

Service Manual

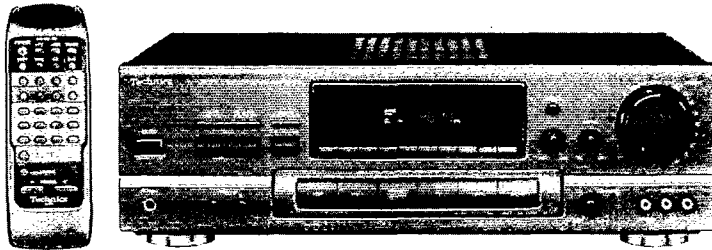
AV Control Stereo Receiver

Receiver

SA-GX170

Colour

(K) ... Black Type



Areas

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EB)	Great Britain.	
(EG)	Germany and Italy.	
(EP)	Poland.	
(G)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

SPECIFICATIONS (DIN 45 500)

■ AMPLIFIER SECTION

Power output	
DIN 1 kHz (T.H.D. 1%)	
[at 240 V for (E, EB, EG, EP) areas.]	2 × 80 W (4 Ω)
[for (G, GN) areas.]	2 × 80 W (8 Ω)
40 Hz–20 kHz continuous power output both channels driven	2 × 60 W (8 Ω)
Total harmonic distortion	
rated power at 40 Hz–20 kHz	0.5% (8 Ω)
half power at 1 kHz	0.03% (8 Ω)
Intermodulation distortion	
rated power at 60 Hz: 7 kHz = 4:1, SMPTE	0.5% (8 Ω)
Power bandwidth	
both channels driven, –3 dB	10 Hz–40 kHz (8 Ω)
Damping factor	40 (8 Ω)
Input sensitivity and impedance	
PHONO	3 mV/47 kΩ
CD, VCR 1, VCR 2, TAPE/DCC	200 mV/22 kΩ
S/N at rated power (8 Ω)	
PHONO	70 dB (IHF, A: 80 dB)
CD, VCR 1, VCR 2, TAPE/DCC	80 dB (IHF, A: 90 dB)
Frequency response	
PHONO	RIAA standard curve
	(30 Hz–15 kHz) ±0.8 dB
CD, VCR 1, VCR 2, TAPE/DCC	10 Hz–40 kHz, ±3 dB
Tone controls	
BASS	50 Hz, +10 to –10 dB
TREBLE	20 kHz, +10 to –10 dB
Output voltage	
VCR 1 OUT, TAPE/DCC REC (OUT)	200 mV
Channel balance (250 Hz–6.3 kHz)	±1 dB
Channel separation	55 dB
Headphones output level and impedance	430 mV/330 Ω
Load impedance	
A or B [For (E, EB, EG, EP) areas.]	4–16 Ω
[For (G, GN) areas.]	8–16 Ω
A and B	8–16 Ω

■ FM TUNER SECTION

Frequency range	87.50–108.00 MHz
Sensitivity	
S/N 30 dB	1.5 μV/75 Ω
S/N 26 dB	1.3 μV/75 Ω
S/N 20 dB	1.2 μV/75 Ω
IHF usable sensitivity	(IHF '58) 1.5 μV/75 Ω
IHF 46 dB stereo quieting sensitivity	22 μV/75 Ω
Total harmonic distortion	
MONO	0.2%
STEREO	0.3%
S/N	
MONO	60 dB (75 dB, IHF)
STEREO	58 dB (71 dB, IHF)
Frequency response	20 Hz–15 kHz, +1 dB, –2 dB
Alternate channel selectivity	
±400 kHz	65 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	40 dB
IF rejection at 98 MHz	70 dB
Spurious response rejection at 98 MHz	70 dB
AM suppression	50 dB
Stereo separation	
1 kHz	40 dB
Carrier leak	
19 kHz	–30 dB (–35 dB, IHF)
38 kHz	–50 dB (–55 dB, IHF)
Channel balance (250 Hz–6.3 kHz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminal(s)	75 Ω (unbalanced)

Technics

AM TUNER SECTION

• For (E, EB, EP, G, GN) areas.

Frequency range
MW 522–1611 kHz (9 kHz steps)
 530–1620 kHz (10 kHz steps)
LW 144–288 kHz

Sensitivity
MW 20 μV, 300 μV/m
LW 45 μV

Selectivity
MW (at 999 kHz) 55 dB
LW (at 252 kHz) 55 dB

Image rejection
MW (at 999 kHz) 40 dB
LW (at 252 kHz) 40 dB

IF rejection
MW (at 999 kHz) 55 dB
LW (at 252 kHz) 55 dB

• For (EG) area.

Frequency range
 522~1611 kHz (9 kHz steps)
 530~1620 kHz (10 kHz steps)

Selectivity (S/N 20 dB) 20 μV, 330 μV/m

Selectivity at 999 kHz 55 dB

Image rejection at 999 kHz 40 dB

IF rejection at 999 kHz 55 dB

GENERAL

Power consumption

[For (E, EB, EG, EP) areas.] 160 W

[For (G, GN) areas.] 150 W

Power supply

[For (E, EB, EP, GN) areas.] AC 50/60 Hz, 230–240 V

[For (EG) area.] AC 50/60 Hz, 230 V

[For (G) area.] AC 50/60 Hz, 110–127 V/220–240 V

Dimensions (W × H × D)

430 × 136 × 305 mm

Weight

6.6 kg

REMOTE CONTROL TRANSMITTER

Control keys

32 keys

Dimensions (W × H × D)

62 × 24.5 × 176 mm

Weight (including batteries)

104 g (3.1 oz)

Power source

Two UM-4

(Panasonic R03/LR03 or equivalent)

Notes:

- Design and specifications are subject to change without notice.
Weight and dimensions are approximate.
- Total harmonic distortions is measured by the digital spectrum analyzer.

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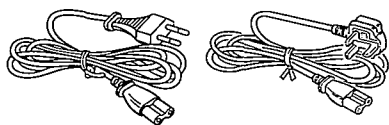
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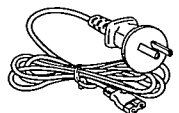
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ACCESSORIES

AC power supply cord 1 pc.
 [RJA0019-2K [VJA0733 (EB)]
 (E, EG, EP, G)]



[RJA0036-K (GN)]



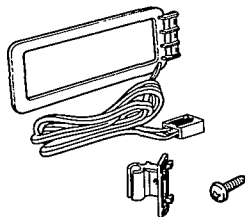
FM indoor antenna 1 pc.
 (RSA0007)



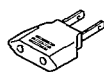
Attachment plug 1 pc.
 [SJP9009 (EB)]



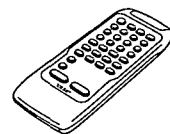
AM loop antenna set 1 pc.
 (RSA0010)
 • AM antenna holder 1 pc.
 (RMN0244)
 • Screw 1 pc.
 (XTN3 + 10AFZ)



Power plug adaptor 1 pc.
 [SJP5213-1 (G)]



Remote control transmitter 1 pc.
 (RAK-SA113XH)

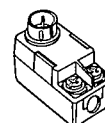


Batteries 2 pcs.
 (UM-4, "AAA", R03)



Note: These are available on sale route.

Antenna plug 1 pc.
 [RFE0014 (G, GN)]



■ CAUTION FOR AC MAINS LEAD



("EB" area code model only)

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:


Blue: Neutral

Brown: Live

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

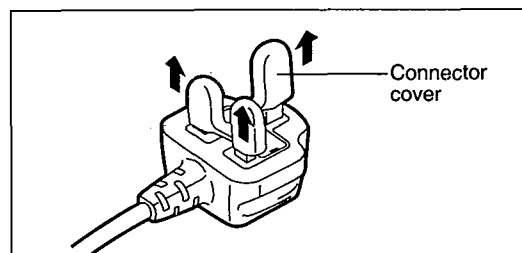
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol .

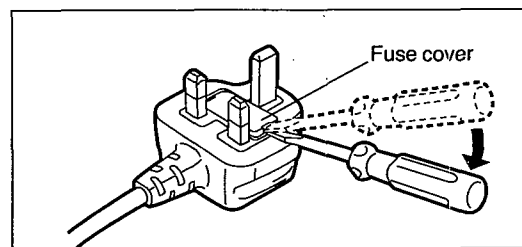
Before use

Remove the connector cover as follows.

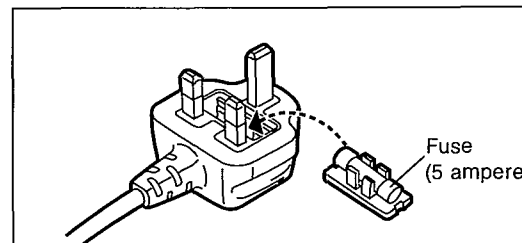


How to replace the fuse

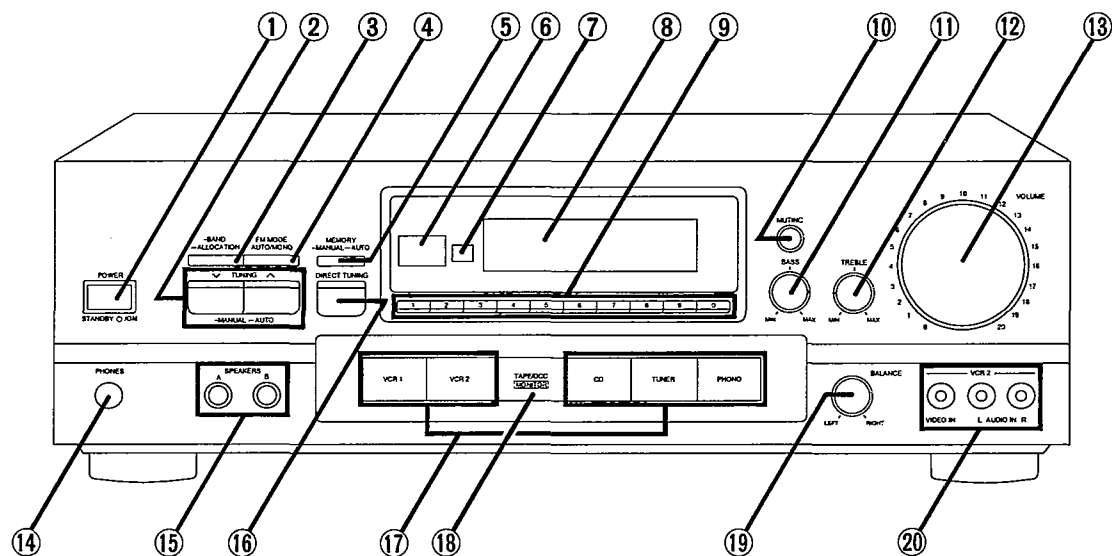
1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



FRONT PANEL CONTROLS

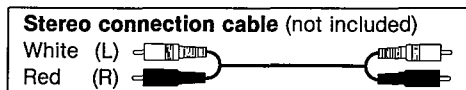


No.	Name
①	Power "STANDBY $\text{\textcircled{I}}$ / ON" switch (POWER, STANDBY $\text{\textcircled{I}}$ / ON) Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
②	Tuning buttons (TUNING)
③	Band select button (BAND)
④	FM mode select button (FM MODE)
⑤	Memory button (MEMORY)
⑥	Remote control signal receptor
⑦	"STANDBY" indicator When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.
⑧	Display
⑨	Numeric buttons (1-0)
⑩	Muting button (MUTING)

No.	Name
⑪	Bass control (BASS)
⑫	Treble control (TREBLE)
⑬	Volume control (VOLUME)
⑭	Headphone jack (PHONES)
⑮	Speaker select buttons (SPEAKERS)
⑯	Direct tuning button (DIRECT TUNING)
⑰	Input select buttons
⑱	Tape/DCC monitor button (TAPE/DCC MONITOR)
⑲	Balance control (BALANCE)
⑳	VCR 2 input terminals (VCR 2)

EQUIPMENT CONNECTIONS

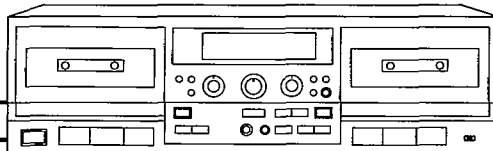
Connecting audio equipment



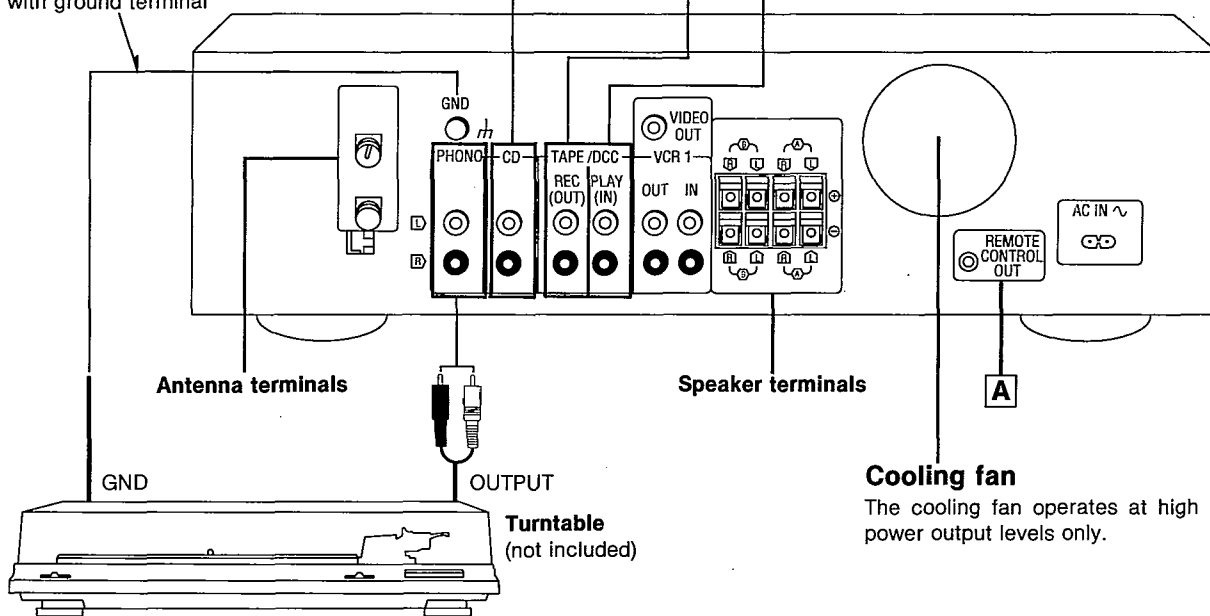
CD player (or CD changer)
(not included)



Tape deck or digital compact cassette deck (DCC)
(not included)

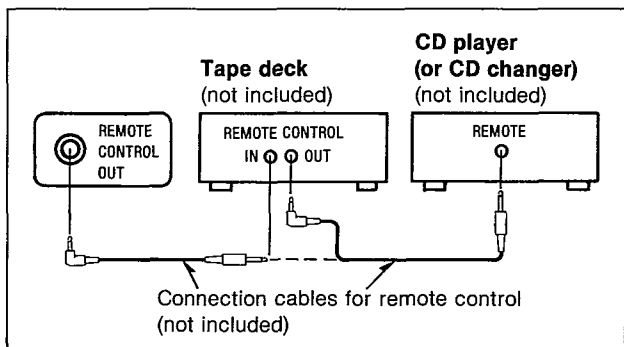


Only for turntable with ground terminal



A "REMOTE CONTROL OUT" terminal

Connect the connection cable for the remote control to a Technics tape deck and/or CD player (or CD changer) which has the appropriate remote control terminal as shown below. If a tape deck is not being used, the CD player (or CD changer) can be connected directly (dotted line).



For a CD player (or CD changer) with a remote control sensor the above connection is not necessary.

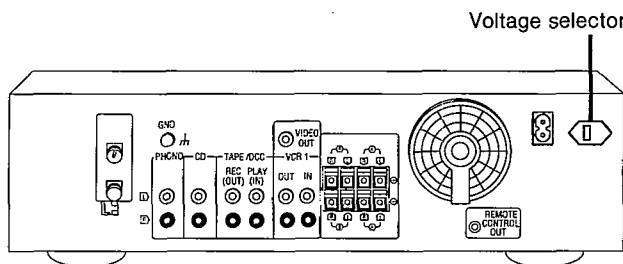
To set the power voltage

[For (G) area only.]

Set the voltage selector to the voltage setting for the area in which the unit will be used.

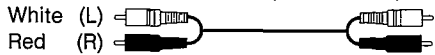
Note

Note that this unit will be seriously damaged if this setting is not made correctly.

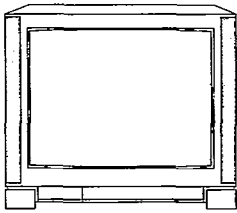


Connecting video equipment

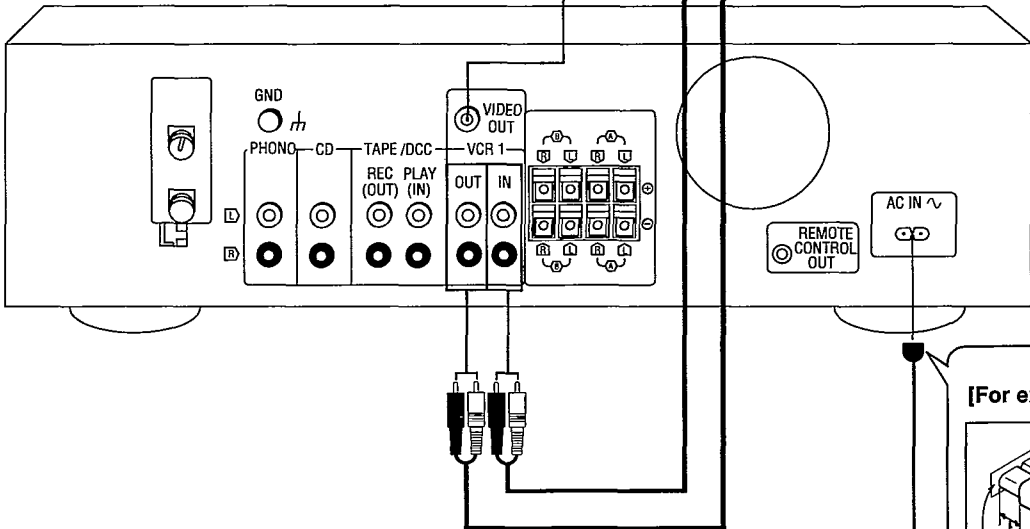
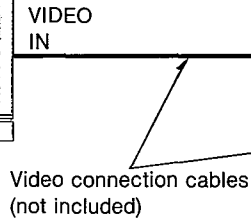
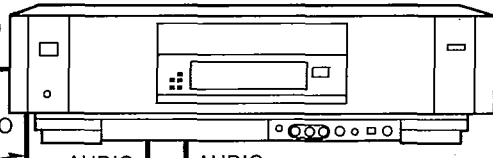
Stereo connection cable (not included)



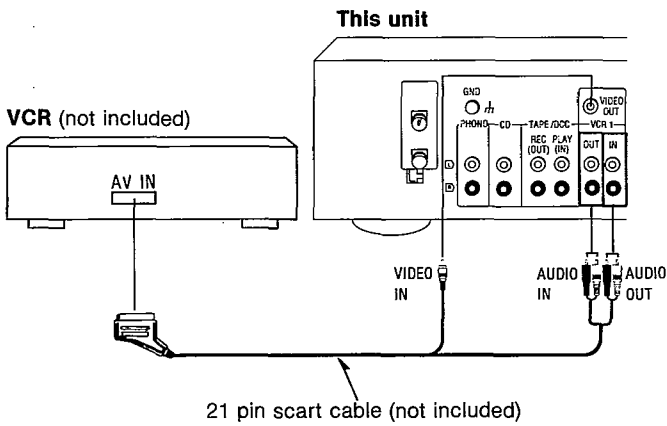
TV (not included)



VCR (not included)



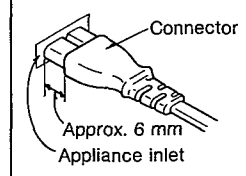
To connect a video deck with 21 pin scart terminal



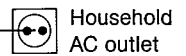
AC power supply cord (included)

Connect this cord after all other cables and cords are connected.

[For except (GN) area only.]



Even when the connector is perfectly inserted, the front part of the connector jut out as shown in the drawing. However there is no problem using the unit.

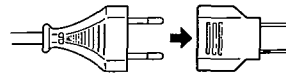


[For (EB) area only.]

BE SURE TO READ THE CAUTION FOR THE AC POWER SUPPLY CORD ON PAGE 3 BEFORE CONNECTION.

[For (G) area only.]

If the power plug will not fit your socket, use the power plug adaptor (included).



REMOTE CONTROL OPERATION

Basic operations

To turn the unit ON/OFF	POWER
To turn the tape monitor function ON	TAPE To turn off the tape monitor function, press one of the input select buttons (TUNER, CD, VCR 1).
To select an input source	TUNER CD VCR 1
To mute the sound level	— MUTING Press once more to return to the original volume.
To adjust the volume level	- VOLUME +
If your unit is equipped with the New Technics Remote Control System (see below)	
To turn the system OFF	— AUDIO OFF

To listen to radio broadcasts

TUNER

→

1

2

3

4

5

6

7

8

9

0

Specify the preset channel using the numeric button(s).

(Example: Channel 12)

1

→

2

Within 2 sec.

PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

BEFORE REPAIR AND ADJUSTMENT

Disconnect AC power, Discharge both Power Supply Capacitors C703 and C704 (56V 4700 μ F/75V 7500 μ F), C705 and C706 (50V 4700 μ F/50V 2200 μ F) through a 10 Ω , 5W resistor to ground.

DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices. After repairs are completed, restore power gradually using a variac, to avoid overcurrent.

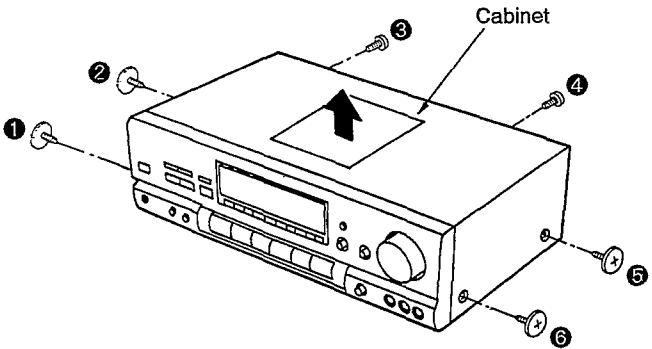
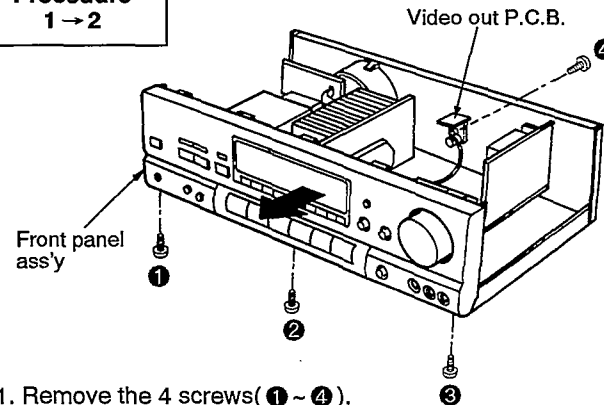
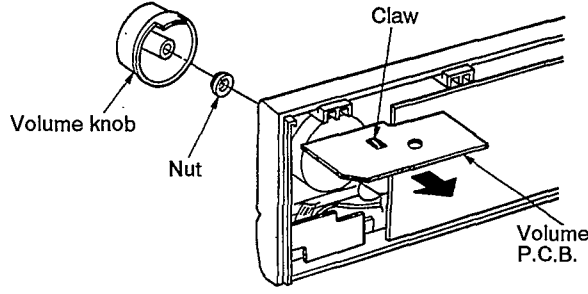
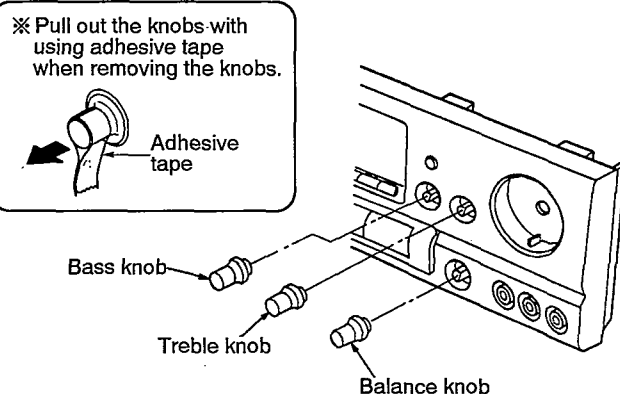
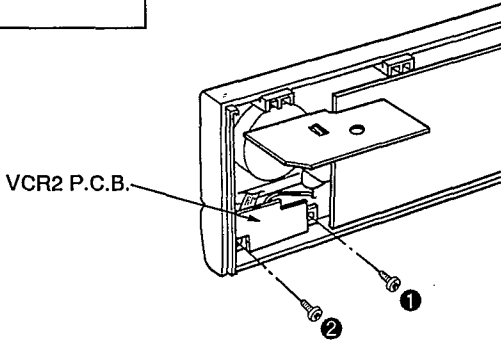
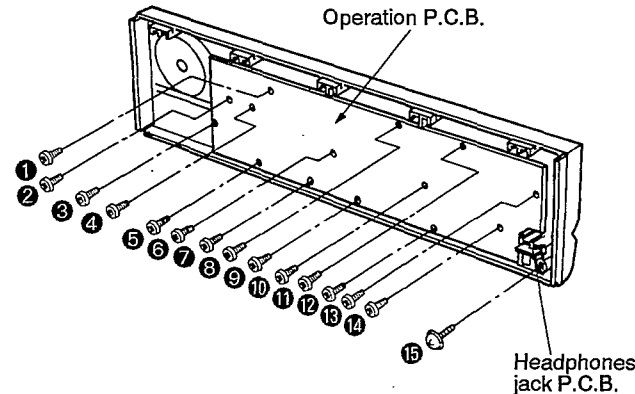
Current consumption at 50Hz/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage AC 230V/240V.

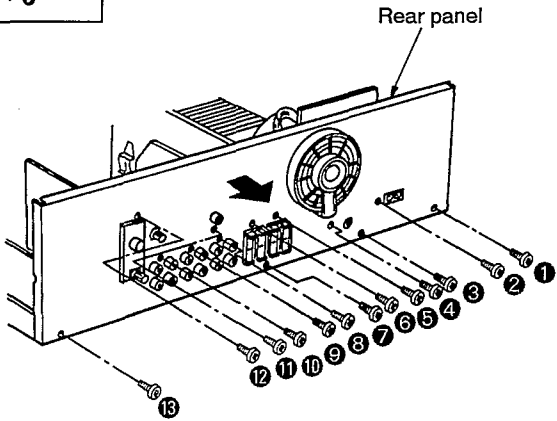
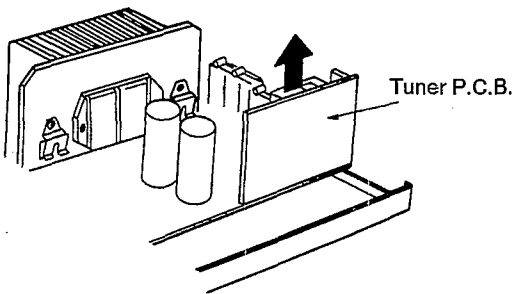
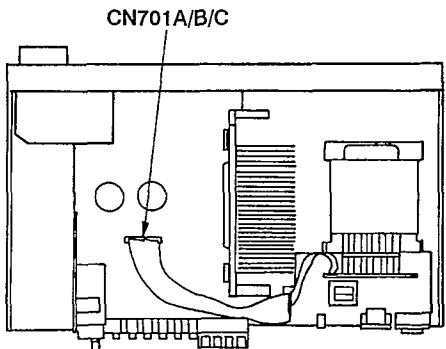
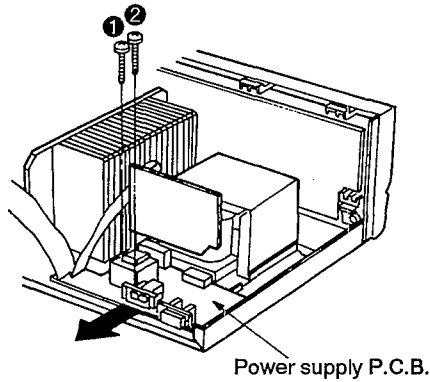
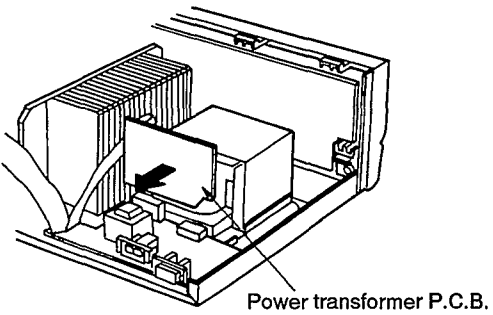
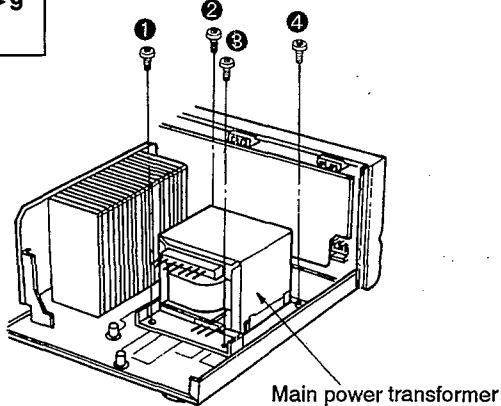
Power supply voltage	AC 230V		AC 240V		AC 110-127V		AC 220-240V	
Consumed current 50/60Hz	50Hz	120~350mA	50Hz	130~380mA	50Hz	250~700mA	50Hz	120~350mA
	60Hz	96~280mA	60Hz	104~304mA	60Hz	200~560mA	60Hz	96~280mA

DISASSEMBLY INSTRUCTIONS

"ATTENTION SERVICER"

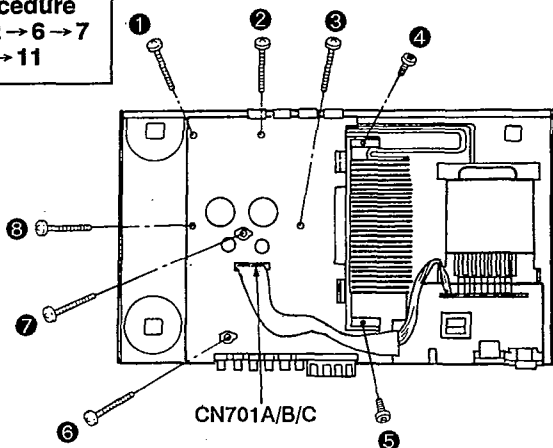
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref.No. 1	Removal of the cabinet	Ref.No. 2	Removal of the front panel ass'y and video out P.C.B.
Procedure 1	 <p>• Remove the 6 screws (① ~ ⑥).</p>	Procedure 1 → 2	 <p>1. Remove the 4 screws (① ~ ④). 2. Remove the video out P.C.B.. 3. Remove the front panel ass'y in the direction of arrow.</p>
Ref.No. 3	Removal of the volume P.C.B.	Ref.No. 4	Removal of the operation P.C.B. and headphones jack P.C.B.
Procedure 1 → 2 → 3	 <p>1. Pull out the volume knob. 2. Remove the nut. 3. Release the 1 claw. 4. Remove the volume P.C.B. in the direction of arrow.</p>	Procedure 1 → 2 → 3 → 4	<p>※ Pull out the knobs with using adhesive tape when removing the knobs.</p>  <p>1. Pull out the balance knob, bass knob and treble knob.</p>
Ref.No. 5	Removal of the VCR2 P.C.B.		
Procedure 1 → 2 → 5	 <p>• Remove the 2 screws (①, ②).</p>	 <p>2. Remove the 15 screws (① ~ ⑮).</p>	

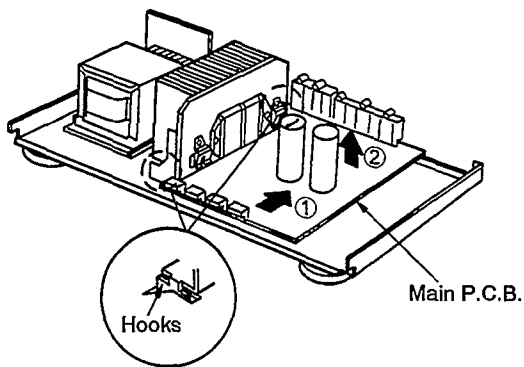
<p>Ref.No. 6</p>	<p>Removal of the rear panel</p>	<p>Ref.No. 7</p>	<p>Removal of the tuner P.C.B.</p>
<p>Procedure 1 → 6</p>	 <p>1. Remove the 13 screws (① ~ ⑬).</p> <p>2. Remove the rear panel in the direction of arrow.</p>	<p>Procedure 1 → 6 → 7</p>	 <p>• Remove the tuner P.C.B. in the direction of arrow.</p>
<p>Ref.No. 8</p>	<p>Removal of the power supply P.C.B.</p>	 <p>1. Remove the 1 flat cable (CN701A/B/C).</p>  <p>2. Remove the 2 screws (①, ②).</p> <p>3. Remove the power supply P.C.B. in the direction of arrow.</p>	
<p>Procedure 1 → 6 → 8</p>	<p>1. Remove the 1 flat cable (CN701A/B/C).</p>	<p>Ref.No. 9</p>	<p>Removal of the power transformer P.C.B.</p>
<p>Procedure 1 → 9</p>	 <p>• Remove the power transformer P.C.B. in the direction of arrow.</p>	<p>Ref.No. 10</p>	<p>Removal of the main power transformer</p>
<p>• Remove the power transformer P.C.B. in the direction of arrow.</p>	<p>• Remove the 4 screws (① ~ ④).</p>	<p>Procedure 1 → 6 → 8 → 9 → 10</p>	 <p>• Remove the 4 screws (① ~ ④).</p>

Ref.No. 11 **Removal of the main P.C.B.**

Procedure
1 → 2 → 6 → 7
→ 11



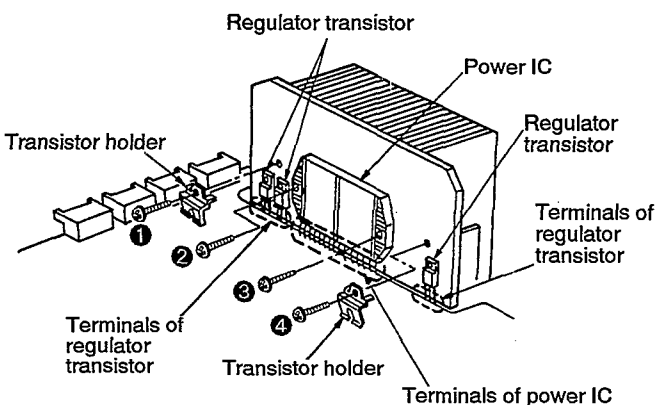
1. Remove the 1 flat cable(CN701A/B/C).
2. Remove the 8 screws(① ~ ⑧).



3. Release the 2 hooks by sliding the main P.C.B. in the direction of arrow ①, and then remove the main P.C.B. in the direction of arrow ②.

Ref.No. 12 **Removal of the power IC and regulator transistor**

Procedure
1 → 2 → 6 → 7
→ 11 → 12

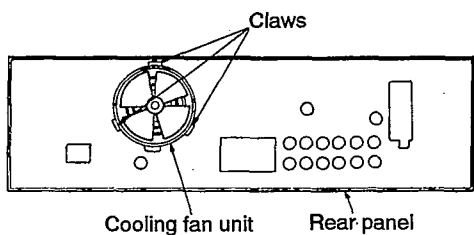


1. Unsolder the terminals of power IC or regulator transistor.
2. Remove the 4 screws(① ~ ④).
3. Remove the transistor holder.

- **When mounting the power IC or regulator transistor.**
Apply silicone compound(RFKX0002) to the rear side of power IC or regulator transistor.

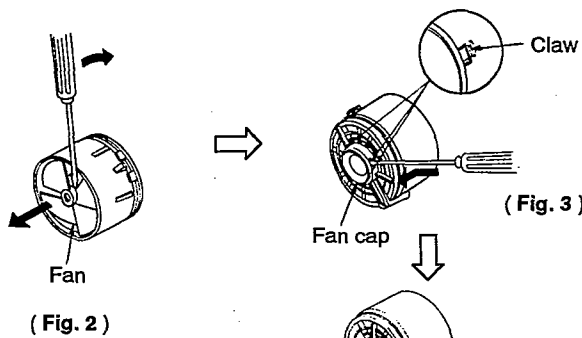
Ref.No. 13 **Removal of the cooling fan motor**

Procedure
1 → 6 → 13

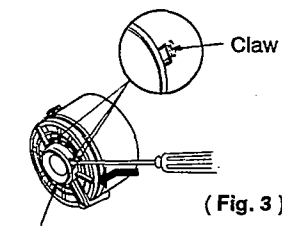


(Fig. 1)

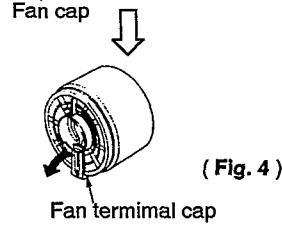
1. Release the 3 claws. (See Fig. 1)
2. Insert a screwdriver at the foot of the fan. Force it out of the motor shaft. (See Fig. 2)
3. Remove the fan cap by used ⊖ screwdriver. (See Fig. 3)
4. Remove the fan terminal cap in the direction of arrow. (See Fig. 4)
5. Remove the fan motor from the fan case. (See Fig. 5)
6. When mounting the fan motor, align the fan casing's projection with the hole of the fan motor. (See Fig. 6)



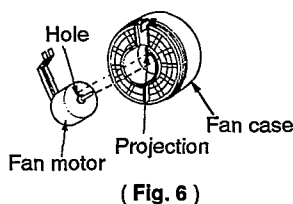
(Fig. 2)



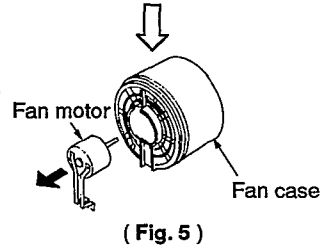
(Fig. 3)



(Fig. 4)

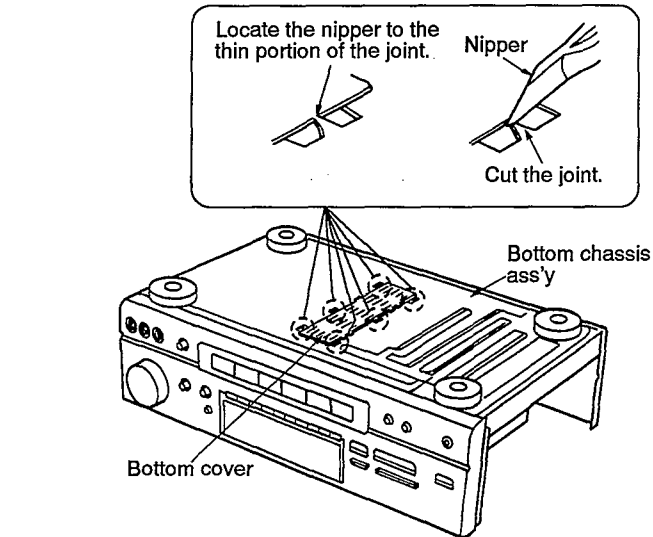


(Fig. 5)

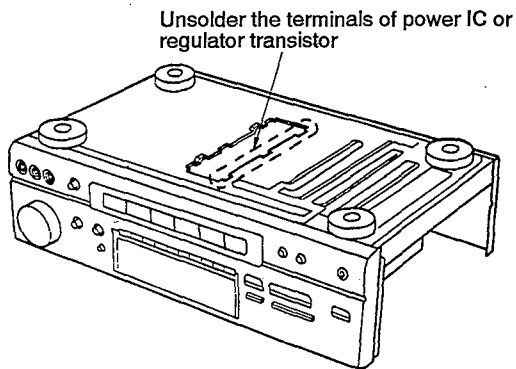


(Fig. 6)

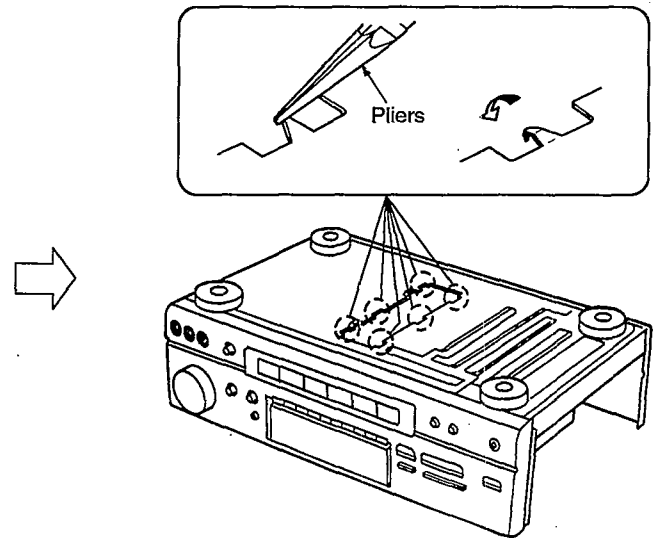
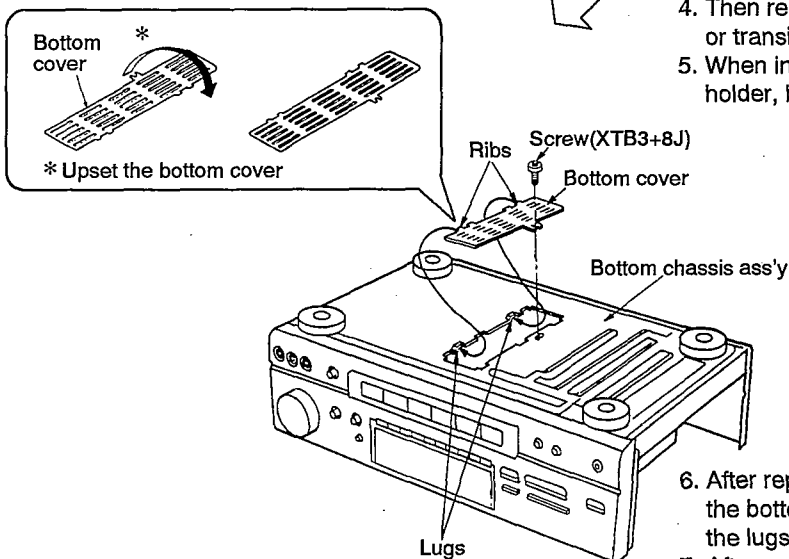
HOW TO REPLACEMENT THE POWER IC AND REGULATOR TRANSISTOR



1. Cut the joints(6 portions) between bottom cover and bottom chassis ass'y with nipper.

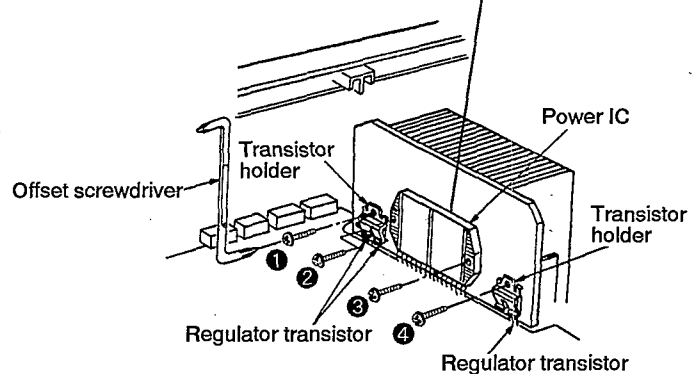


3. When replacing the power IC or regulator transistor, unsolder the terminals of power IC or regulator transistor on the soldered surface.



2. After cutting the joints(6 portions), bend the portions of the bottom chassis ass'y in the direction of arrow with pliers.

- CAUTION**
- After replacing the power IC or regulator transistor, apply a sufficient quantity of compound grease (RFKX0002) between the heat sink and the power IC or regulator transistor. (Radiation of power IC & transistor)
 - Tighten enough the screws (①~④) after replacing the power IC or regulator transistor. Otherwise, the heat radiation works little.



4. Then remove the 4 screws(①~④) fixed to the power IC or transistor holder.
5. When installing or removing the power IC or transistor holder, be sure to use an offset screwdriver.

6. After replacing the power IC or regulator transistor, upset the bottom cover and align the ribs of the bottom cover to the lugs on the bottom chassis ass'y.
7. After mounting the bottom cover on the bottom chassis ass'y, fix it with a screw(XTB3+8J).

CAUTION:

1. A long straight screwdriver cannot be used for removal or mounting since its long grip interferes with the neighboring P.C.B. (See Fig.1)
2. A short straight screwdriver may be used for removal, but cannot be used for mounting because the limited space in the unit will not allow sufficient tightening torque. (See Fig.2)



A short straight screwdriver

A long straight screwdriver

Fig.2

3. Insufficient tightening will cause poor heat dissipation from the power IC and regulator transistor and, in the worst case, may lead their thermal breakdown. (See Fig.2)

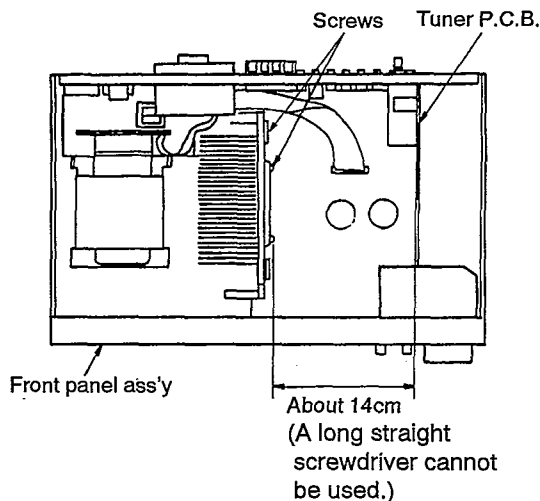
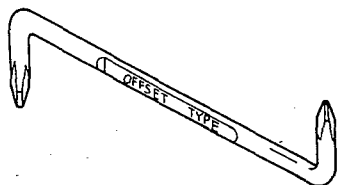

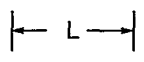


Fig.1

—OFFSET SCREWDRIVER—

- The PROTO offset screwdriver No.34- 1/4 is recommended for use in the application above.



No.		
34 1/4	1 & 2	4 3/4"

- The address of PROTO International Sales is as follows.



International Sales

International Sales Office
Stanley-Proto Industrial Tools
14117 Industrial Park Blvd.
Covington, GA 30209 U.S.A.
Fax: 706-786-4387
Phone: 706-787-3800

Australia, New Zealand &
South Pacific
Stanley-Proto Industrial Tools
P.O.Box 10
400 Whitehorse Road
Nunweding 3131
Victoria, Australia
Fax: 61-3-894-1173
Phone: 61-3-878-9244

Singapore, Indonesia,
Philippines, Korea, Hong
Kong, Malaysia, China.
Stanley-Proto Asia Pacific
12 Gul Drive
Singapore 2262
Fax: 65-861-3206
Phone: 65-862-0883

Thailand
Stanley-Proto Thailand Ltd.
1017 Moo 13 Bangnatrad
Highway, Tambol Bankaew
Amphur Bangplee
Samutprakarn, Thailand
Fax: 66-2-316-6071
Phone: 66-2-316-8655

Japan
Stanley Works Japan
2-7-16 Hyakunin-Cho
Shinjuku-ku
Tokyo 160 Japan
Fax: 81-3-3360-8456
Phone: 81-3-3360-8458

Mexico
Herramientas Stanley S.A.
DE C.V.
Apartado Postal 675
72030 Puebla, Pue, Mexico
Fax: 52-22-494-4880
Phone: 52-22-495-300

South & Central America,
Puerto Rico, The Caribbean
Stanley Inter-America
2101 N.W. 84th Ave.
Miami, Florida 33122
Fax: 305-594-4261
Phone: 305-591-3828

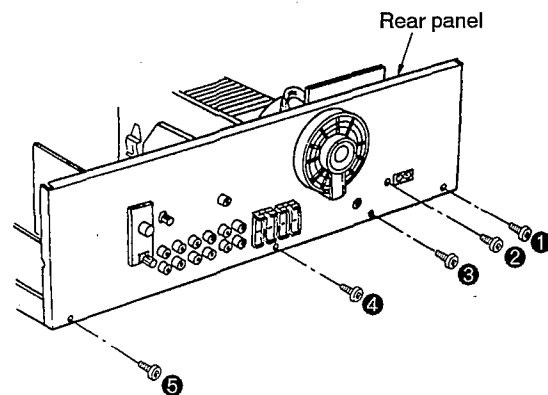
Europe
Stanley-Proto Europe
Woodside, Sheffield
S39PD
England
Fax: 44-742-739-038
Phone: 44-742-768-888

Canada
Stanley-Proto Canada
1100 Corporate Drive
Burlington, Ontario
Canada, L7L 5R6
Fax: 416-335-0075
Phone: 416-335-0075

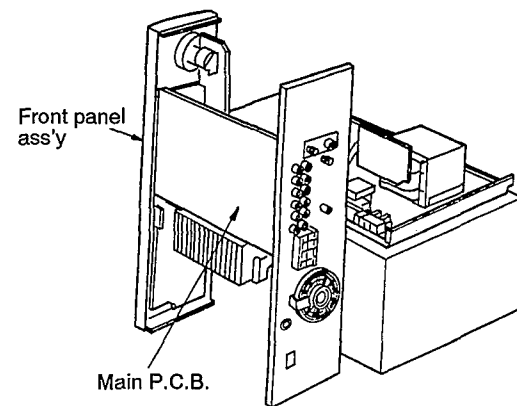
Middle East, Mediterranean
& Africa
Stanley-MEMA
Cory House The Ring
Bracknell Berkshire
RG 12 1A2
England
Fax: 44-344-485-526
Phone: 44-344-51813

HOW TO CHECK THE MAIN P.C.B.

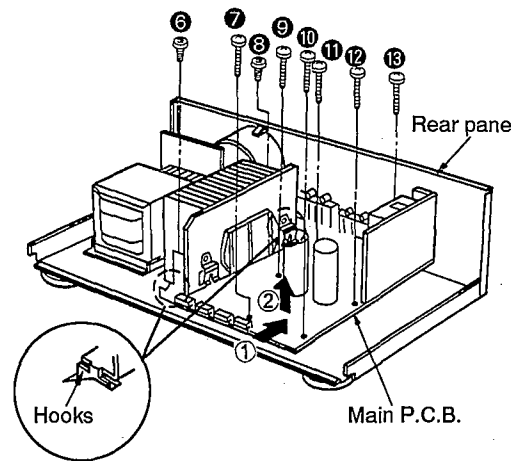
1. Remove the cabinet according to the disassembly instructions, procedure 1 "Removal of the cabinet" on page 8.
2. Remove the front panel ass'y according to the disassembly instructions, procedure 2 "Removal of the front panel ass'y" on page 8.



3. Remove the 5 screws (1 ~ 5).



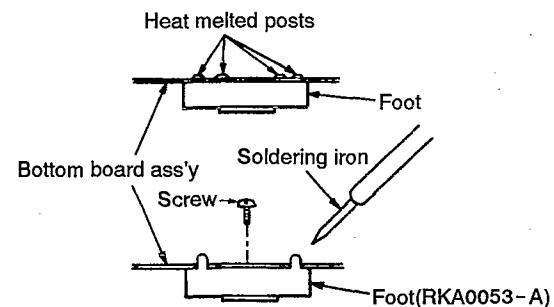
6. Reinstall the front panel ass'y to the main P.C.B.
7. When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown in above.



4. Remove the 8 screws (6 ~ 13).
5. Release the 2 hooks by sliding the main P.C.B. in the direction of arrow ①, and then remove the main P.C.B. equipped with rear panel in the direction of arrow ②.

REPLACEMENT OF THE FOOT

1. Remove the 4 heat melted posts on the Bottom board ass'y with a pair of nippers or similar tool.
2. To replace the foot (RKA0053-A) on the Bottom board ass'y melt the 4 posts with a soldering iron or install it with a screw (XTB3+6J).



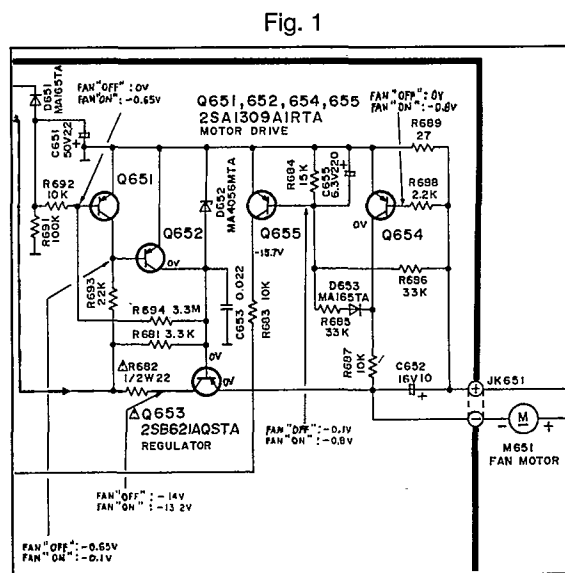
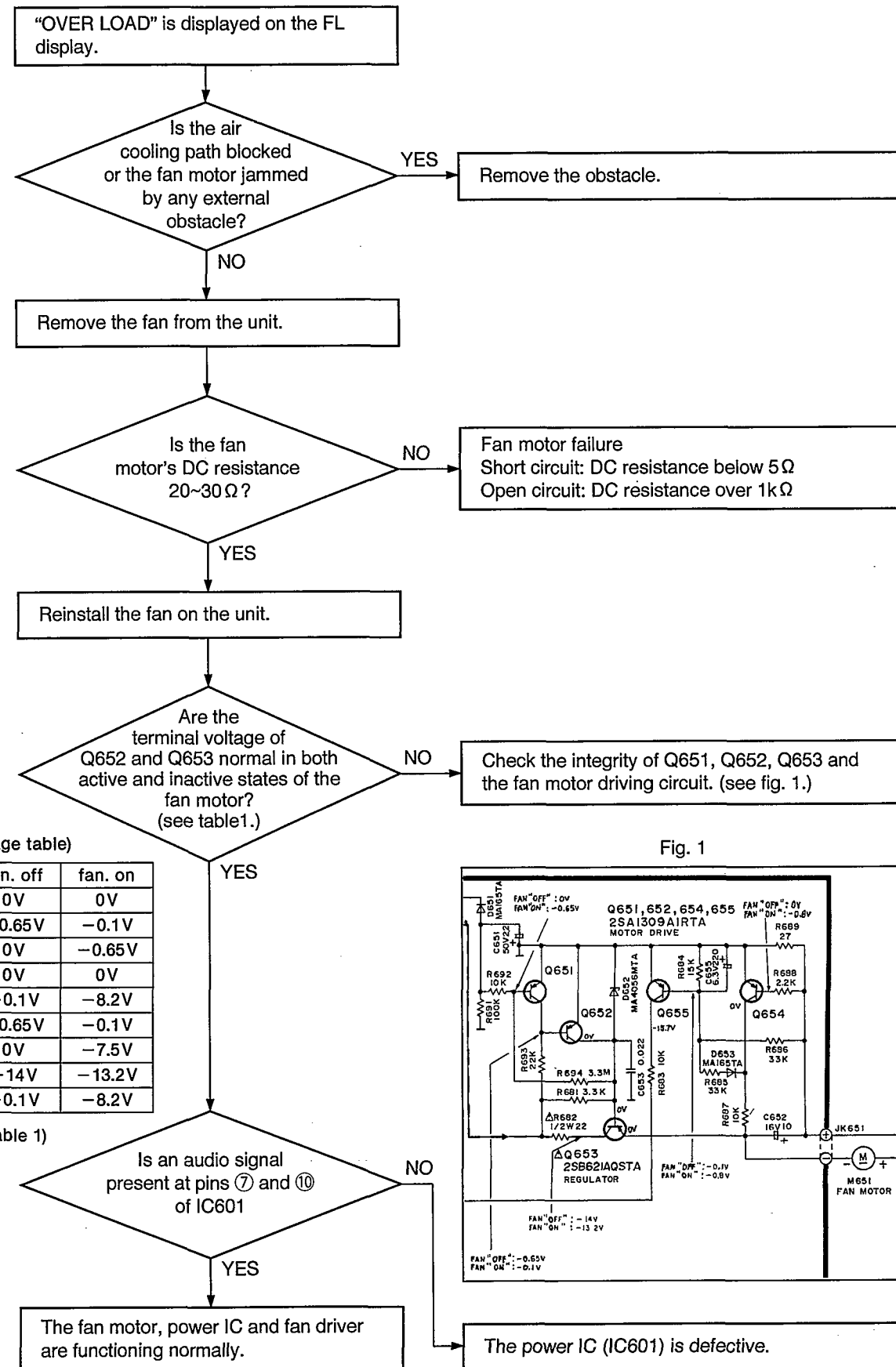
TERMINAL FUNCTION OF IC

• IC901 (LC8A012C5481) [E, EB, EG, EP], (LC8A012C5470) [G, GN]: Microcomputer

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	SPA	O	Speaker select control terminal	41	DATA1	O	Serial data signal
2	SPB	O		42	OVER LOAD	I	Over load detect terminal
3	ST5	O	Level shift control terminal	43	CK1	O	Serial clock signal
4	RFM	—	Not used, open	44	DATA2	O	Serial data signal
5	RLY	O	Relay control terminal	45	ST2	O	Level shift control terminal
6	AFM	O	Muting control terminal	46	CK2	O	Serial clock signal
7	-20	O	Muting control (-20dB) terminal	47	5-6	O	Remote control terminal
8	DG1 DG8	O	Digit signal of FL display	48	ST4	O	Level shift control terminal
15					49	TEST1	—
16	S13	O	Segment signal of FL display	50	RES	I	Reset detect terminal
17	VDD	I	Power supply terminal	51	XT1	—	Not used, connected to power supply
18	VPP	I	Power supply terminal of FL display	52	XT2	—	Not used, open
19	S12 S1	O	Segment signal of FL display	53	VSS	—	GND terminal
30					54	CF1	I
31	FWD REV	O	Rotation control terminal of volume motor	55	CF2	O	Terminal (6MHz)
32					56	VDD	I
33	INI	—	Not used, connected to resistor	57	KEY1 KEY4	I	Key matrix detect terminal
34	FMST	I	Stereo signal detect terminal	61			
35	SD	I	Received signal detect terminal	62	ENCODE A ENCODE B	I	Not used, connected to power supply
36	IFDAIN	I	Serial data signal	63			
37	LOUD	—	Not used, open	64	REM	I	Remote control terminal
38	ST3	O	Level shift control terminal				
39	V2	O	Video selector control terminal				
40	CE	O	Chip enable terminal				

FAN MOTOR TROUBLESHOOTING GUIDE

The Model SA-GX170 employ fan motor error sensing electronics. If the cooling fan is not operation and "OVER LOAD" is displayed on the FL display, check the fan motor and its driving circuit.



SCHEMATIC DIAGRAM (Parts list on pages 38~43.)

(This schematic diagram may be modified at any time with the development of new technology.)

Notes 1:

- Signal line
 - : FM OSC
 - ▨▨▨▨ : AM (MW/LW) OSC
 - : FM signal
 - ▨▨▨▨ : AM (MW/LW) signal
 - ▨▨▨▨ : Rec out signal (Lch)
 - ▨▨▨▨ : AF signal (Lch)
 - : Positive voltage lines
 - - - : Negative voltage lines
- Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts. Indicated voltage values are standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on internal impedance of the DC circuit tester.

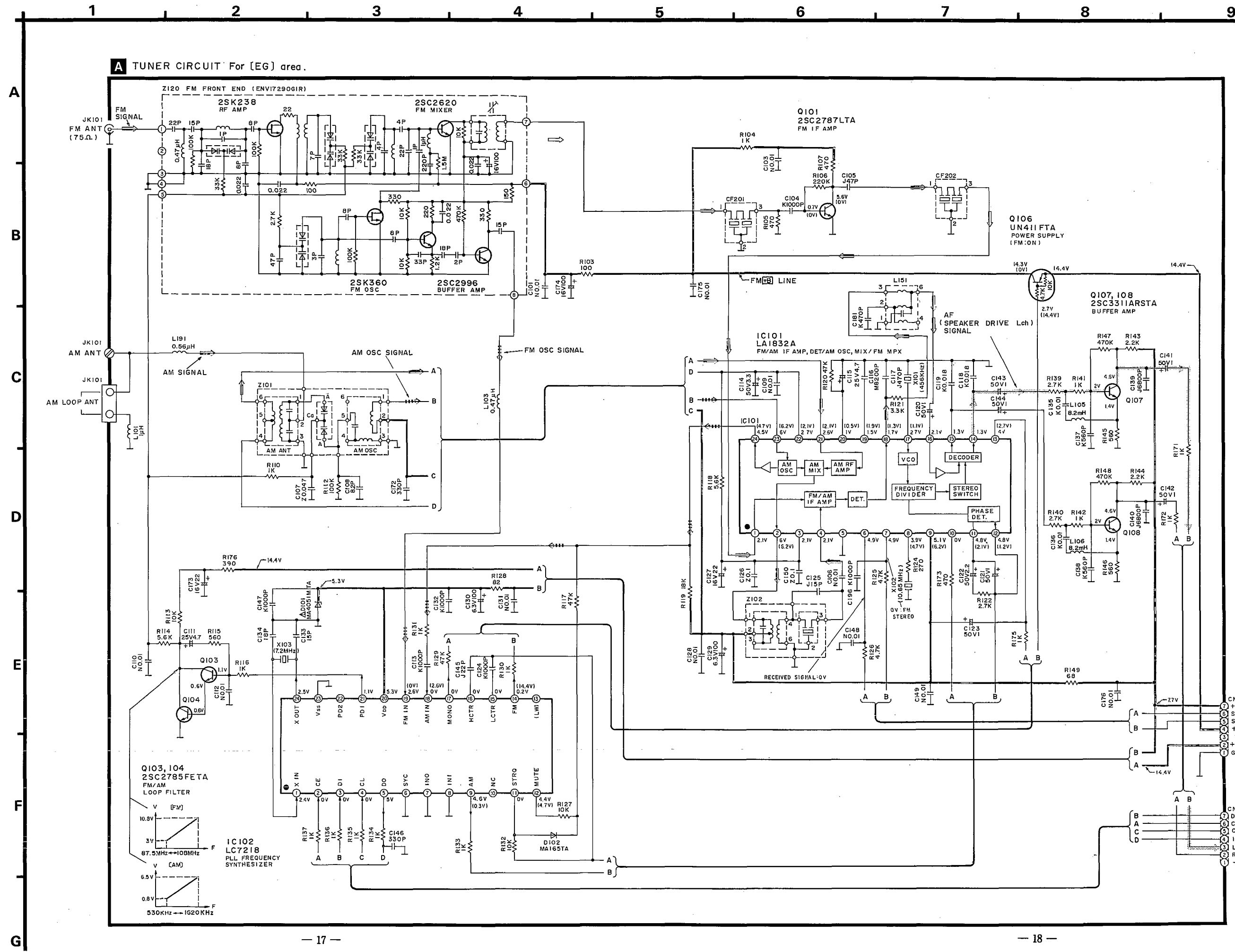
- All voltage values shown in circuitry are DC voltage in FM signal (Stereo signal) reception mode.
- * Figures in () Stand for DC-voltage in AM (MW) signal reception mode.
- * Figures in < > Stand for DC-voltage in LW signal reception mode.

* Caution!

- IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.
- * Cover the parts boxes made of plastics with aluminum foil.
- * Ground the soldering iron.
- * Put a conductive mat on the work table.
- * Do not touch the legs of IC or LSI with the fingers directly.

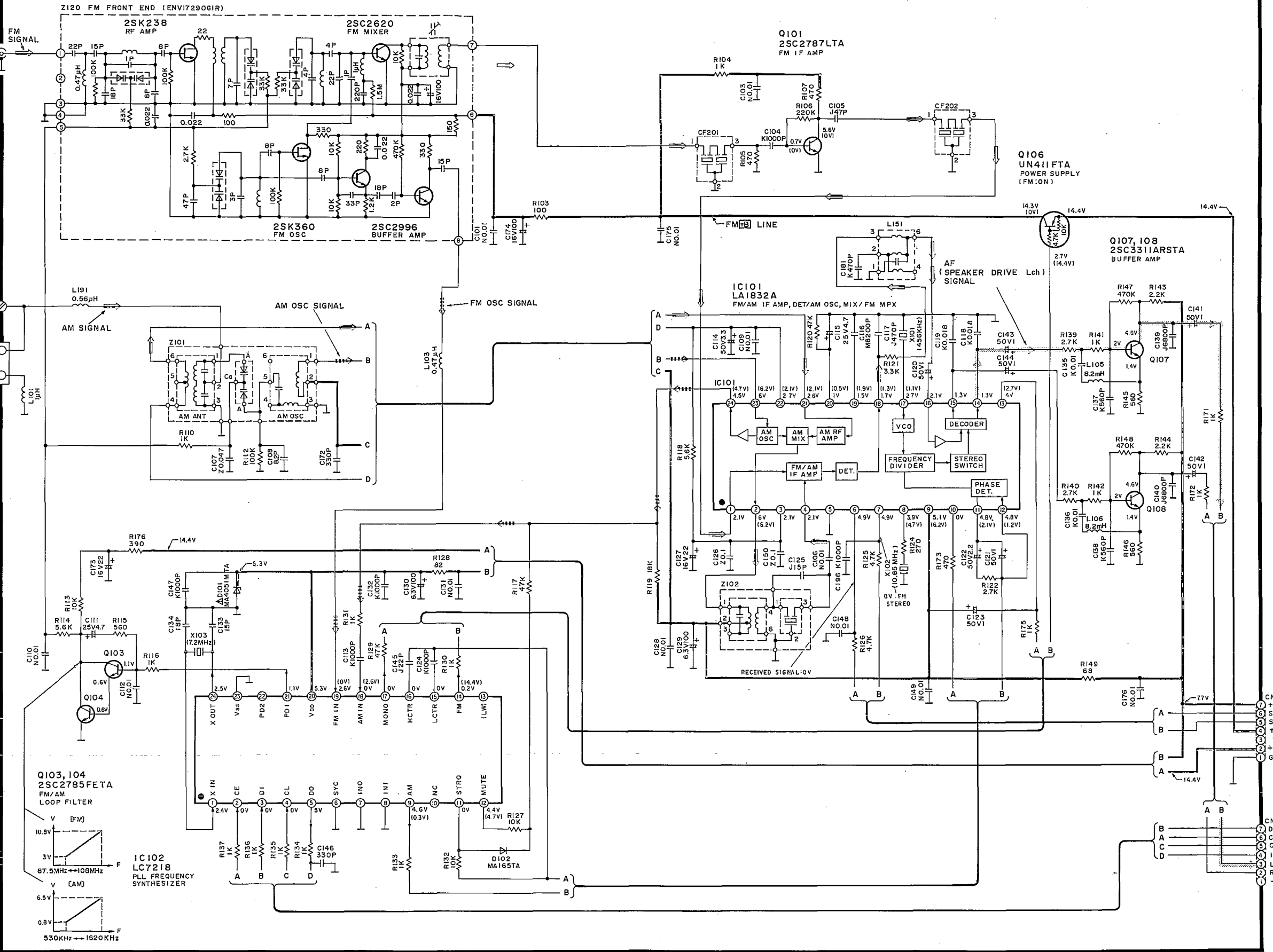
• Terminal guide of IC's, transistors and diodes

<ul style="list-style-type: none"> • For (G, GN) areas. LC8A012C5470 • For (E, EB, EG, EP) areas. LC8A012C5481 	<table border="1"> <tr><td>M5218AP</td><td>8Pin</td></tr> <tr><td>LA1832A</td><td>24Pin</td></tr> <tr><td>LC7218</td><td>24Pin</td></tr> </table>	M5218AP	8Pin	LA1832A	24Pin	LC7218	24Pin	<table border="1"> <tr><td>AN6558-FSG</td><td>8Pin</td></tr> <tr><td>UPC4570C</td><td>8Pin</td></tr> <tr><td>NJU7312AL</td><td>28Pin</td></tr> </table>	AN6558-FSG	8Pin	UPC4570C	8Pin	NJU7312AL	28Pin	<table border="1"> <tr><td>RSN3306A</td><td></td></tr> </table>	RSN3306A													
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BA6218																													
2SC3940AQSTA																													
2SC3327ABTP																													
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<table border="1"> <tr><td>2SB1187DEF</td><td></td></tr> <tr><td>2SD1761DEF</td><td></td></tr> </table>	2SB1187DEF		2SD1761DEF		<table border="1"> <tr><td>2SB621AQSTA</td><td></td></tr> </table>	2SB621AQSTA		<table border="1"> <tr><td>MA165TA</td><td></td></tr> <tr><td>MA700ATA</td><td></td></tr> <tr><td>1SS291TA</td><td></td></tr> <tr><td>1SR35200TB</td><td></td></tr> </table>	MA165TA		MA700ATA		1SS291TA		1SR35200TB		<table border="1"> <tr><td>MA4039MTA</td><td></td></tr> <tr><td>MA4051MTA</td><td></td></tr> <tr><td>MA4056MTA</td><td></td></tr> <tr><td>MA4062MTA</td><td></td></tr> <tr><td>MA4068MTA</td><td></td></tr> <tr><td>MA4075MTA</td><td></td></tr> </table>	MA4039MTA		MA4051MTA		MA4056MTA		MA4062MTA		MA4068MTA		MA4075MTA	
2SB1187DEF																													
2SD1761DEF																													
2SB621AQSTA																													
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<table border="1"> <tr><td>MA4160MTA</td><td></td></tr> <tr><td>MA4220MTA</td><td></td></tr> </table>	MA4160MTA		MA4220MTA		<table border="1"> <tr><td>P300DLF</td><td></td></tr> <tr><td>P300D5002T</td><td></td></tr> <tr><td>SB3806501T</td><td></td></tr> </table>	P300DLF		P300D5002T		SB3806501T		<table border="1"> <tr><td>LN846RPH</td><td></td></tr> </table>	LN846RPH																
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MA4220MTA																													
P300DLF																													
P300D5002T																													
SB3806501T																													
LN846RPH																													



A
B
C
D
E
F
G

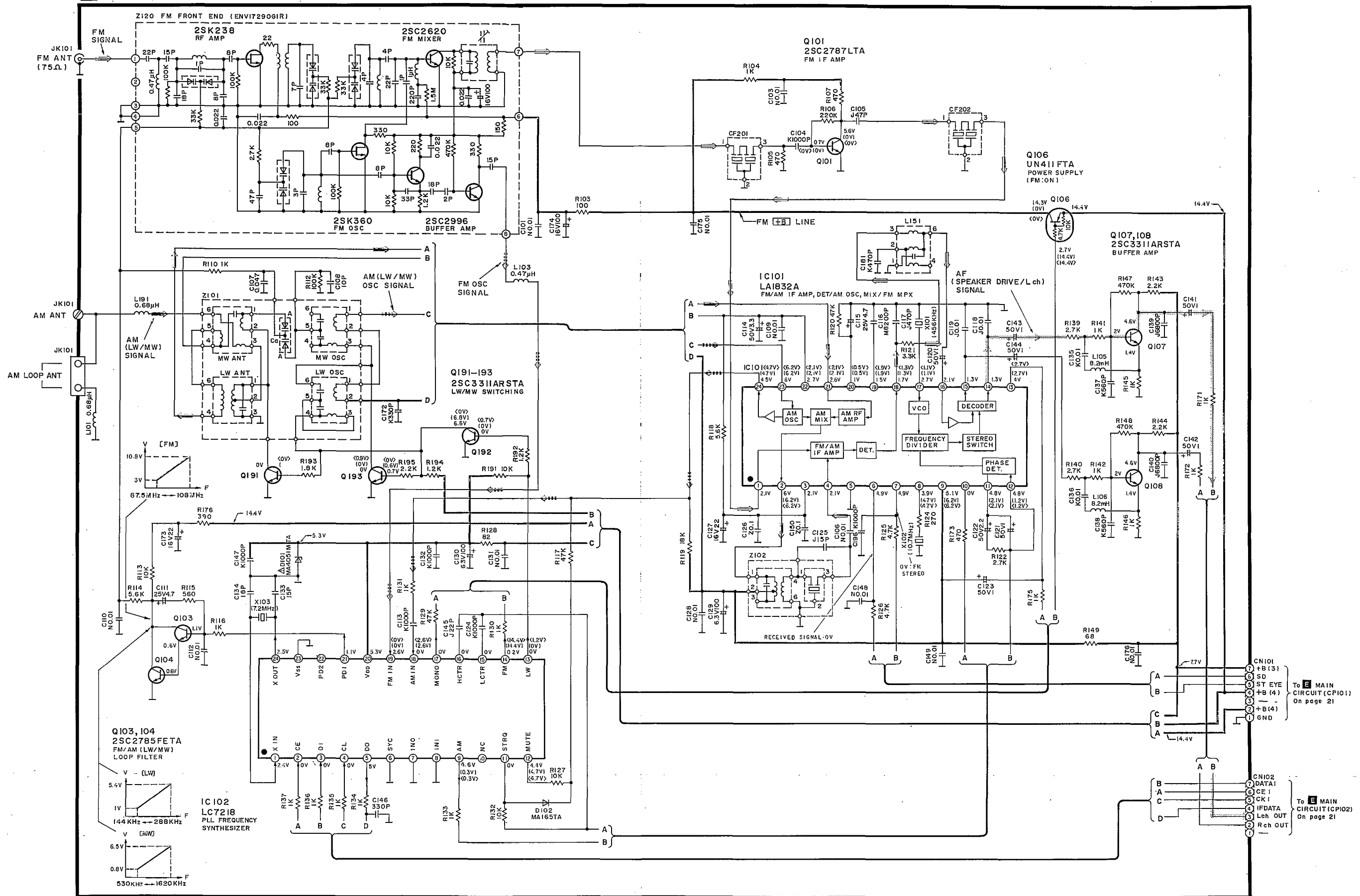
A TUNER CIRCUIT For [EG] area.



To **E** MAIN CIRCUIT (CP101) On page 21

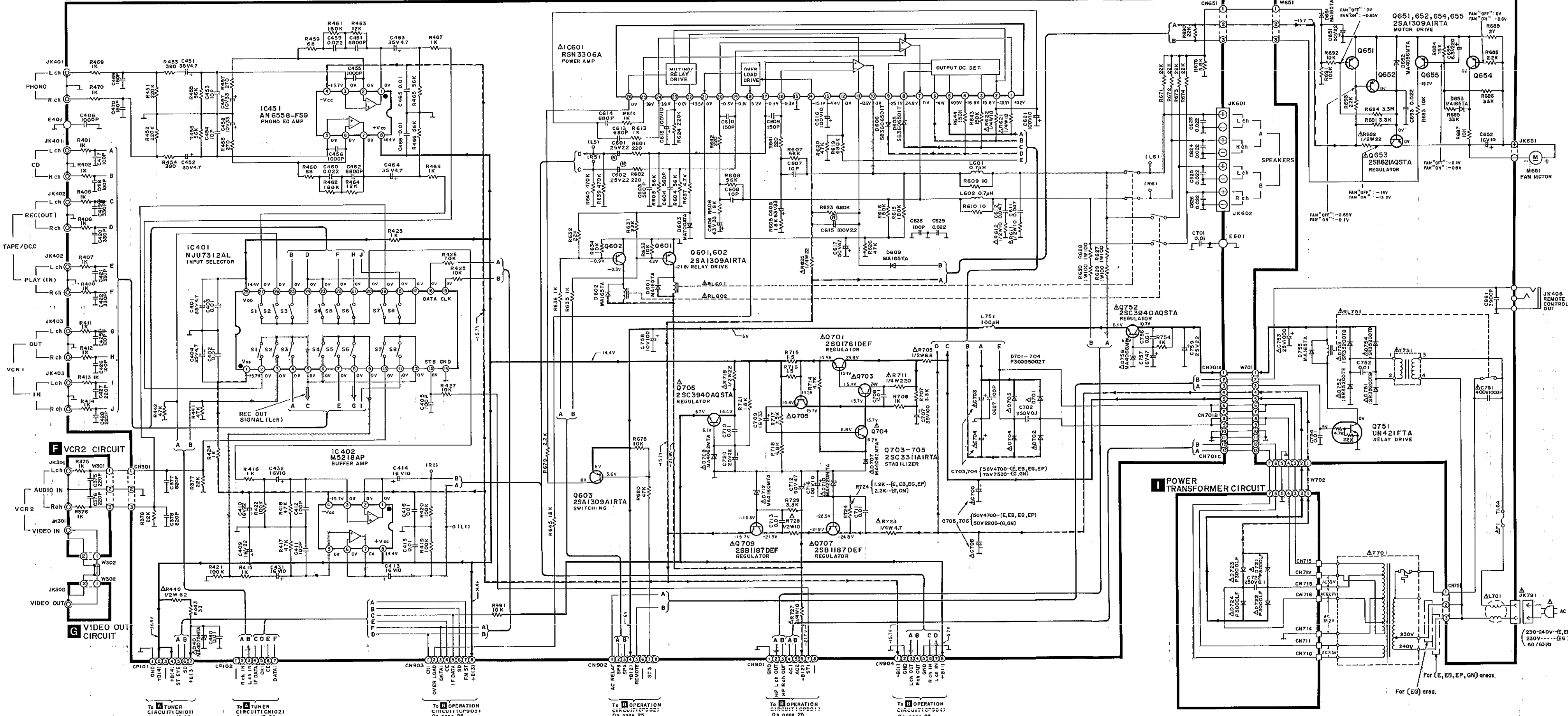
To **F** MAIN CIRCUIT (CP102) On page 21

A TUNER CIRCUIT For [E,EB,EP,G,GN] areas.



E MAIN CIRCUIT (PHONO EQ AMP/ INPUT SELECTOR/ BUFFER AMP/ POWER AMP/ REGULATOR)

H POWER SUPPLY CIRCUIT



To **A** TUNER CIRCUIT (CN101) On page 18,20

To **B** TUNER CIRCUIT (CN102) On page 18,20

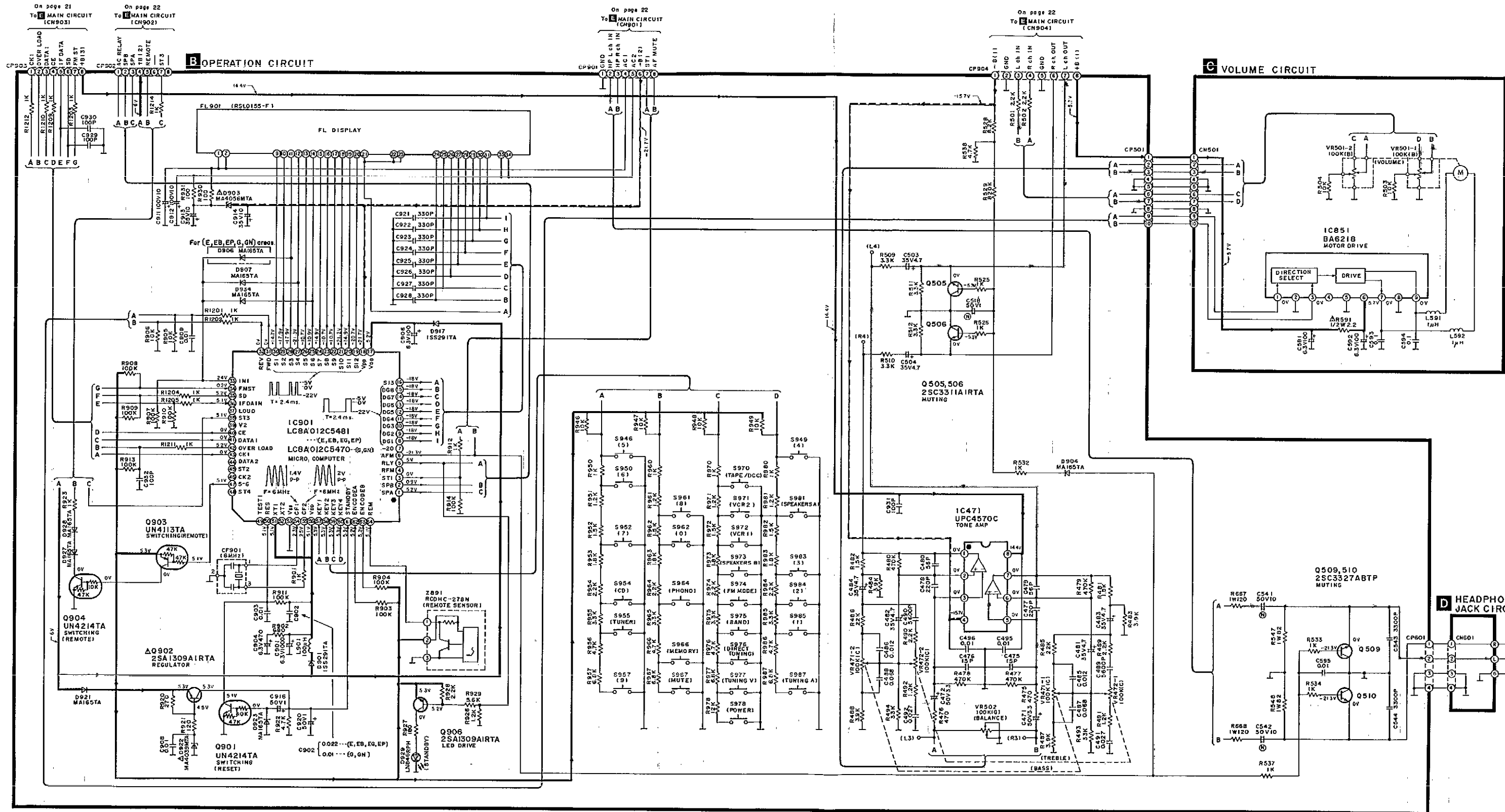
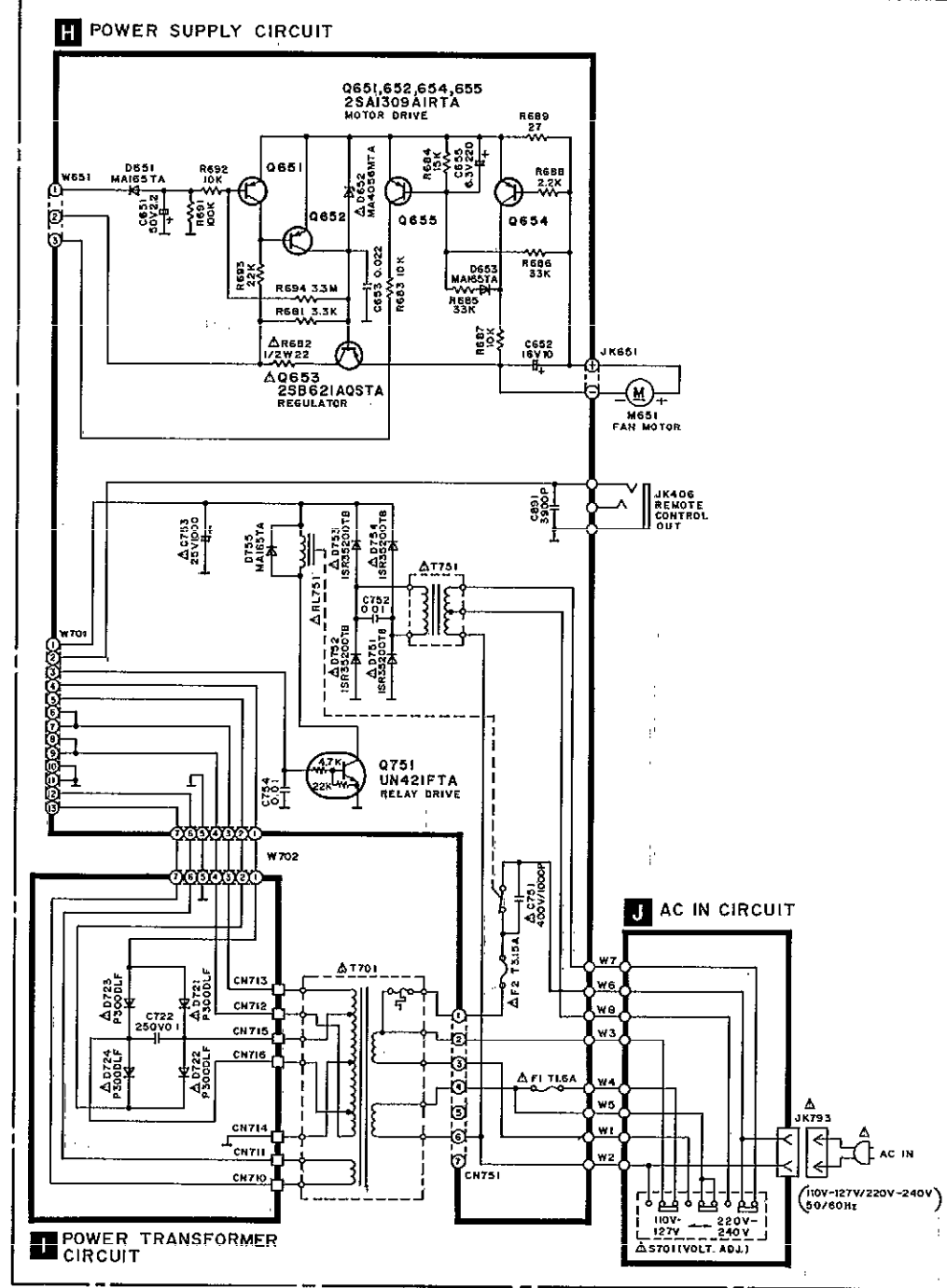
To **C** OPERATION CIRCUIT (CN903) On page 24

To **D** OPERATION CIRCUIT (CN902) On page 25

To **E** OPERATION CIRCUIT (CN904) On page 25

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Power Source Circuit For (G) area.



BLOCK DIAGRAM

Notes 2:

- S701 : Voltage adjustment switch in "240V" position. (110V ↔ 127V ↔ 220V ↔ 240V) (For (G) area only.)
- S946 : Numeric (5) switch.
- S949 : Numeric (4) switch.
- S950 : Numeric (6) switch.
- S952 : Numeric (7) switch.
- S954, 955 : Input select switches. (S954: CD, S955: TUNER)
- S957 : Numeric (9) switch.
- S961 : Numeric (8) switch.
- S962 : Numeric (0) switch.
- S964 : Input select (PHONO) switch.
- S966 : Memory (MEMORY) switch.
- S967 : Muting (MUTING) switch.
- S970 : Tape/DCC monitor (TAPE/DCC MONITOR) switch.
- S971, 972 : Input select switches. (S971: VCR2, S972: VCR1)
- S973 : Speaker select (SPEAKERS B) switch.
- S974 : FM mode select (FM MODE) switch.
- S975 : Band select (BAND) switch.
- S976 : Direct tuning (DIRECT TUNING) switch.
- S977 : Tuning (TUNING V) switch.
- S978 : Power "STANDBY Ⓟ /ON" (POWER, STANDBY Ⓟ /ON) switch.
- S981 : Speaker select (SPEAKERS A) switch.
- S983 : Numeric (3) switch.
- S984 : Numeric (2) switch.
- S985 : Numeric (1) switch.
- S987 : Tuning (TUNING Δ) switch.

Signal line

- : FM OSC
- ■ ■ ■ : AM (MW/LW) OSC
- : FM signal
- : AM (MW/LW) signal
- : Rec out signal (Lch)
- : AF signal (Lch)
- : Positive voltage lines
- - - : Negative voltage lines

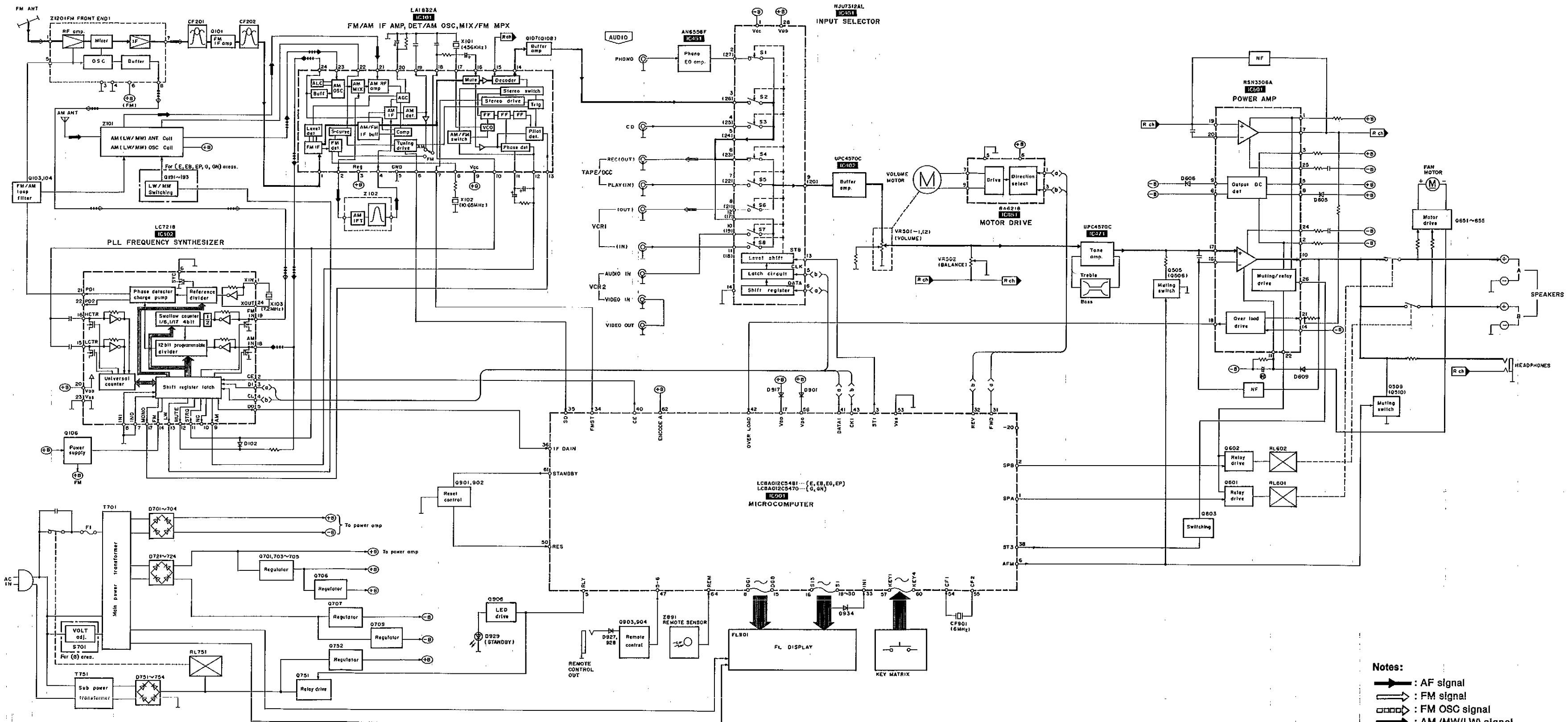
Important safety notice:

Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts. Indicated voltage values are standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on internal impedance of the DC circuit tester.

All voltage values shown in circuitry are DC voltage in FM signal (Stereo signal) reception mode.

* Figures in () Stand for DC-voltage in AM (MW) signal reception mode.

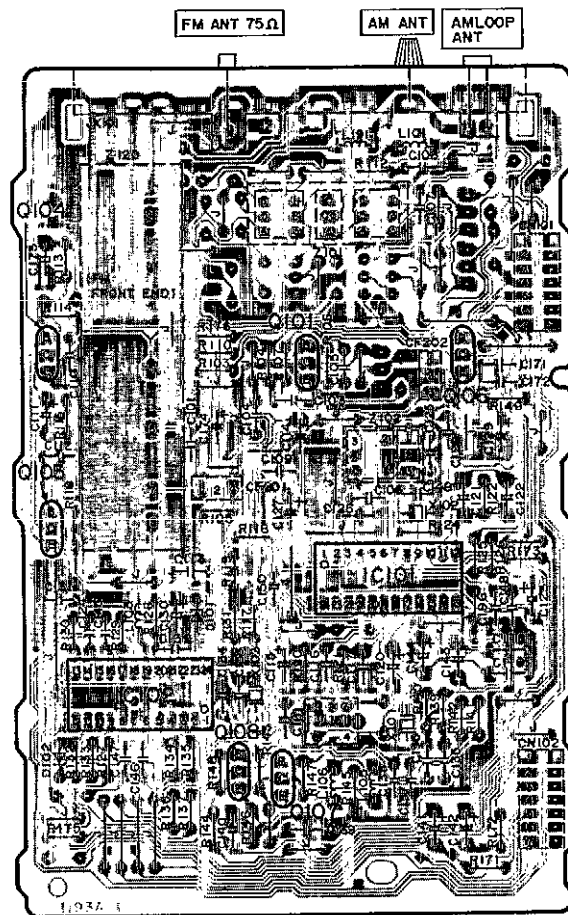
* Figures in < > Stand for DC-voltage in LW signal reception mode.



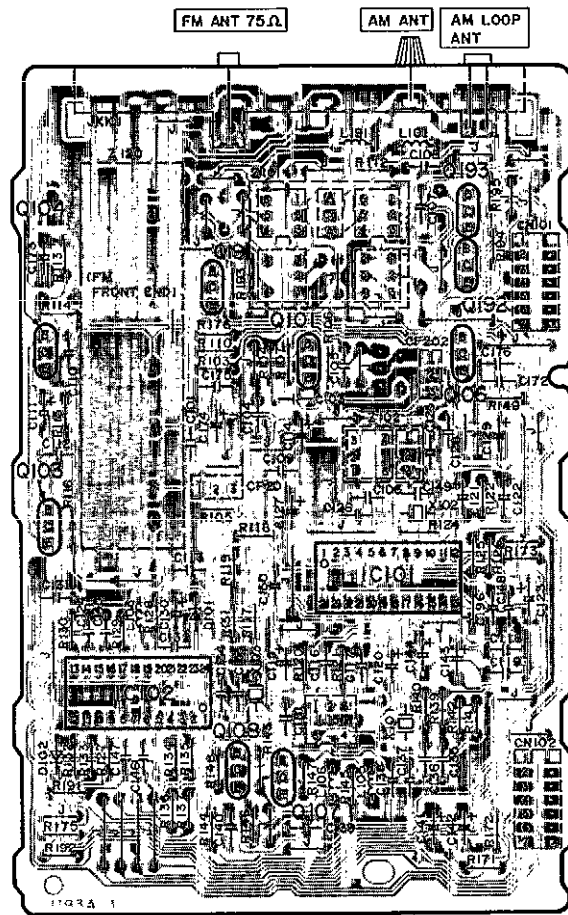
- ### Notes:
- : AF signal
 - : FM signal
 - : FM OSC signal
 - ■ ■ ■ : AM (MW/LW) signal
 - : AM (MW/LW) OSC signal
 - : Rec out signal
 - * () indicates Pin No. of right channel.

PRINTED CIRCUIT BOARDS

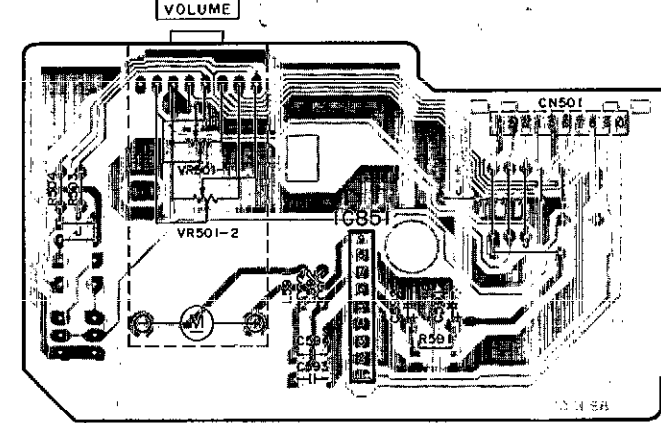
A TUNER P.C.B. For (EG) area.
(REP1750C-T)



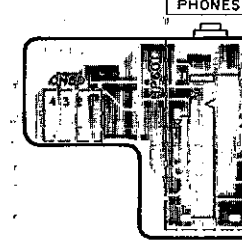
A TUNER P.C.B. For (E, EB, EP, G, GN) areas.
(REP1750B-T)



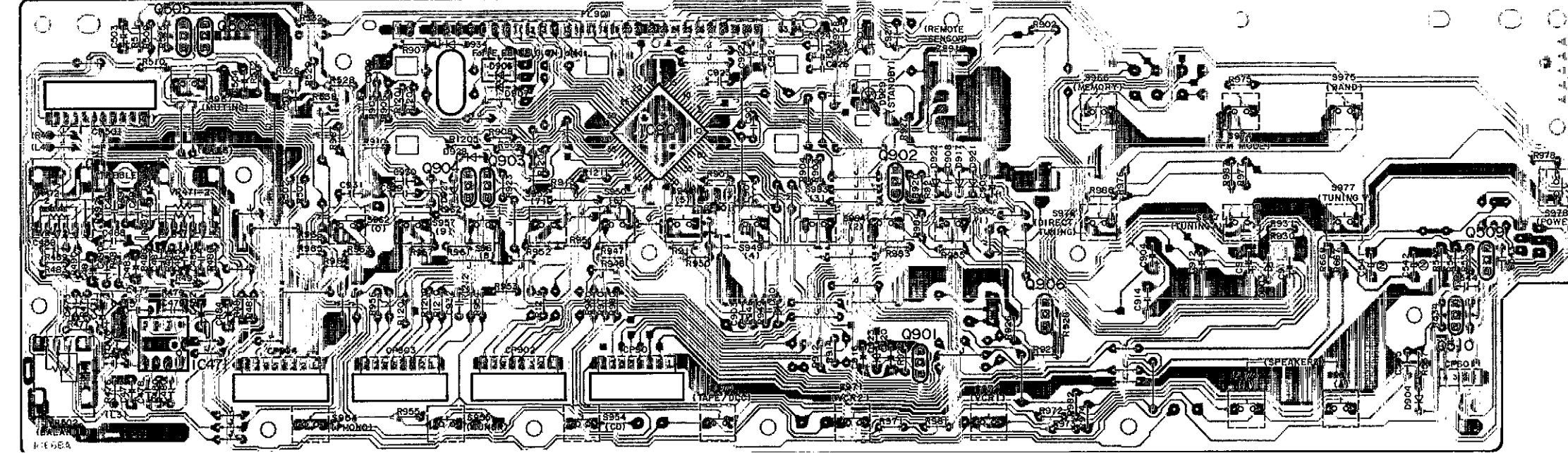
C VOLUME P.C.B. (REP1604B-S... (E, EB, EP)
REP1604C-S... (EG)
REP1604D-S... (G, GN)



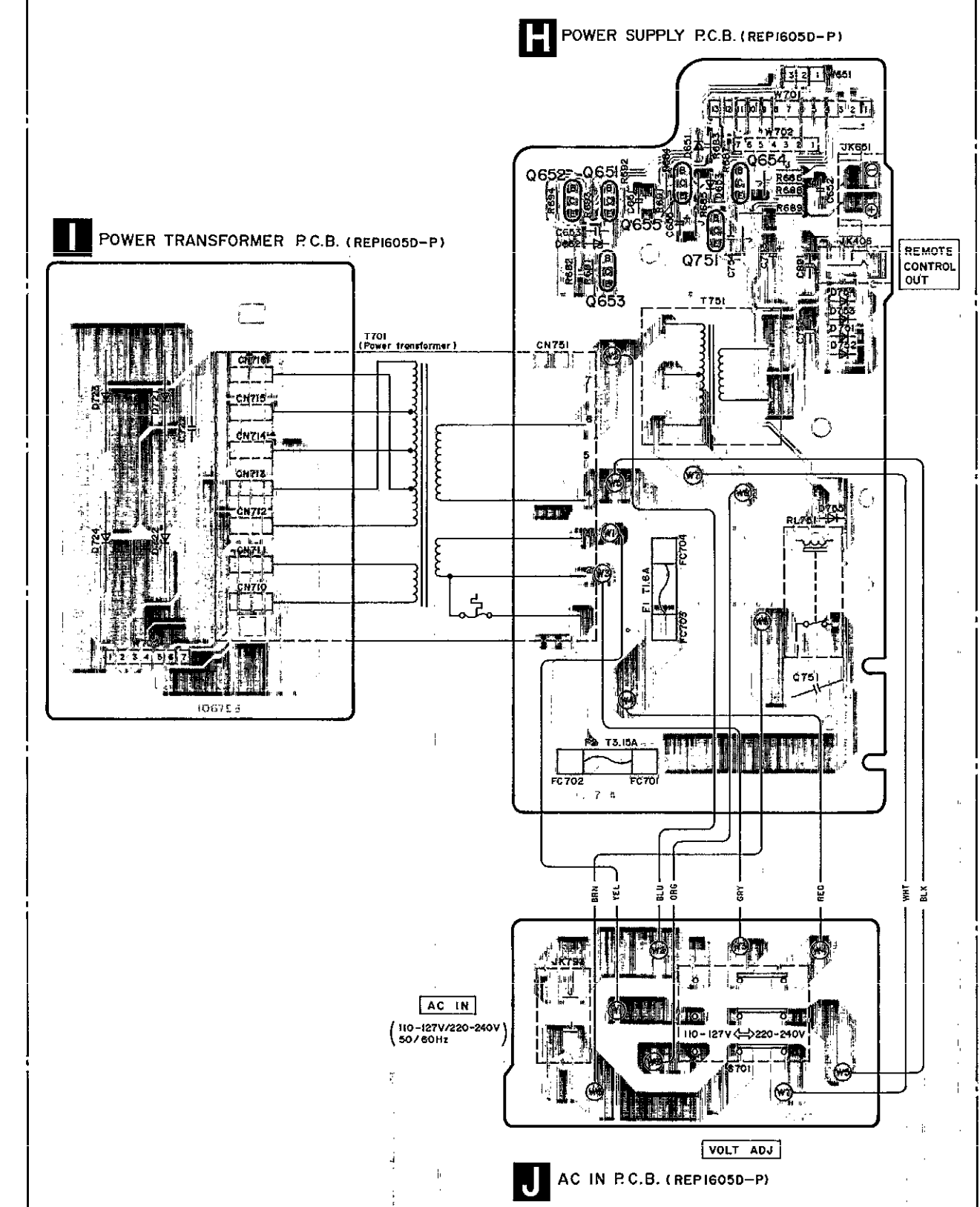
D HEADPHONES JACK P.C.B.
(REP1604B-S... (E, EB, EP)
REP1604C-S... (EG)
REP1604D-S... (G, GN)



B OPERATION P.C.B. (REP1604B-S... (E, EB, EP)
REP1604C-S... (EG)
REP1604D-S... (G, GN)

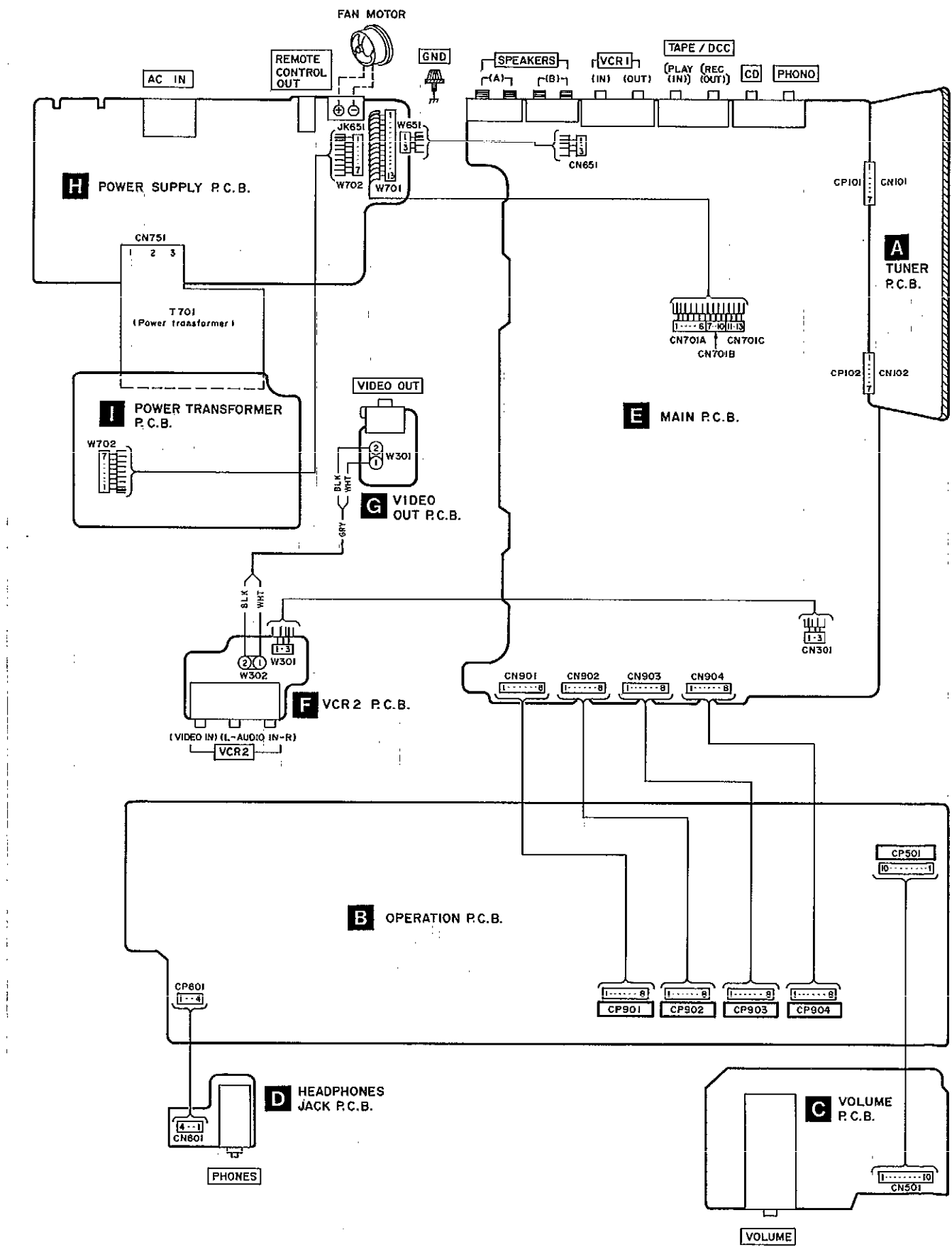
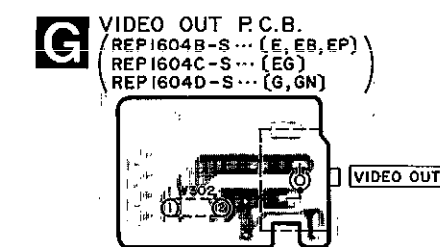
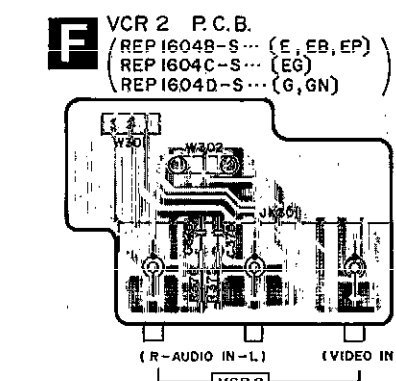
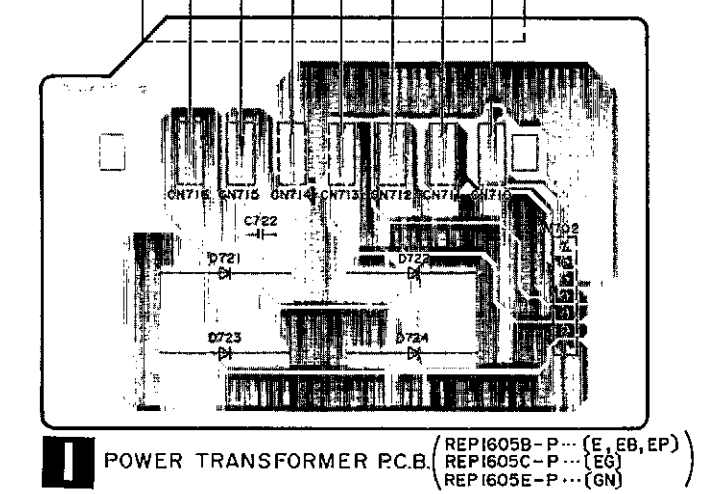
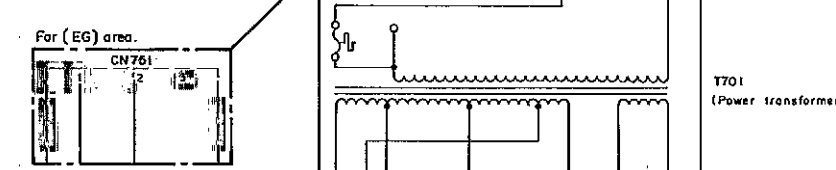
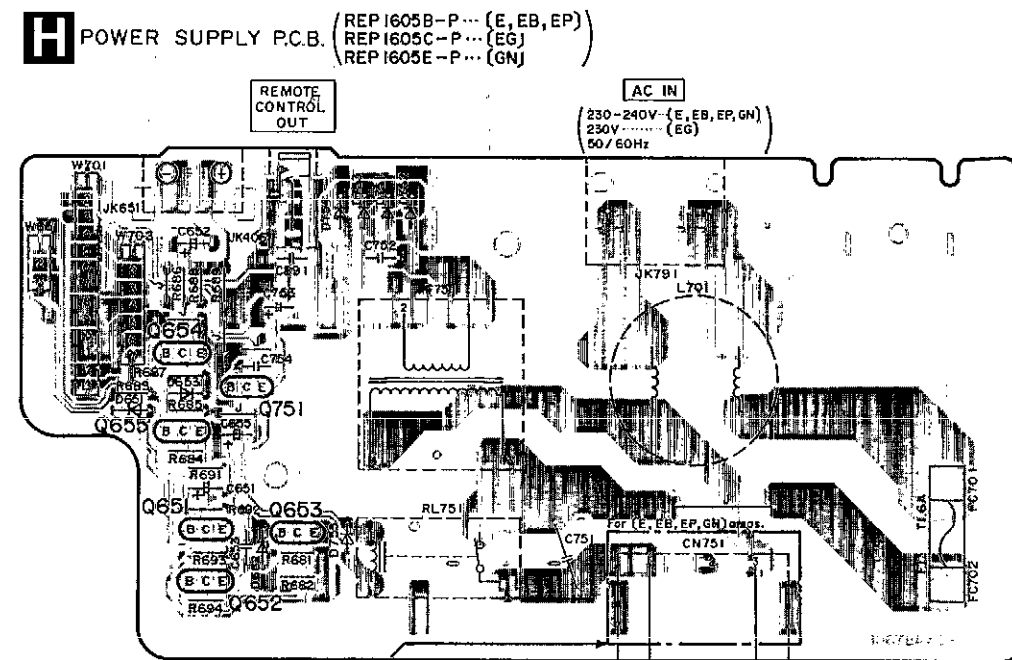
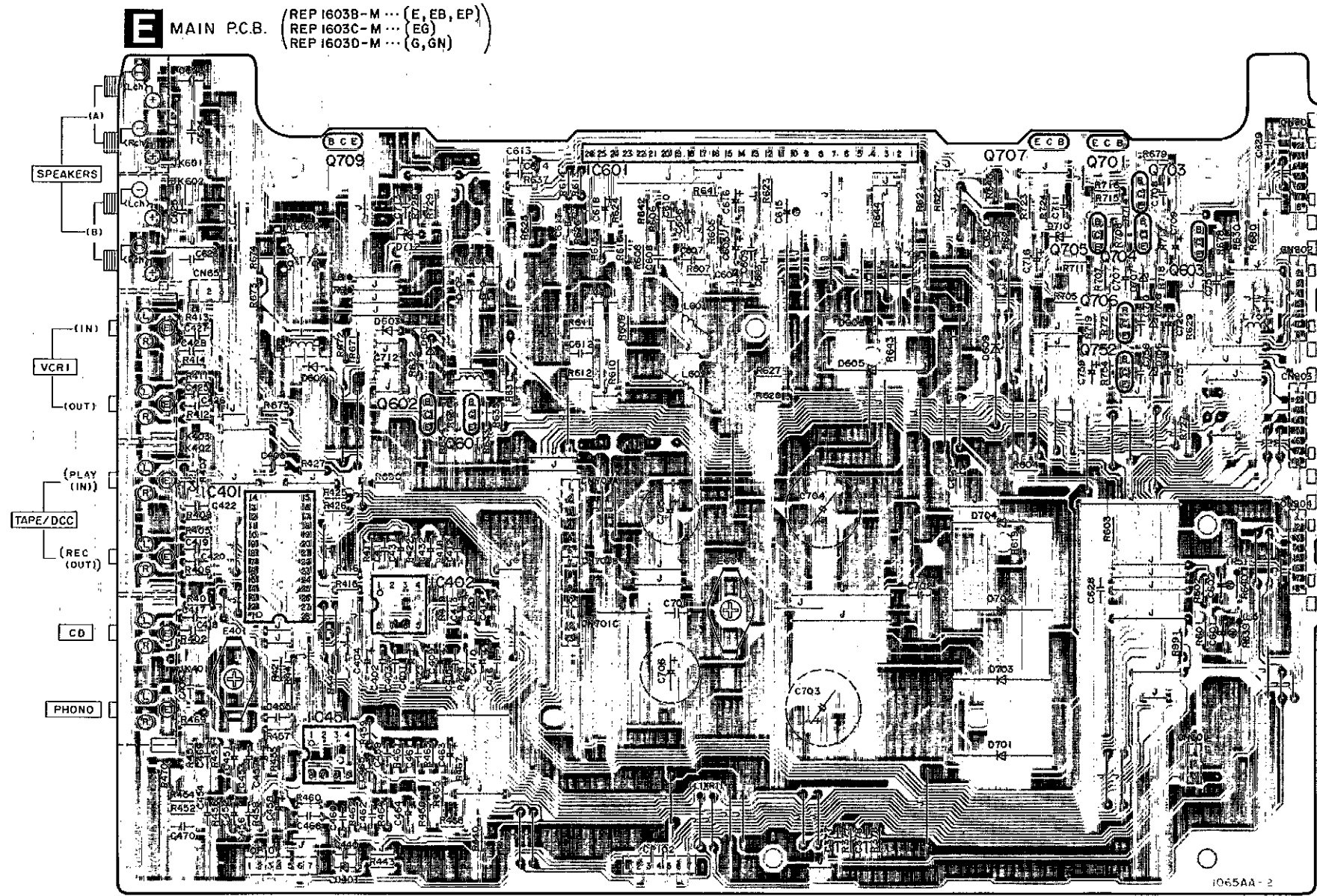


Power Source P.C.B. For (G) area.

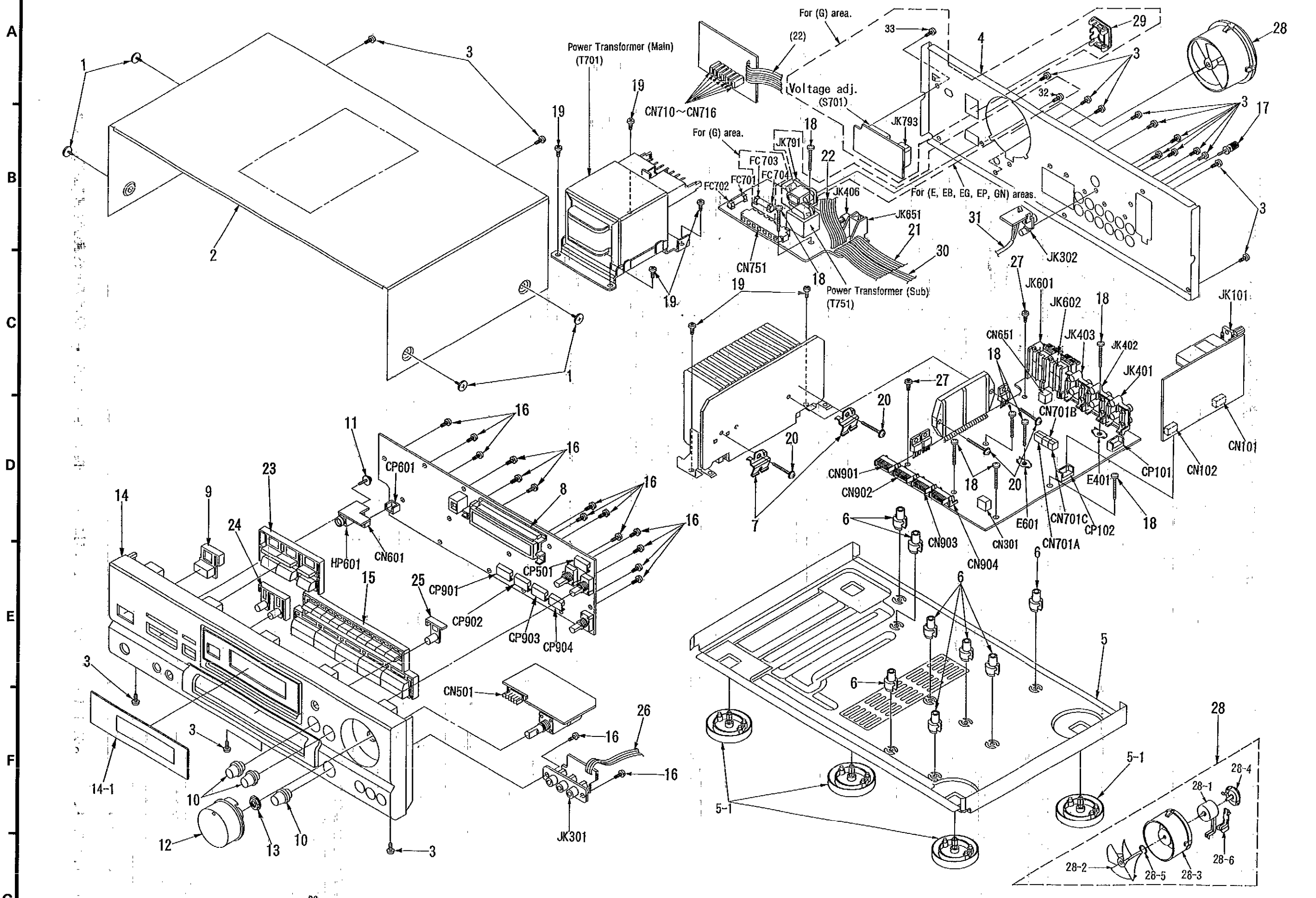


15 16 17 18 19 20 21 22 23 24

WIRING CONNECTION DIAGRAM



■ CABINET PARTS LOCATION



■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
 Components identified by Δ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list. *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.) Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS		31	RFKAGX170EK	CONNECTOR ASS'Y (3P) (W302)	
				32	XTBS3+8JFZ1	SCREW	(E, EB, EG, EP, GN)
				33	XTBS3+8JFZ1	SCREW	(G)
		INTEGRATED CIRCUIT(S)					
1	RHD30035-K1	SCREW		IC101	LA1832A	FM/AM IF AMP./AM OSC	
2	RRD260B-K	CABINET		IC102	LC7218	PLL FREQ. SYNTHESIZER	
3	XTBS3+8JFZ1	SCREW		IC401	NJU7312AL	INPUT SELECTOR	
4	RRD178B-B	REAR PANEL	(E, EP)	IC402	W5218AP	BUFFER AMP	
4	RRD178B-C1	REAR PANEL	(EB)	IC451	ANG558-ESG	PHONO EQ AMP	
4	RRD178B-A1	REAR PANEL	(EG)	IC471	UPC4570C	TONE CONTROL	
4	RRD178C-A1	REAR PANEL	(G)	5-1	RK4053-A	FOOT	
4	RRD178B-D	REAR PANEL	(GN)	IC601	RSN3306A	POWER AMP	Δ
5	RFKJAGX170PK	BOTTOM CHASSIS ASS'Y		IC851	BA6218	MOTOR DRIVE	
5-1	RK4053-A	FOOT		IC901	LC8A012C5481	MICROCOMPUTER	(E, EB, EG, EP)
6	RKQ089	P. C. B. SUPPORT		IC901	LC8A012C5470	MICROCOMPUTER	(G, GN)
7	RMC0158	TRANSISTOR HOLDER				TRANSISTOR (S)	
8	RRD248-1	FL HOLDER		Q101	ZSC2787L	TRANSISTOR	
9	RFKNAGX170AK	POWER BUTTON ASS'Y		Q103, 104	ZSC2785FE	TRANSISTOR	
10	RGW0198-K	BALANCE/TREBLE/BASS KNOB		Q106	UN411FTA	TRANSISTOR	
11	RHD26016	SCREW		Q107, 108	ZSC3311ARSTA	TRANSISTOR	
12	RGW0145-1K	VOLUME KNOB		Q191-193	ZSC3311ARSTA	TRANSISTOR	(E, EB, EP, G, GN)
13	RHN90001	NUT		Q505, 506	ZSC3311AIRTA	TRANSISTOR	
14	RFKNAGX170E	FRONT PANEL ASS'Y	(E, EB, EG, EP)	Q509, 510	ZSC3327-A	TRANSISTOR	
14	RFKNAGX170G	FRONT PANEL ASS'Y	(G, GN)	Q601-603	2SA1309AIRTA	TRANSISTOR	
14-1	RKW0317A-Q	TRANSPARENT PLATE		Q651, 652	2SA1309AIRTA	TRANSISTOR	
15	RGU1057-K	SELECTOR BUTTON		Q653	2SB621AQSTA	TRANSISTOR	Δ
16	XTBS26+8J	SCREW		Q654, 655	2SA1309AIRTA	TRANSISTOR	
17	SNE2123	GND TERMINAL		Q701	ZSD1761DEF	TRANSISTOR	Δ
18	XTBS3+20JF2	SCREW		Q703-705	ZSC3311AIRTA	TRANSISTOR	Δ
19	XTBS3+8JFZ	SCREW		Q706	ZSC3940AQSTA	TRANSISTOR	Δ
20	XTW3+15T	SCREW		Q707	ZSB1187DEF	TRANSISTOR	Δ
21	RRJ181330QK	FLAT CABLE (13P) (W701)		Q709	ZSB1187DEF	TRANSISTOR	Δ
22	RRJ1807180KK	FLAT CABLE (7P) (W702)		Q751	UN421FTA	TRANSISTOR	
23	RFKNAGX170BK	MODE BUTTON ASS'Y		Q752	ZSC3940AQSTA	TRANSISTOR	Δ
24	RFKNAGX170CK	SPEAKER BUTTON ASS'Y		Q801	UN4214TA	TRANSISTOR	
25	RFKNAGX170DK	MUTING BUTTON ASS'Y		Q902	2SA1309AIRTA	TRANSISTOR	Δ
26	RRJ1803150QK	FLAT CABLE (3P) (W301)		Q903	UN4113TA	TRANSISTOR	
27	XTWS3+8T	SCREW		Q904	UN4214TA	TRANSISTOR	
28	REMO020-1	COOLING FAN UNIT		Q906	2SA1309AIRTA	TRANSISTOR	
28-1	MDN-4RB4MFC	FAN MOTOR				DIODE (S)	
28-2	SNE232-1	FAN		D101	MA4051MTA	DIODE	Δ
28-3	RRQ0209-K	FAN CASE					
28-4	RRQ0208-K	FAN CAP					
28-5	SUS271	SPRING					
28-6	RRQ0212-K	FAN TERMINAL CAP					
29	SJS9231A	AC INLET COVER	(G)				
30	REZ0682	FLAT CABLE (3P) (W651)					

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
D102	MA165	DIODE					
D401	MA4075MTA	DIODE	△	T701	RTP1N5E014-V	POWER TRANSFORMER (MAIN)	(E, EB, EG, EP) △
D601, 602	MA165	DIODE		T701	RTP1N5E015-V	POWER TRANSFORMER (MAIN)	(G) △
D603	MA700	DIODE		T701	RTP1N5E016-V	POWER TRANSFORMER (MAIN)	(GN) △
D605, 606	SB3606501T	DIODE		T751	RTP115E003-V	POWER TRANSFORMER (SUB)	(E, EB, EG, EP, GN) △
D609	MA165	DIODE		T751	RTP115E005-V	POWER TRANSFORMER (SUB)	(G) △
D651	MA165	DIODE					
D652	MA4056MTA	DIODE				COMPONENT COMBINATION (S)	
D653	MA165	DIODE					
D701-704	P300D5002T	DIODE	△	Z101	RLA6Z005M-T	COMPONENT COMBINATION	(E, EB, EP, G, GN)
D707, 708	MA4062MTA	DIODE	△	Z101	RLA2Z002M-T	COMPONENT COMBINATION	(EG)
D710	MA4220MTA	DIODE	△	Z102	RL1Z2006M-T	COMPONENT COMBINATION	
D712	MA4160M	DIODE	△	Z891	RCDHC-278N	REMOTE SENSOR	
D721-724	P300DLF	DIODE	△				
D751-754	1SR35200TB	DIODE	△			FILTER(S) AND OSCILLATOR(S)	
D755	MA165	DIODE					
D756	MA4068M	DIODE	△	CF201	RLFFETNGD01L	FILTER	
D901	1SS291TA	DIODE		CF202	RLFFETMGD01L	FILTER	
D903	MA4056MTA	DIODE	△	CF901	EFOEC6004T4	OSCILLATOR (6MHz)	
D904	MA165	DIODE		X101	RSXZ456KM07M	OSCILLATOR (456kHz)	
D906	MA165	DIODE	(E, EB, EP, G, GN)	X102	RLFDGTD01I	OSCILLATOR (10.65MHz)	
D907	MA165	DIODE		X103	SVQ49U722-S	OSCILLATOR (7.2MHz)	
D917	1SS291TA	DIODE					
D921	MA165	DIODE				DISPLAY TUBE (S)	
D922	MA4039MTA	DIODE	△				
D923	MA165	DIODE		FL901	RSL0155-F	DISPLAY TUBE	
D927, 928	MA165	DIODE					
D929	LN846RPH	L. E. D.				FM FRONT END PACK ASS'Y(S)	
D934	MA165	DIODE					
		VARIABLE RESISTOR(S)		Z120	ENV17290G1R	FM FRONT END	
						FUSE(S)	
VR471, 472	EVJYA1FA5C15	TONE CONTROL					
VR501	EUWMB025B15	VOLUME CONTROL		F1	XBA2C16TBO	FUSE, 125V, 1.6A	△
VR502	EVJ02QF02G15	BALANCE CONTROL		F2	XBA2C31TBO	FUSE, 25V, 3.15A	(G) △
		COIL (S)				SWITCH(ES)	
L101	ELESNR68MA	COIL	(E, EB, EP, G, GN)	S701	ESD26840A	VOLTAGE ADJUSTMENT	(G) △
L101	ELESNR0MA	COIL	(EG)	S946	EVQ21405R	NUMERIC 5	
L103	ELEXTR47MA9	COIL		S949	EVQ21405R	NUMERIC 4	
L105, 106	RLQZB822KT-D	COIL		S950	EVQ21405R	NUMERIC 6	
L151	SLM1B10M-1M	COIL		S952	EVQ21405R	NUMERIC 7	
L191	ELESNR68MA	COIL	(E, EB, EP, G, GN)	S954	EVQ21405R	CD	
L191	ELESNR56MA	COIL	(EG)	S955	EVQ21405R	TUNER	
L591, 592	RLQZPIROKT-Y	COIL		S957	EVQ21405R	NUMERIC 9	
L601, 602	RLQYR73M	COIL		S961	EVQ21405R	NUMERIC 8	
L701	SLQZ650MH49	COIL	(E, EB, EG, EP, GN) △	S962	EVQ21405R	NUMERIC 0	
L751	ELESNR101KA	COIL		S964	EVQ21405R	PHONO	
L901	RLQZP101KT-Y	COIL		S966	EVQ21405R	MEMORY	
		TRANSFORMER (S)		S967	EVQ21405R	MUTING	
				S970	EVQ21405R	TAPE/DCC	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
S971	EVQ21405R	VCR2		JK791	SJSD16	AC INLET	(GN) △
S972	EVQ21405R	VCR1		JK793	SJS9231-1B	AC INLET	(G) △
S973	EVQ21405R	SP-B					
S974	EVQ21405R	FM MODE				GND PLATE (S)	
S975	EVQ21405R	BAND					
S976	EVQ21405R	DIRECT TUNING		E401	SNE1004-2	GND PLATE	
S977	EVQ21405R	TUNING DOWN		E601	SNE1004-2	GND PLATE	
S978	EVQ21405R	POWER					
S981	EVQ21405R	SP-A				FUSE HOLDER(S)	
S983	EVQ21405R	NUMERIC 3					
S984	EVQ21405R	NUMERIC 2		FC701, 702	EYF52BC	FUSE HOLDER	
S985	EVQ21405R	NUMERIC 1		FC703, 704	EYF52BC	FUSE HOLDER	(G)
S987	EVQ21405R	TUNING UP					
		RELAY(S)					
RL601, 602	RSY0013M-0	RELAY	△				
RL751	RSY0019M-0	RELAY	△				
		CONNECTOR(S) AND SOCKET(S)					
CN101, 102	RJU057W007	SOCKET (7P)					
CN301	RJS1A6603	CONNECTOR (3P)					
CN501	RJU003K010M1	SOCKET (10P)					
CN601	RJU057W004	SOCKET (4P)					
CN651	RJS1A6603	CONNECTOR (3P)					
CN701A	RJS1A6606	CONNECTOR (6P)					
CN701B	RJS1A6604	CONNECTOR (4P)					
CN701C	RJS1A6603	CONNECTOR (3P)					
CN710-716	RJS1A1101T1	CONNECTOR (1P)					
CN751	SJS305-1	CONNECTOR (3P)	(E, EB, EG, EP, GN)				
CN751	SJS702-1	CONNECTOR (7P)	(G)				
CN901-904	RJU003K008M1	SOCKET (8P)					
CP101, 102	RJT057W007-1	CONNECTOR (7P)					
CP501	RJT003K010-1	CONNECTOR (10P)					
CP601	RJT057W004-1	CONNECTOR (4P)					
CP901-904	RJT003K008-1	CONNECTOR (8P)					
		JACK(S) AND TERMINAL(S)					
HP601	RJJ63TS01	HEADPHONE JACK					
JK101	RJH4202M	ANT TERMINAL					
JK301	SJFK5-1	VCR2 IN TERMINAL					
JK302	SJFD7-6	VCR2 OUT TERMINAL					
JK401	SJF3069N	PHONO/CD TERMINAL					
JK402	SJF3069N	TAPE/VCR2/DCC TERMINAL					
JK403	SJF3069N	VCR1 TERMINAL					
JK406	RJJ33TR01	REMOTE CONTROL OUT TERMINAL					
JK601	RJR0054	SPEAKER (A) TERMINAL					
JK602	RJR0054	SPEAKER (B) TERMINAL					
JK651	RJS1A7402-1	FAN CONNECTOR					
JK791	SJS9236	AC INLET	(E, EB, EG, EP) △				

RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (μ F) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
 * Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS			G, GN)	R615	ERDS2TJ184T	1/4W 180K
			R375, 376	ERDS2TJ102	1/4W 1K	R616	ERDS2TJ154	1/4W 150K
			R377, 378	ERDS2TJ223	1/4W 22K	R619	ERDS2TJ684	1/4W 680K
R103	ERDS2TJ101	1/4W 100	R401, 402	ERDS2TJ102	1/4W 1K	R620	ERDS2TJ473	1/4W 47K
R104	ERDS2TJ102	1/4W 1K	R405-408	ERDS2TJ102	1/4W 1K	R621, 622	ERD25FVJ180T	1/4W 18 Δ
R105	ERDS2TJ471	1/4W 470	R411-416	ERDS2TJ102	1/4W 1K	R623	ERDS2TJ684	1/4W 680K
R106	ERDS2TJ224T	1/4W 220K	R417, 418	ERDS2TJ473	1/4W 47K	R624	ERDS2TJ224T	1/4W 220K
R107	ERDS2TJ471	1/4W 470	R419-422	ERDS2TJ104	1/4W 100K	R625	ERD25FJ220	1/4W 22 Δ
R110	ERDS2TJ102	1/4W 1K	R423, 424	ERDS2TJ102	1/4W 1K	R626	ERDS2TJ473	1/4W 47K
R112	ERDS2TJ104	1/4W 100K	R425-427	ERDS2TJ103	1/4W 10K	R627-630	ERGISJ101E	1W 100
R113	ERDS2TJ103	1/4W 10K	R440	ERDS1FVJ820T	1/2W 82 Δ	R631, 632	ERDS2TJ223	1/4W 22K
R114	ERDS2TJ562	1/4W 5.6K	R441, 442	ERDS2TJ473	1/4W 47K	R633, 634	ERDS2TJ103	1/4W 10K
R115	ERDS2TJ561	1/4W 560	R443	ERDS2TJ330	1/4W 33	R635, 636	ERDS2TJ102	1/4W 1K
R116	ERDS2TJ102	1/4W 1K	R451, 452	ERDS2TJ224T	1/4W 220K	R637	ERDS2TJ472	1/4W 4.7K
R117	ERDS2TJ473	1/4W 47K	R453, 454	ERDS2TJ391	1/4W 390	R639, 640	ERDS2TJ474	1/4W 470K
R118	ERDS2TJ562	1/4W 5.6K	R455, 456	ERDS2TJ563	1/4W 56K	R641, 642	ERDS2TJ221	1/4W 220
R119	ERDS2TJ183T	1/4W 18K	R457, 458	ERDS2TJ271	1/4W 270	R643, 644	ERDS2TJ154	1/4W 150K
R120	ERDS2TJ473	1/4W 47K	R459, 460	ERDS2TJ680T	1/4W 68	R645	ERDS2TJ183T	1/4W 18K
R121	ERDS2TJ332	1/4W 3.3K	R461, 462	ERDS2TJ184T	1/4W 180K	R667, 668	ERGISJ121E	1W 120
R122	ERDS2TJ272T	1/4W 2.7K	R463, 464	ERDS2TJ123	1/4W 12K	R671-674	ERDS2TJ223	1/4W 22K
R124	ERDS2TJ271	1/4W 270	R465, 466	ERDS2TJ563	1/4W 56K	R675	ERDS2TJ682T	1/4W 6.8K
R125, 126	ERDS2TJ472	1/4W 4.7K	R467-470	ERDS2TJ102	1/4W 1K	R678	ERDS2TJ103	1/4W 10K
R127	ERDS2TJ103	1/4W 10K	R475, 476	ERDS2TJ471	1/4W 470	R679	ERDS2TJ222	1/4W 2.2K
R128	ERDS2TJ820	1/4W 82	R477-480	ERDS2TJ474	1/4W 470K	R680	ERDS2TJ473	1/4W 47K
R129	ERDS2TJ473	1/4W 47K	R481, 482	ERDS2TJ152	1/4W 1.5K	R681	ERDS2TJ332	1/4W 3.3K
R130, 131	ERDS2TJ102	1/4W 1K	R483, 484	ERDS2TJ392T	1/4W 3.9K	R682	ERDS1FVJ220T	1/2W 22 Δ
R132	ERDS2TJ103	1/4W 10K	R485, 486	ERDS2TJ223	1/4W 22K	R683	ERDS2TJ103	1/4W 10K
R133-137	ERDS2TJ102	1/4W 1K	R487, 488	ERDS2TJ392T	1/4W 3.9K	R684	ERDS2TJ153	1/4W 15K
R139, 140	ERDS2TJ272T	1/4W 2.7K	R489, 490	ERDS2TJ222	1/4W 2.2K	R685, 686	ERDS2TJ333	1/4W 33K
R141, 142	ERDS2TJ102	1/4W 1K	R491, 492	ERDS2TJ122	1/4W 1.2K	R687	ERDS2TJ103	1/4W 10K
R143, 144	ERDS2TJ222	1/4W 2.2K	R493, 494	ERDS2TJ333	1/4W 33K	R688	ERDS2TJ222	1/4W 2.2K
R145, 146	ERDS2TJ102	1/4W 1K (E, EB, EP, G, GN)	R501, 502	ERDS2TJ222	1/4W 2.2K	R689	ERDS2TJ270T	1/4W 27
R145, 146	ERDS2TJ561	1/4W 560 (EG)	R503, 504	ERDS2TJ103	1/4W 10K	R690	ERDS2TJ223	1/4W 22K
R147, 148	ERDS2TJ474	1/4W 470K	R509-512	ERDS2TJ332	1/4W 3.3K	R691	ERDS2TJ104	1/4W 100K
R149	ERDS2TJ680T	1/4W 68	R525, 526	ERDS2TJ102	1/4W 1K	R692	ERDS2TJ103	1/4W 10K
R171, 172	ERDS2TJ102	1/4W 1K	R528	ERDS2TJ822	1/4W 8.2K	R693	ERDS2TJ223	1/4W 22K
R173	ERDS2TJ471	1/4W 470	R529	ERDS2TJ824	1/4W 820K	R694	ERDS2TJ335T	1/4W 3.3M
R175	ERDS2TJ102	1/4W 1K	R532-534	ERDS2TJ102	1/4W 1K	R705	ERDS1FVJ688T	1/2W 6.8 Δ
R176	ERDS2TJ391	1/4W 390	R537	ERDS2TJ102	1/4W 1K	R707	ERDS2TJ332	1/4W 3.3K
R191	ERDS2TJ103	1/4W 10K (E, EB, EP, G, GN)	R538	ERDS2TJ472	1/4W 4.7K	R708	ERDS2TJ102	1/4W 1K
R192	ERDS2TJ122	1/4W 1.2K (E, EB, EP, G, GN)	R547, 548	ERGISJ820E	1W 82	R711	ERD25FVJ221T	1/4W 220 Δ
R193	ERDS2TJ182	1/4W 1.8K (E, EB, EP, G, GN)	R591	ERDS1FVJ2R2T	1/2W 2.2 Δ	R714	ERDS2TJ472	1/4W 4.7K
R194	ERDS2TJ122	1/4W 1.2K (E, EB, EP, G, GN)	R601, 602	ERDS2TJ221	1/4W 220	R715, 716	ERDS2TJ1R5T	1/4W 1.5
R195	ERDS2TJ222	1/4W 2.2K (E, EB, EP, G, GN)	R603, 604	ERDS2TJ563	1/4W 56K	R717	ERDS2TJ752T	1/4W 7.5K
			R605, 606	ERDS2TJ182	1/4W 1.8K	R718	ERDS2TJ682T	1/4W 6.8K
			R607, 608	ERDS2TJ563	1/4W 56K	R719	ERDS1FVJ220T	1/2W 22 Δ
			R609, 610	ERDS2TJ100	1/4W 10	R721	ERDS2TJ182	1/4W 1.8K
			R611, 612	ERDS1FVJ100T	1/2W 10 Δ	R723	ERD25FVJ4R7T	1/4W 4.7 Δ
			R613, 614	ERDS2TJ102	1/4W 1K	R724	ERDS2TJ122	1/4W 1.2K (E, EB, EG,

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		EP)	R984	ERDS2TJ222	1/4W 2. 2K	C173	ECEA1CKA220B	16V 22U
R724	ERDS2TJ222	1/4W 2. 2K (G, GN)	R985	ERDS2TJ332	1/4W 3. 3K	C174	ECEA1CKA101B	16V 100U
R727	ERD25FVJ180T	1/4W 18 Δ	R986	ERDS2TJ472	1/4W 4. 7K	C175, 176	ECBT1C103NS5	16V 0. 01U
R728	ERDS1FVJ100T	1/2W 10 Δ	R987	ERDS2TJ682T	1/4W 6. 8K	C181	ECBT1H471KB5	50V 470P
R729	ERDS2TJ332	1/4W 3. 3K	R991	ERDS2TJ103	1/4W 10K	C196	ECBT1H102KB5	50V 1000P
R754	ERDS2TJ102	1/4W 1K	R1201-1205	ERDS2TJ102	1/4W 1K	C375, 376	ECBT1H221KB5	50V 220P
R901	ERDS2TJ102	1/4W 1K	R1209-1212	ERDS2TJ102	1/4W 1K	C377, 378	ECBT1H821KB5	50V 820P
R902	ERDS2TJ681	1/4W 680	R1214	ERDS2TJ102	1/4W 1K	C401	ECEA1VKA4R7B	35V 4. 7U
R903, 904	ERDS2TJ104	1/4W 100K				C402, 403	ECBT1E103ZF	25V 0. 01U
R905, 906	ERDS2TJ103	1/4W 10K			CAPACITORS	C404	ECEA1VKA4R7B	35V 4. 7U
R907-911	ERDS2TJ104	1/4W 100K				C405	ECBT1H101KB5	50V 100P
R912	ERDS2TJ102	1/4W 1K	C101	ECBT1C103NS5	16V 0. 01U	C406	ECBT1H102KB5	50V 1000P
R913, 914	ERDS2TJ104	1/4W 100K	C103	ECBT1C103NS5	16V 0. 01U	C409, 410	ECEA1CKA220B	16V 22U
R920	ERDS2TJ271	1/4W 270	C104	ECBT1H102KB5	50V 1000P	C411, 412	ECBT1H101KB5	50V 100P
R921	ERDS2EJ121	1/4W 120	C105	ECBT1H470J5	50V 47P	C413, 414	ECEA1CKA100B	16V 10U
R922	ERDS2TJ472	1/4W 4. 7K	C106	ECBT1C103NS5	16V 0. 01U	C415, 416	ECBT1E103ZF	25V 0. 01U
R923	ERDS2TJ102	1/4W 1K	C107	ECBT1H473ZF5	50V 0. 047U	C417, 418	ECBT1H101KB5	50V 100P
R926	ERDS2TJ122	1/4W 1. 2K	C108	ECBT1H100JC5	50V 10P (E, EB, EP, G, GN)	C419-422	ECBT1H331KB5	50V 330P
R927	ERDS2TJ181T	1/4W 180				C425, 426	ECBT1H101KB5	50V 100P
R928	ERDS2TJ222	1/4W 2. 2K	C108	ECBT1H8R2KC5	50V 8. 2P (EG)	C427, 428	ECBT1H221KB5	50V 220P
R929	ERDS2TJ562	1/4W 5. 6K	C109, 110	ECBT1C103NS5	16V 0. 01U	C431, 432	ECEA1CKA100B	16V 10U
R930, 931	ERDS2TJ101	1/4W 100	C111	ECEA1EKA4R7B	25V 4. 7U	C440	ECBT1E103ZF	25V 0. 01U
R946-949	ERDS2TJ103	1/4W 10K	C112	ECBT1C103NS5	16V 0. 01U	C451, 452	ECEA1VKA4R7B	35V 4. 7U
R950	ERDS2TJ102	1/4W 1K	C113	ECBT1H102KB5	50V 1000P	C453, 454	ECBT1H100JC5	50V 10P
R951	ERDS2TJ122	1/4W 1. 2K	C114	ECEA1HKA3R3B	50V 3. 3U	C455, 456	ECBT1H102KB5	50V 1000P
R952	ERDS2TJ152	1/4W 1. 5K	C115	ECEA1EKA4R7B	25V 4. 7U	C457, 458	ECEA1AKA330B	10V 33U
R953	ERDS2TJ182	1/4W 1. 8K	C116	ECBT1C822MS5	16V 8200P	C459, 460	ECFR1E223KR	25V 0. 022U
R954	ERDS2TJ222	1/4W 2. 2K	C117	ECQB1H471JF3	50V 470P	C461, 462	ECFR1E682KR	25V 6800P
R955	ERDS2TJ332	1/4W 3. 3K	C118, 119	ECQB1H103JF3	50V 0. 01U	C463, 464	ECEA1VKA4R7B	35V 4. 7U
R956	ERDS2TJ472	1/4W 4. 7K	C120, 121	ECEA1HKA010B	50V 1U	C465, 466	ECBT1E103ZF	25V 0. 01U
R957	ERDS2TJ682T	1/4W 6. 8K	C122	ECEA1HKA2R2B	50V 2. 2U	C469, 470	ECBT1H181KB5	50V 180P
R960	ERDS2TJ102	1/4W 1K	C123	ECEA1HKA010B	50V 1U	C471, 472	ECEA1HKA3R3B	50V 3. 3U
R961	ERDS2TJ122	1/4W 1. 2K	C124	ECBT1H102KB5	50V 1000P	C475, 476	ECBT1H150J5	50V 15P
R962	ERDS2TJ152	1/4W 1. 5K	C125	ECBT1H150JC5	50V 15P	C477, 478	ECBT1H221KB5	50V 220P
R963	ERDS2TJ182	1/4W 1. 8K	C126	ECBT1H1042F5	50V 0. 1U	C479, 480	ECBT1H560J5	50V 56P
R964	ERDS2TJ222	1/4W 2. 2K	C127	ECEA1CKA220B	16V 22U	C481-484	ECEA1VKA4R7B	35V 4. 7U
R965	ERDS2TJ332	1/4W 3. 3K	C128	ECBT1C103NS5	16V 0. 01U	C485, 486	ECFR1E123KR	25V 0. 012U
R966	ERDS2TJ472	1/4W 4. 7K	C129, 130	ECEA0JKA101B	6. 3V 100U	C487, 488	ECQV1H683JM3	50V 0. 068U
R967	ERDS2TJ682T	1/4W 6. 8K	C131	ECBT1C103NS5	16V 0. 01U	C489, 490	ECBT1C562KR5	16V 5600P
R970	ERDS2TJ102	1/4W 1K	C132	ECBT1H102KB5	50V 1000P	C491, 492	ECFR1E273KR	25V 0. 027U
R971	ERDS2TJ122	1/4W 1. 2K	C133	ECBT1H150JC5	50V 15P	C495, 496	ECBT1E103ZF	25V 0. 01U
R972	ERDS2TJ152	1/4W 1. 5K	C134	ECBT1H180JC5	50V 18P	C503, 504	ECEA1VKA4R7B	35V 4. 7U
R973	ERDS2TJ182	1/4W 1. 8K	C135, 136	ECBT1C103KS5	16V 0. 01U	C518	ECEA1HKN010B	50V 1U
R974	ERDS2TJ222	1/4W 2. 2K	C137, 138	ECBT1H561KB5	50V 560P	C541, 542	ECEA1HN100SB	50V 10U
R975	ERDS2TJ332	1/4W 3. 3K	C139, 140	ECQB1H682JF3	50V 6800P	C543, 544	ECBT1C332KR5	16V 3300P
R976	ERDS2TJ472	1/4W 4. 7K	C141-144	ECEA1HKA010B	50V 1U	C591, 592	ECEA0JKA101B	6. 3V 100U
R977	ERDS2TJ682T	1/4W 6. 8K	C145	ECBT1H220JC5	50V 22P	C593, 594	ECFR1E104KR	25V 0. 1U
R978	ERDS2TJ123	1/4W 12K	C146	ECBT1H331KB5	50V 330P	C595	ECBT1E103ZF	25V 0. 01U
R980	ERDS2TJ102	1/4W 1K	C147	ECBT1H102KB5	50V 1000P	C601, 602	ECEA1EKN2R2B	25V 2. 2U
R981	ERDS2TJ122	1/4W 1. 2K	C148, 149	ECBT1C103NS5	16V 0. 01U	C603, 604	ECBT1H561KB5	50V 560P
R982	ERDS2TJ152	1/4W 1. 5K	C150	ECBT1H1042F5	50V 0. 1U	C605, 606	ECA1JM330B	63V 33U
R983	ERDS2TJ182	1/4W 1. 8K	C172	ECBT1H331KB5	50V 330P	C607, 608	ECER1H100K5	50V 10P

Ref.No.	Part No.	Values & Remarks	Ref.No.	Part No.	Values & Remarks			
C609, 610	ECBT1H151KB5	50V 150P	C913, 914	ECEA1VKA100B	35V 10U			
C611, 612	ECQV1H473JM3	50V 0.047U	C916	ECEA1HKA010B	50V 1U			
C613, 614	ECBA1H681KB5	50V 680P	C920	ECEA1HKA010B	50V 1U			
C615	ECEA2AN2R2SB	100V 2.2U	C921-928	ECBT1H331KB5	50V 330P			
C616	ECEA2AU100	100V 10U	C929-932	ECBT1H101KB5	50V 100P			
C617	ECA1HM470B	50V 47U						
C618	ECEA2AU100	100V 10U						
C621	ECEA2AU100	100V 10U						
C623-626	ECKT1H223ZF	50V 0.022U						
C627	ECKR2H101KB5	500V 100P						
C628	ECBT1H101KB5	50V 100P						
C629	ECBT1E223ZF	25V 0.022U						
C651	ECEA1HKA2R2B	50V 2.2U						
C652	ECEA1CKA100B	16V 10U						
C653	ECBT1E223ZF	25V 0.022U						
C655	RCE0JKA221BV	6.3V 220U						
C701	ECBT1E103ZF	25V 0.01U						
C702	ECQE2104KF3	250V 0.1U						
C703, 704	ECES56V472NX	56V 4700U (E, EB, EG, EP) Δ						
C703, 704	ECES75V752UX	75V 7500U (G, GN) Δ						
C705, 706	ECA1VM472B	50V 4700U (E, EB, EG, EP) Δ						
C705, 706	ECA1HM222B	50V 2200U (G, GN) Δ						
C707	RCE1VM101BV	35V 100P						
C708	ECKR1H103ZF5	50V 0.01U						
C709	ECEA1CKA330B	16V 33U						
C710	ECBT1E103ZF	25V 0.01U						
C711	ECKR1H103ZF5	50V 0.01U						
C712	ECA1HM470B	50V 47U						
C713	ECKR1H103ZF5	50V 0.01U						
C716	ECEA2AU100	100V 10U						
C720	ECEA1EKA220B	25V 22U						
C722	ECQE2104KF3	250V 0.1U						
C751	ECKWNS102MBM	400V 1000P Δ						
C752	ECKR1H103ZF5	50V 0.01U						
C753	ECA1EM102B	25V 1000U Δ						
C754	ECBT1E103ZF	25V 0.01U						
C756	ECBT1E103ZF	25V 0.01U						
C757	ECEA1CKA470B	16V 47U						
C758	ECEA1AKA101B	10V 100U						
C759	ECEA1EKA220B	25V 22U						
C891	ECFR1E392KR	25V 3900P						
C901	ECA0JM102B	6.3V 1000U						
C902	ECBT0J223MS5	6.3V 0.022U (E, EB, EG, EP)						
C902	ECBT1E103ZF	25V 0.01U (G, GN)						
C903	ECBT1E103ZF	25V 0.01U						
C904	ECA0JM471B	6.3V 470U						
C906	ECEA0JKA101B	6.3V 100U						
C908, 909	ECBT1E103ZF	25V 0.01U						
C911, 912	ECEA2AU100	100V 10U						

REPLACEMENT PARTS LIST

Notes: *Important safety notice:

Components identified by Δ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
 *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
 Parts without these indications can be used for all areas.
 *Remote Control Ass'y: Supply period for three years from termination of production.
 *The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIAL		A1	RQF2297	INSTRUCTION MANUAL ASS'Y	(EP)
				A2	RJA0019-2K	AC POWER SUPPLY CORD	(E, EG, EP, G) Δ (SF)
				A2	VJA0733	AC POWER SUPPLY CORD	(EB) Δ (SF)
				A2	RJA0036-K	AC POWER SUPPLY CORD	(GN) Δ (SF)
P1	RPG2062	PACKING CASE	(E, EG, EP, G, GN)	A3	RSA0007	FM INDOOR ANTENNA	
P1	RPG2063	PACKING CASE	(EB)	A4	RSA0010	AM LOOP ANTENNA SET	
P2	RPN0752	CUSHION		A4-1	RMN0244	AM ANTENNA HOLDER	
P3	RPQ0164	PAD (ACCESSORIES)		A4-2	XTN3+10AFZ	SCREW	
P4	XZB24K34C04	PROTECTION BAG (ACCESSORIES)		A5	RQCB0169	SERVICENTER LIST	(E, EB, EG, G, GN)
P5	XZB60X65A01Z	PROTECTION BAG (UNIT)		A6	RQA0013	WARRANTY CARD	(E, EB, EG)
P6	RPH0032	PROTECTION SHEET	(EB, GN)	A6	RQX7433ZA	WARRANTY CARD	(GN)
		ACCESSORIES		A7	RAK-SA113XH	REMOTE CONTROL TRANSMITTER	
				A7-1	RKK0057-K	BATTERY COVER	FOR R/C TRANSMITTER
A1	RFKSAGX170E	INSTRUCTION MANUAL ASS'Y	(E)	A8	SJP9009	ATTACHMENT PLUG	(EB) Δ
A1	RFKSAGX170G	INSTRUCTION MANUAL ASS'Y	(G)	A9	RFE0014	ANTENNA PLUG	(G, GN)
A1	RQT2458-B	INSTRUCTION MANUAL	(EB, GN)	A10	RQLA0134	VOLTAGE CAUTION LABEL	(G)
A1	RQT2456-D	INSTRUCTION MANUAL	(EG)	A11	SJP5213-1	POWER PLUG ADAPTOR	(G) Δ

PACKAGING

