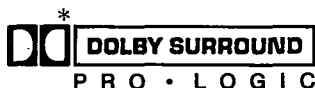


Service Manual

AV Control Stereo Receiver

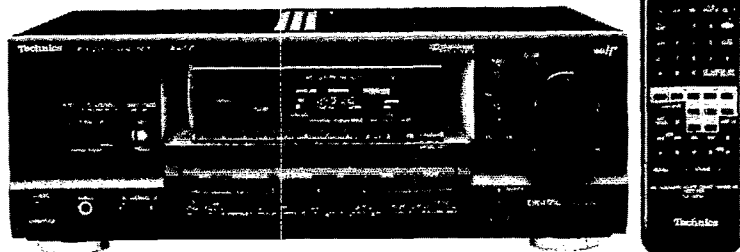


Receiver

SA-GX690

Colour

(K) ... Black Type



Areas

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

* Manufactured under license from Dolby Laboratories Licensing Corporation. Additionally licensed under one or more of the following patents: U.S. numbers 3,632,886, 3,746,792 and 3,959,590; Canadian numbers 1,004,603 and 1,037,877.

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SPECIFICATIONS (DIN 45 500)

■ AMPLIFIER SECTION

Power output (at 240 V)

DIN 1 kHz (T.H.D. 1%)

[For (E, EB, EG) areas.]

2 × 100 W (4 Ω)

[For (G, GN) areas.]

2 × 100 W (8 Ω)

20 Hz–20 kHz continuous power output

both channels driven

[For (E, EB, EG) areas.]

2 × 65 W (8 Ω)

[For (G, GN) areas.]

2 × 90 W (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

DIN 1 kHz (T.H.D. 1%)

Front [For (E, EB, EG) areas.]

2 × 60 W (4 Ω)

[For (G, GN) areas.]

2 × 70 W (8 Ω)

Center [For (E, EB, EG) areas.]

60 W (8 Ω)

[For (G, GN) areas.]

70 W (8 Ω)

Surround [For (E, EB, EG) areas.]

60 W (8 Ω)

[For (G, GN) areas.]

70 W (8 Ω)

Intermodulation distortion

rated power at 60 Hz: 7 kHz=4:1, SMPTE

0.5% (8 Ω)

Power bandwidth

both channels driven, -3 dB

10 Hz–40 kHz (8 Ω)

Damping factor

30 (8 Ω)

Input sensitivity and impedance

PHONO

3 mV/47 kΩ

CD, VCR 1, VCR 2/VIDEO CD, TAPE

200 mV/22 kΩ

S/N at rated power (8 Ω)

PHONO

70 dB (IHF, A: 80 dB)

CD, VCR 1, VCR 2/VIDEO CD, TAPE

75 dB (IHF, A: 88 dB)

Frequency response

PHONO

RIAA standard curve
(30 Hz–15 kHz) ± 0.8 dB

CD, VCR 1, VCR 2/VIDEO CD, TAPE

10 Hz–40 kHz, ± 3 dB

Tone controls

BASS

50 Hz, +10 to -10 dB

TREBLE

20 kHz, +10 to -10 dB

Loudness control (volume at -30 dB)

50 Hz, +9 dB

Output voltage

VCR 1 OUT, TAPE REC (OUT)

200 mV

Channel balance (250 Hz–6.3 kHz)

± 1 dB

Channel separation

55 dB

Headphones output level and impedance

430 mV/330 Ω

Load impedance

Front

A or B [For (E, EB, EG) areas.]

4–16 Ω

[For (G, GN) areas.]

8–16 Ω

A and B

8–16 Ω

Center

8–16 Ω

Surround

14–16 Ω

■ FM TUNER SECTION

Frequency range

87.50–108.00 MHz

Sensitivity

S/N 30 dB

1.5 μV/75 Ω

S/N 26 dB

1.3 μV/75 Ω

S/N 20 dB

1.2 μV/75 Ω

IHF usable sensitivity

(IHF '58) 1.5 μV/75 Ω

IHF 46 dB stereo quieting sensitivity

22 μV/75 Ω

Total harmonic distortion

MONO

0.2%

STEREO

0.3%

S/N

MONO

60 dB (75 dB, IHF)

STEREO

58 dB (71 dB, IHF)

Frequency response

20 Hz–15 kHz, +1 dB, -2 dB

Alternate channel selectivity

± 400 kHz

65 dB

Capture ratio

1 dB

Image rejection at 98 MHz

40 dB

IF rejection at 98 MHz

70 dB

Spurious response rejection at 98 MHz

70 dB

AM suppression

50 dB

Stereo separation

1 kHz

40 dB

Carrier leak

19 kHz

-30 dB (-35 dB, IHF)

38 kHz

-50 dB (-55 dB, IHF)

Channel balance (250 Hz–6.3 kHz)

± 1.5 dB

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▲ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Limiting point	1.2 μ V
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminal(s)	75 Ω (unbalanced)

■ AM TUNER SECTION

• For (E, EB) areas.

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

Sensitivity	
MW	20 μ V, 330 μ V/m
LW	45 μ V

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

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

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

• For (EG, G, GN) areas.

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

Selectivity (S/N 20 dB)	20 μ V, 330 μ V/m
-------------------------	---------------------------

Selectivity at 999 kHz	55 dB
------------------------	-------

Image rejection at 999 kHz	40 dB
----------------------------	-------

IF rejection at 999 kHz	55 dB
-------------------------	-------

■ VIDEO SECTION

Output voltage at 1 V input (unbalanced)	1 \pm 0.1 Vp-p
--	------------------

Maximum input voltage	1.5 Vp-p
-----------------------	----------

Input/output impedance	75 Ω (unbalanced)
------------------------	--------------------------

■ CONTENTS

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BEFORE REPAIR AND ADJUSTMENT	2
CAUTIONS FOR AC MAINS LEAD	3
PROTECTION CIRCUITRY	3
FRONT PANEL CONTROLS	4
TO SET THE POWER VOLTAGE	4
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REPLACEMENT PROCEDURE	9~14
FAN MOTOR TROUBLESHOOTING GUIDE	15
TROUBLESHOOTING	16~19

■ GENERAL**Power consumption (In standby condition: 3)**

[For (E, EB, EG) areas.] 235 W

[For (G) area.] 240 W

[For (GN) area.] 225 W

Power supply

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

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

Dimensions (W \times H \times D) 430 \times 158 \times 352 mm**Weight**

[For (E, EB, EG, GN) areas.] 9.8 kg

[For (G) area.] 10.1 kg

■ REMOTE CONTROL TRANSMITTER**Control keys**

[For (E, EB, EG) areas.] 38 keys

[For (G, GN) areas.] 58 keys

Dimensions (W \times H \times D)[For (E, EB, EG) areas.] 62 \times 24.5 \times 176 mm[For (G, GN) areas.] 70 \times 28 \times 215 mm**Weight (Including batteries)**

[For (E, EB, EG) areas.] 104 g

[For (G, GN) areas.] 160 g

Power sourceTwo UM-4/AAA
(Panasonic R03/LR03 or equivalent)**Notes:**

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

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■ BEFORE REPAIR AND ADJUSTMENT

Disconnect AC power, Discharge both Power Supply Capacitors C703 and C704 (75V 7500 μ F), C705 and C706 (50V 3300 μ F) through a 10 Ω , 5W resistor to ground.

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

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

Power supply voltage	AC 230V		AC 240V		AC 110–127V		AC 220–240V	
	Consumed current 50/60Hz	50Hz	140~420mA	50Hz	150~450mA	50Hz	400~1000mA	50Hz
60Hz		112~336mA	60Hz	120~360mA	60Hz	320~800mA	60Hz	120~360mA



CAUTIONS FOR AC MAINS LEAD

("EB" area code model only)

For your safety, please read the following text carefully.

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

A 5-ampere fuse is fitted in this plug.

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

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

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

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

CAUTION!

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

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

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

If in any doubt please consult a qualified electrician.

IMPORTANT

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

Blue: Neutral

Brown: Live

As these colours may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

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

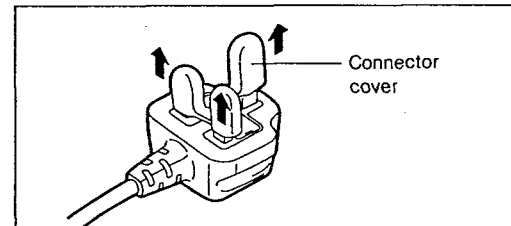
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

WARNING: DO NOT CONNECT EITHER WIRE TO THE EARTH TERMINAL WHICH IS MARKED WITH THE LETTER E, BY THE EARTH SYMBOL  OR COLOURED GREEN OR GREEN/YELLOW.

THIS PLUG IS NOT WATERPROOF—KEEP DRY.

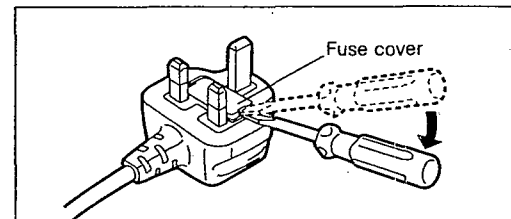
Before use

Remove the connector cover as follows.

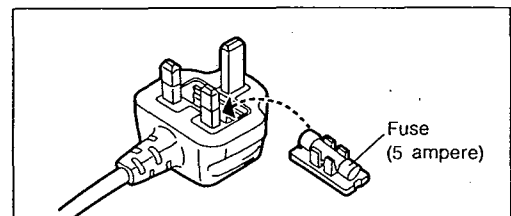


How to replace the fuse

1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover



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.

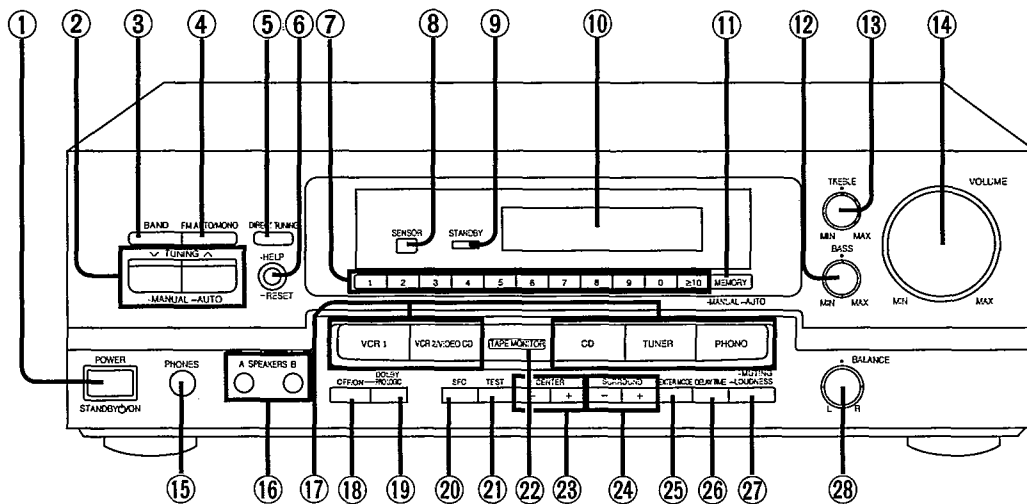
If this occurs, follow the procedure outlines below:

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.

FRONT PANEL CONTROLS



No.	Name	Ref. page
①	Power "STANDBY ϕ /ON" switch (POWER, STANDBY ϕ /ON) Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.	
②	Tuning control (TUNING)	
③	Band select button (BAND)	
④	FM mode select button (FM AUTO/MONO)	
⑤	Direct tuning button (DIRECT TUNING)	
⑥	Help/reset button (-HELP -RESET)	
⑦	Numeric buttons (1-0, \geq10)	
⑧	Remote control signal receptor	
⑨	"STANDBY" indicator When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.	
⑩	Display	
⑪	Memory button (MEMORY)	
⑫	Bass control (BASS)	
⑬	Treble control (TREBLE)	

No.	Name	Ref. page
⑭	Volume control (VOLUME)	
⑮	Headphone jack (PHONES)	
⑯	Speaker select buttons (SPEAKERS)	
⑰	Input select buttons	
⑱	DOLBY PRO LOGIC/SFC OFF ON button (OFF/ON)	
⑲	DOLBY PRO LOGIC mode select button (PRO LOGIC)	
⑳	SFC mode select button (SFC)	
㉑	Test signal button (TEST)	
㉒	Tape monitor button (TAPE MONITOR)	
㉓	Center level adjust button (CENTER)	
㉔	Surround level adjust button (SURROUND)	
㉕	Center mode select button (CENTER MODE)	
㉖	Delay time adjust button (DELAY TIME)	
㉗	Muting/loudness button (-MUTING -LOUDNESS)	
㉘	Balance control (BALANCE)	

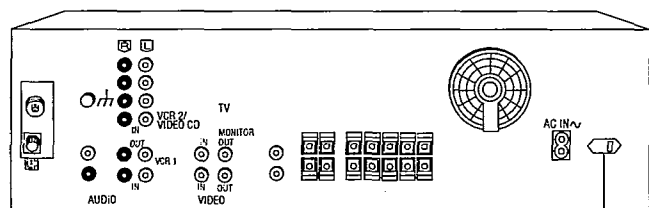
TO SET THE POWER VOLTAGE

[For (G) area only.]

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

Note

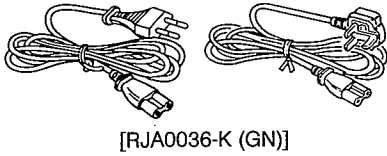
Note that this unit will be seriously damaged if this setting is not made correctly.



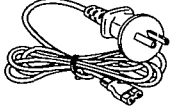
Voltage adjustment

ACCESSORIES

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



[RJA0036-K (GN)]



FM indoor antenna 1 pc.
 (RSA0007)



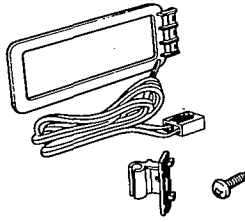
Attachment plug..... 1 pc.
 [SJP9009 (EB)]



AM loop antenna set..... 1 pc.
 (RSA0010)

• AM antenna holder..... 1 pc.
 (RMN0244)

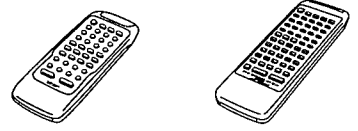
• Screw..... 1 pc.
 (XTN3+12AFZ)



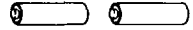
Power plug adaptor 1 pc.
 [SJP5213-2 (G)]



Remote control transmitter 1 pc.
 [RAK-SA179XH [RAK-SA603MH
 (E, EB, EG) (G, GN)]

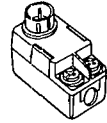


Batteries for remote control
 transmitter 2 pcs.
 ("AAA", R03)



Note: These are available on sale route.

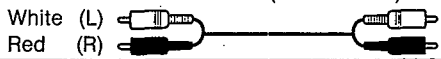
Antenna plug..... 1 pc.
 [RFE0014 (G, GN)]



EQUIPMENT CONNECTIONS

Connecting audio equipment

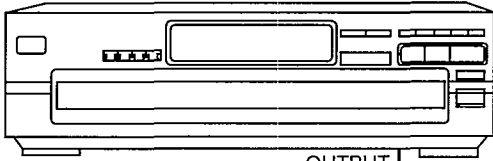
Stereo connection cable (not included)



Note

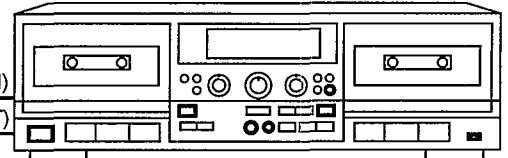
Do not place books, etc., on top of this unit or block the heat radiation vents in any way.

CD changer (or CD player)
 (not included)



OUTPUT

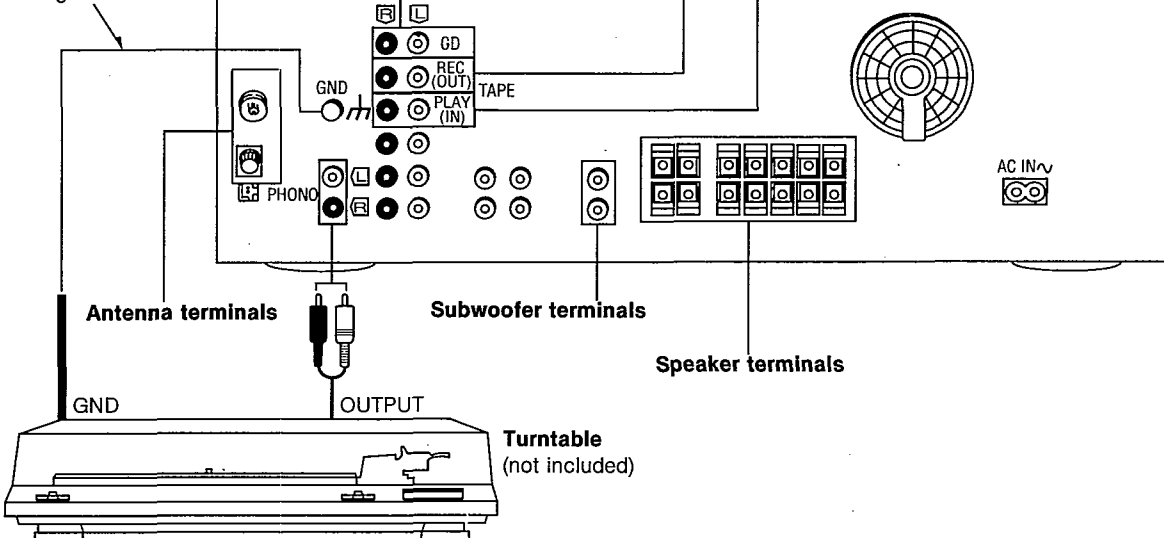
Tape deck (not included)



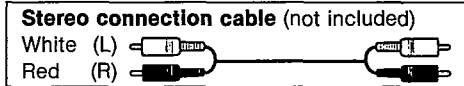
REC (IN)

PLAY (OUT)

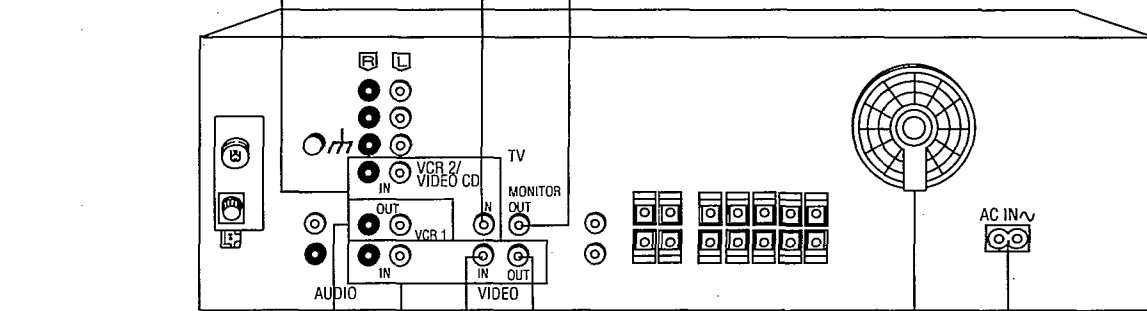
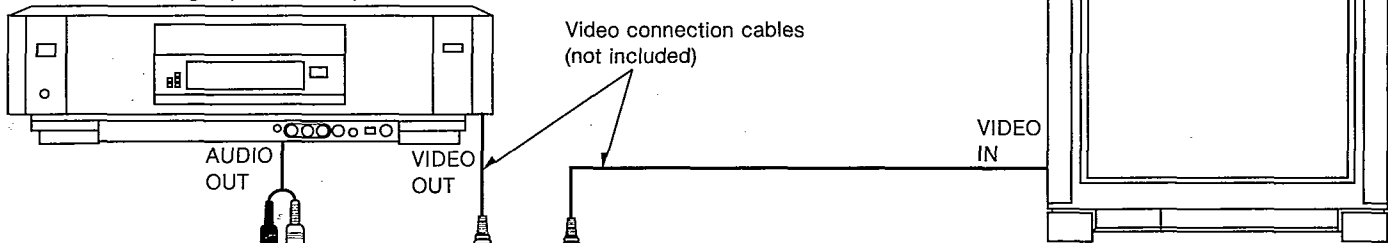
Only for turntable
 with ground terminal



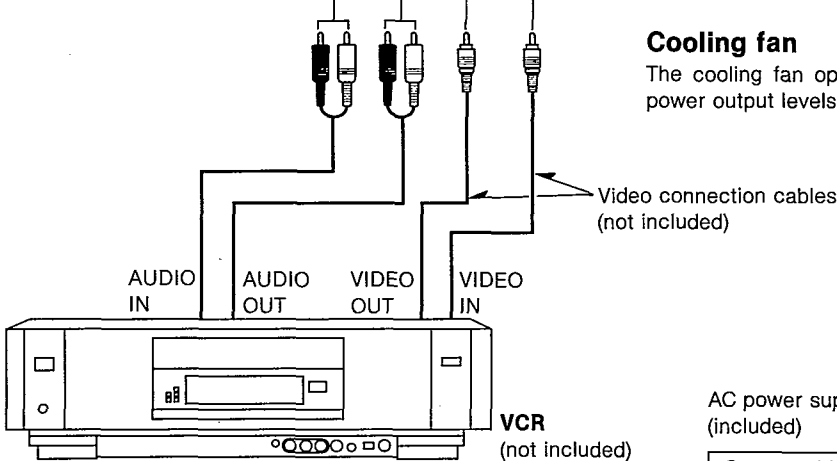
Connecting video equipment



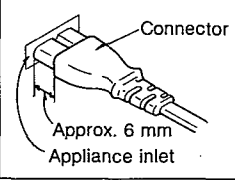
Second VCR (for playback only) or video CD changer (not included)



Cooling fan
 The cooling fan operates at high power output levels only.



[For (EB) area.]

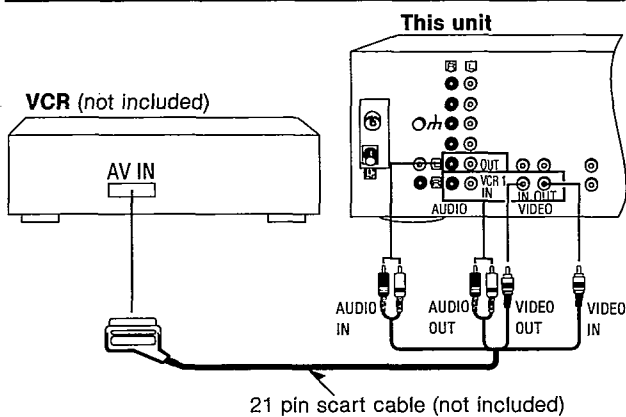


Connector
 Approx. 6 mm
 Appliance inlet

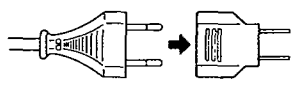
Even when the connector is perfectly inserted, the front part of the connector jut out as shown in the drawing. However there is no problem using the unit.

AC power supply cord (included)
 Connect this cord after all other cables and cords are connected.

To connect a video deck with 21 pin scart terminal



[For (G) area.]
 If the power plug will not fit your socket, use the power plug adaptor (included).



Household AC outlet

REMOTE CONTROL OPERATION

[For (E, EB, EG) areas.] (RAK-SA179WH)

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

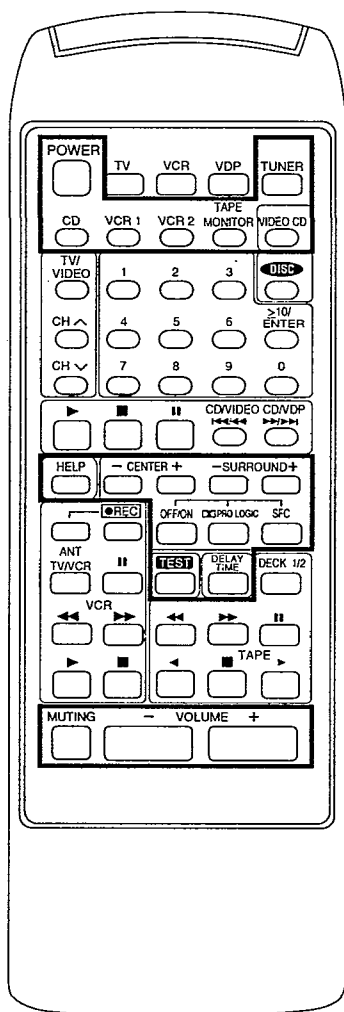
- For detailed information concerning operation steps, etc., please refer to the appropriate page for each unit and the respective operating instructions.
- Make sure that the power of each unit is set to the "ON" position before beginning the operations.

To operate the receiver

	To turn the unit ON/OFF	POWER -AUDIO (Touch only)	
	To select an input source	TUNER VCR 1 CD TAPE VCR 2/ VIDEO CD Note • PHONO can not be selected with this remote control. • Selecting TAPE turns ON the tape monitor function. Pressing it again or another input select button turns the function OFF.	
	To select the Dolby Pro Logic mode	PRO LOGIC Changes as follows each time the button is pressed. → SURROUND → 3 STEREO → (OFF)	
	To output a test signal	When the 3 STEREO or SURROUND mode is ON TEST Press once more to stop the test signal.	
	To adjust the output level of the center speaker	When the 3 STEREO or SURROUND mode is ON - CENTER + Note Output level cannot be changed when the surround mode is ON and the center mode is on PHANTOM.	
	To adjust the output level of the surround speakers	When the SURROUND mode is ON - SURROUND +	
	To mute the sound level	MUTING Press once more to return to the original volume.	
	To adjust the volume level	- VOLUME +	
	If your unit is equipped with the New Technics Remote Control System (see below)		
	To turn the system OFF	POWER -AUDIO Press for approx. 2 seconds.	
To listen to radio broadcasts			
Specify the preset channel using the numeric button(s). (Example: Channel 9) TUNER → (Example: Channel 12) ≥10/- →			

[For (G, GN) areas.] (RAK-SA603MH)

To operate the receiver



Basic operations	
To turn the power supply ON/OFF	<p>TUNER → POWER</p> <p>Once the power has been set to ON, it can be turned ON and OFF simply by pressing POWER.</p>
To select an input source	<p>TUNER CD VCR 1 VCR 2 TAPE MONITOR VIDEO CD</p> <p>Note</p> <ul style="list-style-type: none"> • PHONO can not be selected with this remote control. • Selecting TAPE MONITOR turns ON the tape monitor function. Pressing it again or another input select button turns the function OFF.
To turn on the Dolby Pro Logic and select the desired mode	<p>PRO LOGIC</p> <p>Changes as follows each time the button is pressed.</p> <p>→ SURROUND → 3 STEREO → (OFF)</p>
To turn on the SFC function and select the desired mode	<p>SFC</p> <p>Changes as follows each time the button is pressed.</p> <p>HALL → LIVE → THEATER</p> <p>← SIMULATED ←</p>
To output a test signal	<p>When the SURROUND or 3 STEREO mode is ON</p> <p>TEST</p> <p>Press once more to stop the test signal.</p>
To adjust the output level of the center speaker	<p>When the SURROUND or 3 STEREO mode is ON</p> <p>- CENTER +</p> <p>Note</p> <p>Output level cannot be changed when the surround mode is ON and the center mode is on PHANTOM.</p>
To adjust the output level of the surround speakers	<p>When the SURROUND or SFC mode is ON</p> <p>- SURROUND+</p>
To turn the Dolby Pro Logic/SFC OFF and ON	<p>OFF/ON</p>
To display simple receiver information and procedures for remedying trouble	<p>HELP</p>
To adjust the delay time	<p>When the SURROUND or SFC mode is ON</p> <p>DELAY TIME</p>
To mute the sound level	<p>MUTING</p> <p>The message "MUTING ON NOW" runs repeatedly from right to left across the display as long as the muting function is on. Press once more to return to the original volume.</p>
To adjust the volume level	<p>- VOLUME +</p>
<p>Note</p> <p>After turning the power of the TV, VCR or laser disc player ON or OFF (see pages 5-7) always press TUNER before pressing POWER when turning the power of the receiver ON and OFF.</p>	

OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURE

NOTE

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.
4. Illustrated screws are equivalent to actual size.
5. Refer the parts No. on the page of "Main component Replacement Procedures", if necessary.

Contents

•Checking Procedure for each P.C.B.

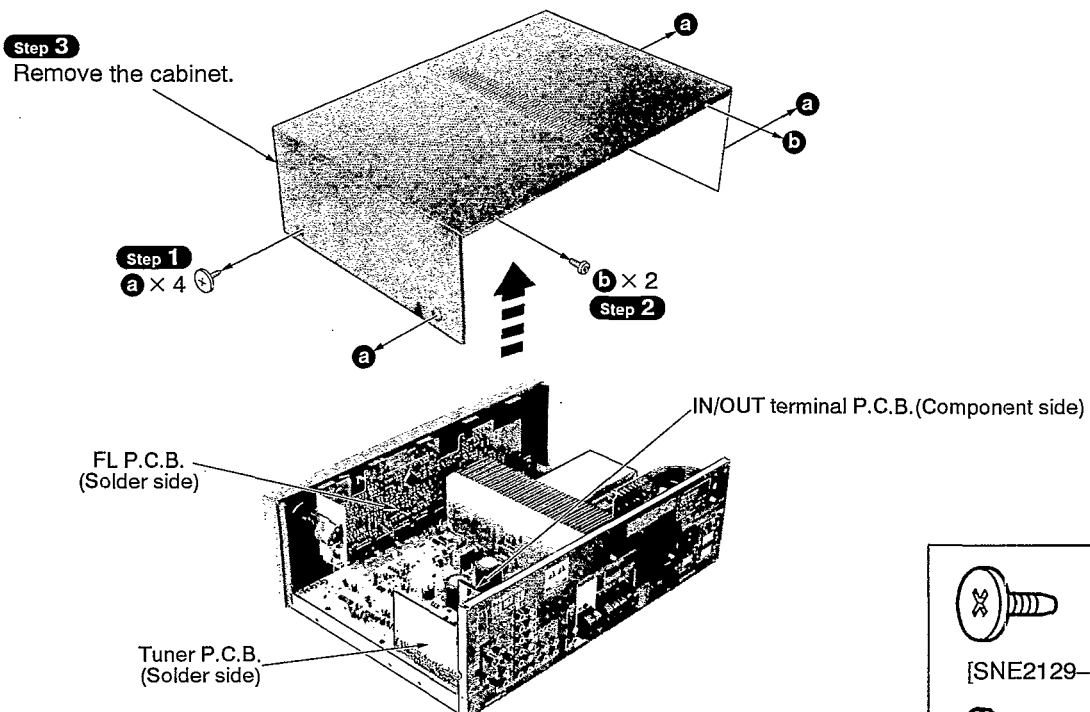
	Page.
1. Checking for the FL P.C.B., Tuner P.C.B. and IN/OUT terminal P.C.B.	9,10.
2. Checking for the Main P.C.B.	10,11.

•Main Component Replacement Procedures

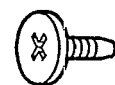
1. Replacement for the foot.	12.
2. Replacement for the power IC and regulator transistor.	12~14.
3. Replacement for the fan motor.	14.

Checking Procedure for each P.C.B.

1. Checking for the FL P.C.B., tuner P.C.B. and IN/OUT terminal P.C.B.



• Check the FL P.C.B., tuner P.C.B. and IN/OUT terminal P.C.B. as shown above.



a

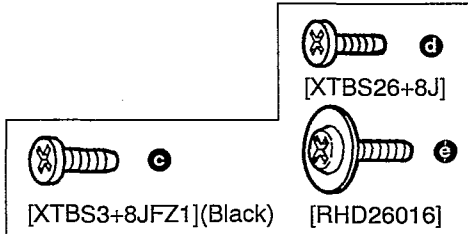
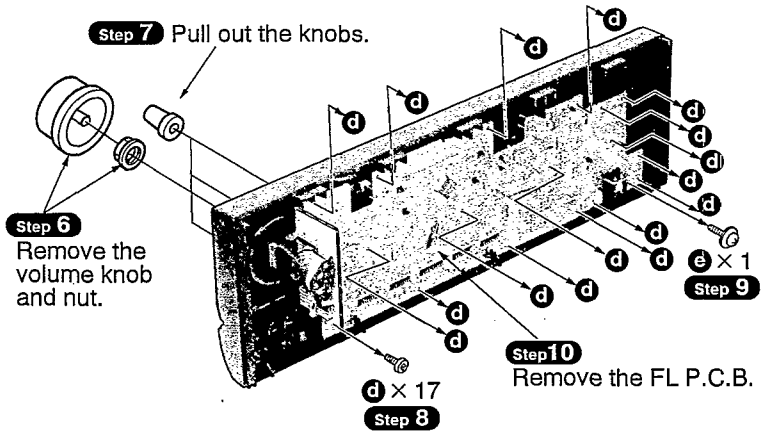
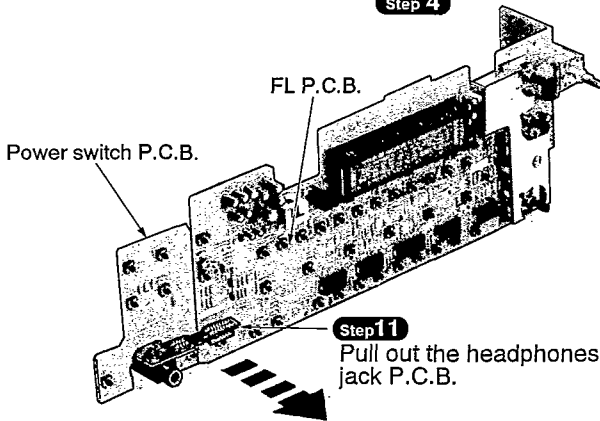
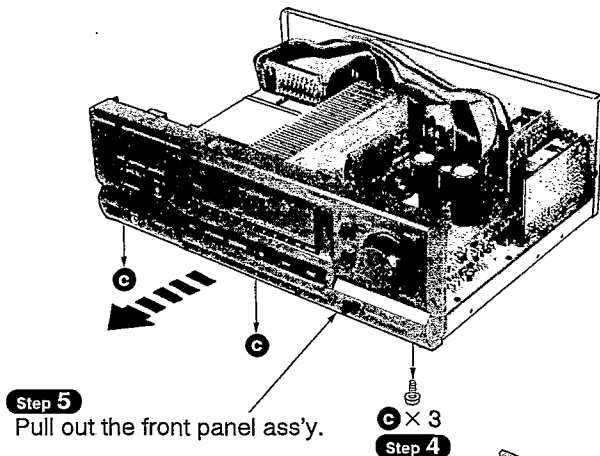
[SNE2129-3] (Black)



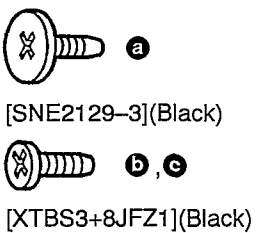
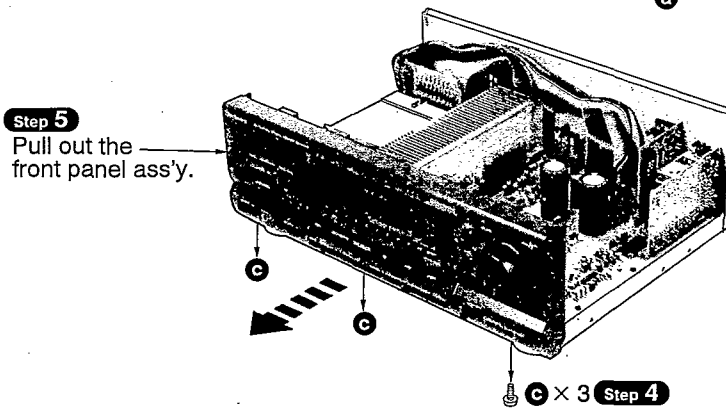
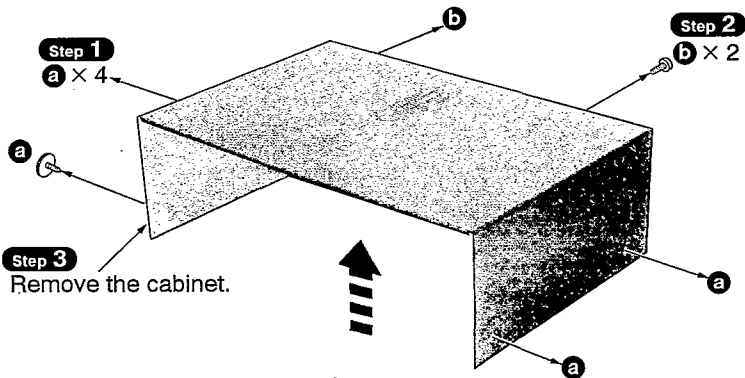
b

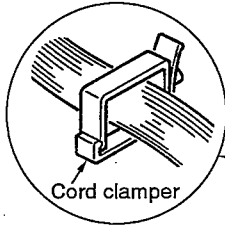
[XTBS3+8JFZ1] (Black)

To remove each P.C.B.



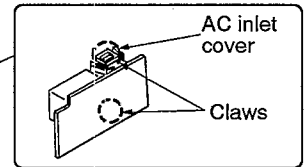
2. Checking for the main P.C.B.



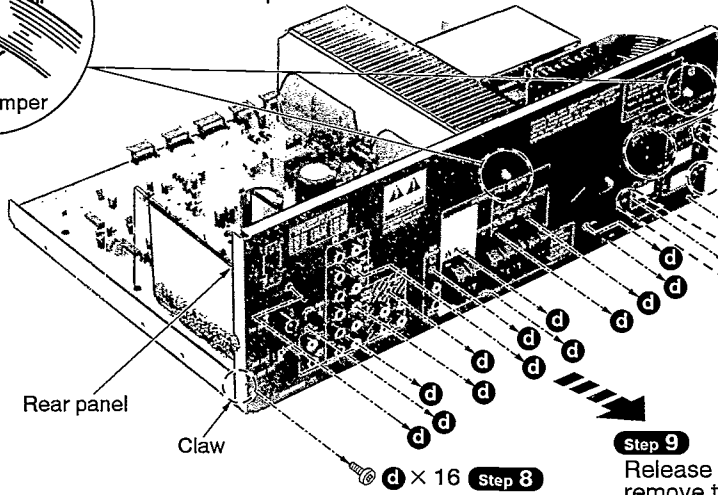


Step 6
Remove the flat cables from cord clamer.

※ For(G)area.



Step 7 Release the claws.



※ For(G)area.

Claw

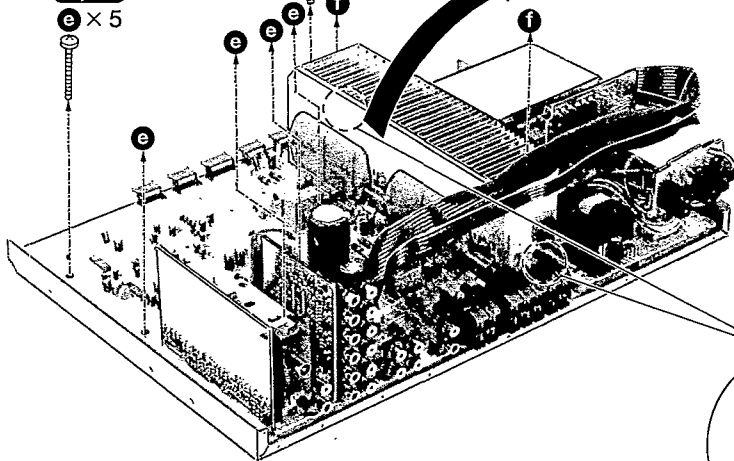
※ For(E,EB,EG,GN)areas.

Step 9
Release the claws, and then remove the rear panel.

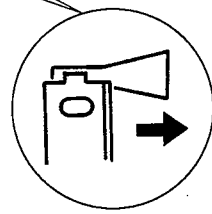
d × 16 **Step 8**

f × 3 **Step 11** **Step 13** Remove the main P.C.B.

Step 10
e × 5



Step 12
Release the hooks.



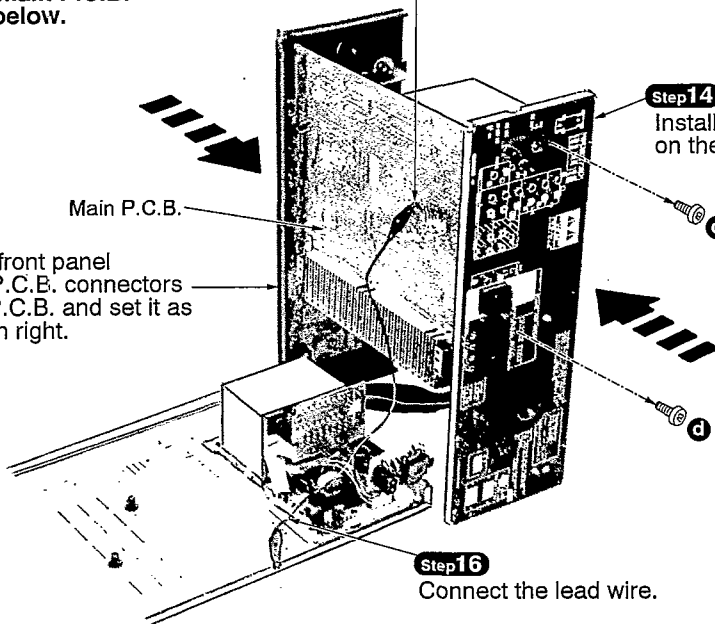
• Check the main P.C.B. as shown below.

GND plate

Main P.C.B.

Step 14
Install the rear panel temporarily on the main P.C.B. again.

Step 15
Connect the front panel ass'y of the P.C.B. connectors to the main P.C.B. and set it as the illustration right.



Step 16
Connect the lead wire.

- d
[XTBS3+8JFZ1](Black)
- e
[XTB3+20JFZ](Black)
- f
[XTB3+8JFZ](Black)

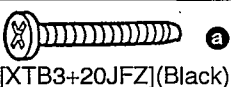
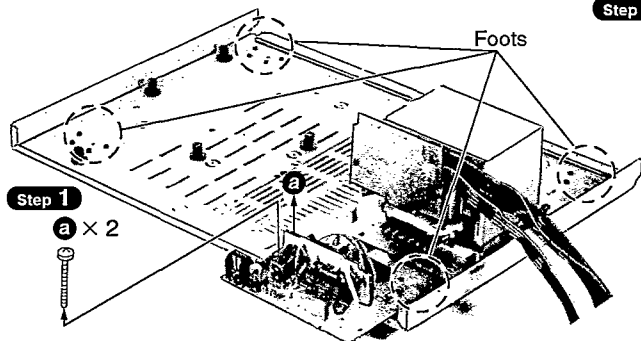
Main Component Replacement Procedures

1. Replacement of the foot

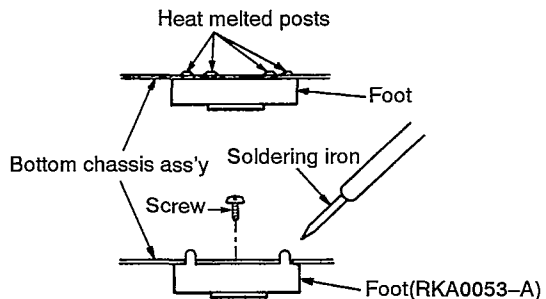
• Follow the **Step 1** ~ **Step 12** in item 2 on checking procedure for each P.C.B. on pages 10 and 11.

Step 3 Remove the 4 heat melted posts on the Bottom chassis ass'y with a pair of nippers or similar tool.

Step 4 To replace the foot(RKA0053-A) on the Bottom chassis ass'y melt the 4 posts with a soldering iron or install it with a screw (XTB3+6J).



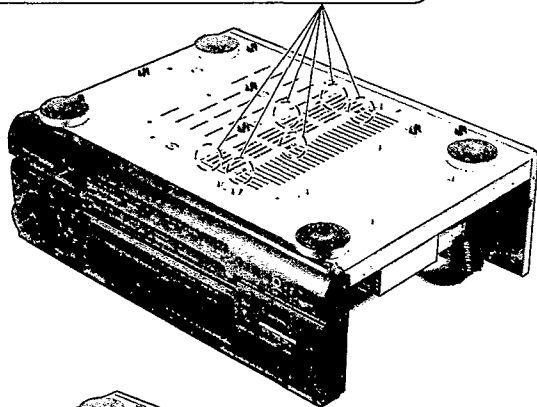
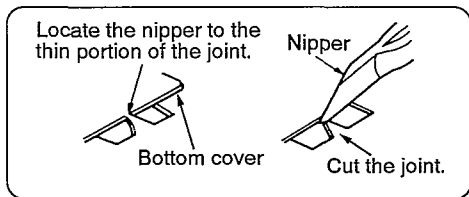
Step 2 Remove the power supply P.C.B.



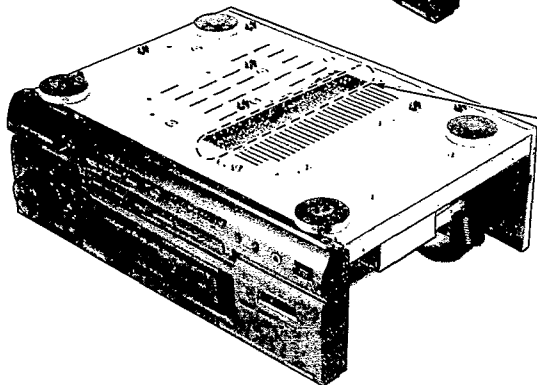
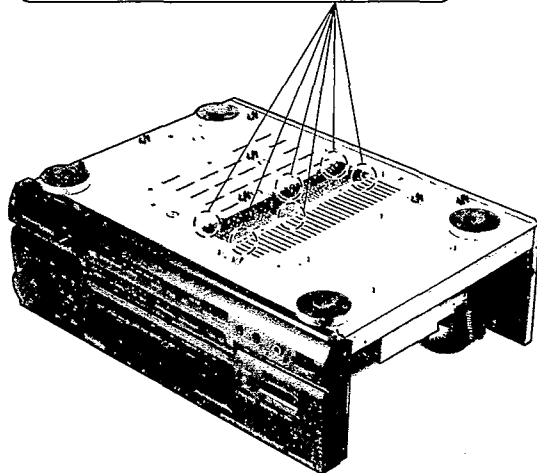
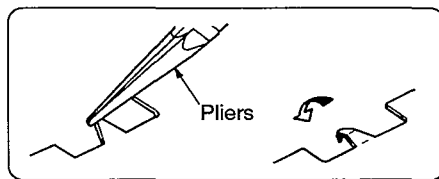
2. Replacement for the power IC and regulator transistor

• Follow the **Step 1** ~ **Step 3** in item 1 on checking procedure for each P.C.B. on page 9.

Step 1 Cut the joints as shown below.(6 portions)

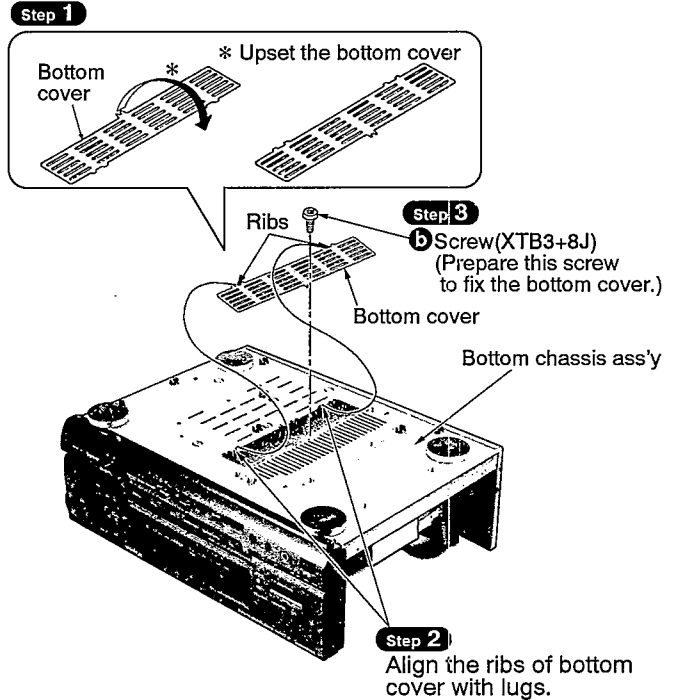
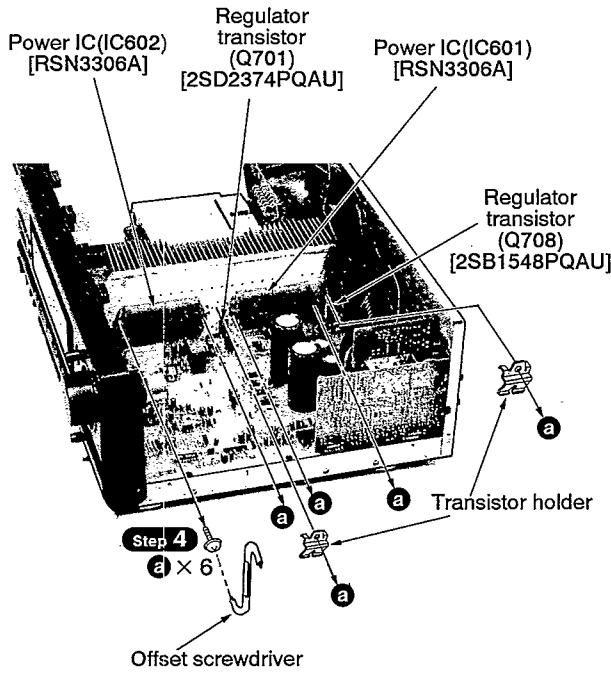


Step 2 Fold the joints.(6 portions)



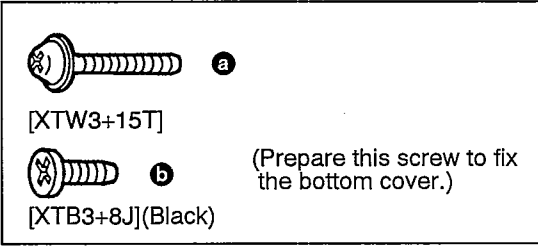
Step 3 Unsolder the terminals of power IC and regulator transistor.

Installation of the bottom cover after replacement

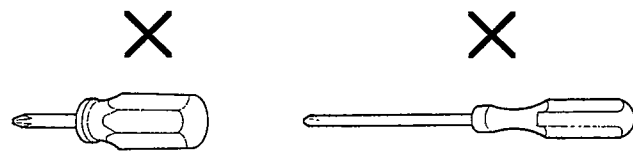


CAUTION

1. After replceing the power IC or regulator transistor, apply a sufficient quantity of compound grease (RFKX0002) between the heat sink and the power IC or regulator transistor (Radiation of power IC).
2. Tighten enough the screws (a) after replacing the power IC and regulator transistor. Otherwise, the heat rabiation works little.
3. When installing or removing the power IC or transistor holder, be sure to use an offset screwdriver.



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



A short straight screwdriver A long straight screwdriver

Fig.2

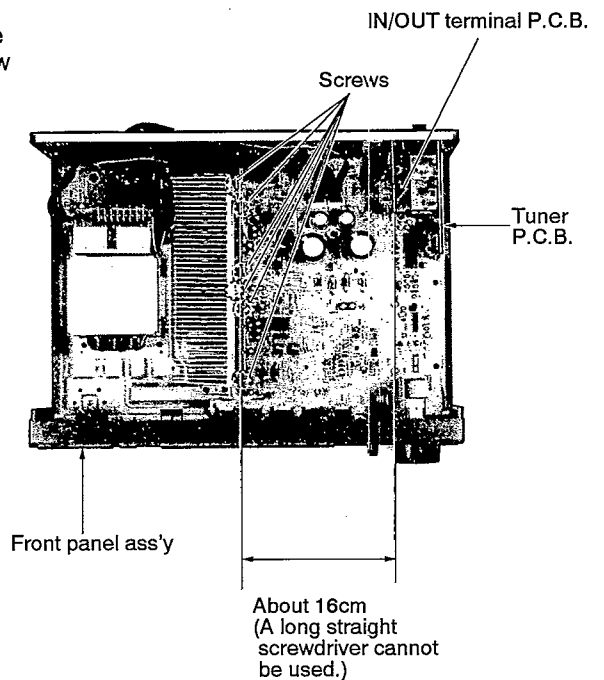
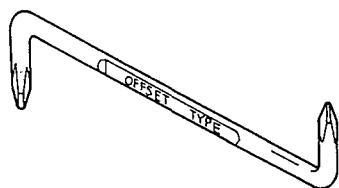


Fig.1

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

—OFFSET SCREWDRIVER—

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



No.		
34¼	1 & 2	4¾"

•The address of PROTO International Sales is as follows.



International Sales

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

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

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

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

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

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

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

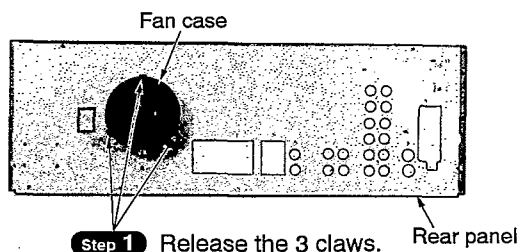
Europe
Stanley-Proto Europe
Woodside, Sheffield
S39PD
England
Fax: 44-742-739-038
Phone: 44-742-768-888

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

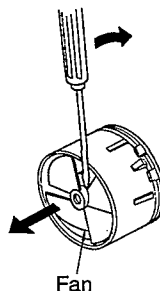
Middle East, Mediterranean
& Africa
Stanley-MEMA
Cory House The Ring
Bracknell Berkshire
RG 12 1A2
England
Fax: 44-344-485-526
Phone: 44-344-51813

3. Replacement for the fan motor

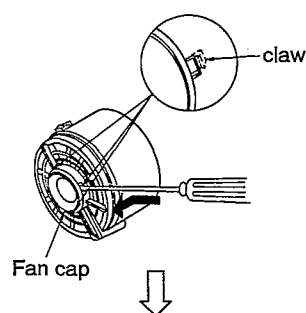
•Follow the **Step 1** ~ **Step 7** in item 2 on checking procedure for each P.C.B. on pages 10 and 11.



Step 2
Put a screwdriver at the root of the fan and remove it.

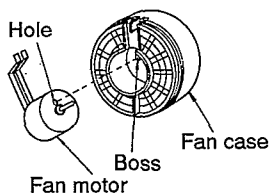


Step 3
Remove the fan cap.

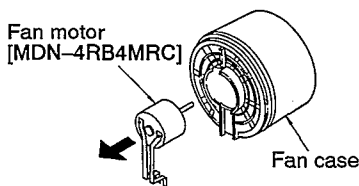


NOTE

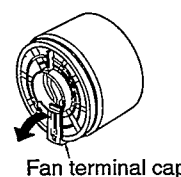
When replacing the fan motor, align the boss of the fan case with the hole of the fan motor.



Step 5
Remove the fan motor.



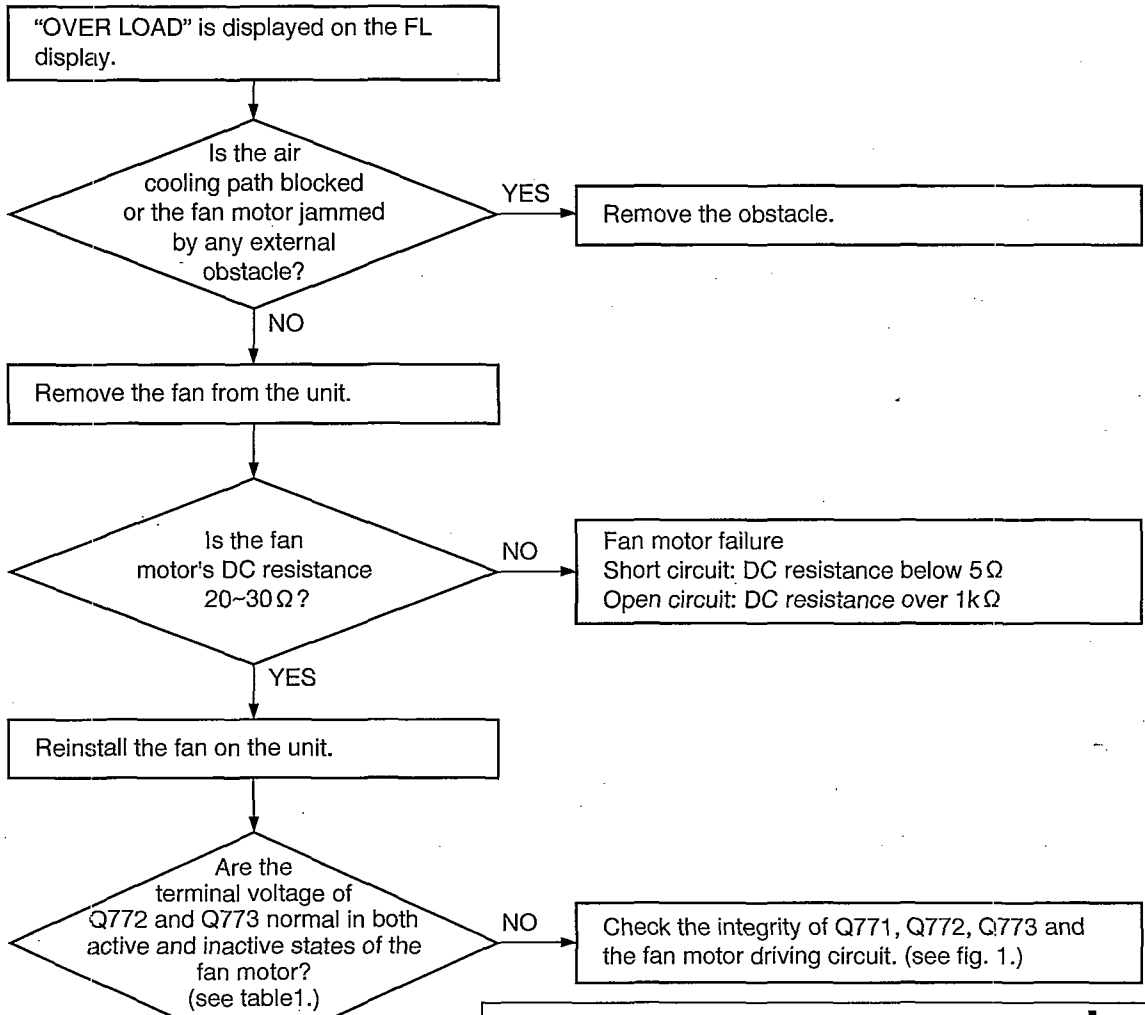
Step 4
Remove the fan terminal cap.



FAN MOTOR TROUBLESHOOTING

The Model SA-GX690 employ fan motor error sensing electronics.

If the cooling fan is not operation and "OVER LOAD" is displayed on the FL display, check the fan motor and its driving circuit.



(Voltage table)

		fan. off	fan. on
Q771	E	0V	0V
	C	-0.9V	0V
	B	0V	-0.9V
Q772	E	0V	0V
	C	0V	-9.3V
	B	-0.9V	0V
Q773	E	0V	-8.1V
	C	-14.5V	-14.5V
	B	0V	-8.7V

(Table 1)

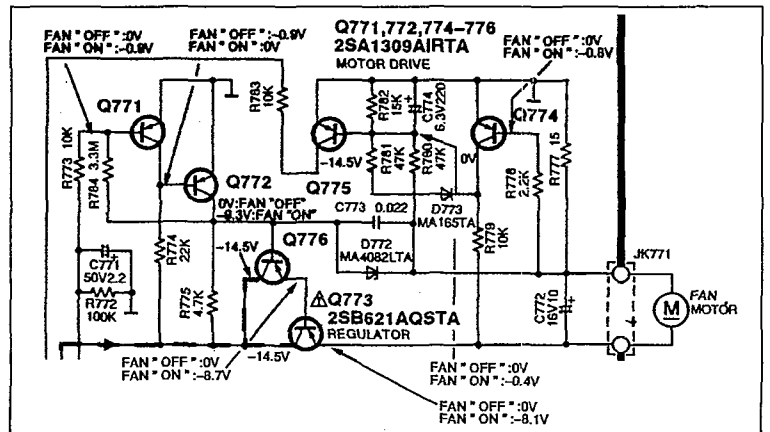
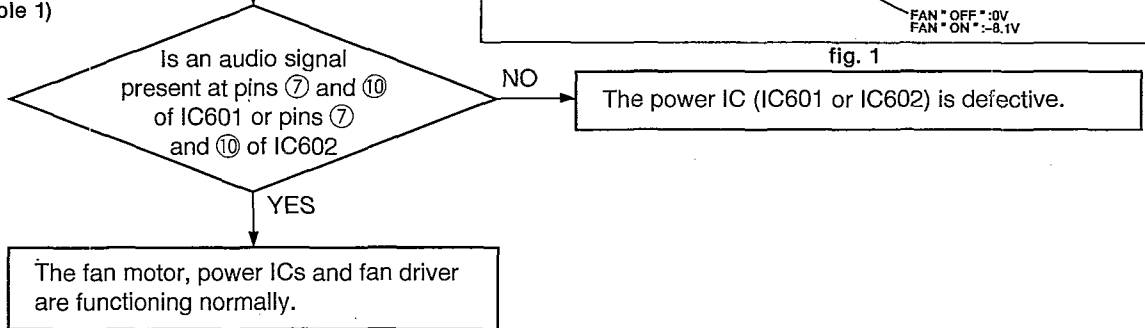


fig. 1

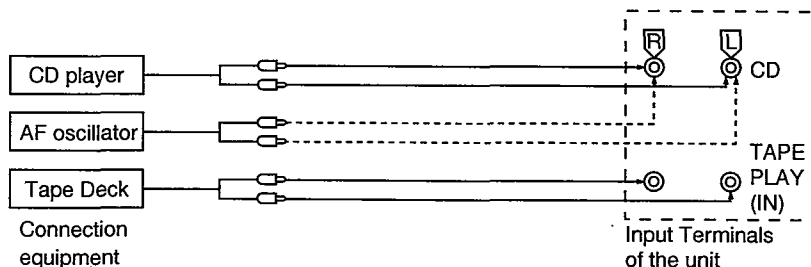


■ TROUBLESHOOTING

This unit has test terminals on each circuit board block for use in troubleshooting.

CONNECTION

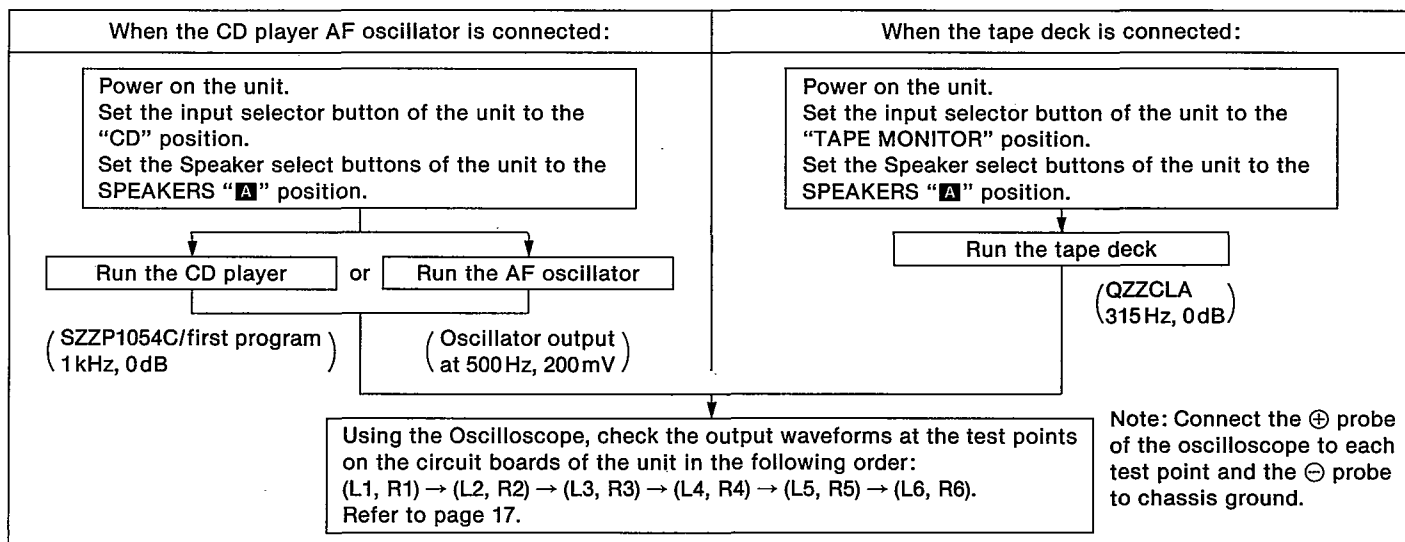
Connect either a CD player, tape deck or AF oscillator to the input terminals of the unit.



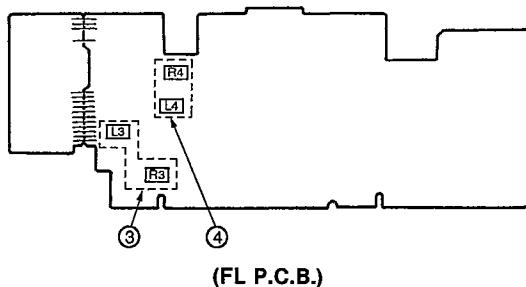
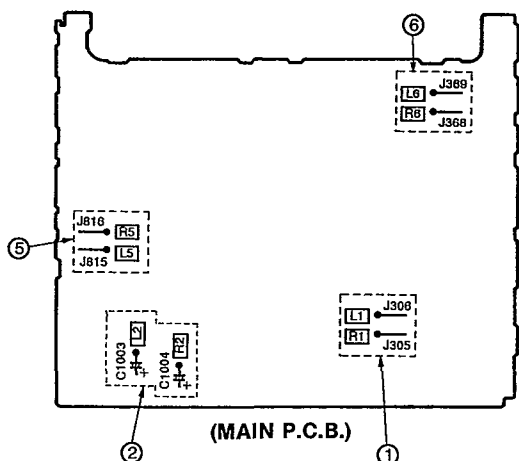
REQUIRED ITEMS

- ① Testing with a CD player ————— Test deck (SZZP1054C/first program, 1 kHz, 0dB)
- ② Testing with a tape deck ————— Test tape (QZZCLA/315Hz, 0dB)
- ③ Testing with a AF oscillator ————— Set the output at 500Hz, 200mV
- ④ Oscilloscope (min. 10 MHz) To measure the output waveform at the test points.

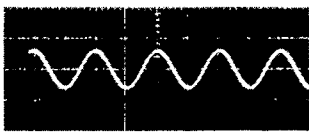
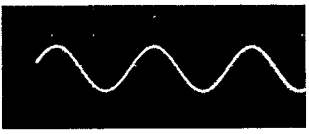
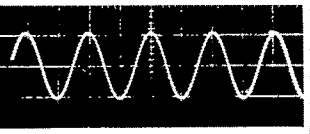
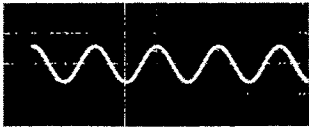
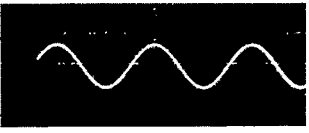
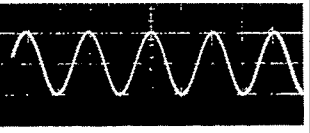
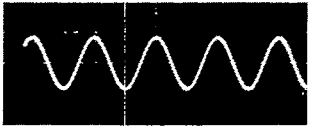
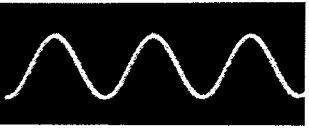
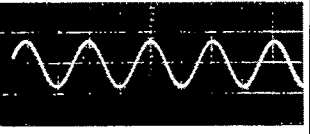
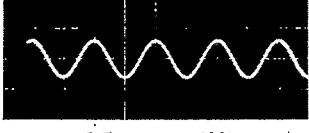
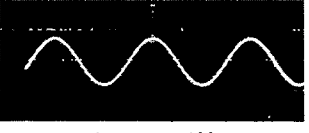
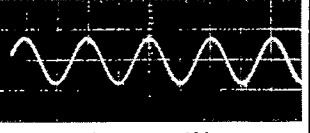
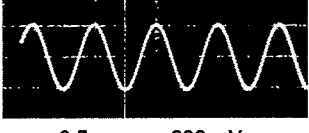
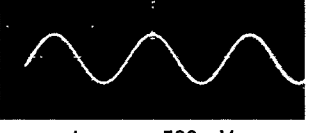
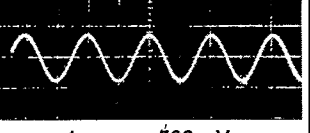
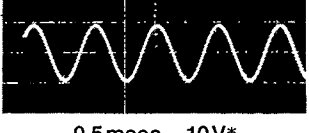
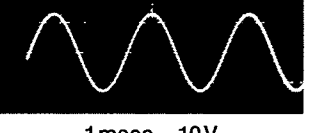
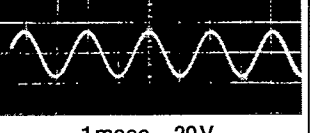
TEST PROCEDURE FOR AMPLIFIER CIRCUIT



TEST POINTS POSITIONS OF AMPLIFIER CIRCUIT



NORMAL WAVEFORMS OF AMPLIFIER CIRCUIT AND LIKELY FAULY BLOCKS

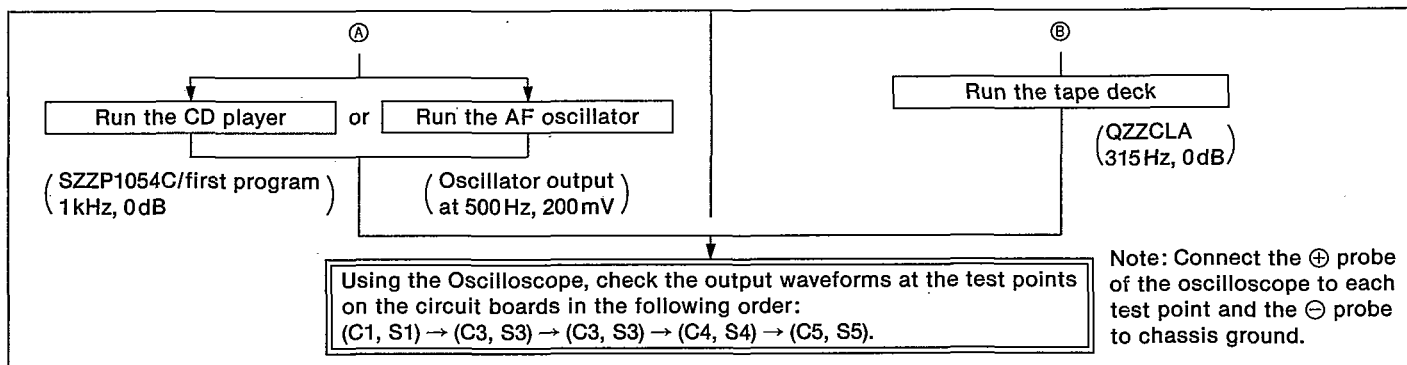
No.	TP	CD player	Tape deck	AF oscillator	Likely faulty block if the normal waveform shown at left is not present.
①	L1/R1	 0.5msec 5V	 1msec 500mV	 1msec 500mV	Input selector block IC402 & area
②	L2/R2	 0.5msec 5V	 1msec 500mV	 1msec 500mV	Dolby pro logic block IC1001 and IC1002 & area
③	L3/R3	 0.5msec 500mV	 1msec 50mV	 1msec 100mV	Master volume block VR501 & area
④	L4/R4	 0.5msec 1V*	 1msec 1V	 1msec 1V	Tone control block IC511 & area
⑤	L5/R5	 0.5msec 200mV	 1msec 500mV	 1msec 500mV	Power limiter block Q581 to Q584 & area
⑥	L6/R6	 0.5msec 10V*	 1msec 10V	 1msec 20V	Main amplifier block IC601 & area

Measurement conditions. Volume control (VR501), Treble control (VR512) and Bass control (VR511) positions: ☉
 *Volume control (VR501) position for these test : ☉

CHECKING PROCEDURE FOR SURROUND CIRCUIT

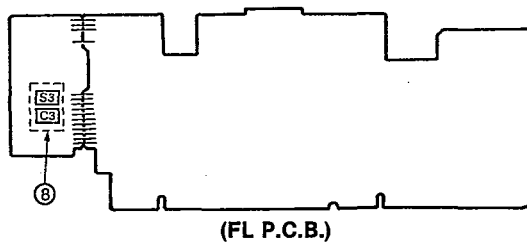
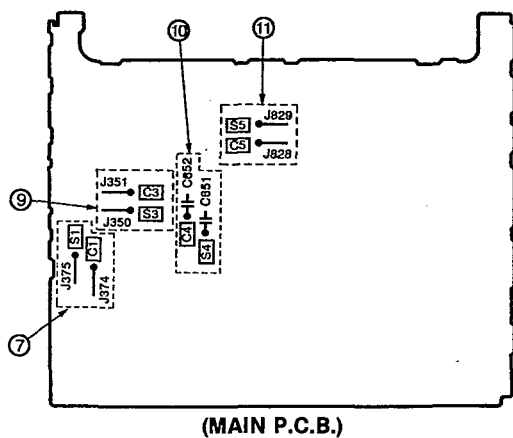
Outputting surround signals normally requires that opposite phase signals be applied to both the left and right channels. However, this unit incorporates a service mode, allowing the surround circuit to be tested using in-phase signals.

When the CD player or AF oscillator is connected:	When the tape deck is connected:
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Power on the unit. Set the input selector button of the unit to the "CD" position.</div> <div style="text-align: center;">↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">While pressing both the "+" and "-" of the surround level adjustment button "SURROUND", press the "Power" button.</div> <div style="text-align: center;">↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">The letters 『SURR』 flash on the FL display.</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">Ⓐ</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Power on the unit. Set the input selector button of the unit to the "TAPE MONITOR" position.</div> <div style="text-align: center;">↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">While pressing both the "+" and "-" of the surround level adjustment button "SURROUND", press the "POWER" button.</div> <div style="text-align: center;">↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">The letters 『SURR』 flash on the FL display.</div> <div style="text-align: center;">↓</div> <div style="text-align: center;">Ⓑ</div>



• To Exit the service mode, power off the unit.

TEST POINTS POSITIONS OF SOURROUND CIRCUIT



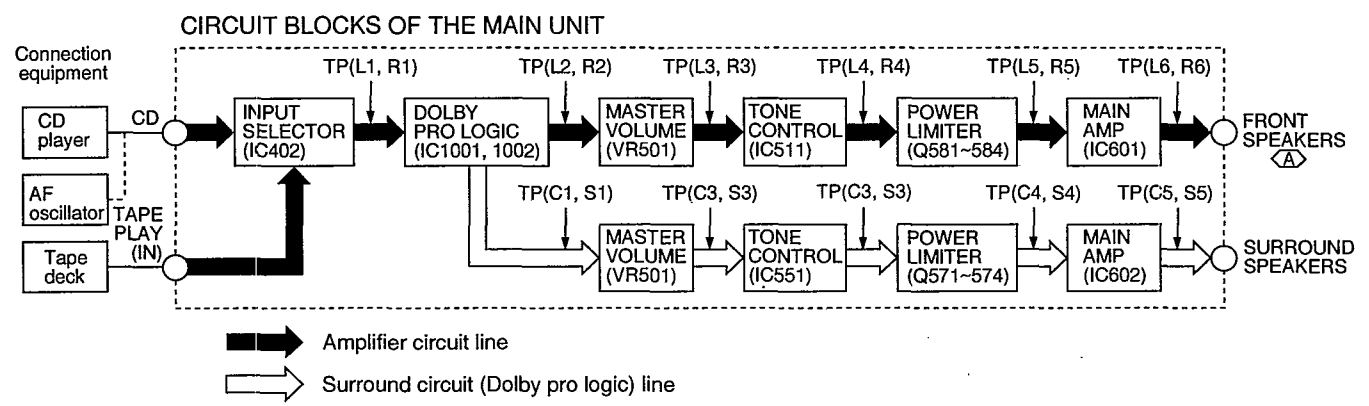
NORMAL WAVEFORMS OF SURROUND CIRCUIT AND LIKELY FAULTY BLOCKS

No.	TP	CD player	Tape deck	AF oscillator	Likely faulty block if the normal waveform shown at left is not present.
⑦	C1				Dolby pro logic block IC1001 and IC1002 & area
	S1				
⑧	C3				Master volume block VR501 & area
	S3				
⑨	C3				Tone control block IC551 & area
	S3				

No.	TP	CD player	Tape deck	AF oscillator	Likely faulty block if the normal waveform shown at left is not present.
⑩	C4				Power limiter block and Q571 through Q574 & area
	S4				
⑪	C5				Main amplifier block IC602 & area
	S5				

Measurement conditions. Volume control (VR501), Treble control (VR512) and Bass control (VR511) positions: ○
 * Volume control (VR501) position for these test : ○

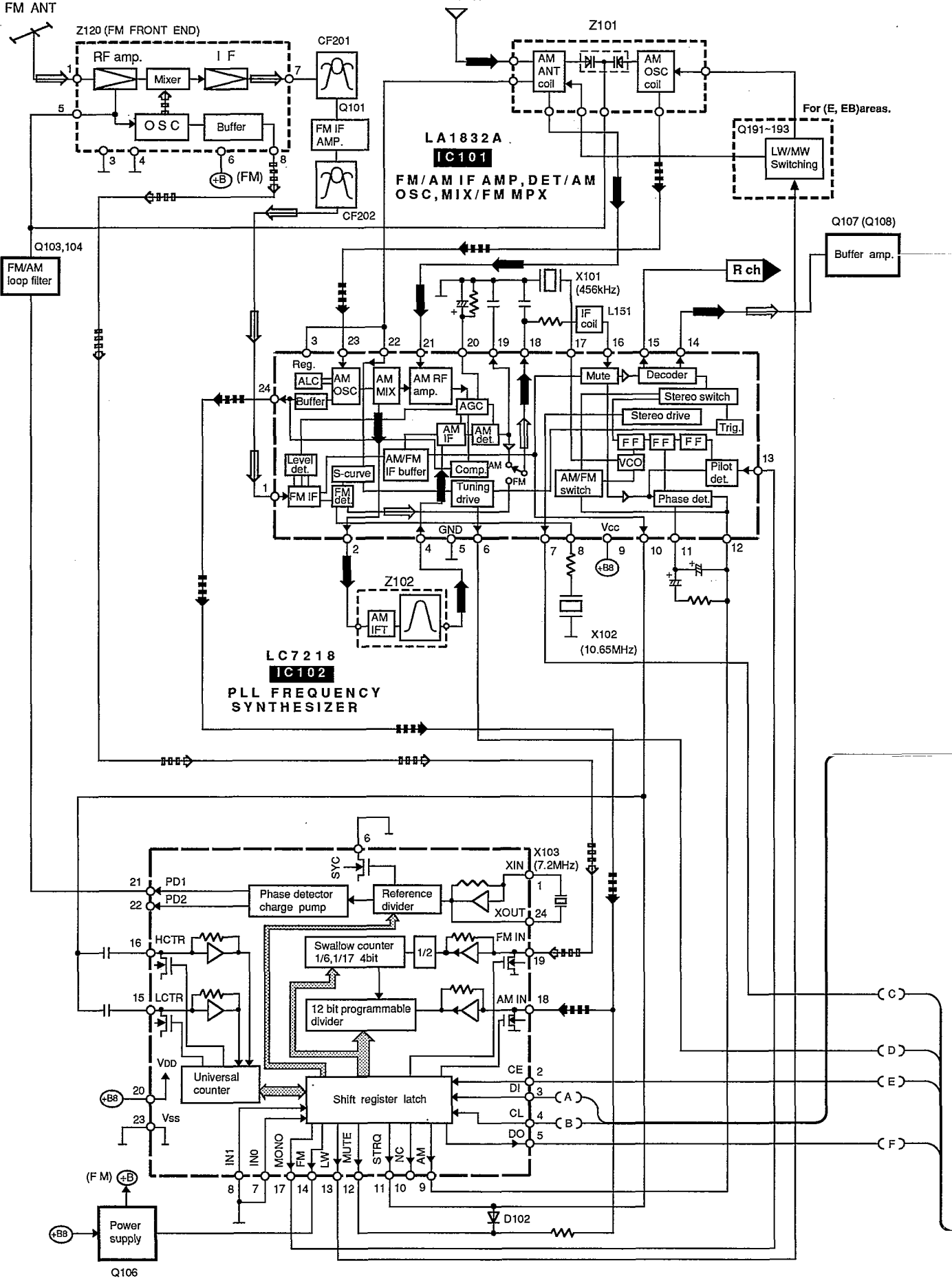
CIRCUIT BLOCKS

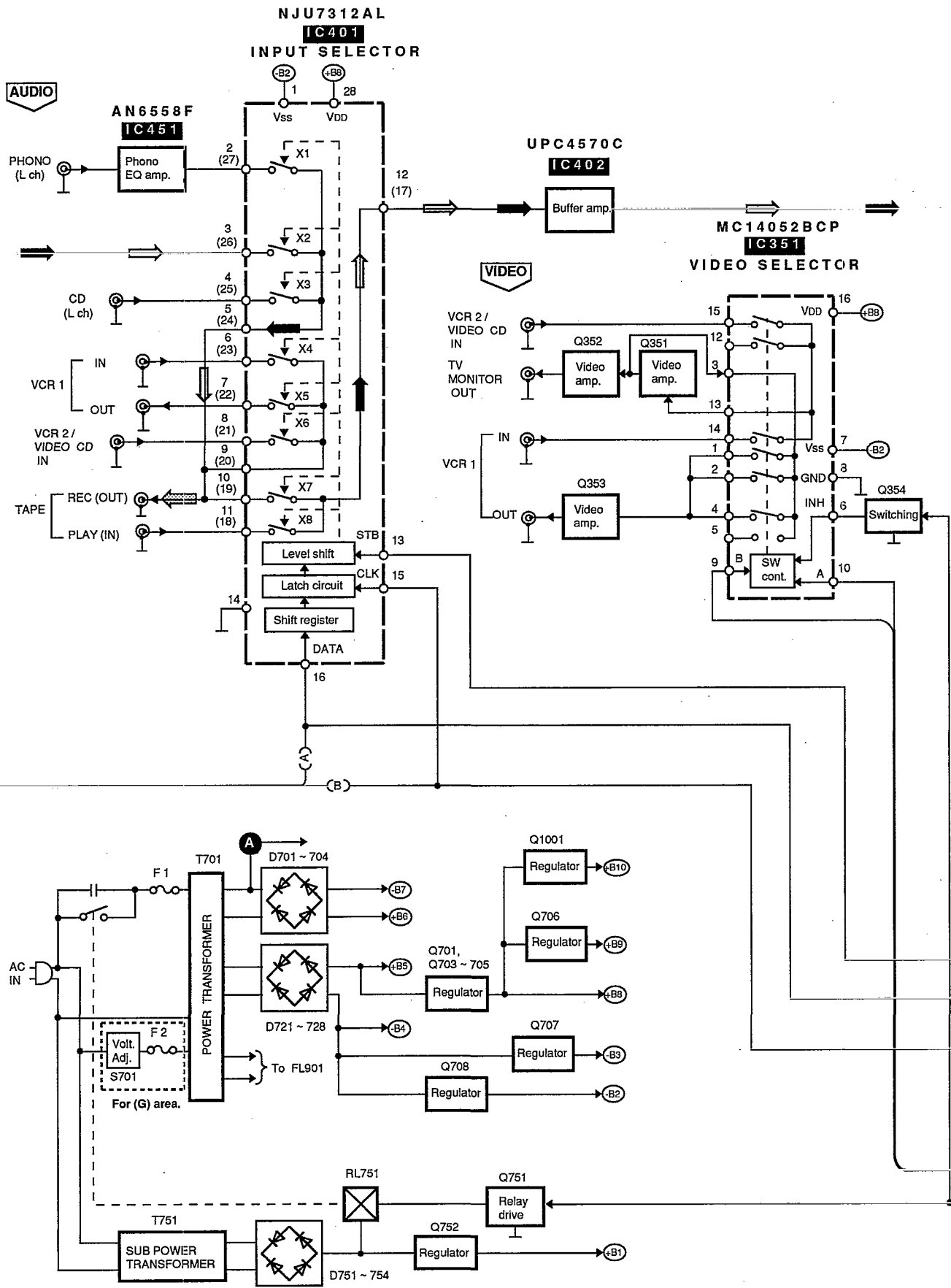


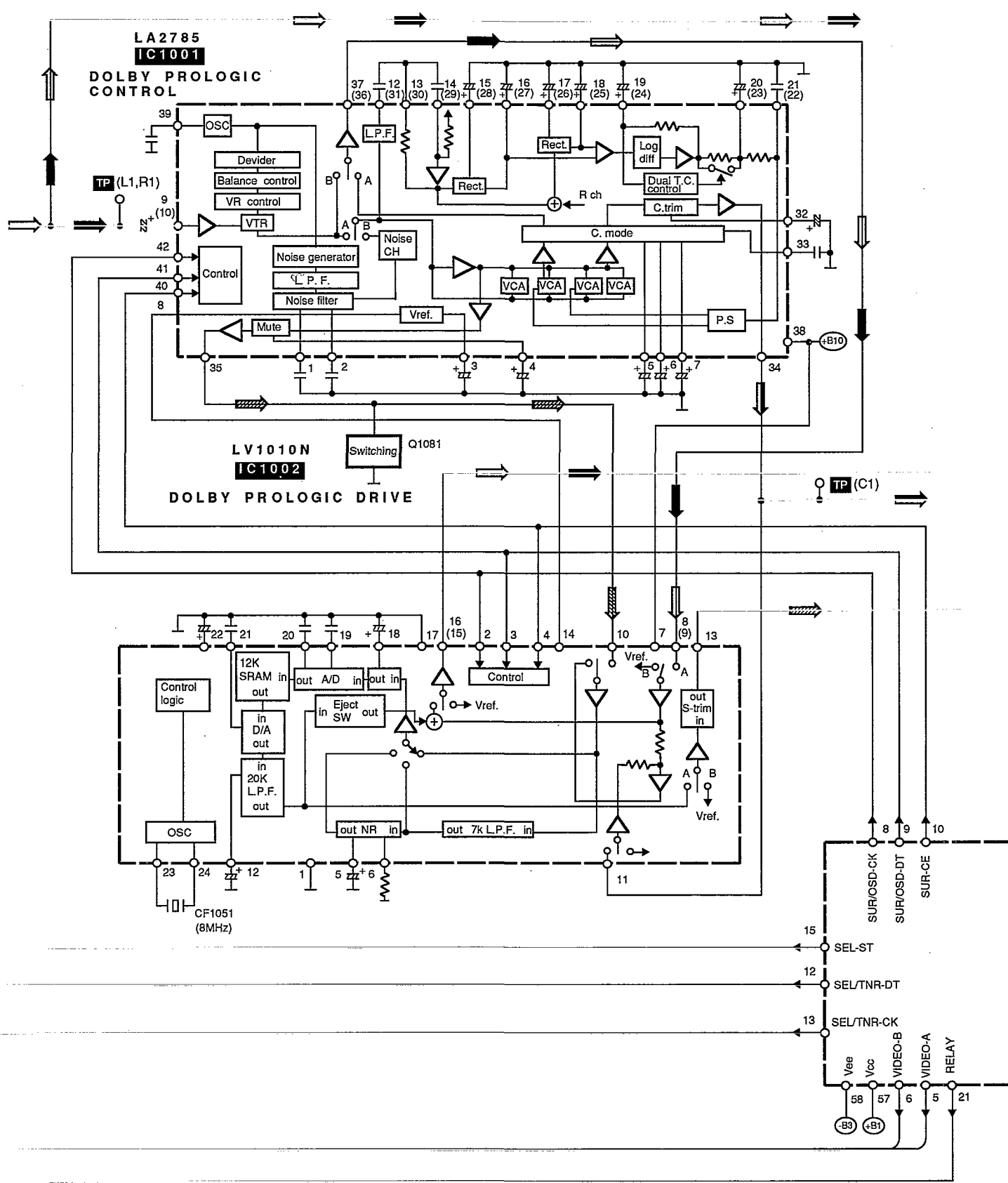
OVERLOAD DETECTION FUNCTION

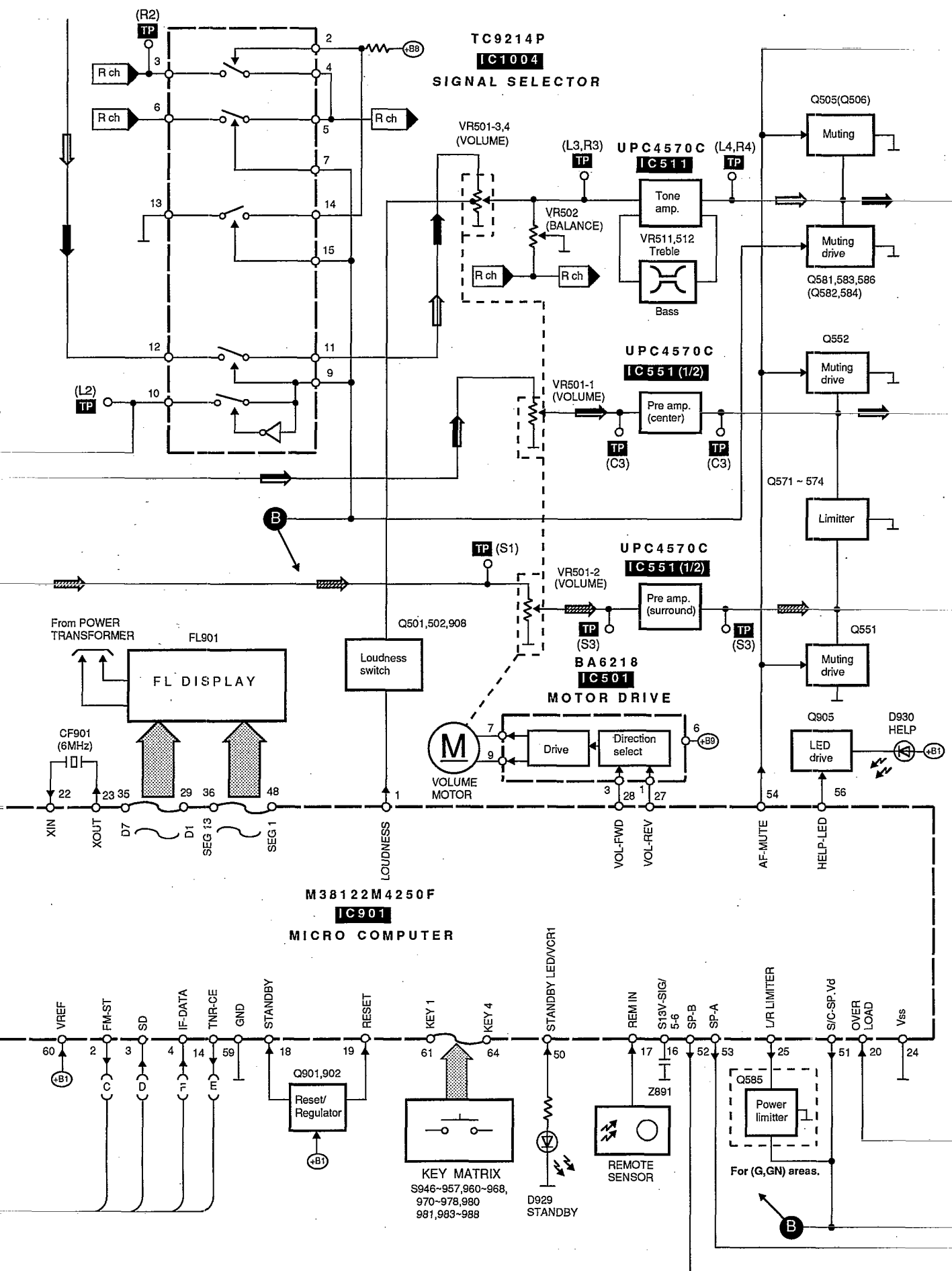
The HIC protection circuit functions if any cord at a speaker terminal is short-circuited or if the unit overheats because of improper operation. At the same time, 『OVERLOAD』 scrolls across the FL display. In this state, all keys remain inoperative; if any key is pressed, 『SWITCH OFF POWER』 scrolls across the FL display. If an overload occurs, immediately power off the unit and check the speaker connections, venting holes and cooling fans. After fixing any faults, power on the unit again and check for proper operation. If no defects are found, or if the unit remains overloaded after it is power on again, check the circuit for faults.

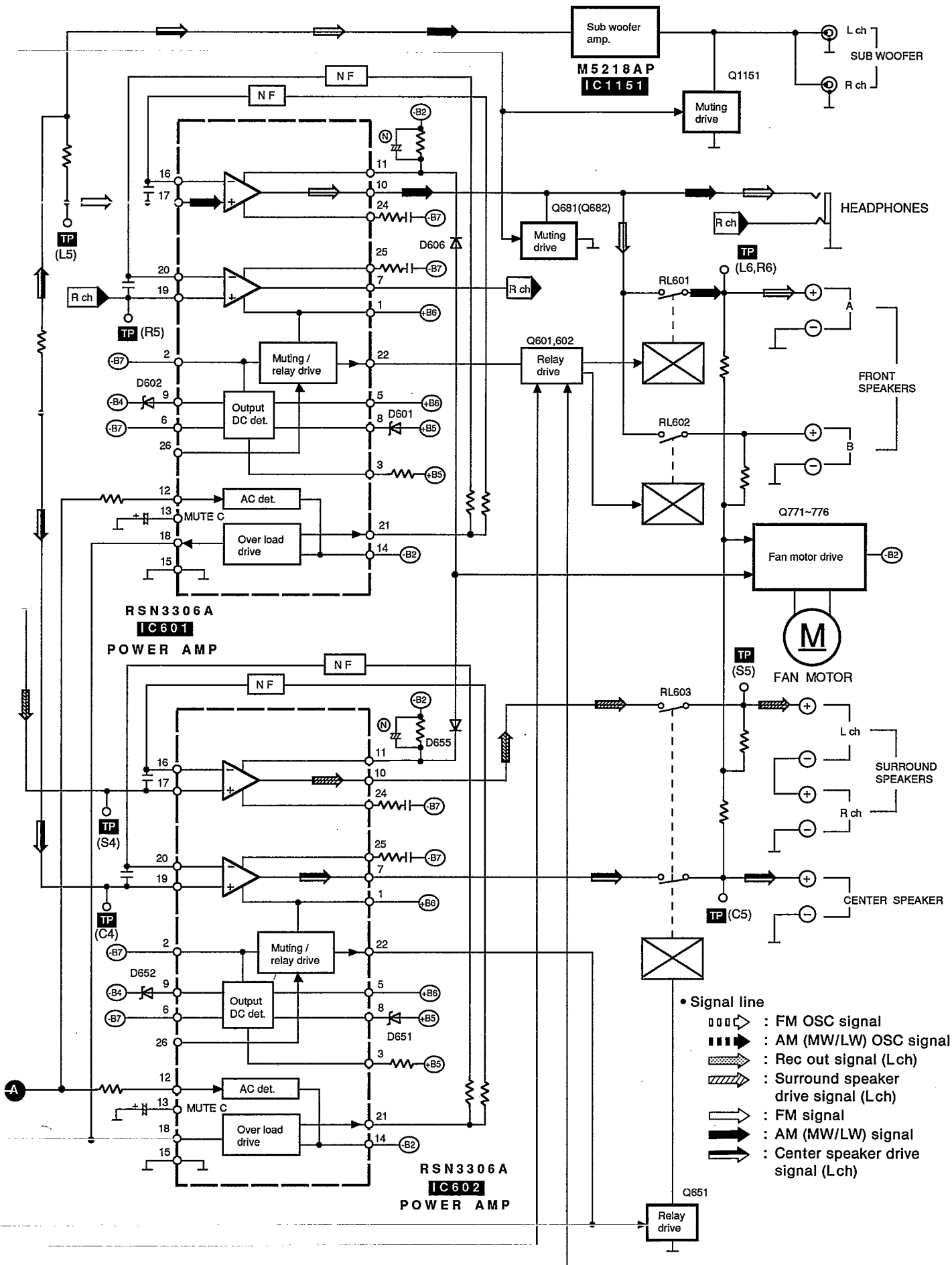
BLOCK DIAGRAM











- Signal line
- : FM OSC signal
 - ▣▣▣▣ : AM (MW/LW) OSC signal
 - ▨▨▨▨ : Rec out signal (Lch)
 - ▧▧▧▧ : Surround speaker drive signal (Lch)
 - ▩▩▩▩ : FM signal
 - : AM (MW/LW) signal
 - : Center speaker drive signal (Lch)