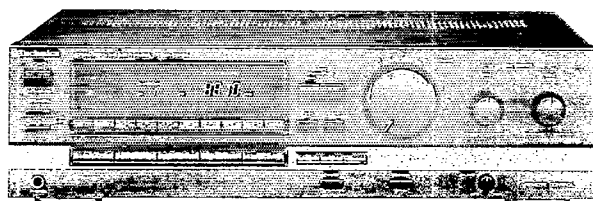


# Service Manual

AV Control Stereo Receiver

Receiver

## SA-GX130



Colour

(K)... Black Type

Area

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EB)	Great Britain.	

## SPECIFICATIONS (DIN 45 500)

### ■ AMPLIFIER SECTION

<b>Power output</b>	
DIN 1 kHz (T.H.D. 1%)	2 × 60 W (4 Ω)
<b>40 Hz~20 kHz continuous power output</b>	
both channels driven	2 × 40 W (8 Ω)
<b>Total harmonic distortion</b>	
rated power at 40 Hz~20 kHz	0.5% (8 Ω)
half power at 1 kHz	0.03% (8 Ω)
<b>Intermodulation distortion</b>	
rated power at 60 Hz: 7 kHz=4:1, SMPTE	0.5% (8 Ω)
<b>Power bandwidth</b>	
both channels driven, -3 dB	10 Hz~40 kHz (8 Ω)
<b>Damping factor</b>	40 (8 Ω)
<b>Input sensitivity and impedance</b>	
PHONO	3 mV/47 kΩ
CD, VCR 1	200 mV/22 kΩ
TAPE/VCR 2	200 mV/22 kΩ
<b>PHONO maximum input voltage (1 kHz, RMS)</b>	150 mV
<b>S/N at rated power (8 Ω)</b>	
PHONO	70 dB (IHF, A: 80 dB)
CD, VCR 1	80 dB (IHF, A: 90 dB)
TAPE/VCR 2	80 dB (IHF, A: 90 dB)
<b>Frequency response</b>	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
CD, VCR 1	10 Hz~40 kHz (±3 dB)
TAPE/VCR 2	10 Hz~40 kHz (±3 dB)
<b>Tone controls</b>	
Bass	50 Hz, +10 dB~-10 dB
Treble	20 kHz, +10 dB~-10 dB
<b>Loudness control (volume at -30 dB)</b>	50 Hz, +9 dB
<b>Output voltage</b>	
VCR 1 OUT	200 mV
TAPE/VCR 2 REC (OUT)	200 mV
<b>Channel balance, 250 Hz~6.3 kHz</b>	±1 dB
<b>Channel separation</b>	55 dB

<b>Headphones output level and impedance</b>	430 mV/330 Ω
<b>Load impedance</b>	
A or B	4 Ω~16 Ω
A and B	8 Ω~16 Ω

### ■ FM TUNER SECTION

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

# Technics

AM TUNER SECTION

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

GENERAL

Power consumption	200 W
Power supply	AC 50 Hz/60 Hz, 230 V/240 V
Dimensions (W × H × D)	430 × 125 × 305 mm
Weight	6.5 kg

REMOTE CONTROL TRANSMITTER

Control keys	32 keys
Dimensions (W × H × D)	70 × 175 × 27 mm
Weight (including batteries)	125 g
Power source	TWO "AAA" (UM-4, R03)

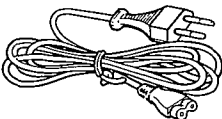
- Notes:
1. Specifications are subject to change without notice.  
Weight and dimensions are approximate.
  2. Total harmonic distortion is measured by the digital spectrum analyzer.

CONTENTS

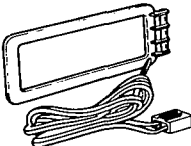
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ACCESSORIES

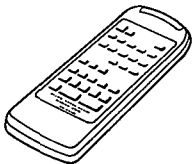
- AC power supply cord..... 1 pc.  
(RJA0019-1K): (E)  
(SJA193): (EB)



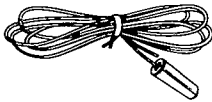
- AM loop antenna  
(SPB1163T) ..... 1 pc.




- Remote control transmitter  
(RAK-SA302E) ..... 1 pc.




- FM indoor antenna  
(RSA0007) ..... 1 pc.




- AM antenna holder  
(SMA231M) ..... 1 pc.




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



- Screws (XTN3+10AFZ) ..... 2 pcs.



- Attachment plug..... 1 pc.  
(SJP9009): (EB)



BEFORE USE



Be sure to disconnect the mains cord before adjusting the voltage selector.  
Use a flat-tip (–) screwdriver to set the voltage selector (on the rear panel) to the voltage setting for the area in which the unit will be used.

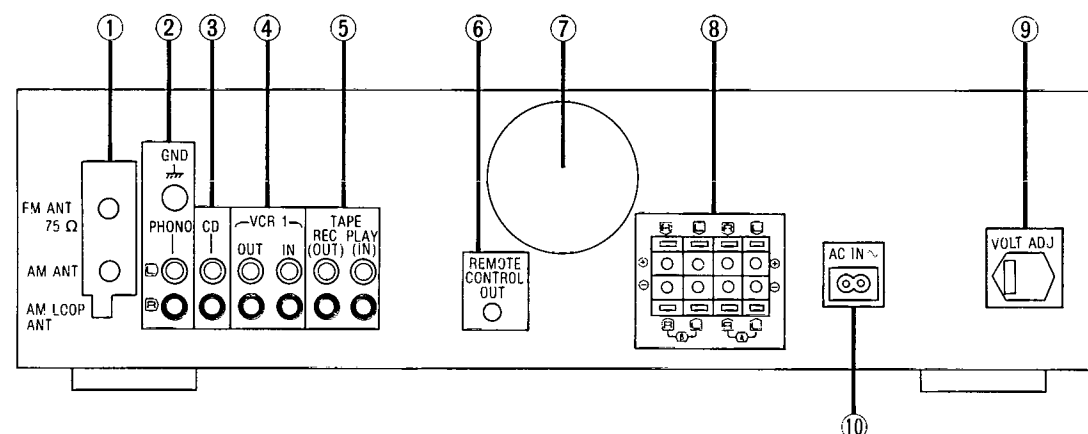
Note that this unit will be seriously damaged if this setting is not made correctly.

## ■ CONNECTIONS TO EQUIPMENT

### Caution:

Do not place books, etc., on top of this unit so that the heat radiation vents remain unblocked.

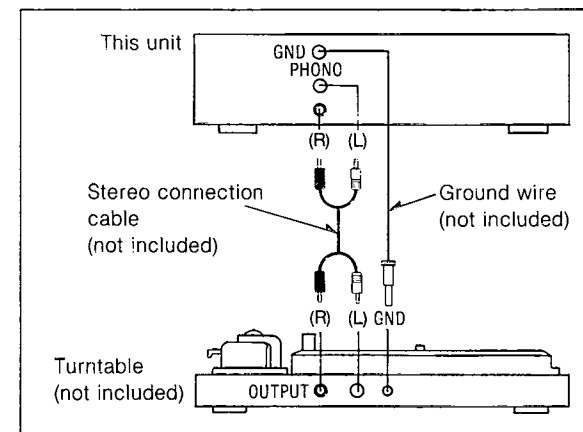
**Stereo connection cable**  
(not included)  
White (L)   
Red (R) 



### 1 Antenna connection terminals

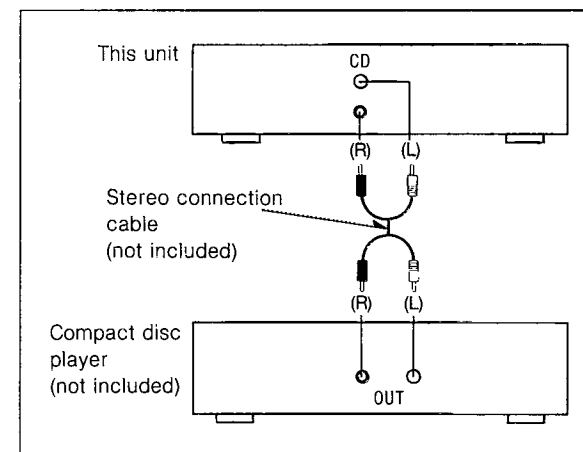
### 2 "PHONO" terminals

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



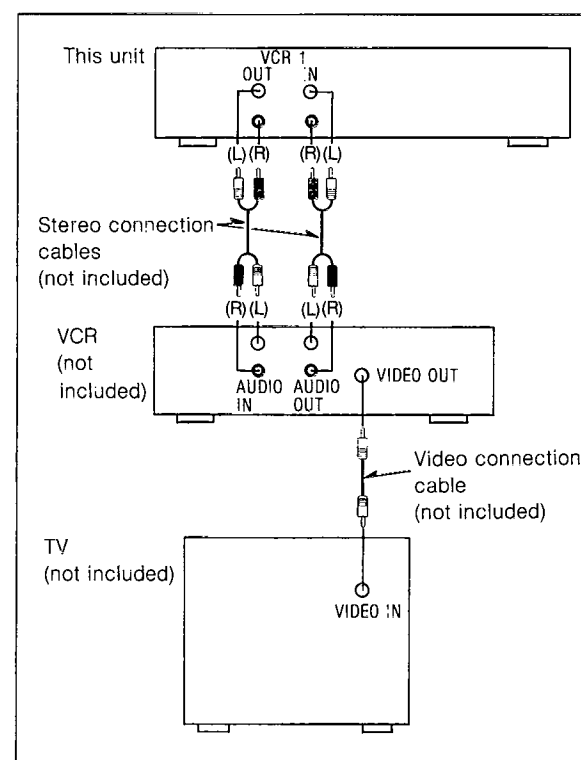
### 3 "CD" terminals

Connect a compact disc player.



### 4 "VCR 1" terminals

Connect a VCR.  
(See the operating instructions of the VCR.)



### 5 "TAPE/VCR 2" terminals

Connect a tape deck or second VCR. (This corresponds to the "TAPE" terminals in the above illustration).

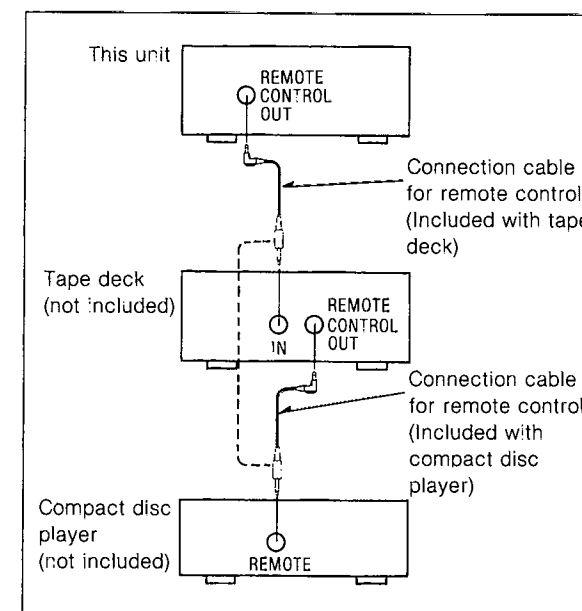
### 6 Remote control OUT terminal (REMOTE CONTROL OUT)

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.

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

If a tape deck is not being used, the compact disc player can be connected directly (dotted line).



### Note:

For a compact disc player with a remote control sensor the above connection is not necessary.

### 7 Cooling fan

The cooling fan operates at high output power levels only.

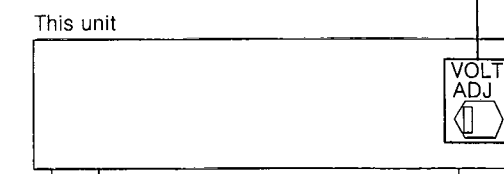
### 8 Speaker connection terminals

### 9 Voltage selector (VOLT ADJ)

### To set the power voltage

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

[Use a minus (-) screwdriver]



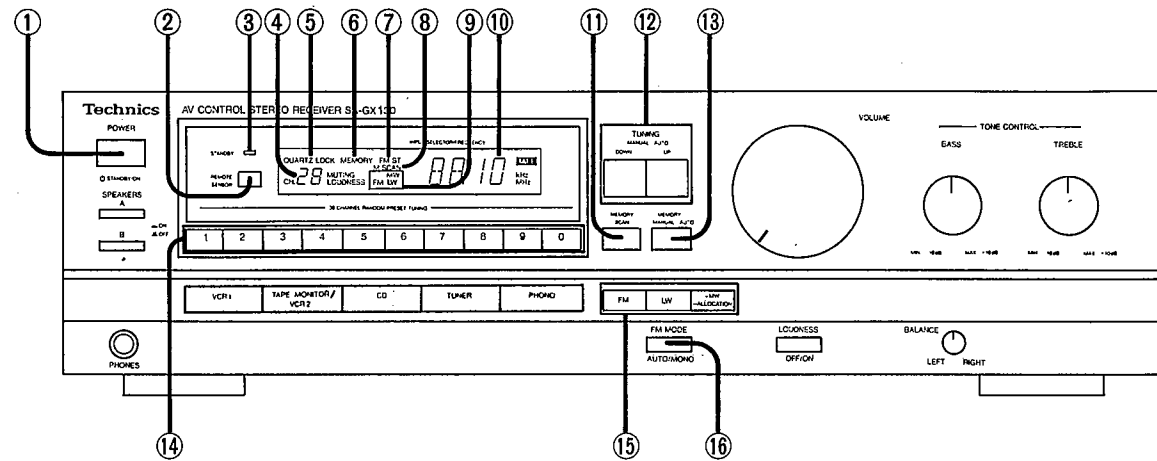
### Note:

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

### 10 AC IN socket (AC IN)

## FRONT PANEL CONTROLS AND FUNCTIONS

### Tuner section



#### ① Power “**⏻** STANDBY/ON” switch (POWER, **⏻** STANDBY/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 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.

#### ③ “STANDBY” indicator (STANDBY)

This indicator illuminates when the “STANDBY” mode is set by the main unit or the remote control transmitter.

#### ④ Channel display

This display shows the channel number selected by one of the preset-tuning buttons. Also this display shows the channel number for about 3 seconds during memory scan operation.

#### ⑤ Quartz-lock indicator (QUARTZ LOCK)

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

#### ⑥ Memory indicator (MEMORY)

This indicator illuminates when the memory button is pressed.

#### ⑦ 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.

#### ⑧ Memory scan indicator (M. SCAN)

This indicator illuminates when the memory scan button is pressed.

#### ⑨ Band indicators (FM, LW, MW)

Indicates the selected band.

#### ⑩ Input selector/frequency display (INPUT SELECTOR/FREQUENCY)

Displays the selected source or broadcast frequency.

#### ⑪ Memory scan button (MEMORY SCAN)

This button is used to locate a desired broadcast station; each broadcast station is selected for about 3 seconds.

#### ⑫ Tuning buttons (TUNING)

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

#### ⑬ Memory button (MEMORY)

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

#### ⑭ Preset-tuning buttons (1–0) (30 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.

#### ⑮ Band selectors (FM, LW, MW)

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

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

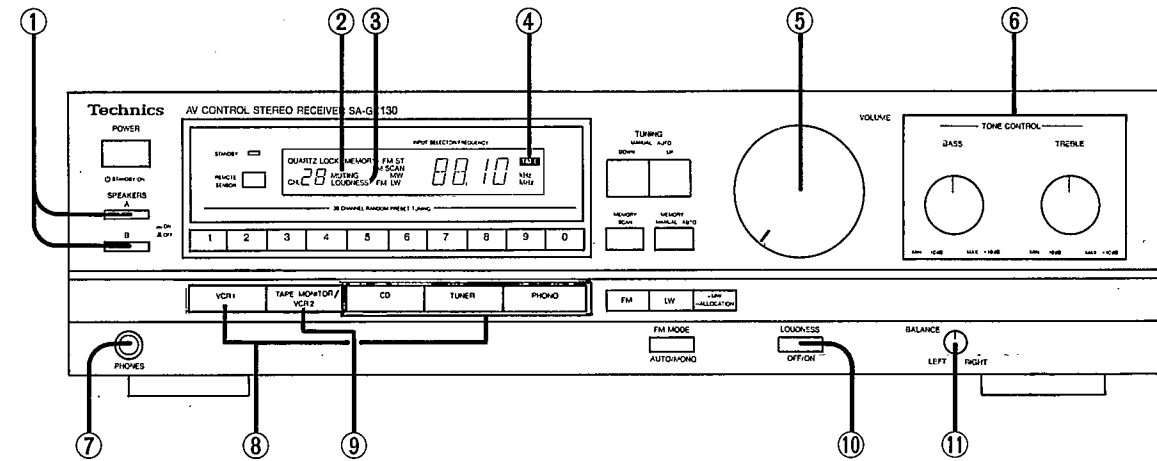
**MW:** Press this button to listen to an MW broadcast.

**ALLOCATION:** When the MW button is pressed for about 3 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 3 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 system(s) (A and/or B).

#### ② Muting indicator (MUTING)

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

#### ③ Loudness indicator (LOUDNESS)

This indicator will illuminate when the loudness button is pressed.

#### ④ Tape indicator (TAPE)

This indicator will illuminate when the tape-monitor/VCR 2 button 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 Headphones jack (PHONES)

#### ⑧ 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 input selector/frequency display.

The “PHONO” input selector has two functions: when pressed momentarily it selects “PHONO”. When pressed and held for about 4 seconds, it de-activates the muting function.

#### ⑨ Tape-monitor/VCR 2 button (TAPE MONITOR/VCR 2)

Press this button to listen to a tape or second VCR connected to the “TAPE/VCR 2” terminals.

To listen to some other source, press this button once again (so that the indicator is switched OFF).

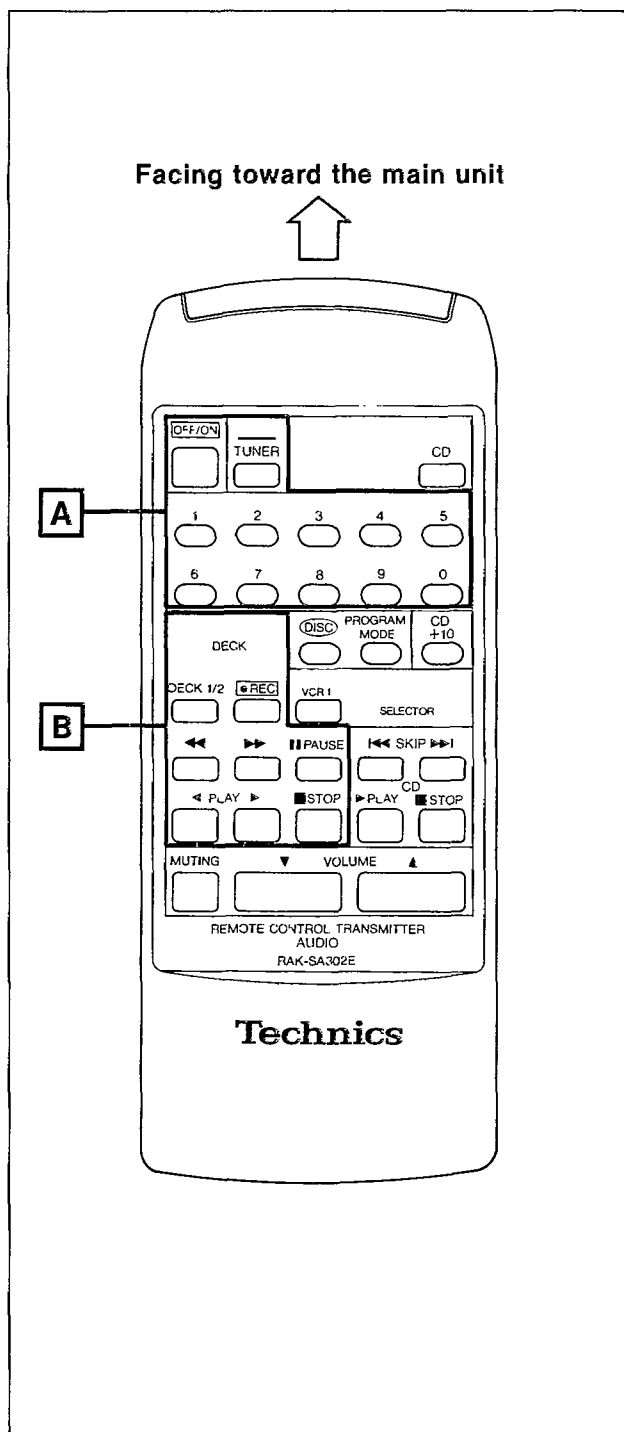
#### ⑩ Loudness button (LOUDNESS)

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.
- For this system, you can listen to tapes or compact discs, etc., by operating the remote control transmitter without using this unit's input selectors.
- Make sure that the power of each unit is set to the "ON" position, before beginning the operations.



### A Tuner controls

#### [TUNER]

Press this button first to use the "OFF/ON" button or the [1] - [0] buttons.

#### [OFF/ON]

This button 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.

#### [1] - [0]

Press these buttons to select the desired preset channel. When these buttons are used, be sure to first press the "TUNER" button.

#### To designate channels 1-9:

Press the appropriate (1-9) preset-tuning button.

**Note:** When selecting channel 1, 2 or 3 enter the selection "01", "02" or "03". If only "1", "2" or "3" is pressed, channel access will be delayed by two seconds.

#### To designate channels 10-30:

- ① Press the button for the "tens" digit (1, 2 or 3).
- ② Press the button for the "units" digit (1-0) within 2 seconds after pressing the first button.

#### Note:

If the interval between pressing the first button and pressing the second button is more than about 2 seconds, the setting may not be made correctly. If this happens, make the setting once again.

### B Tape deck controls

#### [DECK 1/2]

Press this button to select the deck ("DECK 1" or "DECK 2") to be controlled.

#### [REC]

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

#### [REWIND] [PLAY]

Press one of these buttons to advance or rewind the tape while the unit is in the stop mode.

Press one of these buttons 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.)

#### [PAUSE]

Press this button to temporarily stop playback or recording. Press the playback button to resume the playback or recording.

#### [PLAY]

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

- ▶ : For the "forward (A)" side of the tape
- ◀ : For the "reverse (B)" side of the tape

#### Note:

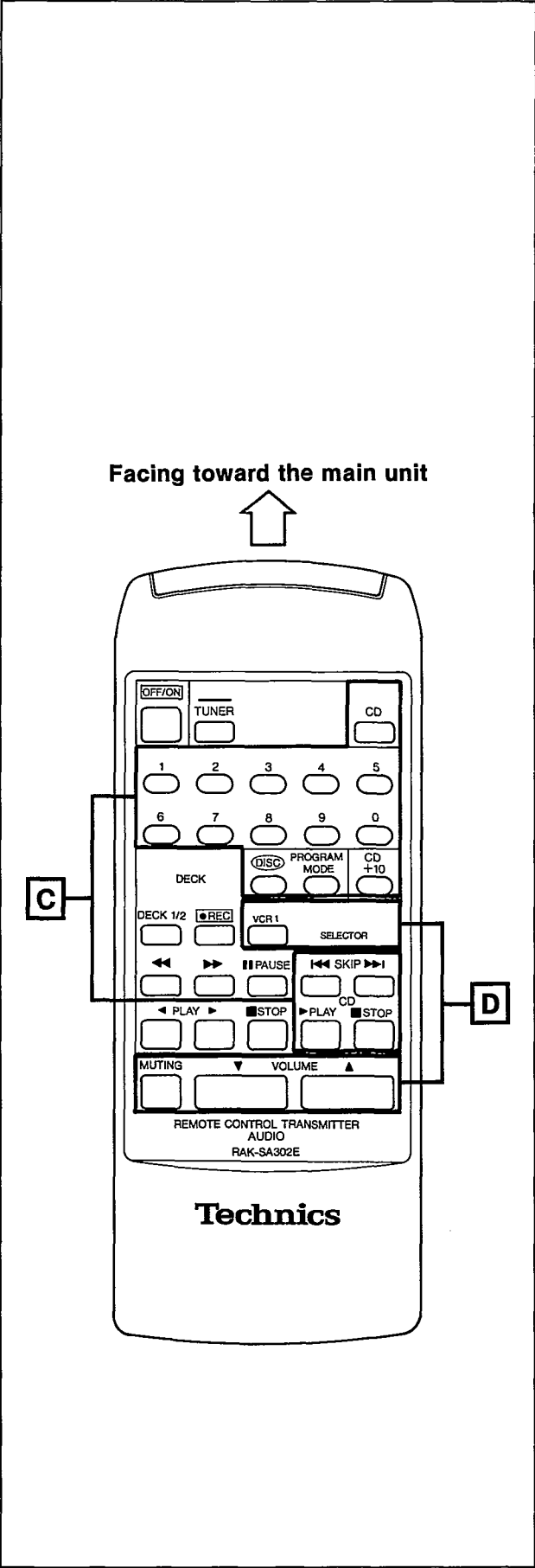
Depending on which Technics tape deck is used in combination with this unit, tape deck 1 might be the "A"-side playback-only type.

#### [STOP]

Press this button to stop tape movement.

#### Note

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



**C Compact disc player controls**

**CD**  
Press this button first to use the **1** - **+10** buttons.

**1** - **+10**  
Press these buttons to select the desired track.  
Playback begins from the track selected.  
When these buttons are used, be sure to first press the "CD" button.

**Tracks 1-9:**  
Press the appropriate numeric button **1** - **9** directly.  
**To select a two-digit track number over 10:**  
Press the **+10** button the necessary number of times to select the "tens" digit, and then one of the **1** - **9** buttons to select the "units" digit.

**DISC**  
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 (**1** - **9**).

**PROGRAM MODE**  
Press this button to select the desired play mode.  
("PROGRAM" or "CONTINUE")

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

**PLAY**  
Press this button to start play.

**STOP**  
Press this button to stop play.

**Note:**  
When operating a compact disc player with a remote control sensor, face this remote control transmitter toward the remote control sensor of the compact disc player.

**D Amplifier controls**

**VCR 1**  
Press this button to select the "VCR 1" input selector on the main unit.

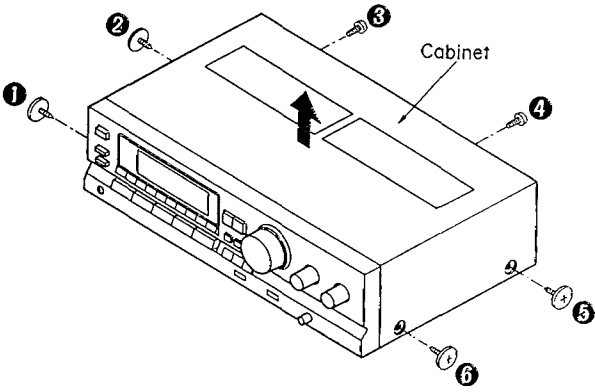
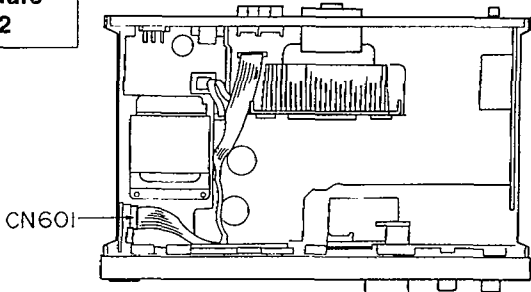
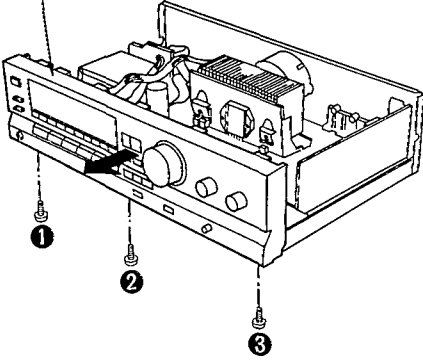
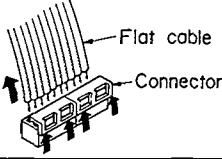
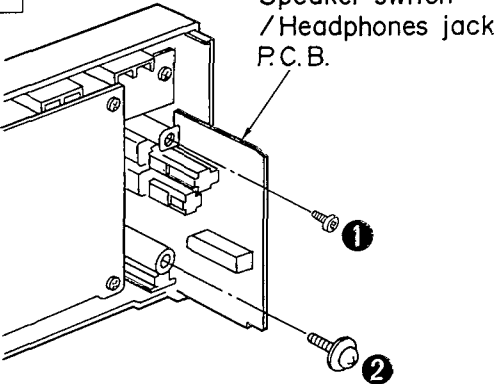
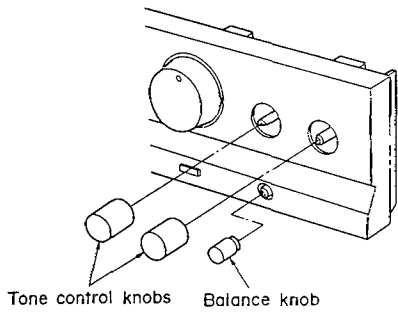
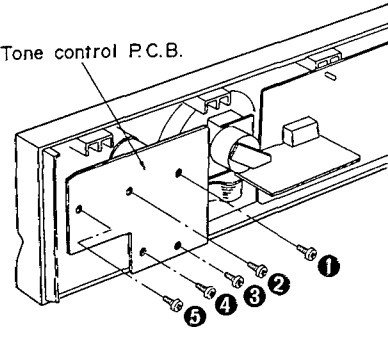
**MUTING**  
Press this button to temporarily reduce the volume level.  
The volume level is attenuated by 20 dB (approx. 1/10).  
Press once again to return to the previous volume level.

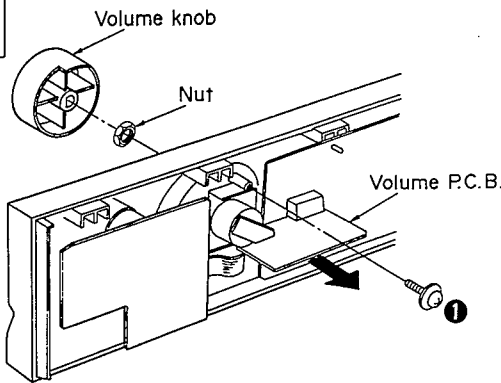
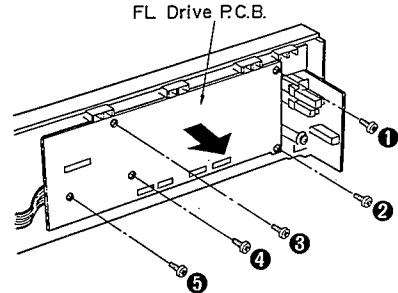
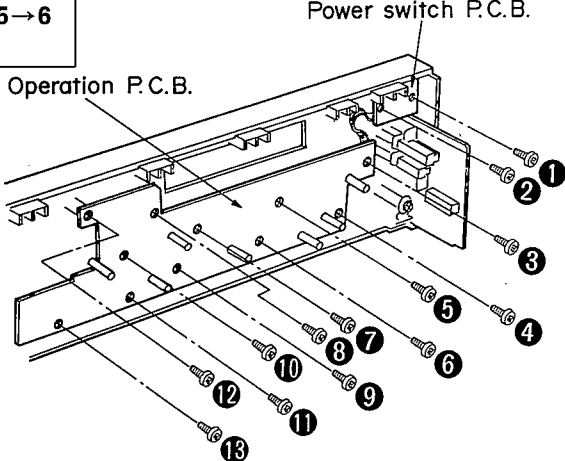
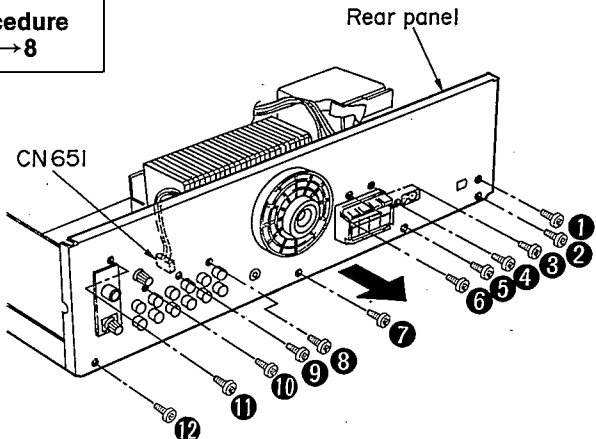
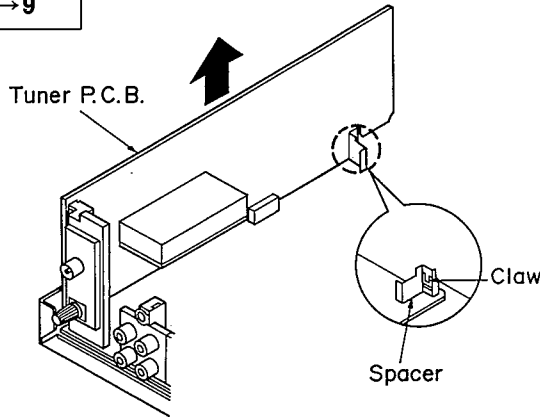
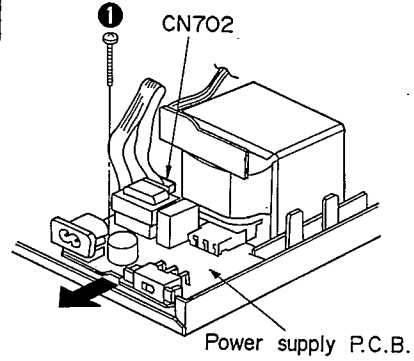
**VOLUME**  
Press one of these buttons to adjust the volume level.

# DISASSEMBLY INSTRUCTIONS

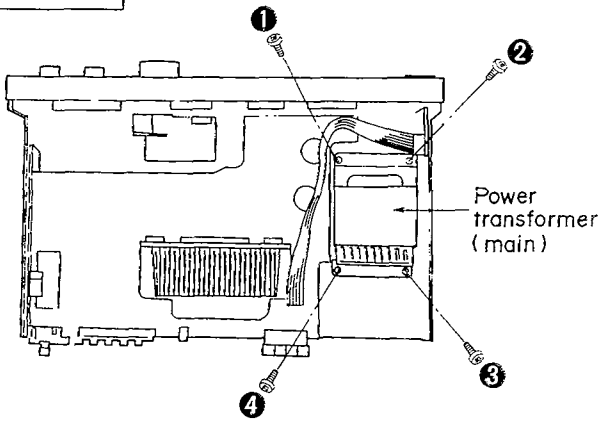
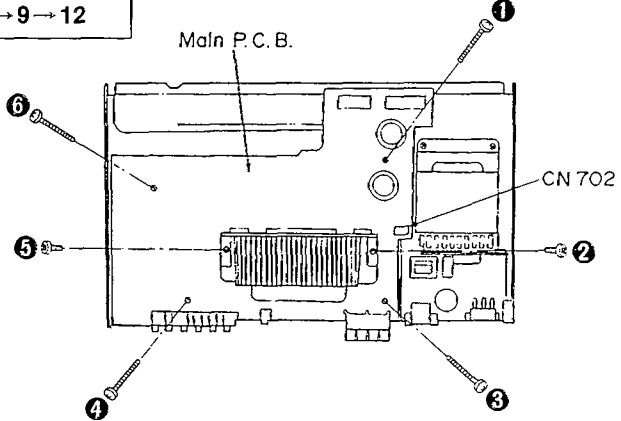
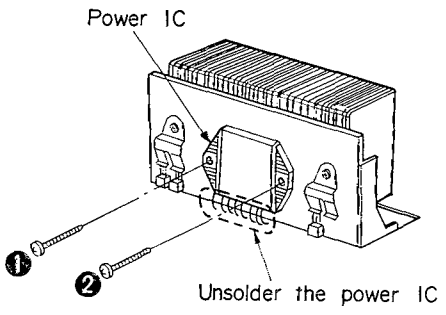
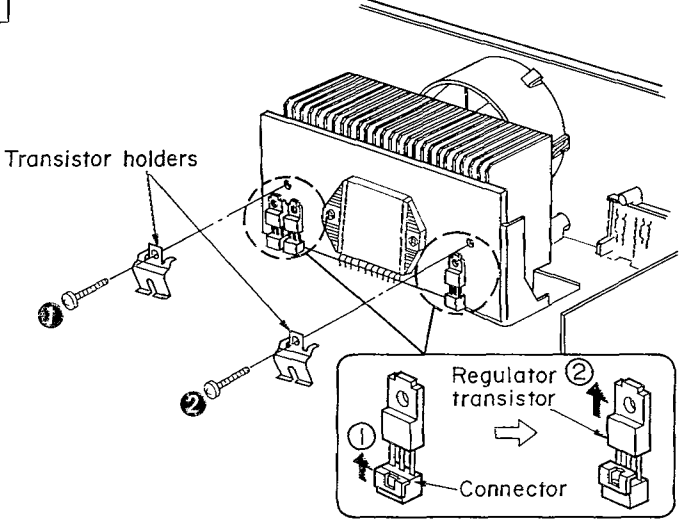
## "ATTENTION SERVICER"

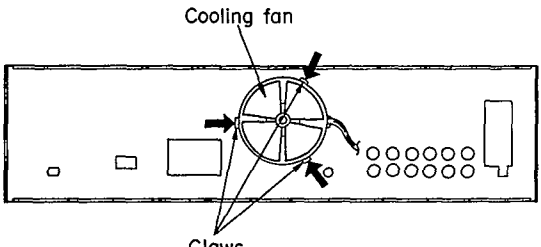
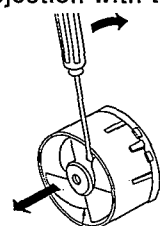
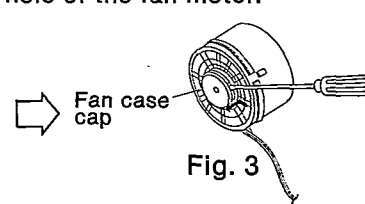
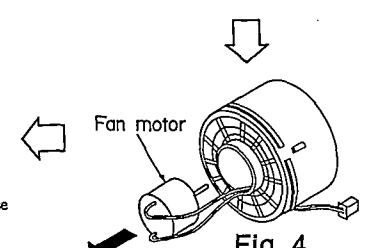
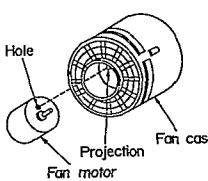
Some chassis components may have sharp edges. Be careful when disassembling and servicing.

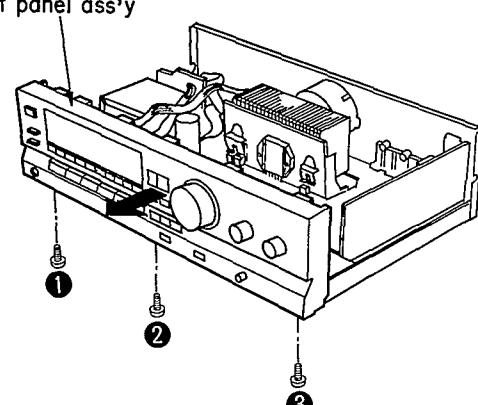
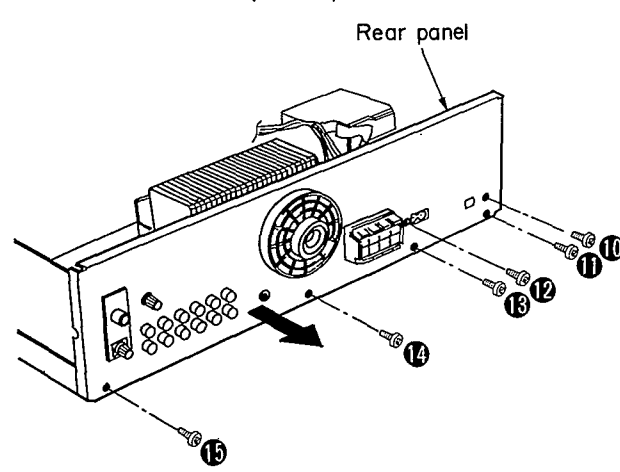
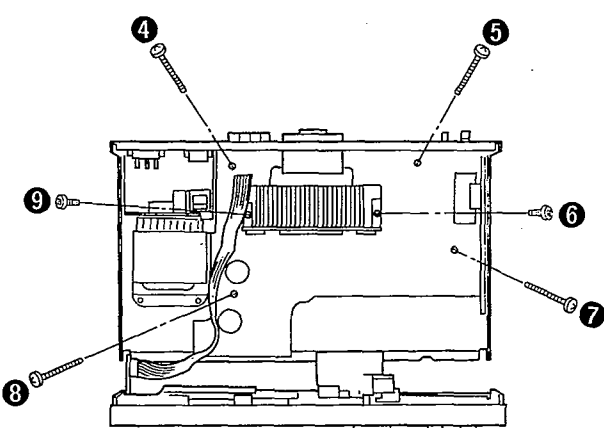
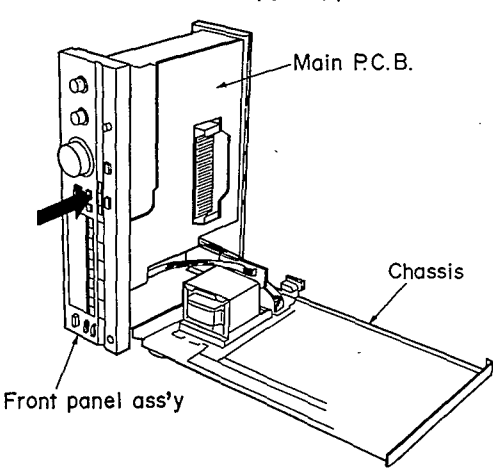
Ref. No. 1	Removal of the cabinet	Ref. No. 2	Removal of the front panel ass'y
Procedure 1	 <p>• Remove the 6 screws (①~⑥).</p>	Procedure 1→2	 <p>1. Remove the 1 flat cable (CN601). Front panel ass'y</p>  <p>2. Remove the 3 screws (①~③). 3. Remove the front panel ass'y in the direction of arrow.</p> <p><b>How to remove the flat cable</b></p> <p>1. Lift up the connector. 2. Pull out the flat cable.</p> 
Ref. No. 3	Removal of the speaker switch/headphones jack P.C.B.		
Procedure 1→2→3	 <p>• Remove the 2 screws (①, ②).</p>		
Ref. No. 4	Removal of the tone control P.C.B.		
Procedure 1→2→4	 <p>1. Remove the 2 tone control knobs and a balance knob.</p>		 <p>2. Remove the 5 screws (①~⑤).</p>

<div>Ref. No. 5</div>	<div>Removal of the volume P.C.B.</div>	<div>Ref. No. 6</div>	<div>Removal of the FL drive P.C.B.</div>
<div>Procedure 1→2→5</div>	<div><p>1. Pull out the volume knob. 2. Remove the nut. 3. Remove the 1 screw (❶). 4. Remove the volume P.C.B. in the direction of arrow.</p></div>	<div>Procedure 1→2→5→6</div>	<div><p>1. Remove the 5 screws (❶~❺). 2. Remove the FL drive P.C.B. in the direction of arrow.</p></div>
<div>Ref. No. 7</div>	<div>Removal of the power switch P.C.B. and Operation P.C.B.</div>	<div>Ref. No. 8</div>	<div>Removal of the rear panel</div>
<div>Procedure 1→2→5→6→7</div>	<div><p>• Remove the 13 screws (❶~❿³).</p></div>	<div>Procedure 1→8</div>	<div><p>1. Remove the 12 screws (❶~❿²). 2. Remove the 1 connector (CN651). 3. Remove the rear panel in the direction of arrow.</p></div>
<div>Ref. No. 9</div>	<div>Removal of the tuner P.C.B.</div>	<div>Ref. No. 10</div>	<div>Removal of the power supply P.C.B.</div>
<div>Procedure 1→8→9</div>	<div><p>1. Release the 1 claw. 2. Remove the tuner P.C.B. in the direction of arrow.</p></div>	<div>Procedure 1→8→10</div>	<div><p>1. Remove the 1 screw (❶). 2. Remove the 1 flat cable (CN702). 3. Remove the power supply P.C.B. in the direction of arrow.</p></div>



<b>Ref. No.</b> 11	<b>Removal of the power transformer (main)</b>	<b>Ref. No.</b> 12	<b>Removal of the main P.C.B.</b>
<b>Procedure</b> 1→8→10→11	 <p>Power transformer (main)</p> <ul style="list-style-type: none"> <li>• Remove the 4 screws (①~④).</li> </ul>	<b>Procedure</b> 1→2→8 →9→12	 <p>Main P.C.B.</p> <p>CN 702</p> <ol style="list-style-type: none"> <li>1. Remove the 1 flat cable (CN702).</li> <li>2. Remove the 6 screws (①~⑥).</li> </ol>
<b>Ref. No.</b> 13	<b>Removal of the power IC</b>	 <p>Power IC</p> <p>Unsolder the power IC</p> <ol style="list-style-type: none"> <li>1. Remove the 2 screws (①, ②).</li> <li>2. Unsolder the power IC.</li> </ol> <ul style="list-style-type: none"> <li>• <b>When mounting the power IC.</b> Apply silicone thermal compound (RFKX0002 or equivalent) to the rear of the power IC.</li> </ul>	
<b>Ref. No.</b> 14	<b>Removal of the regulator transistor</b>	 <p>Transistor holders</p> <p>Regulator transistor</p> <p>Connector</p> <ol style="list-style-type: none"> <li>1. Remove the 2 screws (①, ②).</li> <li>2. Remove the 2 transistor holders.</li> <li>3. Lift up the connector in the direction of arrow ①.</li> <li>4. Remove the regulator transistor in the direction of arrow ②.</li> </ol> <ul style="list-style-type: none"> <li>• <b>When mounting the regulator transistor.</b> Apply silicone thermal compound (RFKX0002 or equivalent) to the rear of the regulator transistor.</li> </ul>	

<b>Ref. No.</b> 15	<b>Removal of the cooling fan motor</b>
<b>Procedure</b> 1→8→15	<div><div><div>1. Release the 3 claws in the direction of arrow and remove the fan motor. (Refer to Fig. 1)</div><div>2. Insert a screwdriver at the root of the cooling fan. Force it out of the motor shaft. (Refer to Fig. 2)</div></div><div><div><p>Fig. 1</p></div><div><div><p>Fig. 2</p></div><div><div><p>Fig. 3</p></div><div><div><p>Fig. 4</p></div><div><div><p>Fig. 5</p></div></div><div><div>3. Remove the motor cover by used ⊖ screwdriver. (Refer to Fig. 3)</div><div>4. Remove the motor from the fancasing. (Refer to Fig. 4)</div><div>5. When mounting the motor fan, align the fan casing's projection with the hole of the fan motor.</div></div></div></div></div></div></div>

<b>Ref. No.</b> 16	<b>Check of the main P.C.B.</b>
<b>Procedure</b> 1→16	<div><div><div>• When checking the soldered surfaces of main P.C.B. and replacing the parts, do as show.</div><div><div><p>Front panel ass'y</p></div><div><p>Rear panel</p></div></div><div><div>1. Remove the 3 screws (1~3).</div><div>2. Remove the 6 screws (4~9).</div><div>3. Remove the 6 screws (10~15).</div><div>4. Remove the rear panel in the direction of arrow.</div><div>5. Remove the chassis.</div><div>6. Reinstall the front panel ass'y to the main P.C.B.</div></div><div><div><p>Main P.C.B.</p></div><div><p>Front panel ass'y</p></div></div></div></div>

## MEASUREMENTS AND ADJUSTMENTS

**Note:** For Z251 (AM (MW/LW) ANT and OSC coil), Z202 (AM (MW/LW)-IFT), they are supplied as adjusted parts. So, do not turn the cores of the parts. It is not necessary to adjust the AM (MW/LW) circuit.

### FM ADJUSTMENT

#### Control positions and equipment used

- FM signal generator (FM-SG).
- Distortion analyser
- DC electronic voltmeter (DC EVM)
- Frequency counter
- Choke coil (100 $\mu$ H)
- Resistor (100k $\Omega$ )

#### FM MONO DISTORTION ADJUSTMENT

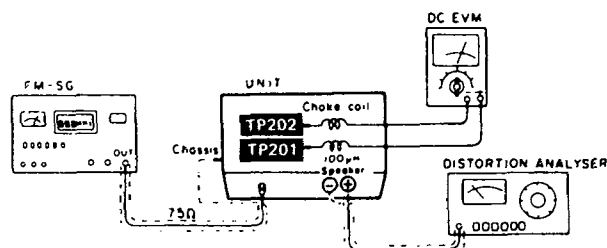
1. Test equipment connection is shown in figure.
2. Set the unit to "FM" position.
3. Set the radio frequency display and signal generator to 100.10MHz.
4. Adjust T201 core so that voltage measured in signal mode is 0mV ( $0 \pm 20$ mV) in 300mV range.
5. Adjust T202 so that the distortion factor of Lch is minimized.
6. Repeat step 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.....66dB

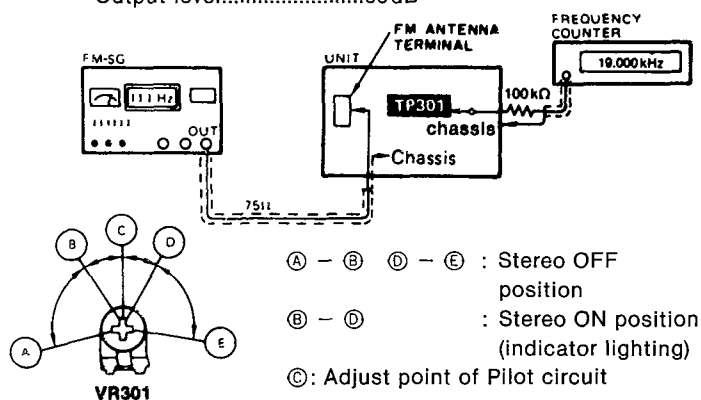


#### FM MPX VCO ADJUSTMENT

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 100.10MHz.
4. Adjust VR301 for  $19.00 \pm 0.03$ kHz on frequency counter reading.

#### FM SIGNAL GENERATOR CONDITION

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

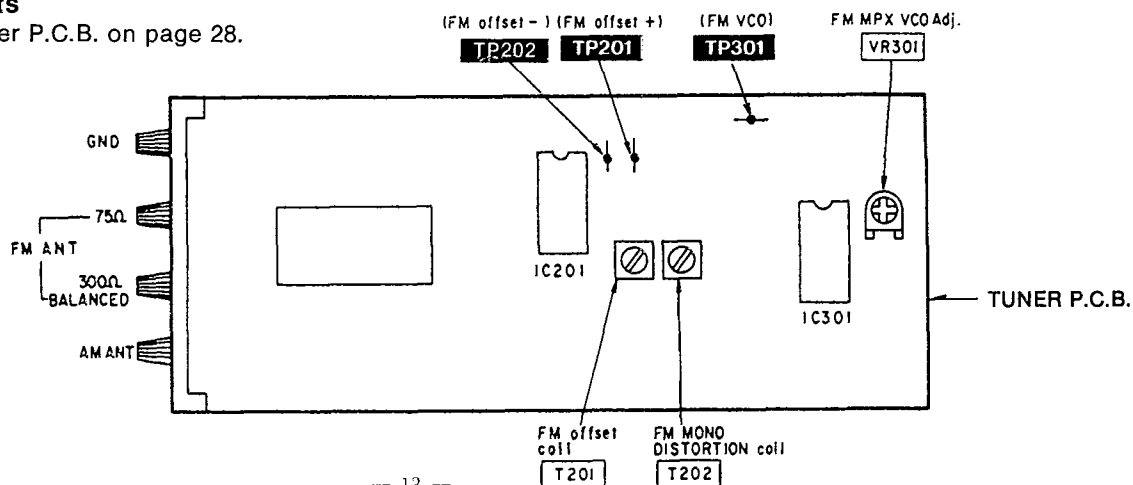


#### ★ USING ALTERNATE SYSTEM

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.

### Adjustment points

Please refer to tuner P.C.B. on page 28.



# **■ TERMINAL FUNCTION OF IC**

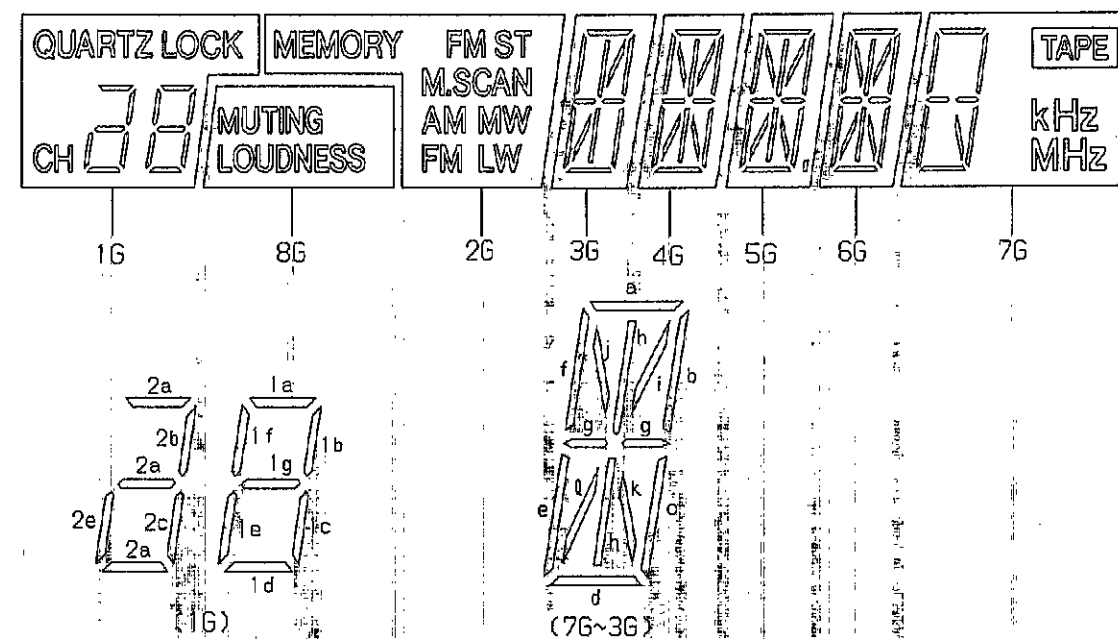
## **• IC901 (MN187125STV): Microcomputer**

Pin No.	Mark	I/O Division	Function
1 } 7	S0 } S6	O	Segment signal to FL display
8	Vpp	I	Power supply terminal to FL display
9	Vdd	I	Power supply terminal
10	OSC2	O	Crystal oscillator terminal (4.19MHz)
11	OSC1	I	
12	Vss	—	GND terminal
13	XI	—	Not used, connected to GND
14	XO	—	Not used, open
15	KEY2	I	Key return signal
16	KEY1		
17	SD	I	Received signal detect terminal
18	FM ST	I	Stereo signal detect terminal
19	F	O	Sense of rotation for volume motor control terminal
20	R		
21	5-6	—	Not used, open
22	ST3	—	Level shift control terminal Not used, connected to resistor.
23	REMOTE	I	Remote control terminal
24	HOLD	I	Service interruption detect terminal
25	ST1	O	Level shift control terminal
26	OFF	—	Not used, connected to GND
27	RLY	O	Relay control terminal
28	ST2	—	Level shift control terminal Not used, connected to resistor.
29	RESET	I	Reset detect terminal
30	CK1	O	Serial clock signal

Pin No.	Mark	I/O Division	Function
31	CE	O	Chip enable terminal
32	DATA1	O	Serial data signal
33	CK2	—	Serial clock signal Not used, open
34	DATA2	—	Serial data signal Not used, open
35	DAC STOP/ VIDEO SELECT	—	Video selector control terminal Not used, connected to resistor.
36	SYNC	—	Not used, open
37	CM	—	Not used, connected to GND
38	3ST	—	Not used, connected to resistor
39	FM mono	O	Forcible monaural signal
40	RFM	O	Muting control to tuner circuit
41	A	—	Rotary tuning control terminal Not used, connected to resistor.
42	B		
43 } 45	KS1 } KS3	O	Key scan signal
46 } 53	DGT0 } DGT7	O	Digit signal to FL display
54	INITIAL	I	Serial data detect terminal
55	DAC/SUR	—	Muting control signal Not used, connected to resistor.
56	LOU	O	Loudness control signal
57	AFM	O	Muting control to amplifier circuit
58	−20dB	O	Muting control (−20dB) to amplifier circuit
59 } 64	S7 } S12	O	Segment signal to FL display

## INTERNAL CONNECTION OF FL

- **Grid connection diagram**



- **Anode connection table**

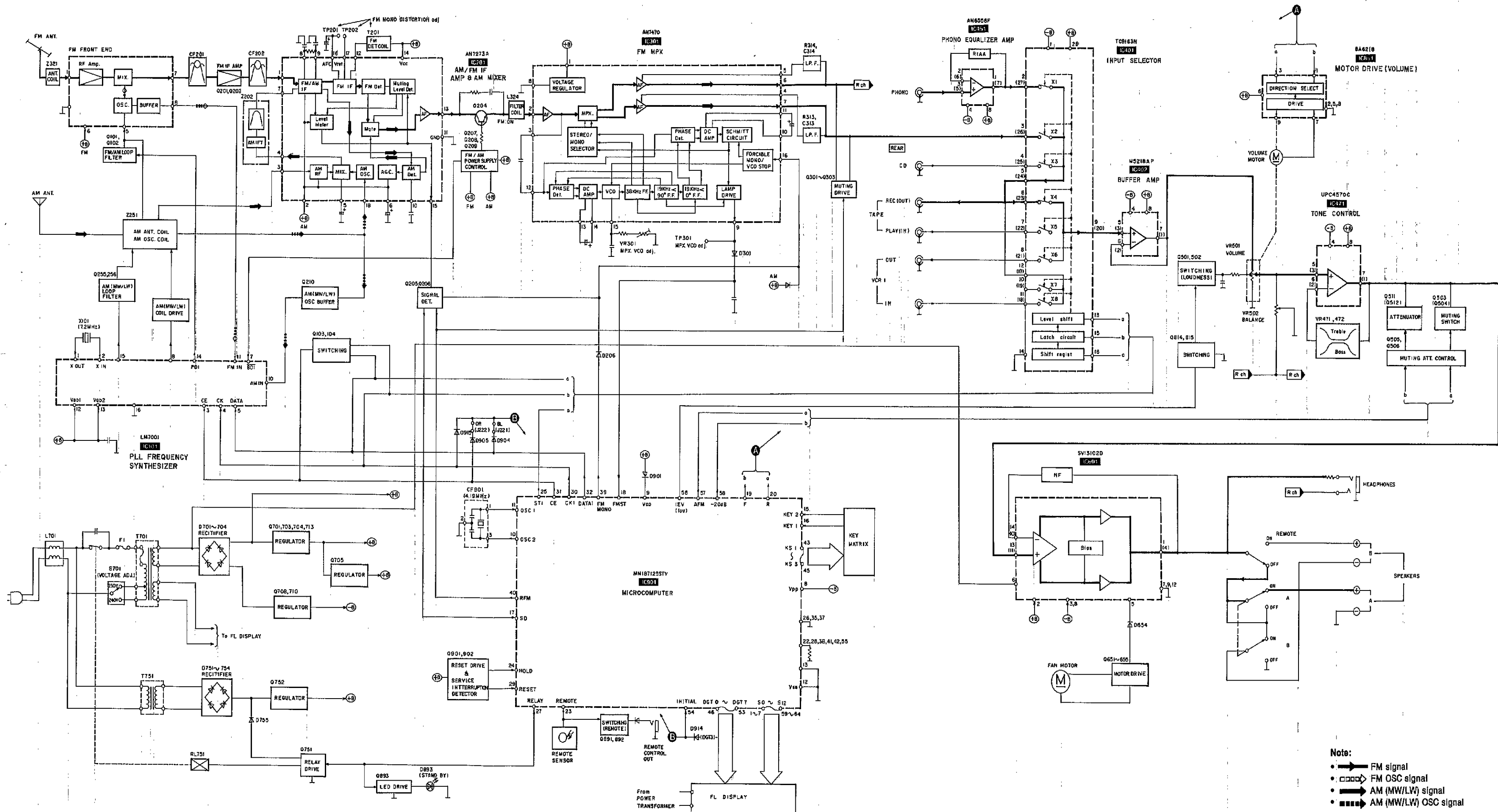
	1G	2G	3G	4G	5G	6G	7G	8G
P1	1a	-	a	a	a	a	a	-
P 2	2b	-	i, l	j	j	j	-	-
P 3	2c	AM	h	h	h	h	TAPE	-
P 4	2a	MW	-	i	i	i	-	-
P 5	1f	FM	f	f	f	f	f	-
P 6	1b	LW	b	b	b	b	b	-
P 7	1g	-	g	g	g	g	g	-
P 8	1e	-	e	e	e	e	e	-
P 9	1c	MSCAN	c	c	c	c	c	MUTING
P10	2e	MEMORY	-	l	l	l	k Hz	LOUDNESS
P11	1d	-	d	d	d	d	d	-
P12	QUARTZ LOCK	-	-	k	k	k	k	-
P13	CH	FM ST	-	-	l	-	MHz	-

- **Pin connection**



[illegible]

NOTE 1) F1,F2 --- Filament  
2) NP ----- No pin  
3) NC ----- No connection  
4) 1G~8G --- Grid

## ■ BLOCK DIAGRAM



**Note:**

-  FM signal
-  FM OSC signal
-  AM (MW/LW) signal
-  AM (MW/LW) OSC signal

\* ( ) indicates Pin No. of right channel.

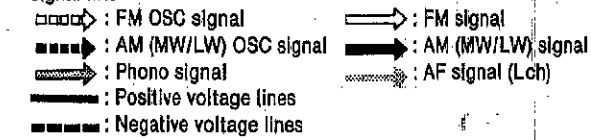
## ■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

**(Parts list on pages 36~40)**

**Note 1:**

- S801 : Speaker selectors (SPEAKERS) switches.  
[S801-1: A, S801-2: B]
- S701 : Voltage adjust switch.
- S901~910 : Preset-tuning (1-10) (30 CHANNEL RANDOM  
PRESET TUNING) switches.  
[S901: 1, S902: 2, S903: 3, S904: 4,  
S905: 5, S906: 6, S907: 7, S908: 8,  
S909: 9, S910: 10]
- S914 : Power (POWER) switch.
- S916, 917,  
922, 923 : Input selector switches.  
[S916: PHONO, S917: TUNER]  
[S922: VCR 1, S923: CD]
- S918 : Tape monitor (TAPE MONITOR/VCR 2)  
switch.
- S925 : Loudness (LOUDNESS) switch.
- S929, 936 : Tuning (TUNING) switches.  
[S929: DOWN, S936: UP]
- S930~932 : Band selector switches.  
[S930: FM, S931: LW, S932: MW]
- S933 : FM mode selector (FM MODE) switch.
- S934 : Memory scan (MEMORY SCAN) switch.
- S935 : Memory (MEMORY) switch.

- Signal line



- Important safety notice:

Components identified by  $\Delta$  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 signal reception mode.

- The supply part number is described alone in the replacement parts list.

Ref. No.	Production Part No.	Supply Part No.
IC301	AN7470	SVIUPC1161C3
Z891	RCDHC-677-E	RCDHC-677

**\* 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 alminum 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.

↳ **Note 2:** -

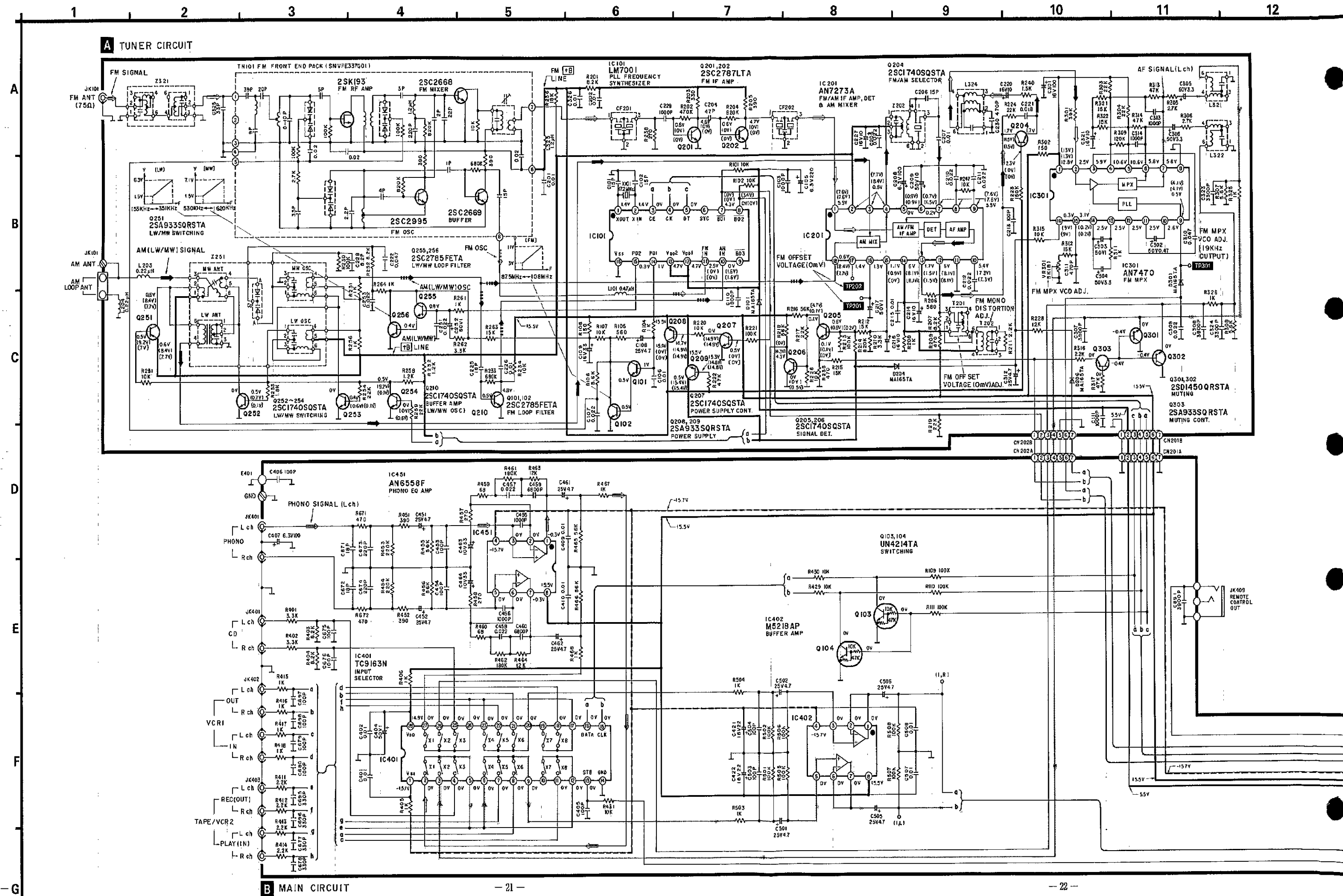
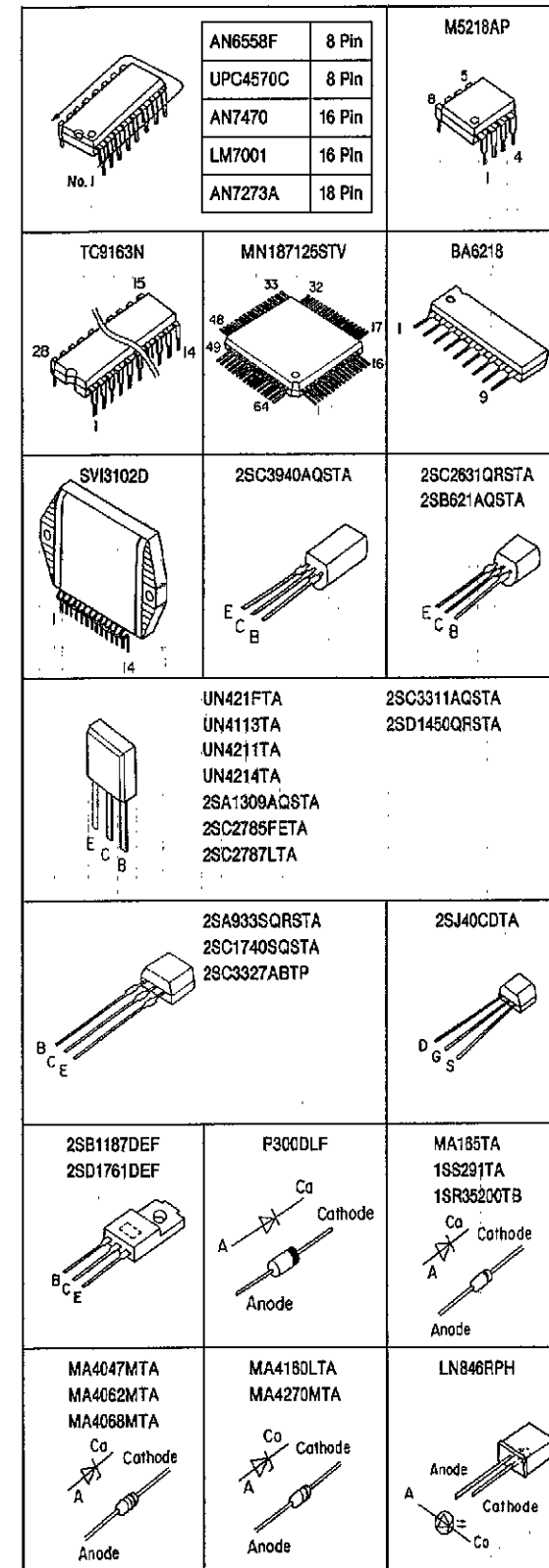
- Use of ceramic filters in pairs

The ceramic filters (CF201, CF202) for FM-IF circuit are available in three ranks. For this circuit, be sure to use the ceramics of the same rank in a pair. At repairing and replacement, pay close attention to the short jumpers (BL, OR) for use as different short jumpers must be used depending on each rank of the ceramic filters.

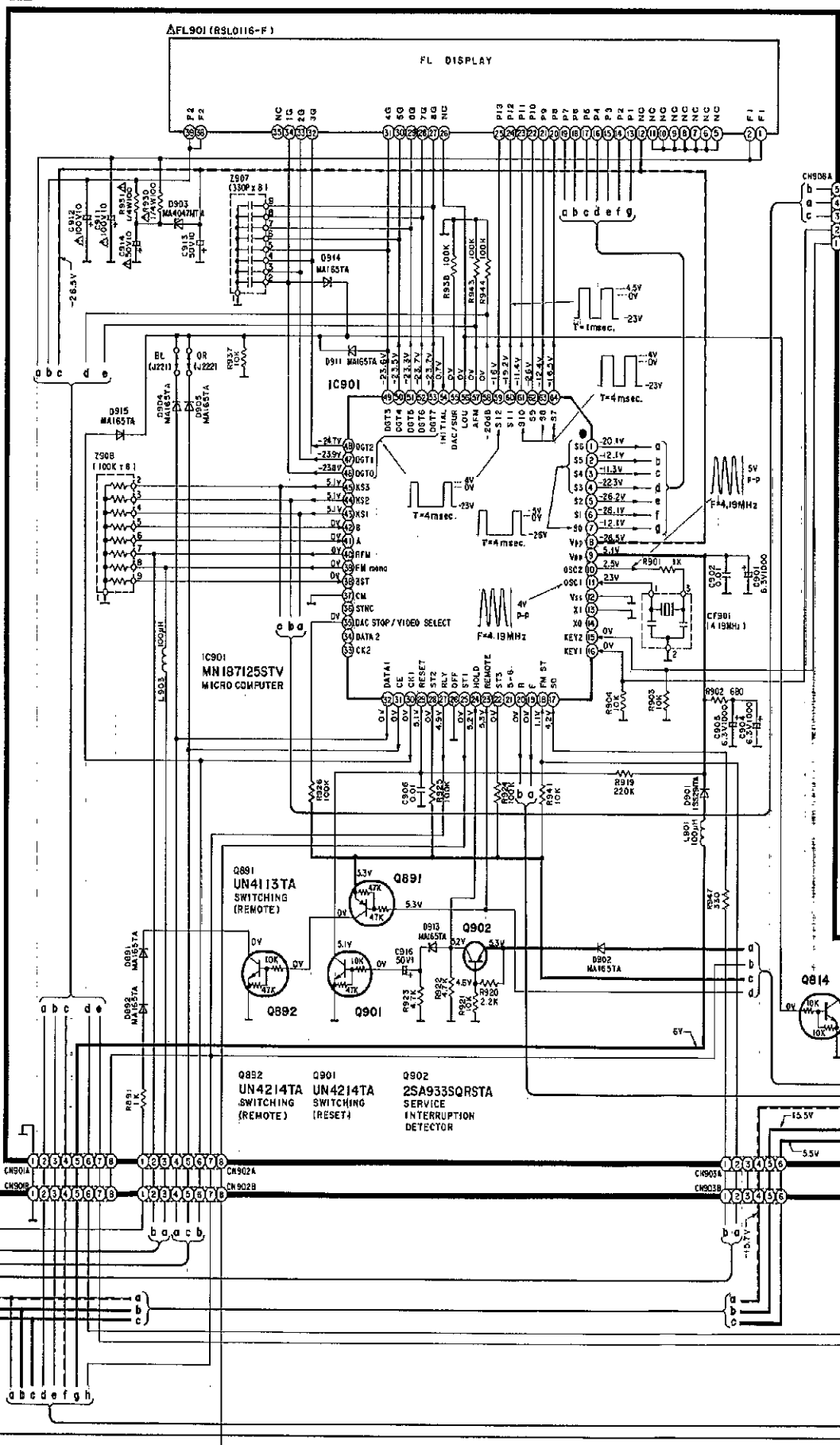
Color marking  
(Blue, Red or

COLOUR (Rank)	BL (J221)	OR (J222)	CENTER FREQUENCY
Blue	○	×	10.675MHz
Red	○	○	10.700MHz
Orange	×	○	10.725MHz

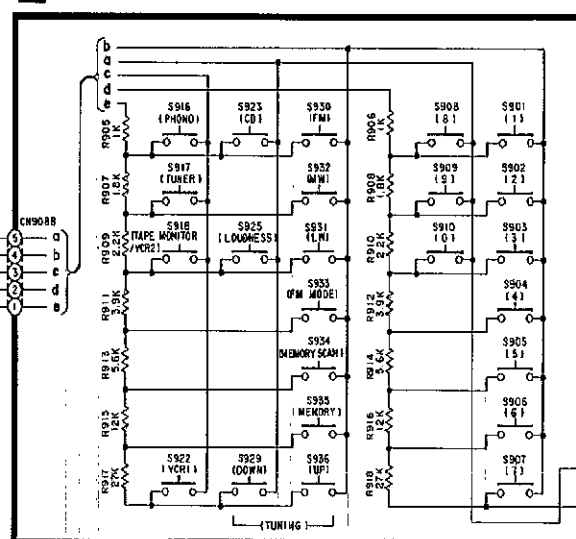
**Note:** ○ mark; short jumper is used.  
× mark; short jumper is not used.



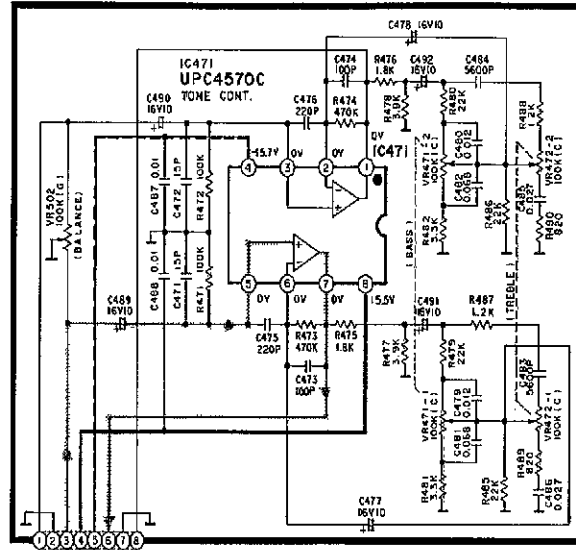
C FL DRIVE CIRCUIT



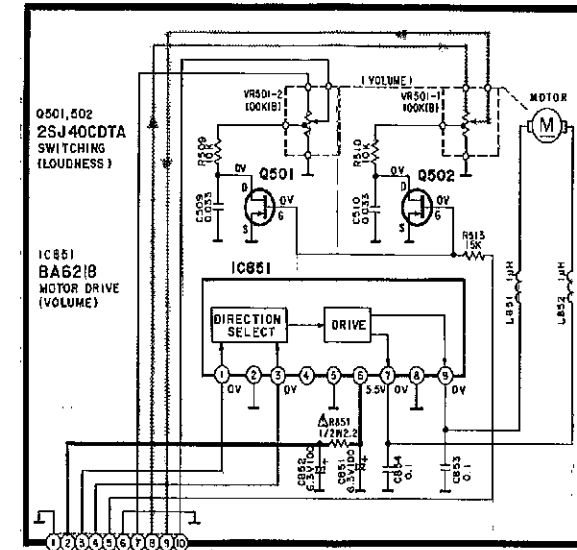
D OPERATION CIRCUIT



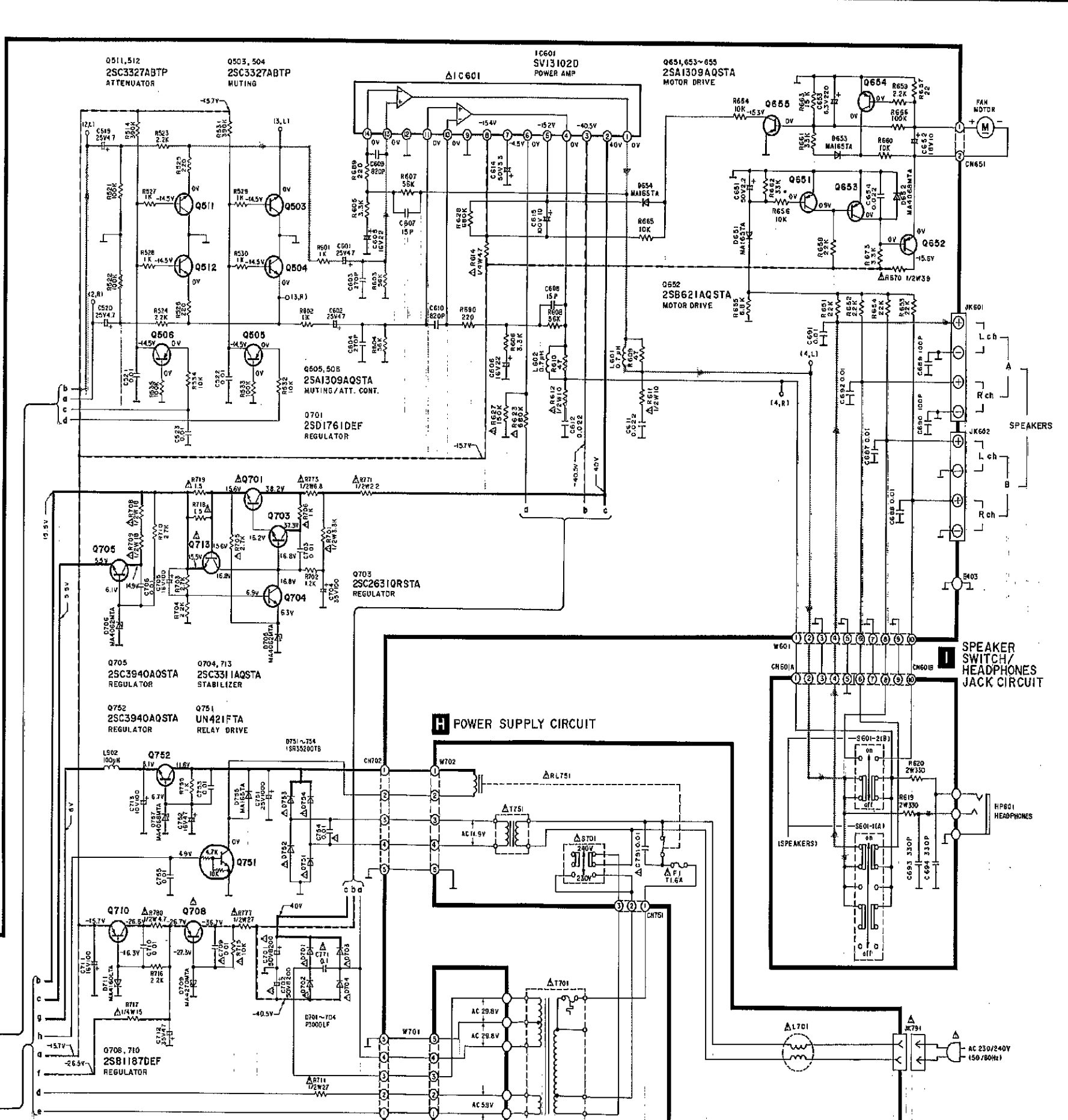
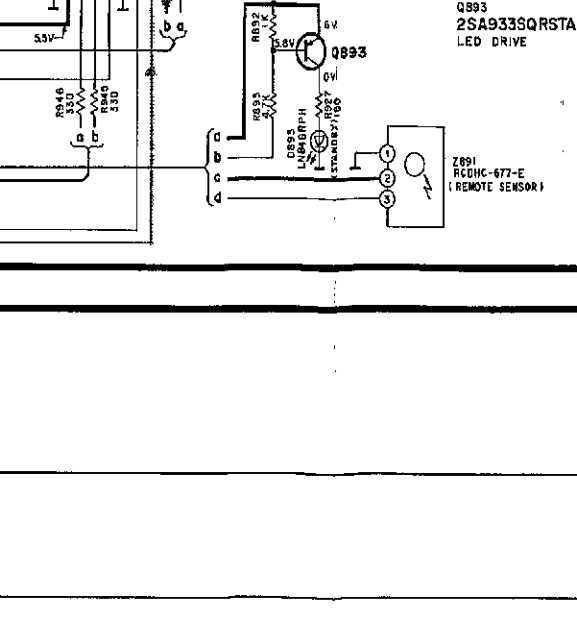
E TONE CONTROL CIRCUIT



F VOLUME CIRCUIT

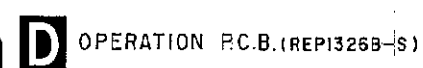
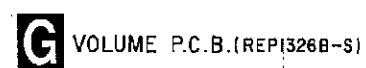
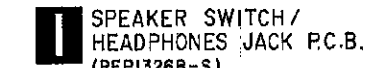


G POWER SWITCH CIRCUIT

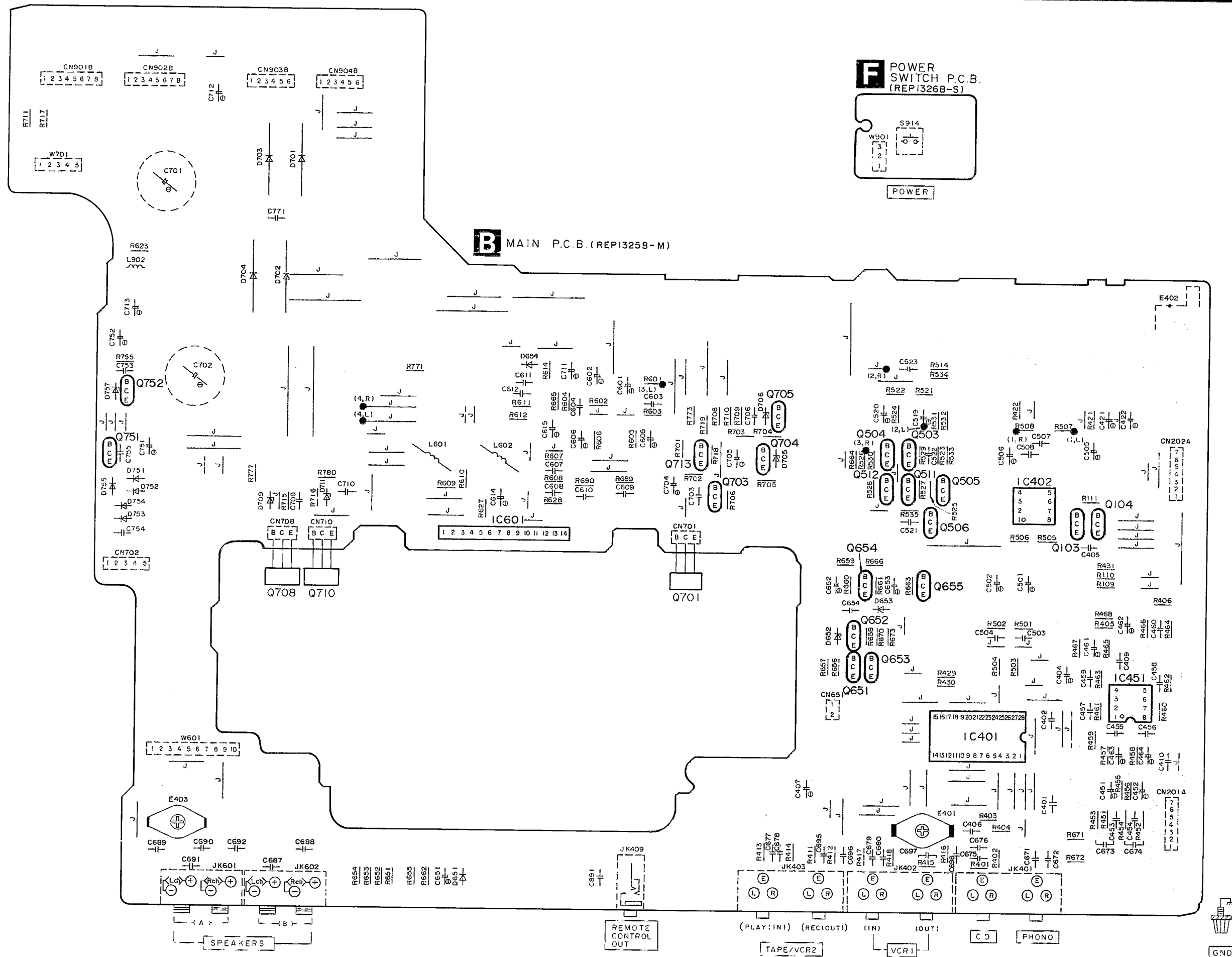


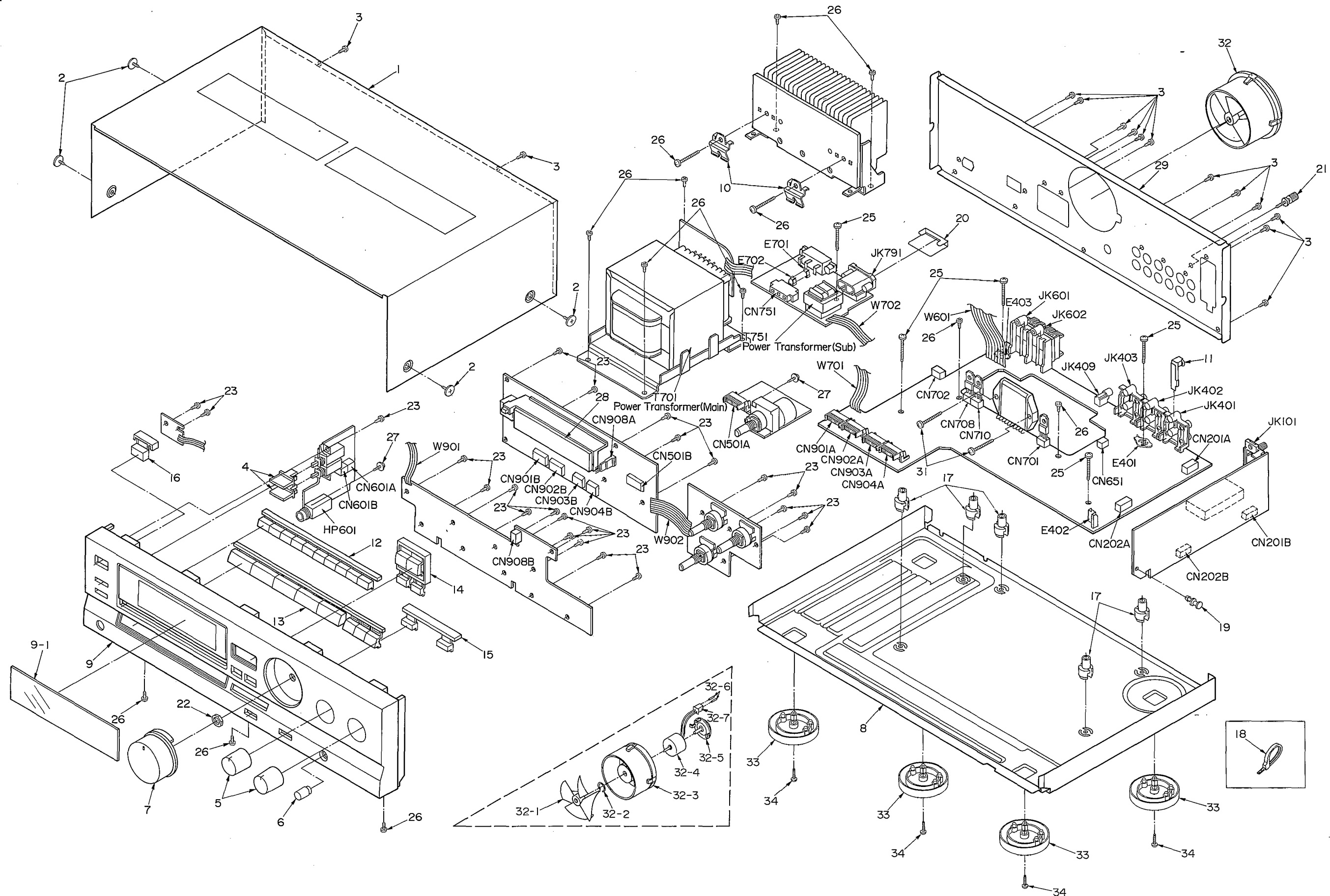


## ■ PRINTED CIRCUIT BOARDS









# REPLACEMENT PARTS LIST

## Notes: \*Important safety notice:

Components identified by  $\Delta$  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.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
						PACKING MATERIAL	
		CABINET AND CHASSIS					
1	RKM0036B-K	CABINET		P1	RP61263	PACKING CASE	
2	SNE2129-3	SCREW		P2	RPW0328	PADS	
3	XTBS3+8JFZ1	SCREW		P3	XZB52X60A01Z	PROTECTION BAG (UNIT)	
4	RGU0101	BUTTON, SPEAKERS		P4	XZB24X34C04	PROTECTION BAG (ACCESSORIES)	
5	RGW0072	KNOB, TONE CONTROLS		P5	RPQ0164	PAD	
6	RGW0073	KNOB, BALANCE				ACCESSORIES	
7	RGW0084	KNOB, VOLUME					
8	RMK0035-4	CHASSIS		A1	RFKSAGX130EK	INST. MANUAL ASS'Y	(E)
9	RFGAGX130EK	FRONT PANEL ASS'Y		A1	RQT1550-B	INSTRUCTION MANUAL	(EB)
9-1	RKW0089C-Q	TRANSPARENT PANEL		A2	RQA0013	WARRANTY CARD	
10	RMC0158	TRANSISTOR HOLDER		A3	RQCB0169	SERVICENTER LIST	
11	RSC0105	SHIELD PLATE		A4	RJA0019-1K	AC POWER SUPPLY CORD	(E) $\Delta$
12	RGU0344A-K1	BUTTON, PRESET TUNING		A4	SJA193	AC POWER SUPPLY CORD	(EB) $\Delta$
13	RGU0345E-K1	BUTTON, INPUT SELECTOR		A5	RSA0007	FM INDOOR ANTENNA	
14	RGU0347-K1	BUTTON, TUNING		A6	SPB1163T	AM LOOP ANTENNA	
15	RGU0348A-K1	BUTTON, MODE/LOUDNESS		A6-1	SMA231M	AM ANTENNA HOLDER	
16	RGU0380	BUTTON, POWER		A6-2	XTN3+10AFZ	SCREW	
17	SHE187-2	P. C. B. SUPPORT		A7	RAK-SA302E	REMOTE CONTROL TRANSMITTER	
18	SHR301	FASTNER		A7-1	RKK0020-K	BATTERY COVER	FOR R/C TRANSMITTER
19	SHR8006	SPACER		A8	SJP9009	ATTACHMENT PLUG	(EB) $\Delta$
20	RMZ0204	AC INLET BARRIER		A9	RQLA0134	VOLT. CAUTION LABEL	
21	SNE2123	GND TERMINAL					
22	XNS7FZ	NUT					
23	XTBS26+8J	SCREW					
25	XTB3+20JFZ	SCREW					
26	XTB3+8JFZ	SCREW					
27	XTWS3+10Q	SCREW					
28	RMN0170	FL. HOLDER					
29	RGR0145A-A1	REAR PANEL	(E)				
29	RGR0145A-B1	REAR PANEL	(EB)				
31	XTW3+15T	SCREW					
32	SYE1128-2	COOLING FAN UNIT					
32-1	SHE232	COOLING FAN					
32-2	SJS271	SPRING					
32-3	SHE233-1	COOLING FAN CASE					
32-4	MDN-4RB4MRC	MOTOR					
32-5	SHE234	COOLING FAN CASE CAP					
32-6	SJT783	CONNECTOR TERMINAL					
32-7	SJS5215	SOCKET (2P)					
33	RKA0009-1	FOOT					
34	XTB3-6J	SCREW					

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		D101	MA165	DIODE	
				D204	MA165	DIODE	
				D206	MA165	DIODE	
IC101	LM7001	IC, PLL FREQ. SYNTHESIZER		D301	MA165	DIODE	
IC201	AN7273A	IC, AM/FM IF AMP&MIXER		D651	MA165	DIODE	
IC301	SVIUPC1161C3	IC, FM MPX		D652	MA4068M	DIODE	
IC401	TC9163N	IC, INPUT SELECTOR		D653, 654	MA165	DIODE	
IC402	M5218AP	IC, BUFFER AMP		D701-704	P300DLF	DIODE	△
IC451	AN6558F	IC, PHONO EQ. AMP		D705, 706	MA4062MTA	DIODE	
IC471	UPC4570C	IC, TONE CONTROL		D709	MA4270	DIODE	
IC601	SVI3102D	IC, POWER AMP	△	D711	MA4160-L	DIODE	
IC851	BA6218	IC, MOTOR DRIVE		D751-754	1SR35200TB	DIODE	△
IC901	MN187125STV	IC, MICRO COMPUTER		D755	MA165	DIODE	
		TRANSISTOR(S)		D757	MA4068M	DIODE	
				D891, 892	MA165	DIODE	
				D893	LN846RPH	L. E. D.	
Q101, 102	2SC2785FE	TRANSISTOR		D901	1SS291TA	DIODE	
Q103, 104	UN4214TA	TRANSISTOR		D902	MA165	DIODE	
Q201, 202	2SC2787L	TRANSISTOR		D903	MA4047MTA	DIODE	
Q204-207	2SC1740SQ	TRANSISTOR		D904, 905	MA165	DIODE	
Q208, 209	2SA933SQR	TRANSISTOR		D911	MA165	DIODE	
Q210	2SC1740SQ	TRANSISTOR		D913, 914	MA165	DIODE	
Q251	2SA933SQR	TRANSISTOR		D915	MA165	DIODE	
Q252-254	2SC1740SQ	TRANSISTOR					
Q255, 256	2SC2785FE	TRANSISTOR				VARIABLE RESISTOR(S)	
Q301, 302	2SD1450QRSTA	TRANSISTOR					
Q303	2SA933SQR	TRANSISTOR		VR301	EVNDXAA00B53	V. R. MPX VCO ADJ.	
Q501, 502	2SJ40CDTA	TRANSISTOR		VR471, 472	EW2XAF25C15	V. R. TONE CONTROL	
Q503, 504	2SC3327-A	TRANSISTOR		VR501	EUMGVYF20B15	V. R. VOLUME CONTROL	
Q505, 506	2SA1309A-R	TRANSISTOR		VR502	EWHFDA014G15	V. R. BALANCE CONTROL	
Q511, 512	2SC3327-A	TRANSISTOR					
Q651	2SA1309A-R	TRANSISTOR				COMPONENT COMBINATION(S)	
Q652	2SB621AQSTA	TRANSISTOR					
Q653-655	2SA1309A-R	TRANSISTOR		Z202	SLI7Z101-T	COMPONENT COMBINATION	
Q701	2SD1761DEF	TRANSISTOR	△	Z251	RLA6Z002-T	COMPONENT COMBINATION	
Q703	2SC2631QRSTA	TRANSISTOR		Z321	SLA4Z13-Z	COMPONENT COMBINATION	
Q704	2SC3311A-Q	TRANSISTOR		Z891	RCDHC-677	REMOTE SENSOR	
Q705	2SC3940AQSTA	TRANSISTOR		Z907	EXFP8331MW	COMPONENT COMBINATION	
Q708	2SB1187DEF	TRANSISTOR	△	Z908	EXBF9E104J	COMPONENT COMBINATION	
Q710	2SB1187DEF	TRANSISTOR					
Q713	2SC3311A-Q	TRANSISTOR	△			COIL(S)	
Q751	UN421FTA	TRANSISTOR					
Q752	2SC3940AQSTA	TRANSISTOR		L101	RLQZPR47KT-Y	COIL	
Q814, 815	UN4211	TRANSISTOR		L203, 204	ELEPKR22MA	COIL	
Q891	UN4113TA	TRANSISTOR		L321, 322	RLM2B003-K	COIL	
Q892	UN4214TA	TRANSISTOR		L324	SLM1B10-1M	COIL	
Q893	2SA933SQR	TRANSISTOR		L325	RLQZP1R2KT-Y	COIL	
Q901	UN4214TA	TRANSISTOR		L601, 602	SLQY07G-40	COIL	
Q902	2SA933SQR	TRANSISTOR		L701	SLQZ650MH49	COIL	△
		DIODE(S)		L851, 852	RLQZP1R0KT-Y	COIL	
				L901, 902	ELEPK101KA	COIL	
				L903	ELEXT101KA9	COIL	

Ref.No.	Part No.	Part Name & Description	Remarks	Ref.No.	Part No.	Part Name & Description	Remarks
		TRANSFORMER(S)		S932	EVQ21405R	SW, BAND SELECT (MW)	
				S933	EVQ21405R	SW, FM MODE	
				S934	EVQ21405R	SW, MEMORY SCAN	
T201	RL14B002-Z	FM OFFSET		S935	EVQ21405R	SW, MEMORY	
T202	RL14B003-Z	FM OFFSET		S936	EVQ21405R	SW, TUNING (UP)	
T701	RTP1N5B011-V	POWER TRANSFORMER (MAIN)	△			RELAY (S)	
T751	RTP115E003-V	POWER TRANSFORMER (SUB)	△				
		FILTER(S) & OSCILLATOR(S)		RL751	RSY0012-0	RELAY	△
						CONNECTOR(S) & SOCKET(S)	
CF201, 202	RLF2KF2M01LA	RED (10.700MHz)		CN201A	RJT057W007-1	CONNECTOR (7P)	
CF201, 202	RLF2KF2M01LB	BLUE (10.675MHz)		CN201B	RJU057W007	SOCKET (7P)	
CF201, 202	RLF2KF2M01LC	ORANGE (10.725MHz)		CN202A	RJT057W007-1	CONNECTOR (7P)	
CF901	EFQGC4194T4	OSCILLATOR (4.19MHz)		CN202B	RJU057W007	SOCKET (7P)	
X101	SVQ49U722-S	OSCILLATOR (7.2MHz)		CN501A	RJU003K010M1	SOCKET (10P)	
		FL DISPLAY(S)		CN501B	RJT003K010-1	CONNECTOR (10P)	
FL901	RSL0116-F	FL DISPLAY	△	CN601A	RJS1A1705	CONNECTOR (5P)	
		FM FRONT END PACK(S)		CN601B	RJS1A1705	CONNECTOR (5P)	
				CN651	SJT3213	CONNECTOR (2P)	
TN101	SNVFE337G01	FM FRONT END PACK		CN701	RJS1A1703	CONNECTOR (3P)	
		FUSE (S)		CN702	RJS1A1705	CONNECTOR (5P)	
				CN708	RJS1A1703	CONNECTOR (3P)	
F1	XBA2C16TB0	FUSE (1.6A, 250V)	△	CN710	RJS1A1703	CONNECTOR (3P)	
		SWITCH(ES)		CN751	SJS305-1	SOCKET (3P)	
				CN901A	RJT003K008-1	CONNECTOR (8P)	
S601	RSP2008-J	SW, SPEAKERS		CN901B	RJU003K008M1	SOCKET (8P)	
S701	ESD26606A	SW, VOLTAGE ADJ.	△	CN902A	RJT003K008-1	CONNECTOR (8P)	
S901	EVQ21405R	SW, PRESET TUNING 1		CN902B	RJU003K008M1	SOCKET (8P)	
S902	EVQ21405R	SW, PRESET TUNING 2		CN903A	RJT003K006-1	CONNECTOR (6P)	
S903	EVQ21405R	SW, PRESET TUNING 3		CN903B	RJU003K006M1	SOCKET (6P)	
S904	EVQ21405R	SW, PRESET TUNING 4		CN904A	RJT003K006-1	CONNECTOR (6P)	
S905	EVQ21405R	SW, PRESET TUNING 5		CN904B	RJU003K006M1	SOCKET (6P)	
S906	EVQ21405R	SW, PRESET TUNING 6		CN908A	SJT30548BB1	CONNECTOR (5P)	
S907	EVQ21405R	SW, PRESET TUNING 7		CN908B	SJS50581BB	SOCKET (5P)	
S908	EVQ21405R	SW, PRESET TUNING 8				GND PLATE (S)	
S909	EVQ21405R	SW, PRESET TUNING 9		E401	SNE1004-1	GND PLATE	
S910	EVQ21405R	SW, PRESET TUNING 0		E402	SME103-6	GND PLATE	
S914	EVQ21405R	SW, POWER		E403	SNE1004-1	GND PLATE	
S916	EVQ21405R	SW, INPUT SELECT, PHONO		E701, 702	EYF52BC	FUSE HOLDER	
S917	EVQ21405R	SW, INPUT SELECT, TUNER				JACK(S)	
S918	EVQ21405R	SW, INPUT SELECT, TAPE/VC R2					
S922	EVQ21405R	SW, INPUT SELECT, VC R1		JK101	RJH4202	ANTENNA CONNECTION TERMINAL	
S923	EVQ21405R	SW, INPUT SELECT, CD		JK401	SJF3069N	PHONO, CD TERMINAL	
S925	EVQ21405R	SW, LOUDNESS		JK402	SJF3069N	VC R1 TERMINAL	
S929	EVQ21405R	SW, TUNING (DOWN)		JK403	SJF3069N	TAPE/VC R2 TERMINAL	
S930	EVQ21405R	SW, BAND SELECT (FM)		JK409	RJJ33TR01	REMOTE CONTROL OUT TERMINAL	
S931	EVQ21405R	SW, BAND SELECT (LW)		JK601	RJR0054	SPEAKER CONNECTER, A	

Ref. No.	Part No.	Part Name & Description	Remarks				
JK602	RJR0054	SPEAKER CONNECTTER, B					
JK791	SJS9236	AC INLET	△				
HP601	RJJ63TS01	HEADPHONES JACK					
		FLAT CABLE(S)					
W601	RWJ1810340KQ	FLAT CABLE (10P)					
W701	RWJ1805260KK	FLAT CABLE (5P)					
W702	RWJ1805220KQ	FLAT CABLE (5P)					
W901	RWJ1803080KK	FLAT CABLE (3P)					
W902	RWJ1808080KC	FLAT CABLE (8P)					

## RESISTORS & CAPACITORS

Notes : \* Capacity values 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	R218	ERDS2TJ563	1/4W 56K	R263	ERDS2TJ153	1/4W 15K
			R219	ERDS2TJ223	1/4W 22K	R264	ERDS2TJ102	1/4W 1K
			R220	ERDS2TJ103	1/4W 10K	R301	ERDS2TJ393	1/4W 39K
R101	ERDS2TJ103	1/4W 10K	R221	ERDS2TJ104	1/4W 100K	R302	ERDS2TJ151	1/4W 150
R102	ERDS2TJ103	1/4W 10K	R222	ERDS2TJ473	1/4W 47K	R303, 304	ERDS2TJ223	1/4W 22K
R104	ERDS2TJ102	1/4W 1K	R223	ERDS2TJ154	1/4W 150K	R305, 306	ERDS2TJ272T	1/4W 2.7K
R105	ERDS2TJ561	1/4W 560	R224	ERDS2TJ223	1/4W 22K	R307, 308	ERDS2TJ562	1/4W 5.6K
R106	ERDS2TJ562	1/4W 5.6K	R226	ERDS2TJ103	1/4W 10K	R309	ERDS2TJ124T	1/4W 120K
R107	ERDS2TJ103	1/4W 10K	R228	ERDS2TJ123	1/4W 12K	R311	ERDS2TJ102	1/4W 1K
R108	ERDS2TJ151	1/4W 150	R230	ERDS2TJ104	1/4W 100K	R312	ERDS2TJ153	1/4W 15K
R109-111	ERDS2TJ104	1/4W 100K	R231	ERDS2TJ102	1/4W 1K	R313, 314	ERDS2TJ473	1/4W 47K
R201	ERDS2TJ822	1/4W 8.2K	R232	ERDS2TJ122	1/4W 1.2K	R315	ERDS2TJ103	1/4W 10K
R202	ERDS2TJ474	1/4W 470K	R233	ERDS2TJ684	1/4W 680K	R316	ERDS2TJ222	1/4W 2.2K
R203	ERDS2TJ331	1/4W 330	R234	ERDS2TJ103	1/4W 10K	R317	ERDS2TJ473	1/4W 47K
R204	ERDS2TJ824	1/4W 820K	R235	ERDS2TJ471	1/4W 470	R321, 322	ERDS2TJ153	1/4W 15K
R205	ERDS2TJ391	1/4W 390	R236	ERDS2TJ183T	1/4W 18K	R325, 326	ERDS2TJ102	1/4W 1K
R206	ERDS2TJ561	1/4W 560	R238	ERDS2TJ271	1/4W 270	R401, 402	ERDS2TJ332	1/4W 3.3K
R207	ERDS2TJ822	1/4W 8.2K	R240	ERDS2TJ152	1/4W 1.5K	R403, 404	ERDS2TJ822	1/4W 8.2K
R208	ERDS2TJ102	1/4W 1K	R247	ERDS2TJ103	1/4W 10K	R405, 406	ERDS2TJ102	1/4W 1K
R209	ERDS2TJ471	1/4W 470	R251	ERDS2TJ103	1/4W 10K	R411-414	ERDS2TJ222	1/4W 2.2K
R210	ERDS2TJ332	1/4W 3.3K	R252	ERDS2TJ822	1/4W 8.2K	R415-418	ERDS2TJ102	1/4W 1K
R211	ERDS2TJ222	1/4W 2.2K	R253	ERDS2TJ182	1/4W 1.8K	R421, 422	ERDS2TJ222	1/4W 2.2K
R212	ERDS2TJ153	1/4W 15K	R254	ERDS2TJ223	1/4W 22K	R429-431	ERDS2TJ103	1/4W 10K
R213	ERDS2TJ104	1/4W 100K	R256	ERDS2TJ102	1/4W 1K	R451, 452	ERDS2TJ391	1/4W 390
R214	ERDS2TJ824	1/4W 820K	R258	ERDS2TJ122	1/4W 1.2K	R453, 454	ERDS2TJ224T	1/4W 220K
R215	ERDS2TJ153	1/4W 15K	R259	ERDS2TJ223	1/4W 22K	R455, 456	ERDS2TJ563	1/4W 56K
R216	ERDS2TJ563	1/4W 56K	R261	ERDS2TJ102	1/4W 1K	R457, 458	ERDS2TJ271	1/4W 270
R217	ERDS2TJ223	1/4W 22K	R262	ERDS2TJ332	1/4W 3.3K	R459, 460	ERDS2TJ680T	1/4W 68

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
R461, 462	ERDS2TJ184T	1/4W 180K	R673	ERDS2TJ332	1/4W 3. 3K	C106	ECKR1H103ZF5	50V 0. 01U
R463, 464	ERDS2TJ123	1/4W 12K	R689, 690	ERDS2TJ221	1/4W 220	C107	ECKT1H223ZF	50V 0. 022U
R465, 466	ERDS2TJ563	1/4W 56K	R701	ERDS1FVJ332T	1/2W 3. 3K $\Delta$	C108	ECEA1EKA4R7B	25V 4. 7U
R467, 468	ERDS2TJ102	1/4W 1K	R702	ERDS2TJ122	1/4W 1. 2K	C109	ECEA1CU330	16V 33U
R471, 472	ERDS2TJ104	1/4W 100K	R703	ERDS2TJ272T	1/4W 2. 7K	C110, 111	ECBT1H102KB5	50V 1000P
R473, 474	ERDS2TJ474	1/4W 470K	R704	ERDS2TJ222	1/4W 2. 2K	C201, 202	ECKR1H103ZF5	50V 0. 01U
R475, 476	ERDS2TJ182	1/4W 1. 8K	R705	ERDS2TJ272T	1/4W 2. 7K $\Delta$	C204	ECBT1H470J5	50V 47P
R477, 478	ERDS2TJ392T	1/4W 3. 9K	R706	ERDS2TJ102	1/4W 1K $\Delta$	C205	ECKT1H223ZF	50V 0. 022U
R479, 480	ERDS2TJ223	1/4W 22K	R708, 709	ERDS1FVJ180T	1/2W 18 $\Delta$	C206	ECBT1H150JC5	50V 15P
R481, 482	ERDS2TJ332	1/4W 3. 3K	R710	ERDS2TJ272T	1/4W 2. 7K	C207	ECBT1C103MS5	16V 0. 01U
R485, 486	ERDS2TJ223	1/4W 22K	R711	ERDS1FJ270	1/2W 27 $\Delta$	C208	ECEA0JU101B	6. 3V 100U
R487, 488	ERDS2TJ122	1/4W 1. 2K	R715	ERDS2TJ103	1/4W 10K $\Delta$	C209	ECEA1HKA100B	50V 10U
R489, 490	ERDS2TJ821	1/4W 820	R716	ERDS2TJ222	1/4W 2. 2K	C210-212	ECKT1H223ZF	50V 0. 022U
R501, 502	ERDS2TJ104	1/4W 100K	R717	ERD25FVJ150T	1/4W 15 $\Delta$	C213	ECBT1H101KB5	50V 100P
R503, 504	ERDS2TJ102	1/4W 1K	R718, 719	ERDS2TJ1R5T	1/4W 1. 5 $\Delta$	C214	ECEA1CKA100B	16V 10U
R505-508	ERDS2TJ104	1/4W 100K	R755	ERDS2TJ102	1/4W 1K	C215	ECKR1H103ZF5	50V 0. 01U
R509, 510	ERDS2TJ103	1/4W 10K	R771	ERDS1FVJ2R2T	1/2W 2. 2 $\Delta$	C216	ECEA1CKA100B	16V 10U
R513	ERDS2TJ153	1/4W 15K	R773	ERDS1FVJ6R8T	1/2W 6. 8 $\Delta$	C217	ECEA1HKA010B	50V 1U
R514	ERDS2TJ394	1/4W 390K	R777	ERDS1FVJ4R7T	1/2W 27 $\Delta$	C220	ECEA1CKA100B	16V 10U
R521, 522	ERDS2TJ104	1/4W 100K	R780	ERDS1FVJ4R7T	1/2W 4. 7 $\Delta$	C221	ECFR1E183KR	25V 0. 018U
R523, 524	ERDS2TJ222	1/4W 2. 2K	R839, 840	ERDS2TJ153	1/4W 15K	C222	ECQB1H473KF3	50V 0. 047U
R525, 526	ERDS2TJ221	1/4W 220	R851	ERDS1FVJ2R2T	1/2W 2. 2 $\Delta$	C225	ECBT1H180JC5	50V 18P
R527-530	ERDS2TJ102	1/4W 1K	R891, 892	ERDS2TJ102	1/4W 1K	C226	ECKR1H103ZF5	50V 0. 01U
R531	ERDS2TJ394	1/4W 390K	R893	ERDS2TJ472	1/4W 4. 7K	C227	ECEA1CKA100B	16V 10U
R532	ERDS2TJ103	1/4W 10K	R901	ERDS2TJ102	1/4W 1K	C228	ECBT1H8R2KC5	50V 8. 2P
R533	ERDS2TJ104	1/4W 100K	R902	ERDS2TJ681	1/4W 680	C229	ECBT1H102KB5	50V 1000P
R534	ERDS2TJ103	1/4W 10K	R903, 904	ERDS2TJ103	1/4W 10K	C230	ECBT1H471KB5	50V 470P
R535	ERDS2TJ104	1/4W 100K	R905, 906	ERDS2TJ102	1/4W 1K	C251	ECKT1H223ZF	50V 0. 022U
R601, 602	ERDS2TJ102	1/4W 1K	R907, 908	ERDS2TJ182	1/4W 1. 8K	C252	ECEA1HKA010B	50V 1U
R603, 604	ERDS2TJ563	1/4W 56K	R909, 910	ERDS2TJ222	1/4W 2. 2K	C253	ECKT1H223ZF	50V 0. 022U
R605, 606	ERDS2TJ332	1/4W 3. 3K	R911, 912	ERDS2TJ392T	1/4W 3. 9K	C301	ECEA1CM101B	16V 100U
R607, 608	ERDS2TJ563	1/4W 56K	R913, 914	ERDS2TJ562	1/4W 5. 6K	C302	ECEA1HKAR47B	50V 0. 47U
R609, 610	ERDS2TJ470	1/4W 47	R915, 916	ERDS2TJ123	1/4W 12K	C303	ECEA1HKA010B	50V 1U
R611, 612	ERDS1FVJ100T	1/2W 10 $\Delta$	R917, 918	ERDS2TJ273	1/4W 27K	C304-306	ECEA1HKA3R3B	50V 3. 3U
R614	ERD25FJ470	1/4W 47 $\Delta$	R919	ERDS2TJ224T	1/4W 220K	C307, 308	ECFR1E392KR	25V 3900P
R619, 620	ERG2SJ331P	2W 330	R920	ERDS2TJ222	1/4W 2. 2K	C309	ECKT1H223ZF	50V 0. 022U
R623	ERDS2TJ684	1/4W 680K $\Delta$	R921	ERDS2TJ103	1/4W 10K	C310	ECFR1E473KR	25V 0. 047U
R627	ERDS2TJ154	1/4W 150K $\Delta$	R922, 923	ERDS2TJ472	1/4W 4. 7K	C311	ECQP1471JZ	50V 470P
R628	ERDS2TJ684	1/4W 680K	R924-926	ERDS2TJ104	1/4W 100K	C312	ECEA1EKA4R7B	25V 4. 7U
R651-654	ERDS2TJ223	1/4W 22K	R927	ERDS2TJ181T	1/4W 180	C313, 314	ECBT1H102KB5	50V 1000P
R655	ERDS2TJ682T	1/4W 6. 8K	R930, 931	ERD25FJ101	1/4W 100 $\Delta$	C321	ECEA1CKA100B	16V 10U
R656	ERDS2TJ103	1/4W 10K	R937	ERDS2TJ103	1/4W 10K	C323, 324	ECFR1E332KR	25V 3300P
R657	ERDS2TJ220T	1/4W 22	R938	ERDS2TJ104	1/4W 100K	C325	ECBT1H330J5	50V 33P
R658	ERDS2TJ223	1/4W 22K	R941	ERDS2TJ103	1/4W 10K	C326	ECKR1H103ZF5	50V 0. 01U
R659	ERDS2TJ222	1/4W 2. 2K	R943, 944	ERDS2TJ104	1/4W 100K	C401, 402	ECBT1E103ZF	25V 0. 01U
R660	ERDS2TJ103	1/4W 10K	R945-947	ERDS2TJ331	1/4W 330	C404	ECEA1HKA010B	50V 1U
R661, 662	ERDS2TJ333	1/4W 33K				C405, 406	ECBT1H101KB5	50V 100P
R663	ERDS2TJ153	1/4W 15K			CAPACITORS	C407	ECEA0JU101B	6. 3V 100U
R664, 665	ERDS2TJ103	1/4W 10K				C409, 410	ECBT1E103ZF	25V 0. 01U
R666	ERDS2TJ104	1/4W 100K	C101, 102	ECBT1H150JC5	50V 15P	C421, 422	ECEA1CKA220B	16V 22U
R670	ERDS1FVJ390T	1/2W 39 $\Delta$	C103	ECBT1H102KB5	50V 1000P	C451, 452	ECEA1EKA4R7B	25V 4. 7U
R671, 672	ERDS2TJ471	1/4W 470	C105	ECEA0JU221	6. 3V 220U	C453, 454	ECBT1H101KB5	50V 100P

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C455, 456	ECBT1H102KB5	50V 1000P	C607, 608	ECCD1H150KC	50V 15P	C710	ECKR1H103ZF5	50V 0.01U
C457, 458	ECFR1E223KR	25V 0.022U	C609, 610	ECBT1H821KB5	50V 820P	C711	ECA1CM101B	16V 100U
C459, 460	ECFR1E682KR	25V 6800P	C611, 612	ECFR1E223KR	25V 0.022U	C712	ECEA1VU470	35V 47U
C461, 462	ECEA1EKA4R7B	25V 4.7U	C614	ECEA1HU330	50V 33U	C713	ECEA1AU101	10V 100U
C463, 464	ECEA1AKA330B	10V 33U	C615	ECEA2AU100	100V 10U	C751	ECA1EM102E	25V 1000U
C471, 472	ECBT1H150JC5	50V 15P	C651	ECEA1HKA2R2B	50V 2.2U	C752	ECEA1CU470	16V 47U
C473, 474	ECBT1H101KB5	50V 100P	C652	ECEA1CKA100B	16V 10U	C753	ECBT1E103ZF	25V 0.01U
C475, 476	ECBT1H221KB5	50V 220P	C653	ECEA0JU221	6.3V 220U	C754	ECKR1H103ZF5	50V 0.01U $\Delta$
C477, 478	ECEA1CKA100B	16V 10U	C654	ECKT1H223ZF	50V 0.022U	C755	ECBT1E103ZF	25V 0.01U
C479, 480	ECFR1E123KR	25V 0.012U	C671, 672	ECBT1H180JC5	50V 18P	C771	ECQE2104KF3	250V 0.1U $\Delta$
C481, 482	ECFR1E683KR	25V 0.068U	C673, 674	ECBT1H221KB5	50V 220P	C791	ECKWNS103ZVS	500V 0.01U $\Delta$
C483, 484	ECFR1E562KR	25V 5600P	C675, 676	ECBT1H101KB5	50V 100P	C851, 852	ECEA0JU101B	6.3V 100U
C485, 486	ECFR1E273KR	25V 0.027U	C677, 678	ECBT1H331KB5	50V 330P	C853, 854	ECFR1E104KR	25V 0.1U
C487, 488	ECBT1E103ZF	25V 0.01U	C679, 680	ECBT1H101KB5	50V 100P	C891	ECFR1E392KR	25V 3900P
C489-492	ECEA1CKA100B	16V 10U	C687, 688	ECKR1H103ZF5	50V 0.01U	C901	ECEA0JU102	6.3V 1000U
C501, 502	ECEA1EKA4R7B	25V 4.7U	C689, 690	ECKT1H101KB	50V 100P	C902	ECBT1E103ZF	25V 0.01U
C503, 504	ECBT1H101KB5	50V 100P	C691, 692	ECKR1H103ZF5	50V 0.01U	C904, 905	ECEA0JU102	6.3V 1000U
C505, 506	ECEA1EKA4R7B	25V 4.7U	C693-696	ECBT1H331KB5	50V 330P	C906	ECBT1E103ZF	25V 0.01U
C507, 508	ECBT1E103ZF	25V 0.01U	C697, 698	ECBT1H101KB5	50V 100P	C911, 912	ECEA2AU100	100V 10U $\Delta$
C509, 510	ECFR1E333KR	25V 0.033U	C701, 702	ECES1HV822UM	50V 8200P $\Delta$	C913	ECEA1HKA100B	50V 10U $\Delta$
C519, 520	ECEA1EKA4R7B	25V 4.7U	C703	ECKR1H103ZF5	50V 0.01U	C914	ECEA1HKA100B	50V 10U
C521-523	ECBT1E103ZF	25V 0.01U	C704	ECA1VM101B	35V 100U	C916	ECEA1HKA010B	50V 1U
C601, 602	ECEA1EKA4R7B	25V 4.7U	C705	ECA1CM101B	16V 100U			
C603, 604	ECBT1H271KB5	50V 270P	C706	ECKR1H103ZF5	50V 0.01U			
C605, 606	ECEA1CKA220B	16V 22U	C709	ECKR1H103ZF5	50V 0.01U $\Delta$			

## PACKAGING

