						
44	A6	O						
45	A7	O						
46	VSS		(Ground)	73	/HWR	O	Write strobe (High)	
47	A8	O	Port A	74	/LWR	O	Write strobe (Low)	
48	A9	O						
49	A10	O						
50	A11	O						
					75	MD0	I	Mode select
					76	MD1	I	
					77	MD2	I	
					78	AVCC		Analog power supply
					79	VREF	I	Reference voltage
					80	P70/AN0	I	Analog data input (EQ)
				81	P71/AN1	I	Analog input (EQ)	
				82	P72/AN2	I	Analog data input	
				83	P73/AN3	I	Analog input (CS)	
				84	P74/AN4	I	Analog data input (BEND)	
				85	P75/AN5	I	Analog input (MOD)	
				86	P76/AN6	I	Analog input (FC)	
				87	P77/AN7	I	Analog input (BAT)	
				88	AVSS		Analog ground	
				89	P80	O	Port 8	
				90	P81//CS3	O	Chip select	
				91	P82//CS2	O		
				92	P83//CS1	O		
				93	P84//CS0	O		
				94	VSS		Ground	
				95	PA0	I	Port A	
				96	PA1	I		
				97	PA2	I		
				98	PA3	O		
				99	PA4	O		
				100	PA5	O		

● YSS228E-F (XQ962D00) DSP3 (Digital Signal Processor)

DM: IC14, 15

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	VSS		Ground	81	VSS	I/O	Ground
2	XI	I	System master clock input (60 M or30 MHz)	82	DB13	I/O	Ground
3	XO		System master clock input (60 M or30 MHz)	83	DB14	I/O	
4	VDD		Power supply	84	DB15	I/O	
5	/SYNCI	I	System synch. input	85	DB16	I/O	
6	/SYNCO	O	System synch. output	86	DB17	I/O	
7	CKI	I	System clock input (30 MHz)	87	DB18	I/O	
8	CKO	O	System clock output (30 MHz)	88	DB19	I/O	
9	CKSL	I	System master clock select (0:60 M,1:30 MHz)	89	DB20	I/O	
10	VSS		Ground	90	DB21	I/O	
11	MCKS	I	Master clock for serial I/O(128 xFs)	91	DB22	I/O	
12	/SSYNC	I	Synch. signal for serial I/O	92	DB23	I/O	
13	/IC	I	Initial clear	93	DB24	I/O	
14	/TEST	I	Test mode setting	94	DB25	I/O	
15	BTYP	I	CPU data bus 8/16 bit select(0:8,1:16)	95	DB26	I/O	
16	/IRQ	O	Interrupt request	96	DB27	I/O	
17	TRIG	I/O	Trigger signal	97	DB28	I/O	
18	VDD		Power supply	98	DB29	I/O	
19	VSS		Ground	99	DB30	I/O	
20	/CS	I	Chip select	100	DB31	I/O	
21	/DS	I	Data strobe	101	TIMO/DBOE	I/O	Timing signal/Parallel data bus control
22	R/W	I	Read/Write select	102	VSS		
23	CA7	I	CPU address bus	103	VDD		Power supply
24	CA6	I					
25	CA5	I					
26	CA4	I					
27	CA3	I					
28	CA2	I					
29	CA1	I					
30	CA0/CD15	I/O	CPU address/data bus	104	DA00	I/O	External memory data bus
31	CD14	I/O					
32	CD13	I/O					
33	CD12	I/O					
34	CD11	I/O	CPU data bus	106	DA02	I/O	
35	CD10	I/O					
36	CD09	I/O					
37	CD08	I/O					
38	CD07	I/O					
39	CD06	I/O					
40	VSS			Ground	107	DA03	I/O
41	VDD		Power supply	108	DA04	I/O	
42	CD05	I/O	CPU data bus	109	DA05	I/O	
43	CD04	I/O					
44	CD03	I/O					
45	CD02	I/O					
46	CD01	I/O					
47	CD00	I/O					
48	/DTACK	O		DTACK signal output	110	DA06	I/O
49	SI0	I	Serial data input	111	DA07	I/O	
50	SI1	I					
51	SI2	I					
52	SI3	I					
53	SI4	I					
54	SI5	I					
55	SI6	I					
56	SI7	I					
57	VSS		Ground	112	DA08	I/O	
58	VDD		Power supply	113	DA09	I/O	
59	SO0	O	Serial data output	114	DA10	I/O	
60	SO1	O					
61	SO2	O					
62	SO3	O					
63	SO4	O					
64	SO5	O					
65	SO6	O					
66	SO7	O					
67	DB00	I/O	Parallel data bus	115	DA11	I/O	
68	DB01	I/O					
69	DB02	I/O					
70	DB03	I/O					
71	DB04	I/O					
72	DB05	I/O					
73	DB06	I/O					
74	DB07	I/O					
75	DB08	I/O					
76	DB09	I/O					
77	DB10	I/O					
78	DB11	I/O					
79	DB12	I/O					
80	VDD		Power supply	116	DA12	I/O	
				117	DA13	I/O	
				118	DA14	I/O	
				119	DA15	I/O	
				120	VSS		Ground
				121	VDD		
				122	DA16	I/O	External memory data bus
				123	DA17	I/O	
				124	DA18	I/O	
				125	DA19	I/O	
				126	DA20	I/O	
				127	DA21	I/O	
				128	DA22	I/O	
				129	DA23	I/O	
				130	DA24	I/O	
				131	DA25	I/O	
				132	DA26	I/O	
				133	DA27	I/O	
				134	DA28	I/O	
				135	DA29	I/O	
				136	DA30	I/O	
				137	DA31	I/O	
				138	VDD		Power supply
				139	VSS		
				140	A00	O	External memory address bus
				141	A01	O	
				142	A02	O	
				143	A03	O	
				144	A04	O	
				145	A05	O	
				146	A06	O	
				147	A07	O	
				148	A08	O	
				149	A09	O	
				150	A10	O	
				151	A11	O	
				152	A12	O	
				153	A13	O	
				154	A14	O	
				155	A15/RAS	O	External memory address bus/Row address strobe
				156	A16/CAS	O	External memory address bus/Column address strobe
				157	A17/CE	O	External memory address bus/Chip enable
				158	/WE	O	External memory write enable
				159	/OE	O	External memory output enable
				160	VDD		Power supply

● **AK4520A-VF-E2 (XT802A00) ADC & DAC**

MAIN: IC301

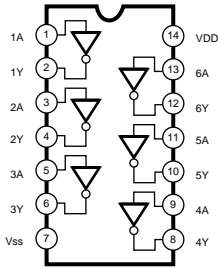
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	VREFH	I	Positive Voltage Reference Input, VA	15	MCLK	I	Master Clock Input
2	VREFL	I	Negative Voltage Reference Input, AGND	16	DEM0	I	De-emphasis Frequency Select
3	AINR+	I	Rch Analog Positive Input	17	DEM1	I	De-emphasis Frequency Select
4	AINR-	I	Rch analog Negative Input	18	TST3	I/O	} Test Pins (Pull Down Pins)
5	AINL+	I	Lch Analog Positive Input	19	TST2	I/O	
6	AINL-	I	Lch analog Negative Input	20	TST1	I	
7	VA	-	Analog Power Supply	21	VD	-	
8	AGND	-	Analog Ground	22	DGND	-	Digital Ground
9	DIF0	I	Audio Data Interface Format	23	/PWDA	I	DAC power-Down Mode
10	DIF1	I	Audio Data Interface Format	24	/PWAD	I	ADC power-Down Mode
11	LRCK	I	Input/Output Channel Clock	25	CMODE	I	Master Clock Select ("H":384 fs,"L":256 fs)
12	SCLK	I	Audio Serial Data Clock	26	AOUTL	O	Lch Analog Output
13	SDTI	I	Audio Serial Data Input	27	AOUTR	O	Rch Analog Output
14	SDTO	O	Audio Serial Data Output	28	VCOM	O	Common Voltage Output, VA/2

■ **IC BLOCK DIAGRAM**

● **TCHCU04AF-TP1 (XD660A00)**

Hex Inverter

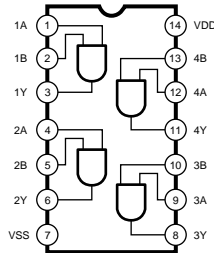
DM: IC 11



● **SN74HC08NSR (XD831A00)**

Quad 2 Input AND

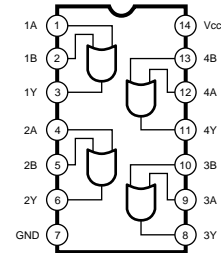
DM: IC 12



● **TC74VHC32F (XR337A00)**

Quad 2 Input OR

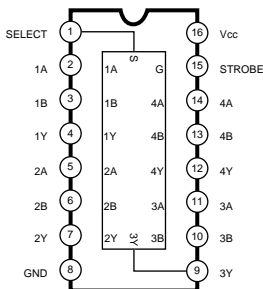
DM: IC 13



● **TC74HC157AF-TP1 (XH603A00)**

Quad 2 to 1 Multiplexer

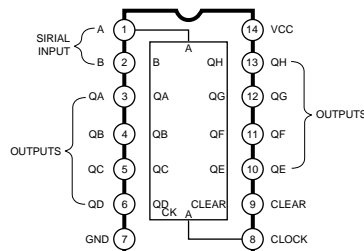
DM: IC 21



● **TC74HC164AF (XQ967A00)**

8-Bit Shift Register

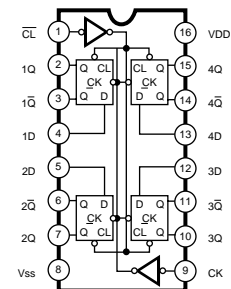
DM: IC 9



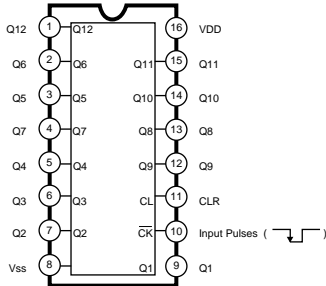
● **TC74HC175AF-TP1 (XD658A00)**

Quad D-Type Flip-Flop

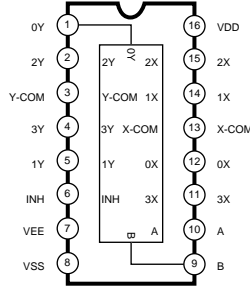
DM: IC 10



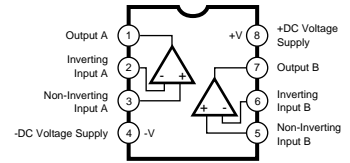
- **TC74HC4040F** (XR684A00)
12-Stage Binary Ripple Counter
DM: IC 8



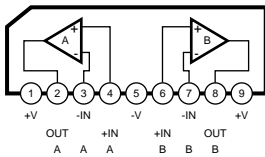
- **TC74HC4052AF** (XS790A00)
Differential 4-Channel Multiplexer/Demultiplexer
DM: IC 19, 20



- **NE5532P** (IG102500)
NJM4556AD (XQ824A00)
Dual Operational Amplifier
DM: IC 1, 2, 4-6



- **NJM072D** (IG107000)
Dual Operational Amplifier
MAIN: IC 201, 202



■ SELF CHECK AND INSPECTIONS

PREPARATIONS

1. If no specific frequency is required, set the test frequency at 1 kHz.
2. Before turning the [POWER] switch on, set the Idling Adjustment Volume (VR201, 1 k ohms) on the MAIN circuit board at minimum.
3. Before turning the [POWER] switch on, set all the knobs at the center position.

SELF CHECK MODE

SET-UP: While pressing the SW2 switch on the DM circuit board, turn the [POWER] switch on. The self check mode program will be started.

0. LED Check

When the DG60-112 enters the self check mode, the LED check is started and the LEDs light automatically as the check follows the circular sequence below, while pressing the SW2 switch.

→ all LEDs on → all LEDs off → A ch LED on → B ch LED on → all LEDs off →

When the SW2 switch on the DM circuit board is released, the check will proceed to the next SW check after all LEDs light-up and the LED check is finished.

1. SW Check

CHANNEL SELECT SWITCH (A/B)

If the channel select switch is turned on (selected B ch) when a plug is not inserted into the CH SELECT jack (JK5), A ch LED will light.

CH SELECT (JK5)

When a plug is inserted into the CH SELECT jack (JK5), the channel select function will go out and the A ch LED will light. Removing the plug will make the A ch LED go out.

REVERB (JK4)

When a plug is inserted into the REVERB jack (JK4), B ch LED will light. Removing the plug will make the B ch LED go out.

SP MUTE (SW3)

When the SP MUTE switch (SW3) is pressed, both the A ch and B ch LEDs will go out.

When the SW2 switch on the DM circuit board is pressed, the check will proceed to the next Volume check after all the LEDs light-up and the SW check is finished.

2. Volume Check

This volume check can be tested in the order below from 1 to 18.

1. A ch AMP SELECT (CN3-1 pin)
2. A ch GAIN (CN3-2 pin)
3. A ch MASTER (CN3-3 pin)
4. A ch TREBLE (CN3-4 pin)
5. A ch HIGH MID (CN3-5 pin)
6. A ch LOW MID (CN3-6 pin)
7. A ch BASS (CN3-7 pin)
8. A ch PRESENCE (CN3-8 pin)
9. A ch REVERB (CN3-9 pin)
10. B ch AMP SELECT (CN4-1 pin)
11. B ch GAIN (CN4-2 pin)
12. B ch MASTER (CN4-3 pin)
13. B ch TREBLE (CN4-4 pin)
14. B ch HIGH MID (CN4-5 pin)
15. B ch LOW MID (CN4-6 pin)
16. B ch BASS (CN4-7 pin)
17. B ch PRESENCE (CN4-8 pin)
18. B ch REVERB (CN4-9 pin)

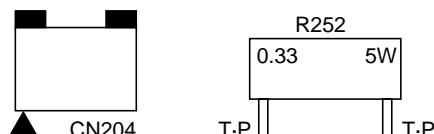
When fully turning the check volume knob counterclockwise, the A ch LED (CN5-2 pin) will light; when fully turning it clockwise, the B ch LED (CN5-3) will light. If the volume is no good, both the A ch and B ch LEDs (CN5-2, 3 pin) will light to indicate the error.

Each press of the switch (SW2) will proceed to the next volume check after lighting both the A ch and B ch LEDs. Press the switch (SW2) after finishing the volume checks to proceed to the next Sound Check. When cancelling a test during a check, hold down on the switch (SW2) for a few seconds. The A ch and B ch LEDs will then go out, re-light, then the test will be cancelled.

3. Sound Check (Power Amplifier Adjustment)

3-1 Idling Adjustment

- 1) Before turning the [POWER] switch on, set the Idling Adjustment Volume (VR201, 1 k ohms) on the MAIN circuit board at minimum.
- 2) Press the channel select switch and select the B ch.
- 3) Connect an 8 ohm load between the speaker terminals BT202 and BT203.
- 4) Set the B ch MASTER volume at minimum.
- 5) After turning the POWER switch on, adjust the Idling Adjustment Volume (VR201) to set the voltage of the terminals of the CN204 or R252 at 5 mV +/- 1 mV.



3-2 Sound Check

This Sound Check is performed by using a signal that goes through the following circuits: the analog circuit, the A/D converter, the DSP-3 and the D/A converter.

This check should be performed after the VOLUME check has finished and when both the A ch and B ch LEDs (CN5-2, 3) are lit.

	Items	Conditions	Responses (standards)
1	Input Sensitivity (High)	1 kHz, -20 dBm, 8 ohms load	+25 dBm +/-2 dB
2	Input Sensitivity (Low)	1 kHz, -10 dBm, 8 ohms load	+25 dBm +/-2 dB
3	RETURN Level (0 dB)	1 kHz, -2 dBm, 8ohms load (SW1: 0 dB)	+28 dBm +/-2 dB
4	RETURN Level (-20 dB)	1 kHz, -22 dBm, 8ohms load (SW1: 20 dB)	+28 dBm +/-2 dB
5	SEND Level (0 dB)	1 kHz, -20 dBm, 100 kohms SEND load (SW1: 0 dB)	-3 dBm +/-2 dB
6	SEND Level (-20 dB)	1 kHz, -20 dBm, 100 kohms LINE OUT load	+2 dBm +/-2 dB
7	Frequency Response (HIGH IN)	-30 dBm Input, 1 kHz standard SP Output Terminals: 8 ohms load	100 Hz: -0.5 +/-1 dB 10 kHz: -0.5 +/-1 dB
8	Remain Noise	TRIM, OUTPUT VR MIN IHF A net	Less than -60 dBm
9	Sensitivity of LED for Input Level	1 kHz, -10 dBm, 8 ohms load	-10 dBm Input: no light +50 dBm Input: lit
10	Output	RETURN, 10 % THD	More than +28 dBm (50 W) 8 ohms load

* 0 dBm = 0.775 V

When Sound Check is completed, turn the [POWER] switch off to quit the self check mode.

GUITAR AMPLIFIER

DG60-112

PARTS LIST


■ CONTENTS

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Notes : DESTINATION ABBREVIATIONS

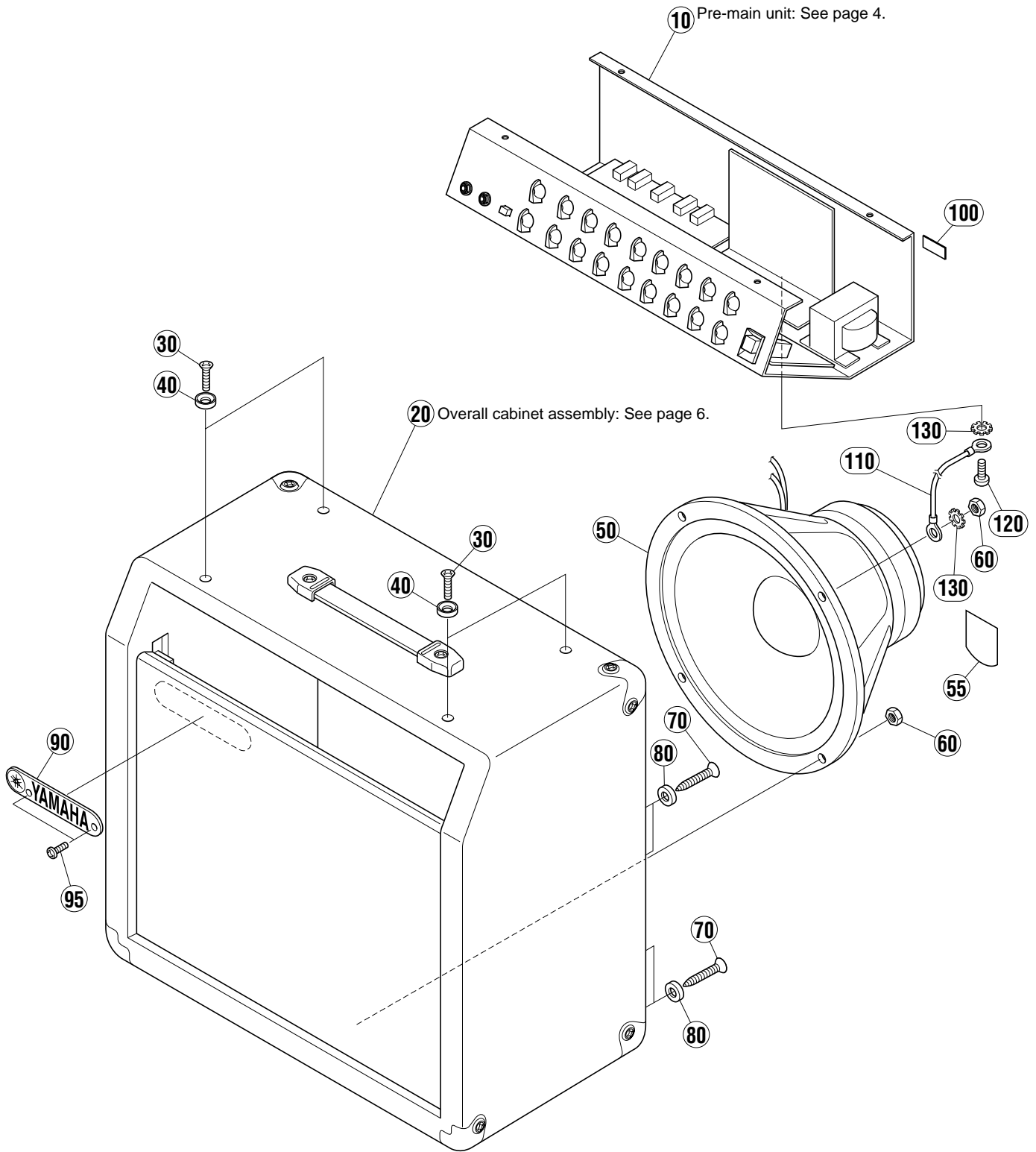
A: Australian model	M: South African model
B: British model	O: Chinese model
C: Canadian model	Q: South-east Asia model
D: German model	T: Taiwan model
E: European model	U: U.S.A. model
F: French model	V: General export model (110 V)
H: North European model	W: General export model (220 V)
I: Indonesian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

■ WARNING

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

- The numbers in "QTY" show quantities for each unit.
- The parts with "--" in "PART NO." are not available as spare parts.
- The mark "}" in the remarks column indicates that these parts are interchangeable.
- The second letter of the shaded () part number is O, not zero.
- The second letter of the shaded () part number is I, not one.

OVERALL ASSEMBLY

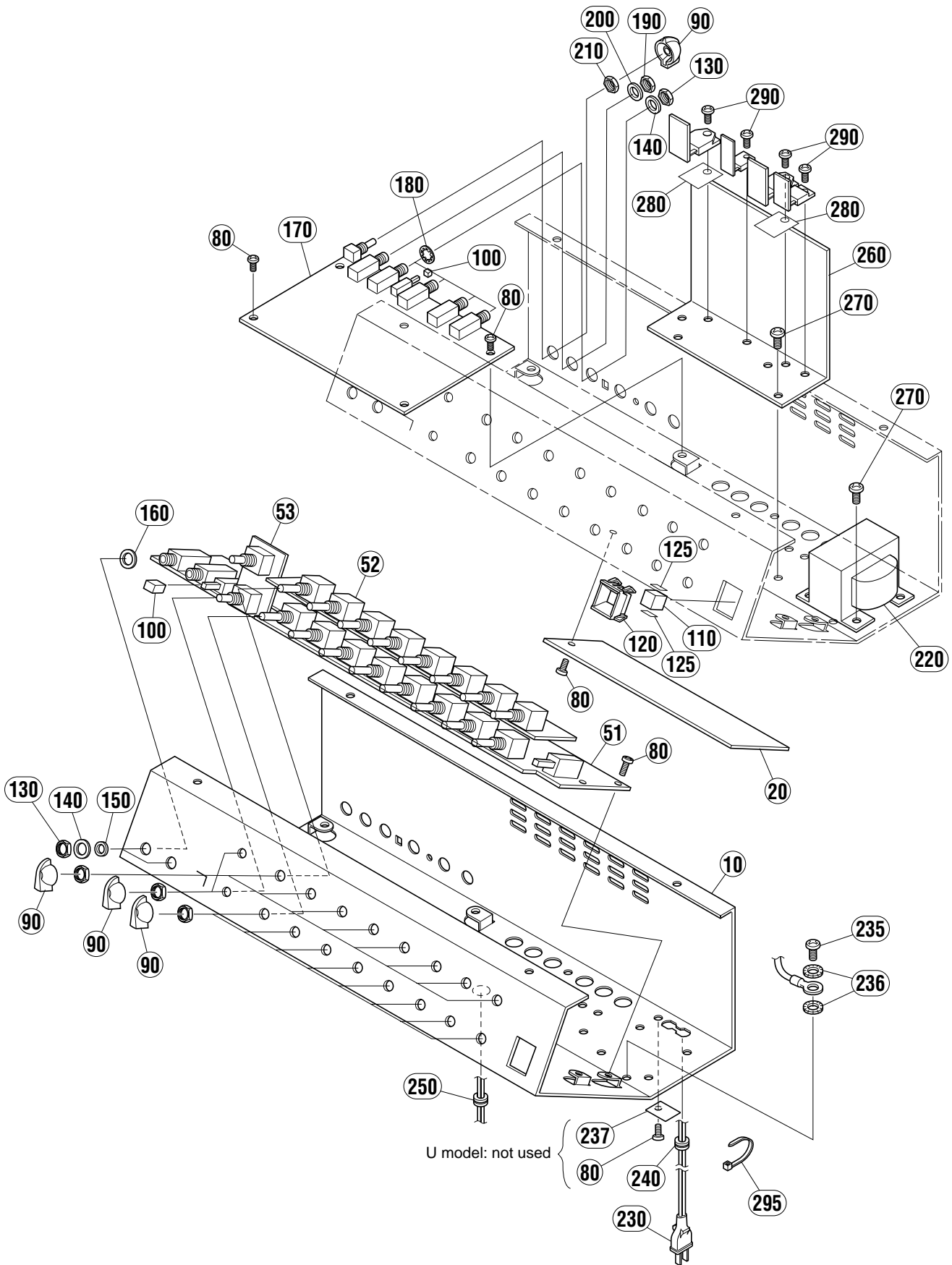


REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
		OVERALL ASSEMBLY		DG60-112		
	--	Overall Assembly		J (V369020)		
	--	Overall Assembly		U (V369030)		
	--	Overall Assembly		H (V369040)		
	--	Overall Assembly		B (V369050)		
10	--	Pre-main Unit		J (V369130)		
10	--	Pre-main Unit		U (V369140)		
10	--	Pre-main Unit		H (V369150)		
10	--	Pre-main Unit		B (V369160)		
* 20	V3691700	Overall Cabinet Assembly				
30	VP104600	Oval Head Screw	5.0X35 MFC2BL	(V374930)	4	
40	EW300020	Washer	5S MFC2BL		4	01
* 50	XW018A00	Speaker	EMINENCE 1217F3831			
* 60	03760900	Hexagonal Nut	4.0 MFZN2Y		4	
70	EN240090	Oval Head Tapping Screw-1	4.0X30 MFC2BL	(V374940)	8	
80	VB890200	Washer	4S MFC2BL		8	01
90	V2237300	Name Plate				09
95	V3623800	Truss Head Tapping Screw-1	3.0X10 FCM3-BL		2	
100	--	Label		U (VA03930)		03
110	--	Connector Assembly	SP frame	U (V374010)		
* 120	VC688900	Bind Head Tapping Screw-C	A4.0X8 MFZN2BL	U		
130	ET900050	Toothed Lock Washer-B	4.0 MFZN2BL	U	2	01

*: New Parts

RANK: Japan only

PRE-MAIN UNIT

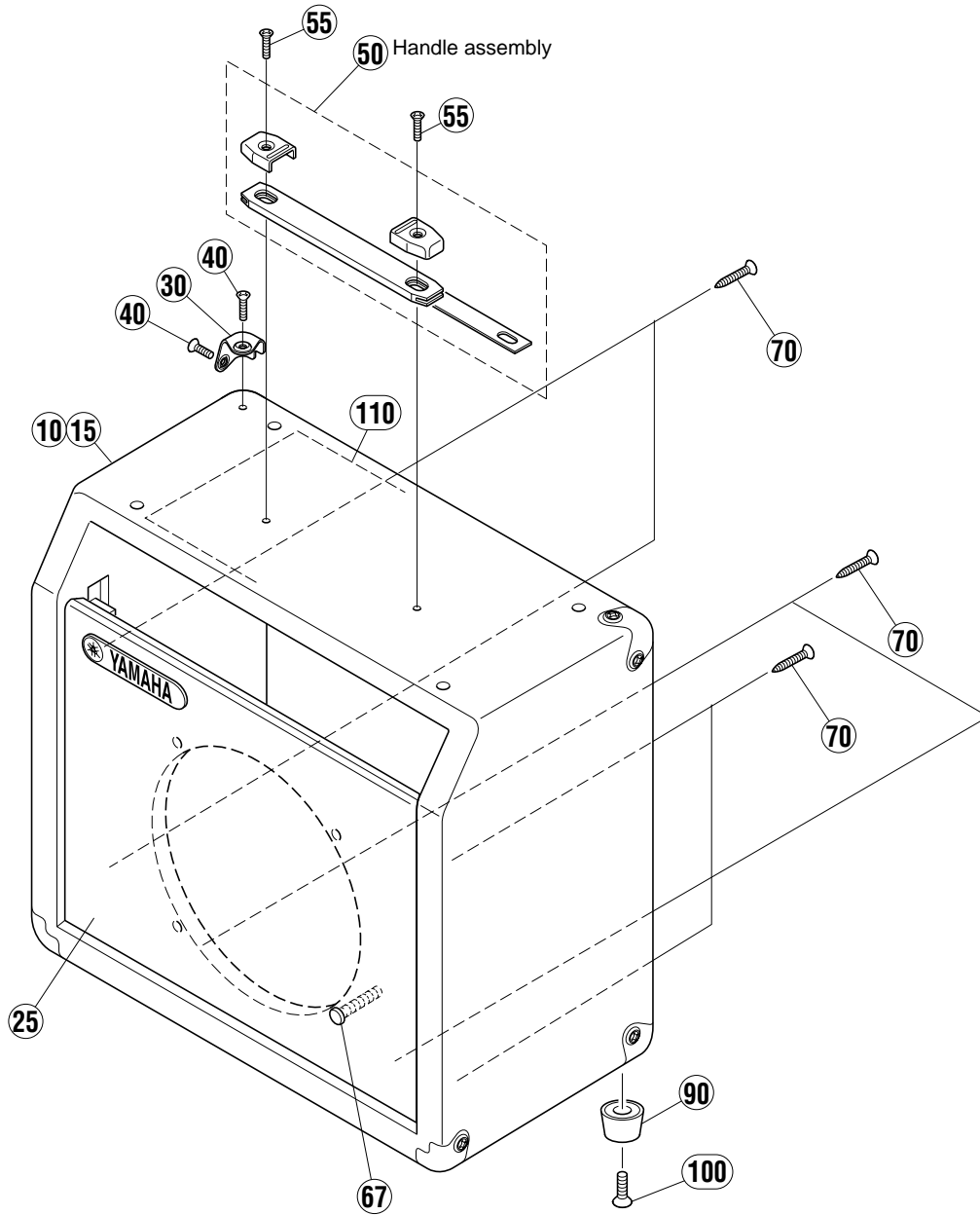


REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
		PRE-MAIN UNIT		DG60-112		
	--	Pre-main Unit		J (V369130)		
	--	Pre-main Unit		U (V369140)		
	--	Pre-main Unit		H (V369150)		
	--	Pre-main Unit		B (V369160)		
* 10	V3692500	Chassis		J		
* 10	V3817700	Chassis		U		
* 10	V3817800	Chassis		H,B		
* 20	V3755700	Insulation Sheet				
* 51	AAX07370	Circuit Board	MAIN	J,U		
* 51	AAX07380	Circuit Board	MAIN	H,B		
* 52	AAX07370	Circuit Board	A-CH			
* 53	AAX07380	Circuit Board	SW			
80	EP600190	Bind Head Tapping Screw-B	3.0X8 MFZN2BL	J,H,B	13	01
80	EP600190	Bind Head Tapping Screw-B	3.0X8 MFZN2BL	U	12	01
* 90	V3694100	Volume Knob (CH)		GAIN,....REVERB,BLEND	19	
100	VZ429100	Button (S)	GY	A/B channel select switch	2	01
				EFFECT SEND/RETURN level SW		
110	VU859000	Power Switch Knob		POWER		01
120	VU859100	Escutcheon, Power Switch				02
* 125	V4126900	Film, Power Switch	13X8X0.15		2	
130	LX200060	Hexagonal Nut	9.0 12X2 MFNI33		6	01
140	VL802300	Flat Washer	9X14 0.5 FNM33		6	01
* 150	V3630000	Insulation Nut			2	
* 160	V3630100	Spacer			2	
* 170	V3732600	Circuit Board	DM			
180	ET800150	Toothed Lock Washer-A	9.0 MFZN2Y		4	01
190	VD794100	Hexagonal Nut	12.0 14X2 MFC2BL			01
200	VB004700	Flat Washer	12S MFC2BL			01
210	VJ388000	Hexagonal Nut	9.0 11X2 MFZN2BL			01
△ * 220	XV965A00	Power Transformer		J		
△ * 220	XV966A00	Power Transformer		U		
△ * 220	XV967A00	Power Transformer		H,B		
△ 230	VZ461100	AC Cord	2X0.75 7A VCTF	J		05
△ 230	VV205600	AC Cord	3X#18 10A SJT	U		06
△ 230	VV058200	AC Cord	H05VV-F3X0.75 6A	H		06
△ 230	VV058300	AC Cord	H05VV-F3X0.75	B		08
235	EL200020	Pan Head Screw	SP 4.0X8 MFZN2Y	U,H,B		01
236	ET900050	Toothed Lock Washer-B	4.0 MFZN2BL	U,H,B		01
* 237	V4491100	Isolation Sheet		J,H,B		
240	VV103000	Cord Strain Relief	SR-5R1	J,H,B		01
240	VV103100	Cord Strain Relief	SR-6P1	U		01
* 250	V3634000	Cord Strain Relief	SR-4N-4 HEYCO			
* 260	V3693100	Heat Sink				
* 270	VC688900	Bind Head Tapping Screw-C	A4.0X8 MFZN2BL		8	
* 280	V3637600	Insulation Sheet	T=0.15		2	
290	VB763800	Bind Head Screw	SP 3.0X12 MFZN2Y		4	01
295	VV104600	Cord Holder			4	01

*: New Parts

RANK: Japan only

OVERALL CABINET ASSEMBLY



REF. NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
*	V3691700	OVERALL CABINET ASSEMBLY		DG60-112		
10	--	Cabinet Assembly		(V369420)		
15	--	Vinyl		(V369430)		
25	--	Speaker Net		(V369860)		
*	V3694400	Corner Protector			6	
*	V3833600	Round Head Tapping Screw-1	3.5X16 MFNI33		12	
*	V3630300	Handle Assembly				
*	V3743700	Oval Head Screw	5.0X25 FNM3-2B		2	
*	V3749500	Screw	4.0X40 MFC2BL		4	
	03747400	Truss Head Tapping Screw-1	4.0X30 MFZN2Y		6	01
	VV085600	Leg			4	01
	03747290	Truss Head Tapping Screw-1	4.0X20 MFZN2BL		4	01
*	V3694800	Shield Sheet				

*: New Parts

RANK: Japan only

ELECTRICAL PARTS

REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
		ELECTRICAL PARTS		DG60-112		
*	V3732600	Circuit Board	DM	(XV996A0)		
*	AAX07370	Circuit Board	MAIN	J,U (XV964B0)		
*	AAX07380	Circuit Board	MAIN	H,B (XV964B0)		
*	AAX07370	Circuit Board	A-CH	(XV964B0)		
*	AAX07380	Circuit Board	SW	(XV964B0)		
*	V3732600	Circuit Board	DM	(XV996A0)		
*	C1 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
	C2 FG651100	Ceramic Capacitor-SL	10P 50V D			01
	C3 UA355100	Mylar Capacitor	0.1000 50V J			01
	C4 UA355100	Mylar Capacitor	0.1000 50V J			01
	C5 FG651220	Ceramic Capacitor-SL	22P 50V J			01
	C6 UA353100	Mylar Capacitor	1000P 50V J			01
*	C7 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
	C8 FG651680	Ceramic Capacitor-SL	68P 50V J			01
	C9 FG651220	Ceramic Capacitor-SL	22P 50V J			01
	C10 UA353100	Mylar Capacitor	1000P 50V J			01
	C11 UR847100	Electrolytic Cap.	10.00 25.0V			01
	C12 VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
	C14 UR847100	Electrolytic Cap.	10.00 25.0V			01
	-17 UR847100	Electrolytic Cap.	10.00 25.0V			01
	C18 VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
	C19 UR847100	Electrolytic Cap.	10.00 25.0V			01
	C20 VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
	C21 VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
	C22 UR847100	Electrolytic Cap.	10.00 25.0V			01
*	C23 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
	C24 UR847100	Electrolytic Cap.	10.00 25.0V			01
	C25 FG651220	Ceramic Capacitor-SL	22P 50V J			01
*	C26 UN857470	Electrolytic Cap.-BP	47.00 35.0V			
	C27 FG613100	Ceramic Capacitor-B	1000P 50V K			01
*	C28 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
*	C29 UN857470	Electrolytic Cap.-BP	47.00 35.0V			
	C30 FG613100	Ceramic Capacitor-B	1000P 50V K			01
*	C31 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
	C32 UR847100	Electrolytic Cap.	10.00 25.0V			01
	C33 FG651220	Ceramic Capacitor-SL	22P 50V J			01
*	C34 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
*	C35 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
	C36 UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
	C37 FG651220	Ceramic Capacitor-SL	22P 50V J			01
*	C38 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
	C39 UR847100	Electrolytic Cap.	10.00 25.0V			01
	C40 FG652100	Ceramic Capacitor-SL	100P 50V J			01
*	C41 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
	C42 FG651220	Ceramic Capacitor-SL	22P 50V J			01
*	C43 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
*	C44 UN857100	Electrolytic Cap.-BP	10.00 35.0V			
	C45 UR847100	Electrolytic Cap.	10.00 25.0V			01
	C46 VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
	C47 VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
	C48 UR848100	Electrolytic Cap.	100.00 25.0V			01
	C49 UR848100	Electrolytic Cap.	100.00 25.0V			01
	C50 UR847100	Electrolytic Cap.	10.00 25.0V			01
	-55 UR847100	Electrolytic Cap.	10.00 25.0V			01
	C56 UR848100	Electrolytic Cap.	100.00 25.0V			01
	C57 VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
	C58 VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
	C59 UR848100	Electrolytic Cap.	100.00 25.0V			01
	C60 VJ899000	Monolithic Ceramic Cap.	CH 5P 50V C			01
	C61 VJ899000	Monolithic Ceramic Cap.	CH 5P 50V C			01
	C62 UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
	-65 UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
	C66 UR828100	Electrolytic Cap.	100.00 10.0V			01
	C67 UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
	C68 UR828100	Electrolytic Cap.	100.00 10.0V			01
	C69 UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
	-72 UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
	C73 UR828100	Electrolytic Cap.	100.00 10.0V			01

*: New Parts

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REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
C74	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C75	UR828100	Electrolytic Cap.	100.00 10.0V			01
C76	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-78	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C79	UR847100	Electrolytic Cap.	10.00 25.0V			01
C80	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C81	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C82	UR847100	Electrolytic Cap.	10.00 25.0V			01
C83	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-85	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C86	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
C87	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C88	UR847100	Electrolytic Cap.	10.00 25.0V			01
C89	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C90	UR847100	Electrolytic Cap.	10.00 25.0V			01
C91	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-93	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C94	UR828100	Electrolytic Cap.	100.00 10.0V			01
C95	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
C96	VD930900	Semiconductive Cera. Cap.	0.1000 25V M			01
C97	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
-118	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01
CN1	VB389800	Connector Base Post	PH- 2P TE			01
CN2	LB918060	Base Post Connector	XH 6P TE			01
CN3	VB390500	Connector Base Post	PH- 9P TE			03
CN4	VB390600	Connector Base Post	PH-10P TE			01
CN5	VB389900	Connector Base Post	PH- 3P TE			01
CN6	LB918030	Base Post Connector	XH 3P TE			01
D1	VB941200	Diode	1SS133,1SS176			01
D2	VB941200	Diode	1SS133,1SS176			01
EM1	FZ006970	LC Filter	LS MT Y223NB			02
-5	FZ006970	LC Filter	LS MT Y223NB			02
IC1	IG102500	IC	NE5532P	OP AMP		06
IC2	IG102500	IC	NE5532P	OP AMP		06
IC3	XT802A00	IC	AK4520A-VF-E2	ADC/DAC		07
IC4	XQ824A00	IC	NJM4556AD	OP AMP		02
IC5	IG102500	IC	NE5532P	OP AMP		06
IC6	IG102500	IC	NE5532P	OP AMP		06
IC7	XA507A00	IC	AN78N05	REGULATOR +5V		02
IC8	XR684A00	IC	TC74HC4040F	COUNTER		03
IC9	XQ967A00	IC	TC74HC164AF	SHIFT REGISTER		03
IC10	XD658A00	IC	TC74HC175AF-TP1	D-FF		02
IC11	XD660A00	IC	TC74HCU04AF-TP1	INVERTER		01
IC12	XD831A00	IC	SN74HC08NSR	AND		01
IC13	XR337A00	IC	TC74VHC32F	OR		01
IC14	XQ962D00	IC	YSS228E-F	DSP3		20
IC15	XQ962D00	IC	YSS228E-F	DSP3		20
IC16	XV077A00	IC	MSM514260C-60JS	} DRAM 4M		07
IC16	XV839A00	IC	SDM4260CLU-6S			
* IC17	XW325100	IC	HD6433042SC10FP	MASK CPU		
* IC18	XV995A00	IC	PST592D-MMP4P	RESET		
IC19	XS790A00	IC	TC74HC4052AF	MULTIPLEXER		02
IC20	XS790A00	IC	TC74HC4052AF	MULTIPLEXER		02
IC21	XH603A00	IC	TC74HC157AF-TP1	DATA SELECTOR		03
J1	VA078900	Jumper Wire	0.55 6mm			
J2	VA078900	Jumper Wire	0.55 6mm			
J4	VA078900	Jumper Wire	0.55 6mm			
-6	VA078900	Jumper Wire	0.55 6mm			
* JK1	V3669200	Phone Jack	HLJ2306-01-30 MONO	EFFECT RETURN		
JK2	LB301800	Phone Jack	HLJ0544-01-11 MONO	EFFECT SEND		03
JK3	LB302070	Phone Jack	HLJ0544-01-010 ST.	LINE OUT/PHONES		03
JK4	LB301800	Phone Jack	HLJ0544-01-11 MONO	FOOT SW REVERB		03
JK5	LB301800	Phone Jack	HLJ0544-01-11 MONO	FOOT SW CH SELECT		03
R1	VA074400	Metal Film Resistor	10.0K 1/5 F			01
R2	VB068100	Metal Film Resistor	22.0K 1/5 F			01
R3	HF757100	Carbon Resistor	10.0K 1/4 J			01
R4	HF757100	Carbon Resistor	10.0K 1/4 J			01
R5	HF756560	Carbon Resistor	5.6K 1/4 J			01
R6	HF756560	Carbon Resistor	5.6K 1/4 J			01
R7	HF755470	Carbon Resistor	470.0 1/4 J			01

*: New Parts

RANK: Japan only

REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
R8	HF755470	Carbon Resistor	470.0 1/4 J			01
R9	VA074400	Metal Film Resistor	10.0K 1/5 F			01
R10	VB064100	Metal Film Resistor	470.0 1/5 F			01
R11	VB066500	Metal Film Resistor	2.7K 1/5 F			01
R12	HF756560	Carbon Resistor	5.6K 1/4 J			01
R13	HF756560	Carbon Resistor	5.6K 1/4 J			01
R14	HF755470	Carbon Resistor	470.0 1/4 J			01
R15	HF755470	Carbon Resistor	470.0 1/4 J			01
R16	HF756470	Carbon Resistor	4.7K 1/4 J			01
R17	HF754330	Carbon Resistor	33.0 1/4 J			01
R18	HF756470	Carbon Resistor	4.7K 1/4 J			01
R19	HF753470	Carbon Resistor	4.7 1/4 J			01
R20	HF756100	Carbon Resistor	1.0K 1/4 J			01
R21	HF757270	Carbon Resistor	27.0K 1/4 J			01
R22	HF757100	Carbon Resistor	10.0K 1/4 J			01
R23	HF757100	Carbon Resistor	10.0K 1/4 J			01
R24	HF756100	Carbon Resistor	1.0K 1/4 J			01
R25	HF754470	Carbon Resistor	47.0 1/4 J			01
R26	HF758100	Carbon Resistor	100.0K 1/4 J			01
R27	HF758100	Carbon Resistor	100.0K 1/4 J			01
R28	HF754470	Carbon Resistor	47.0 1/4 J			01
R29	HF758100	Carbon Resistor	100.0K 1/4 J			01
R30	HF757100	Carbon Resistor	10.0K 1/4 J			01
R31	HF757100	Carbon Resistor	10.0K 1/4 J			01
R32	HF756100	Carbon Resistor	1.0K 1/4 J			01
R33	HF757270	Carbon Resistor	27.0K 1/4 J			01
R34	HF757100	Carbon Resistor	10.0K 1/4 J			01
R35	HF756220	Carbon Resistor	2.2K 1/4 J			01
R36	HF756100	Carbon Resistor	1.0K 1/4 J			01
R37	HF756100	Carbon Resistor	1.0K 1/4 J			01
R38	HF758100	Carbon Resistor	100.0K 1/4 J			01
R39	HF755100	Carbon Resistor	100.0 1/4 J			01
R40	HF757100	Carbon Resistor	10.0K 1/4 J			01
-44	HF757100	Carbon Resistor	10.0K 1/4 J			01
R45	HF756100	Carbon Resistor	1.0K 1/4 J			01
R46	HF757100	Carbon Resistor	10.0K 1/4 J			01
R47	HF758100	Carbon Resistor	100.0K 1/4 J			01
R48	HF758220	Carbon Resistor	220.0K 1/4 J			01
R49	HF757220	Carbon Resistor	22.0K 1/4 J			01
R50	HF758220	Carbon Resistor	220.0K 1/4 J			01
R51	HF757100	Carbon Resistor	10.0K 1/4 J			01
R52	HF758470	Carbon Resistor	470.0K 1/4 J			01
R53	HF757100	Carbon Resistor	10.0K 1/4 J			01
R54	HF756470	Carbon Resistor	4.7K 1/4 J			01
R55	HF756100	Carbon Resistor	1.0K 1/4 J			01
R56	HF757100	Carbon Resistor	10.0K 1/4 J			01
R57	HF758100	Carbon Resistor	100.0K 1/4 J			01
R58	RD259100	Carbon Resistor (chip)	1.0M 0.1 J			01
R59	RD255680	Carbon Resistor (chip)	680.0 0.1 J			01
R60	RD255220	Carbon Resistor (chip)	220.0 0.1 J			01
R61	RD255270	Carbon Resistor (chip)	270.0 0.1 J			01
R62	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
-65	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
R66	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
R67	VB066700	Metal Film Resistor	3.3K 1/5 F			01
RA1	RE047100	Resistor Array	10KX4			01
-19	RE047100	Resistor Array	10KX4			01
SW1	VR140800	Push Switch	SPPJ2-EN-PW	EFFECT SEND/RETURN Level SW		03
SW2	VN121700	Push Switch	SKHHP	TEST		01
* SW3	V3669300	Tact Switch	SKHHLWA010	SP MUTE		01
TR1	IC287820	Transistor	2SC2878 A,B			01
-5	IC287820	Transistor	2SC2878 A,B			01
* VR1	V3739600	Rotary Variable Resistor	RK09L1120 20KB	EFFECT BLEND		01
X1	VN277000	Quartz Crystal Unit	24.576M AF3817CQA			03
X2	VU682100	Quartz Crystal Unit	30.00MHz DOC-49S2			06
ZD1	VQ454300	Zener Diode	MTZJ2.0A 2.0V			01
ZD2	VQ454300	Zener Diode	MTZJ2.0A 2.0V			01
*	AAX07370	Circuit Board	MAIN	J,U (XV964B0)		
*	AAX07380	Circuit Board	MAIN	H,B (XV964B0)		

*: New Parts

RANK: Japan only

REFNO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
*	AA07370	Circuit Board	A-CH	(XV964B0)		
*	AA07380	Circuit Board	SW	(XV964B0)		
*	V3690100	LED Holder	LED3-4A		2	
	VV319600	Fuse Holder	CQ-05CT		8	01
	VV291400	Jumper Wire	0.60		41	01
BT201	--	Cable Kit	#18 1P L 100	(V363230)		
BT202	--	Connector Assembly	SP #18 2P L 300	(V363240)		
C201	VV321100	Monolithic Mylar Capacitor	0.22 50V J			01
C202	VZ353500	Ceramic Capacitor-SL	100P 50V J			01
C203	UJ847100	Electrolytic Cap.	10.00 25.0V			01
C204	VV321100	Monolithic Mylar Capacitor	0.22 50V J			01
C205	VZ354600	Monolithic Ceramic Cap.	0.10 50V Z			01
C206	VZ353500	Ceramic Capacitor-SL	100P 50V J			01
C207	UJ847100	Electrolytic Cap.	10.00 25.0V			01
-209	UJ847100	Electrolytic Cap.	10.00 25.0V			01
C210	UJ847100	Electrolytic Cap.	10.00 25.0V			01
C211	VZ353500	Ceramic Capacitor-SL	100P 50V J			01
C212	UJ866470	Electrolytic Cap.	4.70 50.0V			01
C213	VV062800	Mylar Capacitor	0.1 50V J			01
C214	UJ847100	Electrolytic Cap.	10.00 25.0V			01
C215	UJ847100	Electrolytic Cap.	10.00 25.0V			01
△ C216	VV520600	Capacitor	0.01 400V J.U.C.S			02
C217	UJ866100	Electrolytic Cap.	1.00 50.0V			01
C218	UJ866470	Electrolytic Cap.	4.70 50.0V			01
* C219	V3632700	Polypropylene Capacitor	0.022U/250V			
* C220	V3632700	Polypropylene Capacitor	0.022U/250V			
* C221	V3632800	Electrolytic Cap.-LP	3300U 50V SNAP IN			
* C222	V3632800	Electrolytic Cap.-LP	3300U 50V SNAP IN			
C223	UJ847100	Electrolytic Cap.	10.00 25.0V			01
C224	UJ847100	Electrolytic Cap.	10.00 25.0V			01
C225	VZ354000	Ceramic Capacitor-F	0.0100 50V Z			01
C226	VZ354000	Ceramic Capacitor-F	0.0100 50V Z			01
C227	VZ354600	Monolithic Ceramic Cap.	0.10 50V Z			01
C228	UJ639220	Electrolytic Cap.	2200 16.0V			02
C229	UJ639220	Electrolytic Cap.	2200 16.0V			02
C230	VZ354000	Ceramic Capacitor-F	0.0100 50V Z			01
C231	VZ354000	Ceramic Capacitor-F	0.0100 50V Z			01
C232	UJ847100	Electrolytic Cap.	10.00 25.0V			01
C233	UJ866100	Electrolytic Cap.	1.00 50.0V			01
C234	VZ353900	Ceramic Cap.-B	1000P 50V K			01
C235	UJ867470	Electrolytic Cap.	47.00 50.0V			01
-237	UJ867470	Electrolytic Cap.	47.00 50.0V			01
C238	VZ353600	Ceramic Cap.-B	220P 50V K			01
C239	VZ353500	Ceramic Capacitor-SL	100P 50V J			01
C240	VZ353600	Ceramic Cap.-B	220P 50V K			01
C241	UJ858100	Electrolytic Cap.	100.00 35.0V			01
C242	VV062800	Mylar Capacitor	0.1 50V J			01
C243	VV062800	Mylar Capacitor	0.1 50V J			01
C244	VZ354600	Monolithic Ceramic Cap.	0.10 50V Z			01
-248	VZ354600	Monolithic Ceramic Cap.	0.10 50V Z			01
CN201	VG879900	Base Post Connector	VA- 2P TE			01
CN202	LB932040	Base Post Connector	VH- 4P TE			01
CN203	LB932050	Base Post Connector	VH- 5P TE			01
CN204	VV066200	Connector Base Post	2P TE			01
CN301	VV066400	Connector Base Post	4P TE			01
CN401	VV068000	Connector Base Post	6P SE			01
D201	VD631600	Diode	1SS133,176,HSS104			01
-205	VD631600	Diode	1SS133,176,HSS104			01
D206	IF005560	Diode	1SS82TD			01
D207	VD631600	Diode	1SS133,176,HSS104			01
△ DB201	VV518200	Diode Stack	PBU403 4.0A 200V			03
△ DB202	VQ379300	Diode Stack	S1VB20 1.0A 200V			02
FT201	IE000010	FET	2SK30ATM Y			03
△ FZ201	VV070600	Fuse	TDS 2A 250V	J,U		01
△ -203	VV070600	Fuse	TDS 2A 250V	J,U		01
△ FZ201	VV071200	Fuse	TSD 1A 250V	H,B		01
△ FZ202	VV071500	Fuse	TSD 2A 250V	H,B		01
△ FZ203	VV071500	Fuse	TSD 2A 250V	H,B		01
△ FZ204	VV070300	Fuse	TDS 1A 250V	J,U		01
△ FZ204	VV071200	Fuse	TSD 1A 250V	H,B		01

*: New Parts

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REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
IC201	IG107000	IC	NJM072D	OP AMP		04
IC202	IG107000	IC	NJM072D	OP AMP		04
△ IC203	XJ607A00	IC	NJM7805FA	REGULATOR +5V		02
* JK201	V3633400	Phone Jack	HTJ-064-12I	INPUT HIGH		
* JK202	V3633400	Phone Jack	HTJ-064-12I	INPUT LOW		
LD201	VV620800	LED	LT311G-41-C13 RE	INPUT peak indicator		01
LD401	VV620800	LED	LT311G-41-C13 RE	Channel indicator A		01
LD402	VV620800	LED	LT311G-41-C13 RE	Channel indicator B		01
R201	HF457100	Carbon Resistor	10.0K 1/4 J			01
R202	HF459100	Carbon Resistor	1.0M 1/4 J			01
R203	HF456470	Carbon Resistor	4.7K 1/4 J			01
R204	HF457270	Carbon Resistor	27.0K 1/4 J			01
R205	HF457100	Carbon Resistor	10.0K 1/4 J			01
R206	HF457100	Carbon Resistor	10.0K 1/4 J			01
R207	HF459100	Carbon Resistor	1.0M 1/4 J			01
R208	HF456470	Carbon Resistor	4.7K 1/4 J			01
R209	HF456470	Carbon Resistor	4.7K 1/4 J			01
R210	HF457100	Carbon Resistor	10.0K 1/4 J			01
R211	HF457100	Carbon Resistor	10.0K 1/4 J			01
R212	HF456470	Carbon Resistor	4.7K 1/4 J			01
R213	HF455100	Carbon Resistor	100.0 1/4 J			01
R214	HF456100	Carbon Resistor	1.0K 1/4 J			01
R215	HF457100	Carbon Resistor	10.0K 1/4 J			01
-218	HF457100	Carbon Resistor	10.0K 1/4 J			01
R219	HF456120	Carbon Resistor	1.2K 1/4 J			01
R220	HF458100	Carbon Resistor	100.0K 1/4 J			01
R221	HF456100	Carbon Resistor	1.0K 1/4 J			01
R222	HF457100	Carbon Resistor	10.0K 1/4 J			01
R223	HF458100	Carbon Resistor	100.0K 1/4 J			01
R224	HF457220	Carbon Resistor	22.0K 1/4 J			01
R225	HF456220	Carbon Resistor	2.2K 1/4 J			01
R226	HF458100	Carbon Resistor	100.0K 1/4 J			01
R227	HF458100	Carbon Resistor	100.0K 1/4 J			01
R228	HF456470	Carbon Resistor	4.7K 1/4 J			01
R229	HF456470	Carbon Resistor	4.7K 1/4 J			01
R230	HF458100	Carbon Resistor	100.0K 1/4 J			01
* R231	V3751900	Metal Oxide Film Resistor	180 5W J			
* -234	V3751900	Metal Oxide Film Resistor	180 5W J			
* R235	V3633200	Metal Oxide Film Resistor	2.2K 3W J			
R236	HF456220	Carbon Resistor	2.2K 1/4 J			01
R237	HF457560	Carbon Resistor	56.0K 1/4 J			01
R238	HF455470	Carbon Resistor	470.0 1/4 J			01
R239	HF457120	Carbon Resistor	12.0K 1/4 J			01
R240	HF456100	Carbon Resistor	1.0K 1/4 J			01
R241	HF456150	Carbon Resistor	1.5K 1/4 J			01
R242	HF456100	Carbon Resistor	1.0K 1/4 J			01
R243	HF457560	Carbon Resistor	56.0K 1/4 J			01
R244	HF456330	Carbon Resistor	3.3K 1/4 J			01
R245	HF456560	Carbon Resistor	5.6K 1/4 J			01
R246	HF456330	Carbon Resistor	3.3K 1/4 J			01
R247	HF456100	Carbon Resistor	1.0K 1/4 J			01
R248	HF455330	Carbon Resistor	330.0 1/4 J			01
R249	HF455330	Carbon Resistor	330.0 1/4 J			01
R250	VV276800	Flame Proof C. Resistor	100 1/4 J			01
R251	HF456220	Carbon Resistor	2.2K 1/4 J			01
* R252	V4480100	Wire Wound Resistor	0.33 5W J			
* R253	V4480100	Wire Wound Resistor	0.33 5W J			
* R254	V3632900	Metal Oxide Film Resistor	4.7 1W J			
* R255	V4480100	Wire Wound Resistor	0.33 5W J			
R401	HF455680	Carbon Resistor	680.0 1/4 J			01
R402	HF455680	Carbon Resistor	680.0 1/4 J			01
R403	HF456100	Carbon Resistor	1.0K 1/4 J			01
-416	HF456100	Carbon Resistor	1.0K 1/4 J			01
△ SW201	VV059400	Push Switch	SDDL11874-YL	POWER		03
* SW202	V3633600	Push Switch	SPPJ22SE01	A/B channel select switch		
* SW401	V3633800	Rotary Switch	SRBV18	Amp select switch A		
* SW402	V3633800	Rotary Switch	SRBV18	Amp select switch B		
TR201	IC1815M0	Transistor	2SC1815 Y,GR			01
TR202	IC1815M0	Transistor	2SC1815 Y,GR			01
TR203	IA101590	Transistor	2SA1015 O,Y			01

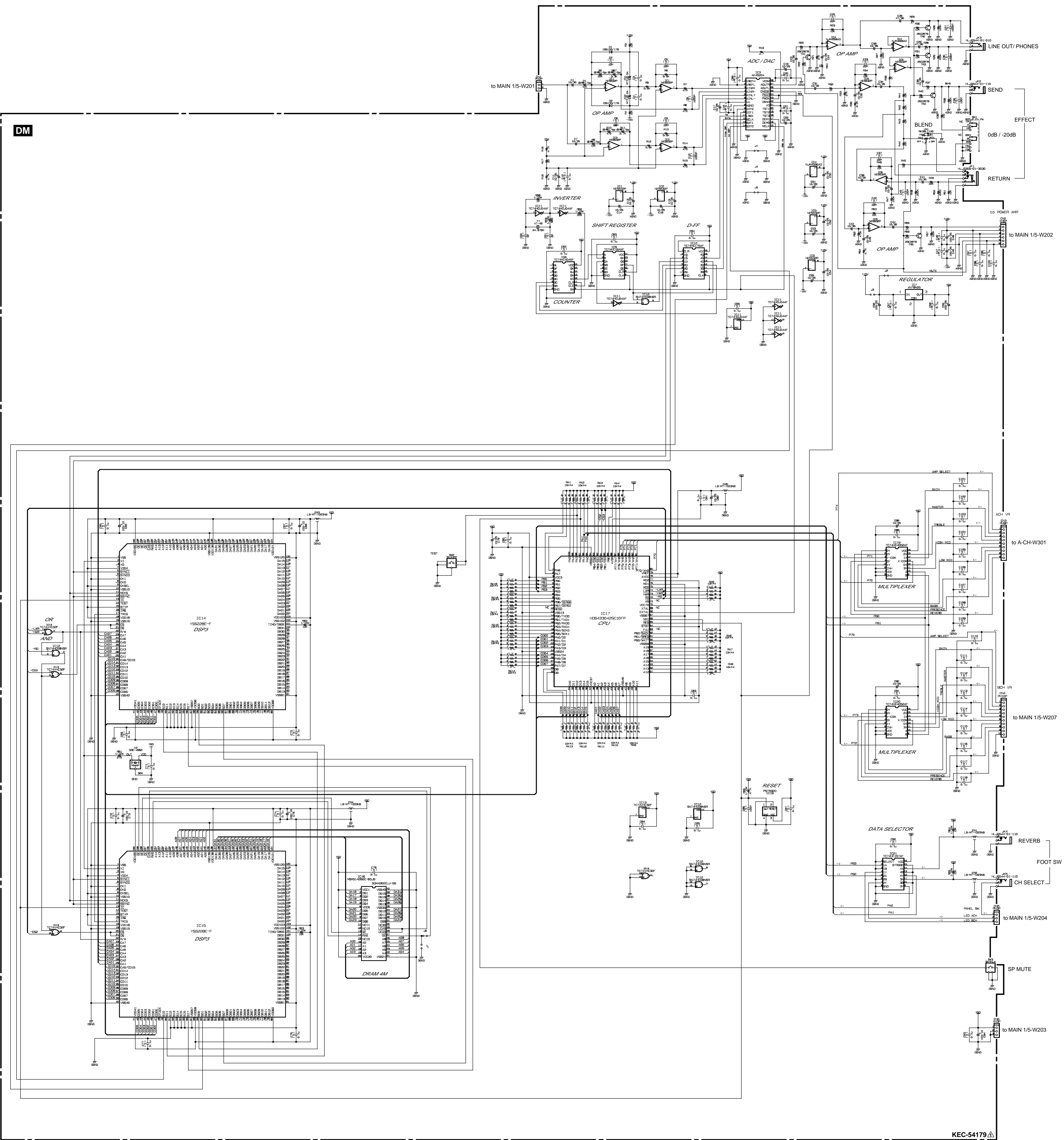
*: New Parts

RANK: Japan only

REF.NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
TR204	IA097030	Transistor	2SA970 GR,BL			01
TR205	IA097030	Transistor	2SA970 GR,BL			01
TR206	VE198800	Transistor	2SC2705 O,Y			01
TR207	IC342100	Transistor	2SC3421 O,Y			02
TR208	IA135800	Transistor	2SA1358 O,Y			02
TR209	VZ222300	Pair Transistor	A1492C3856(Z)(210)			06
TR210	IC342100	Transistor	2SC3421 O,Y			02
* VR201	V3633500	Trimmer Potentiometer	B 1K TB655MC			
* VR202	V3633700	Rotary Variable Resistor	RK09L1120 10KB	B CH GAIN,....REVERB		
* -209	V3633700	Rotary Variable Resistor	RK09L1120 10KB			
* VR301	V3633700	Rotary Variable Resistor	RK09L1120 10KB	A CH GAIN,....REVERB		
* -308	V3633700	Rotary Variable Resistor	RK09L1120 10KB			
W201	--	Cable Kit	B&C 2P L 50 2.0mm	(V363140)		
W202	--	Cable Kit	B&C 6P L110 2.5mm	(V363220)		
W203	--	Cable Kit	B&C 3P L130 2.5mm	(V363210)		
W204	--	Cable Kit	B&C 3P L 50 2.0mm	(V363160)		
W205	--	Cable Kit	B&C 4P L 80 2.0mm	(V363170)		
W206	--	Cable Kit	B&C 6P L100 2.0mm	(V363180)		
W207	--	Cable Kit	B&C 10P L 60 2.0mm	(V363200)		
W208	--	Cable Kit	B&B 3P L120 2.0mm	(V363150)		
W210	--	Cable Kit	B&B 3P L200 2.5mm	(V363250)		
W212	--	Cable Kit	B&B 3P L120 2.5mm	(V363260)		
W214	--	Cable Kit	B&B 3P L120 2.5mm	(V363260)		
W301	--	Cable Kit	B&C 9P L120 2.0mm	(V363190)		
ZD201	VG440800	Zener Diode	MTZ J 15.0B 15.0V			01
ZD202	VG440800	Zener Diode	MTZ J 15.0B 15.0V			01
* ZD203	V3752000	Zener Diode	3Z15 15V 3W			
* ZD204	V3752000	Zener Diode	3Z15 15V 3W			
* XW018A00	Speaker	EMINENCE 1217F3831				
△ *	XV965A00	Power Transformer		J		
△ *	XV966A00	Power Transformer		U		
△ *	XV967A00	Power Transformer		H,B		
△	VZ461100	AC Cord	2X0.75 7A VCTF	J		05
△	VV205600	AC Cord	3X#18 10A SJT	U		06
△	VV058200	AC Cord	H05VV-F3X0.75 6A	H		06
△	VV058300	AC Cord	H05VV-F3X0.75	B		08

*: New Parts

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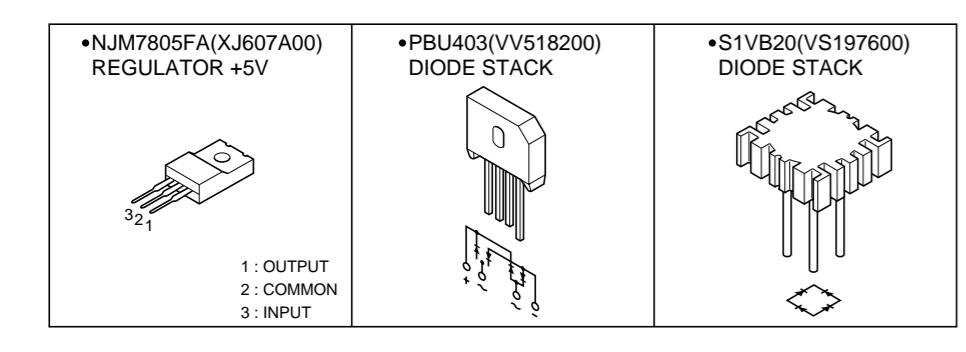
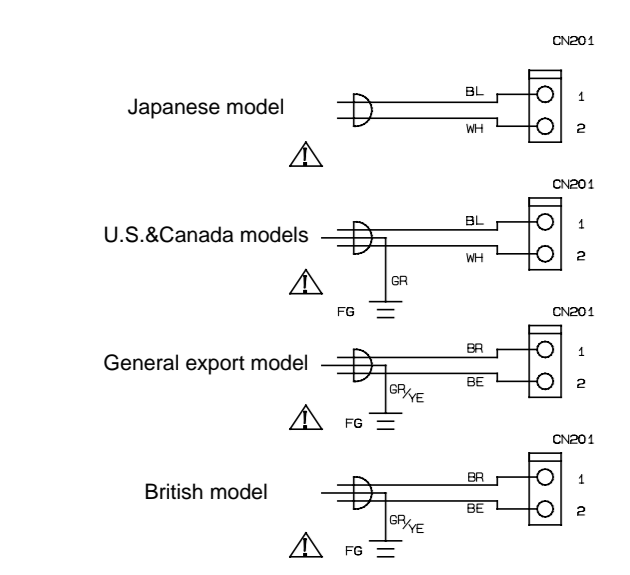


Note : See parts list for details of circuit board component parts.

- (半七) : Semiconductive Ceramic Capacitor
- (七) : Ceramic Capacitor
- (金被) : Metal Film Resistor

Power transformer	AC cord	Cord strain relief	
J	XV96A00	VZ461100	VH103000
U.C	XV96A00	VZ256000	VH103100
H	XV96A00	VV566000	VH103000
B.S	XV96A00	VV566000	VH103000

	FZ201	FZ202	FZ204
J.U.C	250V2A	250V2A	250V1A
H.B.S	V366270	V366300	V366300
	250V1A L	250V2A L	250V1A L
	V366300	V366300	V366300
	250V1A L	250V2A L	250V1A L

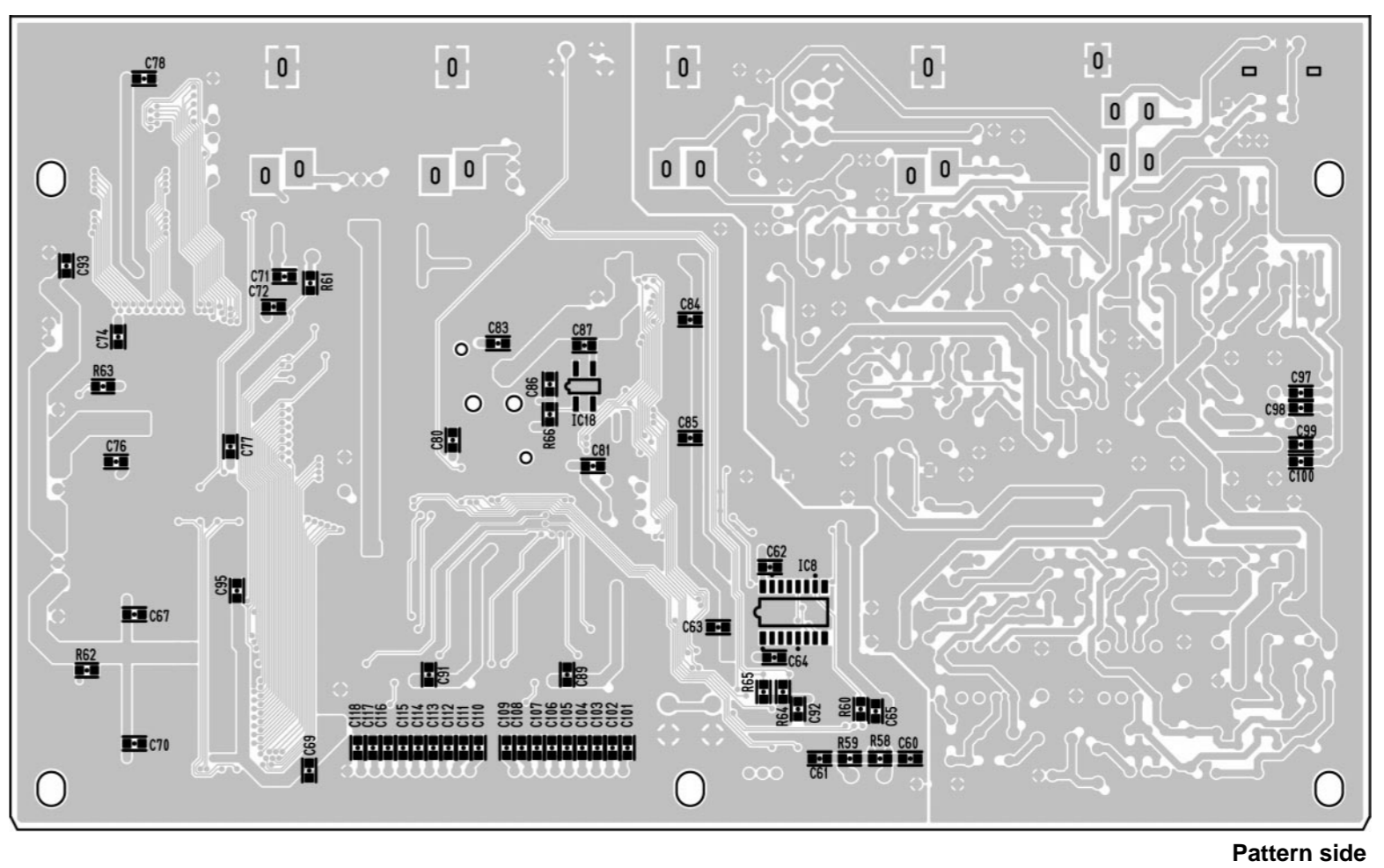
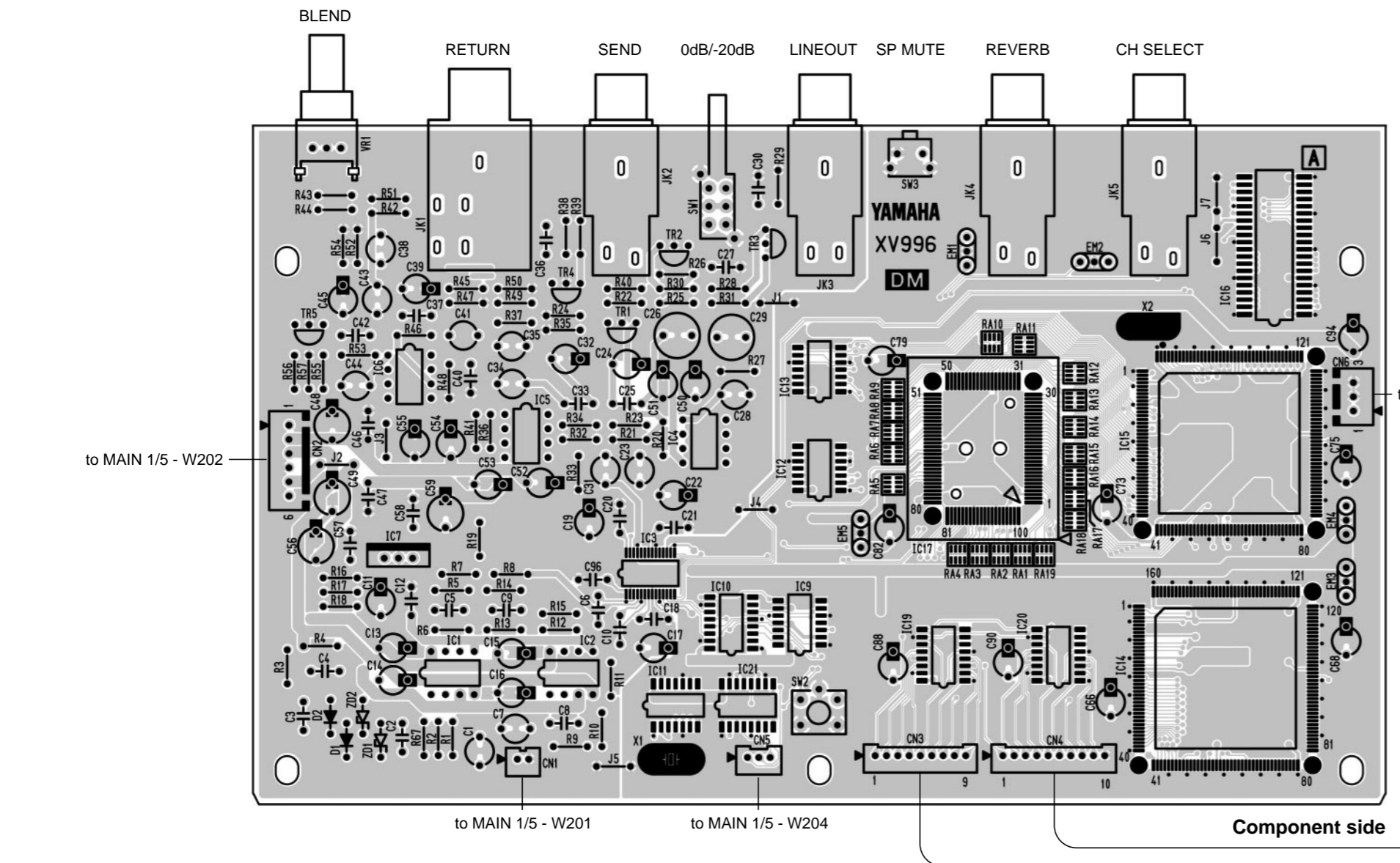


WARNING
Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.

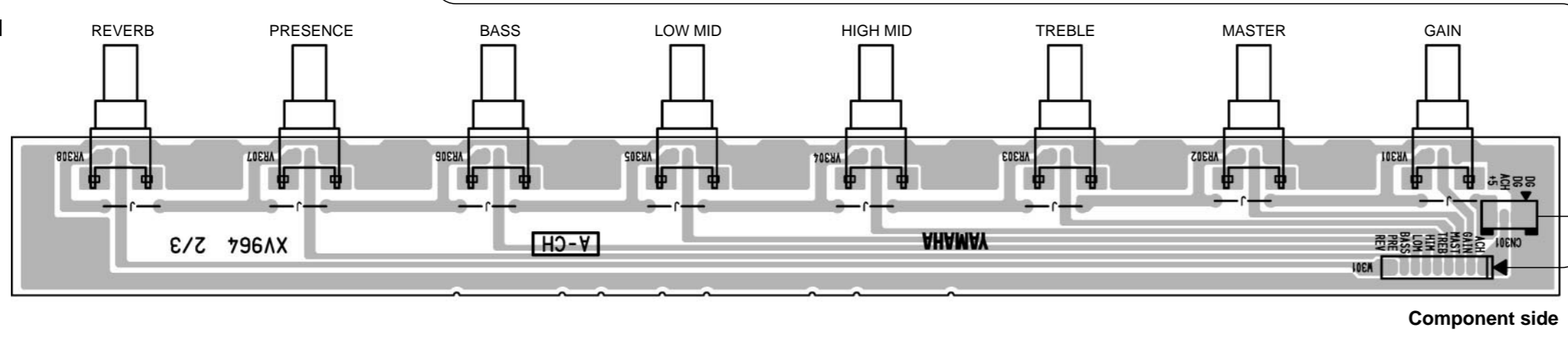
Note: See parts list for details of circuit board component parts.

■ CIRCUIT BOARDS

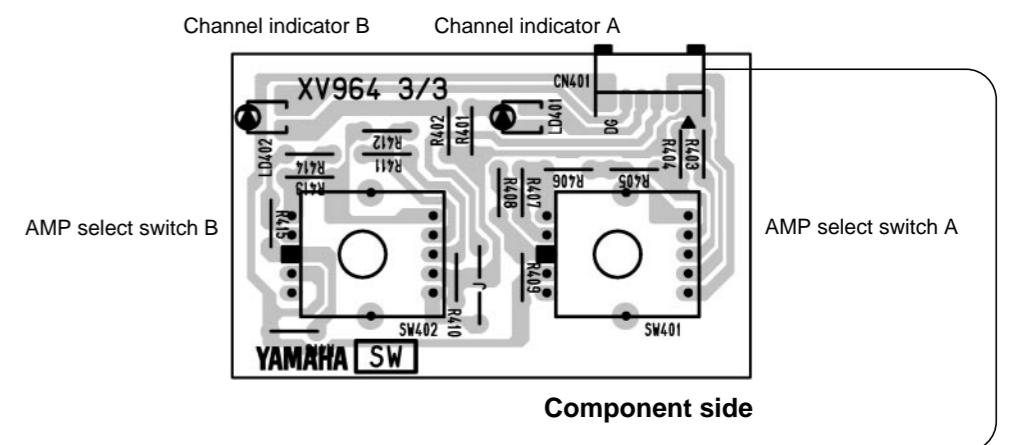
• DM Circuit Board



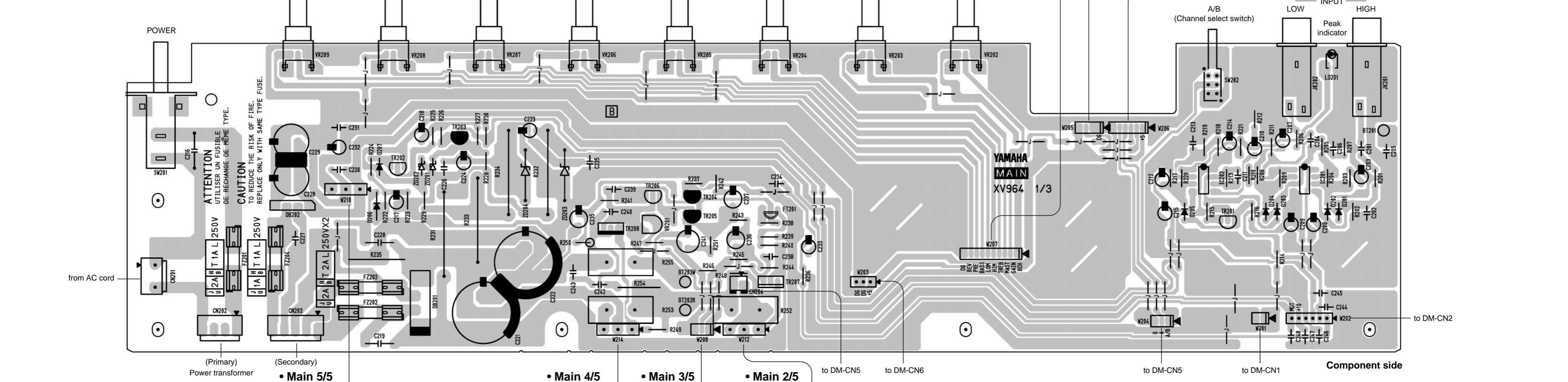
• A-CH Circuit Board



• SW Circuit Board



• Main 1/5



Circuit Board Parts No.	FZ201	FZ202	FZ204
J.U.C	V366270	2A	2A
H.B.S	V366300	250V 1A L	250V 2A L
	250V	250V	250V
	250V	250V	250V

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

DM: CNA-V373260
MAIN, A-CH, SW: CNA-V366270