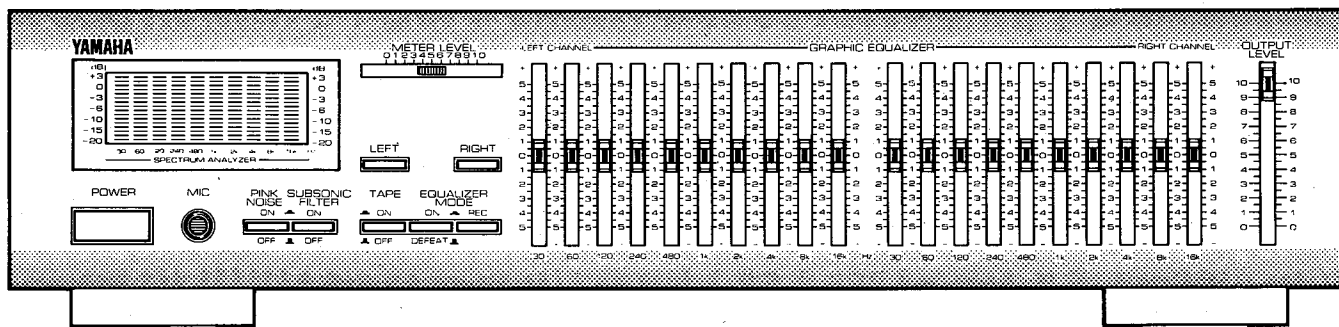


STEREO GRAPHIC EQUALIZER EQ-550

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

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
WARNING: CHEMICAL CONTENT NOTICE!	1
SPECIFICATIONS	1
DIMENSIONS	1
DESCRIPTION OF OPERATIONS	2
REAR PANELS	2~3
INTERNAL VIEW	3

DISASSEMBLY PROCEDURES	3
BLOCK DIAGRAM	4
ADJUSTMENTS	5
WIRING	6
PRINTED CIRCUIT BOARD	7~9
SCHEMATIC DIAGRAM	10
PARTS LIST	11~15

100359

YAMAHA

YAMAHA CORPORATION
P.O. Box 1, Hamamatsu, Japan

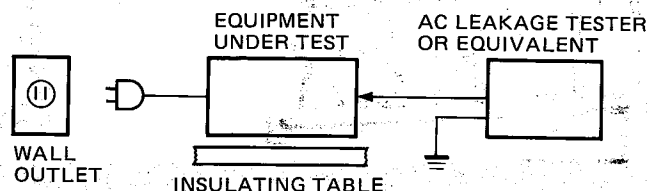
3.05K-131 N © Printed in Japan '90.9

EQ-550

■ 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 120V 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 $0.15\mu\text{F}$.

- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



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.

■ SPECIFICATIONS

Input Sensitivity/Impedance

LINE IN, TAPE, 1 kHz 1V/47k-ohms

MIC 0.3 mV/47k-ohms

Rated Output/Impedance

LINE OUT, REC OUT, 1 kHz
(OUTPUT LEVEL → Max.) 1V/600-ohms

Frequency Response 10 Hz — 35 kHz,
±0.5 dB

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

Equalizer Control Range ±12 dB

Signal-to-Noise Ratio (Input short, IHF A Network)

At 1V output More than 105 dB

Total Harmonic Distortion

(1 kHz, 1V output) Less than 0.005%

Maximum Output (20 Hz — 20 kHz) More than 7V

Subsonic Filter Cutoff

Frequency 15 Hz
(12 dB/Oct)

Pink Noise Output 150 mV RMS

Display 10 bands
Switchable between L or R, L + R

Power Requirements

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

Europe model 220V, 50 Hz

Australia and U.K. models 240V, 50 Hz

U.S.A. and Canada models 120V, 60 Hz

Power Consumption 15W

Dimensions (W x H x D) 435 x 102 x 232 mm
(17-1/8" x 4" x 9-1/8")

Weight 3.7 kg (8 lbs. 2 oz.)

Accessories Pin plug cords (2)

MM-110 Electret Condenser Mic

Mic stand

Dry battery "AA" (R06) type (1)

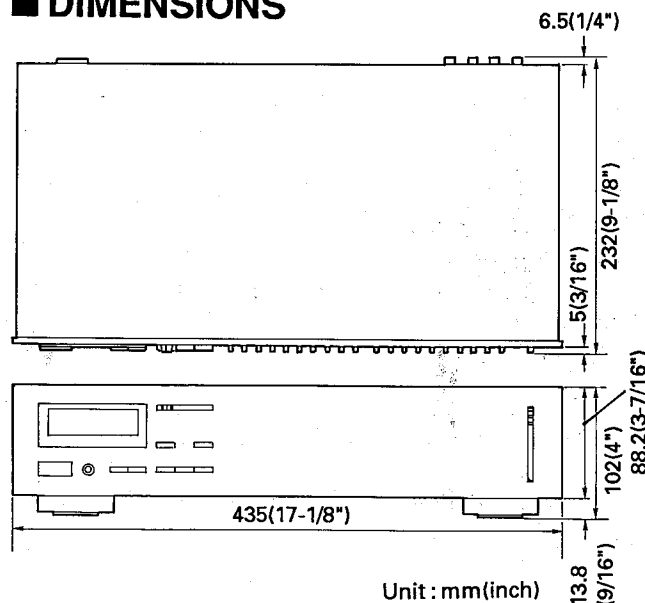
* Specifications subject to change without notice.

(U) U.S.A. model (G) European model

(C) Canadian model (B) British model

(A) Australian model (R) General model

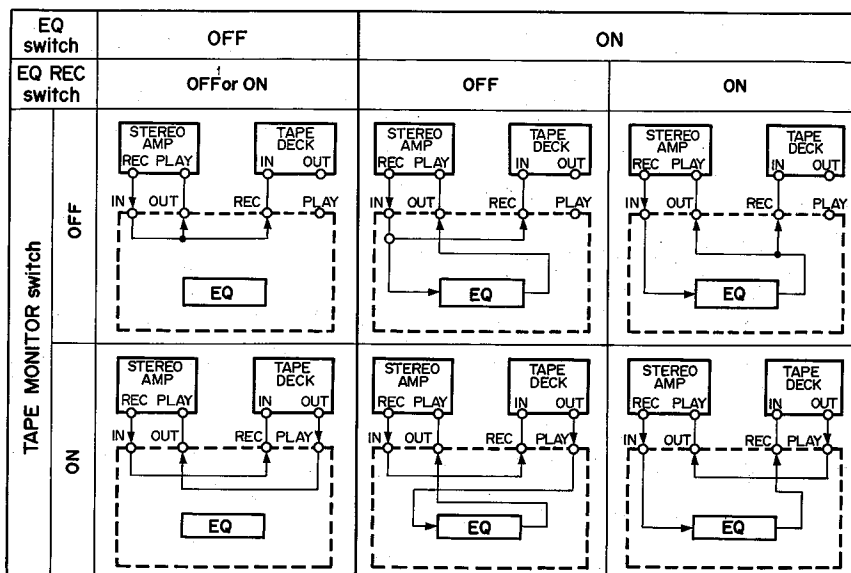
■ DIMENSIONS



Unit : mm(inch)

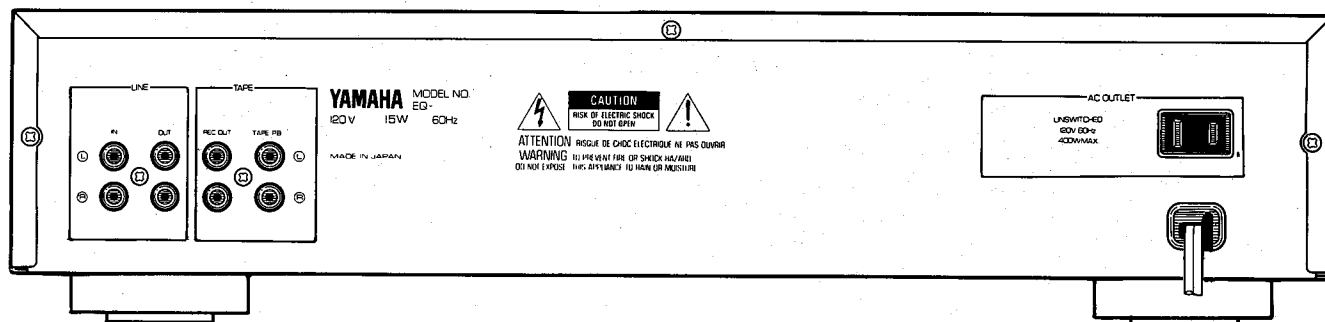
DESCRIPTION OF OPERATIONS

(Relationship of Switches)

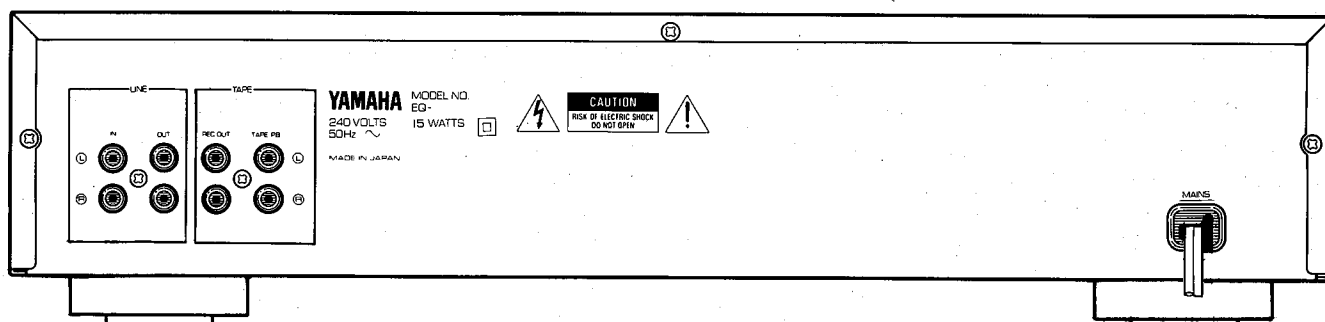


REAR PANELS

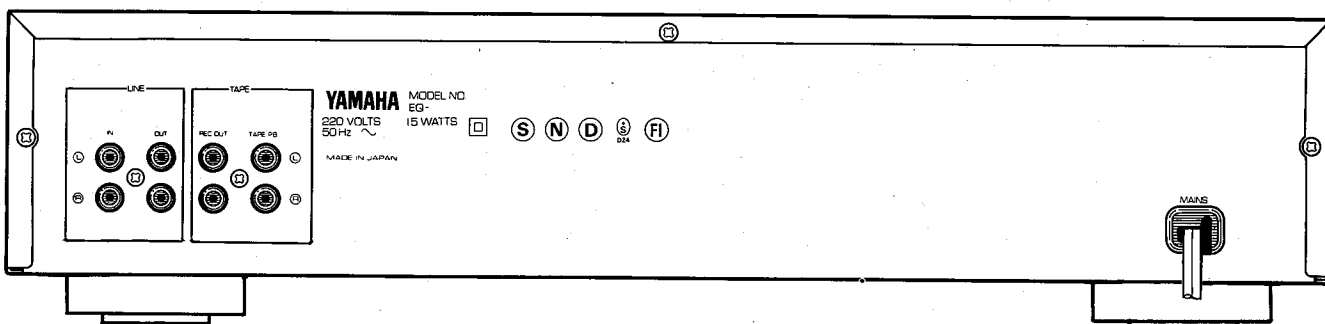
U.S.A. and Canadian models



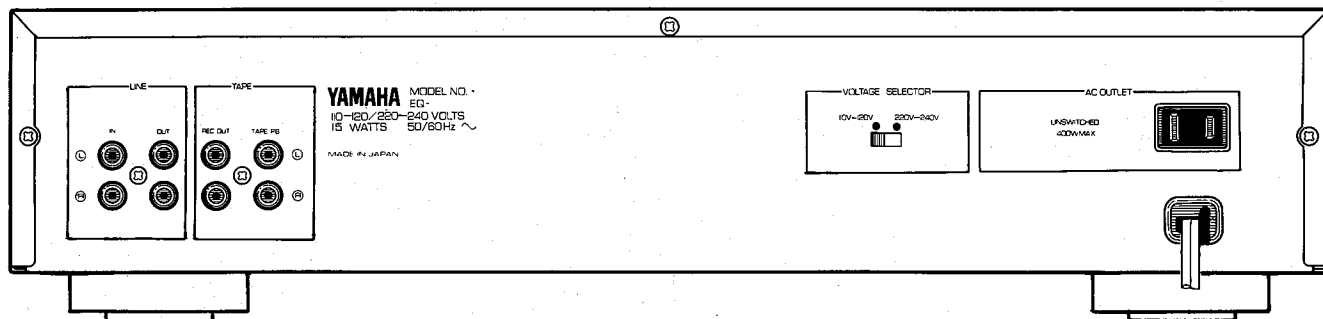
Australian and British models



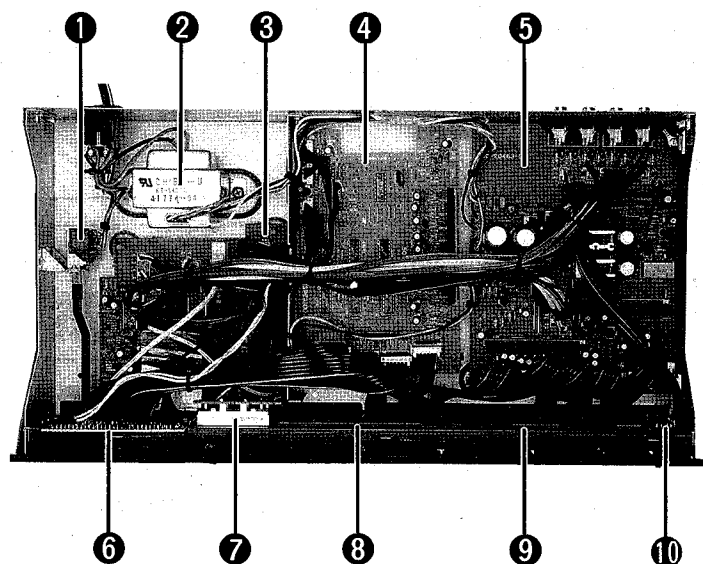
European model



● General model



■ INTERNAL VIEW



- ① POWER SWITCH
- ② POWER TRANSFORMER
- ③ MAIN CIRCUIT BOARD (2)
- ④ SPA CIRCUIT BOARD
- ⑤ MAIN CIRCUIT BOARD (1)
- ⑥ DISPLAY UNIT
- ⑦ MAIN CIRCUIT BOARD (4)
- ⑧ SLIDE VOLUME UNIT (L)
- ⑨ SLIDE VOLUME UNIT (R)
- ⑩ MAIN CIRCUIT BOARD (3)

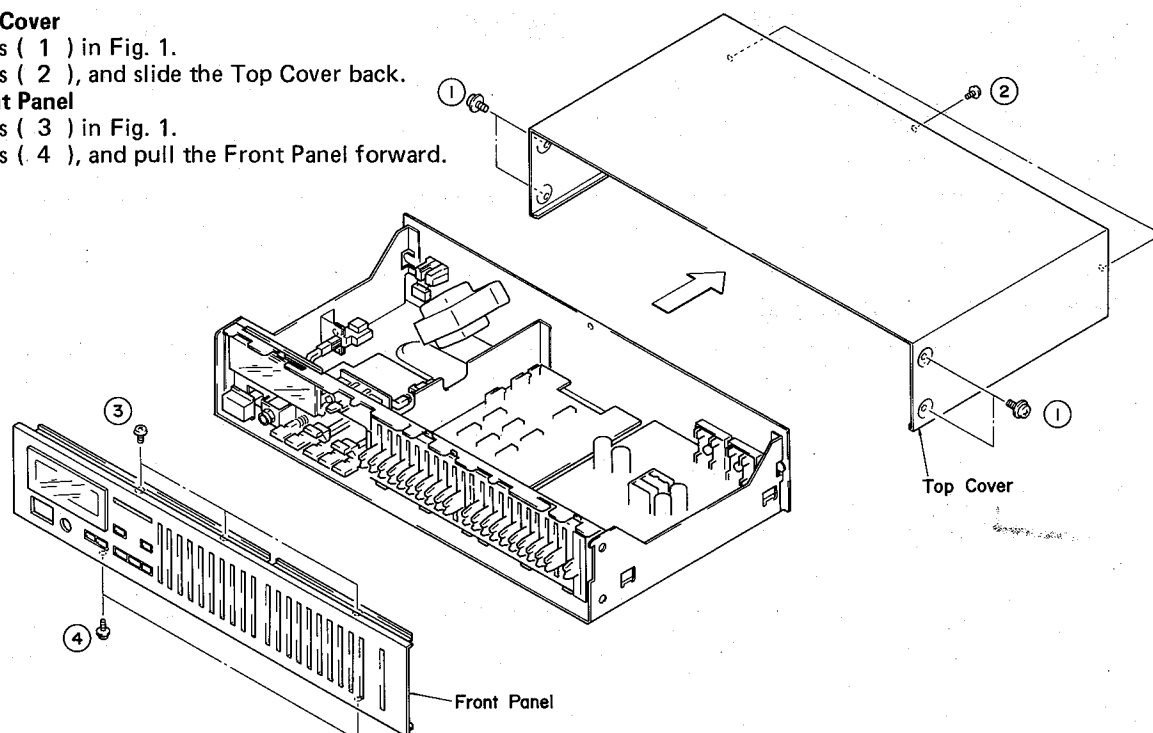
■ DISASSEMBLY PROCEDURES (Remove parts in disassembly order as numbered)

1. Removal of Top Cover

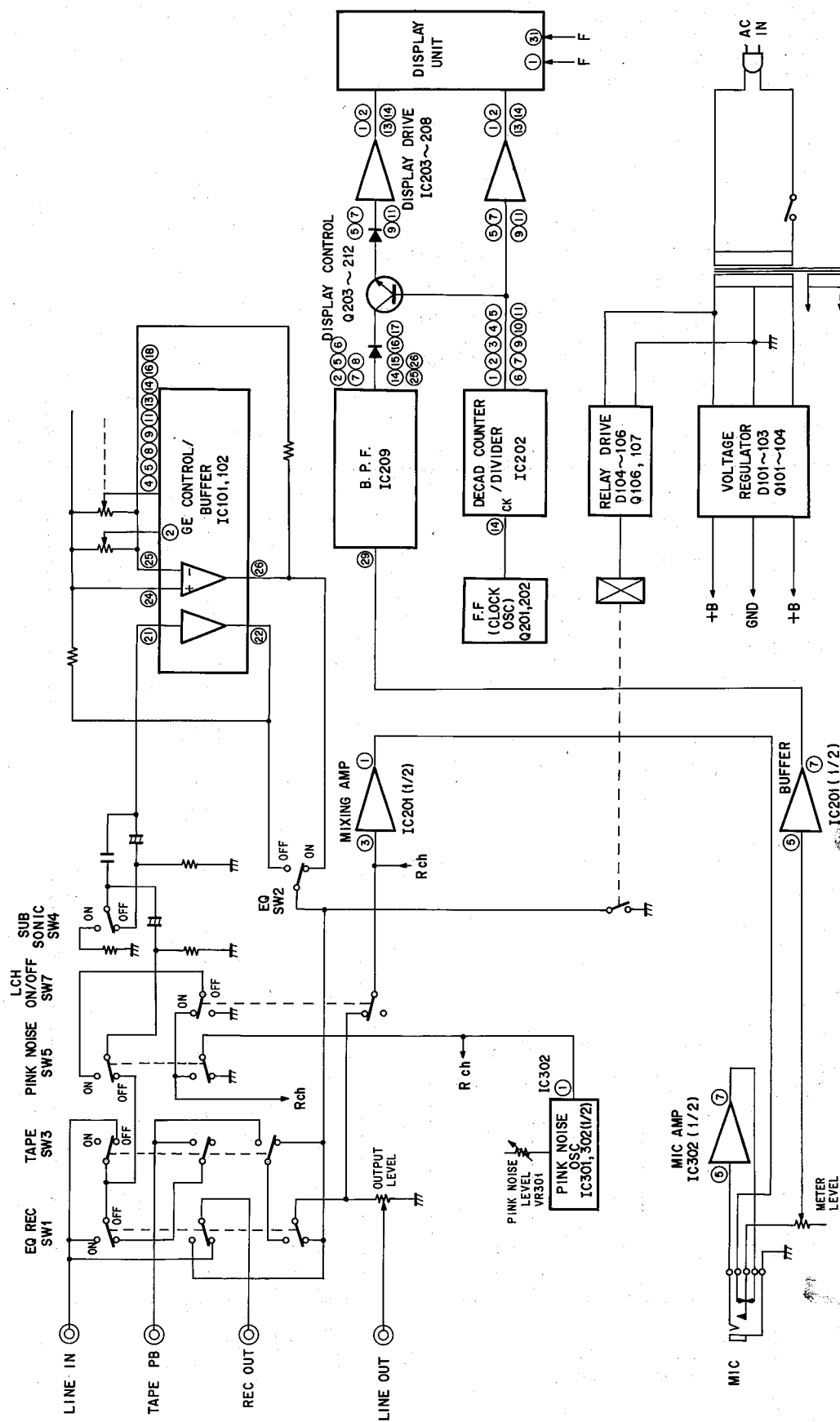
- a. Removal 4 screws (1) in Fig. 1.
- b. Removal 3 screws (2), and slide the Top Cover back.

2. Removal of Front Panel

- a. Removal 3 screws (3) in Fig. 1.
- b. Removal 2 screws (4), and pull the Front Panel forward.



BLOCK DIAGRAM



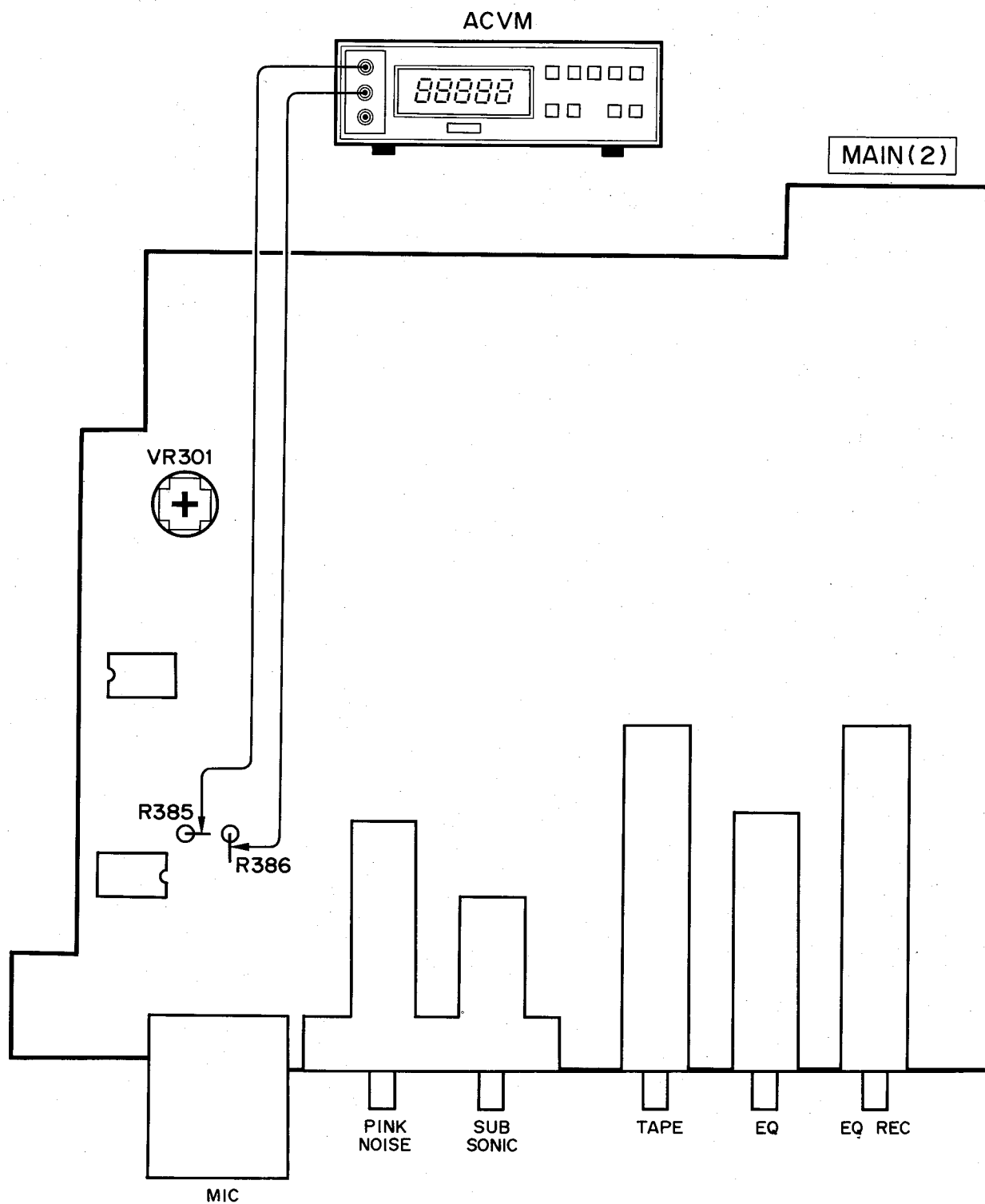
■ ADJUSTMENTS

1. Before adjustment.

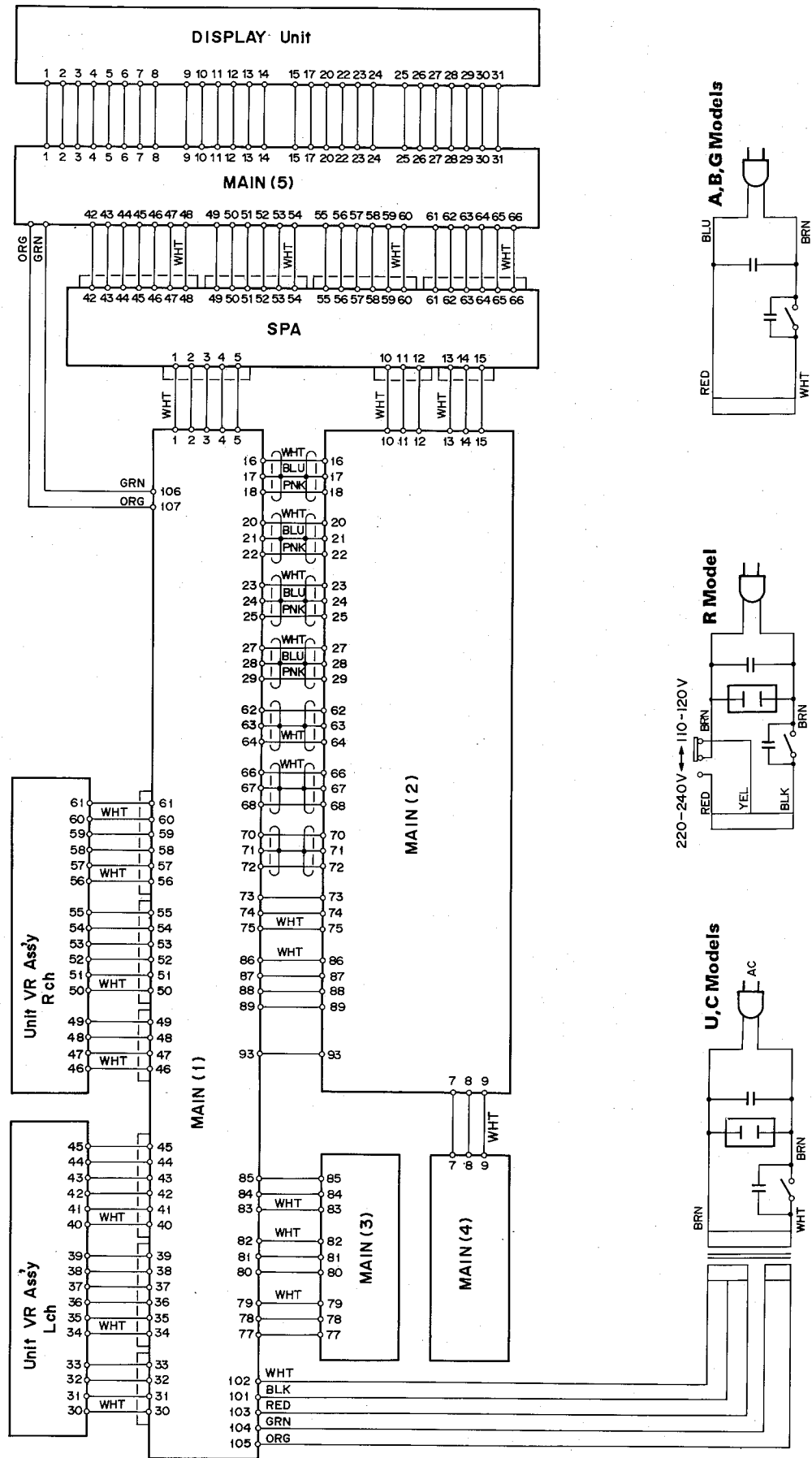
- 1) Power source voltage: 120V AC $\pm$ 10%(U,C models)
220V AC $\pm$ 10%(G model)
240V AC $\pm$ 10%(A,B models)
- 2) Let age for approximately 5 minutes after turning the power on.

■ Pink noise level adjustment

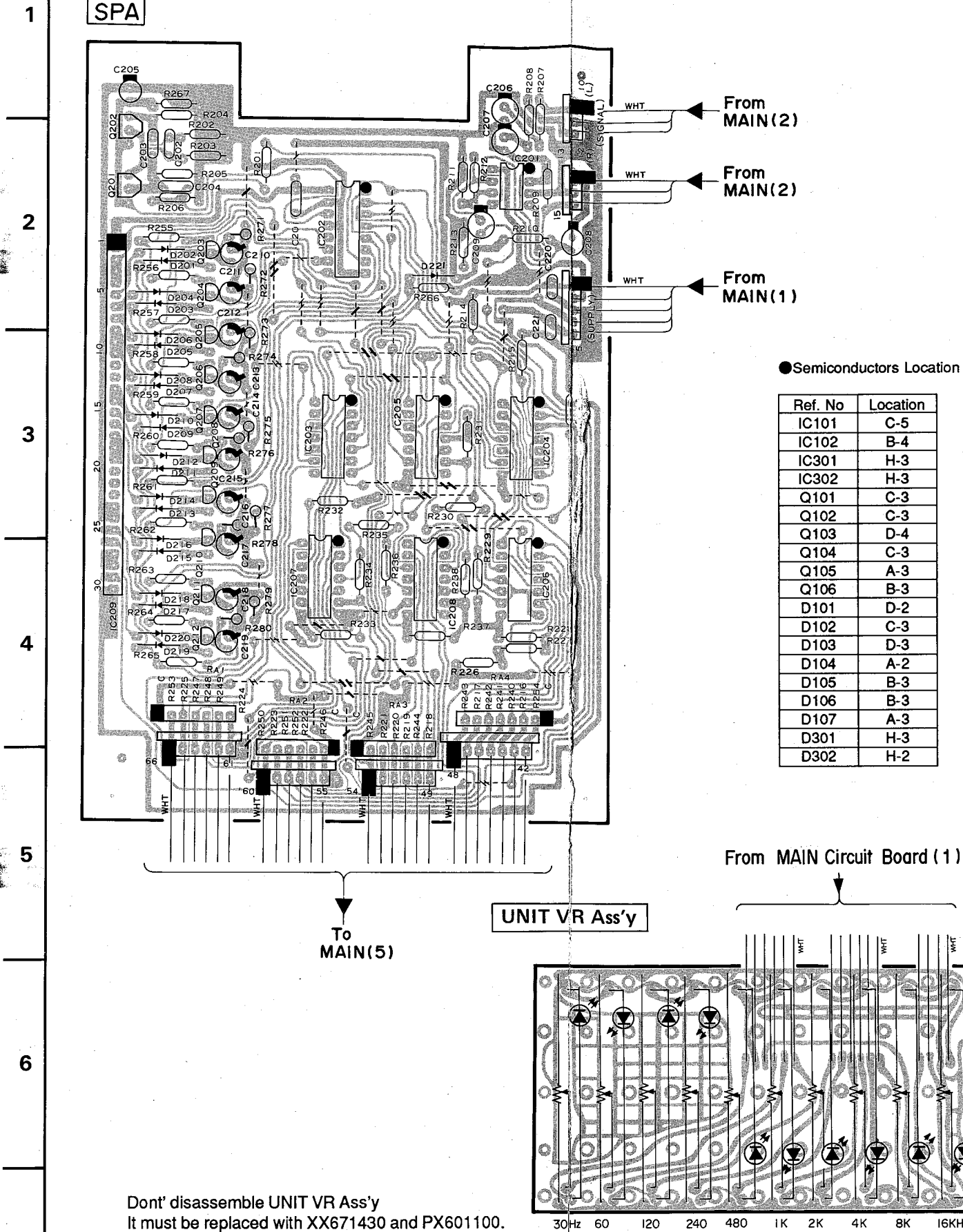
- 1) Connect on AC voltmeter to both sides of R386 and adjust VR301 for a reading of 150mV.



WIRING



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

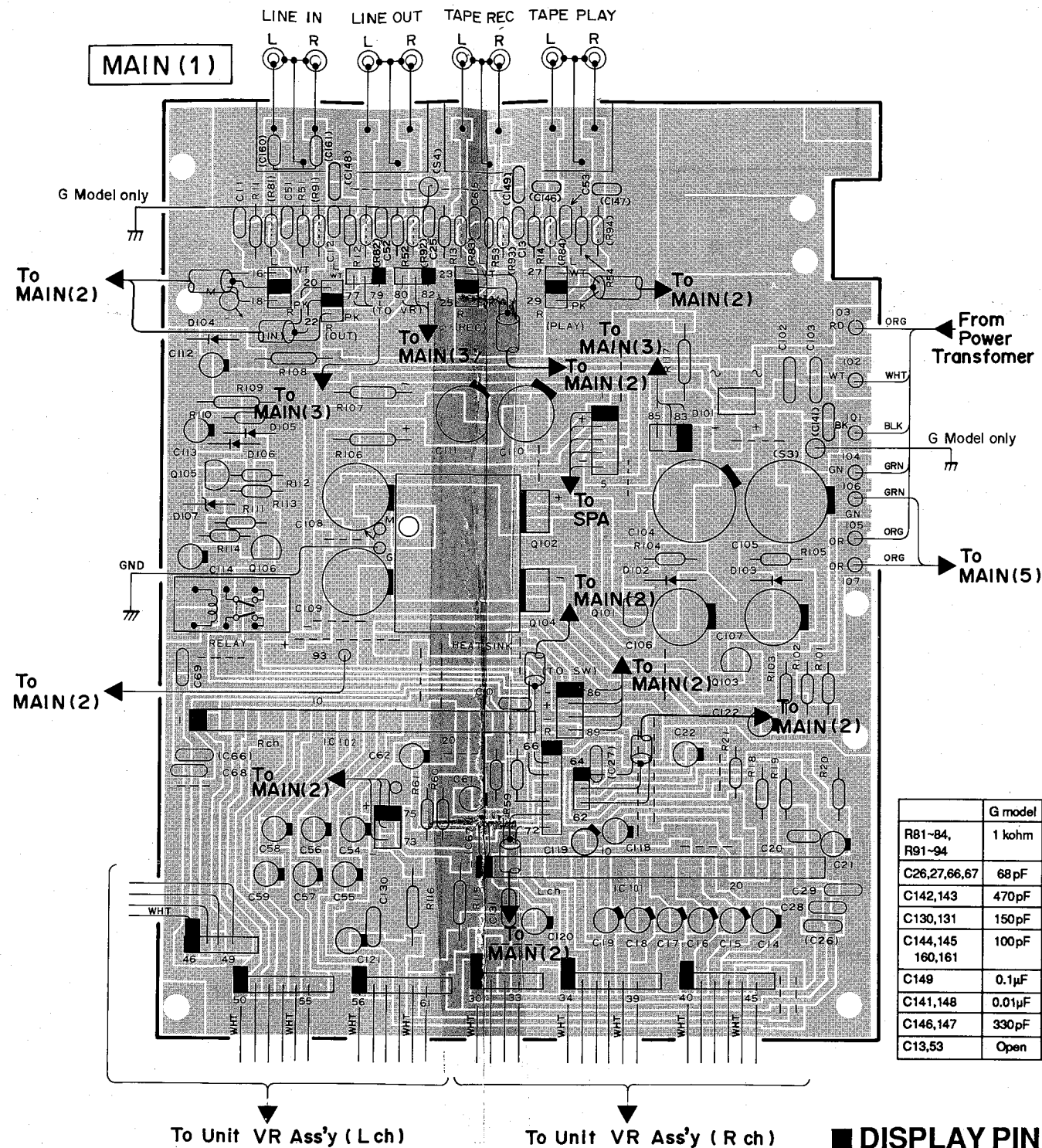


EQ-550

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

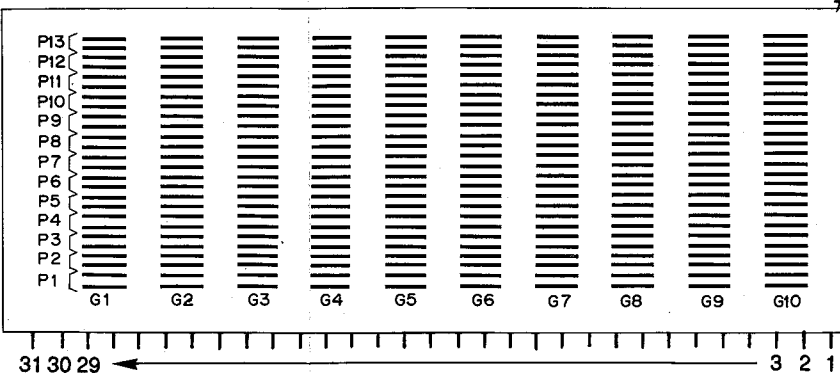
Semiconductors Location

Ref. No	Location
IC201	C-2
IC202	B-2
IC203	B-3
IC204	C-3
IC205	B-3
IC206	C-4
IC207	B-4
IC208	B-4
Q201	A-2
Q202	A-2
Q203	A-2
Q204	A-2
Q205	A-3
Q206	A-3
Q207	A-3
Q208	A-3
Q209	A-3
Q210	A-4
Q211	A-4
Q212	A-4
D201	A-2
D202	A-2
D203	A-2
D204	A-2
D205	A-3
D206	A-3
D207	A-3
D208	A-3
D209	A-3
D210	A-3
D211	A-3
D212	A-3
D213	A-3
D214	A-3
D215	A-4
D216	A-4
D217	A-4
D218	A-4
D219	A-4
D220	A-4
D221	B-2



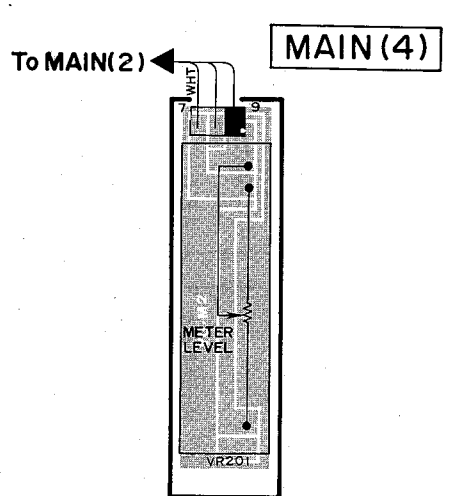
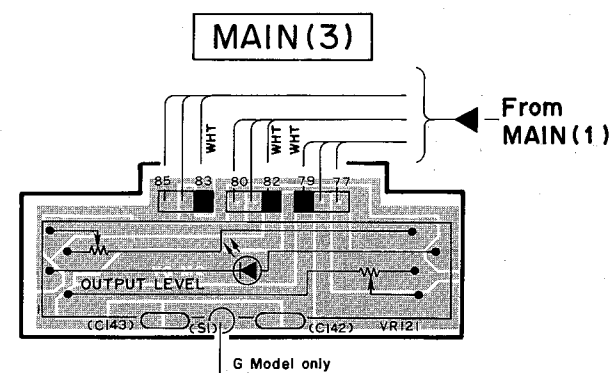
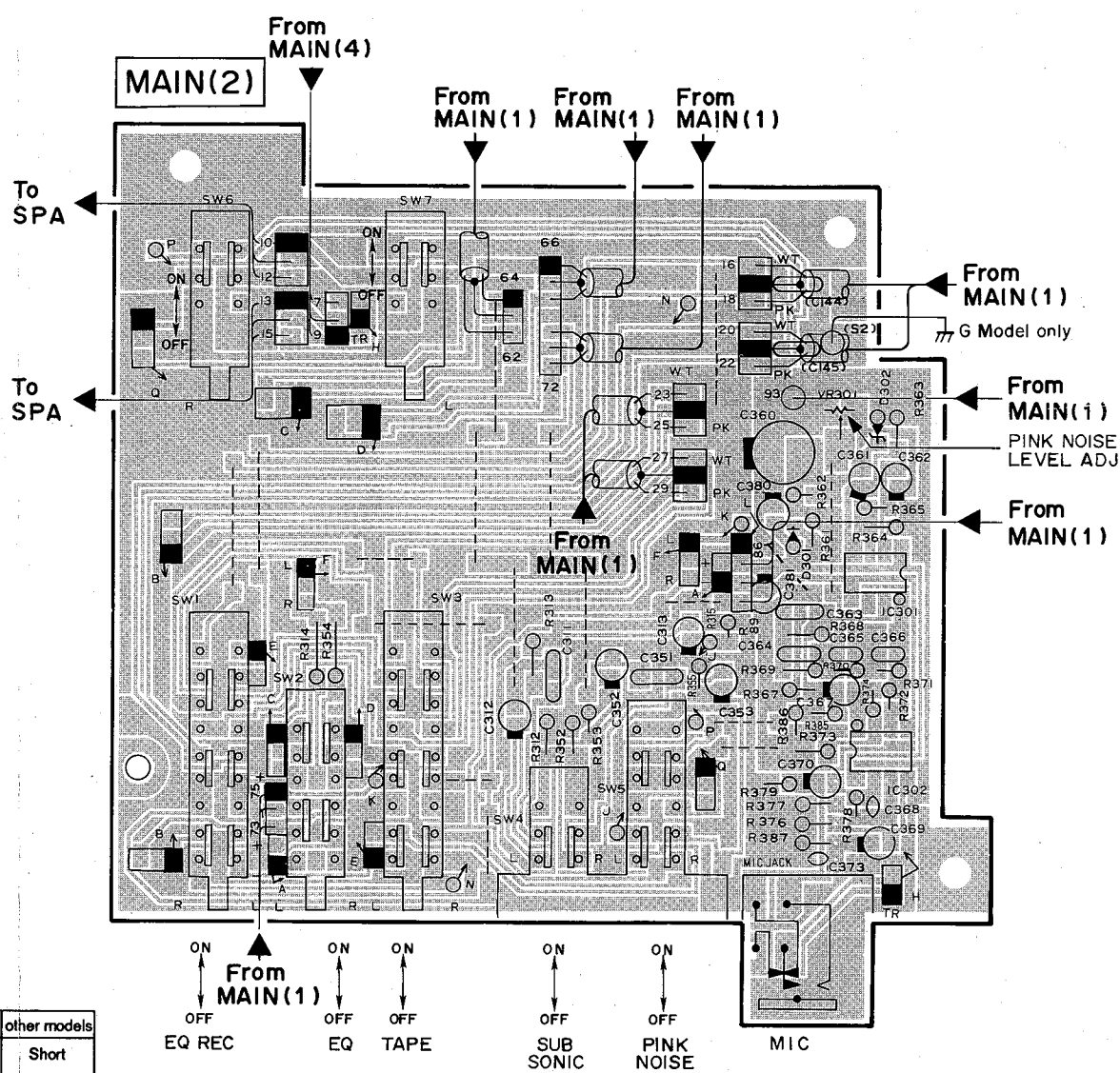
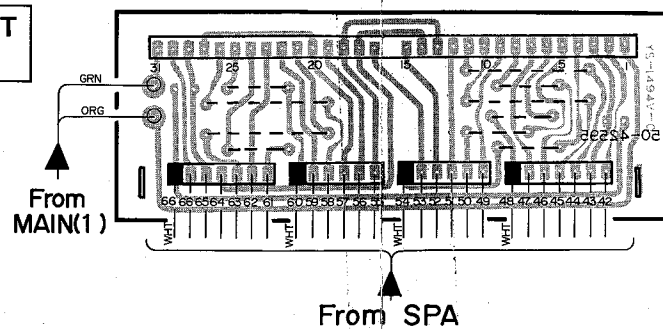
	G model	other models
R81-84, R91-94	1 kohm	Short
C26,27,66,67	68 pF	Open
C142,143	470 pF	Open
C130,131	150 pF	Open
C144,145, 160,161	100 pF	Open
C149	0.1 μF	Open
C141,148	0.01 μF	Open
C146,147	330 pF	Open
C13,53	Open	470 pF

DISPLAY PIN CONNECTIONS

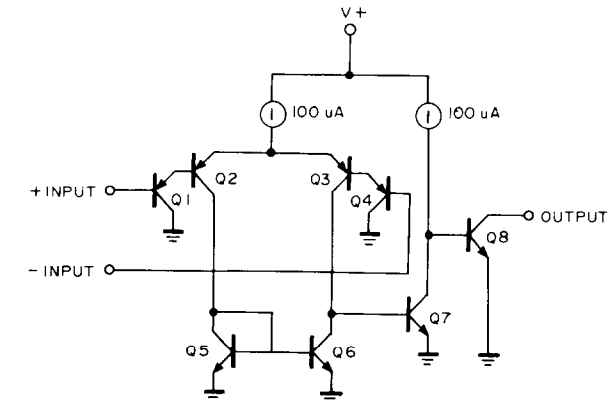
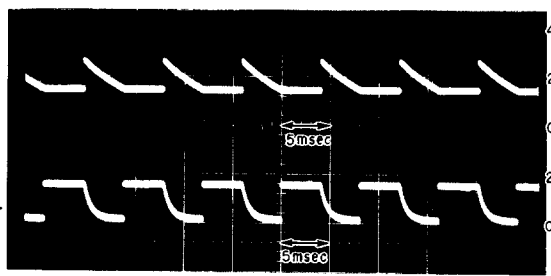


Notes F: Filament NR: No Pin
G: Grid NC: No Connection
P: Anode

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ELECTRODE	F	P(10)	10G	P(8)	P(9)	P(10)	9G	P(11)	8G	P(12)	P(13)	7G	P(7)	P(6)	6G	NP
TERMINAL NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
ELECTRODE	5G	NP	NP	4G	NP	P(5)	3G	P(4)	2G	P(3)	P(2)	P(1)	1G	P(2)	F	

DISPLAY UNIT
MAIN (5)

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____



Timing diagram for the 68000 microprocessor showing signals from 0 to 14. The signals include clock (0), address bus (1), data bus (2), bus arbiter (3), bus master (4), bus slave (5), bus master (6), bus slave (7), bus master (8), bus slave (9), bus master (10), bus slave (11), bus master (12), bus slave (13), and bus master (14). Each signal is a square wave with a period of 100 ns. The signals are labeled with their respective bus master and slave addresses.

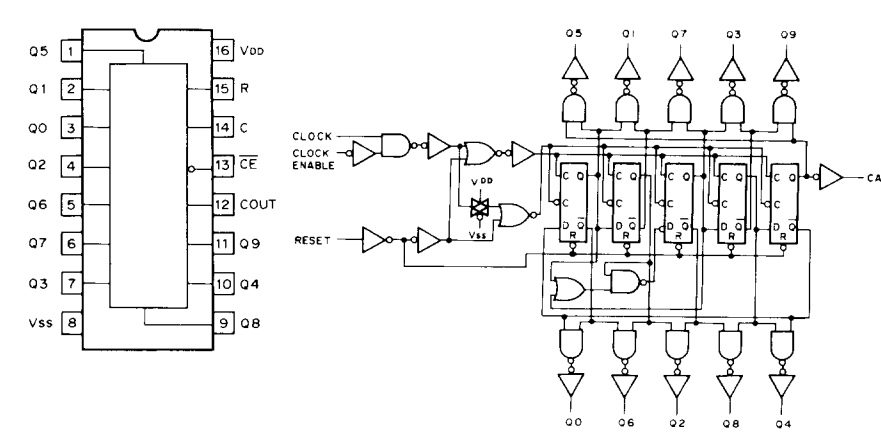
8

The schematic diagram shows a 10-bit digital-to-analog converter. It features a 32V supply connected to a series of resistors with values 64, 125, 250, 500, 1K, 2K, 4K, 8K, 16K, and 32K. The output is taken from the 32K resistor. The circuit includes two operational amplifiers (IC) and a feedback loop. The output is labeled OUT.

(TOP VIEW)

Pin 1: A-OUT
Pin 2: A-IN
Pin 3: A+IN
Pin 4: V=
Pin 5: B+IN
Pin 6: B-IN
Pin 7: B-OUT
Pin 8: V+

10



10

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 1/4 W are not included in the ELECTRICAL PARTS list. For the parts No. of the carbon resistor, refer to the last Page.

Ref. No.	Parts No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	XX690830	Main Circuit Board	メインシート	Black	EQ-500	U, C, A, B, R	
	XX690840	"	"	"	"	G	
	NX608610	"	"	Titan		U, C, A, B, R	
	NX608620	"	"	"		G	
	FG211100	Ceramic Cap.	セラコン	C368			
	FG211680	"	68pF 50V	"	C26, 27, 66, 67	G	
	FG212100	"	100pF 50V	"	C28, 29, 68, 69		
	FG212470	"	470pF 50V	"	C142, 143	G	
	FG212150	"	150pF 50V	"	C130, 131	G	
	FG212100	"	100pF 50V	"	C144, 145	G	
	FG213100	"	0.001 μ F 50V	"	C373		
	FG245100	"	0.1 μ F 50V	"	C149	G	
	FG244100	"	0.01 μ F 50V	"	C141, 148	G	
	UJ137100	Electrolytic Cap.	10 μ F 16V	ケミコン	C371, 362, 367		
	UJ137100	"	10 μ F 16V	"	C21, 61, 122		
	UJ638220	"	220 μ F 16V	"	C360		
	UJ146470	"	4.7 μ F 25V	"	C14, 22, 54, 62, 118~121, 370		
	UJ147220	"	22 μ F 25V	"	C113		
	UJ147470	"	47 μ F 25V	"	C112, 114		
	UJ148220	"	220 μ F 25V	"	C106, 107, 110, 111		
	UJ148470	"	470 μ F 25V	"	C108, 109		
	UJ159100	"	1000 μ F 35V	"	C104, 105		
	UW565150	"	0.15 μ F 50V	"	C19, 59		
	UJ165330	"	0.33 μ F 50V	"	C18, 58, 313, 353		
	UW565680	"	0.68 μ F 50V	"	C17, 57		
※	UJ666100	"	1 μ F 50V	"	C312, 352		
	UJ166150	"	1.5 μ F 50V	"	C16, 56		
	UJ666220	"	2.2 μ F 50V	"	C15, 55, 369		
	FX605600	Mylar Cap.	330pF 50V	マイラーコン	C146, 147	G	
	UA252470	"	470pF 50V	"	C11, 12, 20, 25, 51, 52, 60, 65		
	UA252470	"	470pF 50V	"	C13, 53	U, C, A, B, R	
	FA153470	"	0.0047 μ F 50V	"	C366		
	FA154120	"	0.012 μ F 50V	"	C365		
	FA154390	"	0.039 μ F 50V	"	C364		
	FA154470	"	0.047 μ F 50V	"	C311, 351		
	FA154100	"	0.01 μ F 50V	"	C102, 103		
	FA155100	"	0.1 μ F 50V	"	C363		
	iA101530	Transistor	2SA1015(GR)	トランジスター	Q103, 105		
	iX608230	"	2SB1094	"	Q104		
	iC181511	"	2SC1815(0)	"	Q101		
	iD043800	"	2SD438	"	Q106		
	iX608240	"	2SD1585	"	Q102		
	iX608300	Diode Bridge	DF02M	ダイオードブリッジ	D101		
	iX608310	Diode	1N4002	ダイオード	D104		
	iF003420	"	1S1588	"	D105, 106		
	iF003420	"	1S1588	"	D301		
	iX608320	Zener Diode	HZ18-1	ゼナーダイオード	D102, 103		
	iF003480	"	HZ3C-1	"	D107		
	iX608660	"	HZ11A2	"	D302		

※New Parts(新規部品)

Ref. No.	Parts No.	Description	部 品 名		Remarks	Common Model	Markets	ランク
	iX606640 iX606650 iX608670 iG001390	IC " " "	NH-0064 NH-0065 NJM2068D-D NJM4558DV	I C " " "	IC101 IC102 IC302 IC301			
	HX601490 HX601500 HX601510 HX601740 HX601750	Flame Proof Carbon Resistor " " " "	15Ω 1W 33Ω 1W 560Ω 1W 1kΩ 1W 2.2kΩ 1W	不燃性抵抗 " " " "	R106, 107 R108 R109 R115, 116 R117 BL			
※	HX604730 XX690880 HX604720 XX690890 XX690900	" Slide VR " " Pre-Set Potentiometer	3.9kΩ 1W K10kΩ × 2 K10kΩ × 2 100kΩ B20kΩ	" スライド VR " " 半固定抵抗	R117 Ti OUTPUT LEVEL BL OUTPUT LEVEL Ti METER LEVEL VR301			
※	XX671430 PX601100 XX690910 XX690920	Unit VR Ass'y " Push Switch "	 MR62 4P	ユニットVR Ass'y " プッシュスイッチ "	BL Ti SW4, 5 SW1, 3			
	XX690930 XX690940 KX600450 XX690960 XX686340	" " Relay Mic Jack Pin Jack	 MR62 4P	" " リレー マイクジャック ピンジャック	SW2 SW6, 7			
	XX686350 Ei330086	Heat Shink Bind Head Tapping Screw	3×8 FCRM3-B1	放熱板 バインドヘッドタッピングネジ				
	XX690860 FG212100 FG244470 UJ137100 UJ637330	S.P.A Circuit Board Ceramic Cap. " Electrolytic Cap. "	100pF 50V 0.047μF 50V 10μF 16V 33μF 16V	スベアナシート セラコン " ケミコン "	C204 C201 C205~209 C210~219	EQ-500		
	FG243680 iX608250 iX608260	Mylar Cap. Transistor "	0.0068μF 50V 2SA1048 (GR) 2SC2062	マイラーコン トランジスタ "	C202, 203 Q201, 202 Q203~212			
	iF003420 iX608680 iX608280 iX608290	Diode IC " "	1S1588 NH-0104 HD4017 NJM2901-N	ダイオード IC " "	D201~221 IC209 IC202 IC203~208			
	iG001390 HX601520 HX601530	" Resistor "	NJM4558DV 10kΩ × 6 10kΩ × 7	" 集合抵抗 "	IC201			
	XX690870	Fluorescent Display		蛍光表示管				

※New Parts(新規部品)

A

B

C

D

E

EQ-550

MECHANISM EXPLODED VIEW

1

2

3

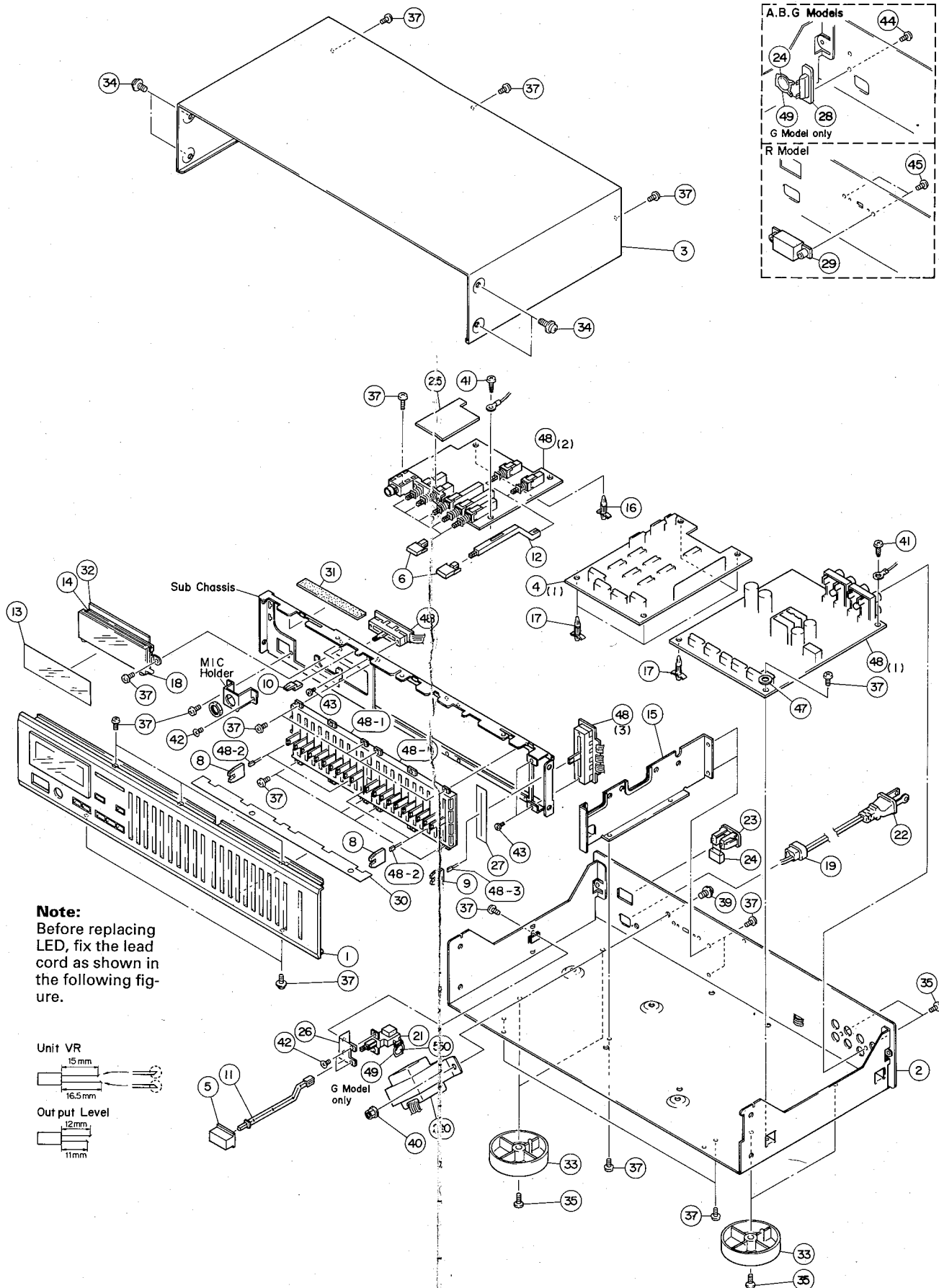
4

5

6

7

13



MECHANISM PARTS

Ref. No.	Parts No.	Description	部 品 名	Remarks	Common Model		
※ 1	PX601070	Front Panel Unit	フロントパネル	Titan		060-22740-02	
※ 2	PX601080	Bottom Case	ボトムケース	Black		060-22740-01	
※ 3	AX611290	Bottom Case	ボトムケース	U, C		060-10575-08	
※ 4	AX611300	Bottom Case	ボトムケース	R		060-10575-09	
※ 5	AX611310	Bottom Case	ボトムケース	G		060-10575-10	
※ 6	AX611320	Top Cover	トップカバー(キャビネット)	A, B		060-10575-11	
※ 7	AX611330	Top Cover	トップカバー(キャビネット)	Titan	EQ-500	060-21397-14	
※ 8	XX670970	Top Cover	トップカバー(キャビネット)	Black	EQ-500	060-21397-04	
※ 9	XX690860	S.P.A Circuit Board	スペアナシート	EQ-500		05-362-07	
※ 10	VH889500	Power Button	パワーボタン	Titan		060-44084-02	
※ 11	VH889400	Switch Button	スイッチボタン	Black		060-44084-01	
※ 12	VH816100	Switch Button	スイッチボタン	Titan		060-31663-02	
※ 13	VH816000	Slide Knob (A)	スライドノブ(A)	Black		060-31663-01	
※ 14	CX615310	Slide Knob (A)	スライドノブ(A)	Titan		060-42167-03	
※ 15	XX686110	Slide Knob (A)	スライドノブ(A)	Black	EQ-500	060-42167-02	
※ 16	CX615220	Slide Knob(B)	スライドノブ(B)	Titan		060-42717-03	
※ 17	CX615230	Meter Slide Knob	メータースライドノブ	Black		060-42717-01	
※ 18	CX615240	Meter Slide Knob	メータースライドノブ	Titan		060-42560-03	
※ 19	XX690670	Joint (A)	ジョイント(A)	Black	EQ-500	060-42560-02	
※ 20	XX690680	Joint (A)	ジョイント(A)	EQ-500		060-42555-01	
※ 21	LX604870	Joint (B)	ジョイント(B)			060-44083-01	
※ 22	NX608590	Sheet	シート			060-44118-01	
※ 23	XX690690	FL Holder	蛍光表示管ホルダー			060-31242-01	
※ 24	XX690700	Shield Plate	シールドプレート			060-31243-01	
※ 25	CX615250	P.C.B. Support	シート押え			060-40811-03	
※ 26	XX671100	P.V.C. Cap	P.V.C. キャップ			060-40811-06	
※ 27	XX690710	Bushing	ブッシング			060-42033-01	
※ 28	XX686200	Power Transformer	電源トランス			060-30677-01	
※ 29	XX690730	Power Transformer	電源トランス	U		050-41774-04	△
※ 30	XX690740	Power Transformer	電源トランス	C		050-42041-03	△
※ 31	XX690770	Push Switch	プッシュスイッチ	R		050-42562-01	△
※ 32	XX690760	AC Cord	電源コード	G		050-41776-03	△
※ 33	XX690750	AC Cord	電源コード	A, B		050-42039-02	△
※ 34	XX686220	AC Cord	電源コード	POWER		050-42456-01	△
※ 35	XX690790	AC Cord	電源コード	U, C		050-41987-01	△
※ 36	XX620160	AC Outlet	ACアウトレット	R		050-41451-01	△
※ 37	XX620280	AC Outlet	ACアウトレット	G		050-41513-01	△
※ 38	XX620270	AC Outlet	ACアウトレット	A		050-41093-01	△
※ 39	XX620330	AC Outlet	ACアウトレット	B		050-40847-02	△
※ 40	XX686210	AC Outlet	ACアウトレット	U, C, R		050-42204-01	△
※ 41	Fi324100	Capacitor	キャパシター	C100	U, C, R, A, B	050-41723-01	
※ 42	Fi414470	Capacitor	キャパシター	C100	G	050-40978-03	
※ 43	NX608600	Shield Sheet	シールドシート			060-42800-01	
※ 44	XX686070	Holder, Power Switch	スイッチホルダー			060-41500-01	
※ 45	XX686170	Blind	ブラインド			060-42186-01	
※ 46	XX671140	Terminal	中継端子	G, A, B		050-40832-01	
※ 47	XX671250	Voltage Selector	電圧切換スイッチ	R		050-41452-01	
※ 48	XX671230	Sheet	シート			060-31139-01	
※ 49	XX690810	Cushion	クッション			060-41763-19	
※ 50	XX690820	Cushion	クッション			060-4763-20	
※ 51	Vi615300	Leg	脚			060-43638-03	
※ 52	EX601150	Cup S-tite Screw	カップSタイトネジ	Titan			

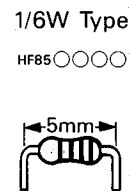
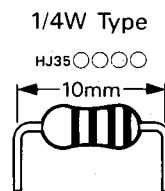
※New Parts(新規部品)

Ref. No.	Parts No.	Description	部 品 名		Remarks	Common Model		
※ 34	EX601080	Cup S-tite Screw	4×8 FCM3-B1	カップSタイトネジ	Black			
35	Ei330086	Binding Head Tapping Screw	3×8 FCRM3-B1	バインド・タッピングネジ	PACK			
37	Ei330066	〃	3×6 FCRM3-B1	〃	〃			
※ 39	AX611340	Hexagon Bolt	4×10 FCRM3-B1	ロカクアッパセット ダフ・ルセムボルト				
40	EV190400	Flange Nut	4φ ZMC2-Y	フランジナット				
41	Ei130086	Binding Head Tapping Screw	3×8 FNM3-3g	バインド・タッピングネジ	PACK			
42	EB030066	Flat Head Screw	3×6 ZMC2-Y	皿小ネジ	〃			
43	EA320036	Pan Head Screw	2×3 FCRM3-B1	ナベ小ネジ	〃			
44	EA330056	〃	3×5 FCRM3-B1	〃	〃	A, B, G		
45	EJ326086	Pan Head Tapping Screw	2.6×8 ZMC2-B1	ナベタッピングネジ	〃	R		
46	Ei130066	Binding Head Tapping Screw	3×6 FNM3-3g	バインド・タッピングネジ	〃	G, R, B		
47	EV201036	Washer	t0.5×3×8	ワッシャー				
※ 48	NX608610	Main Circuit Board		メインシート	Titan	U, C, R, A, B	050-470-03	
※ 〃	XX690830	〃		〃	Black	U, C, R, A, B	EQ-500	050-470-01
〃	NX608620	〃		〃	Titan	G		050-470-02
〃	XX690840	〃		〃	Black	G	EQ-500	050-470-04
※ 48-1	XX671430	Unit VR Ass'y		ユニットVR Ass'y	Black			050-42118-03
〃	PX601100	〃		〃	Titan			050-42118-04
※ 48-2	iX606680	LED		GL9PR441	Black			
〃	iX618360	〃		GL8HS29	Titan			
※ 48-3	iX606690	〃		GL9PR22	Black			
〃	iX618350	〃		GL8HS42	Titan			
49	XX671260	Condenser Cover		コンデンサ カバー	G		060-41487-01	
50	Fi324100	Capacitor	0.01μF 250V	キャパシター	C101	U, C, R, A, B		050-41723-01
〃	Fi504100	〃	0.01μF 400V	〃	〃	G		050-40978-01
〃	CB069250	Binding Tie		インシュロックタイ				
※	Mi088790	Accessory Pin Cord		付属品 ピンコード			052-286-19	
	PX601090	Microphone Unit		マイクユニット				

※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	※	12K Ω	HJ357120	HF857120
1.8 "	HJ353180	※	15 "	HJ357150	HF857150
2.2 "	HJ353220	HF853220	18 "	HJ357180	HF857180
3.3 "	HJ353330	HF853330	22 "	HJ357220	HF857220
4.7 "	HJ353470	HF853470	27 "	HJ357270	HF857270
5.6 "	HJ353560	HF853560	33 "	HJ357330	HF857330
10 "	HJ354100	HF854100	39 "	HJ357390	HF857390
15 "	HJ354150	HF854150	47 "	HJ357470	HF857470
22 "	HJ354220	HF854220	56 "	HJ357560	HF857560
27 "	HJ354270	HF854270	68 "	HJ357680	HF857680
33 "	HJ354330	HF854330	82 "	HJ357820	HF857820
39 "	HJ354390	HF854390	91 "	HJ357910	HF857910
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	※
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			



JUL. '85