

Service Manual

QUARTZ Synthesizer
LW/MW/FM Stereo Receiver

Receiver
SA-GX100L



Color

(K)... Black Type

Area

Country Code	Area	Color
(E)	Continental Europe.	(K)
(EB)	Great Britain.	

SPECIFICATIONS (DIN 45 500)

■ AMPLIFIER SECTION

Power output	
DIN 1 kHz	2 × 40 W (4 Ω)
40 Hz~20 kHz continuous power output both channels driven	2 × 30 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 80 Hz: 7 kHz=4:1, SMPTE, 8 Ω	0.5 %
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, TAPE/VCR 2	200 mV/22 kΩ
PHONO maximum input voltage (1 kHz, RMS)	150 mV
S/N	
rated power (8 Ω)	
PHONO	70 dB (IHF, A: 80 dB)
CD, VCR 1, TAPE/VCR 2	80 dB (IHF, A: 90 dB)
Frequency response	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
CD, VCR 1, TAPE/VCR 2	10 Hz~70 kHz (±3 dB)
Bass	50 Hz, +10 dB~-10 dB
Treble	20 kHz, +10 dB~-10 dB

Loudness control (volume at -30 dB)	50 Hz, +9 dB
Output voltage	
VCR 1 AUDIO OUT, TAPE/VCR 2 REC OUT	200 mV
Channel balance, 250 Hz~6,300 Hz	±1 dB
Channel separation	55 dB
Headphones output level and Impedance	430 mV/330 Ω
Load Impedance	
A or B	4 Ω~16 Ω
A and B	8 Ω~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	1.5 μV (IHF'58, 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

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

Alternate channel selectivity	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
10 kHz	30 dB
Carrier leak	
19 kHz	-55 dB (-60 dB, IHF)
38 kHz	-50 dB (-55 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	75 Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	
MW	522 kHz~1611 kHz (9-kHz steps) 530 kHz~1620 kHz (10-kHz steps)
LW	155 kHz~353 kHz (9-kHz steps) 153 kHz~351 kHz (-2-kHz shift)
Sensitivity (S/N 20 dB)	
MW	20 μV, 330 μV/m
LW	45 μV

Selectivity (±9 kHz)	
MW (at 999 kHz)	55 dB
LW (at 254 kHz)	55 dB
Image rejection	
MW (at 999 kHz)	40 dB
LW (at 254 kHz)	40 dB
IF rejection	
MW (at 999 kHz)	55 dB
LW (at 254 kHz)	55 dB

■ GENERAL

Power consumption	265 W
Power supply	
For United Kingdom	AC 50 Hz/60 Hz, 240 V
For continental Europe	AC 50 Hz/60 Hz, 220 V
Dimensions (W × H × D)	430 × 124 × 300 mm (16-15/16" × 4-7/8" × 11-13/16")
Weight	5.5 kg (12.1 lb.)

Notes:

1. Specifications are subject to change without notice. Weight and dimensions are approximate.
2. Total harmonic distortion is measured by the digital spectrum analyzer.

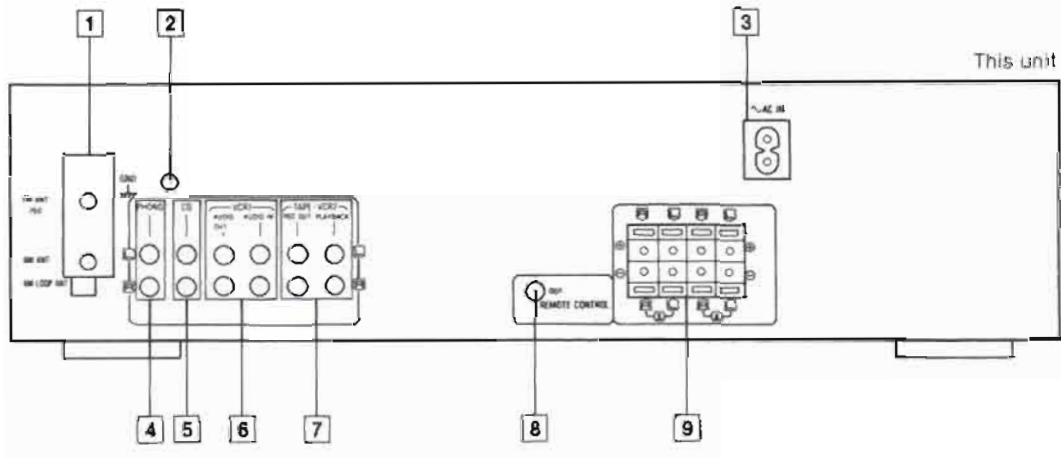
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■ ACCESSORIES

● AC power supply cord (1) [SFDAC05E03... (E)] [SJA193... (EB)]	● FM indoor antenna (1) (SSA270M)	● Attachment plug (1) (For United Kingdom only) (SJP9009)	● AM loop antenna (1) (SPB1163T)
● AM antenna holder (1) (SMA233-1M)	● Screws (2) (XTN3+10AFZ)	● Remote-control transmitter (1) (RAK-SA301E)	● Batteries (2) (LM-4NE/2S)

CONNECTIONS TO EQUIPMENT



1 Antenna connection terminals

2 "GND" terminal

Connect the turntable's ground wire to this terminal (if applicable).

3 AC IN socket (AC IN)

Connect this socket to an AC outlet on the wall by using the included AC power supply cord.

4 "PHONO" terminals

Connect a turntable only. Do not connect any other sound source to these terminals.

* Phono input capacitance is about 100pF.

5 "CD" terminals

Connect a compact disc player or other sound source.

6 "VCR 1" terminals

Connect a video cassette recorder.
(See the operating instructions of the VCR.)

7 "TAPE/VCR 2" terminals

Connect a tape deck or a second VCR.

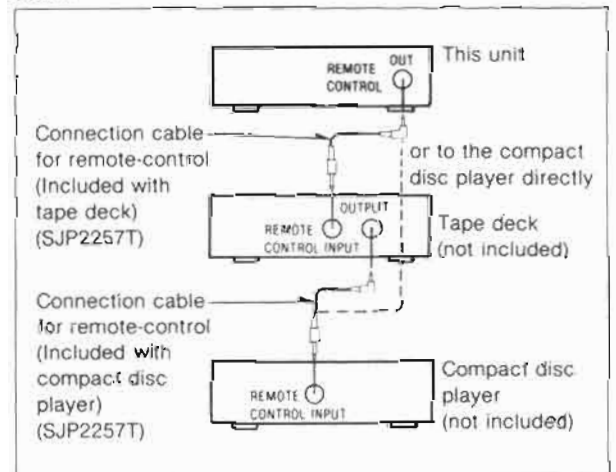
8 Remote-control terminal

This terminal can be used only with Technics components which have the appropriate remote-control terminal.
(Consult your dealer for details.)

Proper connection with remote-control connection cables SJP2257T will allow control of some functions from this unit's remote-control transmitter. (See page 6 for details.)

OUT:

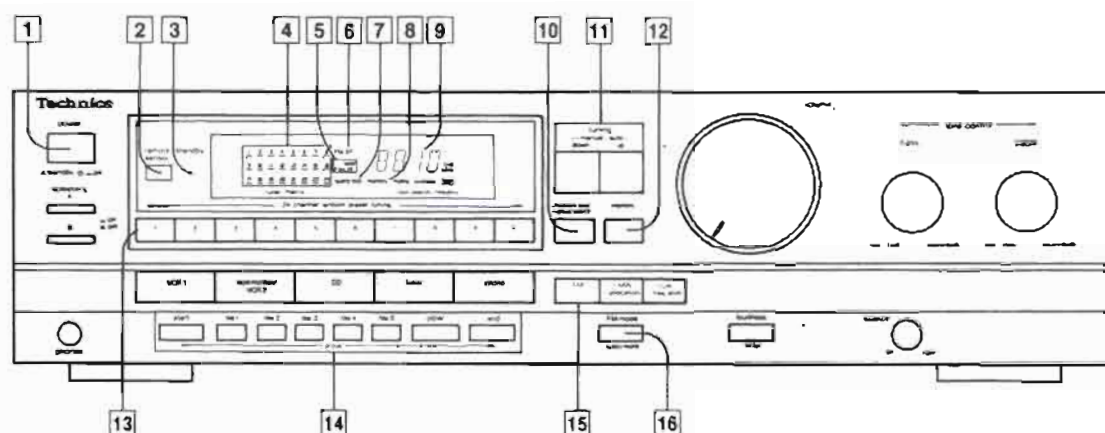
Connect a tape deck and/or compact disc player as shown below.



9 Speaker connection terminals

FRONT PANEL CONTROLS AND FUNCTIONS

Tuner section



1 Power "standby ϕ /on" switch (power/ \blacksquare standby ϕ \blacksquare on)

This switch switches ON and OFF the secondary circuit power only. The unit is in the "standby" condition when this switch is set to the standby ϕ position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

2 Remote-control signal receptor (remote sensor)

Receives the signals from the remote-control transmitter.

3 "standby" indicator (standby)

This indicator illuminates when the power switch of this unit or that of the remote control is switched "OFF". Its purpose is to alert the user of the constant supply voltage to the internal circuitry even with the power switch OFF.

4 Preset channel matrix display (tuner matrix)

When an entry is made to the memory, the bar under the figure illuminates. The bar of the "channel" now being received flashes continuously.

5 Band indicators (FM/MW/LW)

Indicates the selected band.

6 FM stereo indicator (FM ST)

This indicator automatically illuminates when an FM stereo broadcast is being received.

Note:

It will not illuminate if the FM mode selector is set to the monaural mode.

7 Quartz-lock indicator (quartz lock)

This indicator illuminates when the unit is tuned precisely to a broadcast station.

8 Memory indicator (memory)

This indicator illuminates when the memory button is pressed.

9 Audio input selector/frequency display (input selector/frequency)

Displays the selected source or broadcast frequency.

10 Memory-scan/group-search button (-memory scan/-group search)

This button is used to scan the memory presets within a group (for about three seconds each) or to search for the desired group.

11 Tuning buttons (tuning)

These buttons are used for tuning to the desired broadcast station.

12 Memory button (memory)

This button is used when presetting broadcast station frequencies into memory.

13 Preset-tuning buttons (1-0) (24 channel random preset tuning)

These buttons are used to preset broadcast frequencies into the memory of this unit, and to recall the desired preset stations.

14 Group registration buttons (group)

These buttons are used to assign memory presets to the desired group or to select the desired group.

15 Band selectors

FM: Press this button to listen to an FM broadcast.

MW: Press this button to listen to an MW broadcast.

allocation: When the MW button is pressed for about 4 seconds, the MW frequency step will change to 10 kHz per step. (This step is set to 9 kHz before shipment.) In order to return to the original frequency indication, press this button for about 4 seconds again.

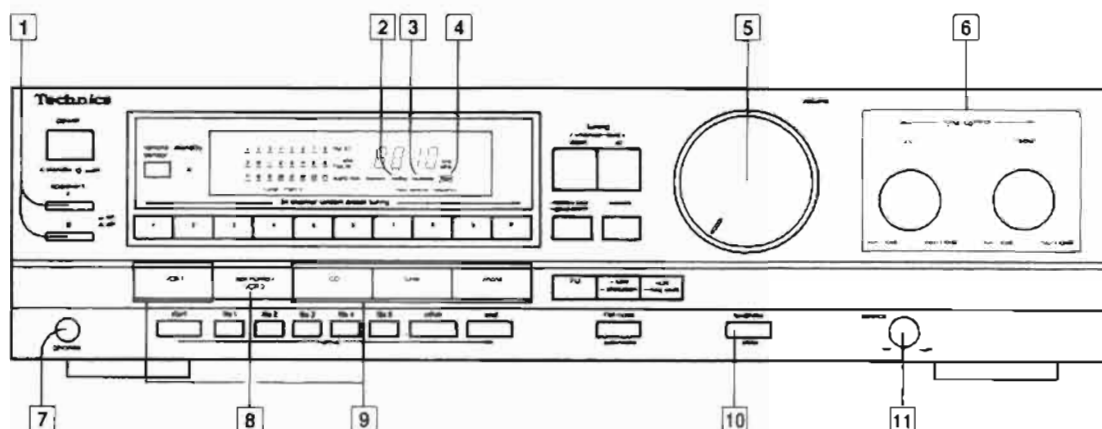
LW: Press this button to listen to an LW broadcast.

freq shift: When the LW button is pressed for about 4 seconds during reception of an LW broadcast, the LW frequency will decrease by 2 kHz. In order to return to the original frequency indication, press this button for about 4 seconds again.

16 FM mode selector (FM mode)

This unit automatically switches to the stereo mode when an FM stereo broadcast is received. This selector is used to select the mode (stereo or monaural) of FM broadcast signals.

Amplifier section



1 Speaker selectors (speakers)

These selectors are used to select the speaker systems (A and/or B).

2 Muting indicator (muting)

This indicator will illuminate when the muting button (on the remote-control transmitter) is pressed.

To cancel the muting function without using the remote-control transmitter, press and hold the "phono" input selector of this unit for about 5 seconds.

Note:

The unit will switch to the phono mode.

3 Loudness indicator (loudness)

This indicator will illuminate when the loudness switch is pressed.

4 Tape indicator (tape)

This indicator will illuminate when the tape-monitor switch is pressed.

5 Volume control (volume)

6 Tone controls (bass/treble)

The bass control is used to adjust the low-frequency sound range, and the treble control is used to adjust the high-frequency sound range.

7 Headphone jack (phones)

8 Tape-monitor/VCR 2 switch

Press this button to listen to a tape or a second VCR.

No other source selected by an input selector can be heard while the tape indicator is illuminated. To listen to some other source, press this switch once again.

9 Input selector buttons

These buttons are used to select the sound source to be heard, such as a disc, radio broadcasts, etc. The selected sound source is shown on the audio input selector/frequency display.

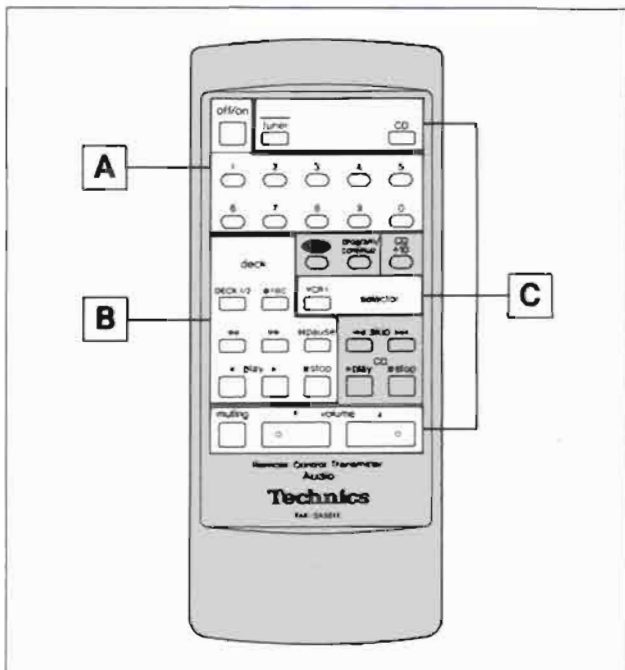
10 Loudness switch (loudness)

Set to the "on" position (the loudness indicator will illuminate); when listening to music at low volume, auditory perception of sound in the low frequency range falls off at low volume, but when the switch is in this position, this deficiency is compensated for, so that the full impact of the musical performance can be enjoyed.

11 Balance control (balance)

REMOTE-CONTROL OPERATION


- This remote-control transmitter can be used for control of a Technics cassette tape deck or a compact disc player with a remote-control terminal. Consult your dealer for details.
- For detailed information concerning operation steps, etc., please refer to the appropriate page for each unit and the respective operating instructions.



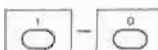
Before beginning

Make sure that the power switch of each unit is set to the "on" position.

A Tuner controls

 This key can be used for ON and OFF switching of this unit.

When switching the power ON and OFF, be sure to first press the "tuner" button on amplifier controls.

 Press this key to select the desired preset channel.

When these buttons are used, be sure to first press the "tuner" button on amplifier controls.

- To designate channels 1–9: Press the appropriate (1–9) preset-tuning button.


Note: When selecting channel 1 or channel 2, enter the selection "01" or "02". If only "1" or "2" is pressed, channel access will be delayed by two seconds.





- To designate channels 10–24:

- Press the button for the left digit (1 or 2).
- Press the button for the right digit (1–0) within 2 seconds after pressing the first button.

Example: To designate channel 12
Press the "1" button and then the "2" button.


B Tape deck controls

 Press this key to select the deck (tape deck 1 or tape deck 2) to be used.

 : For the "A"-side of the tape
 : For the "B"-side of the tape

Press one of these keys to begin the playback or recording, pressing the key corresponding to the side of the tape to be played (or recorded).

Note: Depending on which Technics tape deck is used in combination with this unit, tape deck 1 might be the "A"-side playback-only type.


 Press this key to stop tape movement.

Press this key to advance or rewind the tape while the unit is in the stop mode.

Press this key to select the desired tune while the unit is in the play mode.

(Only applicable to a Technics tape deck with the "music select" functions.)


 Press this key to temporarily stop playback or recording. Press the playback key to resume the play or recording.


 Press this key to change to the recording stand-by mode.


Note


Depending on which Technics tape deck is used in combination with this unit, it might be that pause of the playback (and the recording), and the recording functions of tape deck 1 not be possible by using the remote-control transmitter.

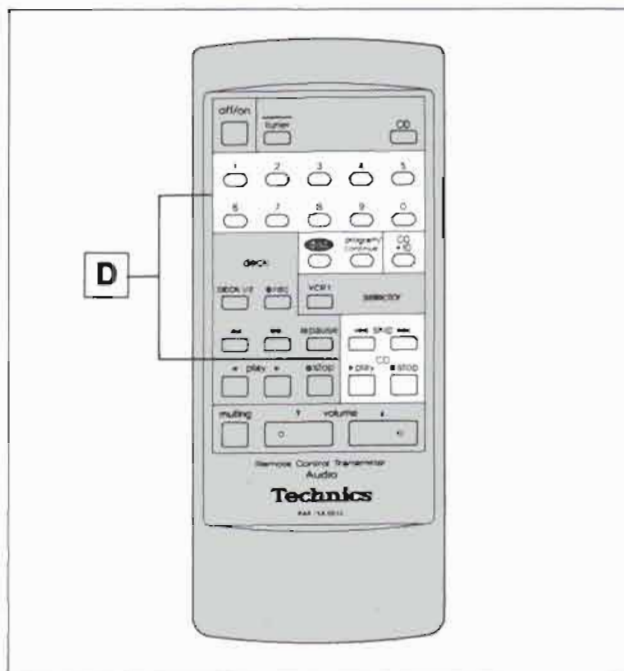
C Amplifier controls

 These sound keys are used to select the source (radio broadcasts or compact disc) to be heard.


 Press this key to temporarily reduce the volume level. The volume level is attenuated by 20 dB (approx. 1/10). Press once again to return to the previous volume level.

 Press this key to adjust the volume level.

 Press this key when a TV broadcast is to be received at the VCR.




D Compact disc player controls


 Press this key to start the play.

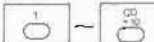
 Press this key to stop the play.



Press one of these buttons briefly to move the pick-up to the beginning of a specific track.

 If a Technics multi compact-disc player is used in combination with this unit, the disc to be played can be selected by first pressing this button and then pressing the appropriate "numeric button".

 Press to select the desired play mode. ("program" or "continue")

 These buttons can be used to select track number. When these buttons are used, be sure to first press the "CD" button on amplifier controls.

Note:

To select a track number 10 or higher in the direct access play or program play mode, first press the "+10" button the necessary number of times and then press the appropriate "numeric button".

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

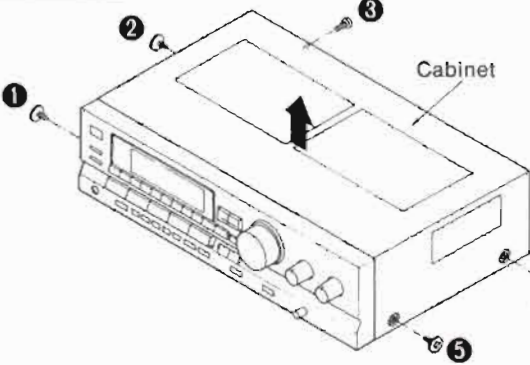
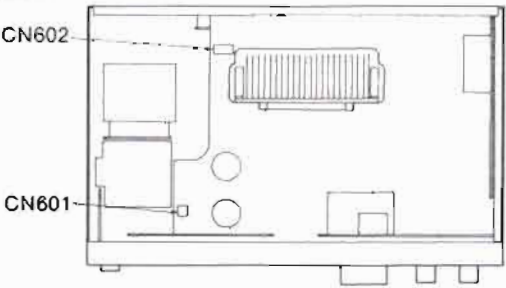
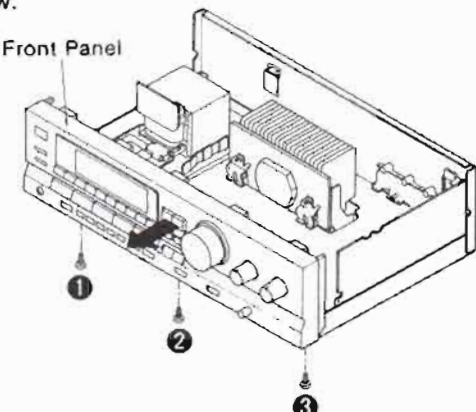
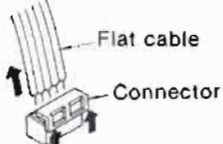
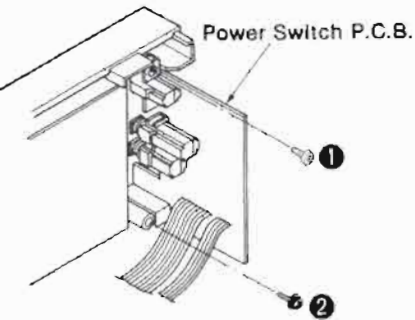
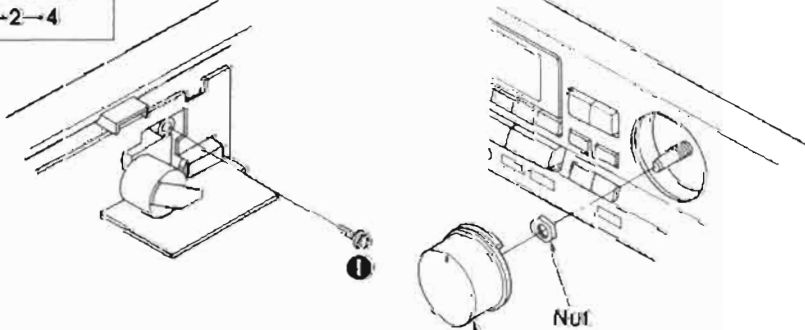
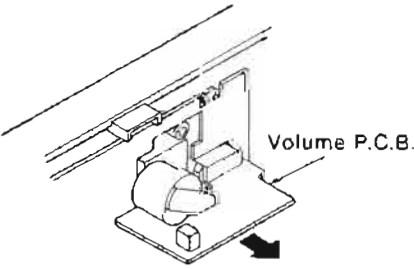
- (1) Turn off the power supply. Using a 10Ω, 5W resistor connect both ends of power supply capacitors (C701, C702, 6800μF) in order to discharge the voltage.
- (2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50Hz/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage 220V/240V.

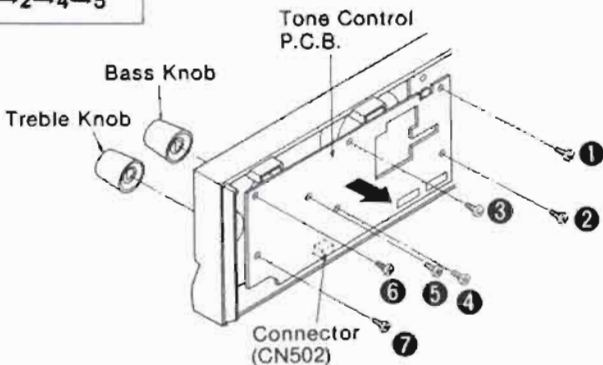
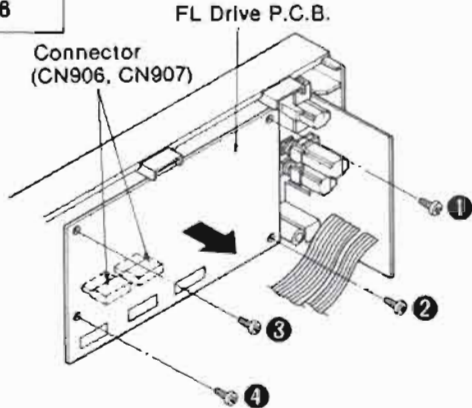
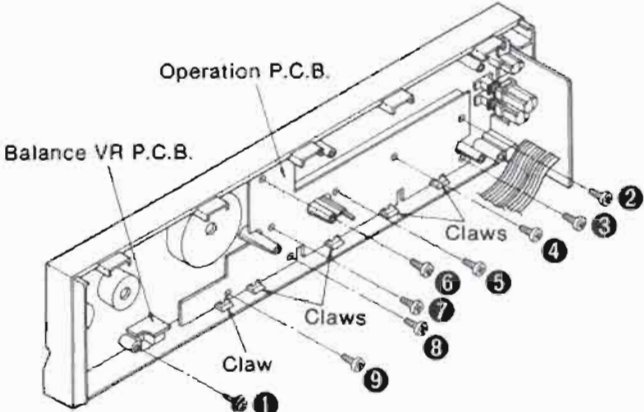
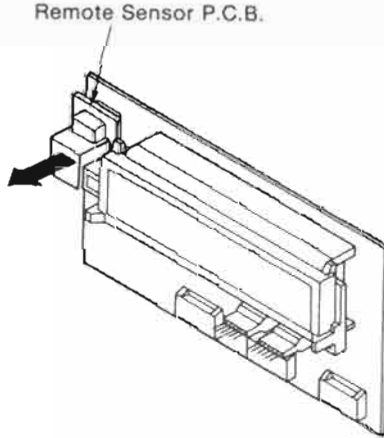
Power supply voltage	AC220V	AC240V
Consumed current 50/60Hz	85 ~ 170 mA	80 ~ 165 mA

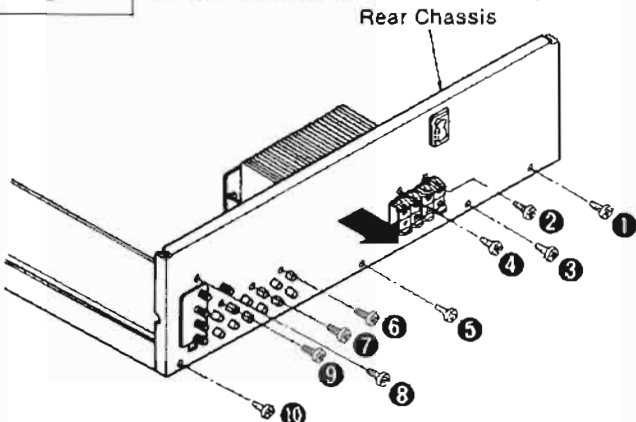
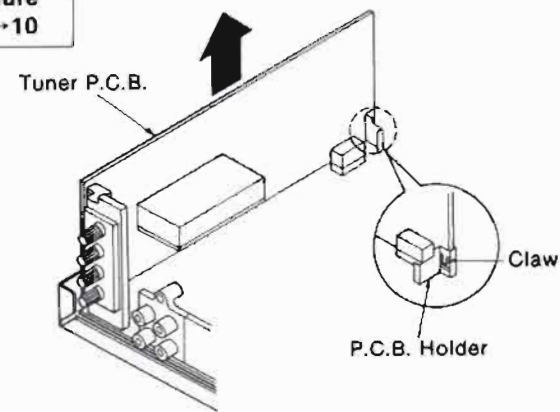
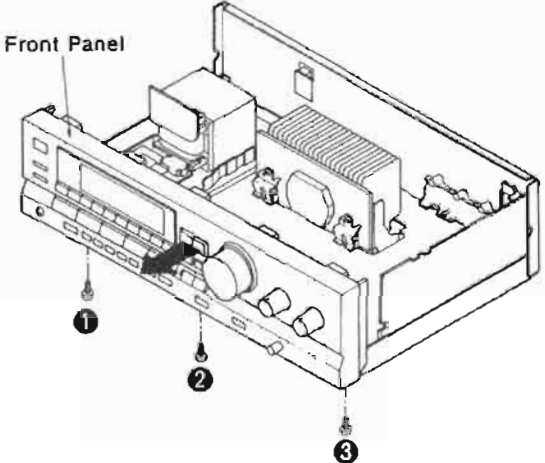
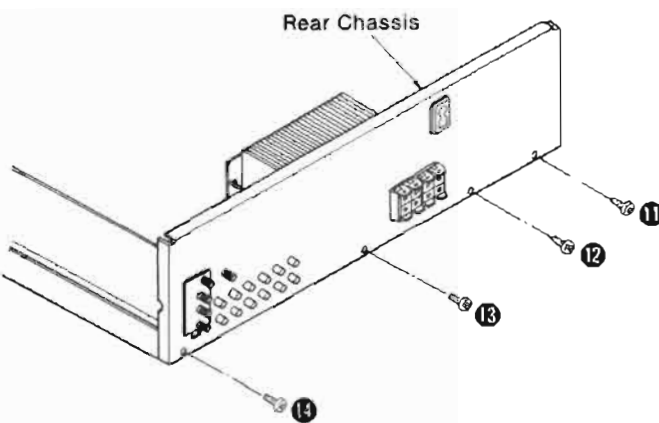
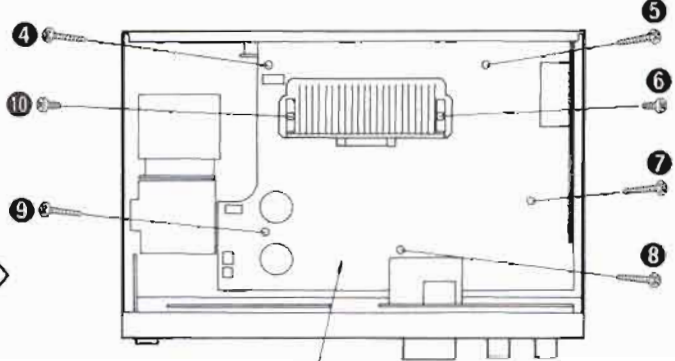
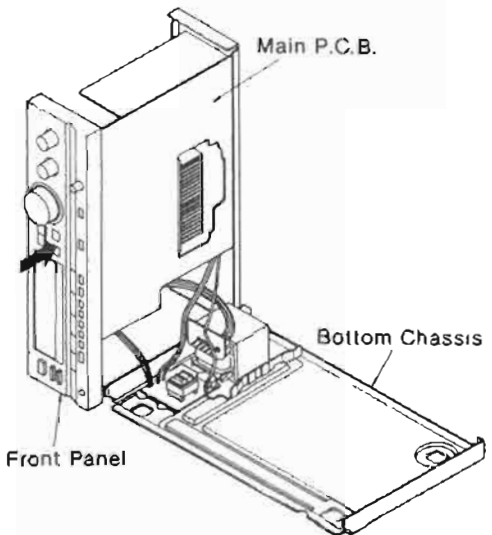
DISASSEMBLY INSTRUCTIONS

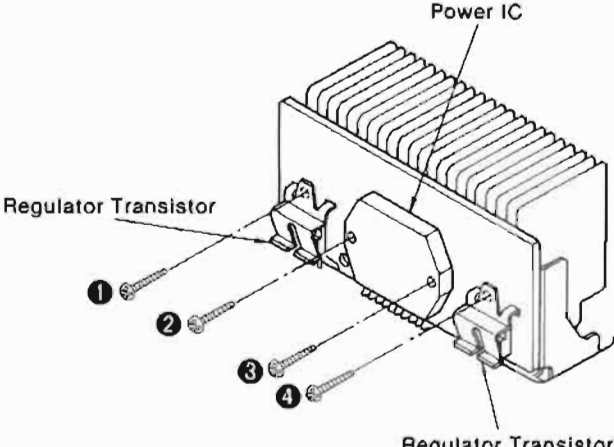
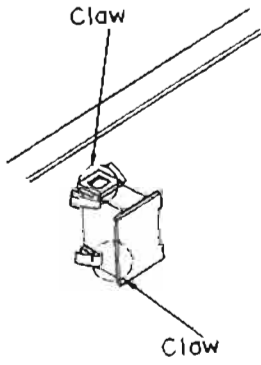
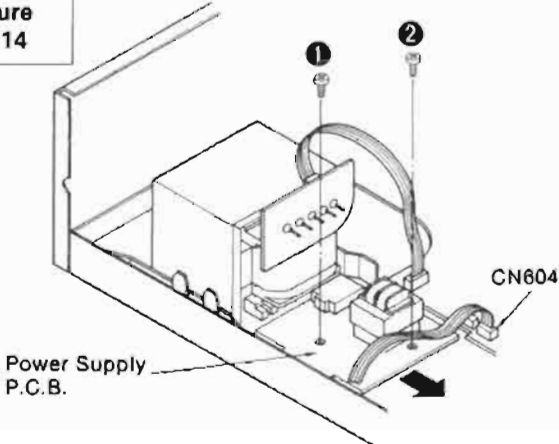
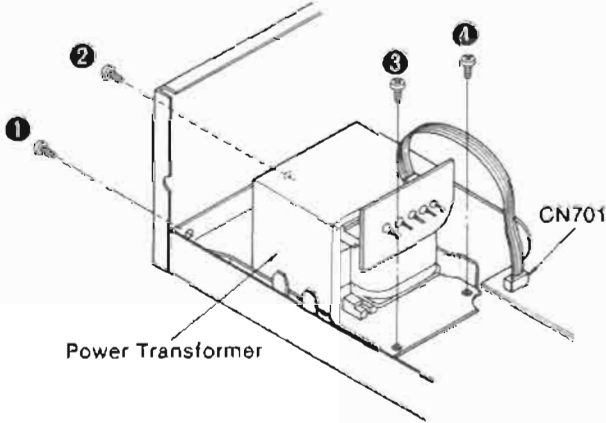
"ATTENTION SERVICER"

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
Procedure 1		Procedure 1→2	1. Remove the 2 flat cables (CN601, CN602)
 <p>• Remove the 5 screws (①~⑤).</p>		 <p>2. Remove the 3 screws (①~③). 3. Remove the front panel in the direction of the arrow.</p>  <p>How to remove the flat cable</p> <ol style="list-style-type: none"> 1. Lift the connector. 2. Pull out the flat cable. 	
Ref. No. 3	Removal of the power switch P.C.B.		
Procedure 1→2→3			
 <p>• Remove the 2 screws (①, ②).</p>			
Ref. No. 4	Removal of the volume P.C.B.		
Procedure 1→2→4			
 <p>1. Remove the 1 screw (①).</p> <p>2. Pull out the volume knob. 3. Remove the nut.</p>		 <p>4. Remove the volume P.C.B. in the direction of the arrow.</p>	

Ref. No. 5	Removal of the tone control P.C.B.	Ref. No. 6	Removal of the FL drive P.C.B.
Procedure 1→2→4→5	 <p>1. Pull out the bass knob and treble knob.</p> <p>2. Remove the 7 screws (①~⑦).</p> <p>3. Remove the tone control P.C.B. in the direction of the arrow. (Take care of CN502.)</p>	Procedure 1→2→6	 <p>1. Remove the 4 screws (①~④).</p> <p>2. Remove the FL drive P.C.B. in the direction of the arrow. (Take care of CN906, CN907.)</p>
Ref. No. 7	Removal of the operation P.C.B. and balance VR P.C.B.	<p>■ Operation P.C.B.</p> <p>1. Remove the 8 screws (②~⑨).</p> <p>2. Release the 5 claws.</p>	
Procedure 1→2→4→5 →6→7	<p>■ Balance VR P.C.B.</p> <p>1. Pull out the balance knob.</p> <p>2. Remove the 1 screw (①).</p>		
Ref. No. 8	Removal of the remote sensor P.C.B.		
Procedure 1→2→6→8			
<p>• Remove the remote sensor P.C.B. in the direction of the arrow.</p>			

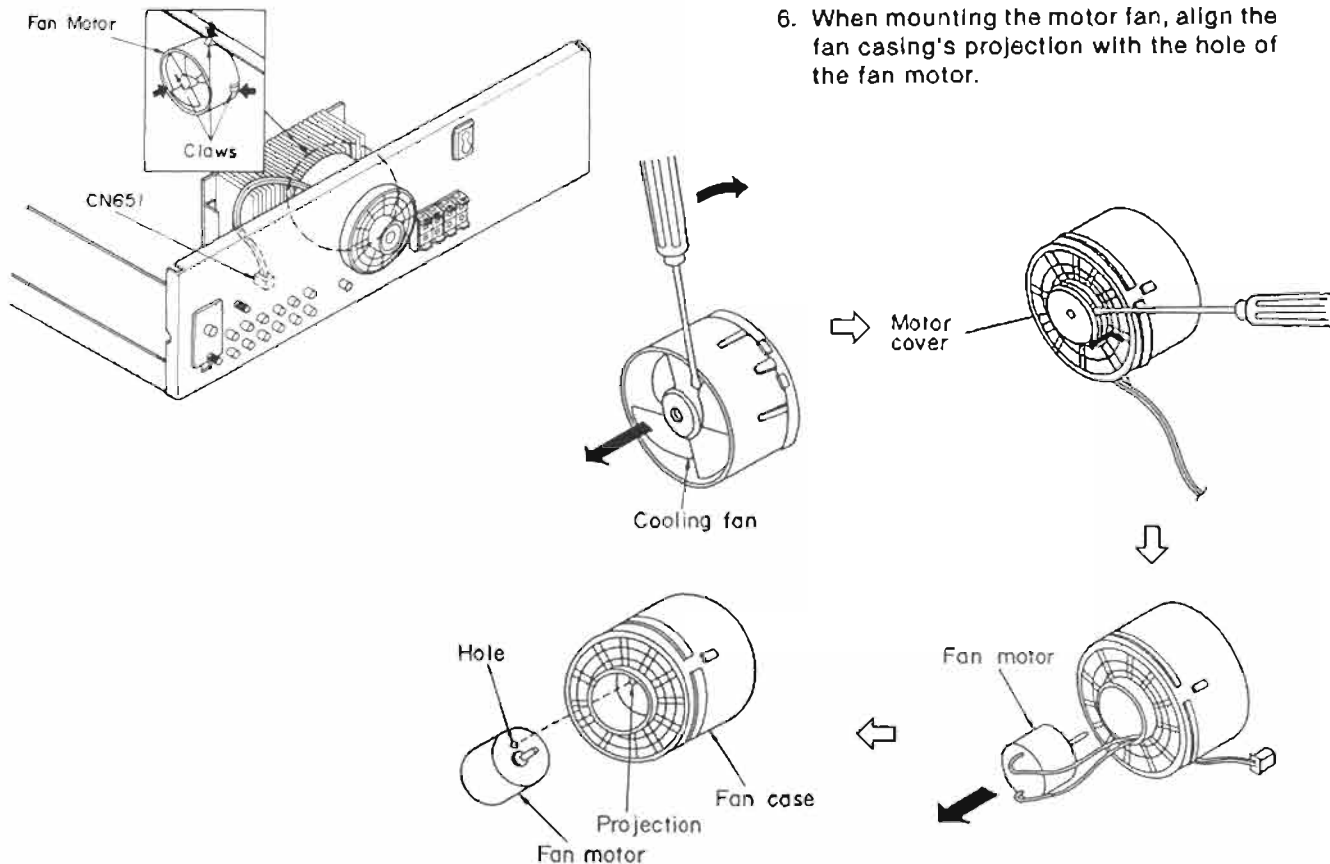
<p>Ref. No. 9</p>	<p>Removal of the rear chassis</p>	<p>Ref. No. 10</p>	<p>Removal of the tuner P.C.B.</p>
<p>Procedure 1→9</p>	<p>1. Remove the 1 connector (CN651). 2. Remove the 10 screws (①~⑩).</p>  <p>3. Remove the rear chassis in the direction of the arrow.</p>	<p>Procedure 1→9→10</p>  <p>1. Release the 1 claw. 2. Remove the tuner P.C.B. in the direction of the arrow.</p>	
<p>Ref. No. 11</p>	<p>How to check the main P.C.B.</p>		
<p>Procedure 1→11</p>			
 <p>1. Remove the 3 screws (①~③). 2. Remove the front panel in the direction of the arrow.</p>  <p>4. Remove the 4 screws (⑪~⑭).</p>	 <p>3. Remove the 7 screws (④~⑩).</p>  <p>5. Remove the bottom chassis. 6. Reinstall the front panel to the main P.C.B.</p>		

Ref. No. 12	Removal of the power IC and regulator transistor	Ref. No. 13	Removal of the AC IN TERMINAL P.C.B.
Procedure 1→11→12	<ol style="list-style-type: none"> 1. Unsolder the power IC or regulator transistor. 2. Remove the 4 screws (①~④). 	Procedure 1→9→13	
 <p>Power IC</p> <p>Regulator Transistor</p> <p>① ② ③ ④</p> <p>Regulator Transistor</p> <p>• When mounting the power IC or regulator transistor, apply silicon thermal compound (SZZ0L15 or equivalent) to the rear of the power IC or regulator transistor.</p>		 <p>Claw</p> <p>Claw</p> <p>• Release the 2 claws.</p>	
Ref. No. 14	Removal of the power supply P.C.B.	Ref. No. 15	Removal of the power transformer
Procedure 1→2→14		Procedure 1→2→14→15	
 <p>Power Supply P.C.B.</p> <p>① ②</p> <p>CN604</p> <p>1. Remove the 1 flat cable (CN604).</p> <p>2. Remove the 2 screws (①, ②).</p> <p>3. Remove the power supply P.C.B. in the direction of the arrow.</p>		 <p>Power Transformer</p> <p>① ② ③ ④</p> <p>CN701</p> <p>1. Remove the 1 flat cable (CN701).</p> <p>2. Remove the 4 screws (①~④).</p>	

Ref. No. 16	Removal of the fan motor (For (EB) area.)
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Procedure 1→16	1. Pull out the 1 connector (CN651). 2. Release the 3 claws.
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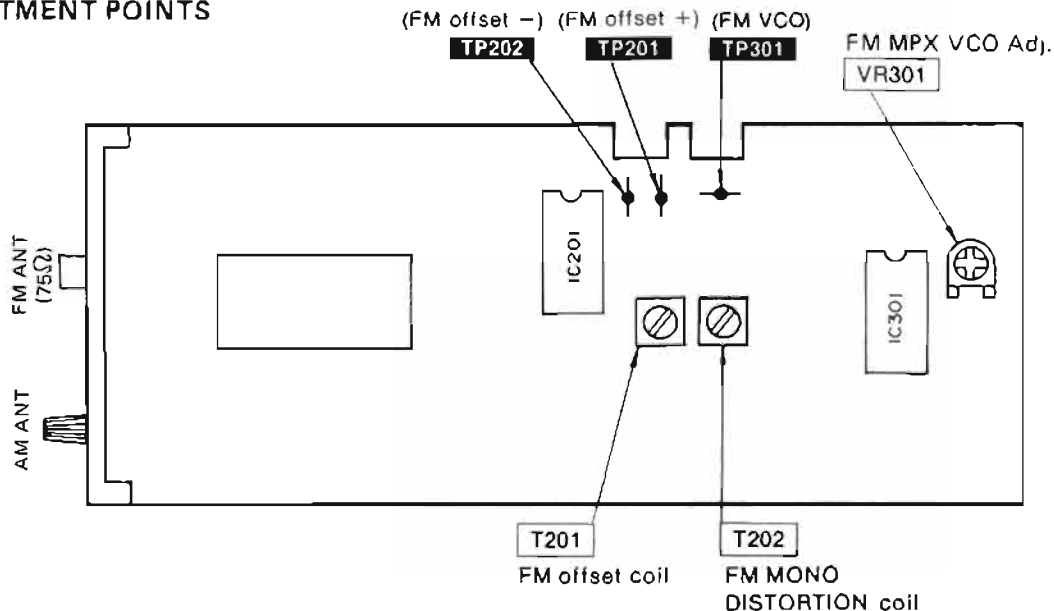
3. Insert a screwdriver at the root of the cooling fan. Force it out of the motor shaft.
4. Remove the motor cover by used ⊖ screwdriver.
5. Remove the motor from the fan casing.
6. When mounting the motor fan, align the fan casing's projection with the hole of the fan motor.



MEASUREMENTS AND ADJUSTMENTS

Note: For Z251 (AM(MW/LW)-IFT), Z201 (AM(MW/LW) ANT and OSC coil) and L321/L322 (MPX coil), they are supplied as adjusted parts. So, do not turn the cores of the parts.
It is not necessary to adjust the AM circuit.

ADJUSTMENT POINTS



• FM ADJUSTMENT

Control positions and equipment used

- FM signal generator (FM-SG).
- Distortion analyser
- Oscilloscope
- DC electronic voltmeter (DC EVM)
- Frequency counter
- Choke coil (100 μ H)
- Resistor (100 k Ω)

FM MONO DISTORTION ADJUSTMENT

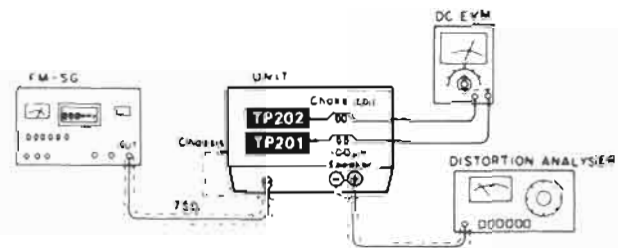
1. Test equipment connection is shown in figure.
2. Set the unit to "FM" position.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Adjust T201 core so that voltage measured in signal mode is 0 mV (0 ± 30 mV) in 300 mV range.
5. Adjust T202 so that the distortion factor of Lch is minimized.
6. Repeat steps 4 and 5 a few times.
7. Make sure that the distortion factors of Lch and Rch are nearly the same with each other to minimum.

Note:

The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION

Modulation.....100%
 Modulation frequency.....1 kHz
 (MONO)
 Output level.....66 dB

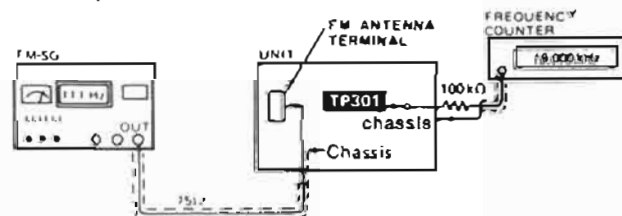


FM MPX VCO ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM auto" position.
3. Set the radio frequency display and signal generator to 100.10 MHz.
4. Adjust VR301 for 19.00 ± 0.03 kHz on frequency counter reading.

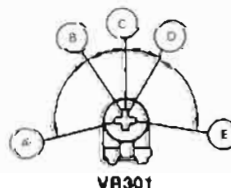
FM SIGNAL GENERATOR CONDITION

Modulation.....0%
 (non-modulation)
 Output level.....66 dB



★ USING ALTERNATE SYSTEM

1. Apply stereo signal from generator or receive the stereo broadcast.
2. Adjust VR301 until stereo indicator lights up. Cement arm of VR301 as shown in figure.



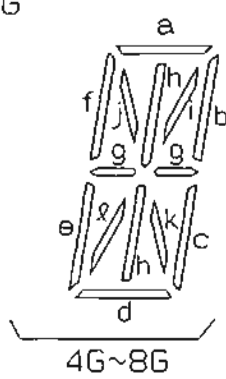
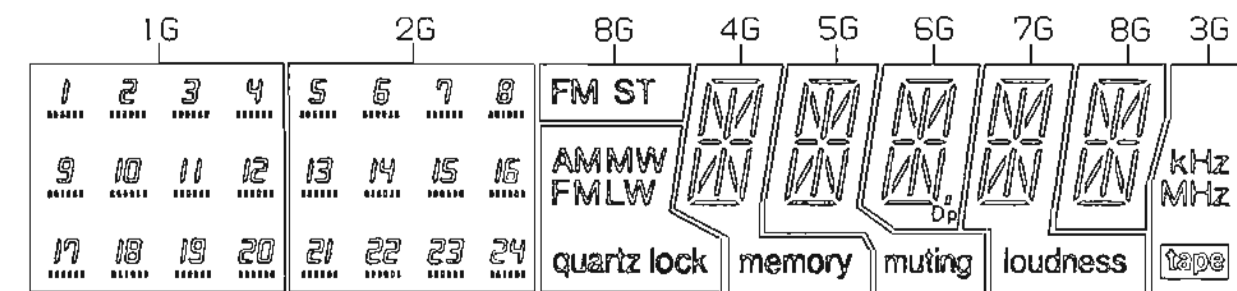
- (A) - (B) (D) - (E) Stereo OFF position
- (B) - (D) Stereo ON position (indicator lighting)
- (C) Adjust point of Pilot circuit

■ TERMINAL FUNCTION OF IC'S

• IC901 (LC6554H4097): Microcomputer

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	S13	O	Segment signal output	33	ST	O	Level shift control output
2 3 5	PA0 PA3	I	Key return signal input	34	L	—	Not used, connected to GND
6 7 8	PB0 PB2	I	Key return signal input	35	V		
9	STAND BY	I	Power supply terminal	36	TUNING 0	O	LED drive control signal for rotary tuning (Not used, connected to GND)
10	OFF	I	Power ON/OFF det. terminal (Not used, open)	37	TUNING 1		
11	STEREO	I	Stereo signal det. terminal	38	LOUDNESS	O	Loudness ON/OFF signal output
12	SD	I	Received signal det. terminal	39	R	O	Volume motor drive output
13	DP	I/O	Cassette deck control terminal	40	F		
14	RELAY	O	Relay control output	41	A	O	Rotary tuning control signal output (Not used, connected to GND)
15	DECK	I	Cassette deck control terminal (Not used, connected to GND)	42	B		
16	OPT1 (IN)	—	Not used, connected to GND	43	Vp	I	Power supply terminal (negative voltage)
17	OPT1 (OUT)						
18	MONO	O	FM AUTO/MONO select signal output	44	S1 S12	O	Segment signal output
19	RFM	O	Muting control output for tuner circuit				
20	AT	O	Muting control output for amplifier circuit	55			
21	AFM	O	Muting control output for amplifier circuit	56	VDD	I	Power supply terminal (positive voltage)
22	TEST	—	Not used, connected to GND	57	D1 D8	O	Digit signal and key scan signal output
23	Vss	—	Ground terminal				
24	OSC1	I	Oscillator terminal	64			
25	OSC2	O					
26	RES	I	Reset signal input				
27	DATA (PF0)	O	Serial data output				
28	CL (PF1)	O	Clock signal terminal for serial data				
29	CE (PF2)	I/O	Chip enable terminal				
30	INT	I	Remote control input				
31	L	—	Not used, connected to GND				
32	L	—	Not used, connected to GND				

• Grid assignment diagram



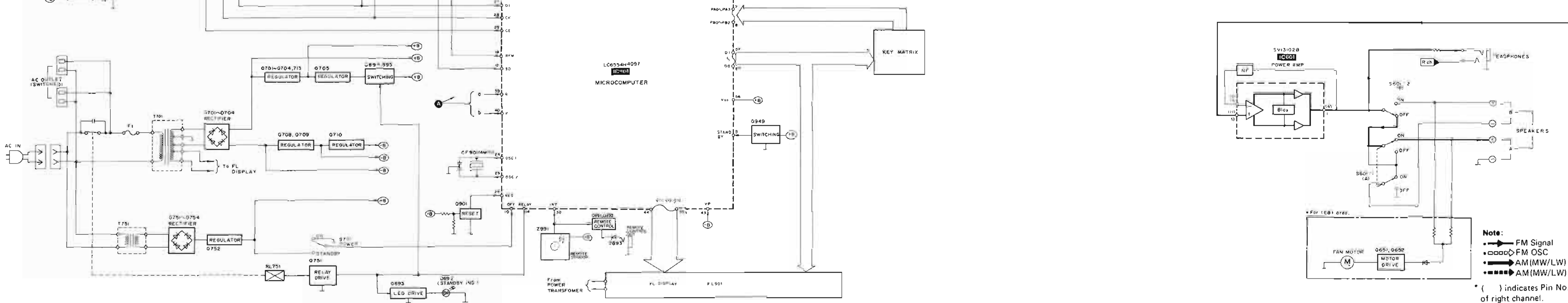
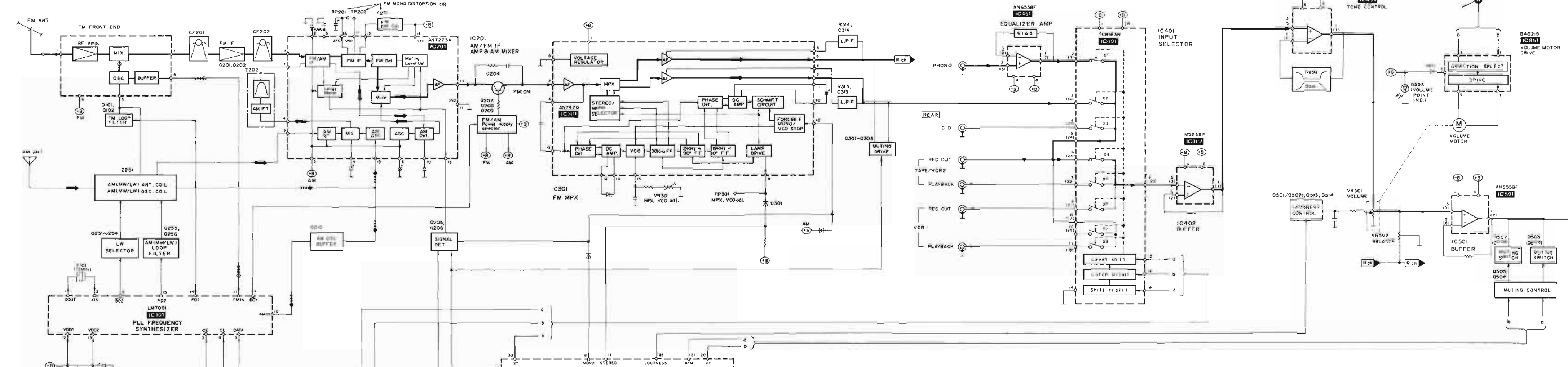
• Pin connection

39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1				
N	F	N	N	N	N	P	k	d	e	c	e	g	b	f	i	h	j	a	N	N	N	N	N	N	N	N	N	1	2	3	4	5	6	7	8	m	N	N	N	F	N	P

Note 1.) NP : No pin.
 2.) 1G~8G : Grid
 3.) F1,F2 : Filament

• Anode connection table

	1G	2G	3G	4G	5G	6G	7G	8G
a	..... (1)	..... (5)	KHz	a	a	a	a	a
b	..... (10)	..... (14)	LW	b	b	b	b	b
c	..... (17)	..... (21)	quartz lock	c	c	c	c	c
d	..... (19)	..... (23)	-	d	d	d	d	d
e	..... (12)	..... (16)	tape	e	e	e	e	e
f	..... (9)	..... (13)	FM	f	f	f	f	f
g	..... (11)	..... (15)	-	g	g	g	g	g
h	..... (3)	..... (7)	AM	h	h	h	h	h
i	..... (4)	..... (8)	MW	i	i	i	i	i
j	..... (2)	..... (6)	MHz	j	j	j	j	j
k	..... (20)	..... (24)	-	k	k	k	k	k
l	..... (18)	..... (22)	-	l	l	l	l	l
m	1-4 9-12 17-20	5-8 13-16 21-24	-	memory	muting	D.P	loudness	FM ST



TRANSISTORS AND DIODES

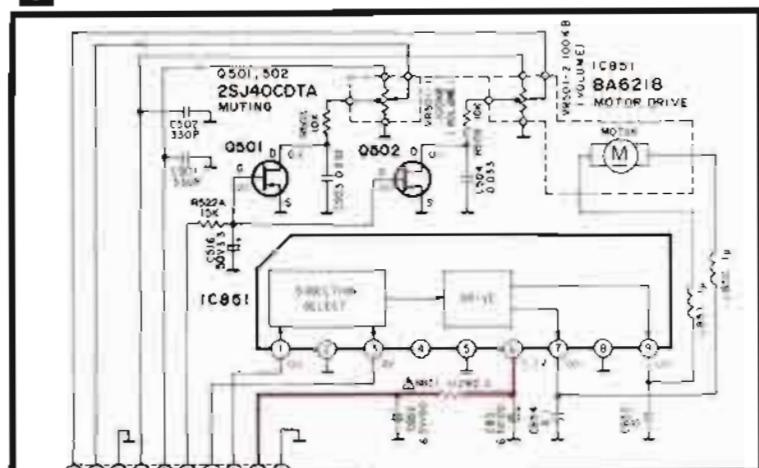
 M5238P 8 PIN	 AN7470 16 PIN	 IC654H4097 64 PIN
 AN858F 8 PIN	 AN7273A 18 PIN	 SV13102B 14 PIN
 LM7001 8 PIN	 TC9163N 28 PIN	
 BA6215 9 PIN	 M5238L 8 PIN	 2SA933SORSTA 2SC2785FETA 2SD1450ORSTA 2SC3327ABTP 2SC3311AQSTA 2SA1309AQSTA
 2SC1740SOSTA 2SC3940AOSTA	 2SJ40CDTA	 UN4113TA
 UN4211TA UN4214TA	 2SB1185DEF 2SD1761DEF	 UN4215TA
 2SB1240PRTV6	 MA185TA MA29WATA SVD5888GT3 1S5291TA P300DLF	 LN848RPLS
	 MA4051MTA MA4062MTA MA4150MTA MA4068MTA MA4110MTA MA4270MTA	

Note:
 ● FM Signal
 ○ FM OSC
 ● AM(MW/LW) Signal
 ● AM(MW/LW) OSC

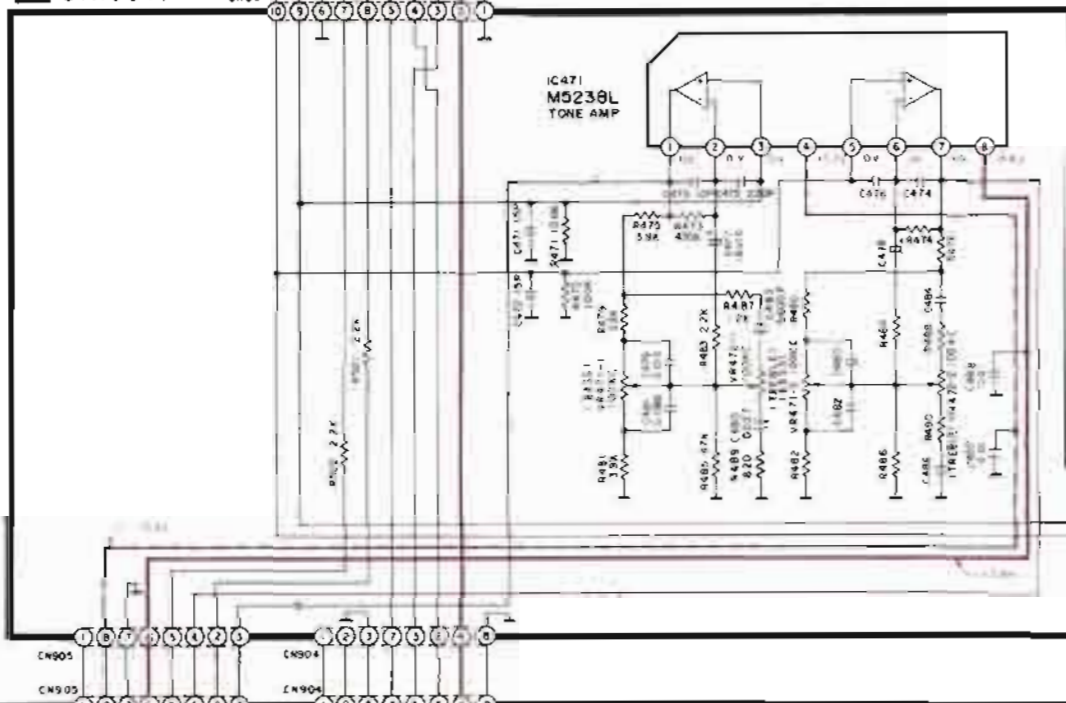
* () indicates Pin No. of right channel.

* () indicates Pin No. of right channel.

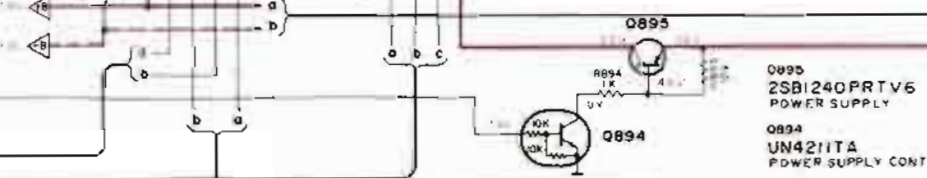
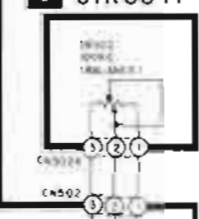
G VOLUME CIRCUIT



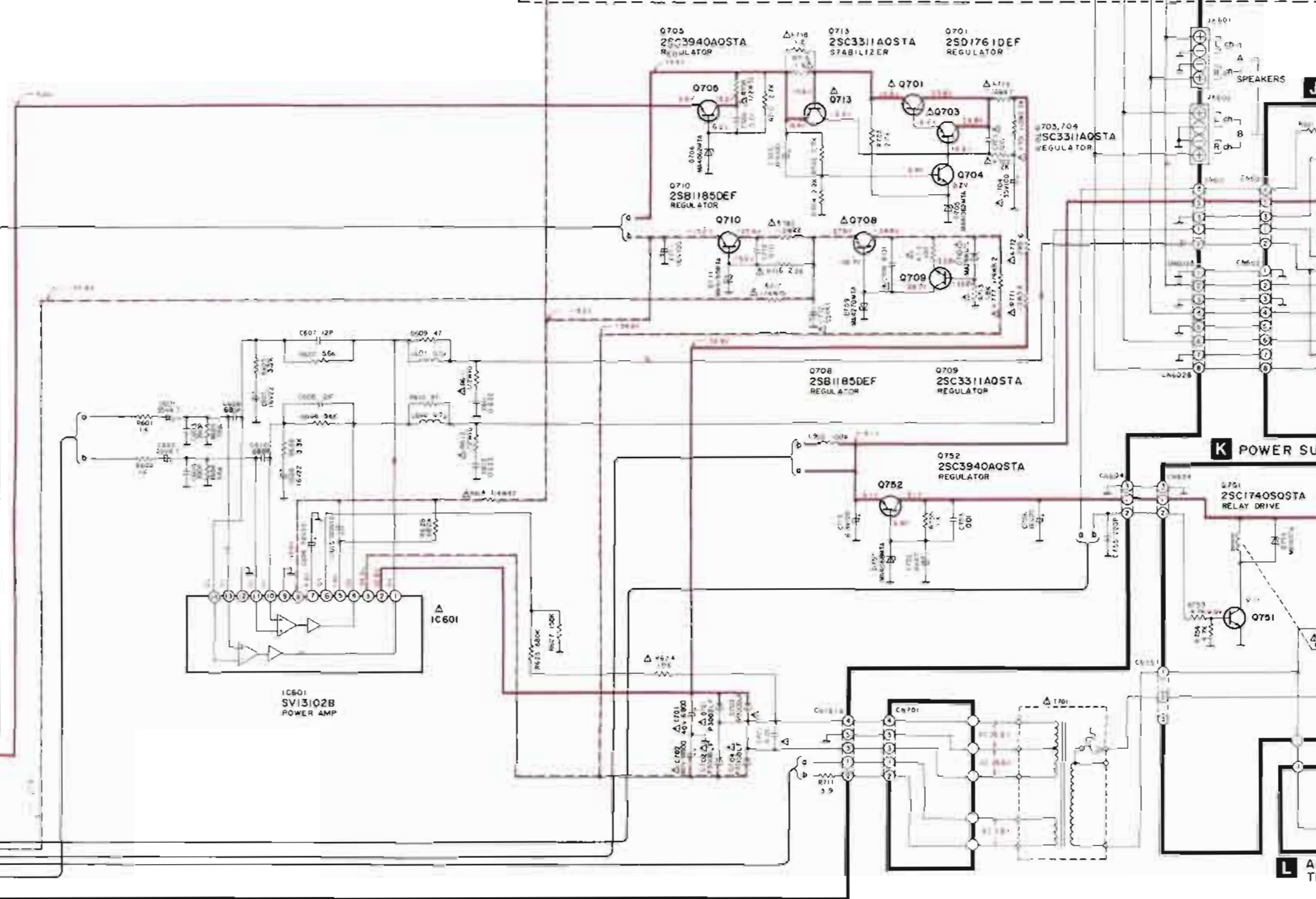
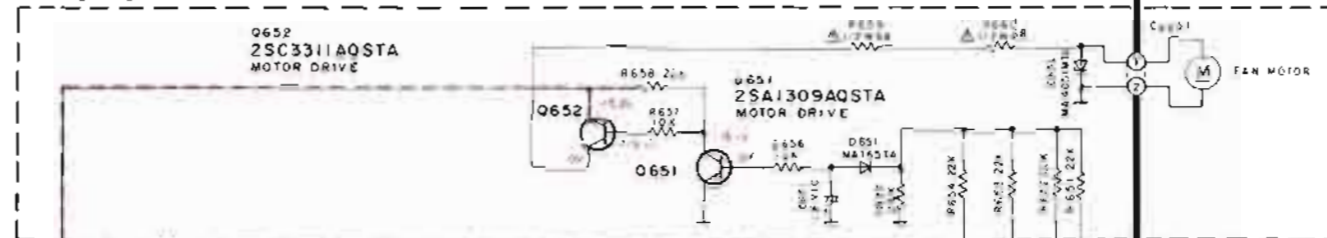
F TONE AMP CIRCUIT



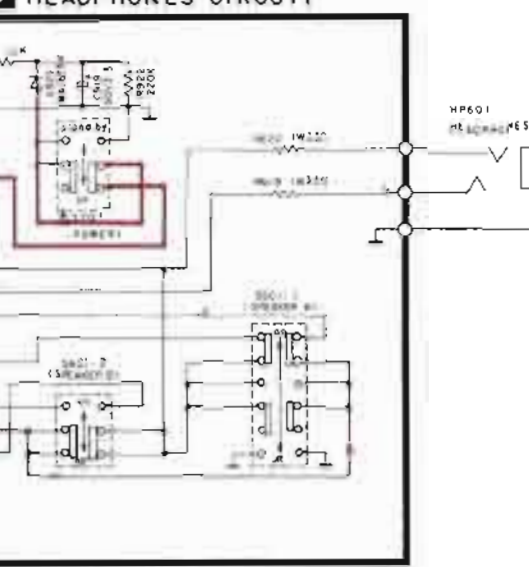
I BALANCE VR CIRCUIT



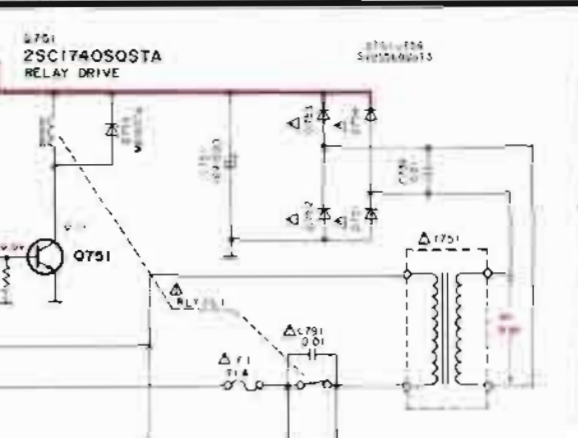
For [EB] area



J POWER/SPEAKER SWITCH, HEADPHONES CIRCUIT



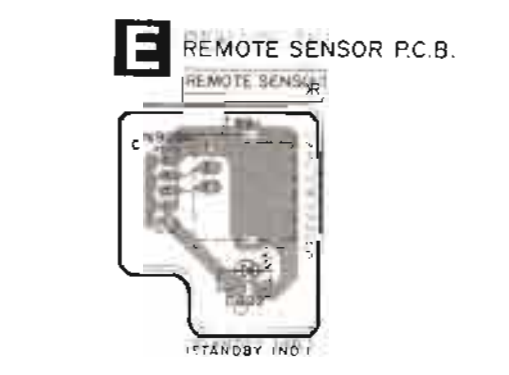
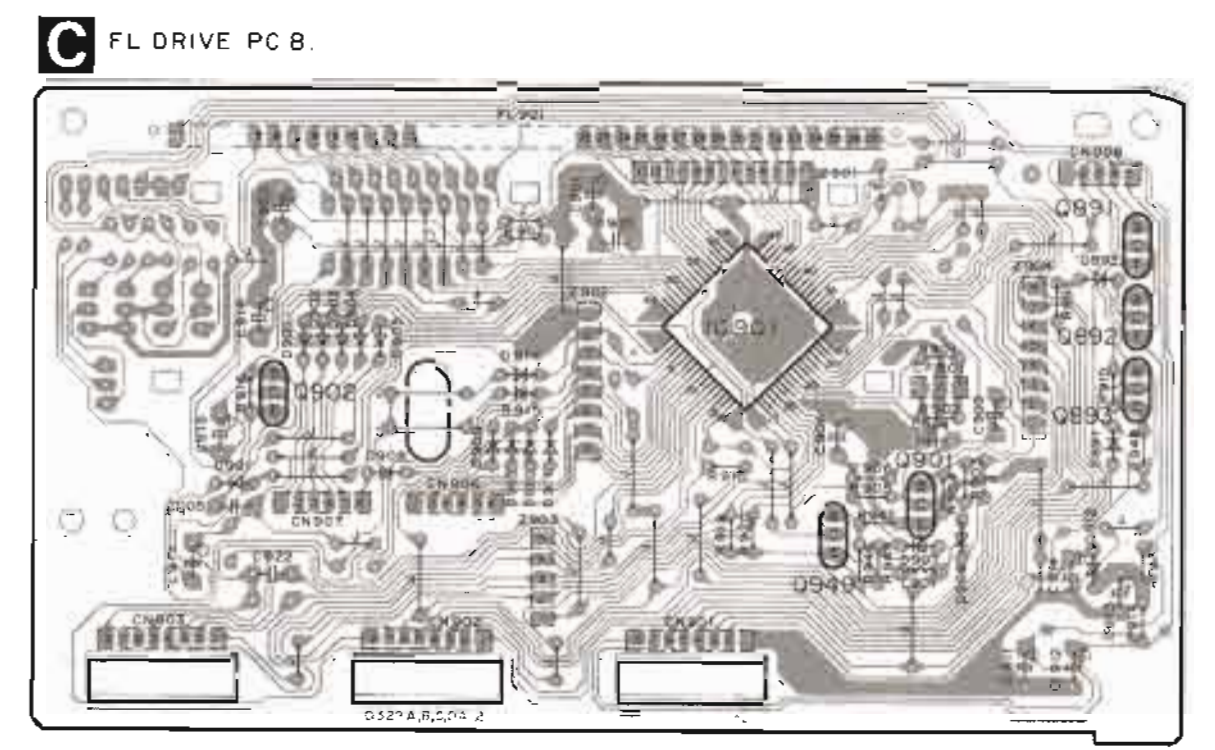
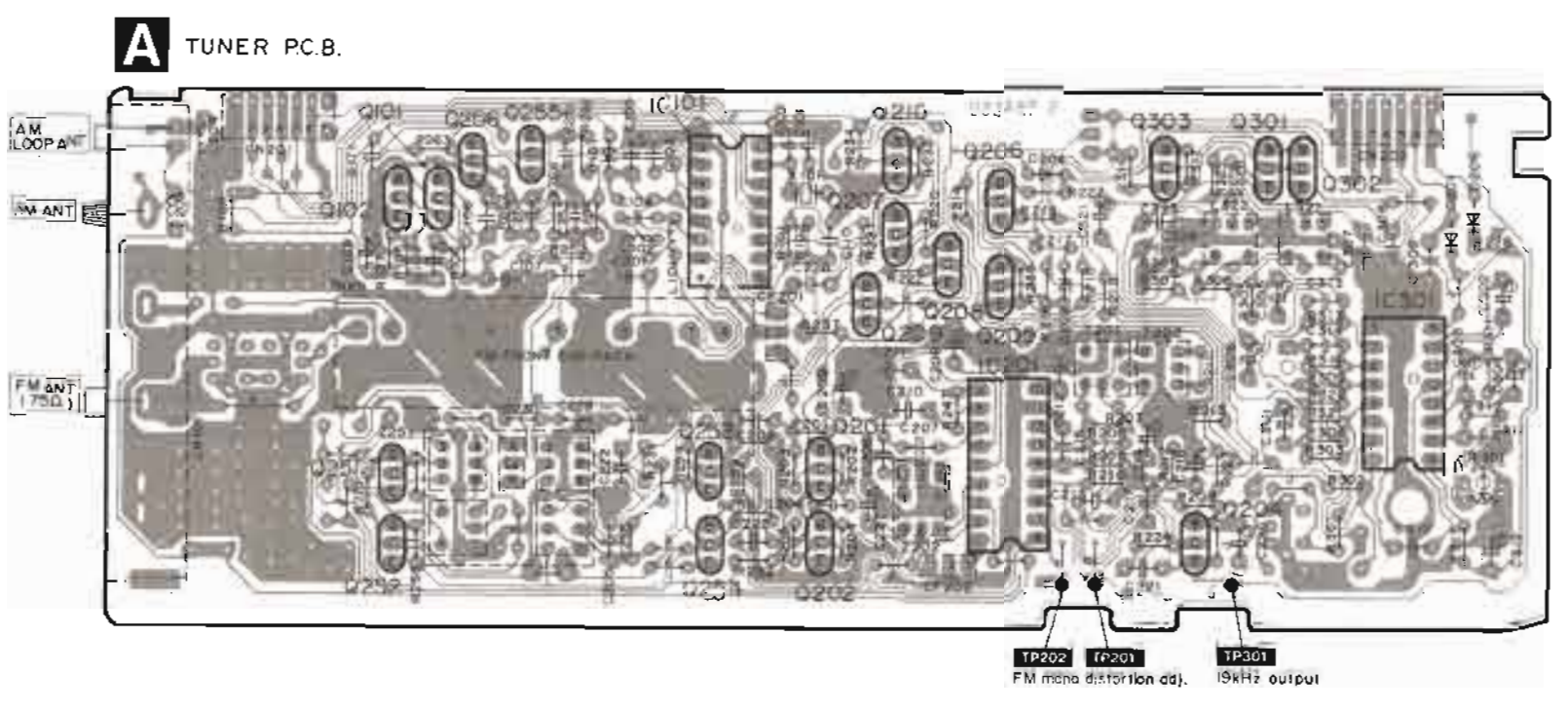
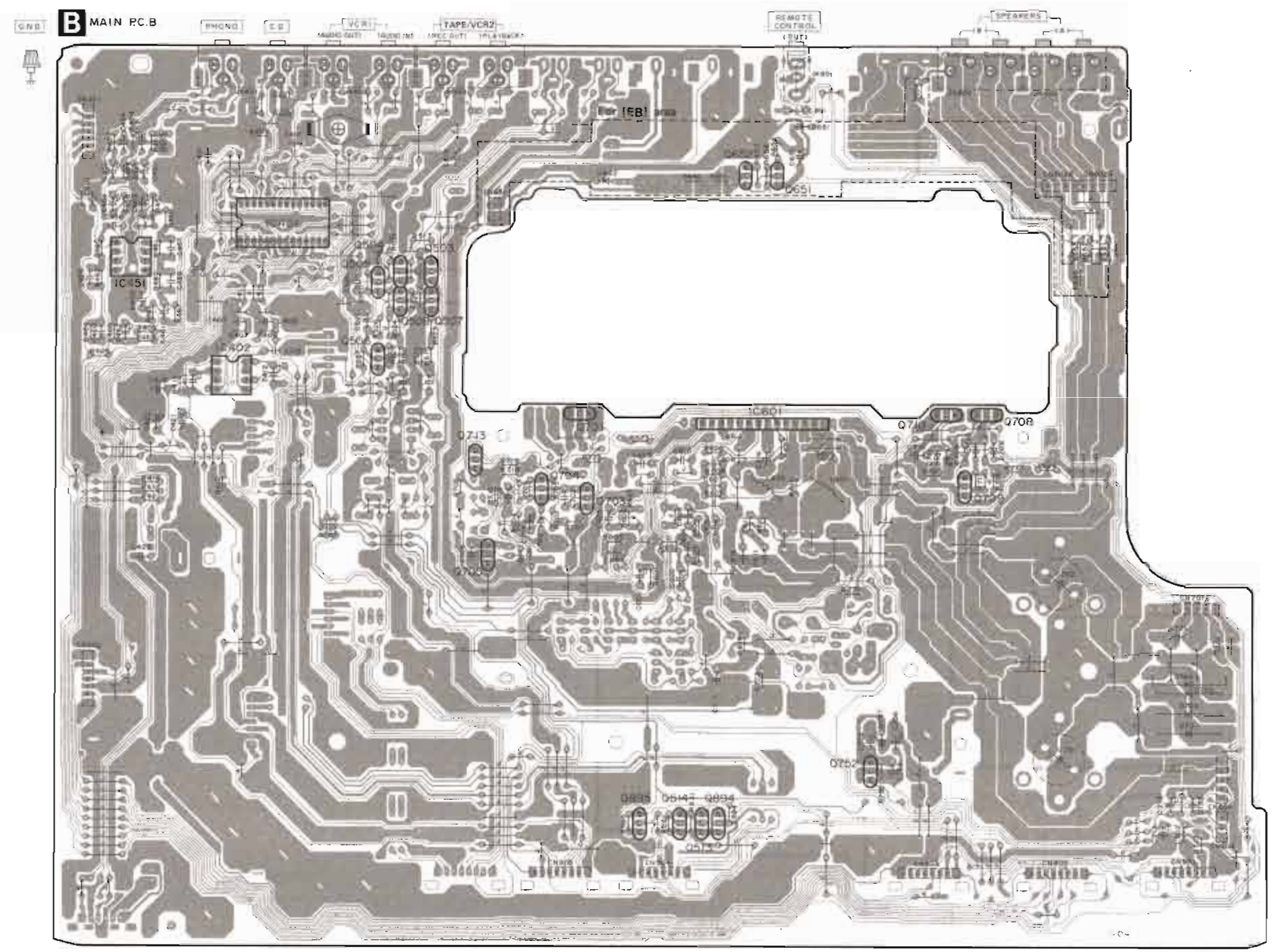
K POWER SUPPLY CIRCUIT



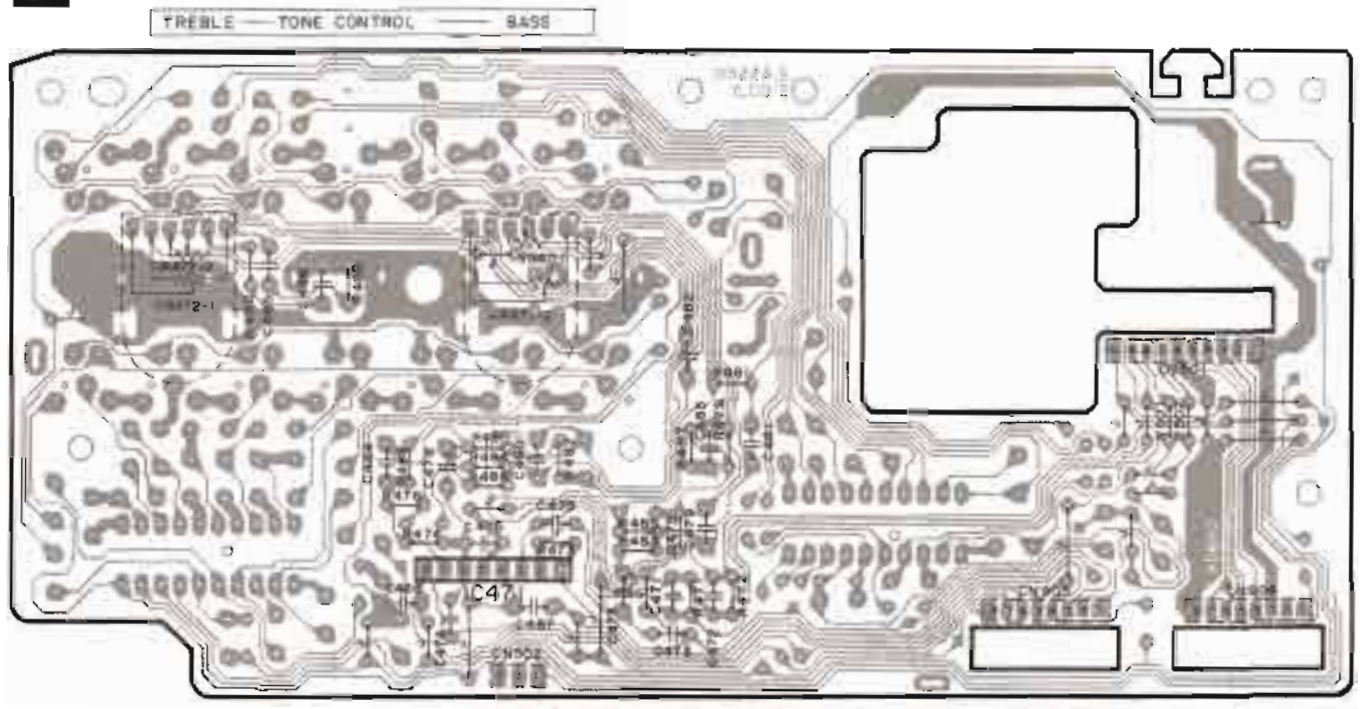
L AC IN TERMINAL CIRCUIT



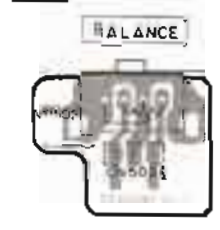
PRINTED CIRCUIT BOARDS



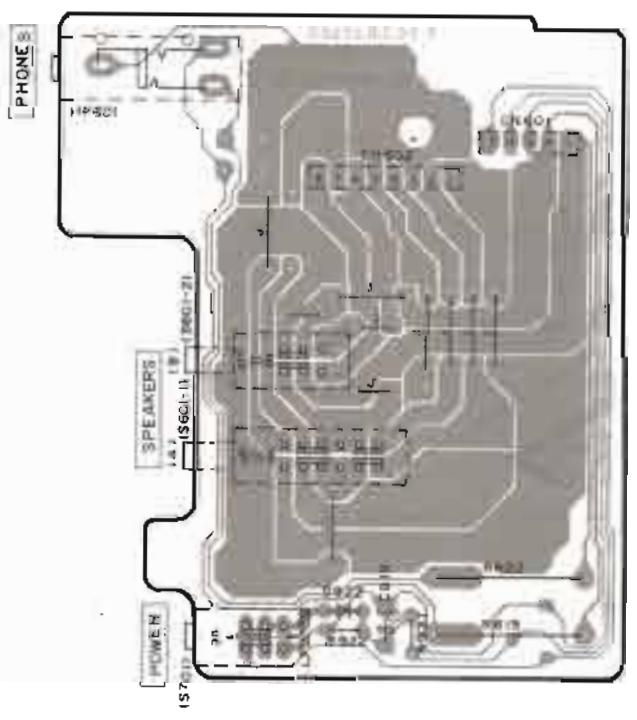
F TONE AMP P.C.B.



I BALANCE VR P.C.B.



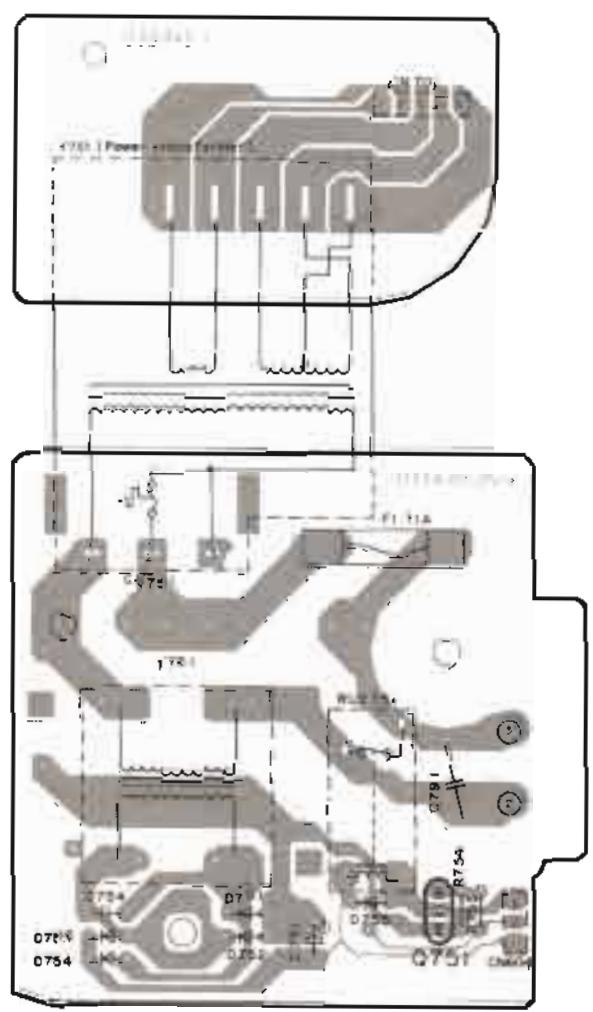
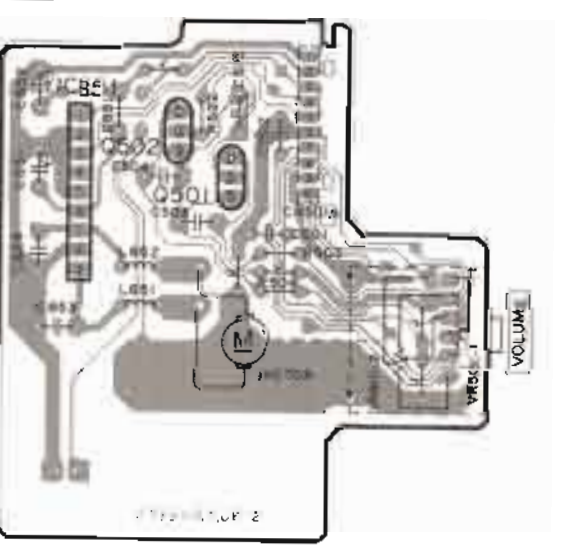
J POWER/SPEAKER SWITCH, HEADPHONES P.C.B.



L AC IN TERMINAL P.C.B.

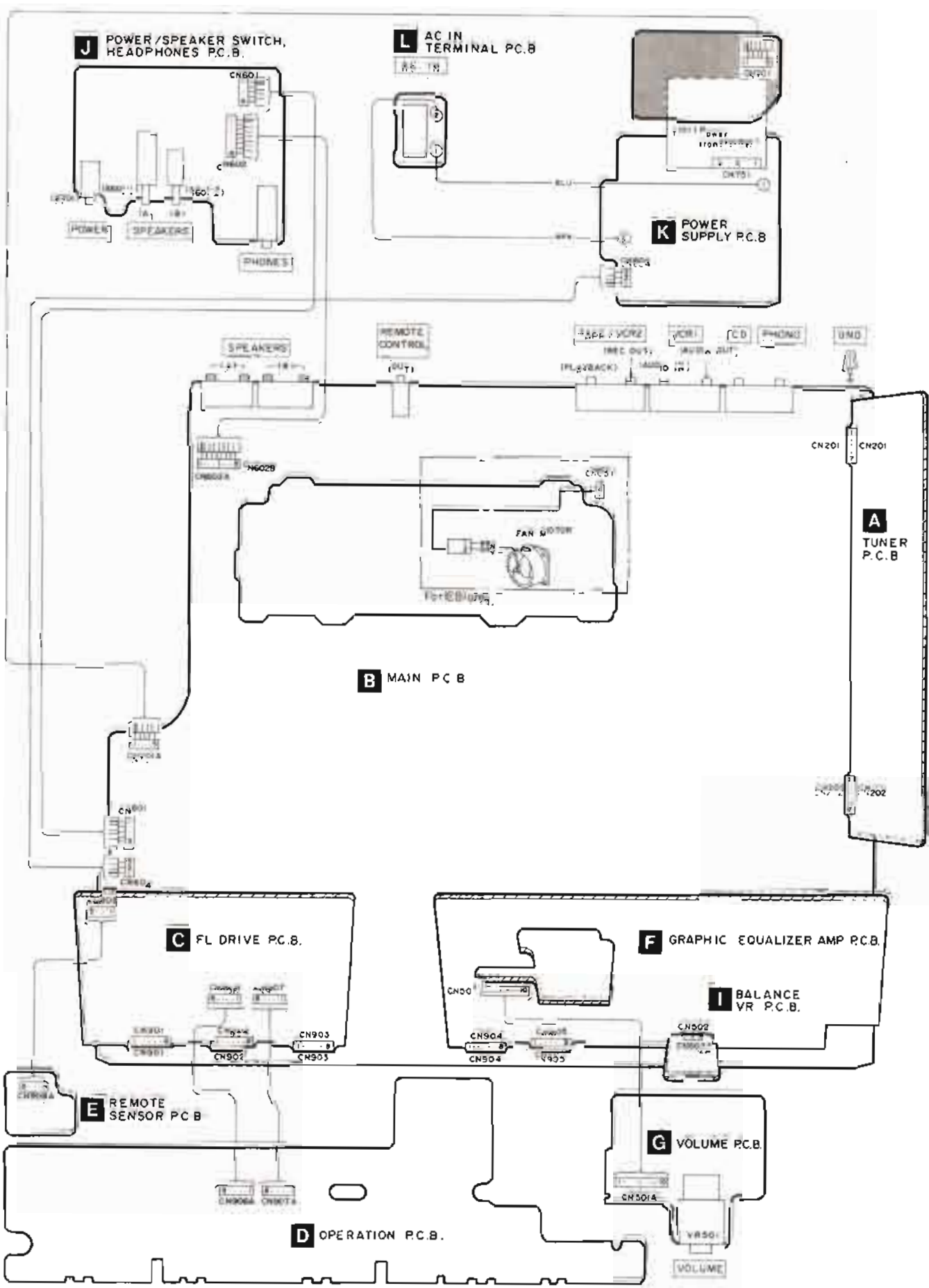


G VOLUME P.C.B.

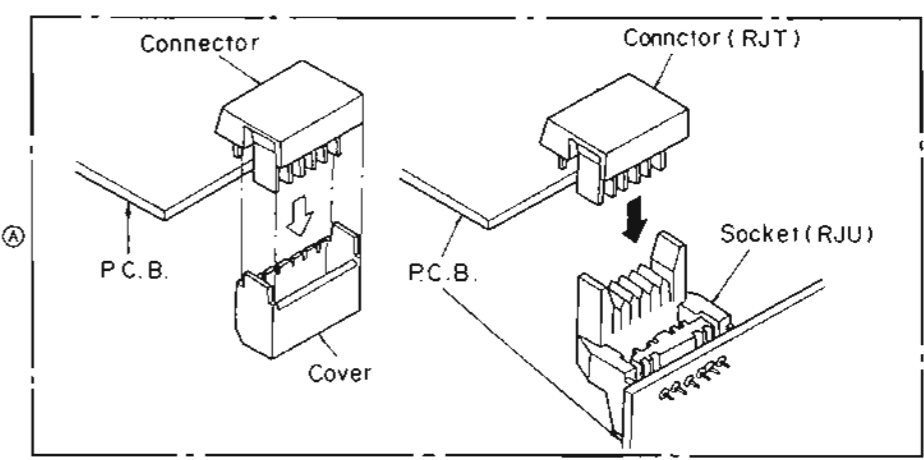
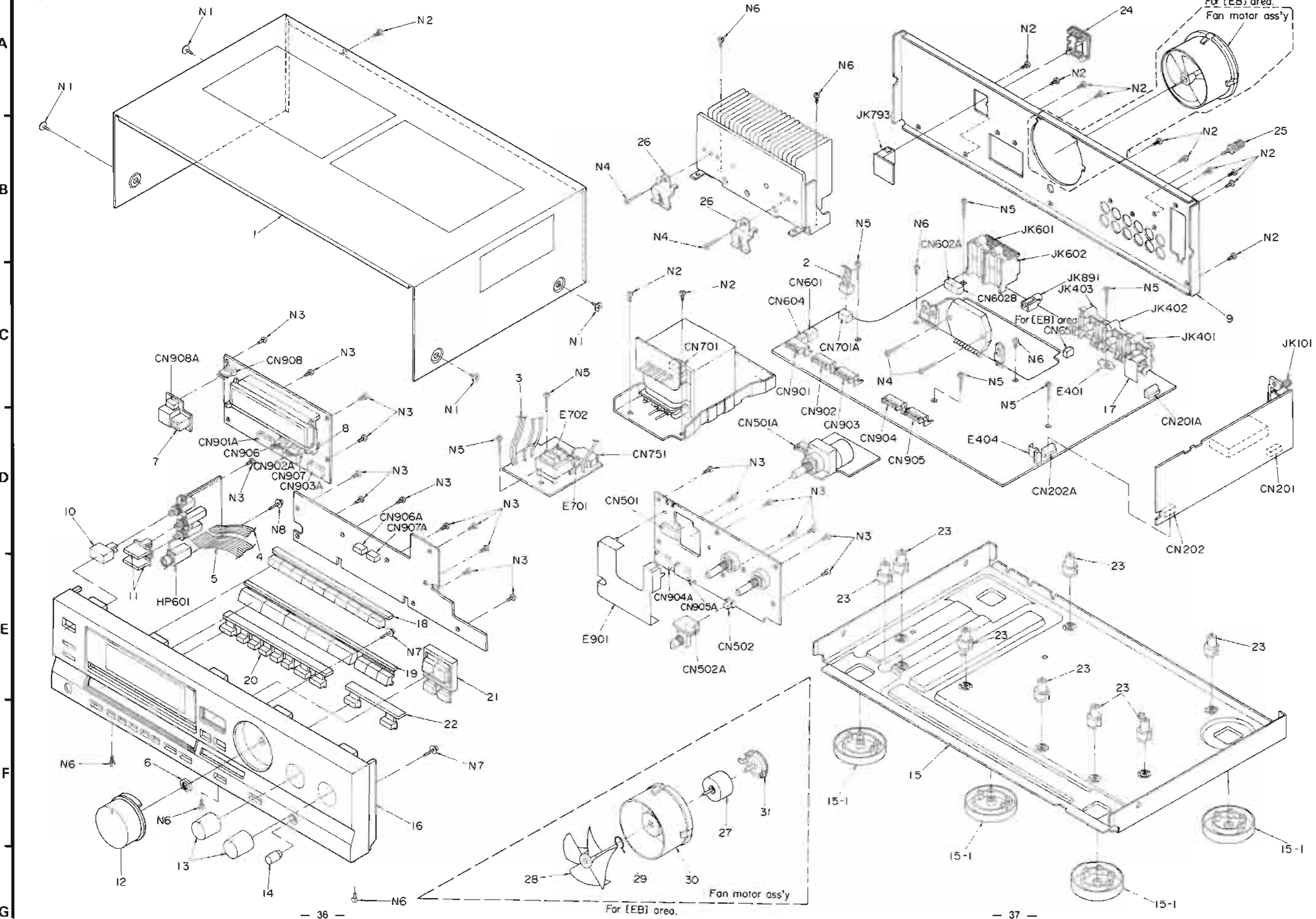


K POWER SUPPLY P.C.B.

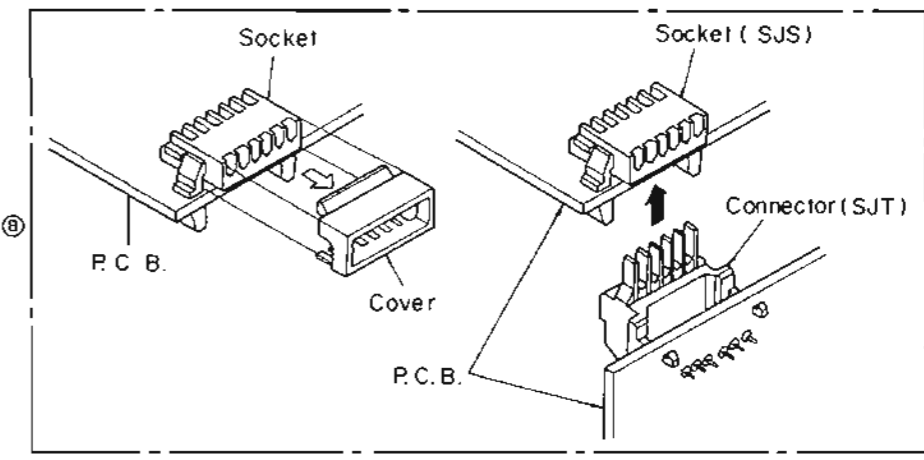
WIRING CONNECTION DIAGRAM



EXPLODED VIEW

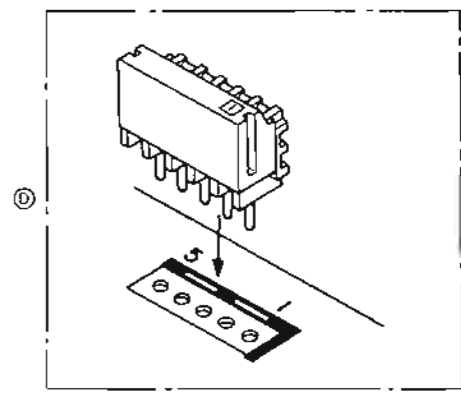
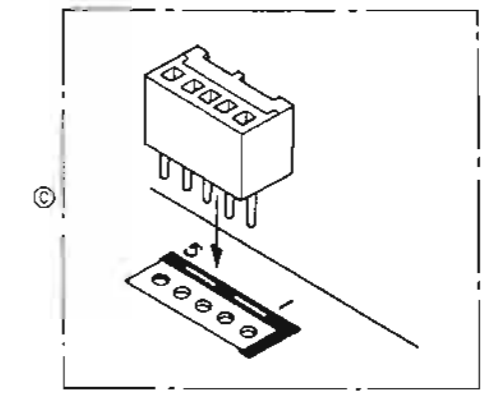


Pins	Part No.	Color
8 Pin	RJT003K008M1	(Black or Gray)
8 Pin	RJU003K008M1	(Black)
10 Pin	RJT003K010M1	(Black or Gray)
10 Pin	RJU003K010M1	(Black)



Pins	Part No.	Color
8 Pin	SJS50887WF	(Ivory)
8 Pin	SJT30854WF	(Ivory)
10 Pin	SJS51087WF	(Ivory)
10 Pin	SJT31054WF	(Ivory)

- Regarding Ref. No. CN501, CN501A, CN901, CN901A, CN902, CN902A, CN903, CN903A, CN904, CN904A, CN905, CN905A, there are two types (Ⓒ and Ⓓ).
- Be sure to order the replacement parts of the desired color by the corresponding part numbers.
- The type-A connector and the type-B socket are protected with covers when they are supplied. Remove the cover after soldering the connector or socket to the P.C.B. (Then discard it.)



- Regarding Ref. No. CN601, CN701, CN701A, there are two types (Ⓒ and Ⓓ).

REPLACEMENT PARTS LIST

Notes : • 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.
- 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		N8	XTWS3-10Q	SCREW	
						PACKING MATERIAL	
1	RMD036A-K	CABINET	(E)	P1	RPG0541	PACKING CASE	
1	RMD036B-K	CABINET	(EB)	P2	RPN0028A	PAD	
2	RWJ18051400Q	CONNECTOR ASS'Y (5P)		P1	RPN0328B	PAD	
3	RWJ18051500Q	FLAT CABLE (3P) (CN604)		P4	RPN0028C	PAD	
4	RWJ18051500K	FLAT CABLE (5P) (CN601)		P5	RPN0328D	PAD	
5	RWJ18083000Q	FLAT CABLE (8P) (CN602)		P6	SPP723	PROTECTION BAG (UNIT)	
6	XNS7	NUT		P7	SPSD152	ACCESSORIES BOX	
7	RMD0069	LFD HOLDER		P8	SPB1061	PROTECTION BAG (F. IL.)	
8	RMD0070	FL. HOLDER				ACCESSORIES	
9	RGR0079E-A	REAR PANEL	(EB)	A1	RQT0580-G	INSTRUCTION MANUAL	(EB)
9	RGR0079C-A	REAR PANEL	(E)	A1	RFBAGK100LE	INST. MANUAL ASS'Y	(E)
10	RGI0030	BUTTON, POWER		A2	SFBAC05E03	POWER CORD	Δ (E)
11	RGR101	BUTTON, SPEAKER SELECTOR		A2	SJA193	POWER CORD	Δ (EB)
12	RGM0084	KNOB, MAIN VOLUME		A3	SPH1637	AM LOOP ANTENNA	
13	RGM0072	KNOB, BASS/TREBLE		A4	SSA270M	FM ANTENNA	
14	RGM0073	KNOB, BALANCE		A5	SMA231-1M	AM ANTENNA HOLDER	
15	RFKJAGX300P	CHASSIS ASS'Y		A6	XTW3-10AFZ	SCREW	
15-1	RKA0009-1	FOOT		A7	SJIP9009	ATTACHMENT PLUG	Δ (EB)
16	RFBAGX100E	FRONT PANEL ASS'Y		A8	RQAD013	WARRANTY CARD	
17	RSD0005	SHIELD PLATE		A9	RQC00169	SERVICE CENTER LIST	
18	RGU0344A	BUTTON, PRESET		A10	RAK-SA301E	REMOTE CONTROL TRANSMITTER	
19	RGU0345B	BUTTON, SELECTOR		A11	RKDD008	BATTERY COVER	
20	RGU0346	BUTTON, GROUP					
21	RGU0347	BUTTON, LP-DOWN					
22	RGU0348A	BUTTON, MODE					
23	SHL187-2	P. C. B. SUPPORT					
24	SJS9231A	AC INLET COVER					
25	SKZ123	GND TERMINAL					
26	SJS894-T	ANGLE, TRANSISTOR					
27	MDN-4RD4MTC	WATTIR	(EB)				
28	SHE222	FAN	(EB)				
29	SJS271	SPRING	(EB)				
30	SHE230	FAM CASE	(EB)				
31	SHE234	CAP	(EB)				
		SCREWS					
N1	SNE2129-3	SCREW					
N2	XTWS3-RJFZ1	SCREW					
N3	XTWS28+8J	SCREW					
N4	XTB3+1GJFZ	SCREW					
N5	XTB3+20JFZ	SCREW					
N6	XTB3+8JFZ	SCREW					
N7	XTWS3-8T	SCREW					

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT (S)		Q101	2SA933SQSTA	TRANSISTOR	
				Q104	UN4211TA	TRANSISTOR	
				Q89	2SB1240PRTV6	TRANSISTOR	
				Q901	2SC1740SQSTA	TRANSISTOR	
				Q902	UN4215TA	TRANSISTOR	
				Q949	2SA933SQSTA	TRANSISTOR	
						DIODE (S)	
				D101	MA165TA	DIODE	
				D202	MA4110MTA	DIODE	
				D204	MA165TA	DIODE	
				D206	MA165TA	DIODE	
				D301	MA165TA	DIODE	
				D651	MA165TA	DIODE	(EB)
				D652	MA4051MTA	DIODE	(EB)
				D701-704	P3000LF	DIODE	Δ
				D705, 706	MA4062MTA	DIODE	
				D709	MA4270MTA	DIODE	
				D710	MA29WATA	DIODE	Δ
				D711	MA4150MTA	DIODE	
				D751-754	SVDS5688GTJ	DIODE	Δ
				D755	MA165TA	DIODE	
				D757	MA4069MTA	DIODE	
				D891	MA165TA	DIODE	
				D892	LN4069P-LS	DIODE	
				D893	MA29WATA	DIODE	
				D901-906	MA165TA	DIODE	
				D907	1SS201TA	DIODE	
				D908-911	MA165TA	DIODE	
				D912	MA4051MTA	DIODE	
				D914, 915	MA165TA	DIODE	
				D920-922	MA165TA	DIODE	
						VARIABLE RESISTOR (S)	
				VR301	EYNDXAA00B53	V. R. MPX YCU ADJ.	
				VR471, 472	EWC2XAF25C15	V. R. TUNE CONTROL	
				VR501	ELW40NOF20B15	V. R. MAIN VOLUME	
				VR502	EYJ01CF01G15	V. R. BALANCE	
						COMPONENT COMBINATION (S)	
				Z202	SE172101-T	COMPONENT COMBINATION	
				Z251	REAG2001-T	COMPONENT COMBINATION	
				Z301	A1QF02000	REMOTE CONT. SENSOR	
				Z901	EXFP12331MF	COMPONENT COMBINATION	
				Q101, 102	2SC2785FETA	TRANSISTOR	
				Q201, 202	2SC2787LTA	TRANSISTOR	
				Q204, 205	2SC1740SQSTA	TRANSISTOR	
				Q208	2SA933SQSTA	TRANSISTOR	
				Q207	2SC1740SQSTA	TRANSISTOR	
				Q208, 209	2SA933SQSTA	TRANSISTOR	
				Q210	2SC1740SQSTA	TRANSISTOR	
				Q251	2SA933SQSTA	TRANSISTOR	
				Q252-254	2SC1740SQSTA	TRANSISTOR	
				Q255, 256	2SC2785FETA	TRANSISTOR	
				Q301, 302	2SD1750QSTA	TRANSISTOR	
				Q303	2SA933SQSTA	TRANSISTOR	
				Q501, 502	2SJ40C07A	TRANSISTOR	
				Q503, 504	2SC3327ABTP	TRANSISTOR	
				Q505, 506	2SA1309AQSTA	TRANSISTOR	
				Q507, 508	2SC3327ABTP	TRANSISTOR	
				Q513, 514	UN4211TA	TRANSISTOR	
				Q651	2SA1309AQSTA	TRANSISTOR	(EB)
				Q652	2SC3311AQSTA	TRANSISTOR	(EB)
				Q701	2SD1751DEF	TRANSISTOR	Δ
				Q703	2SC3311AQSTA	TRANSISTOR	Δ
				Q704	2SC3311AQSTA	TRANSISTOR	
				Q705	2SC3311AQSTA	TRANSISTOR	
				Q708	2SB1185DEF	TRANSISTOR	Δ
				Q709	2SC3311AQSTA	TRANSISTOR	
				Q710	2SB1185DEF	TRANSISTOR	
				Q713	2SC3311AQSTA	TRANSISTOR	Δ
				Q751	2SC1740SQSTA	TRANSISTOR	
				Q752	2SC3940AQSTA	TRANSISTOR	
				Q891	UN4113TA	TRANSISTOR	
				Q892	UN4214TA	TRANSISTOR	

RESISTORS & CAPACITORS

Notes : • Capacity value are in microfarads (uF) 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						
R101, 102	ERDS2TJ103T	1/4W 10K	R259	ERDS2TJ223T	1/4W 22K	R520	ERDS2TJ394T	1/4W 390K
R104	ERDS2TJ102T	1/4W 1K	R261	ERDS2TJ102T	1/4W 1K	R521	ERDS2TJ104T	1/4W 100K
R105	ERDS2TJ561T	1/4W 560	R262	ERDS2TJ332T	1/4W 3.3K	R522	ERDS2TJ103T	1/4W 10K
R106	ERDS2TJ562T	1/4W 5.6K	R263	ERDS2TJ153T	1/4W 15K	R522A	ERDS2TJ153T	1/4W 15K
R107	ERDS2TJ103T	1/4W 10K	R264	ERDS2TJ102T	1/4W 1K	R523, 524	ERDS2TJ221T	1/4W 220
R108	ERDS2TJ151T	1/4W 150	R301	ERDS2TJ393T	1/4W 39K	R525, 526	ERDS2TJ102T	1/4W 1K
R201	ERDS2TJ332T	1/4W 3.3K	R302	ERDS2TJ151T	1/4W 150	R527	ERDS2TJ394T	1/4W 390K
R202	ERDS2TJ824T	1/4W 820K	R303, 304	ERDS2TJ223T	1/4W 22K	R528	ERDS2TJ104T	1/4W 100K
R203	ERDS2TJ122T	1/4W 1.2K	R305, 306	ERDS2TJ272T	1/4W 2.7K	R529	ERDS2TJ222T	1/4W 2.2K
R204	ERDS2TJ824T	1/4W 820K	R307, 308	ERDS2TJ562T	1/4W 5.6K	R531, 532	ERDS2TJ153T	1/4W 15K
R205	ERDS2TJ391T	1/4W 390	R309	ERDS2TJ224T	1/4W 220K	R601, 602	ERDS2TJ102T	1/4W 1K
R206	ERDS2TJ561T	1/4W 560	R311	ERDS2TJ102T	1/4W 1K	R603, 604	ERDS2TJ563T	1/4W 56K
R207	ERDS2TJ822T	1/4W 8.2K	R312	ERDS2TJ153T	1/4W 15K	R605, 606	ERDS2TJ332T	1/4W 3.3K
R208	ERDS2TJ102T	1/4W 1K	R313, 314	ERDS2TJ473T	1/4W 47K	R607, 608	ERDS2TJ563T	1/4W 56K
R209	ERDS2TJ471T	1/4W 470	R315, 316	ERDS2TJ103T	1/4W 10K	R609, 610	ERDS2TJ470T	1/4W 47
R210	ERDS2TJ332T	1/4W 3.3K	R317	ERDS2TJ473T	1/4W 47K	R611, 612	ERDS1FVJ100T	1/2W 10 Δ
R211	ERDS2TJ222T	1/4W 2.2K	R321, 322	ERDS2TJ333T	1/4W 33K	R614	ERD25FVJ470T	1/4W 47 Δ
R212	ERDS2TJ153T	1/4W 15K	R325, 326	ERDS2TJ102T	1/4W 1K	R619, 620	ERGLANJP331S	1W 330
R213	ERDS2TJ104T	1/4W 100K	R401, 402	ERDS2TJ332T	1/4W 3.3K	R623	ERDS2TJ684T	1/4W 680K
R214	ERDS2TJ824T	1/4W 820K	R403, 404	ERDS2TJ822T	1/4W 8.2K	R624	ERDS2TJ103T	1/4W 10K Δ
R215	ERDS2TJ822T	1/4W 8.2K	R405, 406	ERDS2TJ470T	1/4W 47	R627	ERDS2TJ154T	1/4W 150K
R216	ERDS2TJ563T	1/4W 56K	R407, 408	ERDS2TJ473T	1/4W 47K	R628	ERDS2TJ684T	1/4W 680K
R217	ERDS2TJ223T	1/4W 22K	R411, 412	ERDS2TJ104T	1/4W 100K	R651-654	ERDS2TJ223T	1/4W 22K (EB)
R218	ERDS2TJ123T	1/4W 12K	R413, 414	ERDS2TJ102T	1/4W 1K	R655	ERDS2TJ392T	1/4W 3.9K (EB)
R219	ERDS2TJ562T	1/4W 5.6K	R417, 418	ERDS2TJ104T	1/4W 100K	R656, 657	ERDS2TJ103T	1/4W 10K (EB)
R220	ERDS2TJ103T	1/4W 10K	R421	ERDS2TJ332T	1/4W 3.3K	R658	ERDS2TJ223T	1/4W 22K (EB)
R221	ERDS2TJ104T	1/4W 100K	R451, 452	ERDS2TJ821T	1/4W 820	R659, 660	ERDS1FVJ680T	1/2W 68 Δ (EB)
R222	ERDS2TJ473T	1/4W 47K	R453, 454	ERDS2TJ224T	1/4W 220K	R701	ERDS1FVJ332T	1/2W 3.3K Δ
R223	ERDS2TJ154T	1/4W 150K	R455, 456	ERDS2TJ563T	1/4W 56K	R702	ERDS2TJ122T	1/4W 1.2K Δ
R224	ERDS2TJ223T	1/4W 22K	R457, 458	ERDS2TJ271T	1/4W 270	R703	ERDS2TJ272T	1/4W 2.7K
R227	ERDS2TJ104T	1/4W 100K	R459, 460	ERDS2TJ680T	1/4W 68	R704	ERDS2TJ222T	1/4W 2.2K
R228	ERDS2TJ123T	1/4W 12K	R461, 462	ERDS2TJ184T	1/4W 180K	R705	ERDS2TJ272T	1/4W 2.7K
R230	ERDS2TJ104T	1/4W 100K	R463, 464	ERDS2TJ123T	1/4W 12K	R708	ERDS1FVJ330T	1/2W 33 Δ
R231	ERDS2TJ102T	1/4W 1K	R465, 466	ERDS2TJ563T	1/4W 56K	R710	ERDS2TJ272T	1/4W 2.7K
R232	ERDS2TJ122T	1/4W 1.2K	R467, 468	ERDS2TJ102T	1/4W 1K	R711	ERDS2TJ3R9T	1/4W 3.9
R233	ERDS2TJ684T	1/4W 680K	R471, 472	ERDS2TJ104T	1/4W 100K	R713	ERDS2TJ183T	1/4W 18K Δ
R234	ERDS2TJ103T	1/4W 10K	R473, 474	ERDS2TJ474T	1/4W 470K	R715	ERDS2TJ101T	1/4W 100 Δ
R235	ERDS2TJ471T	1/4W 470	R475, 476	ERDS2TJ392T	1/4W 3.9K	R716	ERDS2TJ222T	1/4W 2.2K Δ
R237	ERDS2TJ221T	1/4W 220	R479, 480	ERDS2TJ223T	1/4W 22K	R717	ERD25FVJ150T	1/4W 15 Δ
R247	ERDS2TJ103T	1/4W 10K	R481, 482	ERDS2TJ392T	1/4W 3.9K	R718, 719	ERDS2TJ1R8T	1/4W 1.8 Δ
R251	ERDS2TJ103T	1/4W 10K	R483, 484	ERDS2TJ222T	1/4W 2.2K	R753, 754	ERDS2TJ472T	1/4W 4.7K
R252	ERDS2TJ822T	1/4W 8.2K	R485, 486	ERDS2TJ473T	1/4W 47K	R755	ERDS2TJ102T	1/4W 1K
R253	ERDS2TJ182T	1/4W 1.8K	R487, 488	ERDS2TJ122T	1/4W 1.2K	R771, 772	ERDS1FVJ5R6T	1/2W 5.6 Δ
R254	ERDS2TJ223T	1/4W 22K	R489, 490	ERDS2TJ821T	1/4W 820	R773	ERD25FVJ4R7T	1/4W 4.7 Δ
R256	ERDS2TJ102T	1/4W 1K	R501, 502	ERDS2TJ222T	1/4W 2.2K	R777	ERD25FVJ8R2T	1/4W 8.2 Δ
R258	ERDS2TJ122T	1/4W 1.2K	R503, 504	ERDS2TJ103T	1/4W 10K	R780	ERDS1FVJ220T	1/2W 22 Δ
			R513, 514	ERDS2TJ393T	1/4W 39K	R851	ERDS1FVJ2R2T	1/2W 2.2 Δ
			R515, 516	ERDS2TJ222T	1/4W 2.2K	R891	ERDS2TJ102T	1/4W 1K
			R517, 518	ERDS2TJ102T	1/4W 1K	R894	ERDS2TJ102T	1/4W 1K

