

# Service Manual

AV Control Stereo Receiver



Receiver

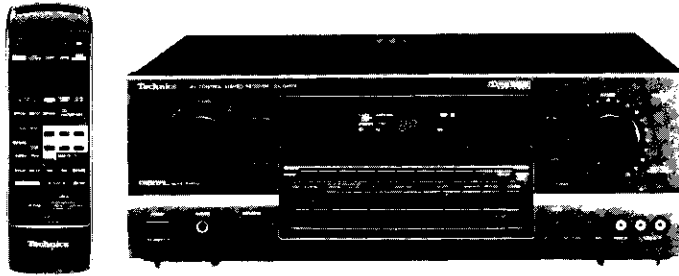
# SA-GX650

Colour

(K) ... Black Type

Area

Suffix for Model No.	Area	Colour
(P)	U.S.A.	(K)
(PC)	Canada.	



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## SPECIFICATIONS (IHF'78)

### ■ AMPLIFIER SECTION

#### Rated minimum sine wave

**RMS power output**

20 Hz – 20 kHz both channels driven

0.05% total harmonic distortion

125 W per channel (8 Ω)

#### 1 kHz continuous power output

both channels driven

0.05% total harmonic distortion

130 W per channel (8 Ω)

#### Total harmonic distortion

rated power at 20 Hz – 20 kHz

0.05% (8 Ω)

half power at 1 kHz

0.03% (8 Ω)

#### Power output at the Dolby Pro Logic operation

0.8 % at 1 kHz

Front 2 × 100 W (8 Ω)

Center 100 W (8 Ω)

Rear 45 W (8 Ω)

#### Dynamic headroom

1.2 dB (8 Ω)

#### SMPTE intermodulation distortion

0.3% (8 Ω)

#### Frequency response

PHONO

RIAA standard curve ±0.8 dB

CD, VCR 1, VCR 2, TAPE/DCC

7 Hz – 70 kHz, ±3 dB

#### Input sensitivity

PHONO

0.4 mV (3 mV, IHF '66)

CD, VCR 1, VCR 2, TAPE/DCC

20 mV (200 mV, IHF '66)

#### S/N (IHF, A)

PHONO

70 dB (80 dB, IHF '66)

CD, VCR 1, VCR 2, TAPE/DCC

75 dB (90 dB, IHF '66)

#### Phono maximum input voltage

150 mV (IHF '66)

#### Input impedance

PHONO

47 kΩ

CD, VCR 1, VCR 2, TAPE/DCC

22 kΩ

#### Tone controls

BASS

50 Hz, +10 dB to –10 dB

TREBLE

20 kHz, +10 dB to –10 dB

**Loudness control (volume at –30 dB)**

50 Hz, +9 dB

**Low frequency damping factor**

30 (8 Ω)

**Load impedance**

A or B

4–8 Ω

A and B

8 Ω

### ■ FM TUNER SECTION

**Frequency range**

87.9–107.9 MHz

**Sensitivity**

11.2 dBf (2 μV, IHF '58)

**50 dB quieting sensitivity**

MONO

18.3 dBf (4.5 μV, IHF '58)

STEREO

38.3 dBf (45 μV, IHF '58)

**Total harmonic distortion**

MONO

0.2%

STEREO

0.3%

**S/N**

MONO

75 dB

STEREO

70 dB

**Frequency response**

20 Hz – 15 kHz, +1 dB, –2 dB

**Alternate channel selectivity**

65 dB

**Capture ratio**

1 dB

**Image rejection at 98 MHz**

45 dB

**IF rejection at 98 MHz**

80 dB

**Spurious response rejection at 98 MHz**

75 dB

**AM suppression**

50 dB

**Stereo separation**

1 kHz

40 dB

10 kHz

30 dB

**Carrier leak**

19 kHz

–35 dB

38 kHz

–50 dB

**Antenna terminals**

300 Ω (balanced)

75 Ω (unbalanced)

# Technics

# DISASSEMBLY INSTRUCTIONS

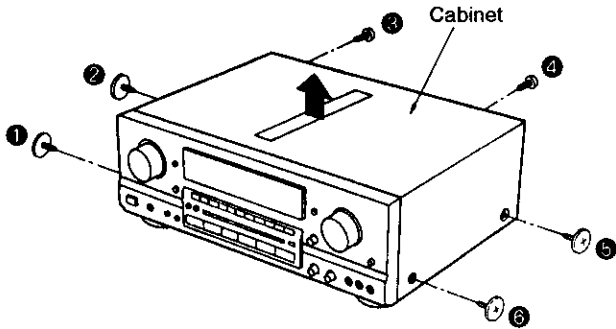
## "ATTENTION SERVICER"

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

Ref.No.  
1

### Removal of the cabinet

Procedure  
1

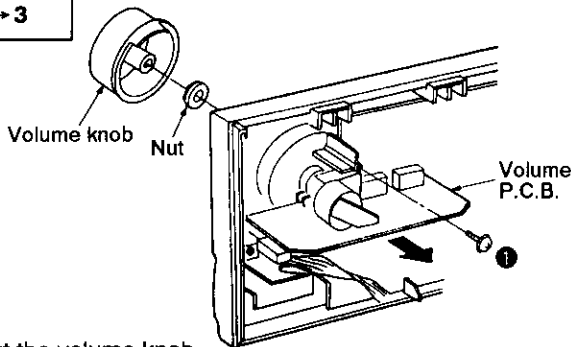


- Remove the 6 screws (① ~ ⑥).

Ref.No.  
3

### Removal of the volume P.C.B.

Procedure  
1 → 2 → 3

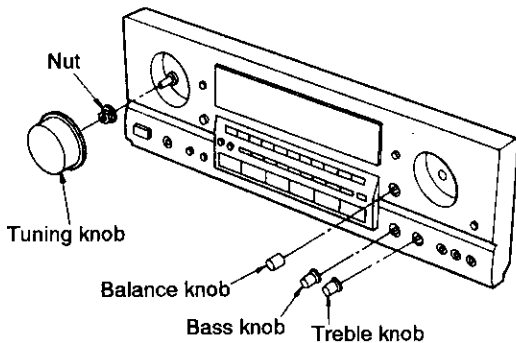


1. Pull out the volume knob.
2. Remove the nut.
3. Remove the 1 screw (①).
4. Remove the volume P.C.B. in the direction of arrow.

Ref.No.  
4

### Removal of the operation P.C.B.

Procedure  
1 → 2 → 3 → 4

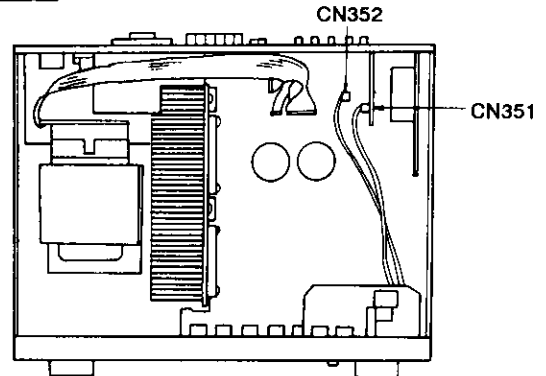


1. Pull out the tuning knob, balance knob, bass knob and treble knob.
2. Remove the nut.

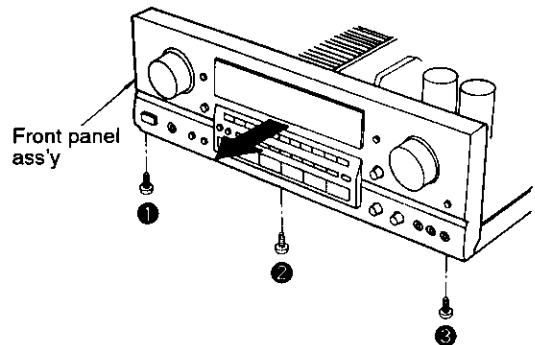
Ref.No.  
2

### Removal of the front panel ass'y

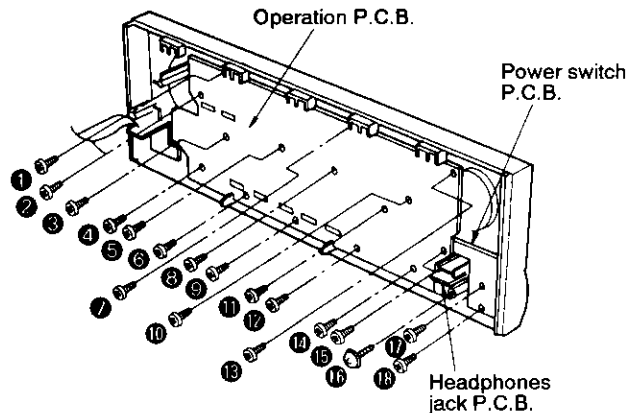
Procedure  
1 → 2



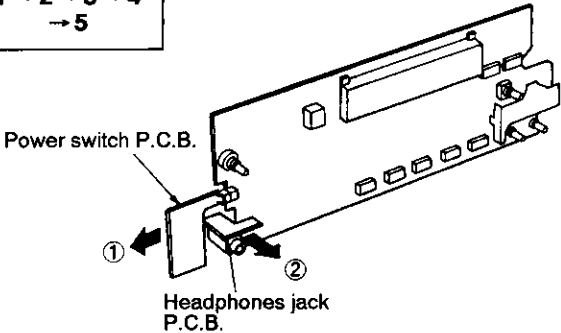
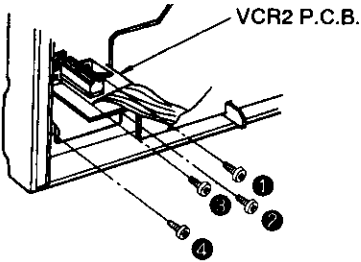
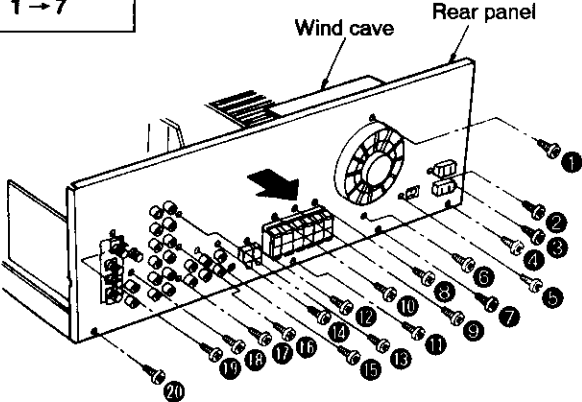
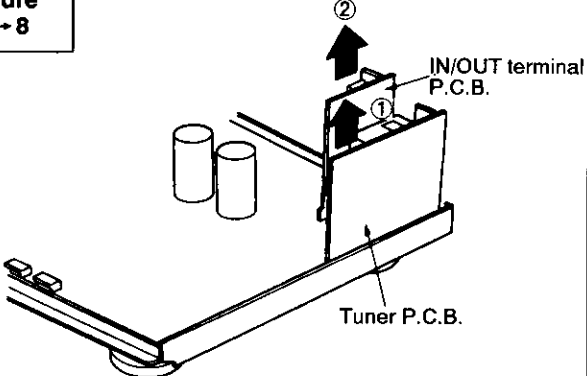
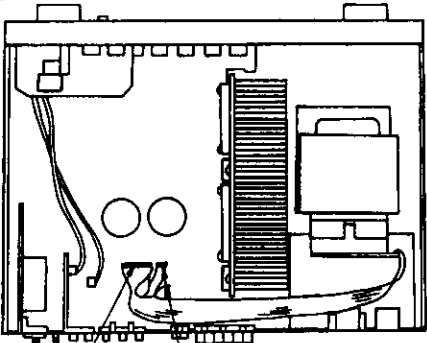
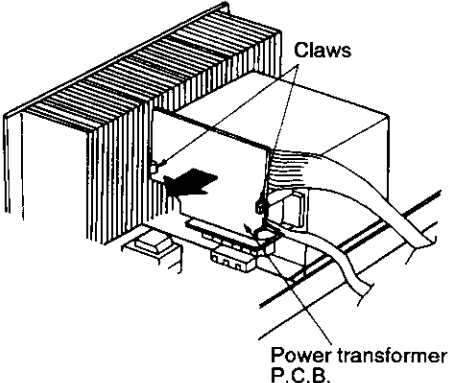
1. Remove the 2 flat cables (CN351, CN352).



2. Remove the 3 screws (① ~ ③).
3. Remove the front panel ass'y in the direction of arrow.



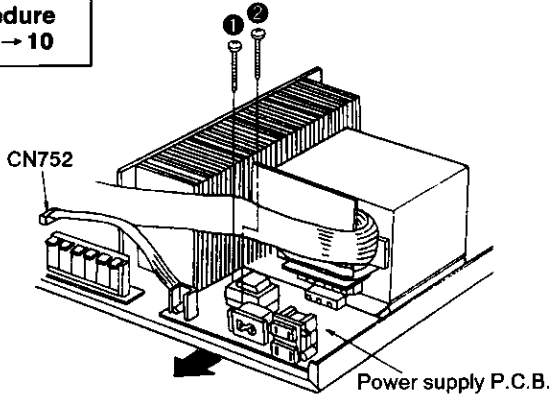
3. Remove the 18 screws (① ~ ⑱).

<p>Ref.No. 5</p>	<p><b>Removal of the power switch P.C.B. and headphones jack P.C.B.</b></p>	<p>Ref.No. 6</p>	<p><b>Removal of the VCR2 P.C.B.</b></p>
<p>Procedure 1 → 2 → 3 → 4 → 5</p>	 <p>Power switch P.C.B.</p> <p>Headphones jack P.C.B.</p> <p>①</p> <p>②</p> <p>■ <b>POWER SWITCH P.C.B.</b></p> <ul style="list-style-type: none"> <li>• Remove the power switch P.C.B. in the direction of arrow ①.</li> </ul> <p>■ <b>HEADPHONES JACK P.C.B.</b></p> <ul style="list-style-type: none"> <li>• Remove the headphones jack P.C.B. in the direction of arrow ②.</li> </ul>	<p>Procedure 1 → 2 → 6</p>	 <p>VCR2 P.C.B.</p> <p>①</p> <p>②</p> <p>③</p> <p>④</p> <ul style="list-style-type: none"> <li>• Remove the 4 screws( ① ~ ④ ).</li> </ul>
<p>Ref.No. 7</p>	<p><b>Removal of the rear panel</b></p>	<p>Ref.No. 8</p>	<p><b>Removal of the tuner P.C.B. and IN/OUT terminal P.C.B.</b></p>
<p>Procedure 1 → 7</p>	 <p>Wind cave</p> <p>Rear panel</p> <p>①</p> <p>②</p> <p>③</p> <p>④</p> <p>⑤</p> <p>⑥</p> <p>⑦</p> <p>⑧</p> <p>⑨</p> <p>⑩</p> <p>⑪</p> <p>⑫</p> <p>⑬</p> <p>⑭</p> <p>⑮</p> <p>⑯</p> <p>⑰</p> <p>⑱</p> <p>⑳</p> <p>1. Remove the 20 screws( ① ~ ⑳ ).</p> <p>2. Remove the wind cave.</p> <p>3. Remove the rear panel in the direction of arrow.</p>	<p>Procedure 1 → 7 → 8</p>	 <p>IN/OUT terminal P.C.B.</p> <p>Tuner P.C.B.</p> <p>①</p> <p>②</p> <p>■ <b>TUNER P.C.B.</b></p> <ul style="list-style-type: none"> <li>• Remove the tuner P.C.B. in the direction of arrow ①.</li> </ul> <p>■ <b>IN/OUT TERMINAL P.C.B.</b></p> <ul style="list-style-type: none"> <li>• Remove the IN/OUT terminal P.C.B. in the direction of arrow ②.</li> </ul>
<p>Ref.No. 9</p>	<p><b>Removal of the power transformer P.C.B.</b></p>		
<p>Procedure 1 → 7 → 9</p>	 <p>CN701</p> <p>CN702</p> <p>1. Remove the 2 flat cables(CN701, CN702).</p>	 <p>Claws</p> <p>Power transformer P.C.B.</p> <p>2. Remove the 2 claws.</p> <p>3. Remove the power transformer P.C.B. in the direction of arrow.</p>	

Ref.No.  
10

### Removal of the power supply P.C.B.

Procedure  
1 → 7 → 10

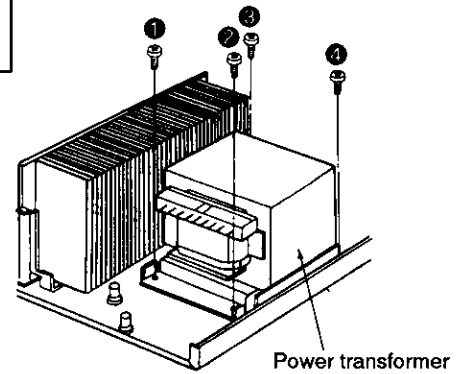


1. Remove the 1 flat cable(CN752).
2. Remove the 2 screws(①, ②).
3. Remove the power supply P.C.B. in the direction of arrow.

Ref.No.  
11

### Removal of the power transformer

Procedure  
1 → 7 → 9 → 10  
→ 11

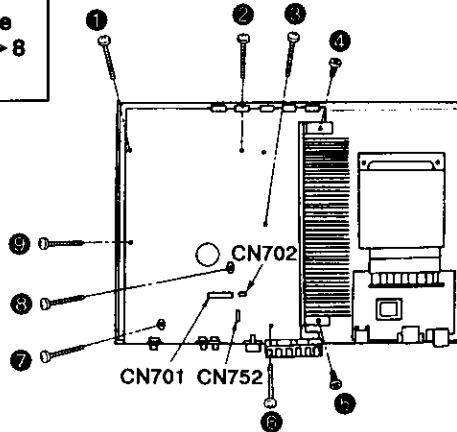


- Remove the 4 screws(① ~ ④).

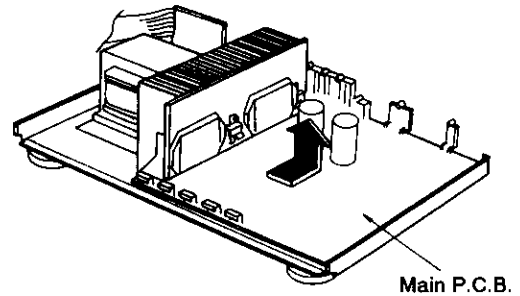
Ref.No.  
12

### Removal of the main P.C.B.

Procedure  
1 → 2 → 7 → 8  
→ 12



1. Remove the 3 flat cables(CN701, CN702, CN752).
2. Remove the 9 screws(① ~ ⑨).

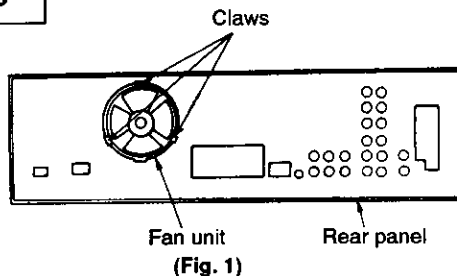


3. Remove the main P.C.B. in the direction of arrow.

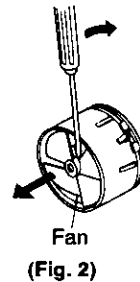
Ref.No.  
13

### Removal of the cooling fan motor

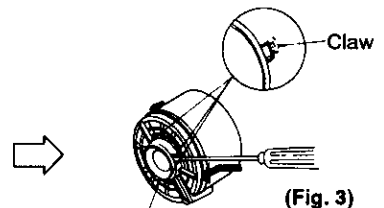
Procedure  
1 → 7 → 13



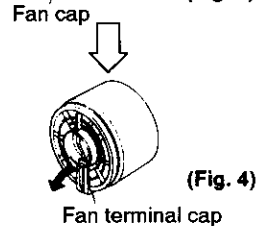
1. Release the 3 claws.(See Fig. 1)
2. Insert a screwdriver at the foot of the fan. Force it out of the motor shaft.(See Fig. 2)
3. Remove the fan cap by used ⊖ screwdriver. (See Fig. 3)
4. Remove the fan terminal cap in the direction of arrow. (See Fig. 4)
5. Remove the motor from the fan case. (See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



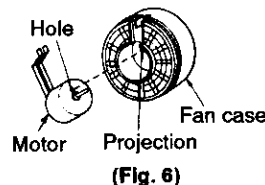
(Fig. 2)



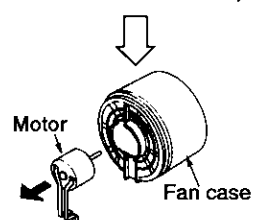
(Fig. 3)



(Fig. 4)



(Fig. 6)



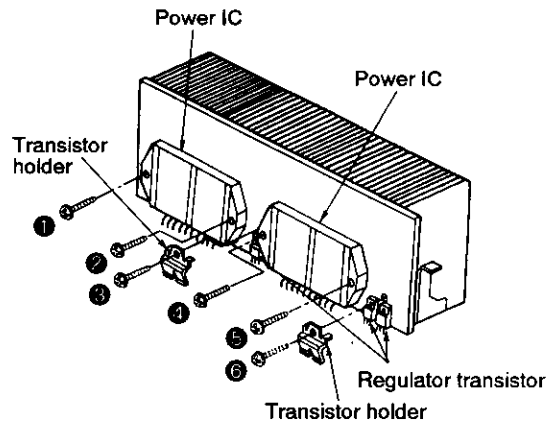
(Fig. 5)

<b>Ref.No.</b> 14	<b>Removal of the power IC and regulator transistor</b>
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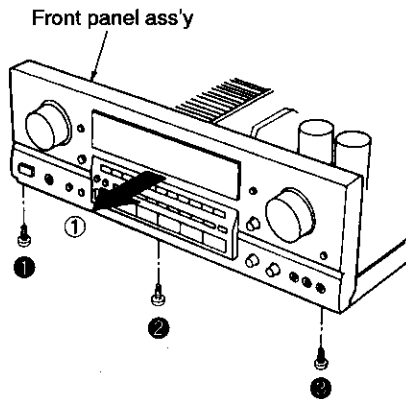
<b>Procedure</b> 1 → 2 → 7 → 8 → 12 → 14
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1. Unsolder the power IC or regulator transistor.
2. Remove the 6 screws (① ~ ⑥).
3. Remove the 2 transistor holders.

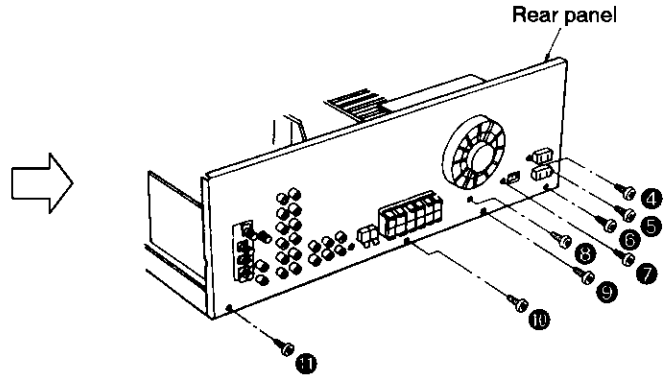
• **When mounting the power IC or regulator transistor.**  
Apply silicone compound (RFKX0002) to the rear side of power IC or regulator transistor.



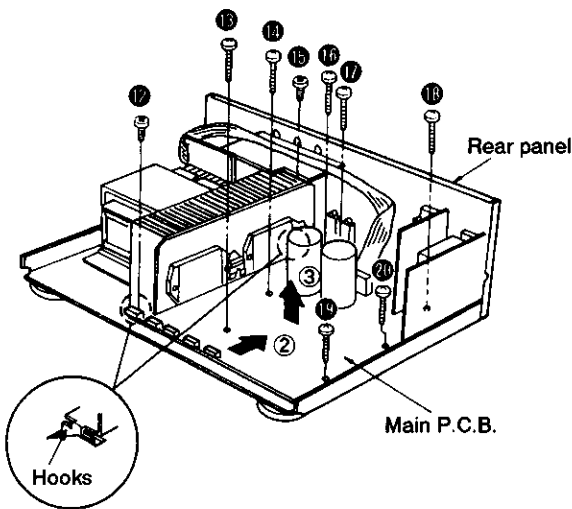
## ■ HOW TO CHECK THE MAIN P.C.B.



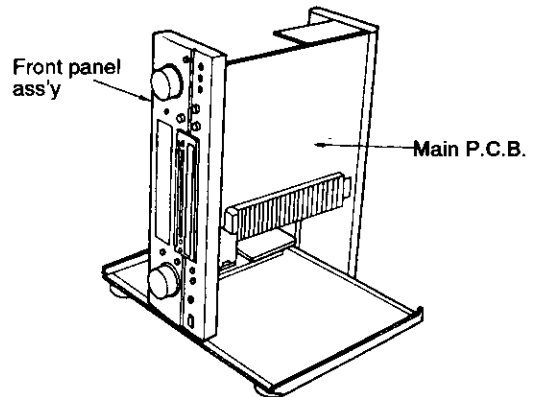
1. Remove the 3 screws (① ~ ③).
2. Remove the front panel ass'y in the direction of arrow ①.



3. Remove the 8 screws (④ ~ ⑪).

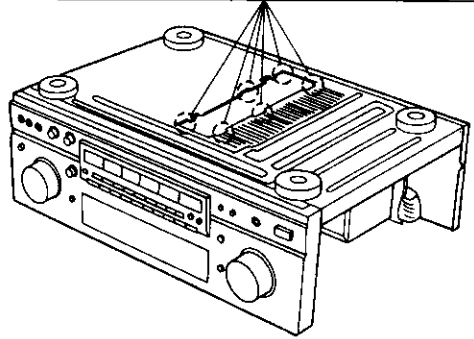
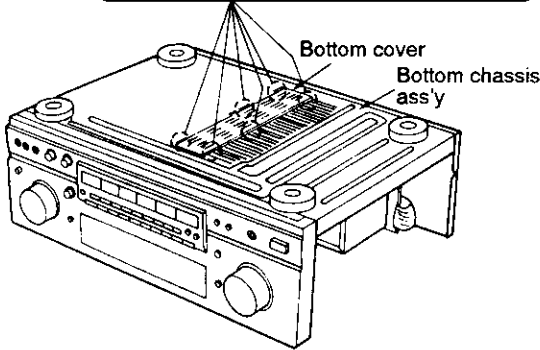
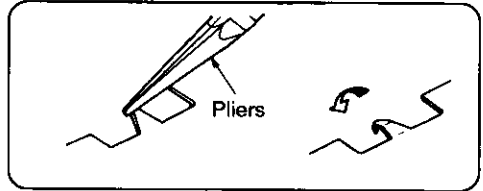
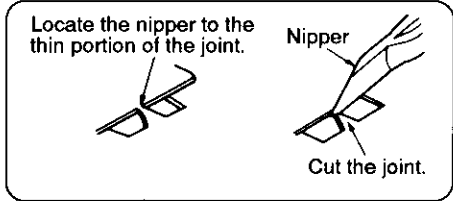


4. Remove the 9 screws (⑫ ~ ⑳).
5. Release the 2 hooks by sliding the main P.C.B. in the direction of arrow ②, and then remove the main P.C.B. equipped with rear panel in the direction of arrow ③.



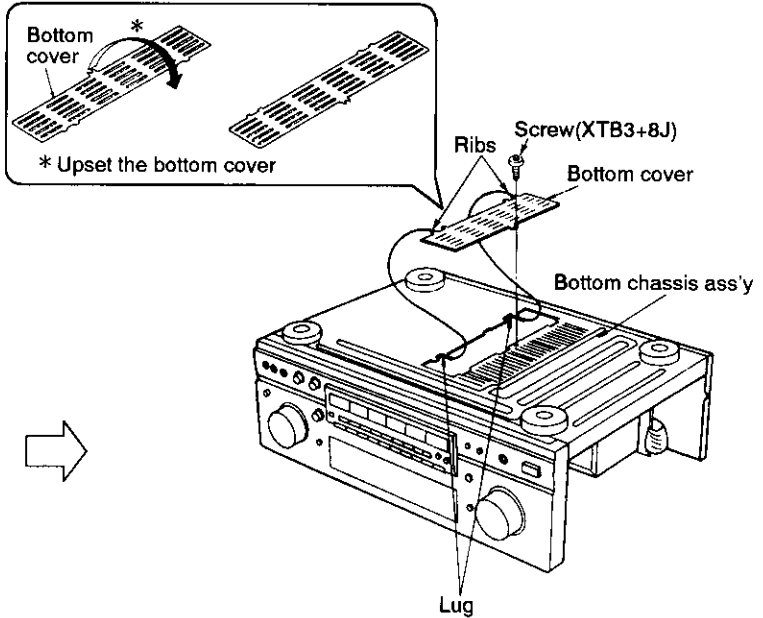
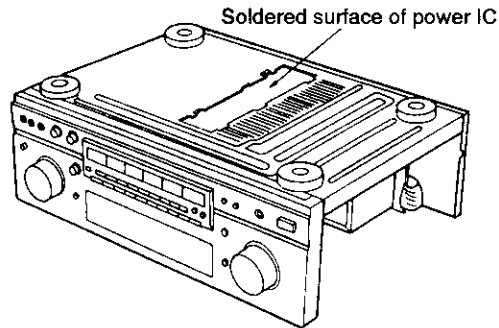
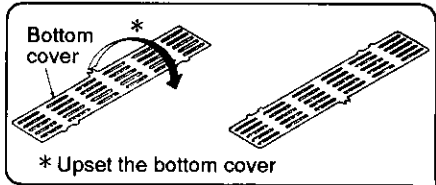
6. Reinstall the front panel ass'y to the main P.C.B.
7. When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown in above.

## HOW TO CHECK THE POWER IC



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

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



3. When checking the soldered surface of power IC, perform as shown above.

4. After checking the power IC, upset the bottom cover and align the ribs of the bottom cover to the lugs on the bottom chassis ass'y.

5. After mounting the bottom cover on the bottom chassis ass'y, fix it with a screw(XTB3+8J).

## INSTALLATION PRECAUTIONS FOR POWER IC'S AND REGULATOR TRANSISTORS

• When installing or removing the power IC or regulator transistor, be sure to use an offset screwdriver.(See Fig. 1)

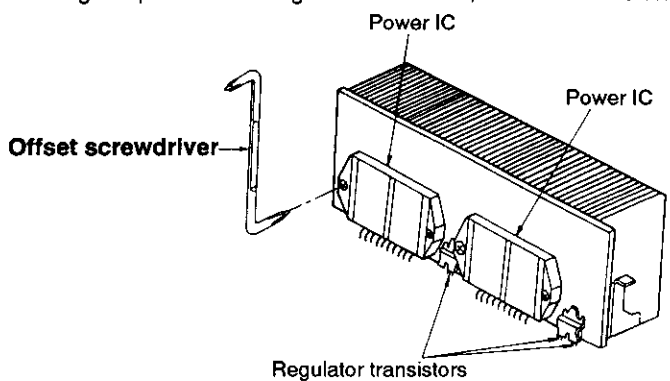
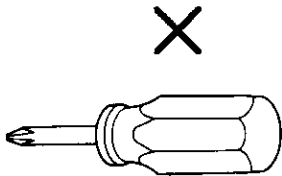


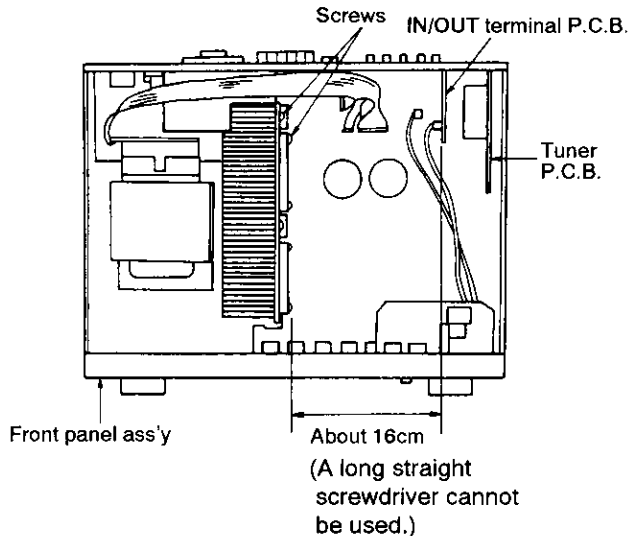
Fig. 1

**CAUTION:**

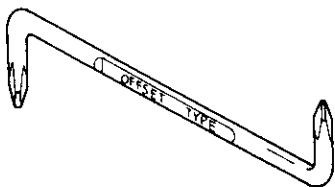
1. A long straight screwdriver cannot be used for removal or mounting since its long grip interferes with the neighboring P.C.B. (See Fig.2)
2. A short straight screwdriver may be used for removal, but cannot be used for mounting because the limited space in the unit will not allow sufficient tightening torque. (See Fig.3)

**Fig.3**

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

**Fig.2****—OFFSET SCREWDRIVER—**

- The PROTO offset screwdriver No.34 - ¼ is recommended for use in the application above.



- The address of PROTO International Sales is as follows.



No.		
34 ¼	1 & 2	4 ¾"

**International Sales**

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

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

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

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

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

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

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

Europe  
Stanley-Proto Europe  
Woodside, Sheffield  
539PD  
England  
Fax: 44-742-739-038  
Phone: 44-742-768-888

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

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

# ■ TERMINAL FUNCTION OF IC

## • IC901 (LC8A012A5328): Microcomputer

Pin No.	Mark	I/O Division	Function
1 • 2	SPA • SPB	O	Speaker select control terminal
3	ST5	O	Level shift control terminal
4	RFM	—	Not used, open
5	RLY	O	Relay control terminal
6	AFM	O	Muting control terminal
7	-20dB	O	Muting control (-20dB) terminal
8 } 15	DG1 } DG8	O	Digit signal of FL display
16	S13	O	Segment signal of FL display
17	VDD	I	Power supply terminal
18	VPP	I	Power supply terminal of FL display
19 } 30	S12 } S1	O	Segment signal of FL display
31 • 32	FWD • REV	O	Rotation control terminal of volume motor
33	INI	—	Not used, connected to resistor
34	FMST	I	Stereo signal detect terminal
35	SD	I	Received signal detect terminal
36	IFDAIN	O	Serial data signal
37	LOUD	O	Not used, open
38	ST3	O	Level shift control terminal
39	V2	O	Video selector control terminal
40	CE	O	Chip enable terminal

Pin No.	Mark	I/O Division	Function
41	DATA1	O	Serial data signal
42	ST1	O	Level shift control terminal
43	CK1	O	Serial clock signal
44	DATA2	O	Serial data signal
45	ST2	O	Level shift control terminal
46	CK2	O	Serial clock Serial clock signal
47	5-6	O	Remote control terminal
48	ST4	O	Level shift control terminal
49	TEST1	—	Test terminal
50	RES	I	Reset detect terminal
51	XT1	—	Not used, connected to power supply
52	XT2	—	Not used, open
53	VSS	—	GND terminal
54	CF1	I	Crystal oscillator
55	CF2	O	Terminal (6MHz)
56	VDD	I	Power supply terminal
57 } 60	KEY1 } KEY4	I	Key matrix detect terminal
61	STANDBY	O	Power detect terminal
62 • 63	ENCODE A • ENCODE B	I	Not used, connected to power supply
64	REM	I	Remote control terminal



## PROTECTION CIRCUITRY

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

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

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

If this occurs, follow the procedure outlines below:

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

**Note:**

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

## BEFORE REPAIR AND ADJUSTMENT

Disconnect AC power, Discharge both Power Supply Capacitors C703 and C704 (75V 15000µF) through a 10Ω, 5W resistor to ground. DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices. After repairs are completed, restore power gradually using a variac, to avoid overcurrent. Current consumption at 120V, 60Hz in NO SIGNAL mode should be 500~1100mA.

## TERMINAL GUIDE OF IC'S TRANSISTORS AND DIODES

<p>LC8A012A5328</p>	<p>M50198P</p>	<p>M5218AP 8 Pin LA1830-H 24 Pin LC7218 24 Pin</p>	<p>AN6654F 14 Pin LA2730 16 Pin</p>	
	<p>AN6558F 8 Pin UPC4570C 8 Pin MC14052BCP 16 Pin MC14094BCP 16 Pin LA2780N 36 Pin</p>	<p>TC9214P 16 Pin TC9212P 20 Pin TC9163N 28 Pin</p>	<p>SVI3206D</p>	<p>BA6218</p>
<p>2SB621AQSTA 2SC2631QRSTA</p>	<p>2SC3940AQSTA</p>		<p>UN4214TA</p>	<p>2SC3327ABTP</p>
<p>2SB1187DEF 2SD1761DEF</p>	<p>2SJ40CDTA</p>	<p>P300DLF</p>	<p>LN018304P</p>	<p>MA165TA MA700ATA 1SS291TA 1SR35200TB</p>

# ■ SCHEMATIC DIAGRAM (Parts list on pages 48~54.)

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

## Note 1:

- **S301** : VCR2 input select (VCR 2 INPUT) switch.
- **S946** : Numeric (5) switch.
- **S947** : Center level adjust (CENTER LEVEL -) switch.
- **S948** : Test signal ON/OFF (TEST) switch.
- **S949** : Numeric (4) switch.
- **S950** : Numeric (6) switch.
- **S951** : Center level adjust (CENTER LEVEL +) switch.
- **S952** : Numeric (7) switch.
- **S953** : Rear level adjust (REAR LEVEL -) switch.
- **S954, 955** : Input select switches.  
[S954: CD, S955: TUNER]
- **S956** : Center mode select (CENTER MODE) switch.
- **S957** : Numeric (9) switch.
- **S960** : Rear level adjust (REAR LEVEL +) switch.
- **S961** : Numeric (8) switch.
- **S962** : Numeric (0) switch.
- **S963** : Delay time (DELAY TIME) adjustment.
- **S964** : Input select (PHONO) switch.
- **S965** : Loudness (LOUDNESS) ON/OFF switch.
- **S966** : Memory (MEMORY) switch.
- **S967** : Muting (MUTING) switch.
- **S970** : Tape/DCC monitor (TAPE/DCC MONITOR) switch.
- **S971** : Input select (VCR2) switch.
- **S972** : Input select (VCR1) switch.
- **S973** : Speaker select (B) switch.
- **S974** : FM mode select (FM MODE) switch.
- **S975** : Band select (BAND) switch.
- **S976** : Direct tuning (DIRECT TUNING) switch.
- **S978** : Power (POWER) switch.
- **S980** : Dolby pro logic 3 STEREO ON/OFF (3 STEREO) switch.
- **S981** : Speaker select (A) switch.
- **S982** : Dolby pro logic surround ON/OFF (SURROUND) switch.
- **S983** : Numeric (3) switch.
- **S984** : Numeric (2) switch.
- **S985** : Numeric (1) switch.
- **S986** : Tuning mode (TUNING MODE) switch.

## • Signal line

-  : FM OSC signal
-  : AM OSC signal
-  : Rec out signal (Lch)
-  : Rear speaker drive signal (Lch)
-  : Positive voltage lines
-  : Negative voltage lines
-  : FM signal
-  : AM signal
-  : AF signal (Lch)
-  : Center speaker drive signal

## • Important safety notice

Components identified by  $\triangle$  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 as occasion calls. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

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

Part No.	Original Part No.	Supply Part No.
IC101	LA1830-H3	LA1830-H
Z891	RCDHC-278-E	RCDHC-278

- 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.

## • Caution!

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


## Note 2:


**CAUTION:** FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE 6.3A 125V FUSE.

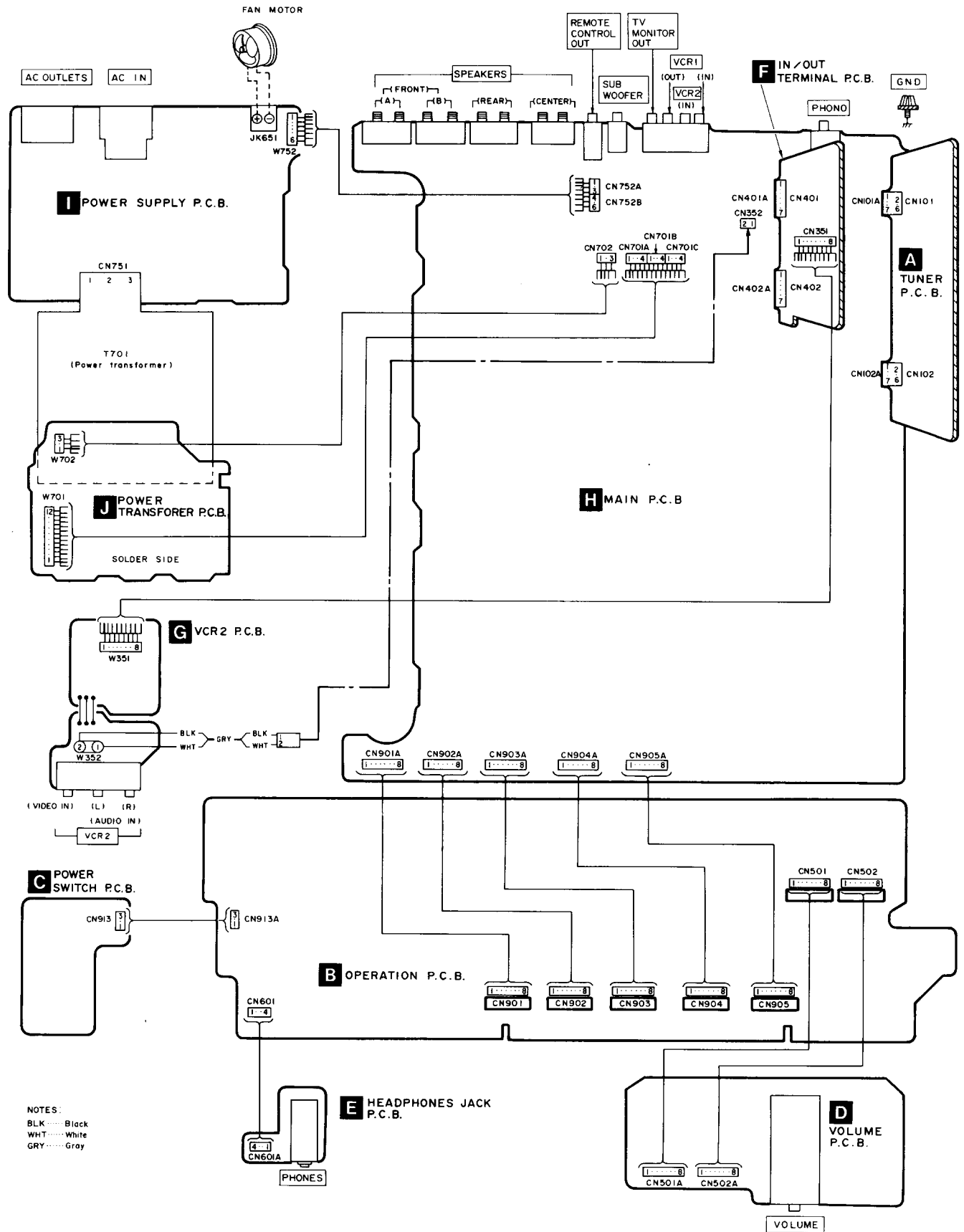


RISK OF FIRE-REPLACE FUSE AS MARKED.

## FUSE CAUTION

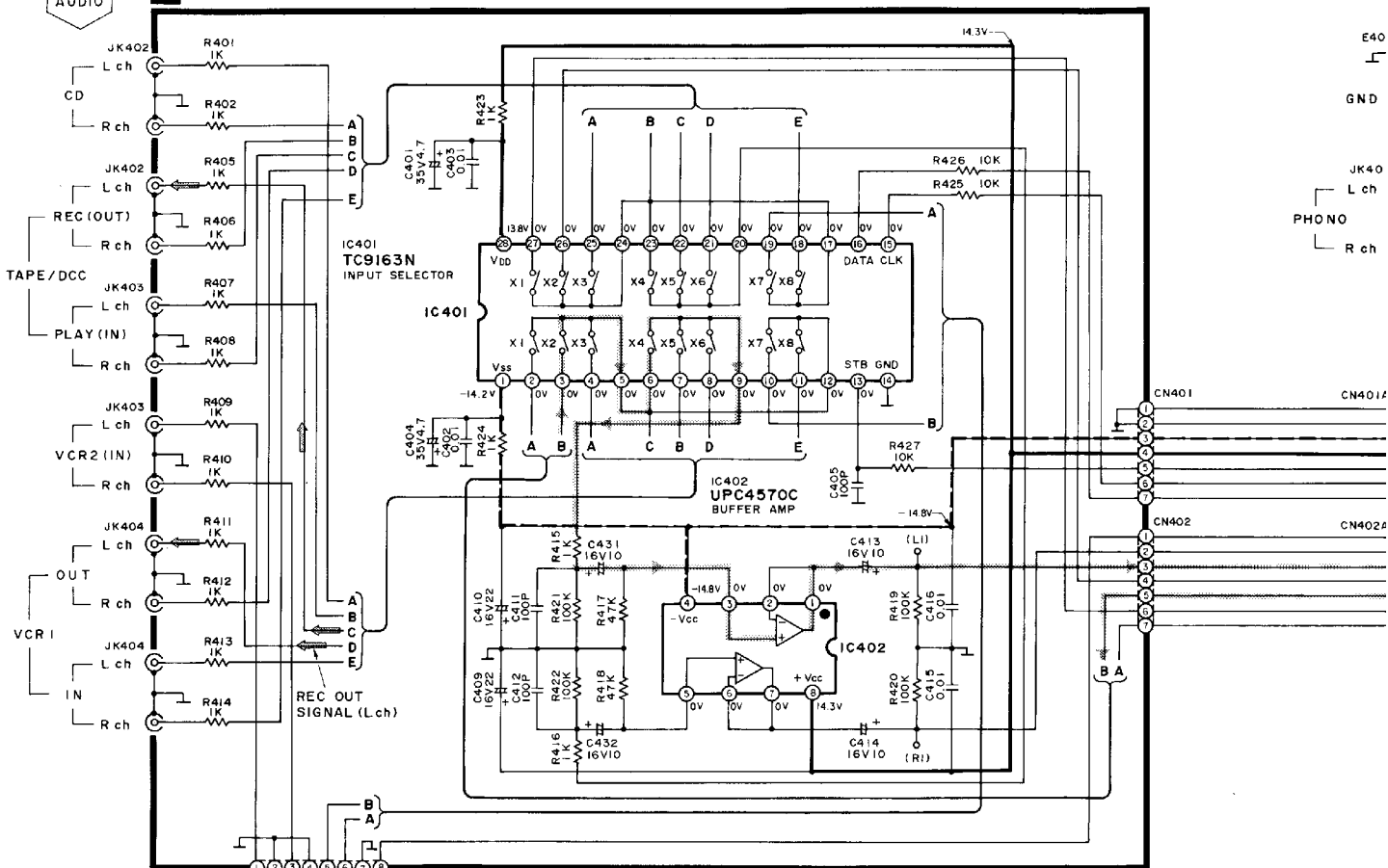
 This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating, refer to the marking adjacent to the symbol.

 Ce symbole indique que le fusible utilisé est à rapide. Pour une protection permanente, n'utiliser que des fusibles de même type. Ce dernier est indiqué là où le présent symbole est apposé.

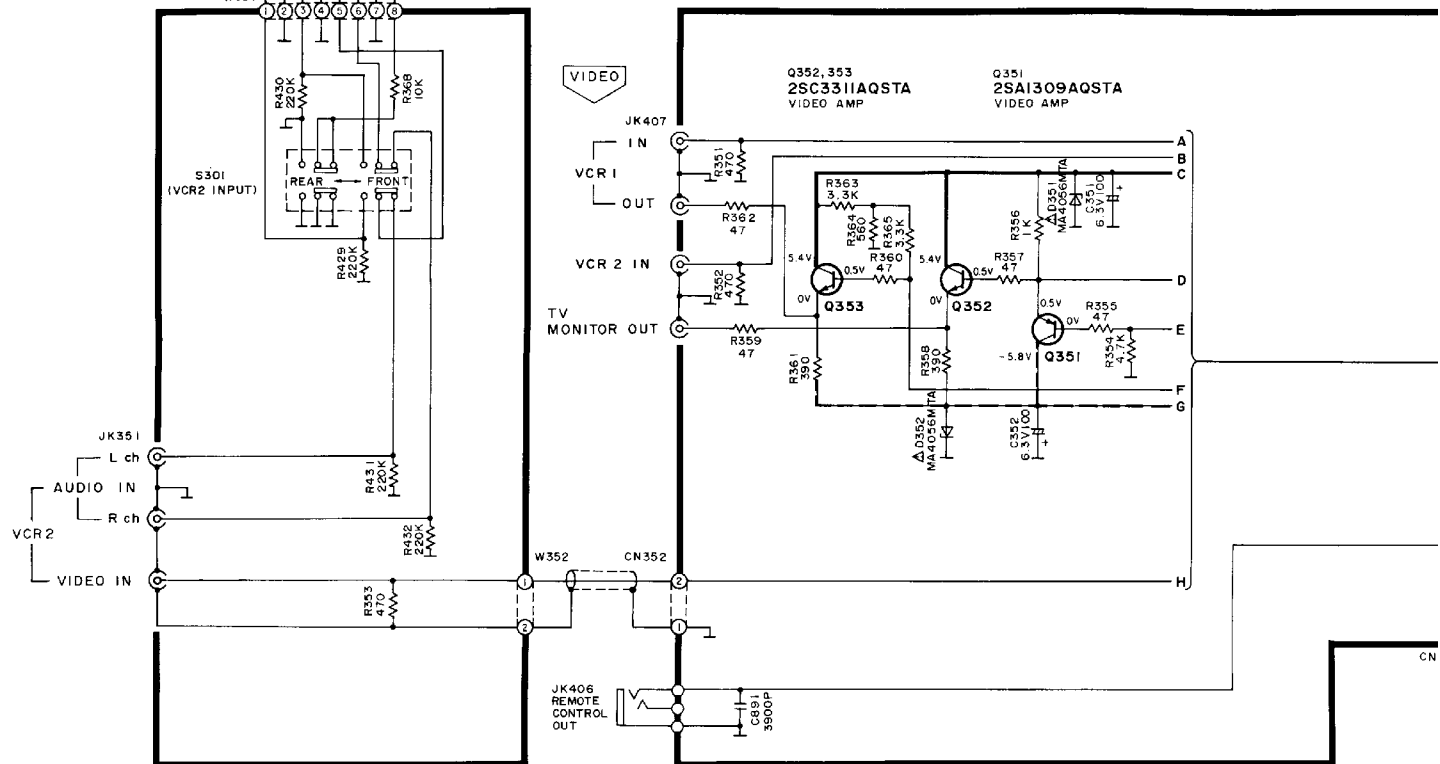


NOTES:  
 BLK.....Black  
 WHT.....White  
 GRY.....Grey

# F IN/OUT TERMINAL CIRCUIT



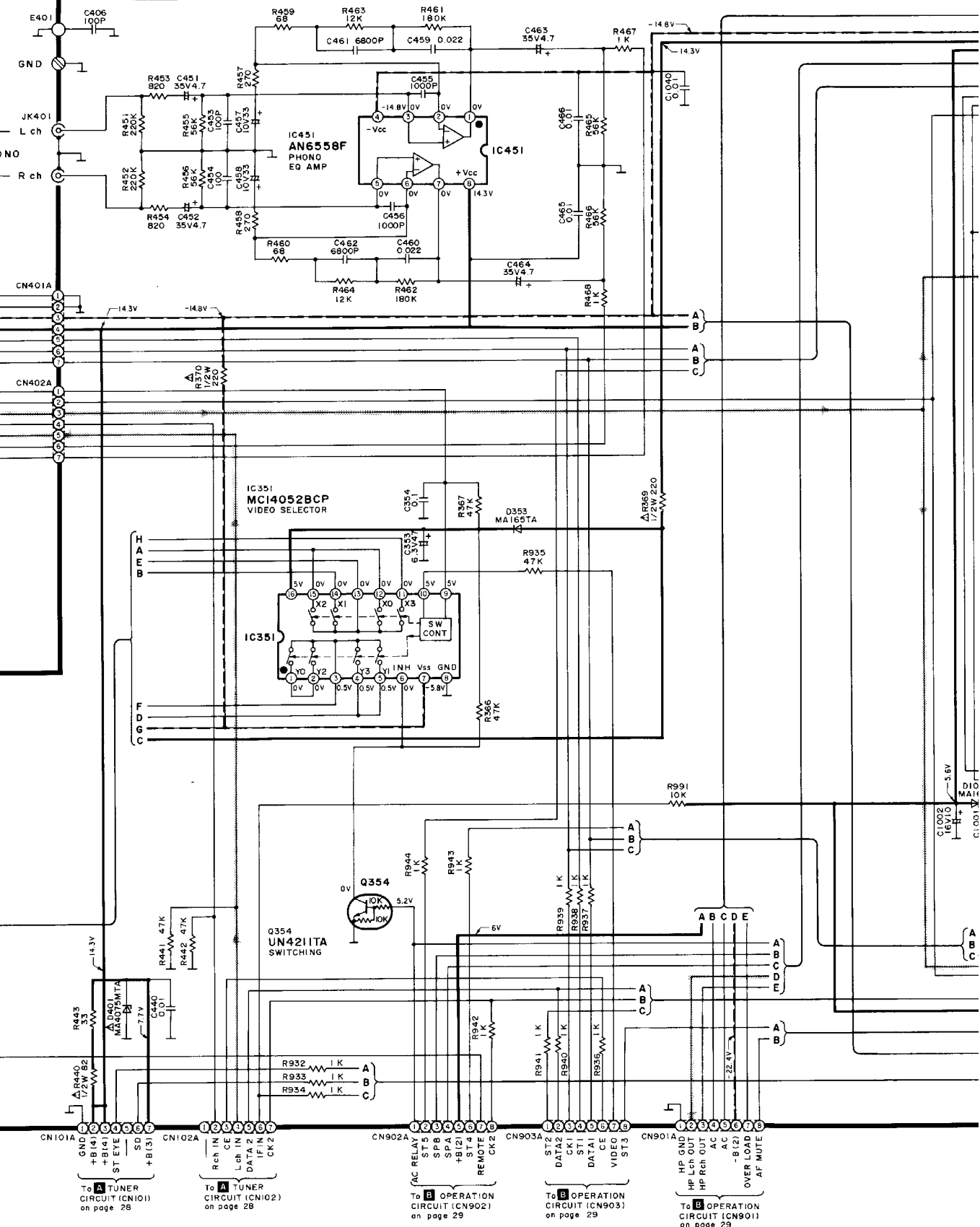
# G VCR2 CIRCUIT



# H VCR2 CIRCUIT



# H MAIN CIRCUIT



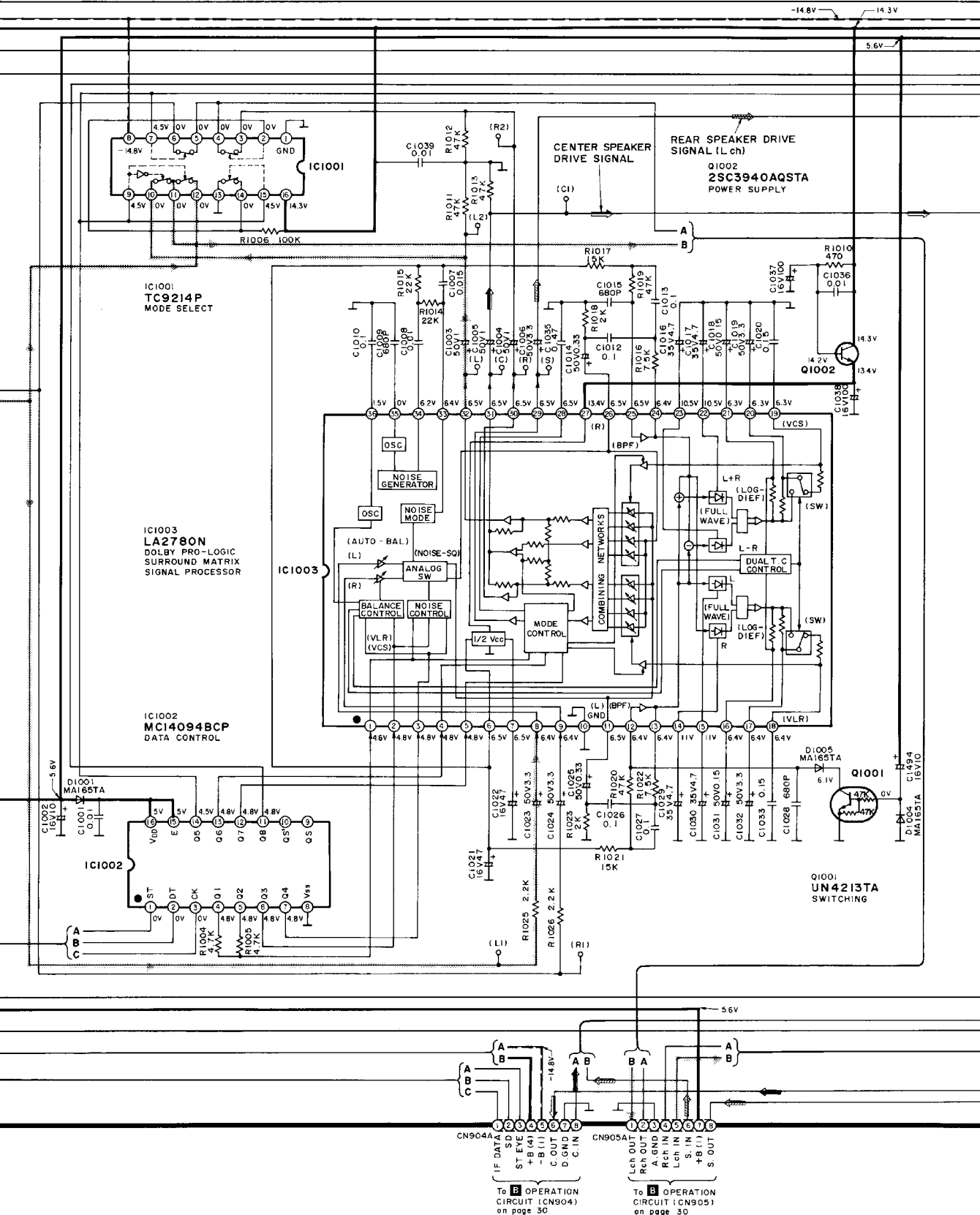
To **A** TUNER CIRCUIT (CN101) on page 28

To **A** TUNER CIRCUIT (CN102) on page 28

To **B** OPERATION CIRCUIT (CN902) on page 29

To **B** OPERATION CIRCUIT (CN903) on page 29

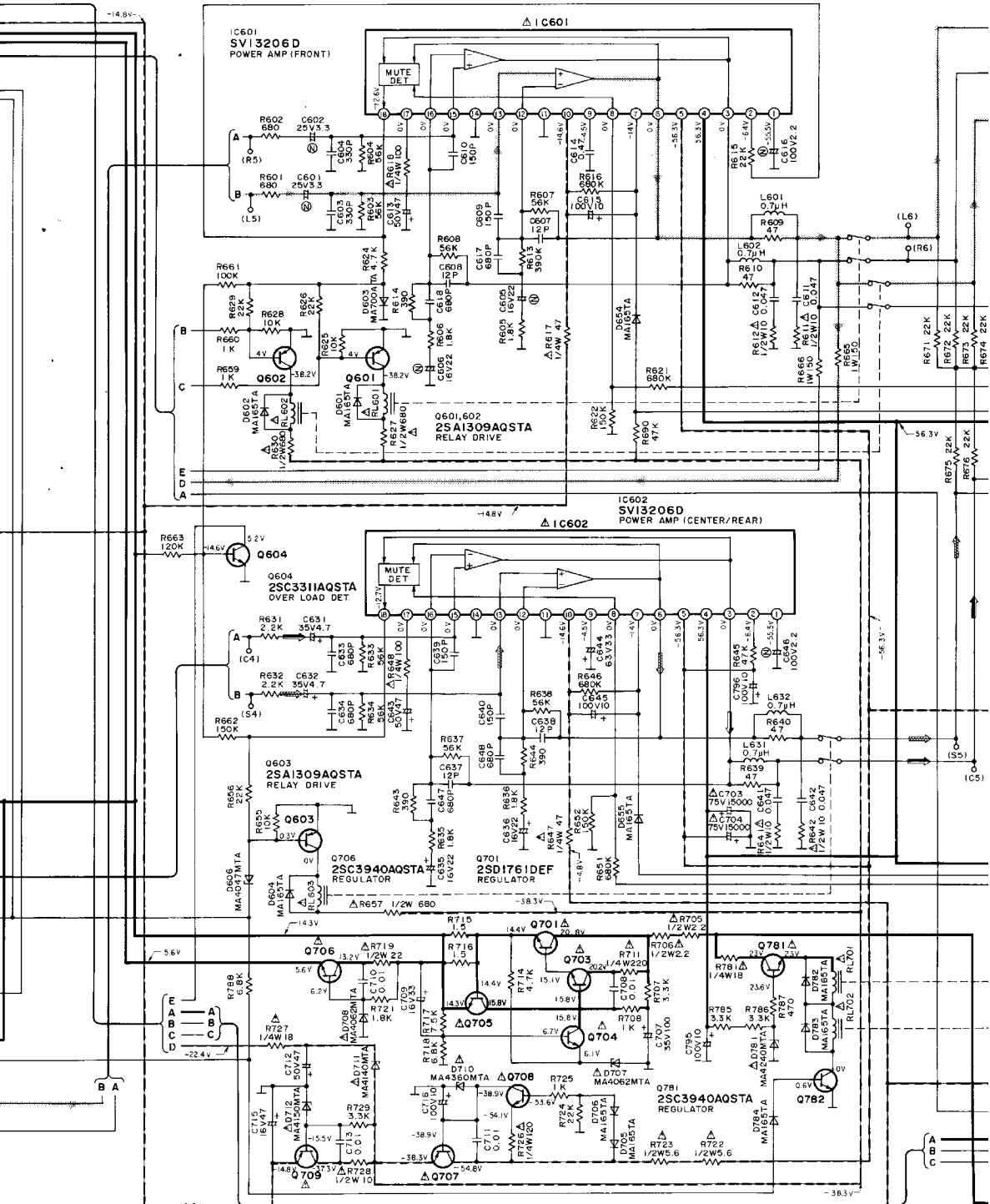
To **E** OPERATION CIRCUIT (CN901) on page 29



CN904A  
 1 IF DATA  
 2 ST EYE  
 3 +B (4)  
 4 -B (4)  
 5 C. OUT  
 6 D. GND  
 7 C. IN  
 8  
 To B OPERATION  
 CIRCUIT (CN904)  
 on page 30

CN905A  
 1 Lch OUT  
 2 Rch OUT  
 3 P. ENO  
 4 Lch IN  
 5 S. IN  
 6 +B (1)  
 7 -B (1)  
 8 S. OUT  
 To B OPERATION  
 CIRCUIT (CN905)  
 on page 30





IC601  
SV13206D  
POWER AMP (FRONT)

△ IC601

IC602  
SV13206D  
POWER AMP (CENTER/REAR)

△ IC602

Q601,602  
2SA1309AQSTA  
RELAY DRIVE

Q603  
2SA1309AQSTA  
RELAY DRIVE

Q706  
2SC3940AQSTA  
REGULATOR

Q701  
2SD1761DEF  
REGULATOR

Q781  
2SC3940AQSTA  
REGULATOR

Q707,709  
2SB1187DFE  
REGULATOR

Q708  
2SC2631QRSTA  
REGULATOR

Q703~705  
2SC3311AQSTA  
REGULATOR

Q782  
2SC3311AQSTA  
RELAY DRIVE





on page 33

To MAIN CIRCUIT (CN902A)

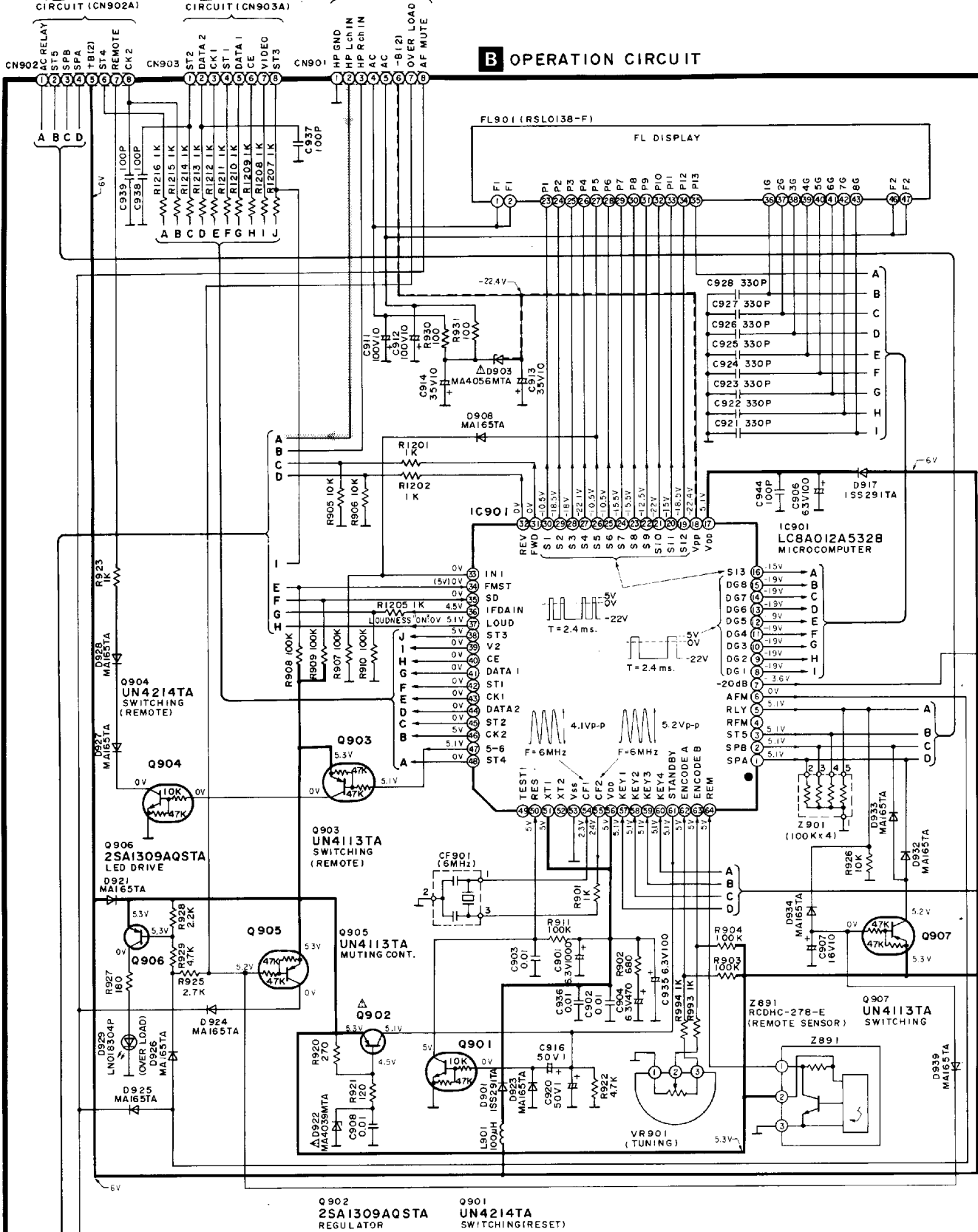
on page 33

To MAIN CIRCUIT (CN903A)

on page 33

To MAIN CIRCUIT (CN901A)

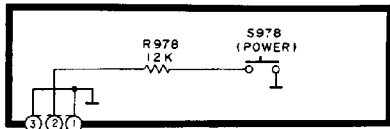
# B OPERATION CIRCUIT



Q902  
2SA1309AQSTA  
REGULATOR

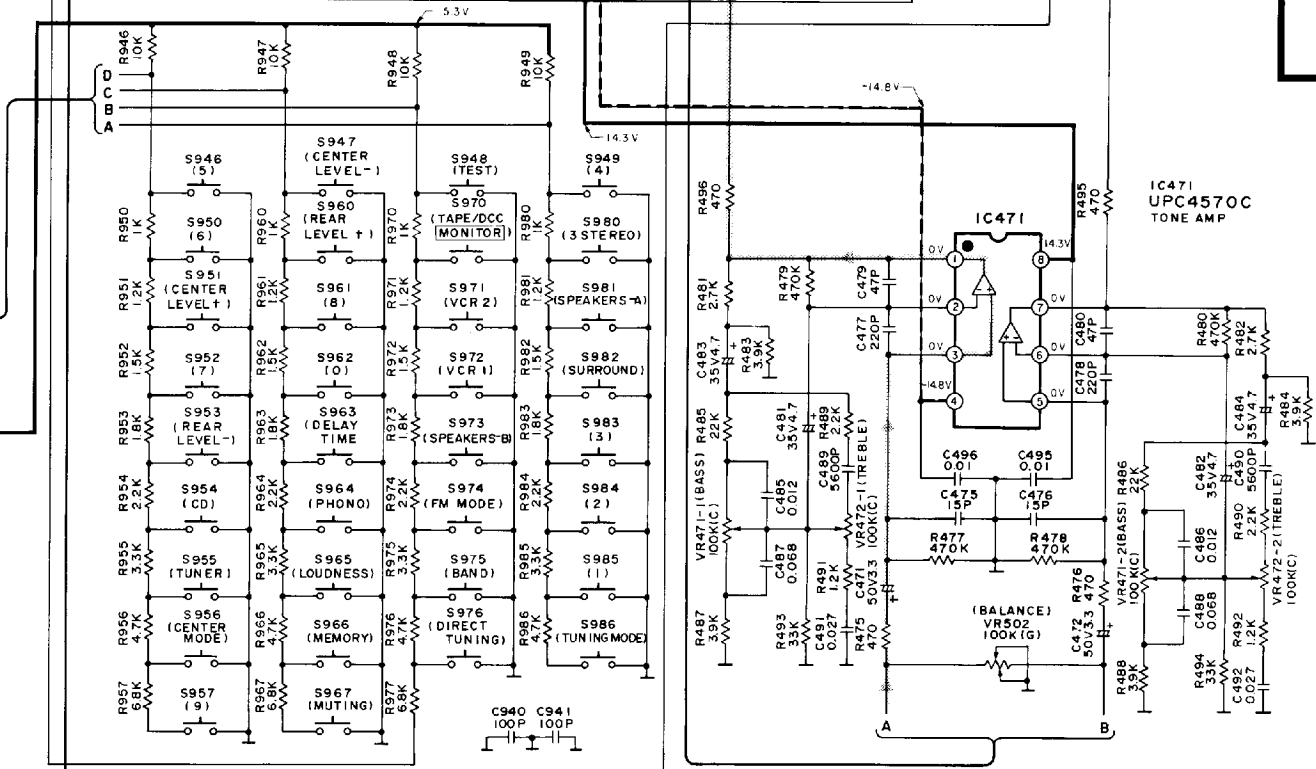
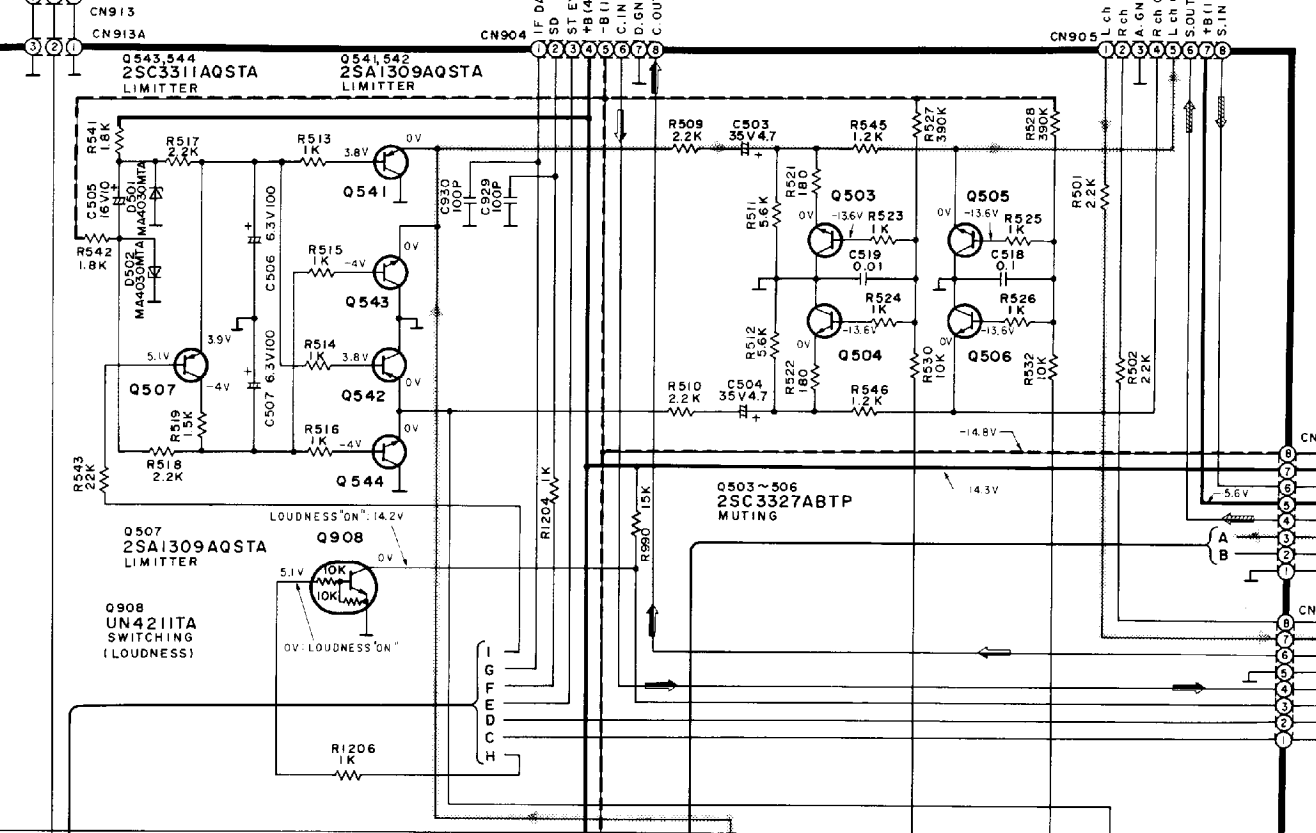
Q901  
UN4214TA  
SWITCHING(RESET)

# C POWER SWITCH CIRCUIT



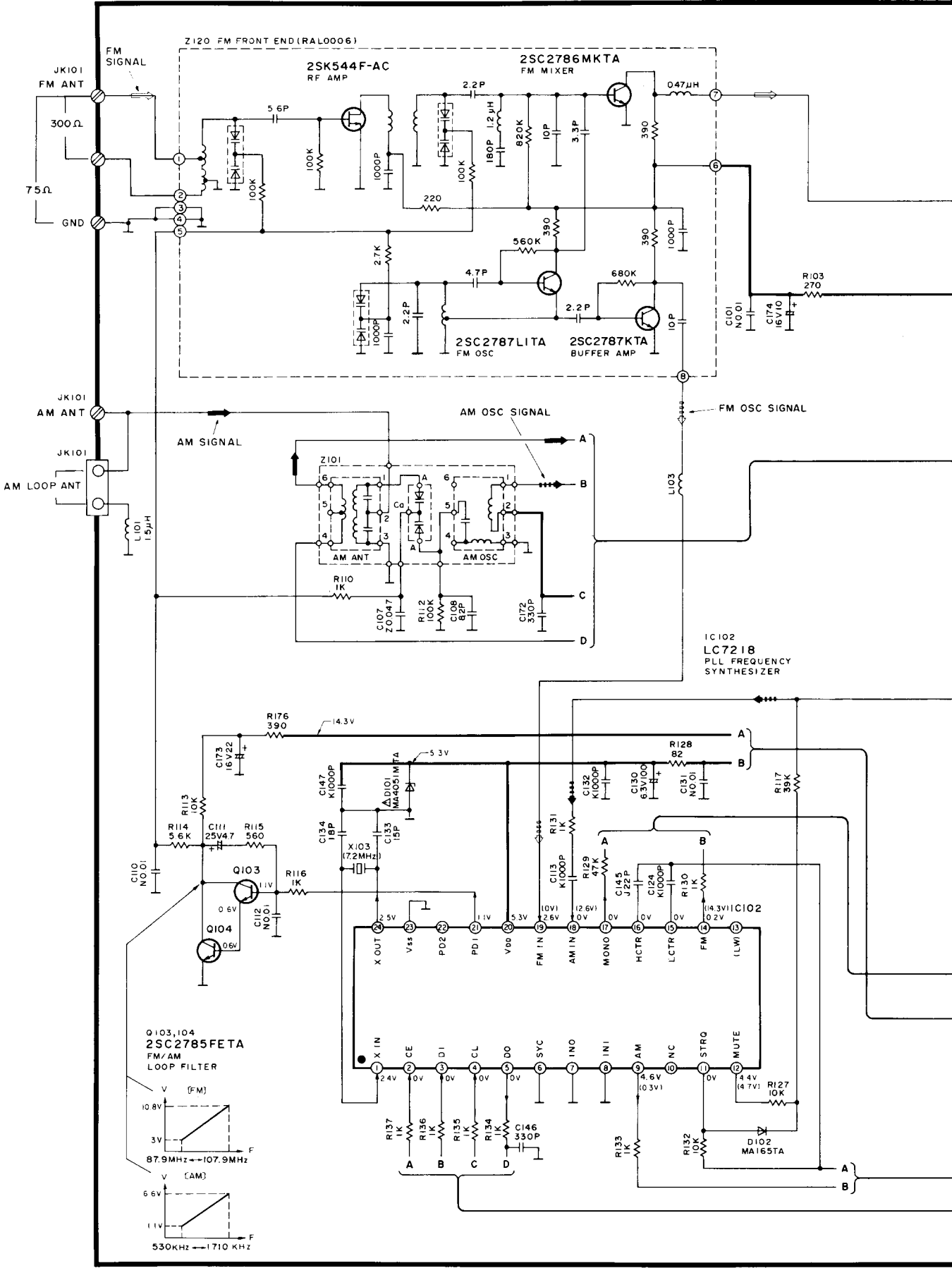
on page 34  
To MAIN CIRCUIT (CN904A)

on page 34  
To MAIN CIRCUIT (CN905A)

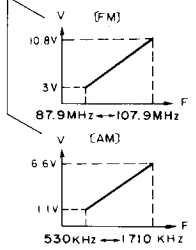




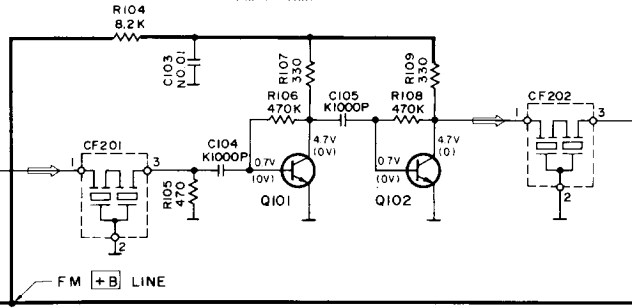
# A TUNER CIRCUIT



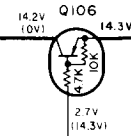
**Q103,104**  
**2SC2785FETA**  
FM/AM  
LOOP FILTER



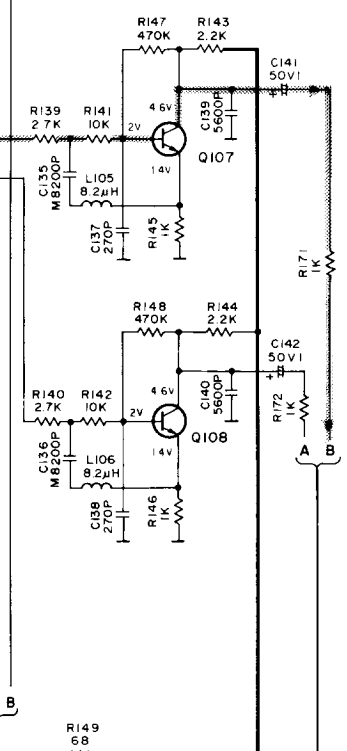
Q101,102  
2SC2787LTA  
FM IF AMP



Q106  
UN411 FTA  
POWER SUPPLY  
(FM ON)

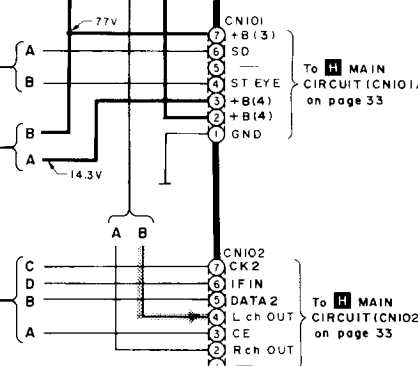
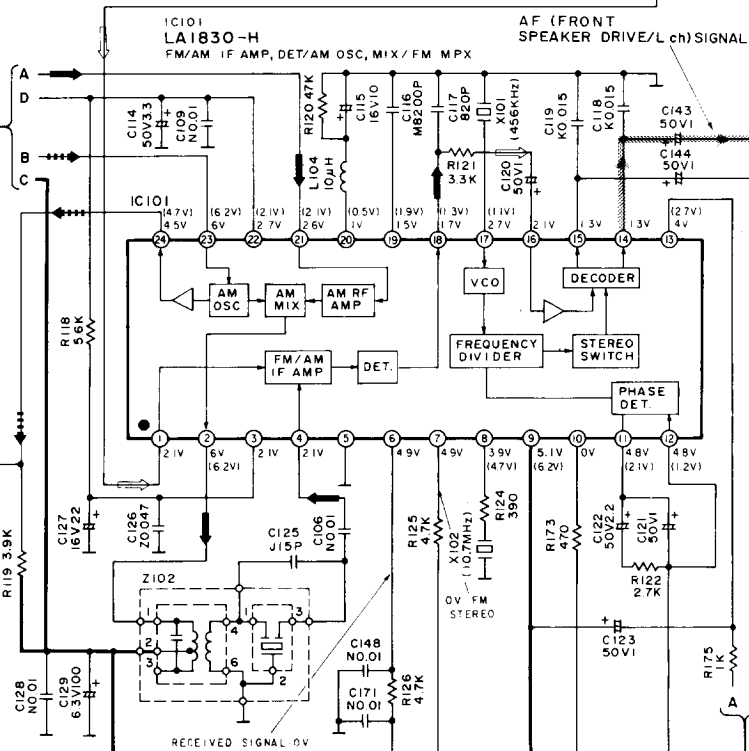


Q107,108  
2SC3311AQSTA  
BUFFER AMP



AF (FRONT  
SPEAKER DRIVE/L ch) SIGNAL

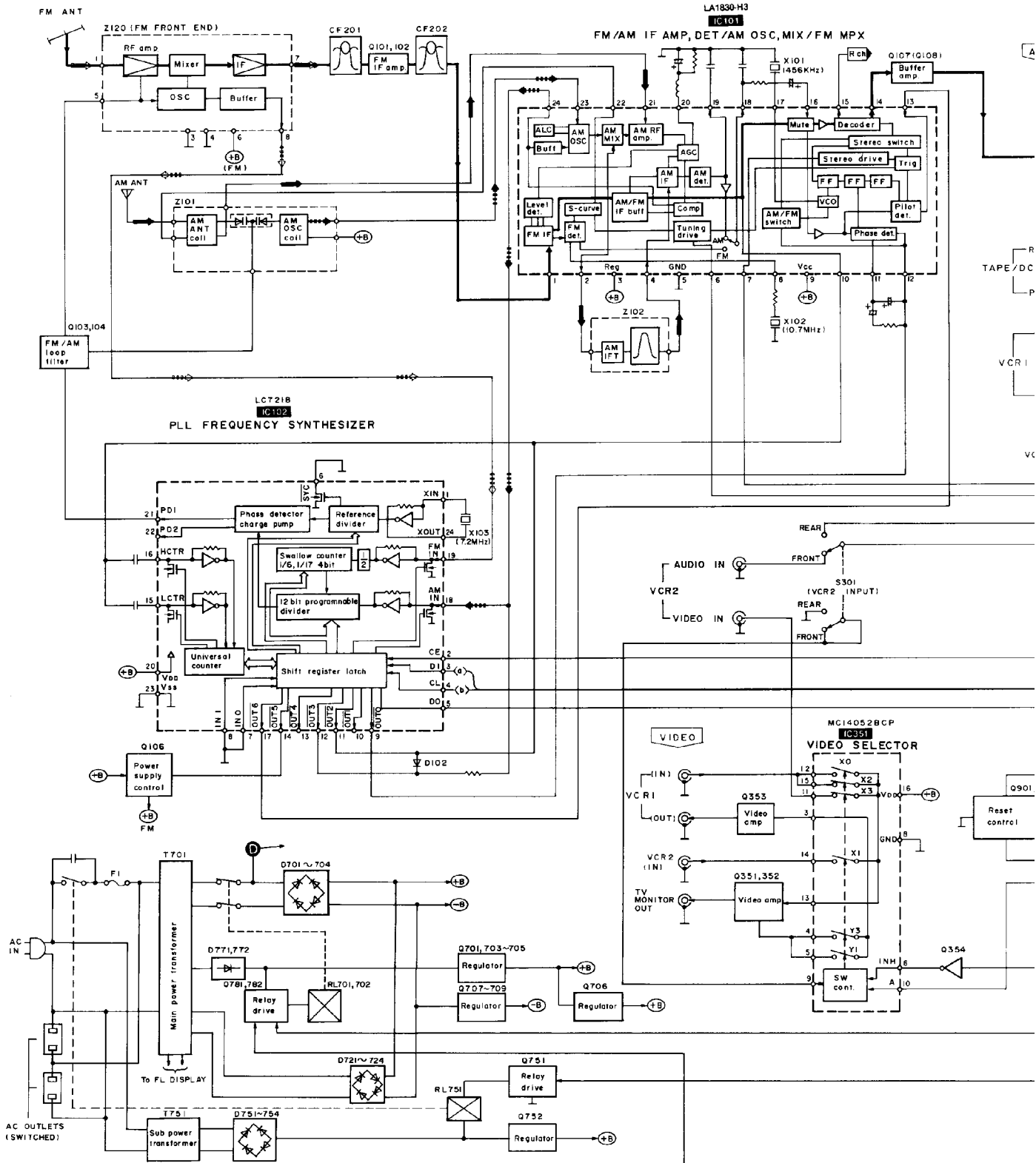
IC101  
LA1830-H  
FM/AM IF AMP, DET/AM OSC, MIX / FM MPX

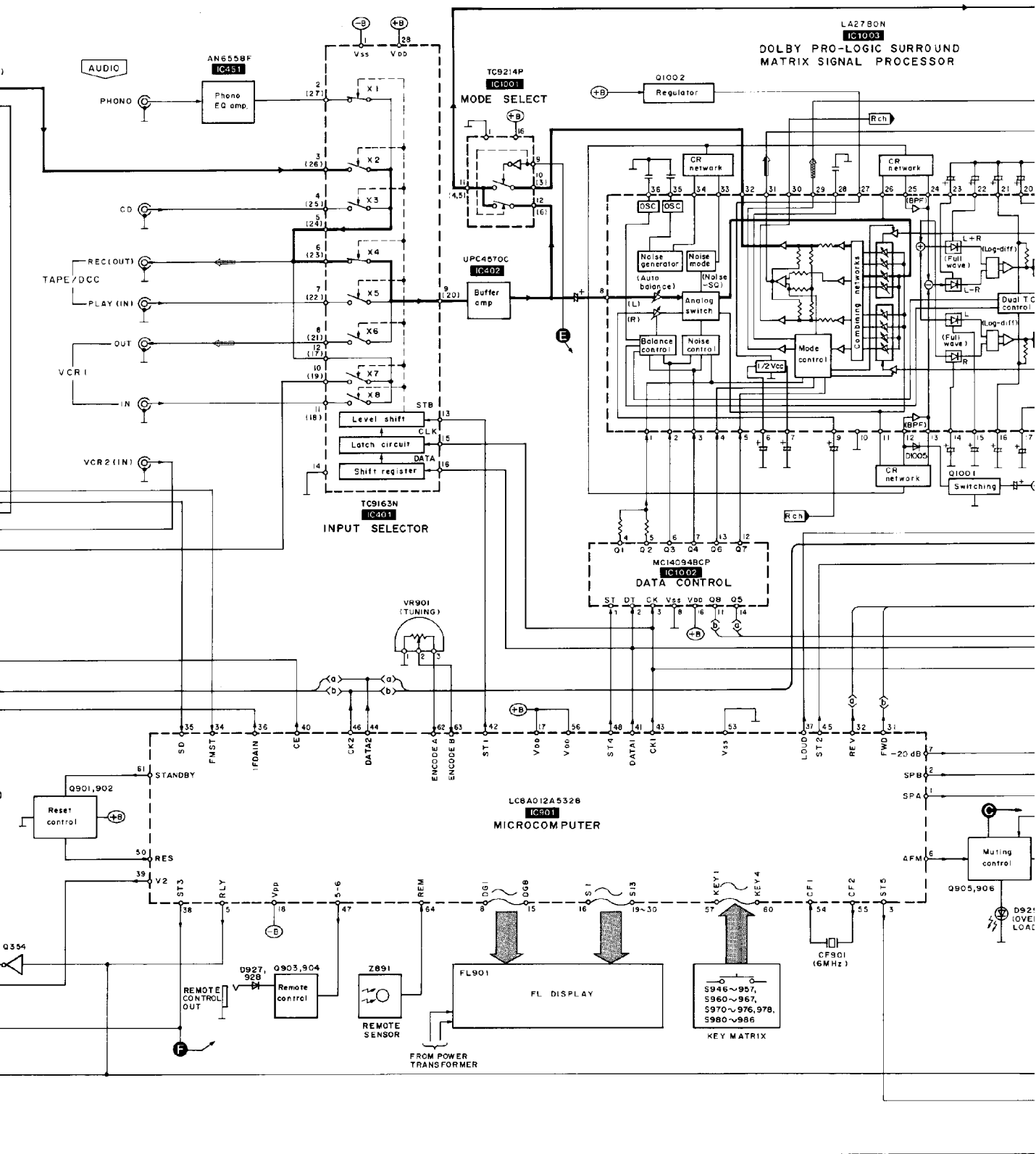


To MAIN CIRCUIT (CNI01A) on page 33

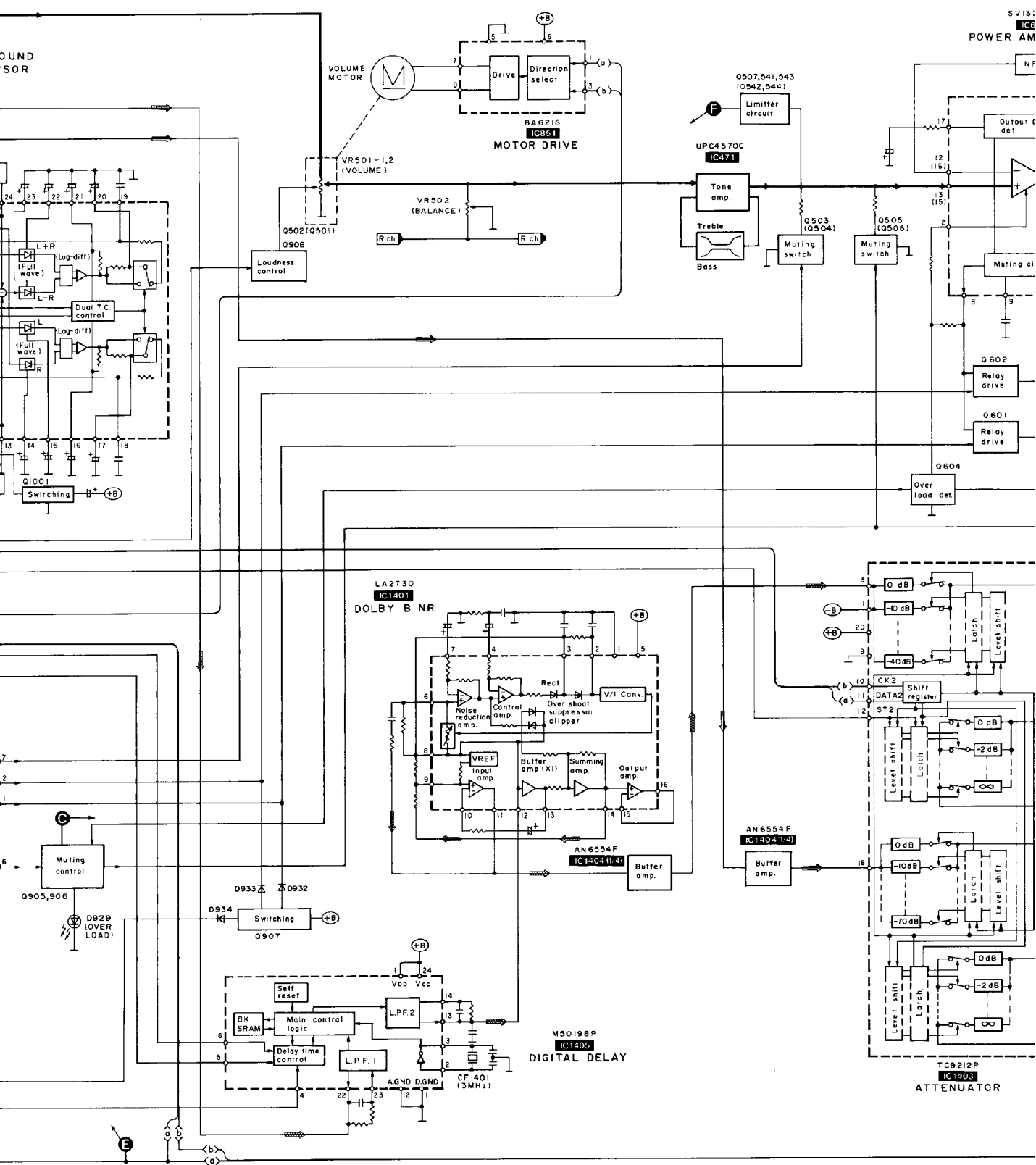
To MAIN CIRCUIT (CNI02A) on page 33

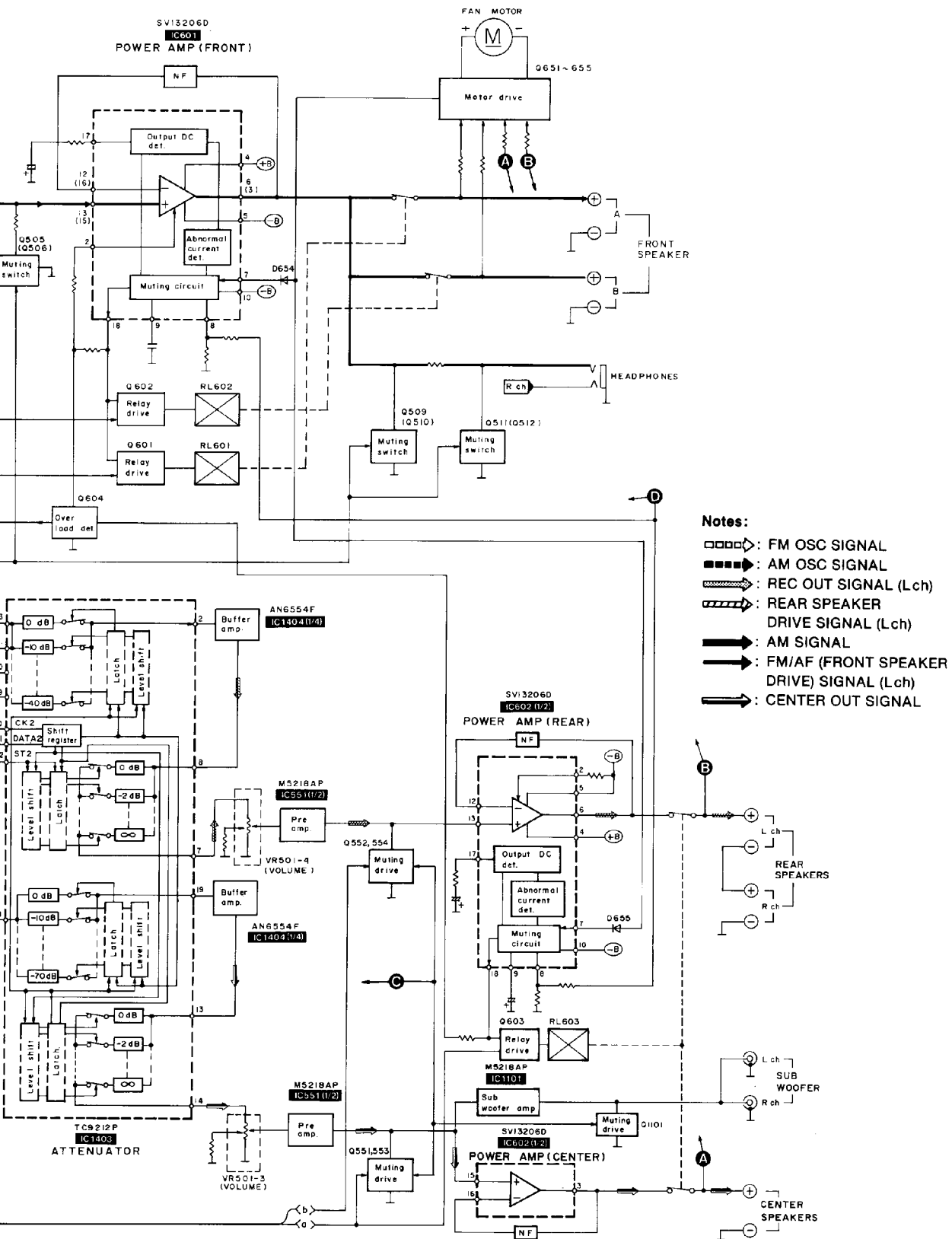
# BLOCK DIAGRAM











**Notes:**

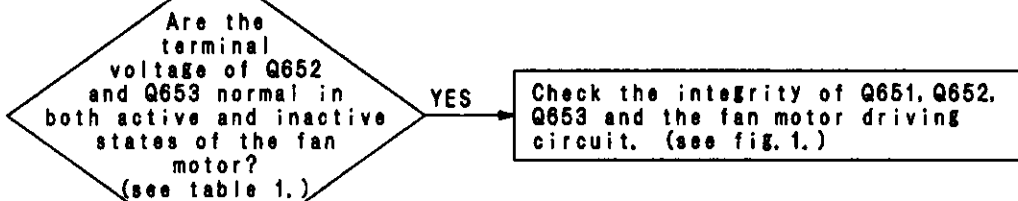
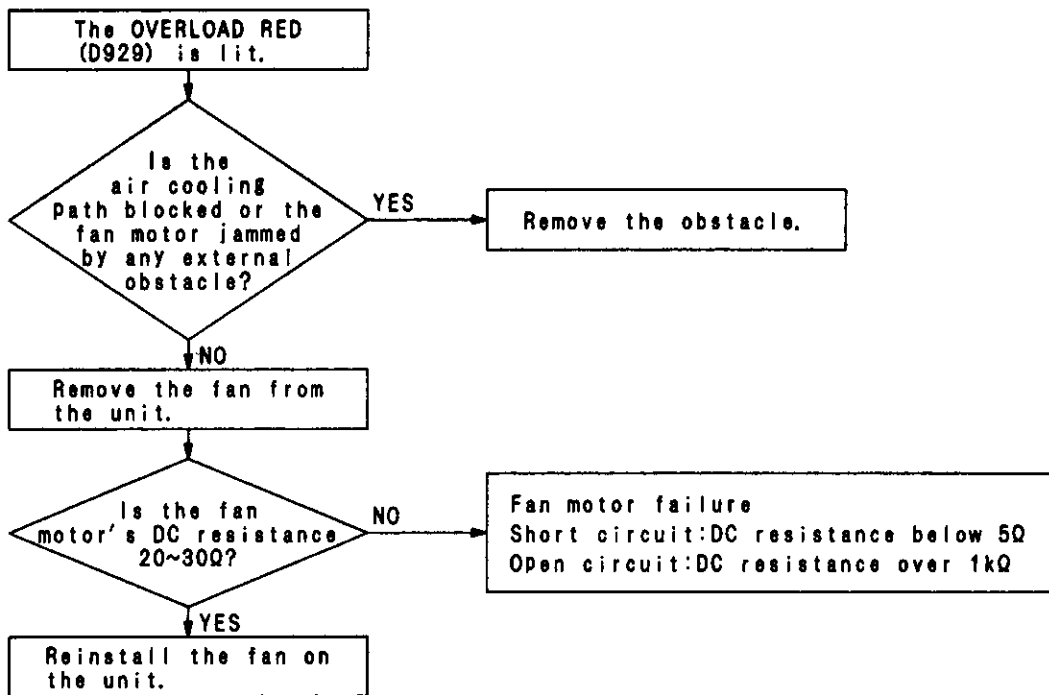
- ▷ : FM OSC SIGNAL
- ■ ■ ▷ : AM OSC SIGNAL
- ▨ ▨ ▨ ▷ : REC OUT SIGNAL (Lch)
- ▨ ▨ ▨ ▷ : REAR SPEAKER DRIVE SIGNAL (Lch)
- ▬ ▷ : AM SIGNAL
- ▬ ▷ : FM/AF (FRONT SPEAKER) DRIVE SIGNAL (Lch)
- ▬ ▷ : CENTER OUT SIGNAL



# FAN MOTOR TROUBLESHOOTING GUIDE

The Models SA-GX350/GX550/GX650 employ fan motor error sensing electronics.

If the cooling fan is not operation and its OVERLOAD light (D929) is on, check the fan motor and its OVERLOAD light (D929) is on, check the fan motor and its driving circuit.



(Voltage table)

	fan. off	fan. on
Q651	E 0V	0V
	C -0.65V	-0.1V
	B 0V	-0.65V
Q652	E 0V	0V
	C -0.1V	-8.2V
	B -0.65V	-0.1V
Q653	E 0V	-7.5V
	C -14V	-12.5V
	B -0.1V	-8.2V

(Table (1))

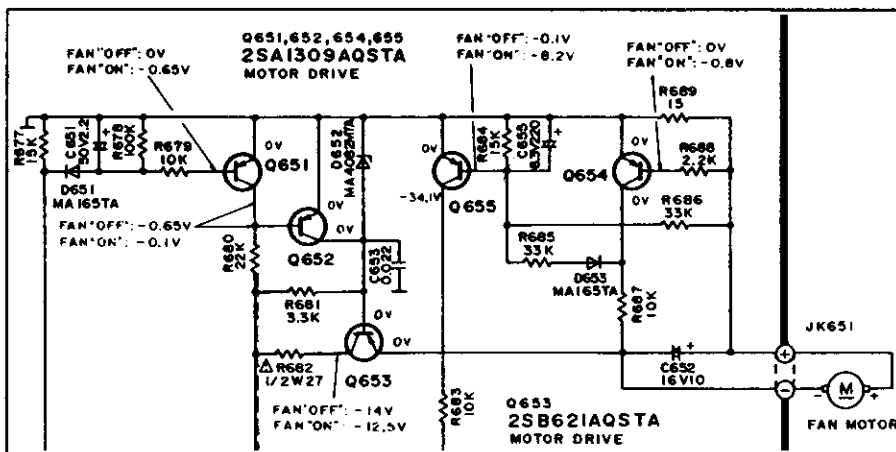
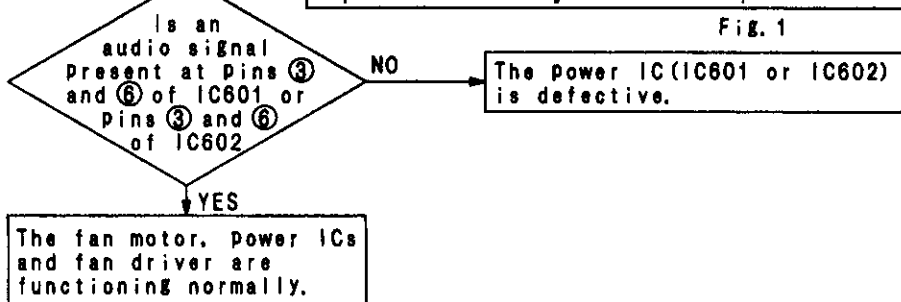
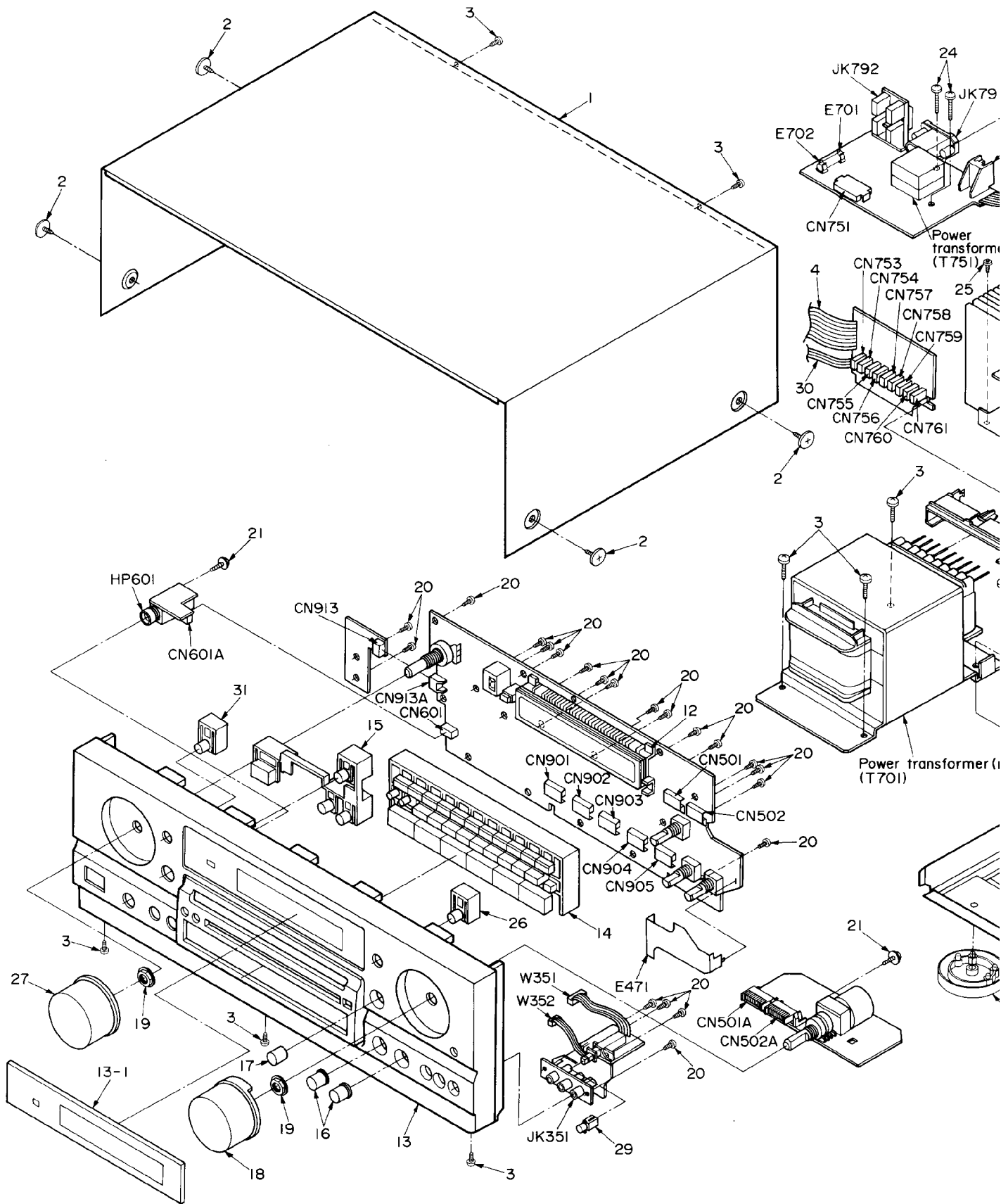
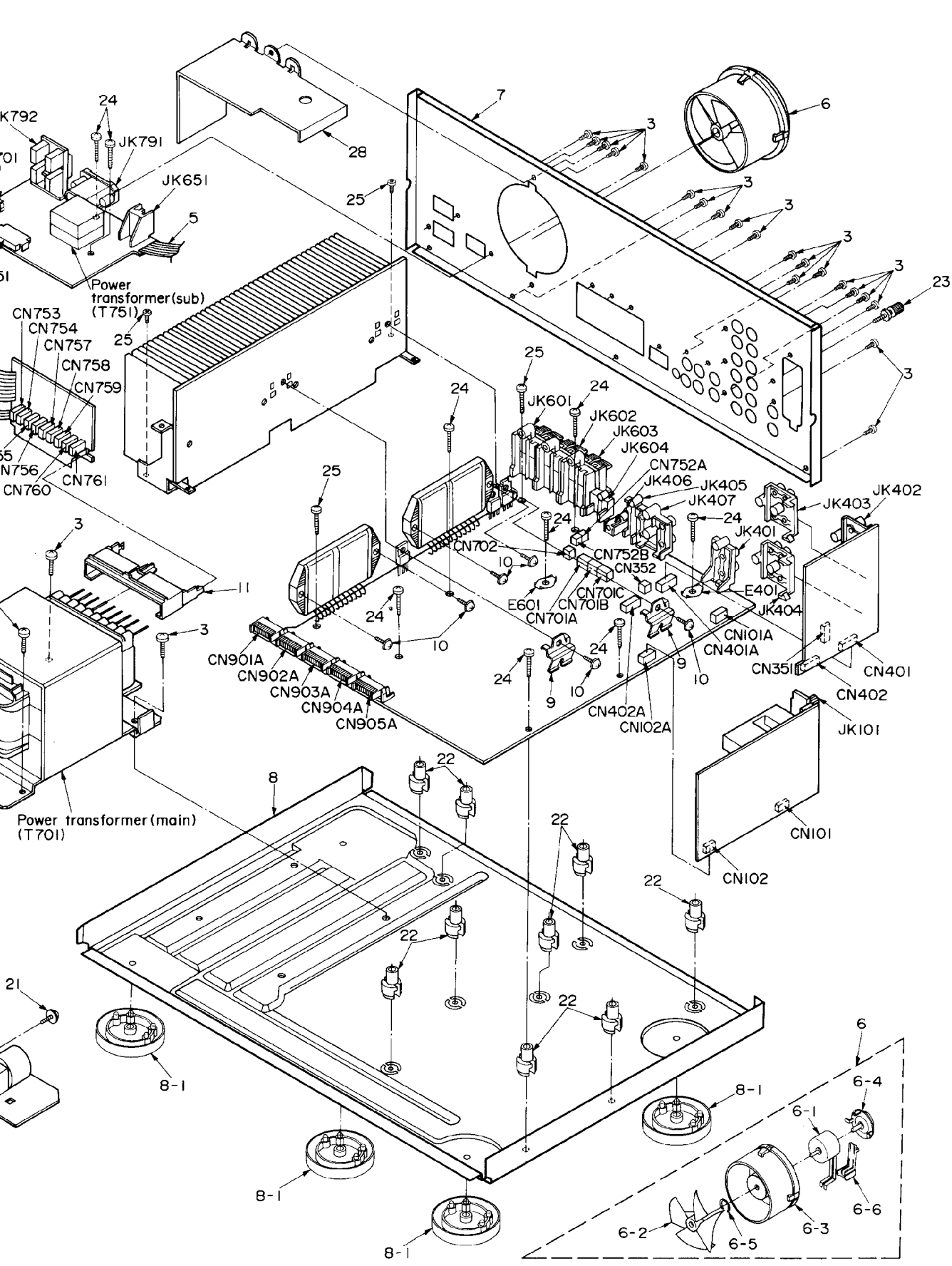


Fig. 1



# CABINET PARTS LOCATION





Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RKM0041A-K	CABINET	
2	SNE2129-3	SCREW	
3	XTBS3+8JF21	SCREW	
4	RWJ1812440QK	FLAT CABLE (W701) (12P)	
5	RWJ1806300QK	FLAT CABLE (W752) (6P)	
6	REMO020-1	FAN MOTOR UNIT	
6-1	MDN-4RB4MRC	MOTOR	
6-2	SHE232-1	FAN	
6-3	RMQ0209-K	FAN CASE	
6-4	RMQ0208-K	FAN CAP	
6-5	SUS271	SPRING	
6-6	RMQ0212-K	FAN TERMINAL CAP	
7	RGR0168B-A	REAR PANEL	
8	RFKJAGX350PK	BOTTOM CHASSIS ASS'Y	
8-1	RKAD053-A	FOOT	
9	RMCD158	TRANSISTOR HOLDER	
10	XTW3+15T	SCREW	
11	RMN0217	P. C. B. HOLDER	
12	RMN0205	FL HOLDER	
13	RFKAGX650PK	FRONT PANEL ASS'Y	
13-1	RKW0268-Q	TRANSPARENT PLATE	
14	RGU0837B-K	SELECTOR BUTTON	
15	RFKNAGX550PA	MODE BUTTON ASS'Y	
16	RGW0012-K1	BASS/TREBLE KNOB	
17	RGW0020	BALANCE KNOB	
18	RGW0163-K	VOLUME KNOB	
19	RHN90001	NUT	
20	XTBS26+8J	SCREW	
21	XTWS3+10T	SCREW	
22	SHE187-2	P. C. B. SUPPORT	
23	SNE2123	GND TERMINAL	
24	XTB3+20JFZ	SCREW	
25	XTB3+8JFZ	SCREW	
26	RFKNAGX350PB	MUTING BUTTON ASS'Y	
27	RGW0171-K	TUNING KNOB	
28	RMA0692	WIND CAVE	
29	RGU0609-K	VCR2 SELECT BUTTON	
30	RWJ1803440QK	FLAT CABLE (W702) (3P)	
31	RFKNAGX550PB	TUNING MODE ASS'Y	
		PACKING MATERIAL	

Ref. No.	Part No.	Part Name & Description	Remarks
P1	RPG1548	PACKING CASE	
P2	RPN0682	CUSHION	
P3	RPQ0164	PAD (ACCESSORIES)	
P4	XZB60X65A01Z	PROTECTION BAG (UNIT)	
P5	XZB24X34C04	PROTECTION BAG (ACCESSORIES)	
		ACCESSORIES	
A1	RFKSAGX650P	INSTRUCTION MANUAL ASS'Y	(P)
A1	RFKSAGX650PC	INSTRUCTION MANUAL ASS'Y	(PC)
A2	SJA172-1	AC POWER SUPPLY CORD	(P) Δ
A2	SJA172	AC POWER SUPPLY CORD	(PC) Δ
A3	RSA0006	FM INDOOR ANTENNA	
A4	SPB1163T	AM LOOP ANTENNA SET	
A4-1	SMA233-1M	AM ANTENNA HOLDER	
A4-2	XTN3+10AFZ	SCREWS	
A5	RQCB0391	SERVICENTER LIST	(P)
A5	SQX9131	SERVICENTER LIST	(PC)
A6	SQX7179	WARRANTY CARD	(P)
A6	SQX7183	WARRANTY CARD	(PC)
A7	RAK-SA901MH	REMOTE CONTROL TRANSMITTER	
A7-1	RKK0020-K	BATTERY COVER	FOR R/C-TRANSMITTER
A8	RQCA0259	SEAL FOR R/C TRANSMITTER	

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT (S)	
IC101	LA1830-H3	IC, FM/AM IF AMP. /AM OSC	
IC102	LC7218	IC, PLL FREQ. SYNTHESIZER	
IC351	MC14052BCP	IC, VIDEO SELECTOR	
IC401	TC9163N	IC, INPUT SELECTOR	
IC402	UPC4570C	IC, BUFFER AMP	
IC451	AN6558F	IC, PHONO EQ AMP	
IC471	UPC4570C	IC, TONE CONTROL	
IC551	M5218AP	IC, FLAT AMP	
IC601, 602	SVI3206D	IC, POWER AMP	△
IC851	BA6218	IC, VOLUME MOTOR DRIVE	
IC901	LC8A012A5328	IC, MICROCOMPUTER	
IC1001	TC9214P	IC, MODE SELECT	
IC1002	MC14094BCP	IC, DATA CONTROL	
IC1003	LA2780N	IC, DOLBY PRO-LOGIC	
IC1101	M5218AP	IC, SUB WOOFER AMP	
IC1401	LA2730	IC, DOLBY B NR	
IC1403	TC9212P	IC, ATTENUATOR	
IC1404	AN6554F	IC, BUFFER AMP	
IC1405	M50198P	IC, DIGITAL DELAY	
		TRANSISTOR (S)	
Q101, 102	2SC2787L	TRANSISTOR	
Q103, 104	2SC2785FE	TRANSISTOR	
Q106	UN411FTA	TRANSISTOR	
Q107, 108	2SC3311A-Q	TRANSISTOR	
Q351	2SA1309A-R	TRANSISTOR	
Q352, 353	2SC3311A-Q	TRANSISTOR	
Q354	UN4211	TRANSISTOR	
Q501, 502	2SJ40CDA	TRANSISTOR	
Q503-506	2SC3327-A	TRANSISTOR	
Q507	2SA1309A-R	TRANSISTOR	
Q509-512	2SC3327-A	TRANSISTOR	
Q541, 542	2SA1309A-R	TRANSISTOR	
Q543, 544	2SC3311A-Q	TRANSISTOR	
Q551, 552	2SC3327-A	TRANSISTOR	
Q553, 554	2SA1309A-R	TRANSISTOR	
Q601-603	2SA1309A-R	TRANSISTOR	
Q604	2SC3311A-Q	TRANSISTOR	
Q651, 652	2SA1309A-R	TRANSISTOR	
Q653	2SB621AQSTA	TRANSISTOR	
Q654, 655	2SA1309A-R	TRANSISTOR	
Q701	2SD1761DEF	TRANSISTOR	△
Q703-705	2SC3311A-Q	TRANSISTOR	△
Q706	2SC3940AQSTA	TRANSISTOR	△
Q707	2SB1187DEF	TRANSISTOR	△
Q708	2SC2631QRSTA	TRANSISTOR	△
Q709	2SB1187DEF	TRANSISTOR	△
Q751	UN421FTA	TRANSISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
Q752	2SC3940AQSTA	TRANSISTOR	△
Q781	2SC3940AQSTA	TRANSISTOR	△
Q782	2SC3311A-Q	TRANSISTOR	
Q901	UN4214TA	TRANSISTOR	
Q902	2SA1309A-R	TRANSISTOR	△
Q903	UN4113TA	TRANSISTOR	
Q904	UN4214TA	TRANSISTOR	
Q905	UN4113TA	TRANSISTOR	
Q906	2SA1309A-R	TRANSISTOR	
Q907	UN4113TA	TRANSISTOR	
Q908	UN4211	TRANSISTOR	
Q1001	UN4213	TRANSISTOR	
Q1002	2SC3940AQSTA	TRANSISTOR	
Q1101	2SC3327-A	TRANSISTOR	
		DIODE (S)	
D101	MA4051MTA	DIODE	△
D102	MA165	DIODE	
D351, 352	MA4056MTA	DIODE	△
D353	MA165	DIODE	
D401	MA4075MTA	DIODE	△
D501, 502	MA4030MTA	DIODE	
D531, 532	MA165	DIODE	
D533-536	MA4030MTA	DIODE	
D551, 552	MA165	DIODE	
D601, 602	MA165	DIODE	
D603	MA700	DIODE	
D604	MA165	DIODE	
D606	MA4047MTA	DIODE	
D651	MA165	DIODE	
D652	MA4082MTA	DIODE	
D653-655	MA165	DIODE	
D701-704	P300DLF	DIODE	△
D705, 706	MA165	DIODE	
D707, 708	MA4062MTA	DIODE	△
D710	MA4360MTA	DIODE	△
D711	MA4140M	DIODE	△
D712	MA4150M	DIODE	△
D721-724	P300DLF	DIODE	△
D751-754	1SR35200TB	DIODE	△
D755	MA165	DIODE	
D756	MA4068M	DIODE	△
D771, 772	1SR35200TB	DIODE	△
D781	MA4240H	DIODE	△
D782-785	MA165	DIODE	
D901	1SS291TA	DIODE	
D903	MA4056MTA	DIODE	△
D908	MA165	DIODE	
D917	1SS291TA	DIODE	
D921	MA165	DIODE	
D922	MA4039MTA	DIODE	△



Ref.No.	Part No.	Part Name & Description	Remarks
D923-928	MA165	DIODE	
D929	LN018304P	L. E. D.	
D932-934	MA165	DIODE	
D939	MA165	DIODE	
D1001	MA165	DIODE	
D1004, 1005	MA165	DIODE	
		VARIABLE RESISTOR(S)	
VR471, 472	EVJYA1FA5C15	V. R. BASS/TREBLE	
VR501	EUMMK3002B15	V. R. VOLUME CONTROL	
VR502	EVJ02QF02G15	V. R. BALANCE CONTROL	
VR901	EVQMPDF2024B	V. R. TUNING CONTROL	
		COMPONENT COMBINATION(S)	
Z101	RLA2Z002M-T	COMPONENT COMBINATION	
Z102	RLI2Z006M-T	COMPONENT COMBINATION	
Z891	RCDHC-278	REMOTE SENSOR	
Z901	EXBF5E104J	COMPONENT COMBINATION	
		COIL(S)	
L101	ELESN1R5MA	COIL	
L103	ELEXTR47MA9	COIL	
L104	ELEXT100KA9	COIL	
L105, 106	RLQZB822KT-D	COIL	
L591, 592	RLQZP1R0KT-Y	COIL	
L601, 602	SLQY07G-40	COIL	
L631, 632	SLQY07G-40	COIL	
L751	ELEPK101KA	COIL	
L901	RLQZP101KT-Y	COIL	
L1401	ELEPK101KA	COIL	
		TRANSFORMER(S)	
T701	RTP1Q5C006-W	POWER TRANSFORMER(MAIN)	△
T751	RTP1H5C001-V	POWER TRANSFORMER(SUB)	△
		FILTER(S) AND OSCILLATOR(S)	
CF201, 202	RLFFETMCD01L	FILTER	
CF901	EFOEC6004T4	OSCILLATOR(6MHz)	
CF1401	EFOGC3004T4	OSCILLATOR(3MHz)	
X101	RSXZ456KM07M	OSCILLATOR(456KHz)	
X102	RLFDFTD03M1	OSCILLATOR(10.7MHz)	
X103	SVQ49U722-S	OSCILLATOR(7.2MHz)	
		DISPLAY TUBE	
FL901	RSI0138-F	DISPLAY TUBE	

Ref.No.	Part No.	Part Name & Description	Remarks
		FM FRONT END PACK(S)	
Z120	RAL0006	FM FRONT END	
		FUSE(S)	
F1	XBAIC63NBAU	FUSE, 125V, 6.3A	△
		SWITCH(ES)	
S301	RSP2D009-J	SW. VCR2 INPUT	
S946	EVQ21405R	SW. NUMERIC(5)	
S947	EVQ21405R	SW. CENTER LEVEL(-)	
S948	EVQ21405R	SW. TEST	
S949	EVQ21405R	SW. NUMERIC(4)	
S950	EVQ21405R	SW. NUMERIC(6)	
S951	EVQ21405R	SW. CENTER LEVEL(+)	
S952	EVQ21405R	SW. NUMERIC(7)	
S953	EVQ21405R	SW. REAR LEVEL(-)	
S954	EVQ21405R	SW. CD	
S955	EVQ21405R	SW. TUNER	
S956	EVQ21405R	SW. CENTER MODE	
S957	EVQ21405R	SW. NUMERIC(9)	
S960	EVQ21405R	SW. REAR LEVEL(+)	
S961	EVQ21405R	SW. NUMERIC(8)	
S962	EVQ21405R	SW. NUMERIC(0)	
S963	EVQ21405R	SW. DELAY TIME	
S964	EVQ21405R	SW. PHONO	
S965	EVQ21405R	SW. LOUDNESS	
S966	EVQ21405R	SW. MEMORY	
S967	EVQ21405R	SW. MUTING	
S970	EVQ21405R	SW. TAPE/DCC	
S971	EVQ21405R	SW. VCR2	
S972	EVQ21405R	SW. VCR1	
S973	EVQ21405R	SW. SPEAKERS-B	
S974	EVQ21405R	SW. FM MODE	
S975	EVQ21405R	SW. BAND	
S976	EVQ21405R	SW. DIRECT TUNING	
S978	EVQ21405R	SW. POWER	
S980	EVQ21405R	SW. 3 STEREO	
S981	EVQ21405R	SW. SPEAKERS-A	
S982	EVQ21405R	SW. SURROUND	
S983	EVQ21405R	SW. NUMERIC(3)	
S984	EVQ21405R	SW. NUMERIC(2)	
S985	EVQ21405R	SW. NUMERIC(1)	
S986	EVQ21405R	SW. TUNING MODE	
		CONNECTOR(S) AND SOCKET(S)	
CN101, 102	RJU063W07T	SOCKET(7P)	
CN351	SJT3809	CONNECTOR(8P)	
CN352	SJT3213	CONNECTOR(2P)	

Ref. No.	Part No.	Part Name & Description	Remarks
CN401, 402	RJU057W007	SOCKET (7P)	
CN501, 502	RJT003K008-1	CONNECTOR (8P)	
CN601	RJT057W004-1	CONNECTOR (4P)	
CN702	RJS1A1703	CONNECTOR (3P)	
CN751	SJS305-1	CONNECTOR (3P)	
CN753-761	RJS1A1101T1	CONNECTOR (1P)	
CN901-905	RJT003K008-1	CONNECTOR (8P)	
CN913	SJT30345JQ	CONNECTOR (3P)	
CN101A	RJT063W07T	CONNECTOR (7P)	
CN102A	RJT063W07T	CONNECTOR (7P)	
CN401A	RJT057W007-1	CONNECTOR (7P)	
CN402A	RJT057W007-1	CONNECTOR (7P)	
CN501A	RJU003K008M1	SOCKET (8P)	
CN502A	RJU003K008M1	SOCKET (8P)	
CN601A	RJU057W004	SOCKET (4P)	
CN701A	RJS1A1704	CONNECTOR (4P)	
CN752A	RJS1A1703	CONNECTOR (3P)	
CN901A	RJU003K008M1	SOCKET (8P)	
CN902A	RJU003K008M1	SOCKET (8P)	
CN903A	RJU003K008M1	SOCKET (8P)	
CN904A	RJU003K008M1	SOCKET (8P)	
CN905A	RJU003K008M1	SOCKET (8P)	
CN913A	SJS50382JQH	CONNECTOR (3P)	
CN701B	RJS1A1704	CONNECTOR (4P)	
CN752B	RJS1A1703	CONNECTOR (3P)	
CN701C	RJS1A1704	CONNECTOR (4P)	
		CONNECTOR ASS'Y(S)	
W351	REX0503	CONNECTOR ASS'Y(8P)	
W352	REX0500	CONNECTOR ASS'Y(2P)	
		GND PLATE(S)	
E401	SNE1004-1	GND PLATE	
E471	RSC0319	GND PLATE	
E601	SNE1004-1	GND PLATE	
E701, 702	EYF52BC	FUSE HOLDER	
		JACK(S) AND TERMINAL(S)	
HP601	RJJ63TA01	HEADPHONES JACK	
JK101	RJH4405M	ANT TERMINAL	
JK351	SJFK5-1	VCR2 IN/VIDEO TERMINAL	
JK401	SJF3068N	PHONO TERMINAL	
JK402	SJF3069N	CD IN/REC OUT TERMINAL	
JK403	SJF3069N	PLAY IN/VCR2 IN TERMINAL	
JK404	SJF3069N	VCR1 OUT/VCR1 IN TERMINAL	
JK405	SJF3068N	SUB WOOFER OUT	
JK406	RJJ33TR01	REMOTE CONTROL OUT TERMINAL	
JK407	SJF3069-3N	TV MONITOR OUT/VIDEO	
JK601	RJR0054	FRONT SPEAKER(A) TERMINAL	

Ref. No.	Part No.	Part Name & Description	Remarks
JK602	RJR0054	FRONT SPEAKER(B) TERMINAL	
JK603	RJR0054	REAR SPEAKER TERMINAL	
JK604	SJF5201-1	CENTER SPEAKER TERMINAL	
JK651	RJS1A7402-1	FAN JACK	
JK791	SJSD16	AC INLET	△
JK792	RJS2A0102-S	AC OUTLET	△
		RELAY(S)	
RL601-603	RSY0013M-0	RELAY	△
RL701, 702	RSY0012-0	RELAY	△
RL751	RSY0012-0	RELAY	△

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R363	ERDS2TJ332	1/4W 3.3K	R537	ERDS2TJ332	1/4W 3.3K
			R364	ERDS2TJ561	1/4W 560	R539, 540	ERDS2TJ330	1/4W 33
			R365	ERDS2TJ332	1/4W 3.3K	R541, 542	ERDS2TJ182	1/4W 1.8K
R103	ERDS2TJ271	1/4W 270	R366, 367	ERDS2TJ473	1/4W 47K	R543	ERDS2TJ223	1/4W 22K
R104	ERDS2TJ822	1/4W 8.2K	R368	ERDS2TJ103	1/4W 10K	R545, 546	ERDS2TJ122	1/4W 1.2K
R105	ERDS2TJ471	1/4W 470	R369, 370	ERDS1FVJ221T	1/2W 220 $\Delta$	R547, 548	ERDS1FVJ271T	1/2W 270 $\Delta$
R106	ERDS2TJ474	1/4W 470K	R401, 402	ERDS2TJ102	1/4W 1K	R551, 552	ERDS2TJ222	1/4W 2.2K
R107	ERDS2TJ331	1/4W 330	R405-416	ERDS2TJ102	1/4W 1K	R553, 554	ERDS2TJ104	1/4W 100K
R108	ERDS2TJ474	1/4W 470K	R417, 418	ERDS2TJ473	1/4W 47K	R555	ERDS2TJ682T	1/4W 6.8K
R109	ERDS2TJ331	1/4W 330	R419-422	ERDS2TJ104	1/4W 100K	R556	ERDS2TJ103	1/4W 10K
R110	ERDS2TJ102	1/4W 1K	R423, 424	ERDS2TJ102	1/4W 1K	R557, 558	ERDS2TJ122	1/4W 1.2K
R112	ERDS2TJ104	1/4W 100K	R425-427	ERDS2TJ103	1/4W 10K	R559, 560	ERDS2TJ104	1/4W 100K
R113	ERDS2TJ103	1/4W 10K	R429-432	ERDS2TJ224T	1/4W 220K	R561, 562	ERDS2TJ222	1/4W 2.2K
R114	ERDS2TJ562	1/4W 5.6K	R440	ERDS1FVJ820T	1/2W 82 $\Delta$	R571, 572	ERDS2TJ102	1/4W 1K
R115	ERDS2TJ561	1/4W 560	R441, 442	ERDS2TJ473	1/4W 47K	R573, 574	ERDS2TJ394	1/4W 390K
R116	ERDS2TJ102	1/4W 1K	R443	ERDS2TJ330	1/4W 33	R575, 576	ERDS2TJ104	1/4W 100K
R117	ERDS2TJ393	1/4W 39K	R451, 452	ERDS2TJ224T	1/4W 220K	R577, 579	ERDS2TJ103	1/4W 10K
R118	ERDS2TJ562	1/4W 5.6K	R453, 454	ERDS2TJ821	1/4W 820	R591	ERDS1FVJ2R2T	1/2W 2.2 $\Delta$
R119	ERDS2TJ392T	1/4W 3.9K	R455, 456	ERDS2TJ563	1/4W 56K	R601, 602	ERDS2TJ681	1/4W 680
R120	ERDS2TJ473	1/4W 47K	R457, 458	ERDS2TJ271	1/4W 270	R603, 604	ERDS2TJ563	1/4W 56K
R121	ERDS2TJ332	1/4W 3.3K	R459, 460	ERDS2TJ680T	1/4W 68	R605, 606	ERDS2TJ182	1/4W 1.8K
R122	ERDS2TJ272T	1/4W 2.7K	R461, 462	ERDS2TJ184T	1/4W 180K	R607, 608	ERDS2TJ563	1/4W 56K
R124	ERDS2TJ391	1/4W 390	R463, 464	ERDS2TJ123	1/4W 12K	R609, 610	ERDS2TJ470	1/4W 47
R125, 126	ERDS2TJ472	1/4W 4.7K	R465, 466	ERDS2TJ563	1/4W 56K	R611, 612	ERDS1FVJ100T	1/2W 10 $\Delta$
R127	ERDS2TJ103	1/4W 10K	R467, 468	ERDS2TJ102	1/4W 1K	R613, 614	ERDS2TJ391	1/4W 390
R128	ERDS2TJ820	1/4W 82	R475, 476	ERDS2TJ471	1/4W 470	R615	ERDS2TJ223	1/4W 22K
R129	ERDS2TJ473	1/4W 47K	R477-480	ERDS2TJ474	1/4W 470K	R616	ERDS2TJ684	1/4W 680K
R130, 131	ERDS2TJ102	1/4W 1K	R481, 482	ERDS2TJ272T	1/4W 2.7K	R617	ERD2FCVG470T	1/4W 47 $\Delta$
R132	ERDS2TJ103	1/4W 10K	R483, 484	ERDS2TJ392T	1/4W 3.9K	R618	ERD2FJ101	1/4W 100 $\Delta$
R133-137	ERDS2TJ102	1/4W 1K	R485, 486	ERDS2TJ223	1/4W 22K	R621	ERDS2TJ684	1/4W 680K
R139, 140	ERDS2TJ272T	1/4W 2.7K	R487, 488	ERDS2TJ392T	1/4W 3.9K	R622	ERDS2TJ154	1/4W 150K
R141, 142	ERDS2TJ103	1/4W 10K	R489, 490	ERDS2TJ222	1/4W 2.2K	R623	ERDS2TJ103	1/4W 10K
R143, 144	ERDS2TJ222	1/4W 2.2K	R491, 492	ERDS2TJ122	1/4W 1.2K	R624	ERDS2TJ472	1/4W 4.7K
R145, 146	ERDS2TJ102	1/4W 1K	R493, 494	ERDS2TJ333	1/4W 33K	R625	ERDS2TJ103	1/4W 10K
R147, 148	ERDS2TJ474	1/4W 470K	R495, 496	ERDS2TJ471	1/4W 470	R626	ERDS2TJ223	1/4W 22K
R149	ERDS2TJ680T	1/4W 68	R501, 502	ERDS2TJ222	1/4W 2.2K	R627	ERDS1FVJ681T	1/2W 680 $\Delta$
R171, 172	ERDS2TJ102	1/4W 1K	R503-506	ERDS2TJ103	1/4W 10K	R628	ERDS2TJ103	1/4W 10K
R173	ERDS2TJ471	1/4W 470	R507	ERDS2TJ153	1/4W 15K	R629	ERDS2TJ223	1/4W 22K
R175	ERDS2TJ102	1/4W 1K	R509, 510	ERDS2TJ222	1/4W 2.2K	R630	ERDS1FVJ681T	1/2W 680 $\Delta$
R176	ERDS2TJ391	1/4W 390	R511, 512	ERDS2TJ562	1/4W 5.6K	R631, 632	ERDS2TJ222	1/4W 2.2K
R351-353	ERDS2TJ471	1/4W 470	R513-516	ERDS2TJ102	1/4W 1K	R633, 634	ERDS2TJ563	1/4W 56K
R354	ERDS2TJ472	1/4W 4.7K	R517, 518	ERDS2TJ222	1/4W 2.2K	R635, 636	ERDS2TJ182	1/4W 1.8K
R355	ERDS2TJ470	1/4W 47	R519	ERDS2TJ152	1/4W 1.5K	R637, 638	ERDS2TJ563	1/4W 56K
R356	ERDS2TJ102	1/4W 1K	R521, 522	ERDS2TJ181T	1/4W 180	R639, 640	ERDS2TJ470	1/4W 47
R357	ERDS2TJ470	1/4W 47	R523-526	ERDS2TJ102	1/4W 1K	R641, 642	ERDS1FVJ100T	1/2W 10 $\Delta$
R358	ERDS2TJ391	1/4W 390	R527, 528	ERDS2TJ394	1/4W 390K	R643, 644	ERDS2TJ391	1/4W 390
R359, 360	ERDS2TJ470	1/4W 47	R530	ERDS2TJ103	1/4W 10K	R645	ERDS2TJ473	1/4W 47K
R361	ERDS2TJ391	1/4W 390	R532	ERDS2TJ103	1/4W 10K	R646	ERDS2TJ684	1/4W 680K
R362	ERDS2TJ470	1/4W 47	R533-536	ERDS2TJ102	1/4W 1K	R647	ERD2FCVG470T	1/4W 47 $\Delta$

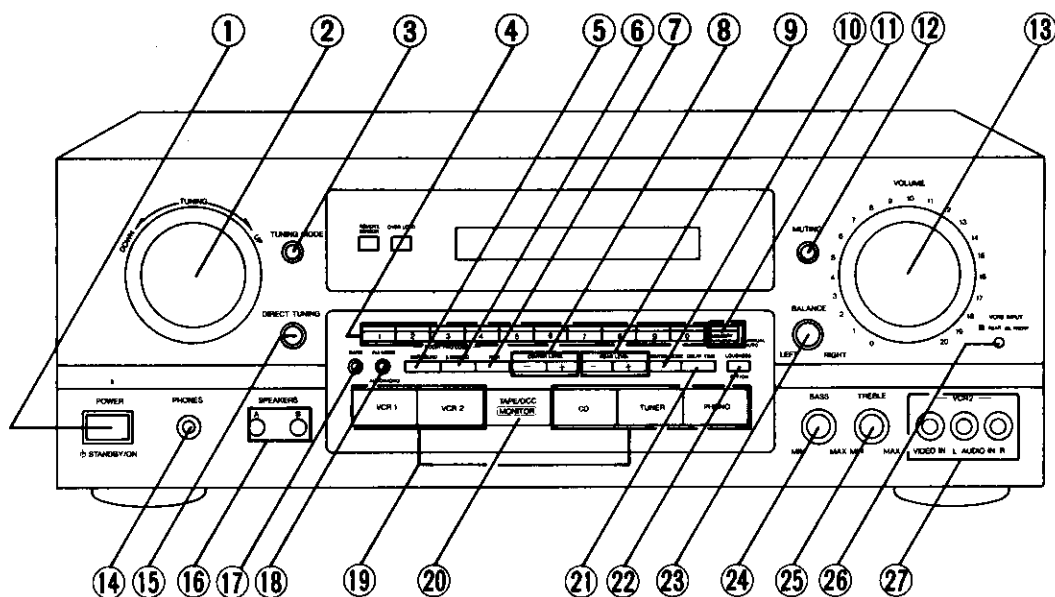
Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
R648	ERD25FJ101	1/4W 100 $\Delta$	R903, 904	ERDS2TJ104	1/4W 100K	R1004, 1005	ERDS2TJ472	1/4W 4.7K
R651	ERDS2TJ684	1/4W 680K	R905, 906	ERDS2TJ103	1/4W 10K	R1006	ERDS2TJ104	1/4W 100K
R652	ERDS2TJ154	1/4W 150K	R907-911	ERDS2TJ104	1/4W 100K	R1008, 1009	ERDS2TJ224T	1/4W 220K
R655	ERDS2TJ103	1/4W 10K	R920	ERDS2TJ271	1/4W 270	R1010	ERDS2TJ471	1/4W 470
R656	ERDS2TJ223	1/4W 22K	R921	ERDS2EJ121	1/4W 120	R1011-1013	ERDS2TJ473	1/4W 47K
R657	ERDS1FVJ681T	1/2W 680 $\Delta$	R922	ERDS2TJ472	1/4W 4.7K	R1014, 1015	ERDS2TJ223	1/4W 22K
R659, 660	ERDS2TJ102	1/4W 1K	R923	ERDS2TJ102	1/4W 1K	R1016	ERDS2TJ752T	1/4W 7.5K
R661	ERDS2TJ104	1/4W 100K	R925	ERDS2TJ272T	1/4W 2.7K	R1017	ERDS2TJ153	1/4W 15K
R662	ERDS2TJ154	1/4W 150K	R926	ERDS2TJ103	1/4W 10K	R1018	ERDS2TJ202T	1/4W 2K
R663	ERDS2TJ124T	1/4W 120K	R927	ERDS2TJ181T	1/4W 180	R1019, 1020	ERDS2TJ473	1/4W 47K
R665, 666	ERG1S1J151E	1W 150	R928	ERDS2TJ222	1/4W 2.2K	R1021	ERDS2TJ153	1/4W 15K
R667-670	ERDS1FVJ680T	1/2W 68 $\Delta$	R929	ERDS2TJ472	1/4W 4.7K	R1022	ERDS2TJ752T	1/4W 7.5K
R671-676	ERDS2TJ223	1/4W 22K	R930, 931	ERDS2TJ101	1/4W 100	R1023	ERDS2TJ202T	1/4W 2K
R677	ERDS2TJ682T	1/4W 6.8K	R932-934	ERDS2TJ102	1/4W 1K	R1025, 1026	ERDS2TJ222	1/4W 2.2K
R678	ERDS2TJ104	1/4W 100K	R935	ERDS2TJ473	1/4W 47K	R1101-1103	ERDS2TJ473	1/4W 47K
R679	ERDS2TJ103	1/4W 10K	R936-944	ERDS2TJ102	1/4W 1K	R1104	ERDS2TJ333	1/4W 33K
R680	ERDS2TJ223	1/4W 22K	R946-949	ERDS2TJ103	1/4W 10K	R1105, 1106	ERDS2TJ393	1/4W 39K
R681	ERDS2TJ332	1/4W 3.3K	R950	ERDS2TJ102	1/4W 1K	R1107	ERDS2TJ222	1/4W 2.2K
R682	ERDS1FJ270	1/2W 27 $\Delta$	R951	ERDS2TJ122	1/4W 1.2K	R1108	ERDS2TJ104	1/4W 100K
R683	ERDS2TJ103	1/4W 10K	R952	ERDS2TJ152	1/4W 1.5K	R1109	ERDS2TJ103	1/4W 10K
R684	ERDS2TJ153	1/4W 15K	R953	ERDS2TJ182	1/4W 1.8K	R1110	ERDS2TJ394	1/4W 390K
R685, 686	ERDS2TJ333	1/4W 33K	R954	ERDS2TJ222	1/4W 2.2K	R1201, 1202	ERDS2TJ102	1/4W 1K
R687	ERDS2TJ103	1/4W 10K	R955	ERDS2TJ332	1/4W 3.3K	R1204-1216	ERDS2TJ102	1/4W 1K
R688	ERDS2TJ222	1/4W 2.2K	R956	ERDS2TJ472	1/4W 4.7K	R1405-1410	ERDS2TJ153	1/4W 15K
R689	ERDS2TJ150T	1/4W 15	R957	ERDS2TJ682T	1/4W 6.8K	R1411	ERDS2TJ272T	1/4W 2.7K
R690	ERDS2TJ473	1/4W 47K	R960	ERDS2TJ102	1/4W 1K	R1431	ERDS2TJ105T	1/4W 1M
R705, 706	ERDS1FVJ2R2T	1/2W 2.2 $\Delta$	R961	ERDS2TJ122	1/4W 1.2K	R1434	ERDS2TJ822	1/4W 8.2K
R707	ERDS2TJ332	1/4W 3.3K	R962	ERDS2TJ152	1/4W 1.5K	R1435	ERDS2TJ103	1/4W 10K
R708	ERDS2TJ102	1/4W 1K	R963	ERDS2TJ182	1/4W 1.8K	R1449	ERDS2TJ102	1/4W 1K
R711	ERD25FVJ221T	1/4W 220 $\Delta$	R964	ERDS2TJ222	1/4W 2.2K	R1450, 1451	ERDS2TJ274	1/4W 270K
R714	ERDS2TJ472	1/4W 4.7K	R965	ERDS2TJ332	1/4W 3.3K	R1452	ERDS2TJ561	1/4W 560
R715, 716	ERDS2TJ1R5T	1/4W 1.5	R966	ERDS2TJ472	1/4W 4.7K	R1453	ERDS2TJ473	1/4W 47K
R717	ERDS2TJ752T	1/4W 7.5K	R967	ERDS2TJ682T	1/4W 6.8K	R1454	ERDS2TJ472	1/4W 4.7K
R718	ERDS2TJ682T	1/4W 6.8K	R970	ERDS2TJ102	1/4W 1K	R1455	ERDS2TJ153	1/4W 15K
R719	ERDS1FVJ220T	1/2W 22 $\Delta$	R971	ERDS2TJ122	1/4W 1.2K	R1456	ERDS2TJ273	1/4W 27K
R721	ERDS2TJ182	1/4W 1.8K	R972	ERDS2TJ152	1/4W 1.5K	R1457	ERDS2TJ103	1/4W 10K
R722, 723	ERDS1FVJ5R6T	1/2W 5.6 $\Delta$	R973	ERDS2TJ182	1/4W 1.8K	R1458	ERDS2TJ332	1/4W 3.3K
R724	ERDS2TJ223	1/4W 22K	R974	ERDS2TJ222	1/4W 2.2K	R1459	ERDS2TJ123	1/4W 12K
R725	ERDS2TJ102	1/4W 1K	R975	ERDS2TJ332	1/4W 3.3K	R1460	ERDS2TJ181T	1/4W 180
R726	ERD25FVJ121T	1/4W 120 $\Delta$	R976	ERDS2TJ472	1/4W 4.7K	R1462	ERDS2TJ822	1/4W 8.2K
R727	ERD25FVJ180T	1/4W 18 $\Delta$	R977	ERDS2TJ682T	1/4W 6.8K	R1463	ERDS2TJ473	1/4W 47K
R728	ERDS1FVJ100T	1/2W 10 $\Delta$	R978	ERDS2TJ123	1/4W 12K	R1464, 1466	ERDS2TJ474	1/4W 470K
R729	ERDS2TJ332	1/4W 3.3K	R980	ERDS2TJ102	1/4W 1K	R1467, 1469	ERDS2TJ332	1/4W 3.3K
R732	ERDS1FVJ6R8T	1/2W 6.8 $\Delta$	R981	ERDS2TJ122	1/4W 1.2K	R1472	ERDS2TJ682T	1/4W 6.8K
R751	ERC12ZGK335	1/2W 3.3M $\Delta$	R982	ERDS2TJ152	1/4W 1.5K	R1473	ERDS2TJ222	1/4W 2.2K
R754	ERDS2TJ102	1/4W 1K	R983	ERDS2TJ182	1/4W 1.8K	R1474, 1476	ERDS2TJ474	1/4W 470K
R781	ERD25FVJ180T	1/4W 18 $\Delta$	R984	ERDS2TJ222	1/4W 2.2K	R1477	ERDS2TJ222	1/4W 2.2K
R785, 786	ERDS2TJ332	1/4W 3.3K	R985	ERDS2TJ332	1/4W 3.3K	R1478	ERDS2TJ682T	1/4W 6.8K
R787	ERDS2TJ471	1/4W 470	R986	ERDS2TJ472	1/4W 4.7K			
R788	ERDS2TJ682T	1/4W 6.8K	R990	ERDS2TJ153	1/4W 15K			CAPACITORS
R901	ERDS2TJ102	1/4W 1K	R991	ERDS2TJ103	1/4W 10K			
R902	ERDS2TJ681	1/4W 680	R993, 994	ERDS2TJ102	1/4W 1K	C101	ECBT1CJ03NS5	16V 0.01U

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C103	ECBT1C103NS5	16V 0.01U	C440	ECBT1E103ZF	25V 0.01U	C639, 640	ECBT1H151KB5	50V 150P
C104, 105	ECBT1H102KB5	50V 1000P	C451, 452	ECEA1VKA4R7B	35V 4.7U	C641, 642	ECQV1H473JM3	50V 0.047U
C106	ECBT1C103NS5	16V 0.01U	C453, 454	ECBT1H101KB5	50V 100P	C643	ECA1HM470B	50V 47U
C107	ECBT1H473ZF5	50V 0.047U	C455, 456	ECBT1H102KB5	50V 1000P	C644	ECA1JM330B	63V 33U
C108	ECBT1H8R2KC5	50V 8.2P	C457, 458	ECEA1KA330B	10V 33U	C645	ECEA2AU100	100V 10U
C109, 110	ECBT1C103NS5	16V 0.01U	C459, 460	ECFR1E223KR	25V 0.022U	C646	ECEA2AN2R2SB	100V 2.2U
C111	ECEA1KA4R7B	25V 4.7U	C461, 462	ECFR1E682KR	25V 6800P	C647, 648	ECBA1H681KB5	50V 680P
C112	ECBT1C103NS5	16V 0.01U	C463, 464	ECEA1VKA4R7B	35V 4.7U	C651	ECEA1HKA2R2B	50V 2.2U
C113	ECBT1H102KB5	50V 1000P	C465, 466	ECBT1E103ZF	25V 0.01U	C652	ECEA1CKA100B	16V 10U
C114	ECEA1HKA3R3B	50V 3.3U	C471, 472	ECEA1HKA3R3B	50V 3.3U	C653	ECBT1E223ZF	25V 0.022U
C115	ECEA1CKA100B	16V 10U	C475, 476	ECBT1H150J5	50V 15P	C655	ECEA0JKA221B	6.3V 220U
C116	ECBT1C822MS5	16V 8200P	C477, 478	ECBT1H221KB5	50V 220P	C701	ECBT1E103ZF	25V 0.01U
C117	ECQB1H821JF3	50V 820P	C479, 480	ECBT1H470J5	50V 47P	C702	ECQE2104KF3	250V 0.1U
C118, 119	ECFR1E153KR	25V 0.015U	C481-484	ECEA1VKA4R7B	35V 4.7U	C703, 704	ECET75V153WX	75V 15000U Δ
C120, 121	ECEA1HKA010B	50V 1U	C485, 486	ECFR1E123KR	25V 0.012U	C707	ECA1VM101B	35V 100U
C122	ECEA1HKA2R2B	50V 2.2U	C487, 488	ECQV1H683JM3	50V 0.068U	C708	ECKR1H103ZF5	50V 0.01U
C123	ECEA1HKA010B	50V 1U	C489, 490	ECFR1E562KR	25V 5600P	C709	ECEA1CKA330B	16V 33U
C124	ECBT1H102KB5	50V 1000P	C491, 492	ECFR1E273KR	25V 0.027U	C710	ECBT1E103ZF	25V 0.01U
C125	ECBT1H150JC5	50V 15P	C495, 496	ECBT1E103ZF	25V 0.01U	C711	ECKR1H103ZF5	50V 0.01U
C126	ECBT1H473ZF5	50V 0.047U	C501, 502	ECFR1E333KR	25V 0.033U	C712	ECA1HM470B	50V 47U
C127	ECEA1CKA220B	16V 22U	C503, 504	ECEA1VKA4R7B	35V 4.7U	C713	ECKR1H103ZF5	50V 0.01U
C128	ECBT1C103NS5	16V 0.01U	C505	ECEA1CKA100B	16V 10U	C715	ECEA1CKA470B	16V 47U
C129, 130	ECEA0JKA101B	6.3V 100U	C506, 507	ECEA0JKA101B	6.3V 100U	C716	ECEA2AU100	100V 10U
C131	ECBT1C103NS5	16V 0.01U	C518	ECBT1H104ZF5	50V 0.1U	C722	ECQE2104KF3	250V 0.1U
C132	ECBT1H102KB5	50V 1000P	C519	ECBT1E103ZF	25V 0.01U	C751	ECKWNS103ZV	500V 0.01U
C133	ECBT1H150JC5	50V 15P	C541, 542	ECA1JM330B	63V 33U	C752	ECKR1H103ZF5	50V 0.01U
C134	ECBT1H180JC5	50V 18P	C551, 552	ECEA1HKA3R3B	50V 3.3U	C753	ECA1EM102B	25V 1000U Δ
C135, 136	ECBT1C822MS5	16V 8200P	C553, 554	ECBT1E103ZF	25V 0.01U	C754	ECBT1E103ZF	25V 0.01U
C137, 138	ECBT1H271KB5	50V 270P	C555, 556	ECBT1H101KB5	50V 100P	C756	ECBT1E103ZF	25V 0.01U
C139, 140	ECFR1E562KR	25V 5600P	C557, 558	ECBT1H221KB5	50V 220P	C757	ECEA1CKA470B	16V 47U
C141-144	ECEA1HKA010B	50V 1U	C559, 560	ECEA1HKA3R3B	50V 3.3U	C758	ECEA1AKA101B	10V 100U
C145	ECBT1H220JC5	50V 22P	C561, 562	ECEA1CKA100B	16V 10U	C771, 772	ECA1VM331B	35V 330U Δ
C146	ECBT1H331KB5	50V 330P	C571, 572	ECBT1E103ZF	25V 0.01U	C795, 796	ECEA2AU100	100V 10U
C147	ECBT1H102KB5	50V 1000P	C573	ECEA1HKA3R3B	50V 3.3U	C891	ECFR1E392KR	25V 3900P
C148	ECBT1C103NS5	16V 0.01U	C591, 592	ECEA0JKA101B	6.3V 100U	C901	ECA0JM102B	6.3V 1000U
C149	ECBT1H104ZF5	50V 0.1U	C593, 594	ECFR1E104KR	25V 0.1U	C902, 903	ECBT1E103ZF	25V 0.01U
C171	ECBT1C103NS5	16V 0.01U	C595	ECBT1E103ZF	25V 0.01U	C904	ECA0JM471B	6.3V 470U
C172	ECBT1H331KB5	50V 330P	C601, 602	ECEA1EKN3R3B	25V 3.3U	C906	ECEA0JKA101B	6.3V 100U
C173	ECEA1CKA220B	16V 22U	C603, 604	ECBT1H331KB5	50V 330P	C907	ECEA1CKA100B	16V 10U
C174	ECEA1CKA100B	16V 10U	C605, 606	ECEA1CKN220B	16V 22U	C908	ECBT1E103ZF	25V 0.01U
C351, 352	ECEA0JKA101B	6.3V 100U	C607, 608	ECCR1H120K5	50V 12P	C911, 912	ECEA2AU100	100V 10U
C353	ECEA0JKA470B	6.3V 47U	C609, 610	ECBT1H151KB5	50V 150P	C913, 914	ECEA1VKA100B	35V 10U
C354	ECBT1H104ZF5	50V 0.1U	C611, 612	ECQV1H473JM3	50V 0.047U	C916	ECEA1HKA010B	50V 1U
C401	ECEA1VKA4R7B	35V 4.7U	C613	ECA1HM470B	50V 47U	C920	ECEA1HKA010B	50V 1U
C402, 403	ECBT1E103ZF	25V 0.01U	C614	ECQV1H474JM3	50V 0.47U	C921-928	ECBT1H331KB5	50V 330P
C404	ECEA1VKA4R7B	35V 4.7U	C615	ECEA2AU100	100V 10U	C929, 930	ECBT1H101KB5	50V 100P
C405, 406	ECBT1H101KB5	50V 100P	C616	ECEA2AN2R2SB	100V 2.2U	C935	ECEA0JKA101B	6.3V 100U
C409, 410	ECEA1CKA220B	16V 22U	C617, 618	ECBA1H681KB5	50V 680P	C936	ECBT1E103ZF	25V 0.01U
C411, 412	ECBT1H101KB5	50V 100P	C631, 632	ECEA1VKA4R7B	35V 4.7U	C937-942	ECBT1H101KB5	50V 100P
C413, 414	ECEA1CKA100B	16V 10U	C633, 634	ECBA1H681KB5	50V 680P	C944	ECBT1H101KB5	50V 100P
C415, 416	ECBT1E103ZF	25V 0.01U	C635, 636	ECEA1CKA220B	16V 22U	C1001	ECBT1E103ZF	25V 0.01U
C431, 432	ECEA1CKA100B	16V 10U	C637, 638	ECCR1H120K5	50V 12P	C1002	ECEA1CKA100B	16V 10U

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C1003-1005	ECEA1HKA010B	50V 1U	C1035	ECQV1H474JM3	50V 0.47U	C1457, 1458	ECEA1CKA100B	16V 10U
C1006	ECEA1HKA3R3B	50V 3.3U	C1036	ECBT1E1032F	25V 0.01U	C1459	ECEA1CKA101B	16V 100U
C1007	ECFR1E153KR	25V 0.015U	C1037, 1038	ECEA1CKA101B	16V 100U	C1460	ECFR1E822KR	25V 8200P
C1008	ECFR1E103KR	25V 0.01U	C1039, 1040	ECBT1E1032F	25V 0.01U	C1461	ECEA1CKA220B	16V 22U
C1009	ECBA1H681KB5	50V 680P	C1101	ECEA1HKA010B	50V 1U	C1462	ECFR1E273KR	25V 0.027U
C1010	ECQV1H104JM3	50V 0.1U	C1102	ECFR1E683KR	25V 0.068U	C1463	ECFR1E472KR	25V 4700P
C1012, 1013	ECQV1H104JM3	50V 0.1U	C1103	ECFR1E273KR	25V 0.027U	C1464	ECEA1CKA100B	16V 10U
C1014	ECEA1HKAR33B	50V 0.33U	C1104	ECEA1VKA4R7B	35V 4.7U	C1465	ECBT1E1032F	25V 0.01U
C1015	ECBA1H681KB5	50V 680P	C1105-1107	ECBT1E1032F	25V 0.01U	C1466	ECQV1H104JM3	50V 0.1U
C1016, 1017	ECEA1VKA4R7B	35V 4.7U	C1403	ECEA1HKA010B	50V 1U	C1468	ECQV1H334JM3	50V 0.33U
C1018	ECEA1HKAR15B	50V 0.15U	C1404	ECFR1E332KR	25V 3300P	C1469	ECFR1E333KR	25V 0.033U
C1019	ECEA1HKA3R3B	50V 3.3U	C1405	ECBT1H561KB5	50V 560P	C1470	ECEA1HKA3R3B	50V 3.3U
C1020	ECQV1H154JM3	50V 0.15U	C1406	ECQV1H104JM3	50V 0.1U	C1472, 1473	ECEA1HKA3R3B	50V 3.3U
C1021, 1022	ECEA1CKA470B	16V 47U	C1407	ECEA1CKA470B	16V 47U	C1474, 1475	ECBT1E1032F	25V 0.01U
C1023, 1024	ECEA1HKA3R3B	50V 3.3U	C1408, 1409	ECQV1H474JM3	50V 0.47U	C1476-1478	ECBT1H181KB5	50V 180P
C1025	ECEA1HKAR33B	50V 0.33U	C1410	ECQV1H104JM3	50V 0.1U	C1479, 1480	ECEA1CKA470B	16V 47U
C1026, 1027	ECQV1H104JM3	50V 0.1U	C1411	ECFR1E332KR	25V 3300P	C1481-1483	ECEA1HKA3R3B	50V 3.3U
C1028	ECBA1H681KB5	50V 680P	C1412	ECBT1H561KB5	50V 560P	C1489, 1490	ECEA1HKA3R3B	50V 3.3U
C1029, 1030	ECEA1VKA4R7B	35V 4.7U	C1414	ECFR1E123KR	25V 0.012U	C1493	ECQV1H563JM3	50V 0.056U
C1031	ECEA1HKAR15B	50V 0.15U	C1415	ECBT1H104ZF5	50V 0.1U	C1494	ECEA1CKA100B	16V 10U
C1032	ECEA1HKA3R3B	50V 3.3U	C1416	ECEA0JKA221B	6.3V 220U			
C1033	ECQV1H154JM3	50V 0.15U	C1451	ECBT1H101KB5	50V 100P			

# FRONT PANEL CONTROLS

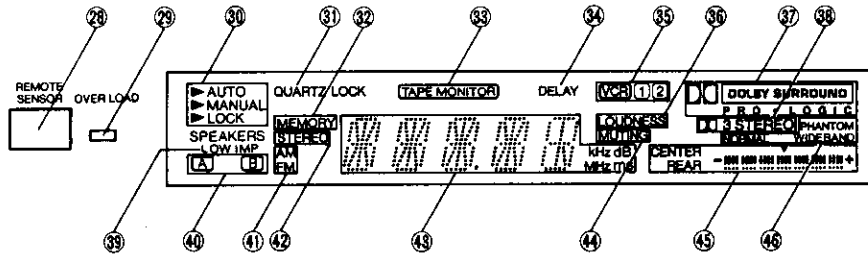
## Control section



No.	Name
①	Power switch (POWER)
②	Tuning control (TUNING)
③	Tuning mode select button (TUNING MODE)
④	Numeric buttons (1 - 0)
⑤	DOLBY PRO LOGIC SURROUND ON/OFF button (SURROUND)
⑥	DOLBY PRO LOGIC 3 STEREO ON/OFF button (3 STEREO)
⑦	Test signal ON/OFF button (TEST)
⑧	Center level adjust button (CENTER LEVEL)
⑨	Rear level adjust button (REAR LEVEL)
⑩	Center mode select button (CENTER MODE)
⑪	Memory button (MEMORY)
⑫	Muting button (MUTING)
⑬	Volume control (VOLUME)

No.	Name
⑭	Headphone jack (PHONES)
⑮	Direct tuning button (DIRECT TUNING)
⑯	Speaker select buttons (SPEAKERS)
⑰	Band select button (BAND)
⑱	FM mode select button (FM MODE)
⑲	Input select buttons
⑳	Tape/DCC monitor button (TAPE/DCC MONITOR)
㉑	Delay time adjust button (DELAY TIME)
㉒	Loudness ON/OFF button (LOUDNESS)
㉓	Balance control (BALANCE)
㉔	Bass control (BASS)
㉕	Treble control (TREBLE)
㉖	VCR 2 input select button (VCR 2 INPUT)
㉗	VCR 2 front input terminals (VCR 2)

# Display section

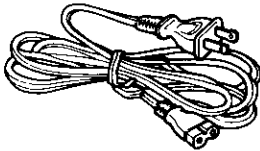


No.	Name
28	Remote control signal receptor
29	Overload indicator
30	Tuning-mode indicators
31	Quartz lock indicator
32	Memory indicator
33	Tape monitor indicator
34	Delay time indicator
35	VCR select indicator
36	Loudness indicator
37	DOLBY PRO LOGIC SURROUND indicator

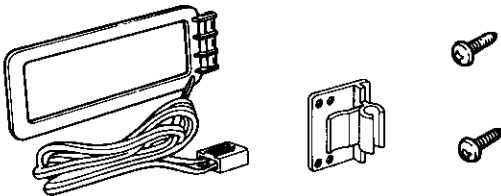
No.	Name
38	DOLBY PRO LOGIC 3 STEREO indicator
39	Low impedance indicator
40	Speaker select indicators
41	Band indicators
42	FM stereo indicator
43	Input selector/frequency display
44	Muting indicator
45	Center/rear level display
46	Center mode indicators

## ACCESSORIES

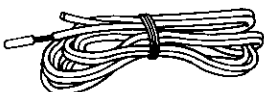
- AC power supply cord ..... 1 pc.
  - { SJA172-1 ..... (P)
  - { SJA172 ..... (PC)



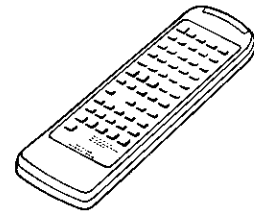
- AM loop antenna set (SPB1163T)
  - AM loop antenna ..... 1 pc.
  - AM antenna holder (SMA233-1M) ..... 1 pc.
  - Screws (XTN3+10AFZ) ..... 2 pcs.



- FM indoor antenna (RSA0006) ..... 1 pc.

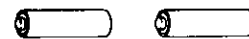


- Remote control transmitter (RAK-SA901MH) ..... 1 pc.



For details on remote control transmitter operation, refer to "How to use the remote control transmitter."

- Batteries "AAA" (R03/UM-4) ..... 2 pcs. for remote control transmitter



**Note:** These are available on sale route.

- Seal for remote control transmitter (RQCA0259) ..... 1 pc.



See page 11 for details.



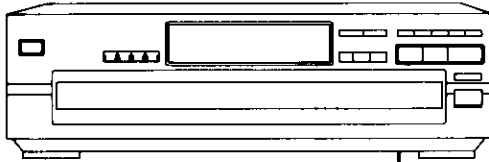
# CONNECTIONS

## Connecting audio equipment

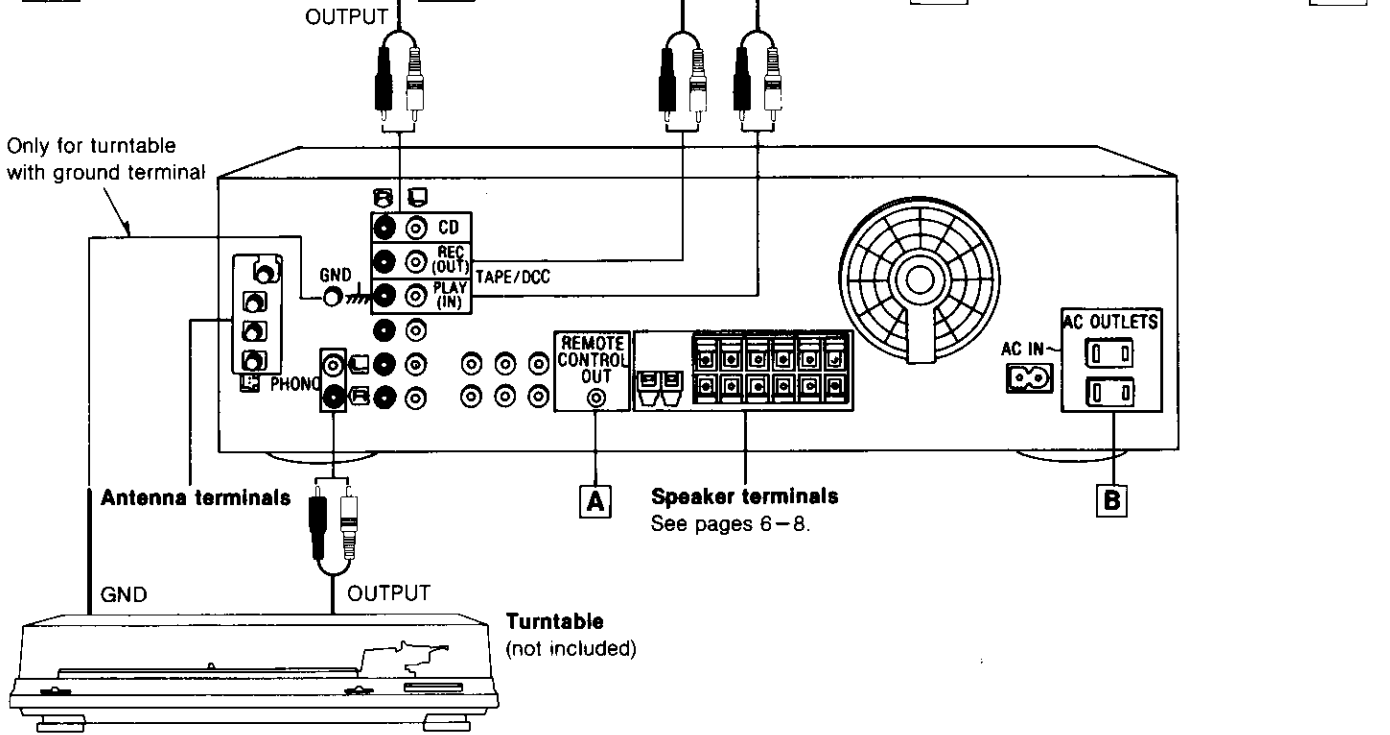
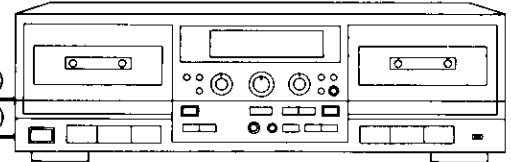
### Stereo connection cable (not included)



### CD changer (or CD player) (not included)



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



### **A** "REMOTE CONTROL OUT" terminal

Connect the connection cable for the remote control to a Technics tape deck and/or CD changer (or CD player) which has the appropriate remote control terminal as shown on the left.

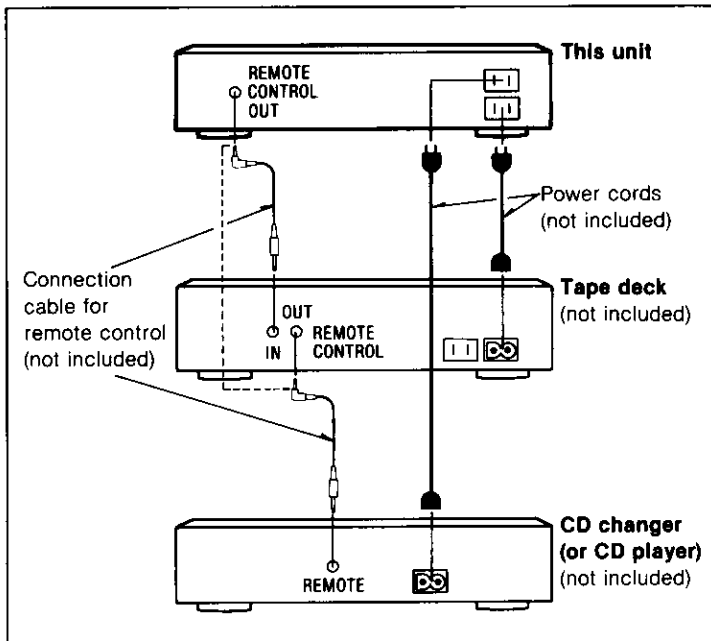
If a tape deck is not being used, the CD changer (or CD player) can be connected directly (dotted line).

### **B** "SWITCHED" AC outlet(s)

Power to these outlets is controlled by the power switch of this unit. Audio equipment rated up to the indicated power ratings can be connected here.

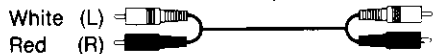
#### For proper remote-control operation

Connect the power cords of the tape deck and CD changer (or CD player) to these outlets as shown on the left.

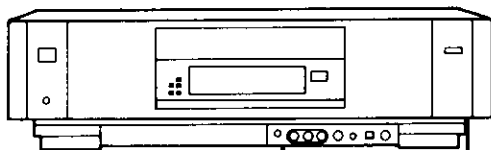


# Connecting video equipment

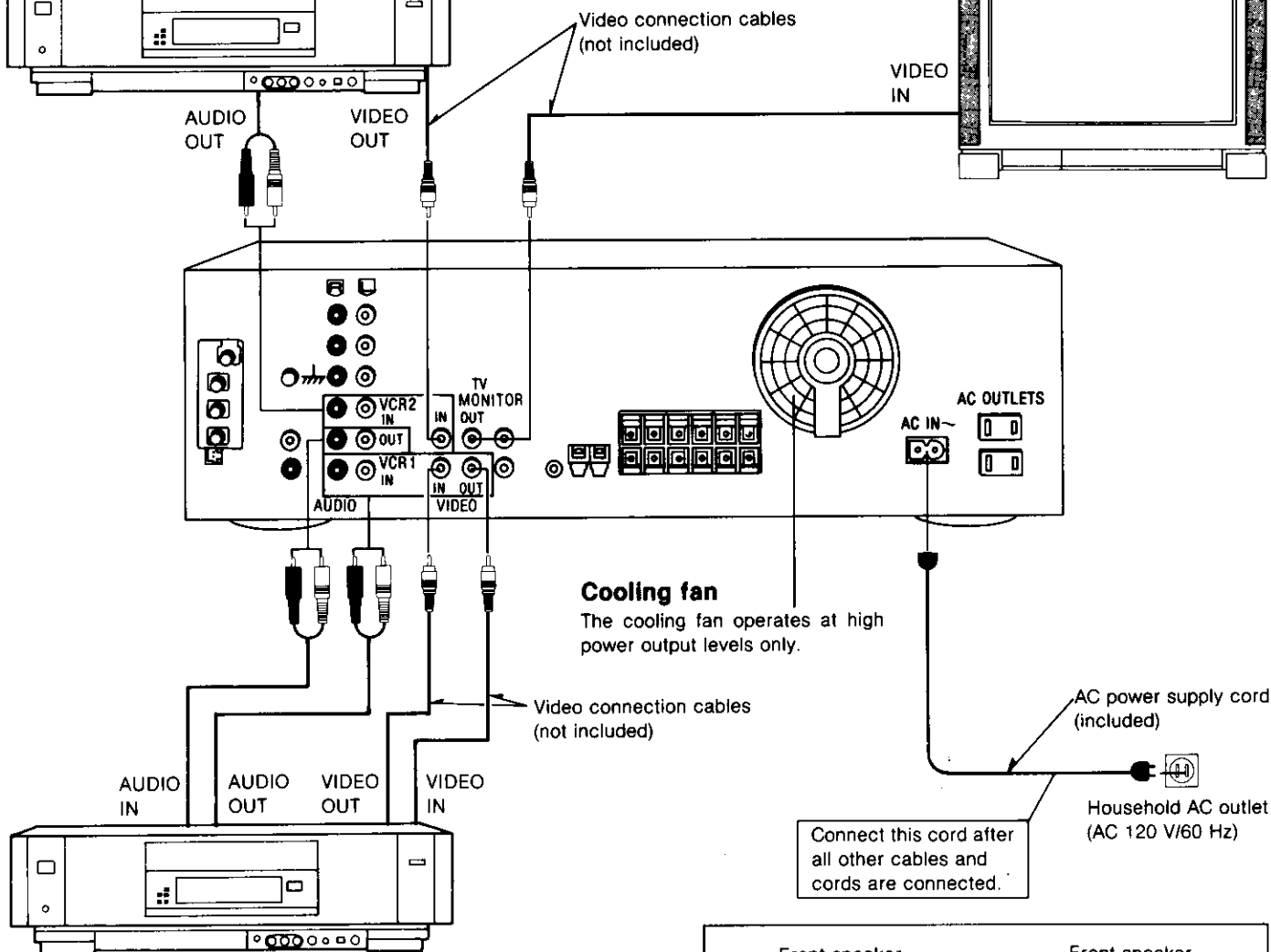
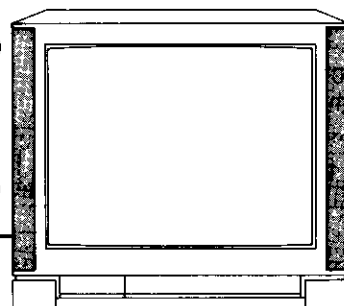
## Stereo connection cable (not included)



## Second VCR (for playback only) (not included)



## Monitor TV (not included)

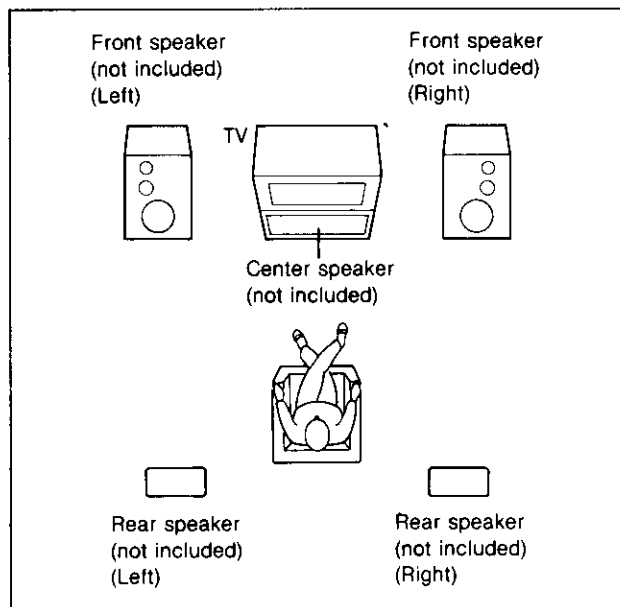


## VCR (not included)

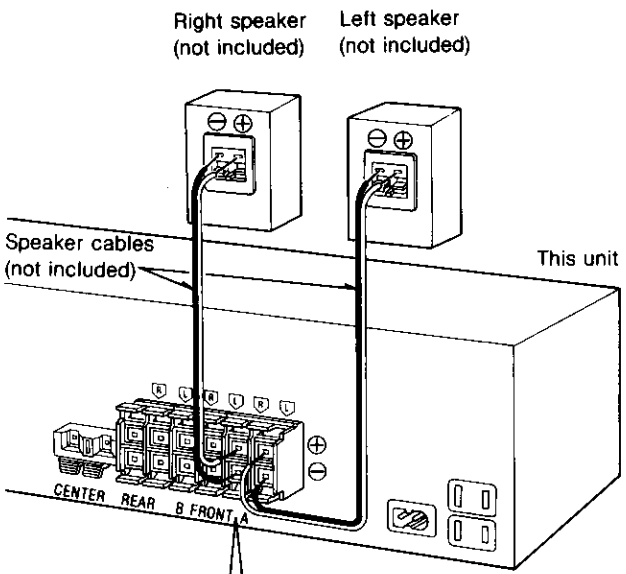
# Placement of speakers

As well as enjoying normal stereo reproduction with both the left and right front speakers connected, a center speaker and rear speakers can also be connected to the main unit in order to enjoy playback using the Dolby Pro-Logic systems.

The illustration below shows where to place the speakers when enjoying sound with Dolby Pro-Logic systems. The listening position at which the effect is the greatest is a position slightly to the rear of a center position of five-speaker systems. However the position should be adjusted to your personal preference, because the effect varies to some degree depending upon the type of music and the music source.



# Connection of front speakers



**1** 15 mm

**2**

**3**

Twist

**NO**

**Note**  
To prevent damage to circuitry, never short-circuit positive (+) and negative (-) speaker wires.

## “B” terminals

For connection to a second pair of speakers.

## Speaker impedance

**When only the “A” or only the “B” speakers are connected:**

The impedance of the speaker used with this unit must be 4–8 Ω.

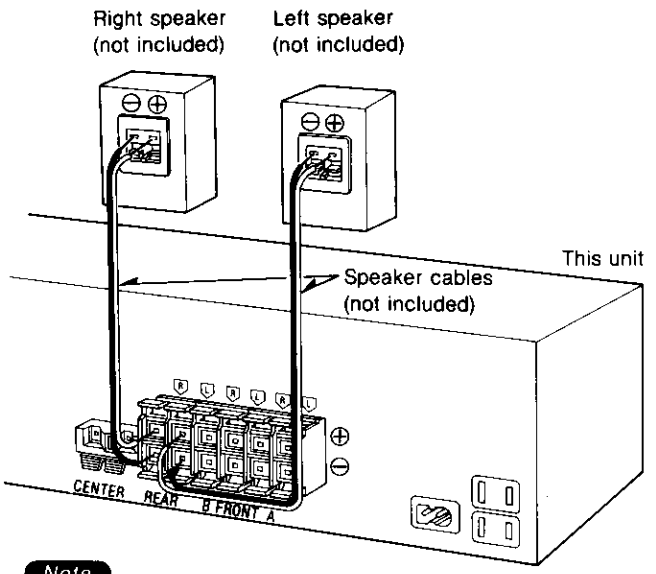
**Note**

If 4 Ω speakers are connected, be sure to set the impedance on the main unit to LOW.

**When both the “A” and the “B” speakers are connected simultaneously:**

The impedance of the speaker used with this unit must be 8 Ω.

# Connection of rear speakers



**Note**

Before sound can be heard, the SURROUND mode (of the Dolby Pro-Logic system) must be on and both rear speakers must be connected.

## Speaker impedance

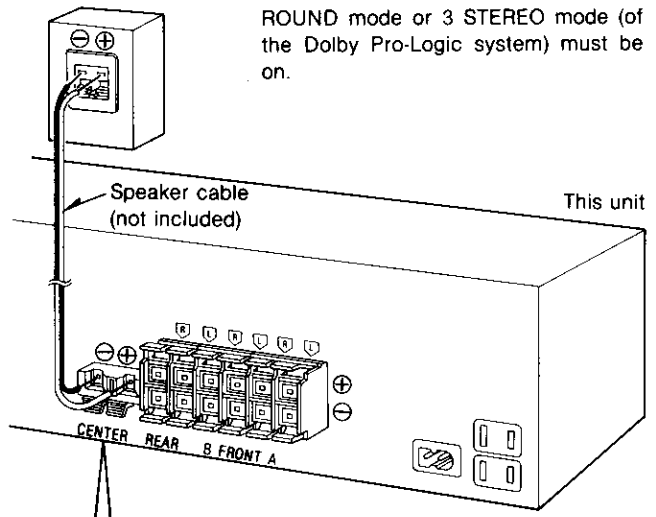
The impedance of any speaker used with this unit must be 8 Ω.

# Connection of center speaker

Center speaker (not included)

**Note**

Before sound can be heard, the SURROUND mode or 3 STEREO mode (of the Dolby Pro-Logic system) must be on.



**1** 15 mm

**2**

Twist

**NO**

## Speaker impedance

The impedance of any speaker used with this unit must be 8 Ω.

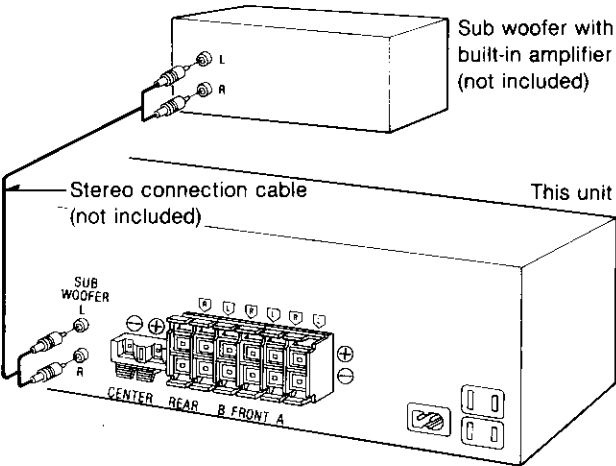
## Connection of sub woofer

The sub woofer is connected when bass sounds are inadequately reproduced because front speakers are too small.

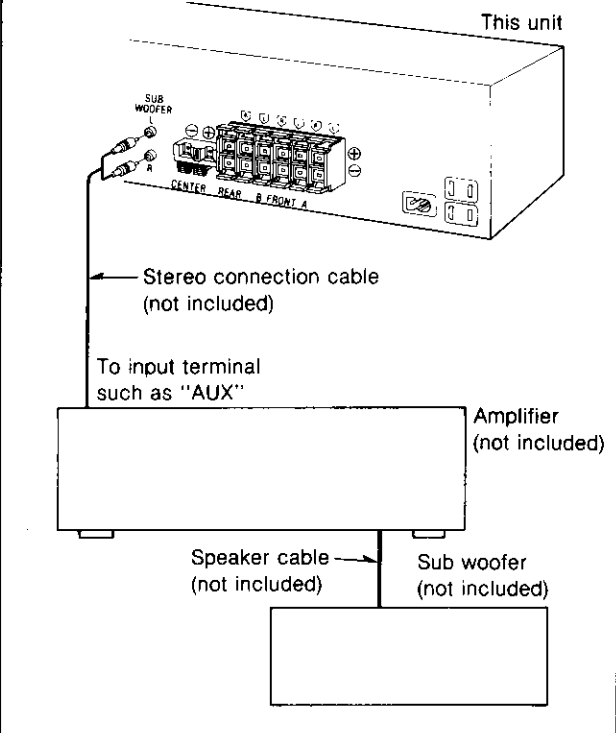
When connected, the sub woofer can be placed in any position.

### Note

This unit has no amplifier section designed especially for the sub woofer, so it is necessary to purchase a sub woofer with a built in amplifier or buy the two separately.



## Connecting a sub woofer which does not have a built-in amplifier



## HOW TO USE THE REMOTE CONTROL TRANSMITTER

This remote control can be used to operate units manufactured by this company other than this receiver unit, including CD changers (or CD players), tape decks and also TVs and VCRs manufactured since 1985.

### Preparations before use

Check the appropriate connection of the power cords and connection cables for the remote control in order to operate CD changers (or CD players) and tape decks correctly.

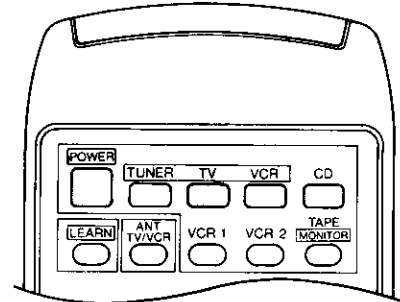
If the connections are made as shown on page 5 and the power supply switches of each unit are set to ON, the power supply for each unit will simultaneously turn ON and OFF when the power supply of the receiver is turned ON and OFF.

### Note

If you operate a TV, VCR or alternative CD changer (or CD player) using this remote control, the unit may fail to operate due to the differing nature of the remote control signal.

### If the remote control fails to operate:

It is necessary to reprogram the signal within the remote control by following this simple procedure.



### For CD changer (or CD player) operation

**POWER** **CD** Press POWER and CD simultaneously, hold for 2 seconds until beep sounds.

### For TV operation

**POWER** **TV** Press POWER and TV simultaneously, hold for 2 seconds until beep sounds.

### For VCR operation

**POWER** **VCR** Press POWER and VCR simultaneously, hold for 2 seconds until beep sounds.

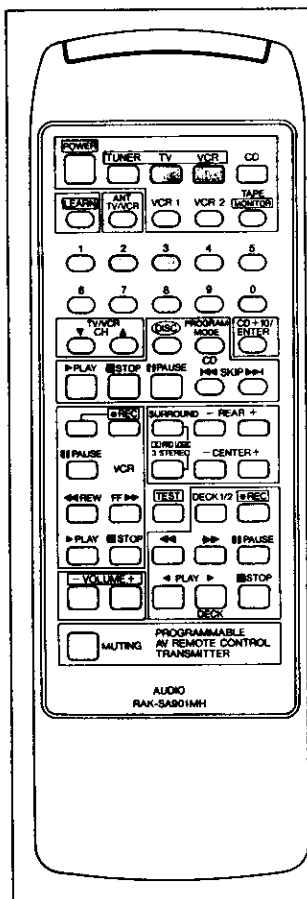
To restore the previous memory contents, carry out the same operations one more time.

Depending on the model, there may be cases where operation is still not possible even if the remote control signal is switched over due to differences in frequency range characteristics.

In addition, operation of TVs and VCRs manufactured by RCA and Zenith can be operated by this remote control by changing over the remote control signals. (See page 9.)

If using a TV or VCR manufactured by a company other than RCA, Zenith or this company, program the signals for the remote control supplied with your TV or VCR into this remote control. (See pages 10 and 11.)

## • Using an RCA VCR or TV



### To change over the signals for VCR 1 operation (VCR 1 mode)

→ Press "VCR" and the number "2" button simultaneously until beep sounds.

### To change over the signals for VCR 2 operation (VCR 2 mode)

→ Press "VCR" and the number "3" button simultaneously until beep sounds.

### To change over the signals for TV operation

→ Press "TV" and the number "2" button simultaneously until beep sounds.

### To return to Panasonic signals

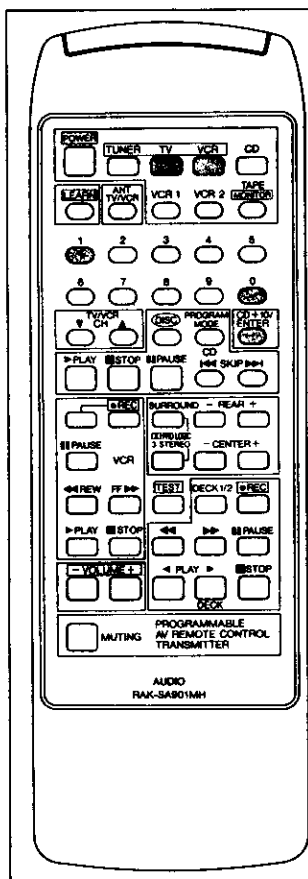
#### For VCR operation

→ Press "VCR" and the "0" button simultaneously until beep sounds.

#### For TV operation

→ Press "TV" and the "0" button simultaneously until beep sounds.

## • Using a Zenith VCR or TV



### To change over the signals for VCR operation

→ Press "VCR" and the number "1" button simultaneously until beep sounds.

#### Note:

For operations using a Zenith VCR it is necessary to select channel numbers 10 or higher by entering a channel number then pressing the "ENTER" key.

### To change over the signals for TV operation

→ Press "TV" and the number "1" button simultaneously until beep sounds.

#### Note:

For operations using a Zenith TV it is necessary to select channel numbers 10 or higher by entering a channel number then pressing the "ENTER" key.

### To return to Panasonic signals

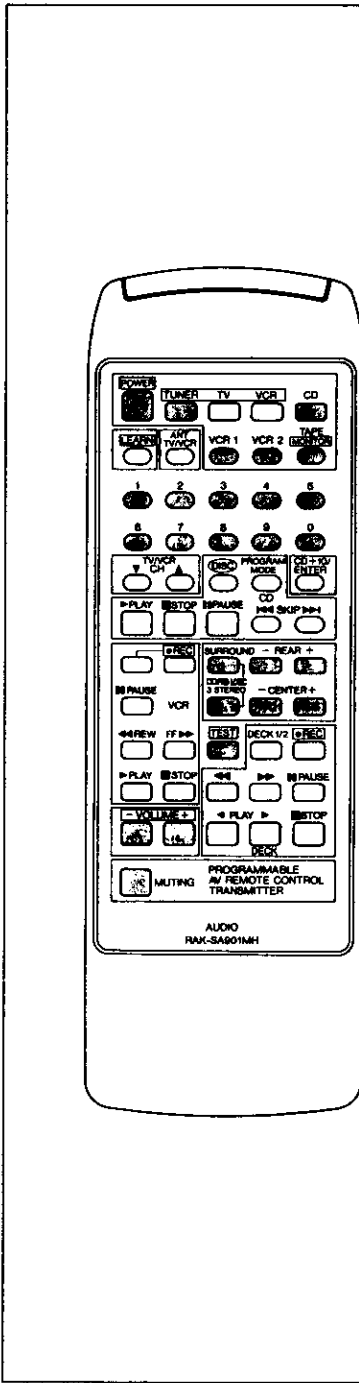
#### For VCR operation






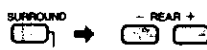




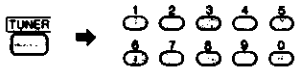
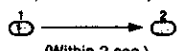
→ Press "VCR" and the "0" button simultaneously until beep sounds.

#### For TV operation

→ Press "TV" and the "0" button simultaneously until beep sounds.

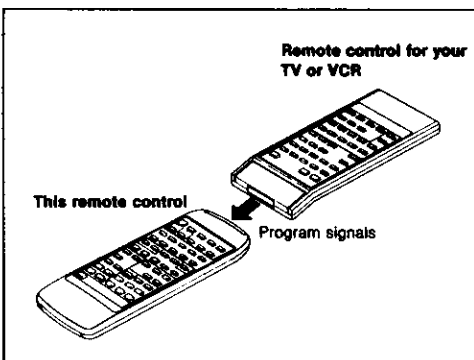
# • Operating the receiver



Basic operations	
To turn the power supply ON/OFF	 <p>Once the power has been set to ON, it can be turned ON and OFF simply by pressing POWER. (See <b>Note</b> below.)</p>
To turn the tape monitor function ON/OFF	 <p>To listen to sources other than a tape or DCC, be sure to turn off the tape monitor indicator on the main unit.</p>
To select an input source	
To turn the Dolby Pro Logic SURROUND mode ON/OFF	
To turn the Dolby Pro Logic 3 STEREO mode ON/OFF	
To adjust the output level of the rear speakers	
To adjust the output level of the center speaker	
To output a test signal	 <p>Press once more to stop a test signal.</p>
To mute the sound level	 <p>Press once more to return to the original volume.</p>
To adjust the volume level	
<p><b>Note</b></p> <p>After carrying out the operation for turning the power of the TV or VCR ON or OFF, always press TUNER before pressing POWER when turning the power of the receiver ON and OFF.</p>	
To listen to radio broadcasts	
 <p>Specify the preset channel using the numeric button(s).</p> <p>(Example: Channel 12)</p>  <p>(Within 2 sec.)</p>	

# • Using the "Learning" function

## What is the "Learning" function ?




If the signals programmed into this remote control will not operate your TV or VCR, the learning function enables the remote control signals from the remote control of your TV or VCR to be stored by this remote control so that it will operate your TV or VCR.

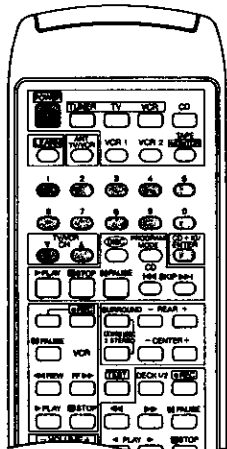
**Note:**

The capability of storing signals from other remote control is limited to those that are of the infrared type only. Furthermore, there are some remote controls that employ a special code system that may not be compatible with this remote control.

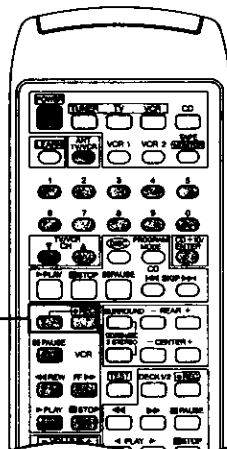
## Which buttons can be used for programming ?

The following buttons (  ) can store signals for operating TVs and VCRs respectively.

For TV operation

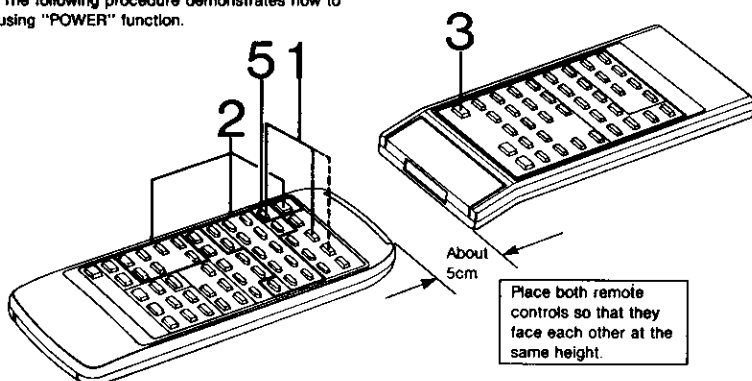






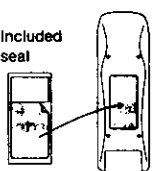
For VCR operation



## To program signals

This remote control informs you of the results of the operation by means of beeps. The following procedure demonstrates how to program signals using "POWER" function.



Operation steps	Beep	Notes
<p>1  Press the "LEARN" and "TV" (or "VCR") buttons simultaneously to switch to the LEARN mode.</p>	Bee...p continuously sounds.	Press the "LEARN" button to cancel LEARN mode. After this condition continues for one minute, LEARN mode will be canceled.
<p>2  For this remote control</p> <p>While the beep is heard, press the button you want the remote control to program. Select the button referring to the information on the page at the left.</p>	Beep sounds twice and then the sound stops.	5 seconds after the sound stops: Three continuous beeps will be heard, and then will return to LEARN mode. Once more, press the button which will memorize the signal.
<p>3  For the other remote control</p> <p>Press and hold the same function button on the other remote control. Keep holding the button until the beep sounds.</p>	<p><b>If the programming is OK</b></p> <p>A one-second beep (OK signal) will sound, and it returns to a LEARN mode state.</p> <p><b>If there is a programming error</b></p> <p>Three beeps (error signal) will sound, and it returns to a LEARN mode state.</p>	<p>⇒ Repeat steps 2 and 3.</p>
<p>4 Repeat steps 2 and 3 to program each signal.</p>		When the memory is full, the error signal (three beeps) will sound three times when a button is pressed.
<p>5  Press the "LEARN" button to return to the operation mode. (The operation is now completed.)</p> <p><b>To return to Panasonic signals</b> See page 9 for operation steps.</p>	<p><b>For your convenience</b> Please paste the included seal at the back of this remote control.</p>	<p>Included seal  Back of this remote control</p>

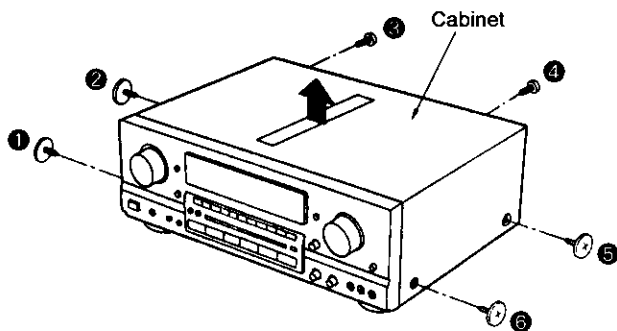
# DISASSEMBLY INSTRUCTIONS

## "ATTENTION SERVICER"

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

### Ref.No. 1 Removal of the cabinet

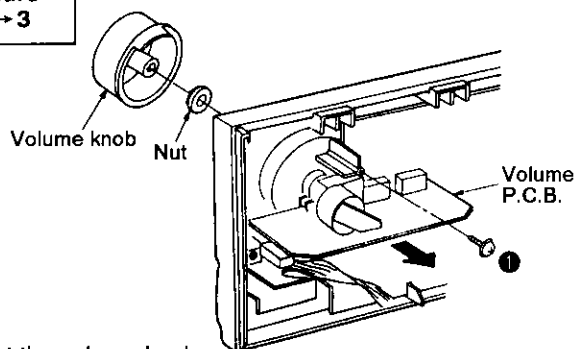
#### Procedure 1



- Remove the 6 screws (① ~ ⑥).

### Ref.No. 3 Removal of the volume P.C.B.

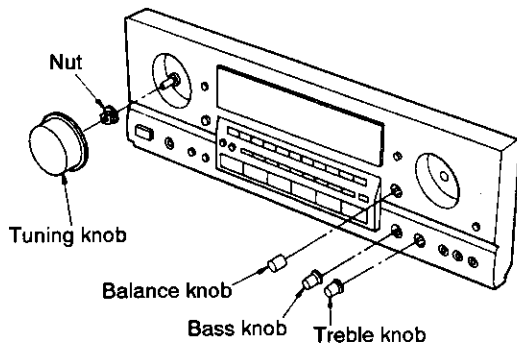
#### Procedure 1 → 2 → 3



1. Pull out the volume knob.
2. Remove the nut.
3. Remove the 1 screw (①).
4. Remove the volume P.C.B. in the direction of arrow.

### Ref.No. 4 Removal of the operation P.C.B.

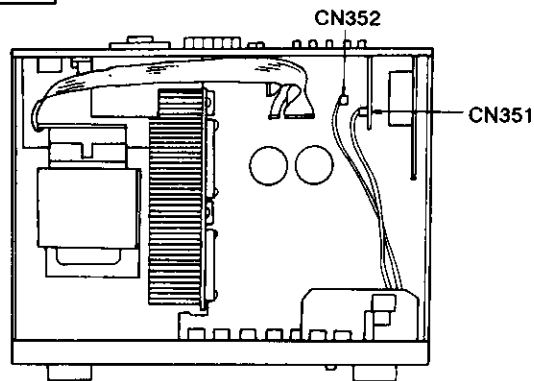
#### Procedure 1 → 2 → 3 → 4



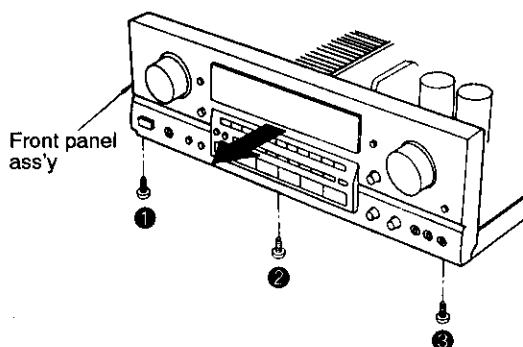
1. Pull out the tuning knob, balance knob, bass knob and treble knob.
2. Remove the nut.

### Ref.No. 2 Removal of the front panel ass'y

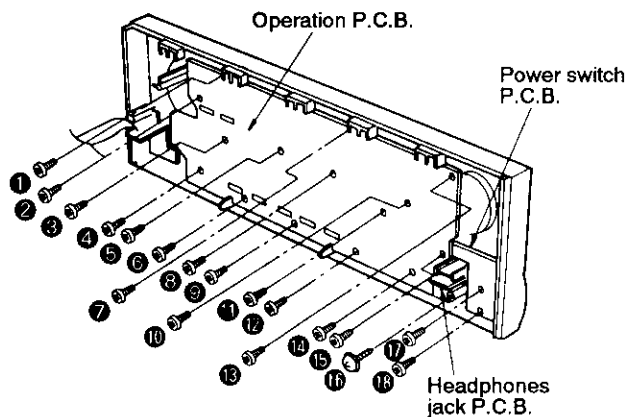
#### Procedure 1 → 2



1. Remove the 2 flat cables (CN351, CN352).



2. Remove the 3 screws (① ~ ③).
3. Remove the front panel ass'y in the direction of arrow.



3. Remove the 18 screws (① ~ ⑱).