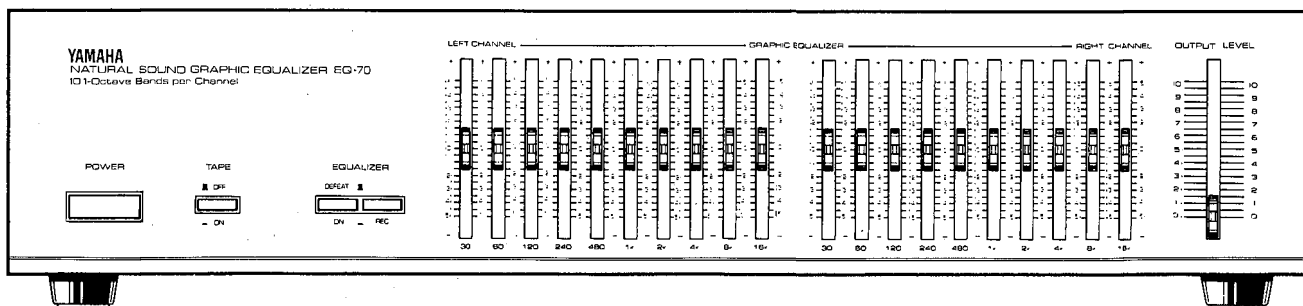


STEREO GRAPHIC EQUALIZER

EQ-70

SERVICE MANUAL

FRONT PANEL



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: The 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 principle-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 specifications 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.

CONTENTS

TO SERVICE PERSONNEL	1	DISASSEMBLY PROCEDURES	4
REAR PANELS	1, 2	BLOCK DIAGRAM	5
SPECIFICATIONS	2	WIRING	5
DIMENSIONS	3	PRINTED CIRCUIT BOARD	6, 7
DESCRIPTION OF OPERATIONS	3	SCHEMATIC DIAGRAM	8
INTERNAL VIEW	4	PARTS LIST	9~12

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YAMAHA

YAMAHA CORPORATION HAMAMATSU, JAPAN
3.3K-08 Printed in Japan '90. 3

EQ-70

■ TO SERVICE PERSONNEL

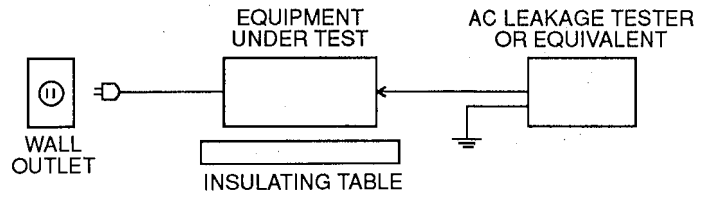
1. Critical Components Information.

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

2. Leakage Current Measurement (For 120 V Model Only).

When service has been completed, it is imperative that you verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohm shunted by 0.15 μ F.
- Leakage current must not exceed 0.5 mA.
- Be sure to test for leakage with the AC plug in both polarities.

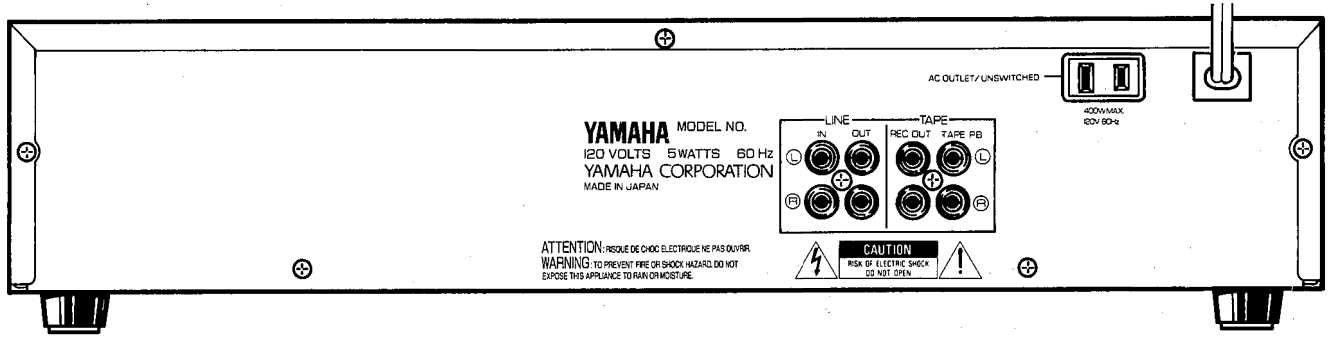


• POLARIZATION

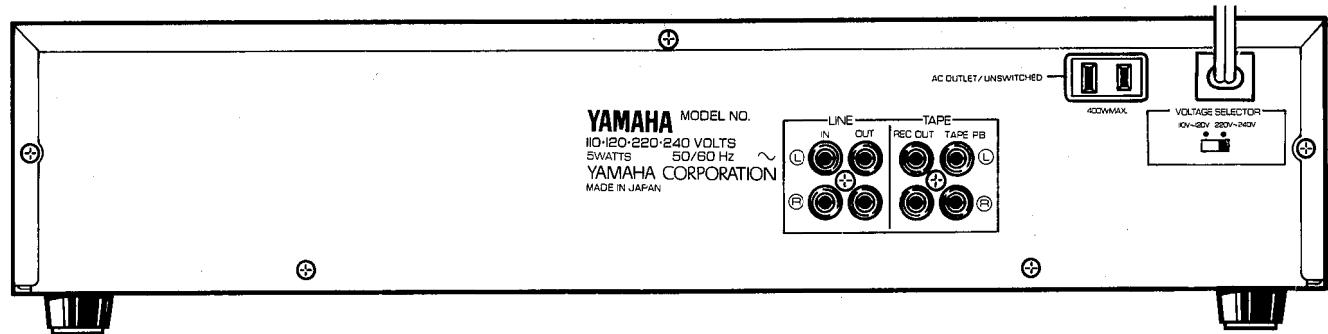
This product is equipped with a polarized alternating current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. (U.C model only)

■ REAR PANELS

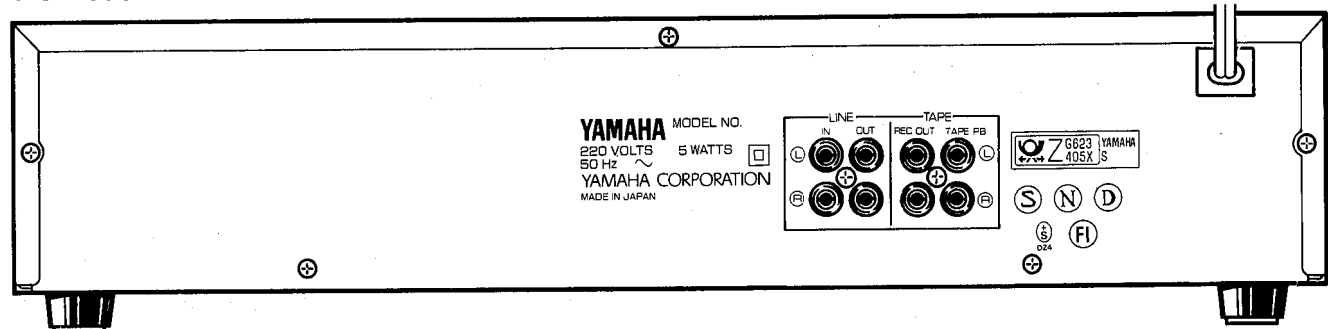
● U.C. Models



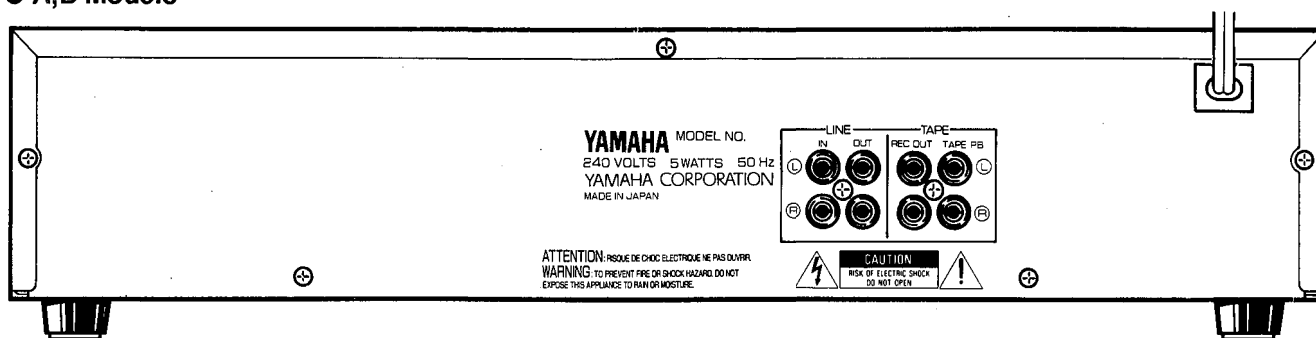
● R Model



● G Model



● A,B Models



■ SPECIFICATIONS

Center Frequency 30, 60, 120, 240, 480 Hz,
1, 2, 4, 8, 16 kHz

Equalizer Control Range ± 12 dB

Input Sensitivity/Impedance
(1 kHz) 1V/31 k Ω

Output Level/Impedance
(1 kHz) 1V/1.8 k Ω

Maximum Output/Impedance
(20–20 kHz) Better than 5.4 V

Frequency Response 10 to 35,000 Hz ± 0.5 dB

Signal-to-Noise Ratio
(IHF-A-Network, Input Shorted, 1 V
output, Unequalized) Better than 105 dB

Harmonic Distortion
(1 kHz, 1 V Output, Unequalized)

..... Less than 0.005%

Power Consumption 5 W

Power Supply

USA and Canada models 120 V, 60 Hz

European model 220 V, 50 Hz

British and Australian models 240 V, 50 Hz

General model 110/120/220/240 V, 50/60 Hz

Dimensions (W \times H \times D) 435 \times 98 \times 232.5 mm
(17-1/8" \times 3-7/8" \times 9-1/8")

Weight 2.4 kg (5 lbs 4 oz)

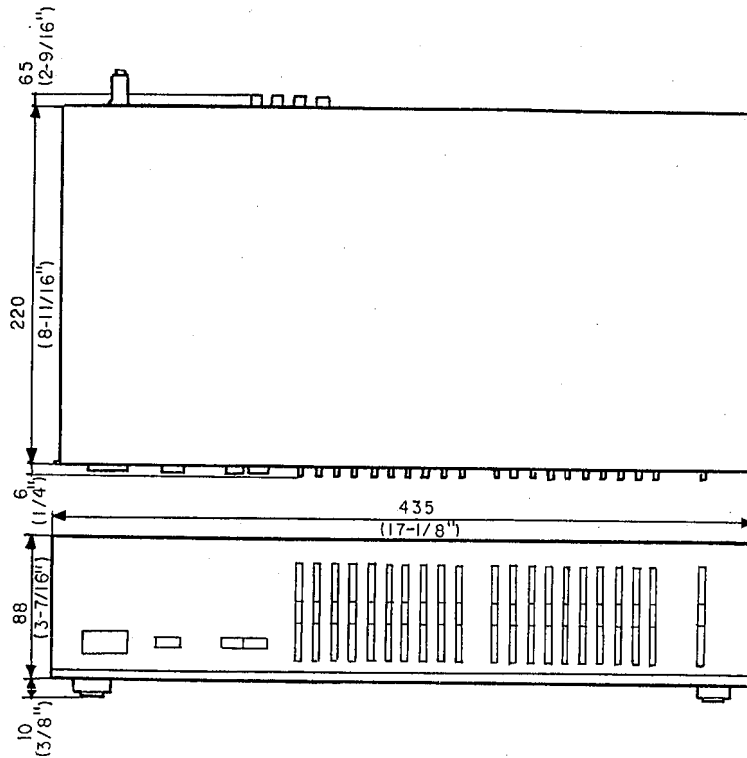
* Specifications subject to change without notice.

U U.S.A. model G European model

C Canadian model B British model

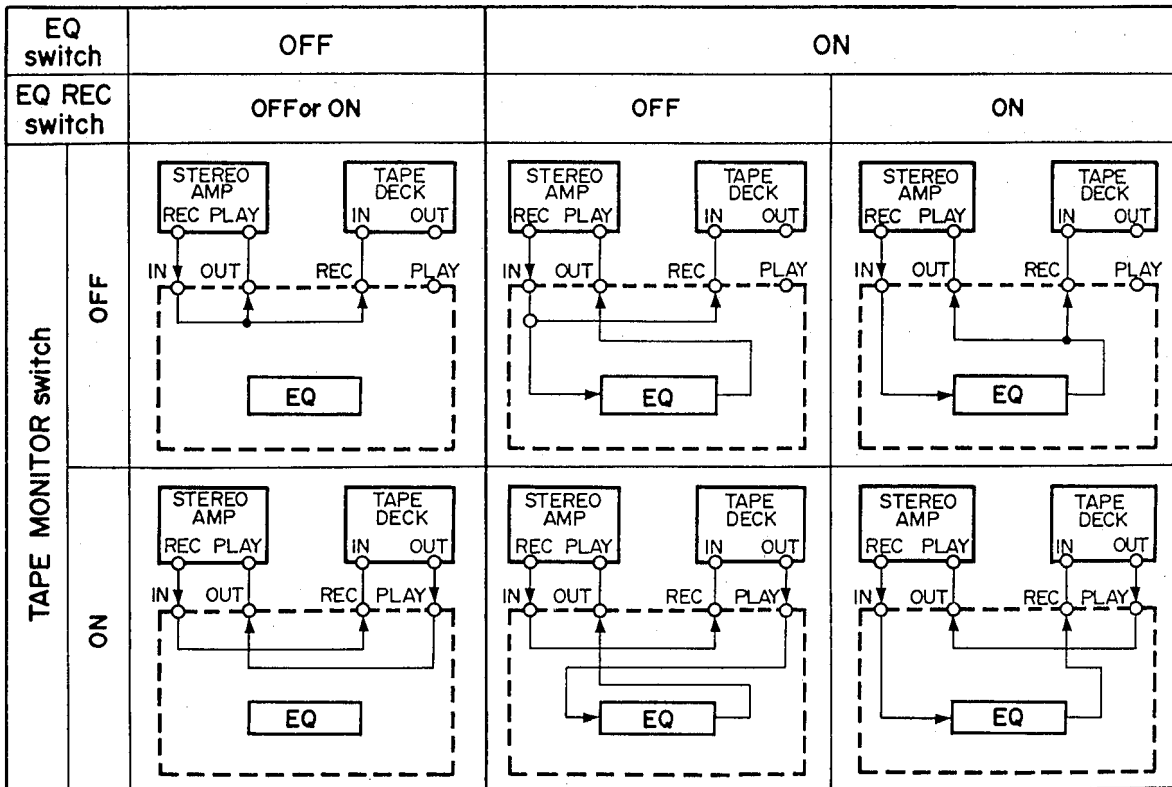
A Australian model R Other model

DIMENSIONS

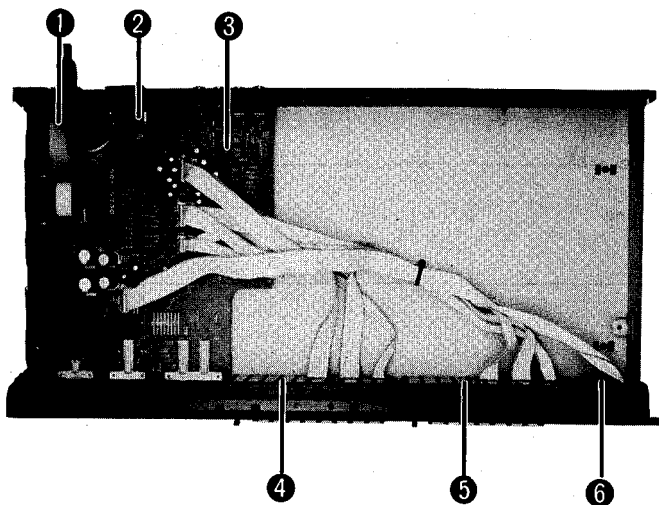


DESCRIPTION OF OPERATIONS

(Relationship of Switches)



INTERNAL VIEW



- ① Main Circuit Board (3)
- ② Main Circuit Board (4)
- ③ Main Circuit Board (1)
- ④ Block VR Ass'y (L)
- ⑤ Block VR Ass'y (R)
- ⑥ Main Circuit Board (2)

DISASSEMBLY PROCEDURES (Remove parts in disassembly order as numbered)

1. Removal of Top Cover

Remove 5 screws (①, ②) in fig. 1 and slide the Topcover back.

2. Removal of Front Panel

Remove 2 screws (③) in fig. 1 and pull the front panel forward.

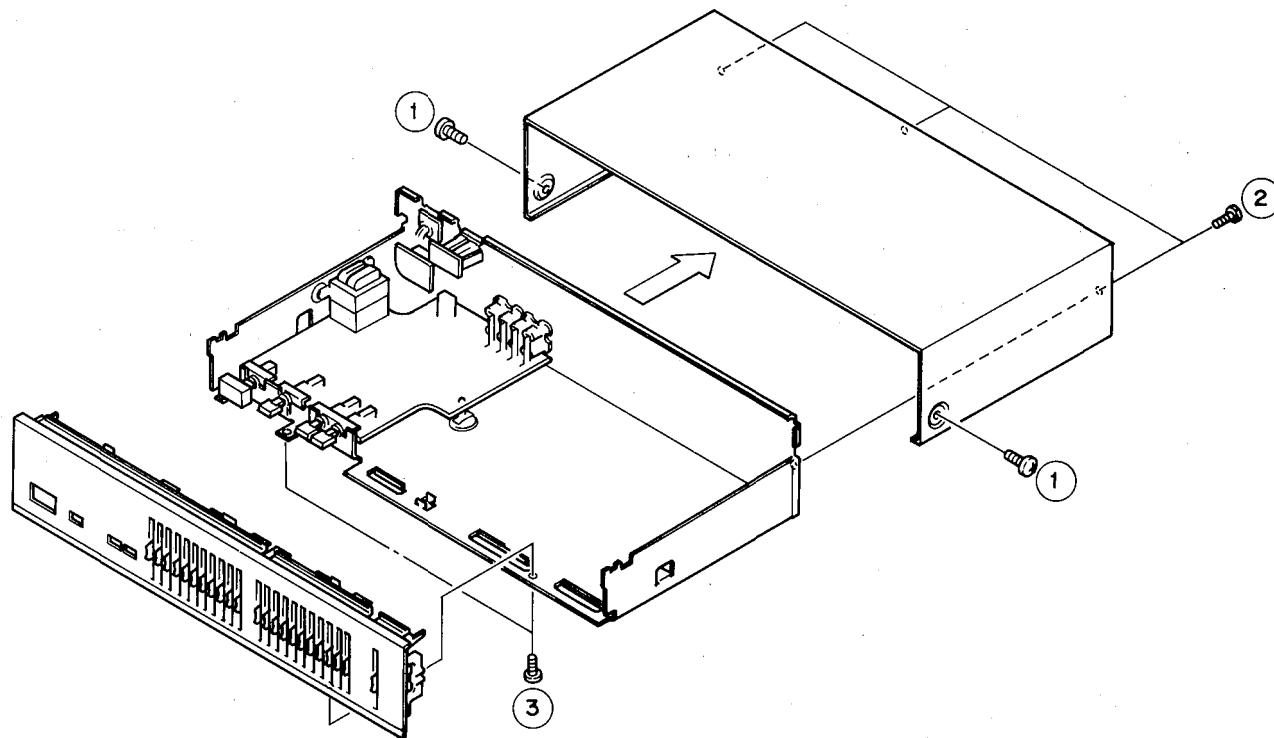
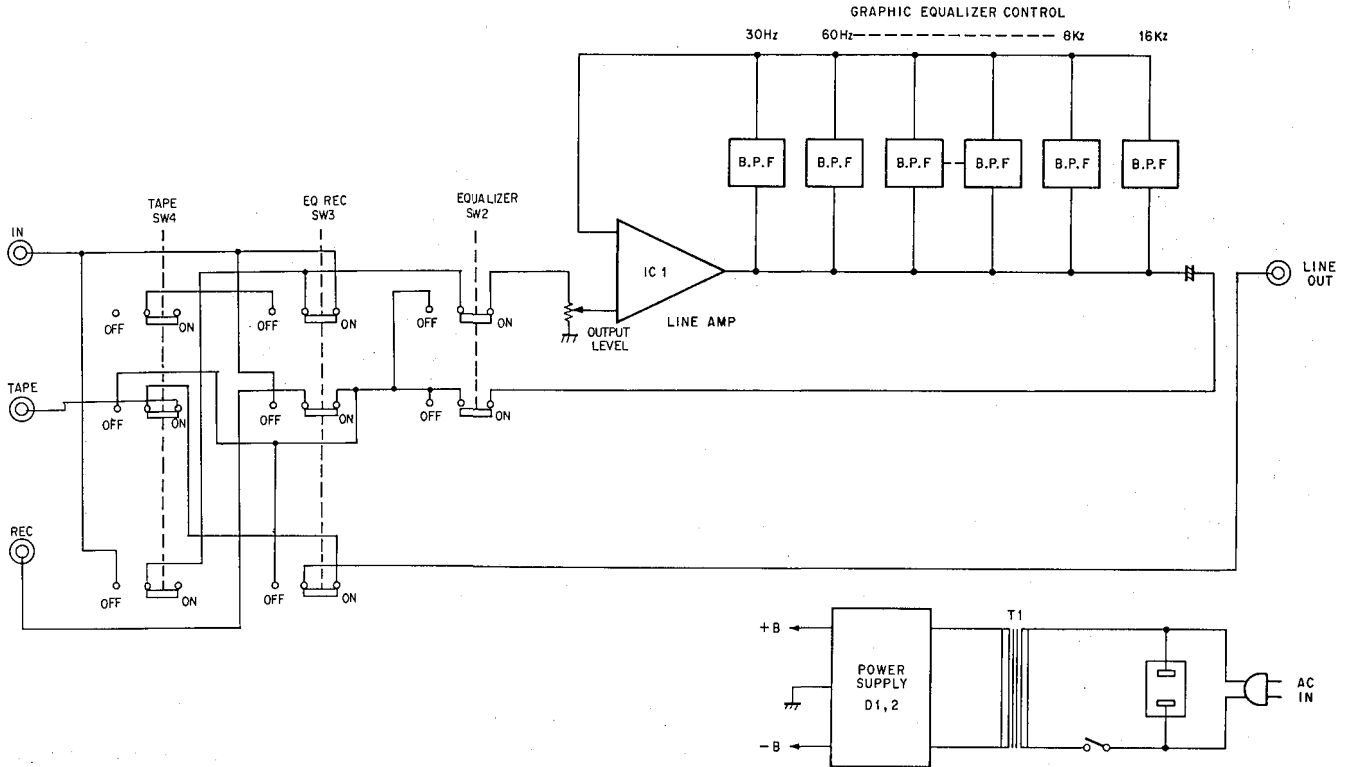
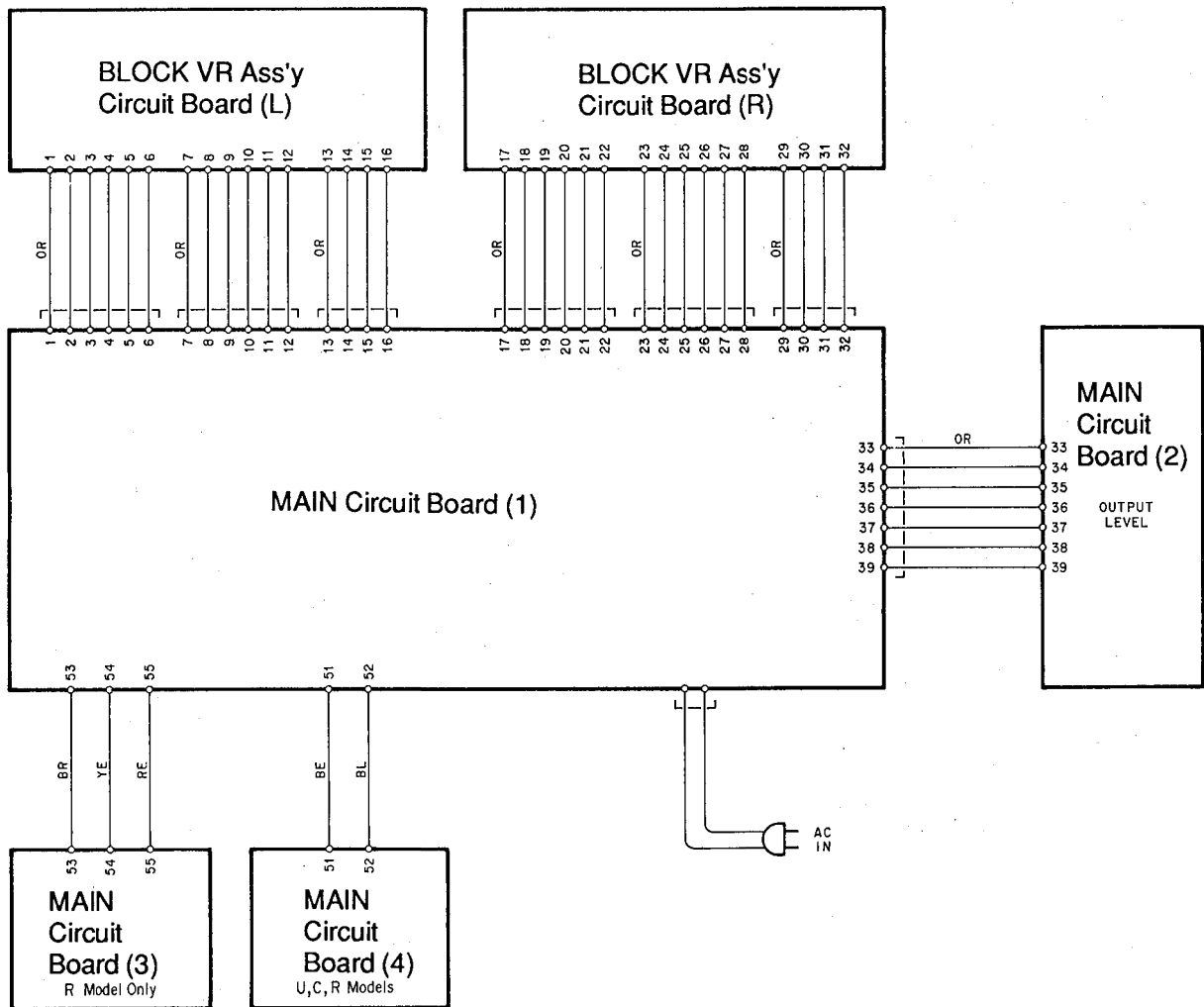


Fig. 1

■ BLOCK DIAGRAM



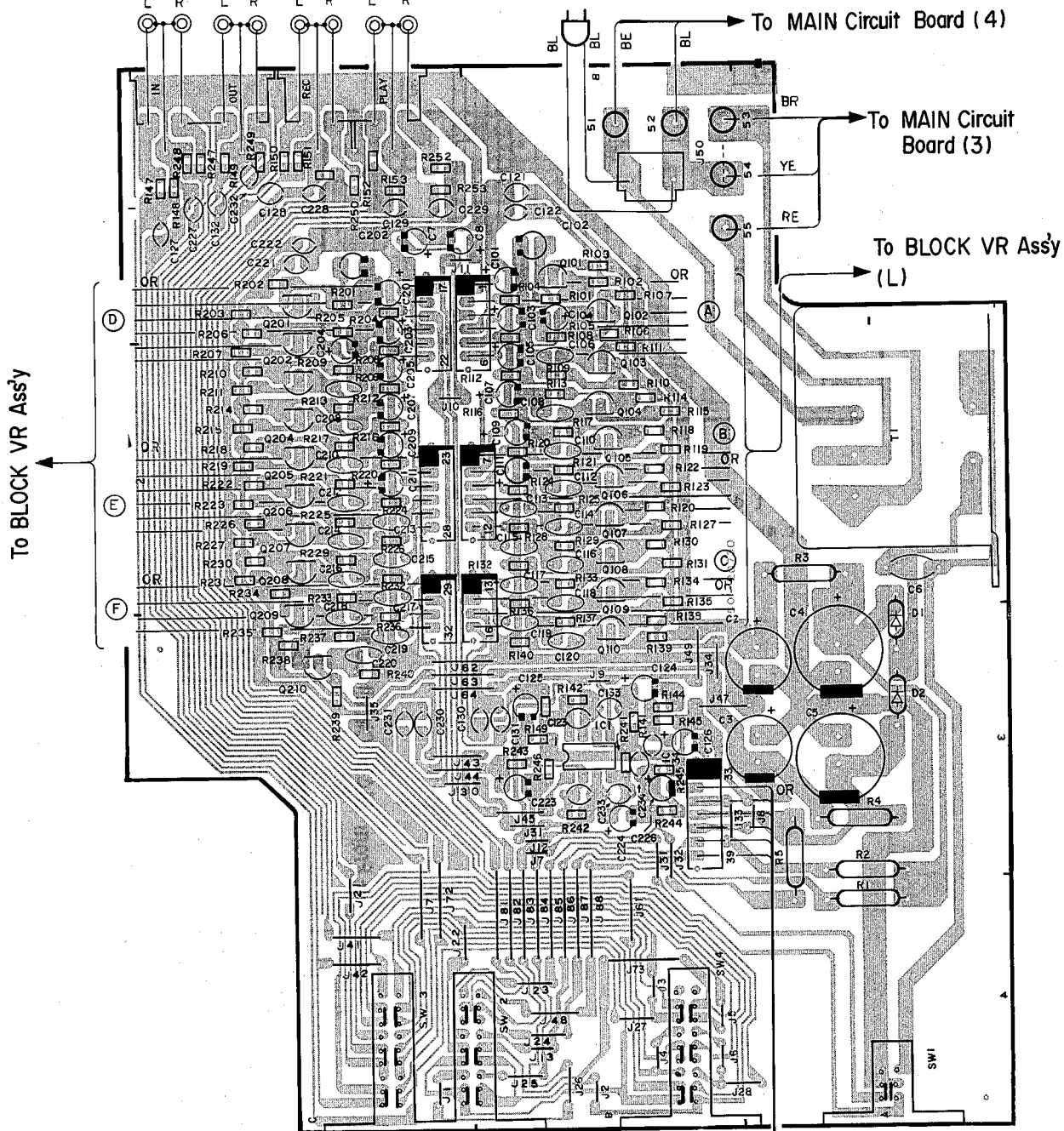
■ WIRING



PRINTED CIRCUIT BOARD (Pattern Side) (Note) 文字面 : Component Side

MAIN Circuit Board (1)

IN L R OUT L R REC L R PLAY L R



To BLOCK VR Assy

To BLOCK VR Assy (L)

To MAIN Circuit Board (4)

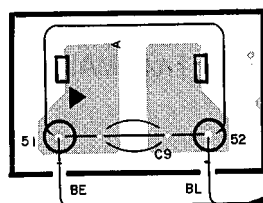
To MAIN Circuit Board (3)

To MAIN Circuit Board (2)

ON REC DEFEAT ON TAPE
OFF EQUALIZER OFF

POWER ON OFF

MAIN Circuit Board (4)



AC OUTLET

From MAIN Circuit Board (1)

1

2

3

4

5

6

7

A

B

C

D

E

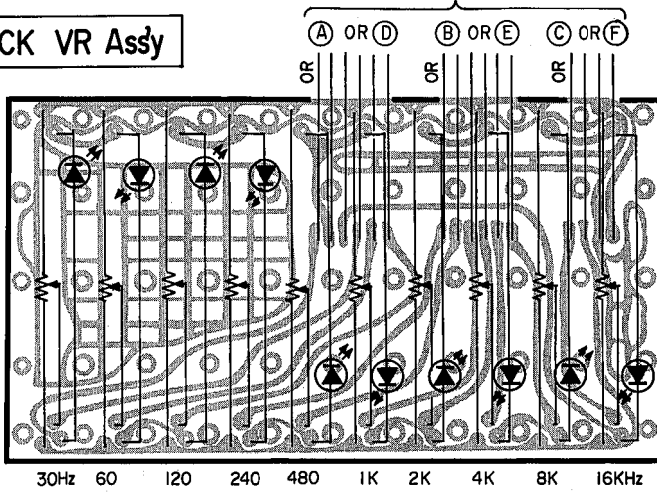
EQ-70

PRINTED CIRCUIT BOARD (Pattern Side)

1

From MAIN Circuit Board (1)

BLOCK VR Assy



Don't disassemble UNIT VR Ass'y
It must be replaced with HX603110.

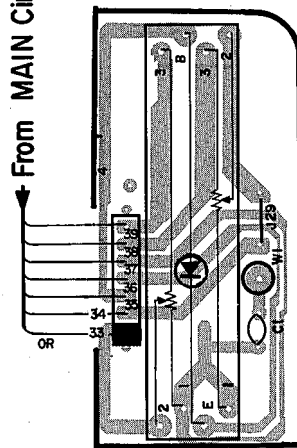
2

3

4

From MAIN Circuit Board (1)

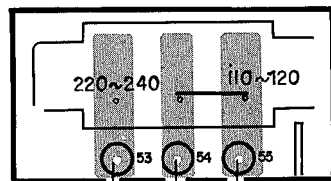
MAIN Circuit Board (2)



5

MAIN Circuit Board (3)

R Model Only



VOLTAGE SELECTOR

From MAIN Circuit Board (1)

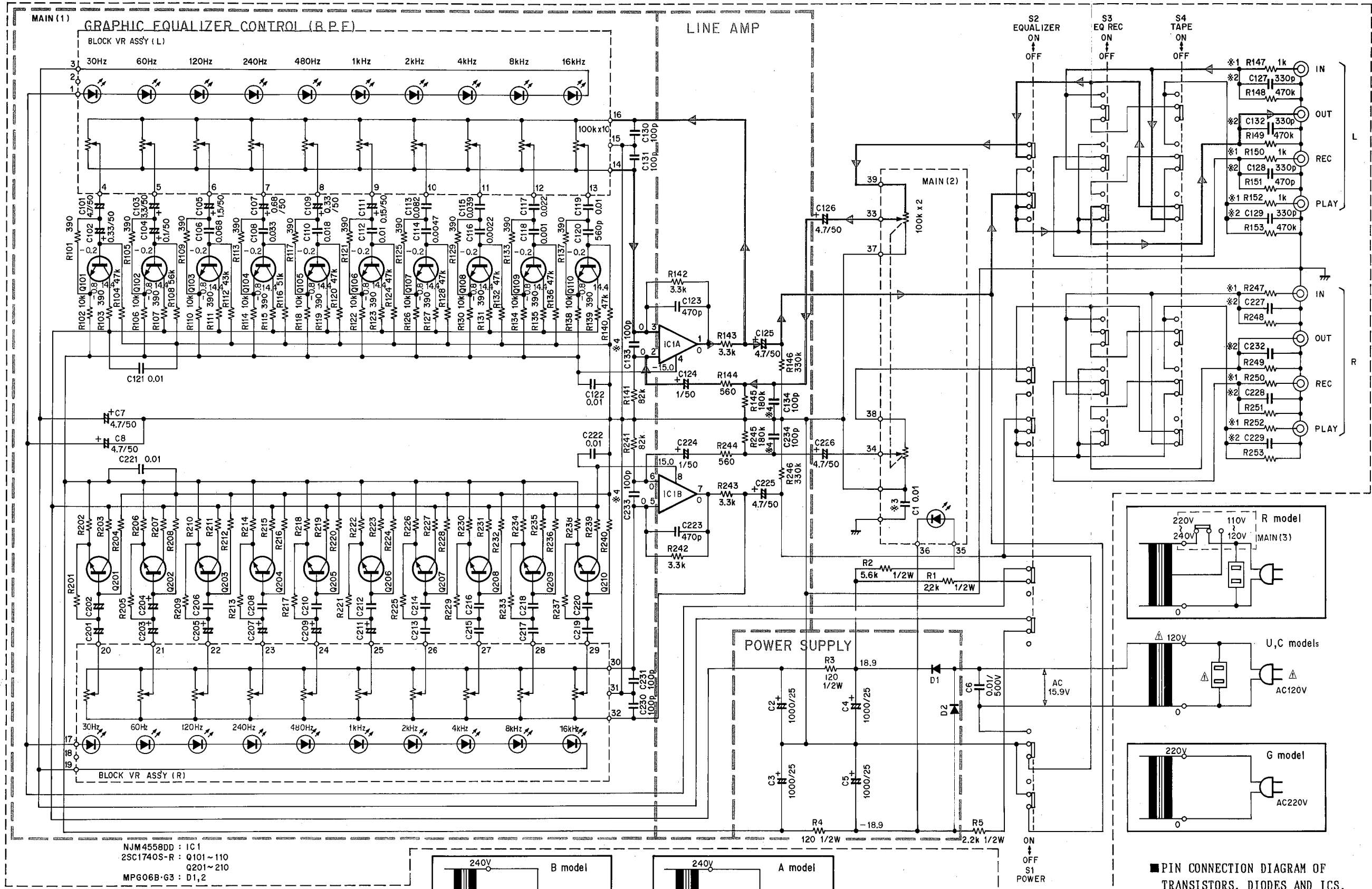
6

7

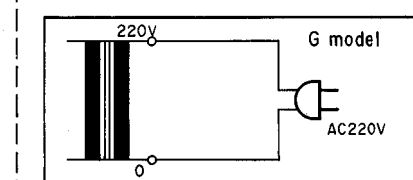
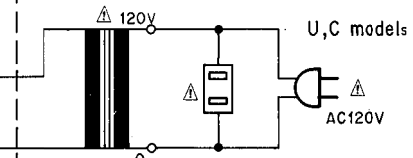
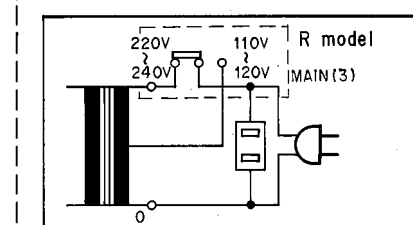
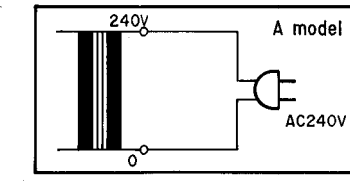
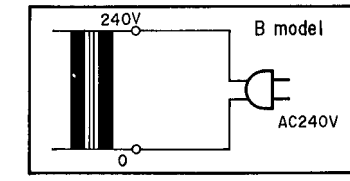
7

SCHEMATIC DIAGRAM

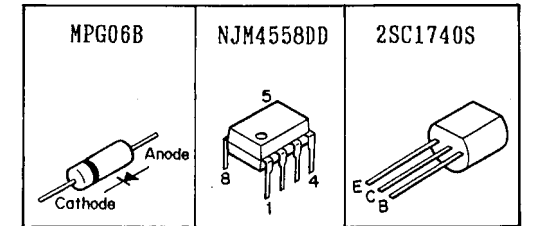
EQ-70



	U, C, R, A, B	G	
*1	R147, 150, 152 R247, 250, 252	SHORT	1k
*2	C127, 128, 129, 132 C227, 228, 229, 232	OPEN	330pF
*3	C1	OPEN	0.01μF
*4	C133, 134 C233, 234	OPEN	100pF




PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.



PARTS LIST

■ ELECTRICAL PARTS



■ WARNING

- Components having special characteristics are marked  and must be replaced with parts having specifications equal to those originally installed.
- Carbon resistors 1/6 W are not included in the ELECTRICAL PARTS list. For the parts No. of the carbon resistor, refer to the last Page.

EQ-70

Ref. No.	Part No.	Description	部 品 名	Remarks/Markets	Common Model	ランク
	NX 60 36 90	Main Circuit Board	メ イ ン シ ー ト	U,C	050-632-01	
	NX 60 37 00	//	//	R	050-632-02	
	NX 60 37 10	//	//	G	050-632-03	
	NX 60 37 20	//	//	A,B	050-632-04	
	FH 23 41 00	Ceramic Cap.	セ ラ コ ン	C6	075-10463-92	
	FG 21 23 30	//	//	C127~129,132,227~229,232	075-33231-95	
	FG 24 41 00	//	//	C1	075-10451-01	
	FG 21 21 00	//	//	C133,134,233,234	075-10231-95	
	FG 21 21 00	//	//	C130,131,230,231	275-10231-95	
	FG 21 24 70	//	//	C123,223	275-47231-95	
	FG 24 41 00	//	//	C121,122,221,222	275-10451-95	
	UJ 14 91 00	Electrolytic Cap.	ケ ミ コ ン	C4,5	074-10945-71	
	UJ 16 51 00	//	//	C104,204	274-10547-71	
	UW 56 51 50	//	//	C111,211	274-15547-71	
	UJ 16 53 30	//	//	C102,109,202,209	274-33547-71	
	UW 56 56 80	//	//	C107,207	274-68547-71	
	UJ 16 61 00	//	//	C124,224	274-10647-71	
	UJ 16 61 50	//	//	C105,205	274-15647-71	
	UJ 46 63 30	//	//	C103,203	274-33647-71	
	UJ 16 64 70	//	//	C7,8,101,125,126,201,225,226	274-47647-71	
	FX 60 43 00	Mylar Cap.	マ イ ラ ー コ ン	C120,220	272-56231-54	
	FA 15 31 00	//	//	C118,218	272-10331-54	
	FA 15 32 20	//	//	C116,216	272-22331-54	
	FA 15 34 70	//	//	C114,214	272-47331-54	
	FA 15 41 00	//	//	C112,119,212,219	272-10431-54	
	FA 15 41 80	//	//	C110,210	272-18431-54	
	FA 15 42 20	//	//	C117,217	272-22431-54	
	FA 15 43 30	//	//	C108,208	272-33431-54	
	FA 15 43 90	//	//	C115,215	272-39431-54	
	FA 15 46 80	//	//	C106,206	272-68431-54	
	FA 15 48 20	//	//	C113,213	272-82431-54	
	IX 60 71 40	Transistor	ト ラ ン ジ ス タ ー	Q101~110,201~210	278-31740-84	
	IX 61 24 70	Diode	ダ イ オ ー ド	D1,D2	078-50359-01	
	IX 60 14 40	IC	I C	IC1	078-00039-05	
	HX 60 31 80	Flame Proof Carbon Resistor	不 燃 化 カ ー ボ ン 抵 抗	R3,4	050-42911-30	
	HX 60 31 90	//	//	R1,5	050-42911-45	
	HX 60 32 00	//	//	R2	050-42911-50	
	HX 60 31 10	Block VR Ass'y	ブ ロ ッ ク V R A s s ' y		050-43384-01	
	KX 60 17 80	Switch, Push	プ ッ シ ュ ス イ ッ チ	S2,3	050-43414-01	
	KX 60 17 90	//	//	S4	050-43415-01	
	KX 60 18 00	//	//	S1	050-43453-01	
	XX 67 14 60	Slide VR with LED	L E D 付 ス ラ イ ド V R	OUTPUT LEVEL	GE-30 050-42121-01	

※New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks/Markets	Common Model	ランク
	LX 60 21 70	Pin Jack	ピ ン ジ ャ ッ ク		050-43416-01	
	LX 60 21 80	Pin Jack with Ground	//		050-43416-02	
	GX 60 29 80	Power Transformer	電 源 ト ラ ン ス	T1 U,C	050-43378-01	
	GX 60 29 90	//	//	R	050-43447-01	
	GX 60 30 00	//	//	G	050-43448-01	
	GX 60 30 10	//	//	A,B	050-43449-01	
	LX 60 21 90	Socket, Dip	デ ィ ッ プ ソ ケ ッ ト	13~16, 29~32	002-48479-04	
	LX 60 22 00	//	//	1~6,7~12, 17~22,23~28	002-48479-06	
	LX 60 22 10	//	//	33~39,	002-48479-07	
	XX 68 62 10	AC Outlet	A C ア ウ ト レ ッ ト	U,C,R	EQ-M77 050-42204-01	
	HF 85 00 00	Jumper, Resistor Type	抵 抗 型 ジ ャ ン パ ー	R147,150,152, 247,250,252	U,C,R 076-10001-12	
	HF 85 00 00	//	//	//	A,B 076-10001-12	
	XX 67 12 50	Switch	電 圧 切 換 ス イ ッ チ	VOLTAGE SELECTOR	R GE-20 050-41452-01	

※New Parts (新規部品)

A

B

C

D

E

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EXPLODED VIEW

1

2

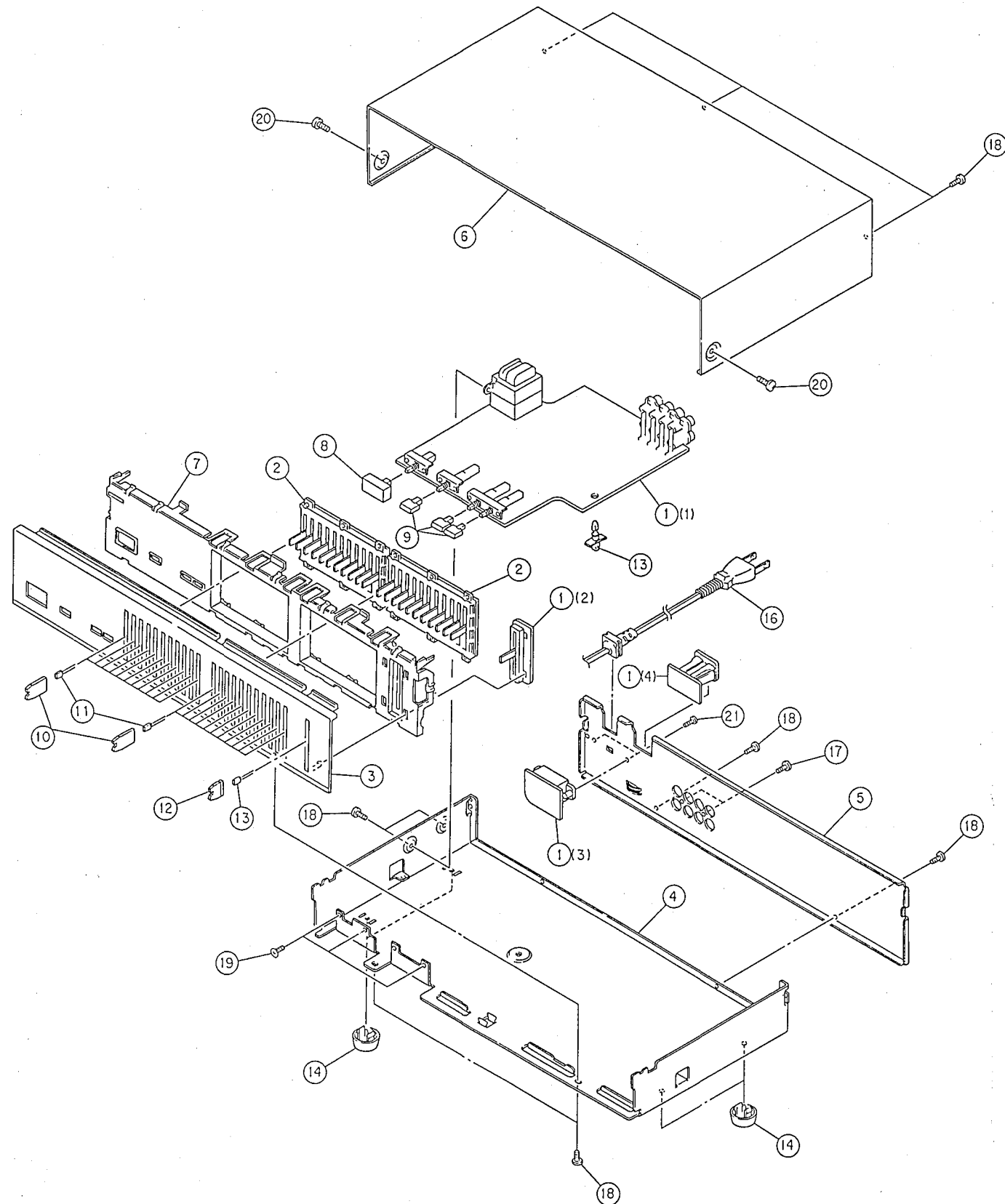
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4

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6

7

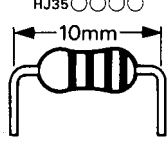
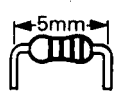


EXPLODED VIEW PARTS

Ref. No.	Part No.	Description	部品名	Remarks/ Markets	Common Model	ランク	
1	NX 60 36 90	Main Circuit Board	メインシート	U,C		050-632-01	
//	NX 60 37 00	//	//	R		050-632-02	
//	NX 60 37 10	//	//	G		050-632-03	
//	NX 60 37 20	//	//	A,B		050-632-04	
2	HX 60 31 10	Block VR Ass'y	ブロックVR Ass'y			050-43384-01	
※	3	NX 60 71 60	Front Panel			060-22605-01	
※	4	AX 60 48 40	Bottom Case			060-10818-01	
※	5	AX 60 89 20	Rear Panel	U,C		060-22188-09	
※	//	AX 60 89 30	//	R		// -10	
※	//	AX 60 89 40	//	G		// -11	
※	//	AX 60 89 50	//	A,B		// -12	
6	AX 60 49 10	Cabinet (Top Cover)	キャビネット (トップカバー)			060-21397-10	
7	CX 60 81 10	Front Escutcheon	フロントエスカッション			060-10820-01	
※	8	CX 61 31 40	Button	10×25	ボタン	POWER	060-43873-01
9	CX 60 73 00	//	5×14	//	//	TAPE EQUALIZER, EQUALIZER REC	060-43355-01
10	XX 68 61 10	Knob(A), Slide	スライドノブ (A)	EQUALIZER	EQ-M77	060-42167-02	
11	iX 61 42 00	LED	GL-9PR441	L E D		078-50451-01	
12	CX 60 73 10	Knob, Slide	スライドノブ	OUTPUT LEVEL		060-42717-01	
13	iX 61 41 90	LED	GL-9PR22	L E D		078-50450-01	
14	CX 60 73 20	Foot	脚			060-43397-01	
15	XX 68 61 50	Support, P.C.B.	シート押え		EQ-M77	060-40811-05	
16	MX 60 10 50	AC Power Cord	DP-201-1	電源コード	U,C	050-42851-01	
//	MX 60 10 60	//	//	//	R	050-43080-01	
//	MX 60 10 70	//	DEP-101	//	G	050-42852-01	
//	MX 60 10 80	//	//	//	A	050-42965-01	
//	MX 60 10 90	//	//	//	B	050-42905-01	
※	17	AX 60 89 60	Bind B-tite Earth Screw			097-40112-02	
18	Ei 33 00 66	//	3×6 FCRM3-BI	//	PACK	097-40014-15	
19	EB 03 00 56	Flat Head Screw	3×5 ZMC2-Y	皿小ネジ	PACK	088-13005-03	
※	20	AX 60 89 70	Binding Head Tapping Screw	4×8 MFZN2-B	バインドタッピングネジ	097-40015-06	
21	EJ 32 60 86	Pam Head Tapping Screw	2.6×8 ZMC2-BI	ナベタッピングネジ	PACK	080-62608-55	
XX 68 62 50	Connecting Cord Ass'y	接続コード Ass'y			EQ-M77	060-40894-01	
CB 06 92 51	Binding Tie	インシュロックタイ				012-46250-01	
		Accessories	付属品				
Mi 08 87 90	Pin Cord	ピンコード					

※New Parts (新規部品)

Parts List for Carbon Resistor

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ353100	HF85 3100	12K Ω	HJ357120	HF85 7120
1.8 "	HJ353180	*	15 "	HJ357150	HF85 7150
2.2 "	HJ353220	HF853220	18 "	HJ357180	HF85 7180
3.3 "	HJ353330	HF853330	22 "	HJ357220	HF85 7220
4.7 "	HJ353470	HF853470	27 "	HJ357270	HF85 7270
5.6 "	HJ353560	HF853560	33 "	HJ357330	HF85 7330
10 "	HJ354100	HF854100	39 "	HJ357390	HF85 7390
15 "	HJ354150	HF854150	47 "	HJ357470	HF85 7470
22 "	HJ354220	HF854220	56 "	HJ357560	HF85 7560
27 "	HJ354270	HF854270	68 "	HJ357680	HF85 7680
33 "	HJ354330	HF854330	82 "	HJ357820	HF85 7820
39 "	HJ354390	HF854390	91 "	HJ357910	HF85 7910
47 "	HJ354470	HF854470	100 "	HJ358100	HF858100
56 "	HJ354560	HF854560	120 "	HJ358120	HF858120
68 "	HJ354680	HF854680	150 "	HJ358150	HF858150
82 "	HJ354820	HF854820	180 "	HJ358180	HF858180
100 "	HJ355100	HF855100	220 "	HJ358220	HF858220
110 "	HJ355110	HF855110	270 "	HJ358270	HF858270
120 "	HJ355120	HF855120	330 "	HJ358330	HF858330
150 "	HJ355150	HF855150	390 "	HJ358390	HF858390
160 "	HJ355160	*	470 "	HJ358470	HF858470
180 "	HJ355180	HF855180	560 "	HJ358560	HF858560
220 "	HJ355220	HF855220	680 "	HJ358680	HF858680
270 "	HJ355270	HF855270	820 "	HJ358820	HF858820
330 "	HJ355330	HF855330	1.0M Ω	HJ359100	HF859100
390 "	HJ355390	HF855390	1.2 "	HJ359120	*
470 "	HJ355470	HF855470	1.5 "	HJ359150	HF859150
510 "	*	HF855510	1.8 "	HJ359180	HF859180
560 "	HJ355560	HF855560	2.2 "	HJ359220	HF859220
680 "	HJ355680	HF855680	3.3 "	HJ359330	HF859330
820 "	HJ355820	HF855820	3.9 "	HJ359390	*
910 "	HJ355910	HF855910	4.7 "	HJ359470	HF859470
1.0K Ω	HJ356100	HF856100			
1.2 "	HJ356120	HF856120			
1.5 "	HJ356150	HF856150			
1.8 "	HJ356180	HF856180			
2.0 "	HJ356200	HF856200			
2.2 "	HJ356220	HF856220			
2.4 "	HJ356240	HF856240			
2.7 "	HJ356270	HF856270			
3.0 "	HJ356300	HF856300			
3.3 "	HJ356330	HF856330			
3.6 "	HJ356360	HF856360			
3.9 "	HJ356390	HF856390			
4.7 "	HJ356470	HF856470			
5.1 "	HJ356510	HF856510			
5.6 "	HJ356560	HF856560			
6.8 "	HJ356680	HF856680			
8.2 "	HJ356820	HF856820			
9.1 "	HJ356910	HF856910			
10 "	HJ357100	HF857100			
				<p>1/4W Type</p> <p>HJ35○○○○</p> 	<p>1/6W Type</p> <p>HF85○○○○</p> 

EQ-70

YAMAHA