

# AV RECEIVER

# RX-V3000

# RX-V3000RDS

## SERVICE MANUAL

### IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

**WARNING:** Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

**IMPORTANT:** The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

**WARNING:** Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

**IMPORTANT:** Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

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This Service Manual uses recycled paper.



## ■ TO SERVICE PERSONNEL

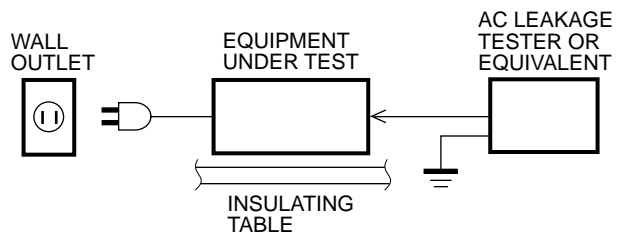
### 1. Critical Components Information

Components having special characteristics are marked  $\triangle$  and must be replaced with parts having specifications equal to those originally installed.

### 2. Leakage Current Measurement (For 120V Models Only)

When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohm shunted by 0.15 $\mu$ F.
- Leakage current must not exceed 0.5mA.



- Be sure to test for leakage with the AC plug in both polarities.



### “CAUTION”

“F311 : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 10A, 250V FUSE.”

### CAUTION

F311 : REPLACE WITH SAME TYPE 10A, 250V FUSE.

### ATTENTION

F311 : UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE DE 10A, 250V.

## WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/ electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

**DO NOT PLACE SOLDER, ELECTRICAL/ ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!**

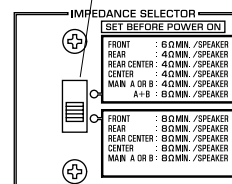
Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

### WARNING

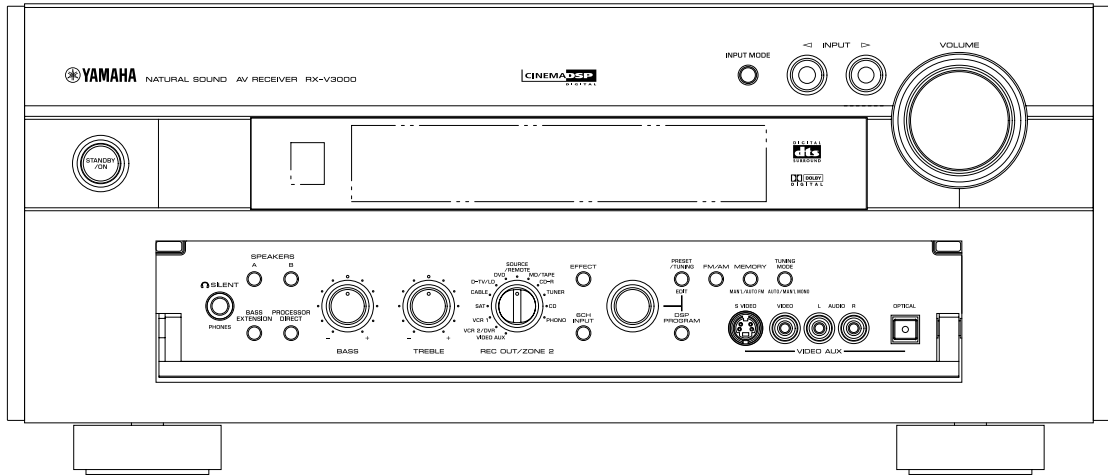
**Do not change the IMPEDANCE SELECTOR switch setting while the power to this unit is on, otherwise this unit may be damaged.**

### IMPEDANCE SELECTOR

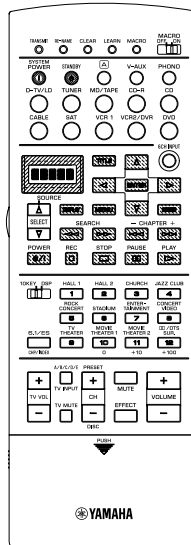
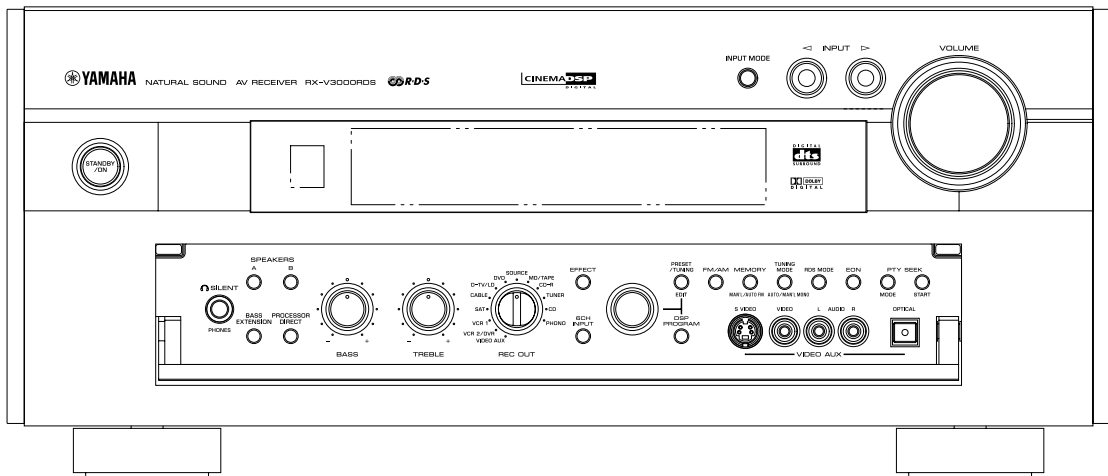


# FRONT PANELS

## ▼ RX-V3000

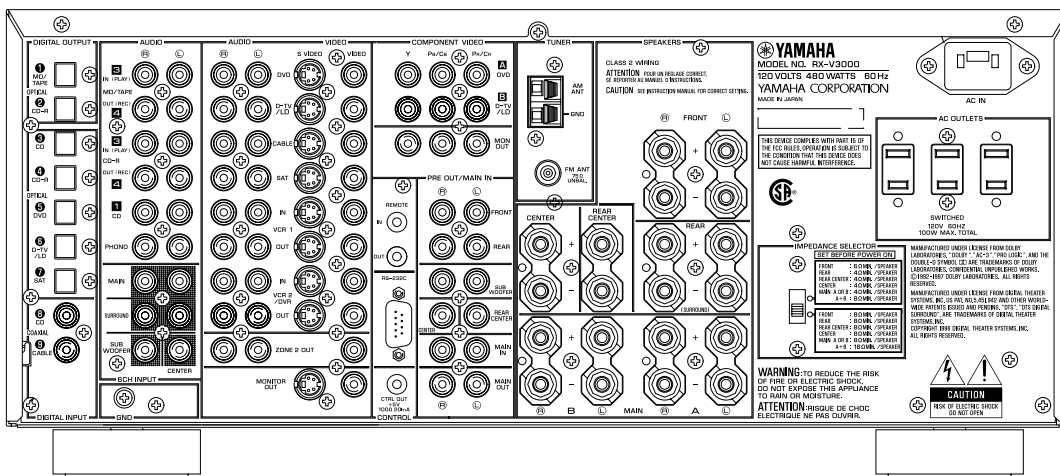


## ▼ RX-V3000RDS

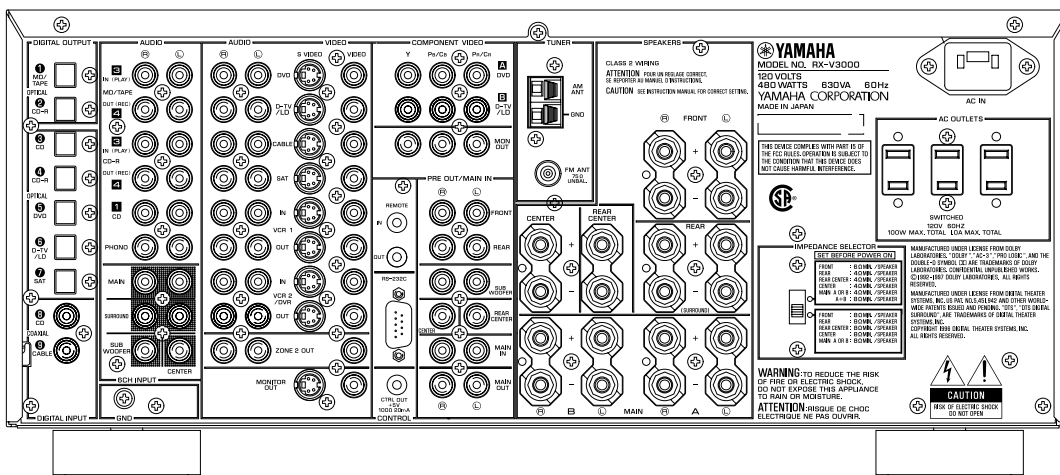


REAR PANELS

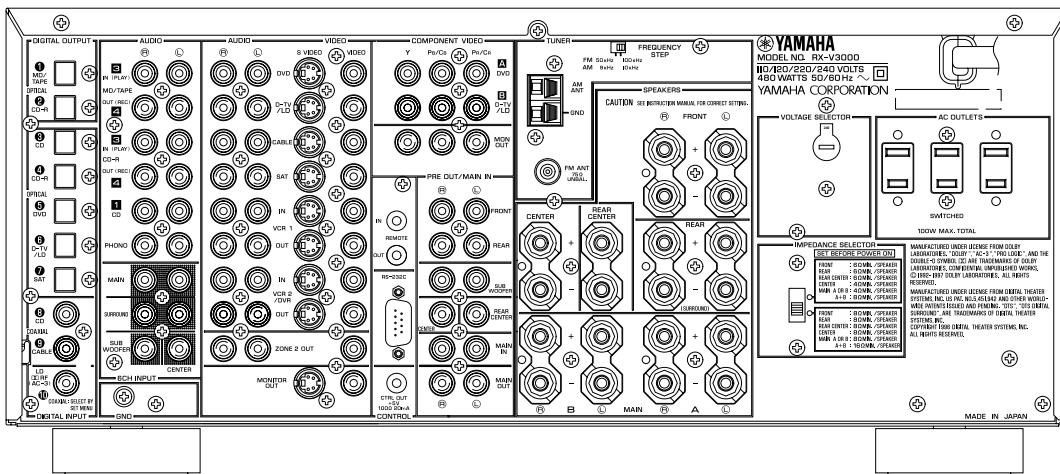
RX-V3000 U model



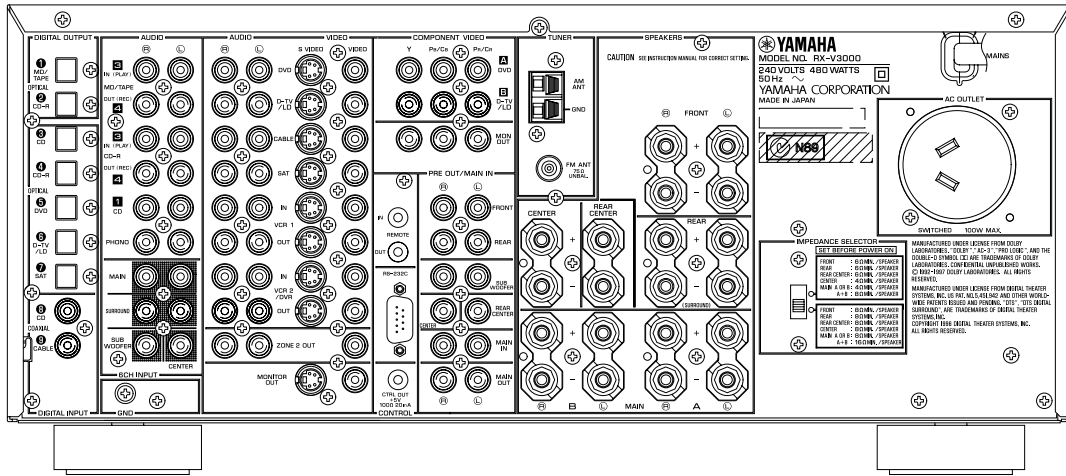
RX-V3000 C model



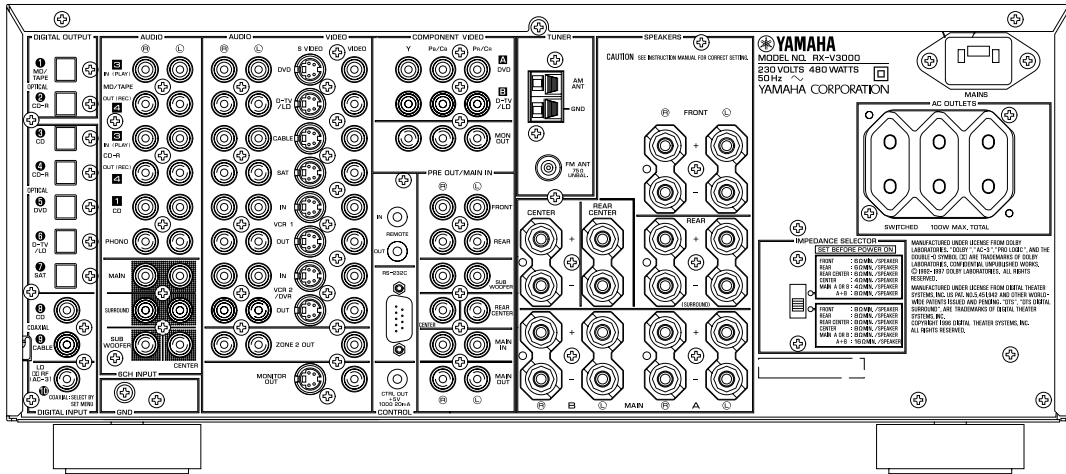
RX-V3000 R, T models



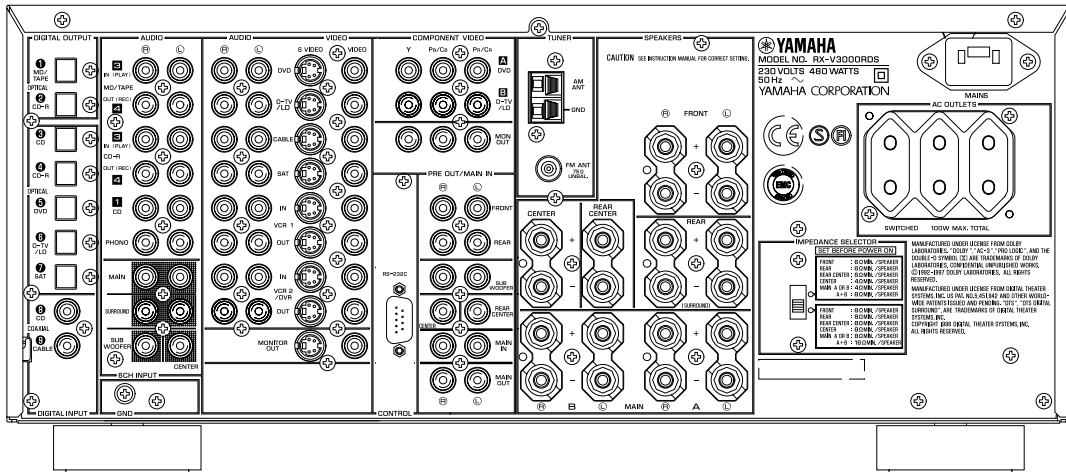
▼ RX-V3000 A model



▼ RX-V3000 L model



▼ RX-V3000RDS G model



## ■ SPECIFICATIONS

### ■ AUDIO SECTION

#### Minimum RMS Output Power per Channel

MAIN, 20Hz to 20kHz, 0.02% THD, 8Ω	100W+100W
CENTER, 20Hz to 20kHz, 0.02% THD, 8Ω	100W
REAR, 20Hz to 20kHz, 0.02% THD, 8Ω	100W+100W
REAR CENTER,	
20Hz to 20kHz, 0.02% THD, 8Ω	100W
FRONT, 1kHz, 0.05% THD, 8Ω	25W+25W

#### Maximum Power per Channel (R, T models only)

MAIN, 1kHz, EIAJ, 10% THD, 8Ω	140W+140W
CENTER, 1kHz, EIAJ, 10% THD, 8Ω	140W
REAR, 1kHz, EIAJ, 10% THD, 8Ω	140W+140W
REAR CENTER, 1kHz, EIAJ, 10% THD, 8Ω	140W
FRONT, 1kHz, EIAJ, 10% THD, 8Ω	35W+35W

#### Dynamic Power per Channel (U, C, R, T models only)

MAIN, 8/6/4/2Ω	140/170/220/320W
----------------	------------------

#### Dynamic Headroom (U, C, R, T models only)

8Ω	1.46dB
----	--------

#### DIN Standard Output Power per Channel (L, G models only)

MAIN, 1kHz, 0.7% THD, 4Ω	160W+160W
CENTER, 1kHz, 0.7% THD, 4Ω	160W
REAR, 1kHz, 0.7% THD, 4Ω	160W+160W
REAR CENTER, 1kHz, 0.7% THD, 4Ω	160W
FRONT, 1kHz, 0.7% THD, 4Ω	40W+40W

#### IEC Power (L, G models only)

MAIN, 1kHz, 0.015% THD, 8Ω	115W
----------------------------	------

#### Power Band Width

MAIN, 0.08% THD, 50W/8Ω	10Hz to 50kHz
-------------------------	---------------

#### Damping Factor

MAIN, 20Hz to 20kHz, 8Ω	200 or more
-------------------------	-------------

#### Input Sensitivity/Impedance

CD, etc (1kHz, 100W/8Ω)	150mV/47kΩ
PHONO MM	2.5mV/47kΩ
MAIN IN	1V/47kΩ

#### Maximum Input Signal Level

PHONO MM, 1kHz, 0.05% THD, (Effect on)	110mV
CD, etc, (Effect on)	2.3V

#### Output Level/Impedance

REC OUT	150mV/1kΩ
PRE OUT (MAIN, etc)	1V/1.2kΩ
SUB WOOFER (EFFECT OFF, MAIN SP : SMALL)	
MONO	4.0V/1.2kΩ
ZONE2 OUT (Except G)	1V/1.5kΩ

#### Maximum Voltage Output (20Hz to 20kHz, 1% THD)

PRE OUT (MAIN L/R)	1.5V
--------------------	------

#### Headphone Jack Rated Output/Impedance

CD, etc (1kHz, 40mV, 8Ω)	150mV/100Ω
--------------------------	------------

#### Frequency Response

CD, etc (10Hz to 100kHz, MAIN L/R)	+0/-3.0dB
MAIN IN (5Hz to 100kHz, MAIN L/R)	+0/-3.0dB

#### RIAA Equalization Deviation

PHONO MM (20Hz to 20kHz)	0±0.5dB
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#### Tone Control Characteristics

BASS : Boost/cut	±10dB (50Hz)
Turnover Frequency	350Hz
TREBLE : Boost/cut	±10dB (20kHz)
Turnover Frequency	3.5kHz

#### Bass Extension

	+6dB (60Hz)
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#### Filter Characteristics

MAIN, CENTER, REAR SP SMALL	
: H.P.F.	fc = 90Hz, 12dB/oct.
SUB WOOFER OUT : L.P.F.	fc = 90Hz, 18dB/oct.

#### Residual Noise (IHF-A-Network)

MAIN L/R, SP OUT	150μV
------------------	-------

#### Total Harmonic Distortion (20Hz to 20kHz)

PHONO MM to REC OUT (3V)	0.01%
CD, etc, to PRE OUT MAIN L/R (1V)	0.005%
CD, etc, to SP OUT L/R (50W/8Ω)	0.015%
MAIN IN to SP OUT L/R (50W/8Ω)	0.008%

#### Signal-to-Noise Ratio (IHF-A-Network)

PHONO MM, Input Shorted 5mV (Effect off)	
U, C, R, T models	86dB
A, L, G models	82dB
CD, etc, Input Shorted 150mV (Effect off)	96dB
CD, etc, Input Shorted 250mV (Effect off)	100dB

#### Channel Separation (Vol. -30dB, Effect off)

PHONO MM, Input Shorted, 1kHz/10kHz	60dB/55dB
CD, etc, Input 5.1kΩ Shorted, 1kHz/10kHz	60dB/45dB

#### Muting

### ■ VIDEO SECTION

#### Video Signal Type

U, C models	NTSC
A, L, G models	PAL
R, T models	NTSC/PAL

#### Composite Video Signal Level

	1Vp-p/75Ω
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#### S-Video Signal Level

Y	1Vp-p/75Ω
C	0.286Vp-p/75Ω

#### Component Signal Level

Y	1Vp-p/75Ω
Cb/Cr	0.7Vp-p/75Ω

#### Video Maximum Input Level

	1.5Vp-p
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#### Video Signal-to-Noise Ratio

	50dB
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#### Monitor Output Frequency Response

Composite Video Signal	5Hz - 10MHz, -3dB
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S-Video Signal	5Hz - 10MHz, -3dB
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Component Signal	DC - 30MHz, -3dB
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■ FM SECTION

**Tuning Range**

U, C models .....87.5 to 107.9MHz  
 A, L, G models .....87.50 to 108.00MHz  
 R, T models ..... 87.5 to 108.0/87.50 to 108.00MHz

**50dB Quieting Sensitivity (IHF, 75 Ω)**

Mono (1kHz, 100% Mod.) ..... 2.0μV (17.3dBf)  
 Stereo (1kHz, 100% Mod.) ..... 25μV (39.2dBf)

**Usable Sensitivity (IHF, 75 Ω)**

Mono ..... 1.0μV (11.2dBf)

**Selectivity**

400kHz ..... 70dB

**Signal-to-Noise Ratio (IHF)**

Mono/Stereo ..... 76/70dB

**Harmonic Distortion**

Mono/Stereo (1kHz) ..... 0.2/0.3%

**Stereo Separation**

1kHz ..... 45dB

**Frequency Response**

20Hz to 15kHz ..... +0.5/-2.0dB

**Antenna Input ..... 75 Ω unbalanced**

■ AM SECTION

**Tuning Range**

U, C models .....530 to 1,710kHz  
 A, L, G models .....531 to 1,611kHz  
 R, T models ..... 530 to 1,710/531 to 1,611kHz

**Usable Sensitivity ..... 300μV/m**

**Antenna ..... Loop antenna**

■ GENERAL

**Power Supply**

U, C models ..... AC 120V, 60Hz  
 A model ..... AC 240V, 50Hz  
 L, G models ..... AC 230V, 50Hz  
 R, T models ..... AC 110/120/220/240V, 50/60Hz

**Power Consumption**

U model ..... 480W  
 C model ..... 480W/630VA  
 A, L, G, R, T models ..... 480W

**Maximum Power Consumption (R, T models only) .. 770W**

**Standby Power Consumption**

U, C, A, L, G models ..... 1.2W  
 R, T models (AC220V, 50Hz) ..... 1.5W

**AC Outlets**

U, R, T, L, G models, Switched x 3 ... 100W max (Total)  
 C model, Switched x 3 ..... 100W max/1.0A max (Total)  
 A model, Switched x 1 ..... 100W max

**Dimensions (W x H x D) ..... 449 x 191 x 468mm  
 (17-11/16" x 7-1/2" x 18-7/16")**

**Weight ..... 22.0 kg (48 lbs 8oz)**


**Finish**

U, C, R, A, G, T models ..... Black color  
 U, C, R, L, T models ..... Gold color

**Accessories**

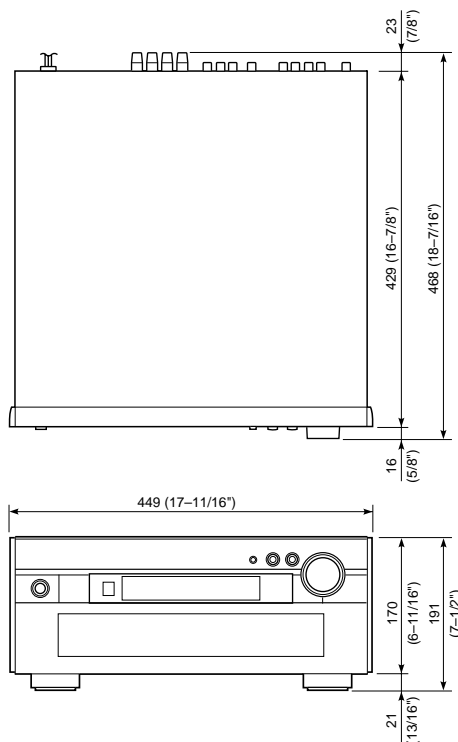
- AM loop antenna x 1
- Indoor FM antenna x 1
- Power cord x 1(U, C, G, L only)
- Sheet/side(L, R) x 1
- Remote Control Transmitter x 1
- Battery (size "AA", "R06") x 3

- U ..... USA model
- C ..... Canadian model
- A ..... Australian model
- L ..... Singapore model
- G ..... European model
- R ..... General model
- T ..... China model

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● DIMENSIONS



Units : mm (inch)

\* Specifications subject to change without notice.

● **SET MENU TABLE**

No.	SET MENU	PRESET VALUE	SETTING RANGES
1.	SPEAKER SET		
1A	CENTER SPEAKER	LARGE	LARGE/SMALL/NONE
1B	MAIN SPEAKER	LARGE	LARGE/SMALL
1C	REAR L/R SPEAKER	LARGE	LARGE/SMALL/NONE
1D	REAR CT SPEAKER	LARGE	LARGE/SMALL/NONE
1E	LFE/BASS OUT	BOTH	SUBWOOFER/MAIN/BOTH
1F	FRONT EFFECT SPEAKER	YES	YES/NONE
1G	MAIN LEVEL	NORMAL	NORMAL/−10dB
2.	LOW FREQ. TEST	TONE : OFF OUTPUT : MAIN L/R FREQUENCY : 88Hz	ON/OFF L/C/R/RS/RC/LS/SW/FRONT 35 — 250Hz
3.	L/R BALANCE	0	L — 0 — R (0.5 step) (L/R 10.0)
4.	HP TONE CTRL	BASS : 0dB TREBLE : 0dB	−6dB — +3dB (1dB step) −6dB — +3dB
5.	CENTER GRAPHIC EQ.	EACH ch : 0dB	100Hz — 10kHz, −6dB — +6dB
6.	INPUT RENAME	DVD(Currently selected input)	
7.	I/O ASSIGNING		
7A	COMPONENT VIDEO INPUT	[A] : DVD [B] : D-TV/LD	DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, V-AUX DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, V-AUX
7B	OPTICAL OUT	(1) : MD/TAPE (2) : CD-R	DVD, MD/TAPE, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, V-AUX, PHONO, CD, CD-R DVD, MD/TAPE, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, V-AUX, PHONO, CD, CD-R
7C	OPTICAL IN	(3) : CD (4) : CD-R (5) : DVD (6) : D-TV/LD (7) : SAT	CD, CD-R, MD/TAPE, DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, PHONO CD, CD-R, MD/TAPE, DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, PHONO CD, CD-R, MD/TAPE, DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, PHONO CD, CD-R, MD/TAPE, DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, PHONO
7D	COAXIAL IN	(8) : CD (9) : CABLE (10) : LD RF (R, T, L only)	CD, CD-R, MD/TAPE, DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, V-AUX, PHONO CD, CD-R, MD/TAPE, DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, V-AUX, PHONO LD RF, CD, CD-R, MD/TAPE, DVD, D-TV/LD, CABLE, SAT, VCR1, VCR2/DVR, V-AUX, PHONO
8.	INPUT MODE	DVD : AUTO	AUTO/LAST
9.	PARAMETER INITIALIZE	OFF	PROGRAM 1 — 12
10.	DOLBY DIGITAL SET		
10A	LFE LEVEL	SPEAKER : 0dB HEAD PHONE : 0dB	−20dB — 0dB −20dB — 0dB
10B	DYNAMIC RANGE	SPEAKER : MAX HEAD PHONE : MAX	MAX/STD/MIN MAX/STD/MIN
11.	DTS SET		
11A	LFE LEVEL	SPEAKER : 0dB HEAD PHONE : 0dB	−10dB — +10dB −10dB — +10dB
12.	6.1/ES AUTO	ON	ON/OFF
13.	SPEAKER DELAY TIME	CENTER : 0ms REAR CENTER : 3ms	0ms — 5ms (1ms step) 0ms — 30ms
14.	DISPLAY SET	BLUE BACK : AUTO OSD SHIFT : 0 DIMMER : 0	AUTO/OFF −5 — +5 −4 — 0
15.	MEMORY GUARD	OFF	ON/OFF
16.	ZONE2 SET (Except G)	ZONE2 OUT : FIXED	FIXED/VAR

● **SUPERIMPOSING**

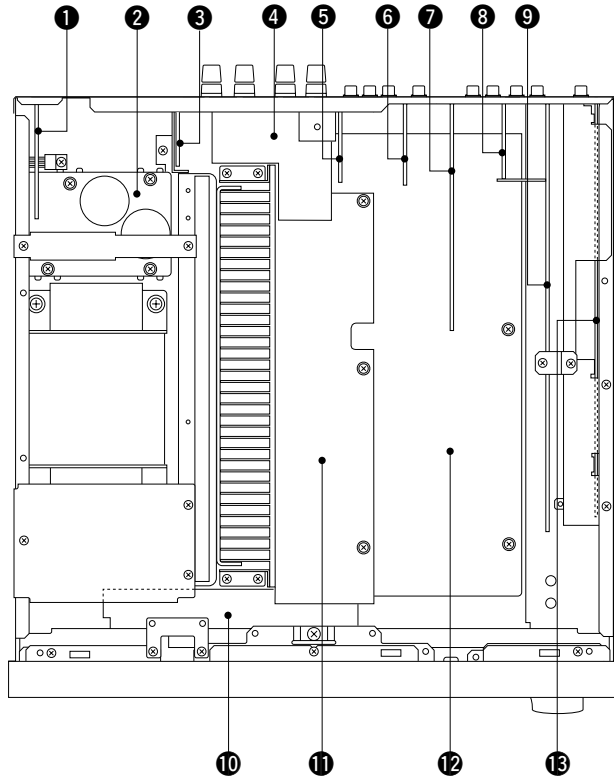
Input LD, etc.		Output	Superimposing
Terminal	Signal	Monitor connection	
S	O	O	O (On screen)
V	O	—	X
S	O	X	X
V	O	—	O (On screen)
S	O	O	O (On screen)
V	X	—	X
S	O	X	X
V	X	—	O (Blue back)
S	X	—	X
V	O	—	X (On screen)
S	X	—	O (Blue back)
V	X	—	O (Blue back)

S : S video signal  
V : Composite video signal  
O : YES  
X : NO  
— : NO CARE

Caution: Superimposing function is not usable for component signals.



## INTERNAL VIEW



- ① F AMP (2) P.C.B.
- ② MAIN (2) P.C.B.
- ③ MAIN (4) P.C.B.
- ④ F AMP (3) P.C.B.
- ⑤ VIDEO (3) P.C.B.
- ⑥ VIDEO (2) P.C.B.
- ⑦ VIDEO (1) P.C.B.
- ⑧ VIDEO (4) P.C.B.
- ⑨ FUNCTION P.C.B.
- ⑩ OPERATION (2) P.C.B.
- ⑪ F AMP (1) P.C.B.
- ⑫ MAIN (1) P.C.B.
- ⑬ DSP P.C.B.

## DISASSEMBLY PROCEDURES (Remove parts in the order as numbered.)

### 1. Removal of Top Cover

Remove 8 screws (①, ② and ③) and then remove the Top Cover in Fig. 1.

### 2. Removal of Bottom Cover

a. Remove 13 screws (④) and then remove the Bottom Cover in Fig. 1.

### 3. Removal of Front Panel

a. Remove a knob in Fig. 1.  
b. Remove 4 screws (⑤) and then remove the Front Panel in Fig. 1.

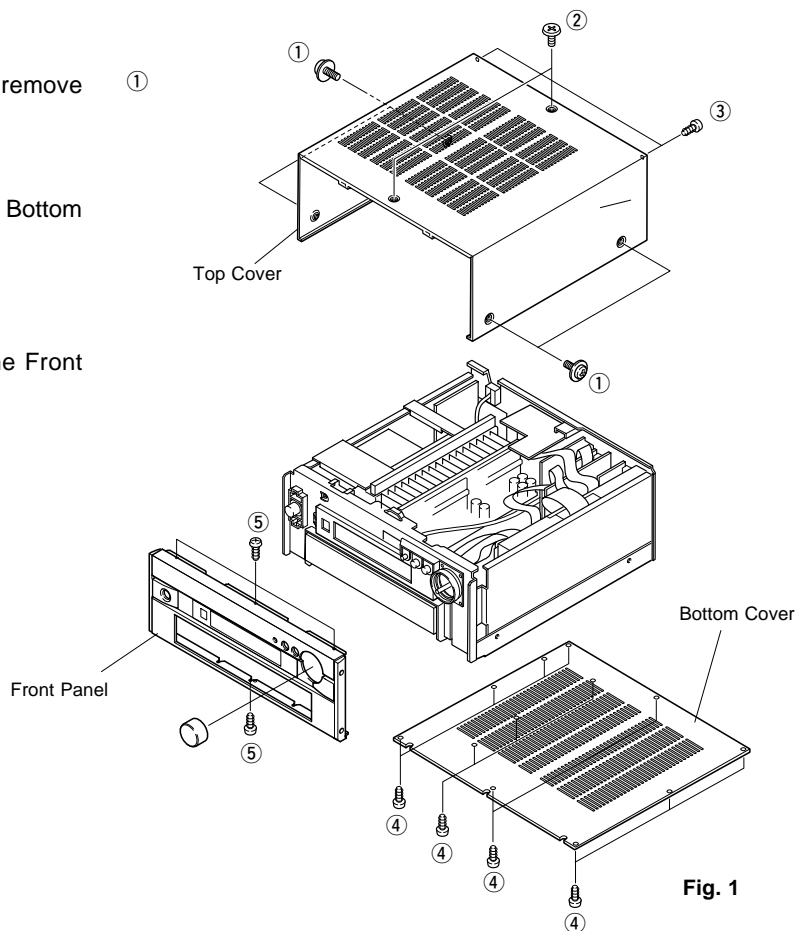


Fig. 1

## ■ SELF DIAGNOSIS FUNCTION

This product has a built-in self diagnosis function (DIAG) to facilitate inspection, measurement and determination of a faulty item, if any. There are 13 DIAG menu items each of which has sub-menu items.

Listed in the table below are menu items and sub-menu items.

(Start-up and menu operation of DIAG is executed by using the main unit and its remote control unit.)

No.	DIAG menu	Sub-menu	Remote control code (key)
1	DSP THROUGH	1. ANALOG BYPASS	7A---90 (PRG 9)
		2. DSP 0dB	7A---91 (PRG 10)
		3. FULL BIT	7A---92 (PRG 11)
2	HP ROUTE	1. 0dB	7A---93 (PRG 12)
		2. FULL BIT	7A---10 (TUNER PRESET +)
3	RAM THROUGH	1. 0dB	7A---11 (TUNER PRESET -)
4	PRO LOGIC	1. YSS928	7A---0C (CD FF)
5	SPEAKERS SET	1. MAIN:SMALL 0dB	7A--88 (PRG 1)
		2. MAIN:LARGE -10	7A--89 (PRG 2)
		3. CENTER:NONE	7A--8A (PRG 3)
		4. LFE/BASS:MAIN	7A--8B (PRG 4)
		5. FRONT MIX:5ch	7A--8C (PRG 5)
		6. REAR CENTER:MUT	7A--8D (PRG 6)
		7. REAR L/R:MUTE	7A--8E (PRG 7)
6	DISPLAY CHECK	1. EFFECT OFF (initial screen)	7A--8F (PRG 8)
		2. DISPLAY OFF	-----
		3. DISPLAY ALL	-----
		4. DISPLAY DIMMER (50%)	-----
		5. CHECKED PATTERN	-----
7	MANUAL TEST	1. ALL	7A--00 (TAPE PLAY)
		2. MAIN L	7A--01 (TAPE RW)
		3. CENTER	7A--02 (TAPE FW)
		4. MAIN R	7A--03 (TAPE STOP)
		5. REAR R	7A--04 (TAPE PAUSE)
		6. REAR C	7A--05 (TAPE MUTE)
		7. REAR L	7A--06 (TAPE A/B)
		8. FRONT L	7A--07 (TAPE DIR A)
		9. FRONT R	7A--08 (CD PLAY)
		10. LFE	7A--09 (CD STOP)
8	RS-232C	1. TX DATA	-----
		2. HARD FLOW	-----
9	PRESET	1. INHIBIT (memory initialization inhibited)	-----
		2. RESERVED (memory initialized)	7A--57 (SLEEP)
10	FAN/AD	1. FAN HISTORY	-----
		2. KY0, KY1(PANEL KEY), RECOU	-----
		3. THM, PRD, PRV	7A--0B (CD SKIP -)
11	IF STATUS	1. IFST	-----
		2. CHS1	-----
		3. CHS2	-----
		4. CHS3	-----
		5. CHS4	-----
		6. CHS5	-----
		7. BSI1	-----
		8. BSI2	-----
		9. BSI3	-----
		10. BSI4	-----
		11. BDS1	-----
		12. BDS2	-----
		13. BDS3	-----
		14. BDS4	-----
		15. YSS1	-----

No.	DIAG menu	Sub-menu	Remote control code (key)
11	IF STATUS	16. YSS2	-----
		17. YSS3	-----
12	DSP RAM CHECK	DSP RAM check	7A---0A (CD SKIP +)
13	SUM/VER/PORT	1. Version	7A---0D (CD REW)
		2. Checksum (ALL/PROG)	-----
		3. Checksum (232C/MAKER)	-----
		4. PORT (check of port settings for judging microprocessor function)	-----

### ● Starting DIAG

Press the "POWER" (STANDBY/ON) key of the main unit while pressing the "EFFECT" key and the "6CH INPUT" key located in the sealing panel of the main unit simultaneously, and DIAG will be activated.

### ● Starting DIAG in the protection cancel mode

If the protection function works and causes hindrance to trouble diagnosis, cancel the protection function as described below, and it will be possible to enter the DIAG mode. (The protection function other than the excess current detect function will be cancelled.)

Press the "POWER" (STANDBY/ON) key while pressing the "EFFECT" key and the "6CH INPUT" key simultaneously. At this time, keep pressing the "EFFECT" key and the "6CH INPUT" for 3 seconds or longer.

In this mode, " ZONE 2 " in the FL display of the main unit flashes.

#### CAUTION!

Using this product with the protection function cancelled may cause damage to itself. Use special care for this point when using this mode.

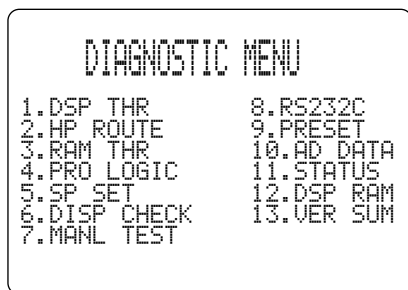
### ● Canceling DIAG

Turn off the power by pressing the "POWER" (STANDBY/ON) key of the main unit or the "POWER" key of the remote control unit.

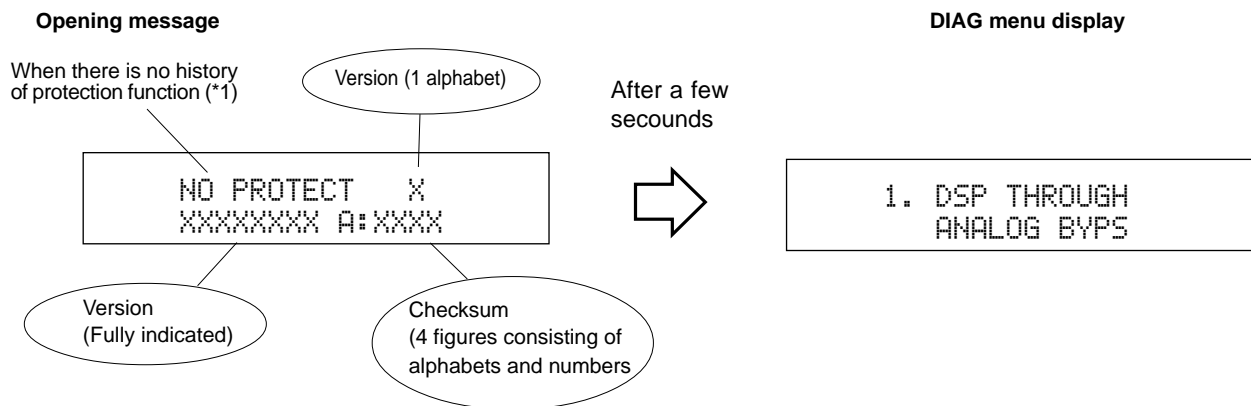
CAUTION: When canceling this function, check that DIAG menu No.9 PRESET (memory initialization inhibited/reserved) has been set. (To keep the user memory, be sure to select "INHIBIT" (initialization inhibited) from the No.9 PRESET menu before canceling the DIAG function.)

● Display at the start of DIAG

The diagnostic menu appears on the monitor screen. (It remains on display until it is canceled.)



On the FL display of the main unit, an opening message (including the version, checksum and the history of protection function) appears for a few seconds followed by the diagnostic menu display of 1 DSP THROUGH: ANALOG BYPS.



Checksum (4 figures consisting of alphabets and numbers)

The checksum is obtained by adding 4M bits per 16bits of the entire program code and expressing the result as a 4-figure hexadecimal data. (0xffff is added for the area where no code has been entered and for the area other than ROM code.)

(\*1) If the history of the protection function has been recorded, the type of the protection function and the voltage value recorded last are displayed.

**In the case where the protection function works after DIAG has been started and the power is turned off ;**  
When the protection function (\*2) works, the history of the protection function appears on display and the power turns off. Repair the faulty parts according to the displayed history.

(\*2) When an excess current or any other faulty condition is found with the power source, DC, etc., the protection function forces the power to turn off.

```
I PROTECT X
XXXXXXXXX A:XXXX
```

#### I PROTECTION display

(When the power is turned on without an abnormality corrected, the protection function works the moment the power relay is turned on to shut off the power supply.)

**Cause:** There is an abnormal current flow to the power amplifier.  
**Supplementary information:** As the current of the power transistor of each channel is detected, the abnormal channel can be identified by checking the current detect transistor.

**Reference:** If I PROTECTION function has worked after SP relay ON, a warning message "CHECK SP WIRES" appears the next time the power is turned on. This indicates that some trouble exists after the SP terminal, such as a short-circuit of the speaker cable.

```
PS PRT :000 X
XXXXXXXXX A:XXXX
```

#### PS PRT display

(When the power is turned on without an abnormality corrected, the protection function works about 1 second later to shut off the power supply. Display may not be provided, if there is an abnormality with the power supply for the display.)

**Cause:** There is an abnormality in the power supply section (voltage).  
**Supplementary information:** As the power from following sources is detected, it is possible to determine where an abnormality exists.

Transformer secondary winding  
VI X 2(CB358), OR x 2(CB359)

Stabilizing power source  
±12, ±5V, +5D1, +5D2, VP

```
DC PRT :000 X
XXXXXXXXX A:XXXX
```

#### DC PRT display

(When the power is turned on without an abnormality corrected, the protection function works about 3 seconds later to shut off the power supply.)

**Cause:** A DC output from the power amplifier of each channel is detected.

```
TMP PRT:000 X
XXXXXXXXX A:XXXX
```

#### TMP PRT display

(When the power is turned on without an abnormality corrected, the protection function works about 1 second later to shut off the power supply.)

**Cause:** The temperature of the heat sinks in the power amplifier is detected. When the temperature rises and an abnormality is detected, the power turns off.

Besides the above possible causes, the cause may exist in the disconnected connector or around CPU. PS PRT, DC PRT and TMP PRT displays include the abnormal A/D value in % (voltage value obtained by considering 5V as 100%). Concerning this value, refer to DIAG menu No.10 FAN/AD described on page 24.

#### ● History of protection function

When the protection function has worked, its history is stored in memory with a backup. Even when no abnormality is noted while the unit is being serviced, an abnormality which has occurred previously can be defined as long as the backup data has been stored.

The protection history is cleared when DIAG is canceled by selecting "RESERVED" (memory initialization) from the setting items of the DIAG menu No.9 PRESET or when the backup data is erased.

● **Operation procedure of DIAG menu and SUB-MENU**

There are No.1 to No.13 MENU items and some SUB-MENU items as well.

**DIAG menu selection**

Main unit: DSP PROGRAM selector (forward/reverse)

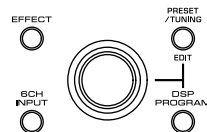
Remote control unit: Cursor Δ(forward)/▽(reverse) key

**SUB-MENU selection**

Main unit: EFFECT key (forward)

Remote control unit: Cursor +(forward)/-(reverse) key

Only the remote control keys indicated in the Menu List can be used to select a sub menu directly.



● **Functions during DIAG being set**

In addition to the DIAG menu, functions as listed below are available.

- Input selection (including ZONE2), 6CH input
- REC OUT switching
- ZONE2 input, volume
- Front/Center/Rear/Sub-woofer level adjustment
- Muting
- Speaker A/B
- Power on/off operation
- Master volume

It is possible to set to the following volume values using the remote control unit

Volume value (dB)	Remote control code (key)
0	7A---E0 (TUNER CHP/INDEX)
-21	7A---E1 (TUNER 9)
-40	7A---E2 (TUNER 10)
MUTE	7A---E3 (TUNER 11)

only during DIAG being set.

\* Functions related to the tuner and the set menu are not available.

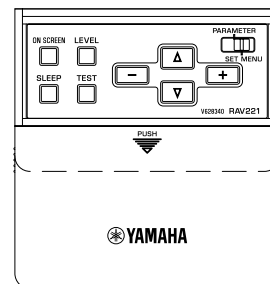
\* It is possible to confirm Menu No.11 "IF STATUS" while keeping the signal process (operation status) of each DIAG menu by using the INPUT MODE key of the main unit.

● **Initial settings used to start DIAG function**

Following initial settings are used when starting the DIAG function.

When the DIAG function is canceled, the settings before starting DIAG will be restored.

- Input, ZONE2 input: DVD (6CH INPUT OFF)
- Master volume: -40dB
- ZONE2 volume: -6dB
- Front/Center/Rear/Sub-woofer level: 0dB
- Audio mute: OFF
- Speaker A/B: ON
- Speakers Settings
  - MAIN: LARGE
  - CENTER: LARGE
  - REAR: LARGE
  - REAR CENTER: LARGE
  - BASS OUT: BOTH
  - FRONT EFFECT: YES
  - MAIN LEVEL: Normal (0dB)
- DIAG menu: DSP THROUGH (ANALOG BYPASS)



# Details of DIAG menu

## 1. DSP THROUGH

There are 3 sub menu items (ANALOG BYPS, DSP 0dB, FULL BIT).

1. DSP THROUGH  
ANALOG BYPS

### ANALOG BYPS [Remote control code: 7A—90(PRG 9)]

- The input mode is fixed to use the analog (A/D) system.
- The L/R signal is output through the analog bypass without using the DSP section.
- C/RC, FL/FR, RL/RR and SWFR signals are output through DSP (see the signal path in the figure below) without using the external DRAM. (Head margin included)

#### Head margin

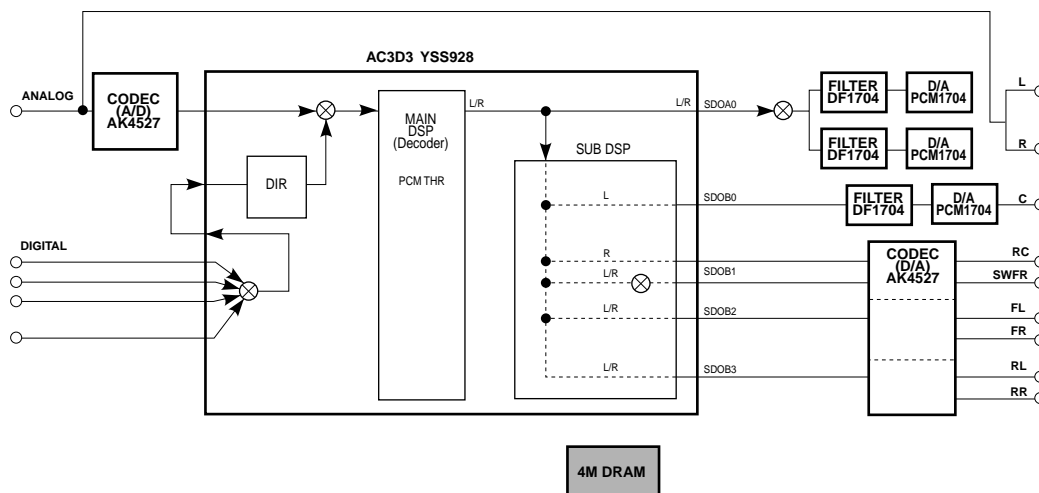
- CENTER: -6dBFS
- REAR CENTER: -3dBFS
- FL/FR: -6dBFS
- RL/RR: -12dBFS
- SWFR: Add L/R signal at -20dBFS.

#### Reference (PRE OUT)

INPUT : DVD ANALOG

SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
Both ch, -20 dBV, volume 0dB	-3.5 dBV	-3.5 dBV	-3.5 dBV	+8.5 dBV	-3.5 dBV	-3.5 dBV



Note: (SDOxx) represents a terminal name of AC3D3.

The shaded square (  ) means that the element included in it does not operate.

1. DSP THROUGH  
DSP 0dB

**DSP 0dB** [Remote control code: 7A—91 (PRG 10)]

- The input signal is automatically identified and switched in the priority order of dts → DOLBY DIGITAL → PCM AUDIO → Analog (A/D) according to the signal detection.
- L/R, C/RC, FL/FR, RL/RR and SWFR signals are output through DSP (see the signal path in the figure below) without using the external DRAM. (Head margin included)

Head margin

MAIN L/R:	0dBFS
CENTER:	-6dBFS
REAR CENTER:	-3dBFS
FL/FR:	-6dBFS
RL/RR:	-12dBFS
SWFR:	Add L/R signal at -20dBFS.

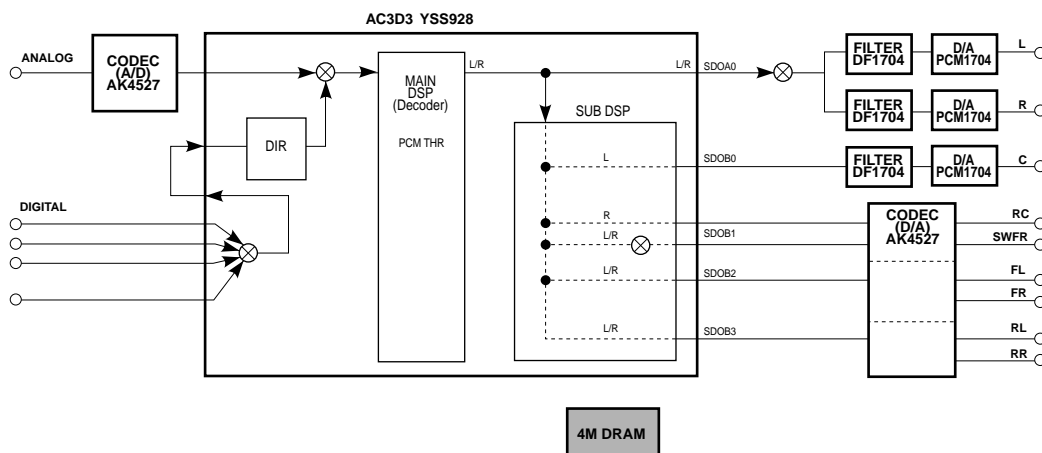
**Reference (PRE OUT)**

INPUT : DVD ANALOG

SWFR: 50Hz, Others: 1kHz

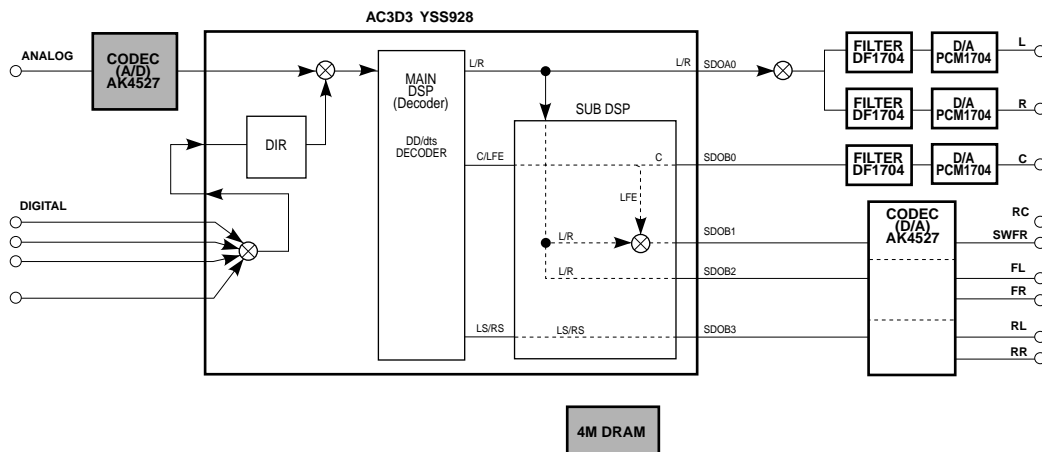
Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
Both ch, -20 dBV, volume 0dB	-3.5 dBV	-3.5 dBV	-3.5 dBV	+8.5 dBV	-3.5 dBV	-3.5 dBV

(In the case of 2-ch source)



(In the case of multi-ch source)

- AC3D3 outputs signals using DOLBY DIGITAL/dts decode operation.



Note: (SDOxx) represents a terminal name of AC3D3.

The shaded square (  ) means that the element included in it does not operate.



1. DSP THROUGH  
FULL BIT

**FULL BIT** [Remote control code: 7A—92 (PRG11)]

- The head margin is unused and the digital data is output in full bit.
- The same applies as “DSP 0dB” except that the digital data is output in full bit at D/A but SWFR is not output in full bit.

**Reference (PRE OUT)**

INPUT : DVD ANALOG

SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
Both ch, -20 dBV, volume -10dB	-13.5 dBV	-7.5 dBV	-10.5 dBV	-1.5 dBV	-1.5 dBV	-7.5 dBV

**2. HP ROUTE (Headphone route)**

There are two sub-menu items (0dB, FULL BIT).

2. HP ROUTE  
0dB

**0dB** [Remote control code: 7A—93 (PRG12)]

- The input signal is automatically identified and switched in the priority order of dts → DOLBY DIGITAL → PCM AUDIO → Analog (A/D) according to the signal detection.
  - L/R, C/RC, FL/FR, RL/RR and SWFR signals are output through DSP (see the signal path in the figure below) without using the external DRAM.
- (The SDOB output is inputted to DAC of MAIN L/R. Other than that, everything is the same as DSP THROUGH.)

Head margin

- MAIN L/R: -18dBFS
- CENTER: -6dBFS
- REAR CENTER: -3dBFS
- FL/FR: -6dBFS
- RL/RR: -18dBFS
- SWFR: Add L/R signal at -20dBFS.

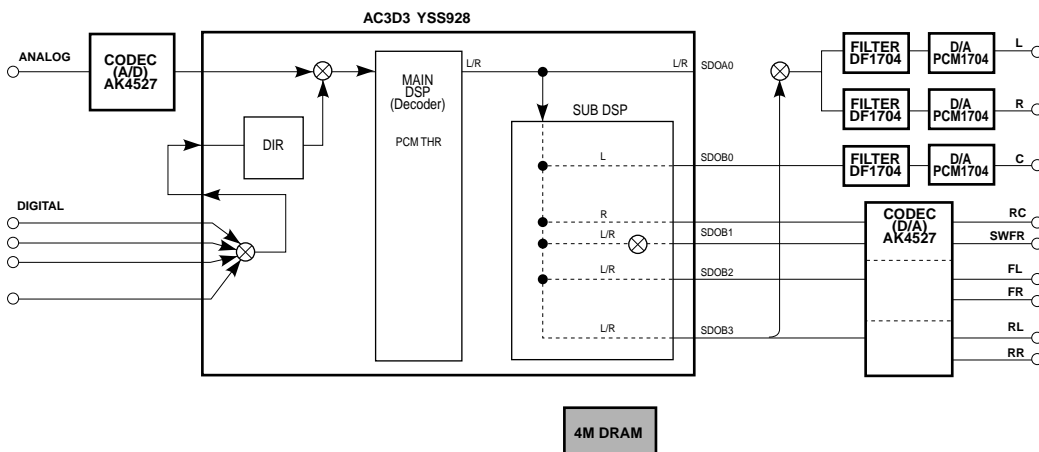
**Reference (PRE OUT)**

INPUT : DVD ANALOG

SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
Both ch, -20 dBV, volume 0dB	-3.5 dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV

(In the case of 2-ch source)

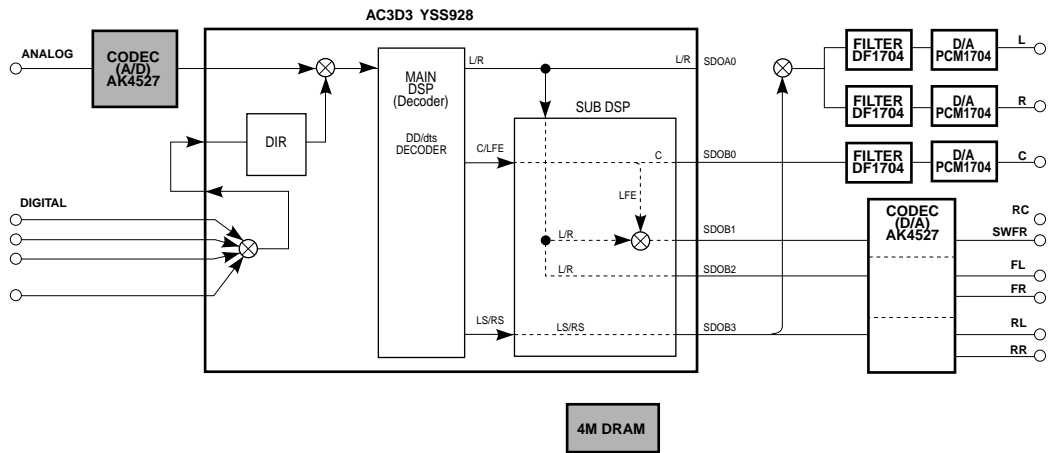


Note: (SDOxx) represents a terminal name of AC3D3.

The shaded square ( ) means that the element included in it does not operate.

**(In the case of multi-ch source)**

- AC3D3 outputs signals using DOLBY DIGITAL/dts decode operation.



Note: (SDOxx) represents a terminal name of AC3D3.  
The shaded square (  ) means that the element included in it does not operate.

**2. HP ROUTE  
FULL BIT**

**FULL BIT** [Remote control code: 7A—10 (TUNER PRESET +)]

- The head margin is unused and the digital data is output in full bit.
- The same applies as "0dB" except that the digital data is output in full bit at D/A but SWFR is not output in full bit.

**Reference (PRE OUT)**

INPUT : DVD ANALOG

SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
Both ch, -20 dBV, volume -20dB	-5.5 dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV

### 3. RAM THROUGH

The input data is automatically identified and switched in the priority order of dts → DOLBY DIGITAL → PCM AUDIO → Analog (A/D) according to the signal detection.

The main L/R uses the analog through method when analog signals are input and the DSP through method when digital signals are input.

C/RC, RL/RR and FL/FR signals are output through the external DRAM.

3. RAM THROUGH  
0dB

0dB [Remote control code: 7A—11 (TUNER PRESET -)]

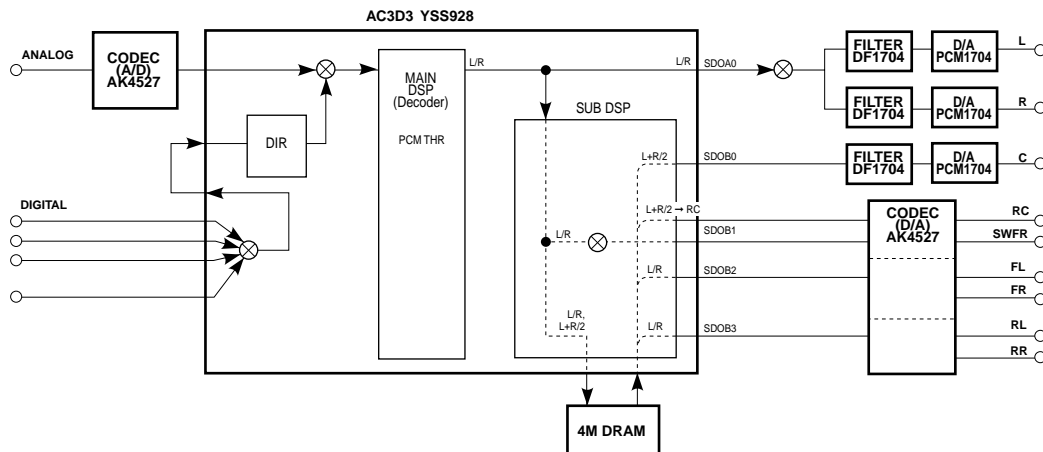
#### Reference (PRE OUT)

INPUT : DVD ANALOG

SWFR: 50Hz, Others: 1kHz

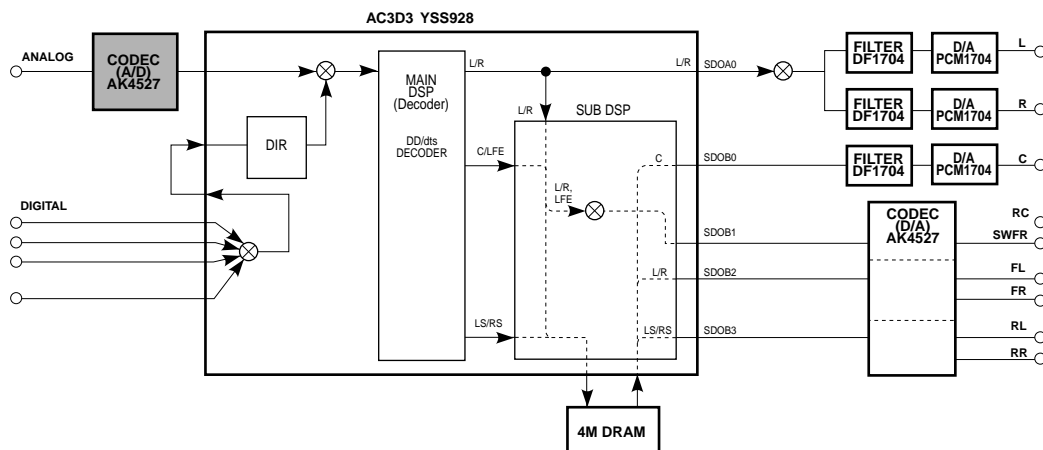
Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
Both ch, -20 dBV, volume 0dB	-3.5 dBV	-3.5 dBV	-3.5 dBV	+8.5 dBV	-3.5 dBV	-3.5 dBV

(In the case of 2-ch source)



(In the case of multi-ch source)

- AC3D3 outputs signals using DOLBY DIGITAL/dts decode operation.



Note: (SDOxx) represents a terminal name of AC3D3.

The shaded square ( ) means that the element included in it does not operate.

4. PRO LOGIC

The input signal is automatically identified and switched in the priority order of dts → DOLBY DIGITAL → PCM AUDIO → Analog (A/D) according to the signal detection.  
The operation conforms to the ordinary DOLBY Normal sound field.

4. PRO LOGIC  
YSS928

YSS928 [Remote control code: 7A—0C (CD FF)]

Reference (PRE OUT)

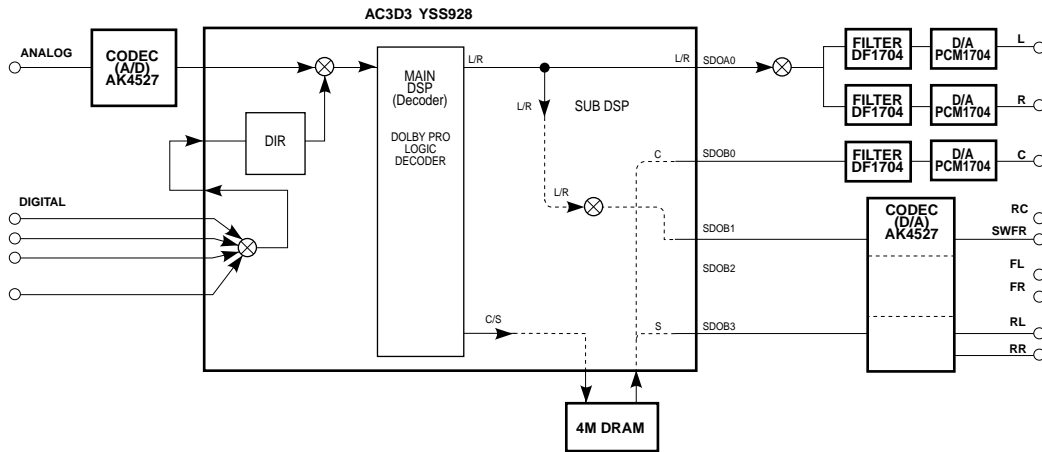
INPUT : DVD ANALOG

SWFR: 50Hz, Others: 1kHz

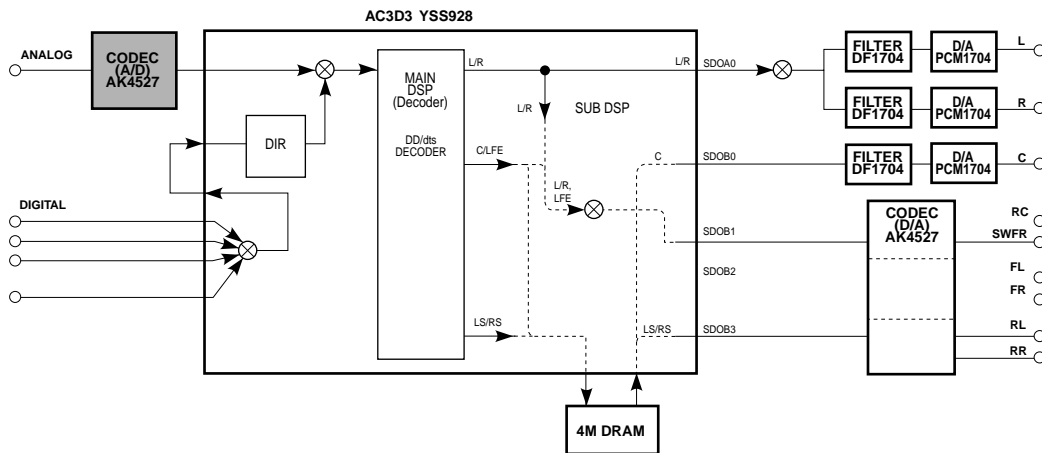
Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
Each ch, -20 dBV, volume 0dB	-3.5 dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV
Both ch, -20 dBV, volume 0dB	-∞ dBV	-0.5 dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV
Both ch, -20 dBV(reverse phase), volume 0dB	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV	-3.5 dBV	-∞ dBV

(2-ch source)

- AC3D3 outputs signals using PRO LOGIC decoding operation with the auto input balance off.



(DOLBY DIGITAL/dts Normal)



Note: (SDOxx) represents a terminal name of AC3D3.

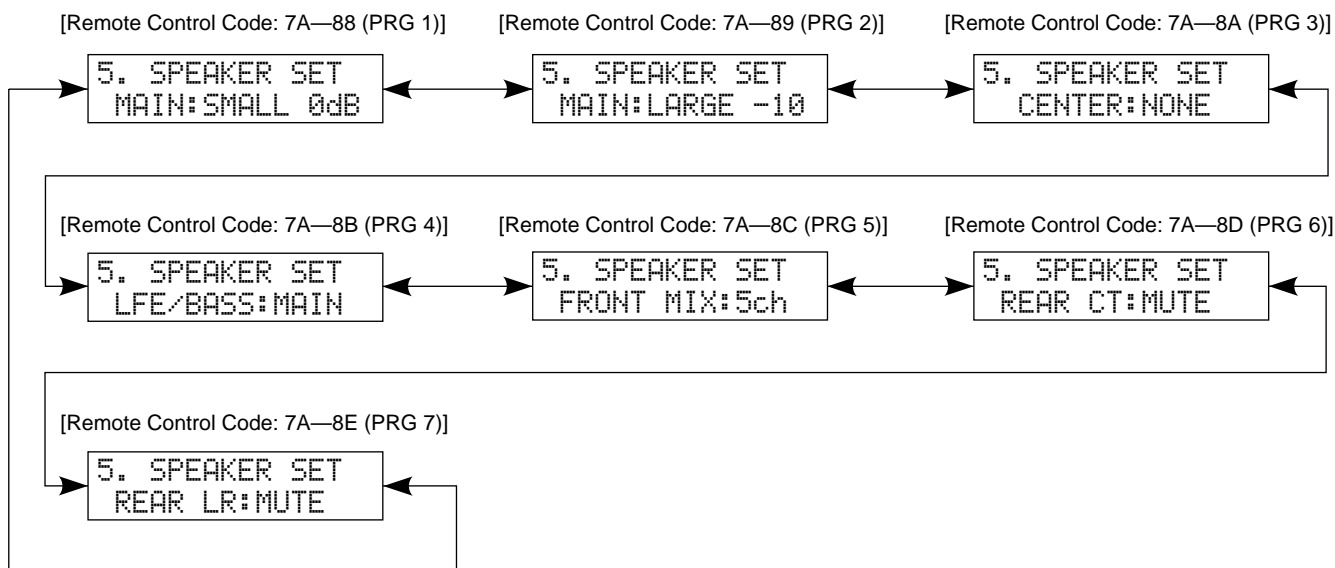
The shaded square ( ) means that the element included in it does not operate.

### 5. SPEAKERS SET

The input signal is automatically identified and switched in the priority order of dts → DOLBY DIGITAL → PCM AUDIO → Analog (A/D) according to the signal detection.

There are seven sub-menu items.

The signals output from the DSP are the same as 1. DSP THROUGH: DSP 0dB.



The analog switch settings for each sub-menu are as shown in the table below.

Sub-menu	CENTER	REAR	MAIN SP	MAIN LVL	LFE/BASS	FRONT MIX
1 MAIN : SMALL 0dB	LARGE	LARGE	SMALL	0dB	SWFR	7ch
2 MAIN : LARGE -10	LARGE	LARGE	LARGE	-10dB	BOTH	7ch
3 CENTER : NONE	NONE	LARGE	LARGE	0dB	BOTH	7ch
4 LFE/BASS : MAIN	SMALL	SMALL	LARGE	0dB	MAIN	7ch
5 FRONT MIX : 5ch	LARGE	LARGE	LARGE	0dB	BOTH	5ch
6 REAR CENTER : MUTE	LARGE	LARGE	LARGE	0dB	BOTH	7ch
7 REAR L/R: MUTE	LARGE	LARGE	LARGE	0dB	BOTH	7ch

LARGE: Signals are output in all bandwidths.

SMALL: Signals exceeding 90Hz are cut in LPF.

NONE: The center contents are distributed to the MAIN L/R channels after -3dB.

#### Reference (PRE OUT)

INPUT : DVD ANALOG (Both ch)

VOLUME : 0 dB

Sub-menu	Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
1 MAIN : SMALL 0dB	1kHz/90Hz, -20 dBV	-3.5/-6.5dBV					
2 MAIN : LARGE -10	1kHz, -20 dBV	-3.5dBV	-3.5dBV	-3.5dBV	+8.5dB	-3.5dBV	-3.5dBV
3 CENTER : NONE	1kHz, -20 dBV	-6.5dBV	-∞ dBV	-3.5dBV	+8.5dB	-3.5dBV	-3.5dBV
4 LFE/BASS : MAIN	50Hz, -20 dBV	-2.0dBV	-6.5dBV(90Hz)	-3.5dBV	-∞ dBV	-6.5dBV(90Hz)	-3.5dBV
5 FRONT MIX : 5ch	1kHz, -20 dBV	-3.5dBV	-3.5dBV	-3.5dBV	+8.5dB	-3.5dBV	-3.5dBV
6 REAR CENTER : MUTE	1kHz, -20 dBV	-3.5dBV	-3.5dBV	-∞ dBV	+8.5dB	-3.5dBV	-3.5dBV
7 REAR L/R: MUTE	1kHz, -20 dBV	-3.5dBV	-3.5dBV	-3.5dBV	+8.5dB	-∞ dBV	-3.5dBV

## 6. DISPLAY CHK

This program is used to check lighting of the FL display which changes as shown below according to operation of the sub-menu.

The signals are processed using EFFECT OFF. (The L/R signals are output using ANALOG MAIN BYPASS setting.)

The video signal internal/external synchronization switching is controlled by the microprocessor. When the initial message is displayed and all the FL segments light up, it is switched to internal synchronization but other than that it is forced to the external synchronization setting.

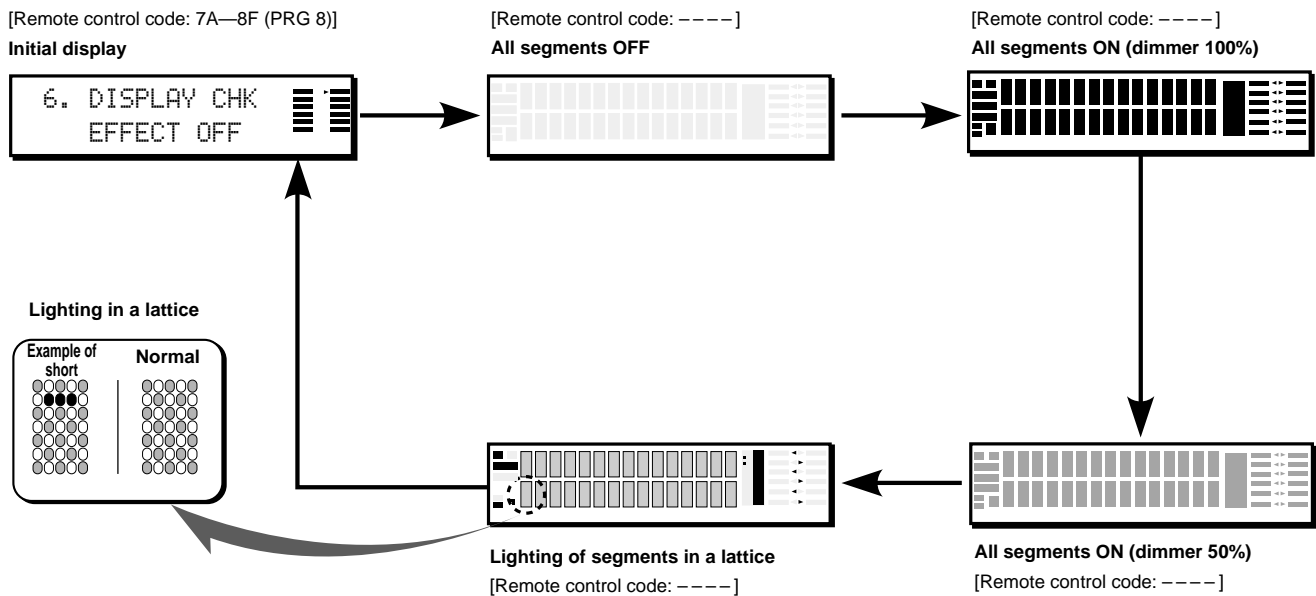
Also, except for the initial display, 128 pictographs for checking the OSD driver are used for the video signal output display (monitor screen).

### Reference (PRE OUT)

INPUT : DVD ANALOG

SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	REAR C	SWFR	REAR L/R	FRONT L/R
Both ch, -20 dBV, volume 0dB	-3.5 dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV	-∞ dBV



Segment conditions of the FL driver (IC901, IC902) and the FL tube are checked by turning ON and OFF all segments. Next, the operation of the FL driver is checked by using the dimmer control. Then a short between segments next to each other is checked by turning ON and OFF all segments alternately (in a lattice). (In the above example, the segments in the second row from the top are shorted.)

## 7. MANUAL TEST

The test noise is output by the noise generator with a built-in DSP from the channels specified by the sub-menu. There are ten sub-menu items.

```
7. MANUAL TEST
  ALL
```

**ALL** [Remote control code: 7A—00 (TAPE PLAY)]

Noise is output from all channels.

**MAIN L** [Remote control code: 7A—01 (TAPE RW)]

Noise is output from the MAIN L channel.

**CENTER** [Remote control code: 7A—02 (TAPE FW)]

Noise is output from the CENTER channel.

**MAIN R** [Remote control code: 7A—03 (TAPE STOP)]

Noise is output from the MAIN R channel.

**REAR R** [Remote control code: 7A—04 (TAPE REC)]

Noise is output from the REAR R channel.

**REAR C** [Remote control code: 7A—05 (TAPE MUTE)]

Noise is output from the REAR CENTER channel.

**REAR L** [Remote control code: 7A—06 (TAPE A/B)]

Noise is output from the REAR L channel.

**FRONT L** [Remote control code: 7A—07 (TAPE DIR A)]

Noise is output from the FRONT L channel.

**FRONT R** [Remote control code: 7A—08 (CD PLAY)]

Noise is output from the FRONT R channel.

**LFE** [Remote control code: 7A—09 (CD STOP)]

Noise is output from the LFE (sub-woofer) channel.

## 8. RS-232C

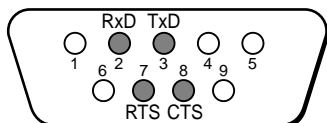
This menu is used to check transmission of the data and the flow port of the hardware.

With the power turned off, short between pins No.2 (RxD) and No.3 (TxD) and between pins No.7 (RTS) and No.8 (CTS) of the RS-232C terminal. (Be sure to turn off the power when shorting pins.)

Start DIAG and select the menu.

There are two sub-menu items.

The signals are processed using EFFECT OFF. (The L/R signals are output using ANALOG MAIN BYPASS setting.)



```
8. RS-232C
TxD/RxD DATA:XX
```

**TxD/RxD DATA** [Remote control code: ----]

This sub-menu is used to check transmission of the test data. "OK" appears when the data is transmitted properly and "NG" when it is not.

In this mode, NULL command transmission is continued after the test command is transmitted.

```
8. RS-232C
HARD FLOW :XX
```

**HARD FLOW** [Remote control code: ----]

This sub-menu is used to check operation of the flow port of the hardware. "OK" appears when the check result is satisfactory and "NG" when it is not.

**9. PRESET**

This menu reserves and inhibits initialization of the back-up RAM (parameter, set menu contents, etc. for the sound field program).

The signals are processed using EFFECT OFF. (The L/R signals are output using ANALOG MAIN BYPASS setting.)

9. PRESET  
INHIBITED

**INHIBIT (Initialization inhibited)** [Remote control code: ----]  
RAM initialization is not executed. Select INHIBIT to protect the values set by the user.

9. PRESET  
RESERVED

**RESERVED (Initialization reserved)** [Remote control code: 7A—57 (SLEEP)]  
Initialization of the back-up RAM is reserved. RESERVED should be selected when shipping out of the factory or resetting RAM. Protection history is also cleared.

\* In order to ensure that back-up RAM be initialized without fail, turn off the power and then on by pressing the POWER (STANDBY/ON) key after selecting RESERVED. Initialization is executed at this point.

**CAUTION** : Before setting to the PRESET RESERVED, write down the existing preset memory content of the Tuner in a table as shown below. (This is because setting to the PRESET RESERVED will cause the user memory content to be erased.)

Preset group	P1	P2	P3	P4	P5	P6	P7	P8
A								
B								
C								
D								
E								

● PRESET STATIONS

STATION		FM FACTORY PRESET DATA (MHz)			STATION		AM FACTORY PRESET DATA (kHz)		
PAGE	NO.	U, C, R, T	R, T, L, G, A	J	PAGE	NO.	U, C, R, T	R, T, L, G, A, J	
A/C/E	1	87.5	87.5	76.0	B/D	1	630	630	
	2	90.1	90.1	83.0		2	1080	1080	
	3	95.1	95.1	84.0		3	1440	1440	
	4	98.1	98.1	86.0		4	530	531	
	5	107.9	108.0	90.0		5	1710	1611	
	6	88.1	88.1	78.0		6	900	900	
	7	106.1	106.1	88.0		7	1350	1350	
	8	107.9	108.0	82.1		8	1400	1404	



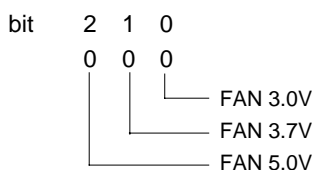
## 10. FAN/AD

The sub-menu of this menu displays the A/D conversion value of the CPU (function circuit board IC526) which detects the keys and protection functions of the main unit in %. (reference voltage 5V: 100%)  
It also displays the history of the fan being driven. When in KY0/KY1/RECOUT page, it is not possible to operate the keys of the main unit because the values of all keys are detected. But one click on the VOLUME of the main unit will cancel this function and sets to the next sub-menu. If this has occurred, restore the DIAG menu being used for testing. The signal processing state remains the same as that before executing this menu.

```
10. FAN/AD
FAN HISTORY:000
```

### FAN HISTORY (History of fan being driven) [Remote control code: ----]

The voltage value detected from the temperature detect circuit is read by the A/D function of the microprocessor as a data. Based on that temperature data, the fan driving speed is controlled in 3 stages. How the fan has been driven is displayed as the history.



\* Selecting "RESERVED" for DIAG menu No.9 will clear the history.

When there is a history of the fan operation: 1

```
KY0 KY1 RECOUT
100 100 060
```

### KY0/KY1/RECOUT (Detection of key scan/REC OUT)[Remote control code: ----]

**KY0/KY1:** Panel key of the main unit (10% step)

- When the standard value is deviated by  $\pm 4\%$ , KEY A/D fails to function properly. In this case, check the circuit voltages, soldering condition, etc.

**RECOUT:** Indicates selected REC OUT position

Indicate	KY0
0	INPUT ▷
10	INPUT ◁
20	INPUT MODE
30	DIAG(*1)
40	6CH INPUT
50	EFFECT
60	SPEAKERS A
70	SPEAKERS B
80	PROC. DIRECT
90	BASS EXTENS.
100	KEY OFF state

Indicate	KY1
0	DSP PROG.
10	PRESET/TUN.
20	FM/AM
30	MEMORY
40	TUNING MODE
50	PTY START
60	PTY MODE
70	RDS EON
80	RDS MODE
90	-
100	KEY OFF state

Indicate	REC OUT
0	MD/TAPE
15	SAT
30	CD
44	V-AUX
60	SOURCE
76	CABLE
92	PHONO
122	CD-R
137	VCR 1
153	TUNER
170	VCR 2/DVR
186	DVD
202	D-TV/LD

(\*1) : "EFFECT" and "6CH INPUT" keys pressed simultaneously

(AD conversion value 100%: 255)

```
THM PRD PRV
028 006 009
```

The above figures are examples for reference.

### THM/PRD/PRV [Remote control code: 7A—0B (CD SKIP -)]

(Detection of the temperature of the heat sink and protection function)

**THM:** Detection of the temperature of the heat sink (Normal value: 6~40) 0.3V~ 2.0V (reference voltage)  
At 5% or less, the protection function works to turn off the power. At more than 40%, possibility is that there is an error in the temperature detection system.

**PRD:** Protection value for DC detection (Normal value: 1~13) 0.05V~ 0.65V (reference voltage)  
When the value is out of the normal value range, the protection function works to turn off the power.

**PRV:** Protection value for power voltage (Normal value: 5~15) 0.25V~ 0.75V (reference voltage)  
When the value is out of the normal value range, the protection function works to turn off the power.

### 11. IF STATUS (Input function status)

Using this menu, the status data is displayed in the hexadecimal notation one after another.

During signal processing, the status before execution of this menu is maintained.

To convert the analog input to the digital input, use the following procedure.

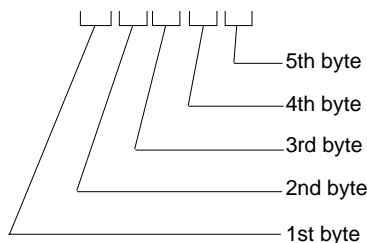
- 1) Select either DIAG menu No.3 or No.4 and enter a digital signal.
- 2) Menu No.11 can be selected by pressing the INPUT MODE key of the main unit. (The input mode will be fixed to the digital mode.)

There are 17 sub-menu items.

The following status information is displayed in the hexadecimal notation according to the sub-menu operation.

```
11. IF STATUS
IFST:4403070500
```

**IFST:** Indicates the information of the microprocessor.



#### 1st byte

Indicates the digital selector position information.

(Upper 4 bits REC OUT selected / lower 4 bits INPUT selected)

Indicate	Selector Position
0	NONE
1	FRONT (VIDEO AUX)
2	OPT1 (CD)
3	OPT2 (CD-R)
4	OPT3 (DVD)
5	OPT4 (D-TV/LD)
6	OPT5 (SAT)
7	OPT6 (-)
8	COAX1 (CD)
9	COAX2 (CABLE)
A	COAX4 (-)
B	COAX5 (-)
C	COAX3 (LD <input type="checkbox"/> RF) R, T, L only
D	RF
E	NONE
F	NONE

#### 3rd byte

Indicates the audio code mode information of the reproduction signals.

Indicate	Audio Code
00	1 + 1
01	1/0
02	2/0
03	3/0
04	2/1
05	3/1
06	2/2
07	3/2
08	2/3
09	3/3
0A	dts7.1
0B	Undefined

#### 2nd byte

Indicates the Fs information of the reproduction signals.

Indicate	Fs (kHz)
00	Analog
01	32
02	44.1
03	48
04	64
05	88.2
06	96
07	Unknown NRM (*1)
08	Unknown DBL (*2)
09	Undefined

(\*1): Unknown (format) sample frequency lower than 48kHz.

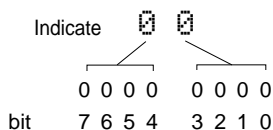
(\*2): Unknown sample frequency exceeding 48kHz.

#### 4th byte

Indicates the format information of the reproduction signals.

Indicate	Format
00	Analog (Unlock)
01	Wrong digital (*1)
02	Digital Data
03	IEC1937 Data
04	PCM Audio
05	Dolby Digital
06	D.D. Karaoke
07	D.D. EX
08	RED dts
09	ORANGE dts
0A	dts ES
0B	NONE PCM

(\*1): Digital reproduction cannot be used due to a commercial bit or 4ch audio reason. Analog reproduction is used instead.



Indicate	bit			
	7	6	5	4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

Indicate	bit			
	3	2	1	0
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

**5th byte**

Indicates the information on the signal processing status.

bit7	MUTE requested
bit6	dts flashing (Red)
bit5	EX sound field being processed
bit4	Full mute (On: 1)
bit3	-
bit2	THROUGH & BYPASS (*2)
bit1	-
bit0	dts analog mute

(\*2): In the case of digital signals other than 32kHz, 44.1kHz and 48kHz, through processing is used for reproducible signals.

**CHS 1 – 4:** IEC60958 channel status information of input signals

11. IF STATUS  
CHS1:02990000200

-----

11. IF STATUS  
CHS5:00000000000

**BSI 1 – 4:** Bit stream information included in the DOLBY DIGITAL signal indicated one by one.

11. IF STATUS  
BSI1:00000000000

-----

11. IF STATUS  
BSI4:00000000000

**BDS 1 – 4:** Bit stream information included in the dts signal indicated one by one.

11. IF STATUS  
BDS1:FFFFFFFFFFF

-----

11. IF STATUS  
BDS4:FFFFFFFFFFF

**YSS 1 – 3:** Device status information of YSS928 (IC501)

\* The numeric values in each example are for reference.

11. IF STATUS  
YSS1:FE0218070F

11. IF STATUS  
YSS2:0101418000

11. IF STATUS  
YSS3:1A41803D

Byte No.	Function
1	YSS MUTE Reg
2	YSS MODE Reg
3	YSS IPORT BIT 7 – 0
4	YSS IPORT BIT 14 – 8
5	YSS OPORT

Byet No.	Function
1	IEC1937 Preamble Pc
2	AC-3 Data Stream No
3	AC-3D Decode Status
4	YSS ZERO Reg
5	MIREG

Byte No.	Function
1	DIR Status
2	DIR fs
3	DIR fs count
4	YSS ZEROBF

**12. DSP RAM CHECK** [Remote control code: 7A—0A (CD SKIP +)]

This menu is used to self-diagnose whether or not YSS928 (IC501 of DSP circuit board) and external RAM (IC502 of DSP circuit board) are connected properly.

During signal processing, the status before execution of this menu is maintained.

```
12.DSP RAM CHK
NoEr
```

Checks the address bus and the data bus, and indicates the connection condition.

“NoEr” appears when no error is detected.

Indicate	Function
WAIT	Bus being checked
NoEr	No error detected
DATA	Short or open of data bus
ADDR	Short or open of address bus

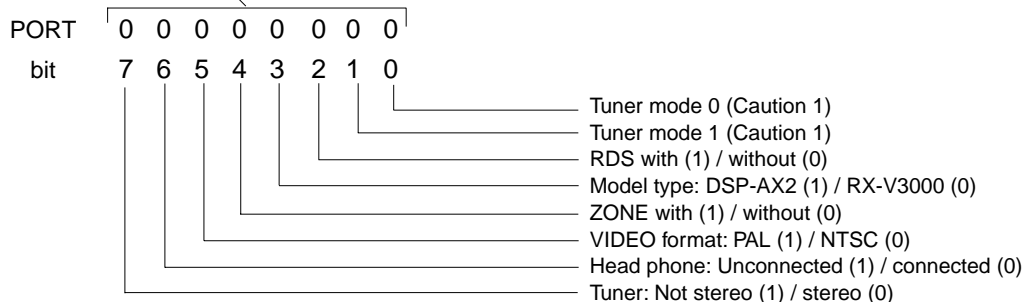
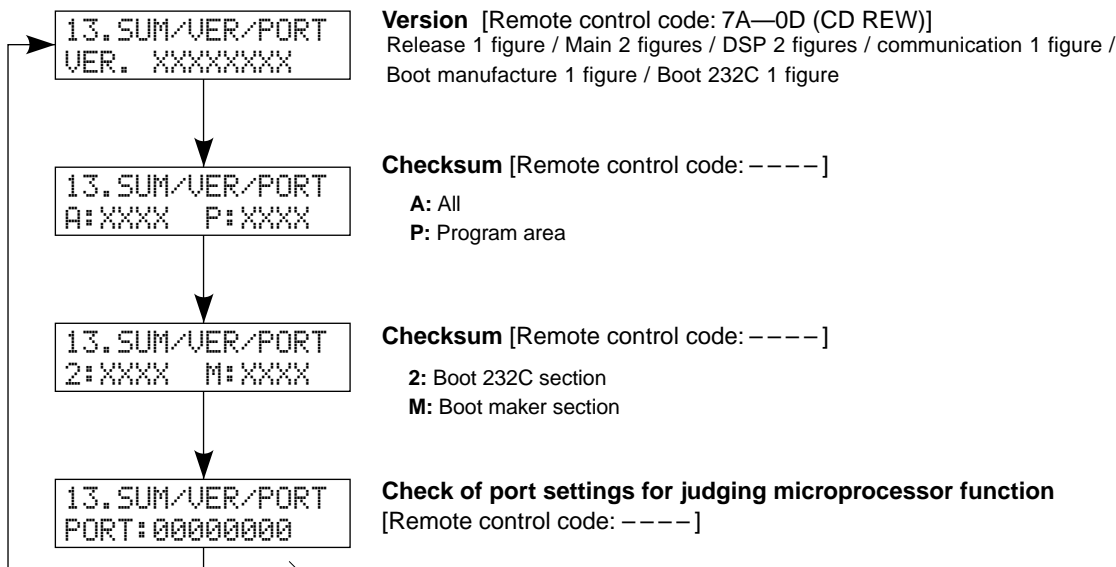
**13. SUM/VER /PORT**

There are four sub-menu items.

Indicates the program version, checksum, specified port of the microprocessor (IC526 of the function circuit board).

The checksum is obtained by adding data for every 16 bits for each program area and expressing the result as a 4-figure hexadecimal data.

The signals are processed using EFFECT OFF. (The L/R signals are output using ANALOG MAIN BYPASS setting.)



(Caution 1)

Tuner mode 0	Tuner mode 1	Tuner frequency
0	0	AM : 531-1611kHz/9kHz FM : 76.0-90.0MHz/100kHz (J)
0	1	AM : 531-1611kHz/9kHz FM : 87.5-108.0MHz/50kHz (A, L, B, G)
1	0	AM : 530-1710kHz/10kHz FM : 87.5-107.9MHz/200kHz (U, C)
1	1	As set by FREQUENCY STEP switch (R, T)

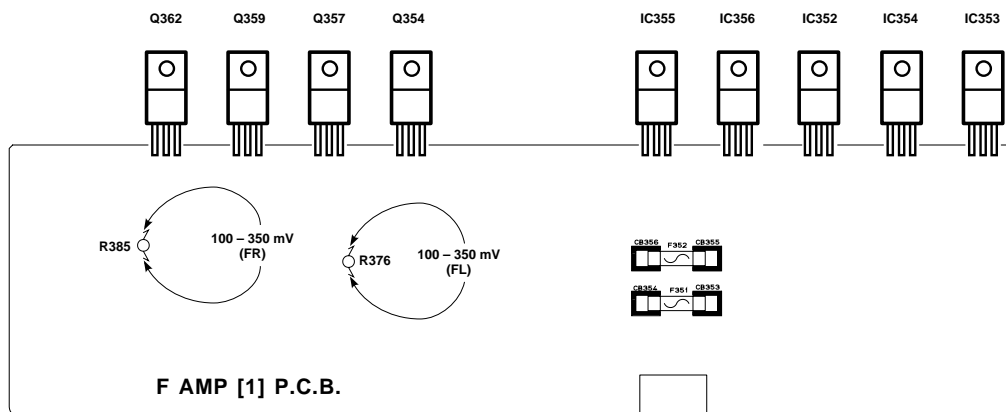
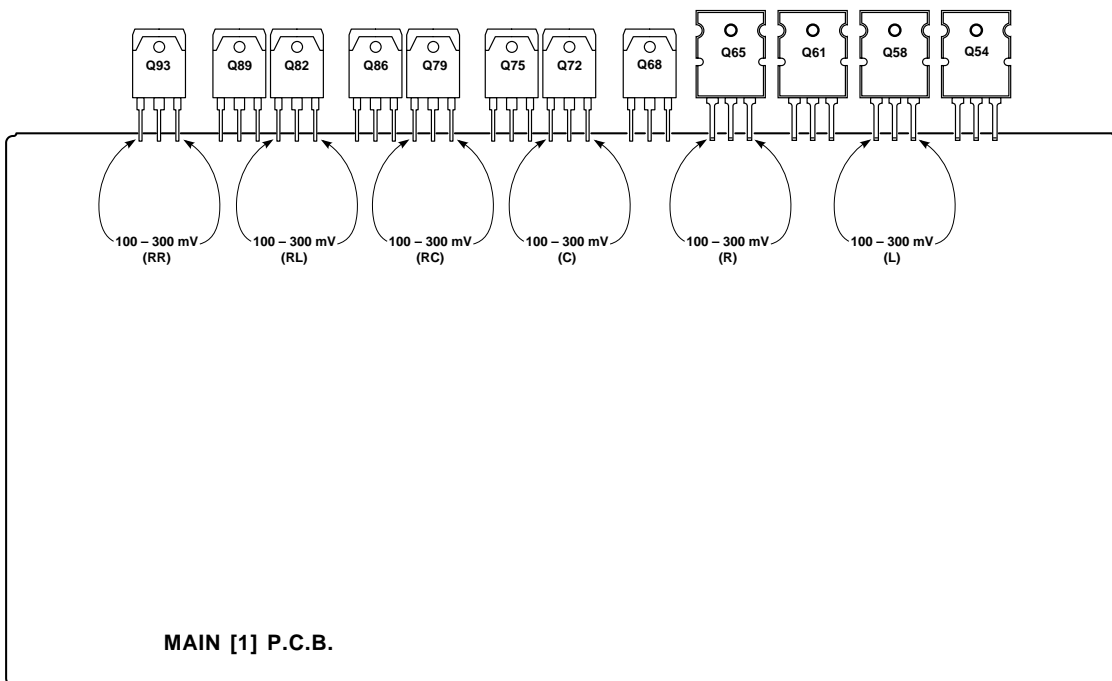
## AMP CHECK

### Confirmation of Idling Current

- 1) No signal applied.
- 2) Non-loaded condition.
- 3) Aging is 10 minutes

Item	Test Point	Rating (DC)
MAIN L	Q58 Base – Emitter (MAIN [1] P.C.B.)	100mV~300mV
MAIN R	Q65 Base – Emitter (MAIN [1] P.C.B.)	
CENTER	Q72 Base – Emitter (MAIN [1] P.C.B.)	
REAR CT	Q79 Base – Emitter (MAIN [1] P.C.B.)	
REAR L	Q86 Base – Emitter (MAIN [1] P.C.B.)	
REAR R	Q93 Base – Emitter (MAIN [1] P.C.B.)	
FRONT L	Both ends of R376 (F AMP [1] P.C.B.)	100mV~350mV
FRONT R	Both ends of R385 (F AMP [1] P.C.B.)	

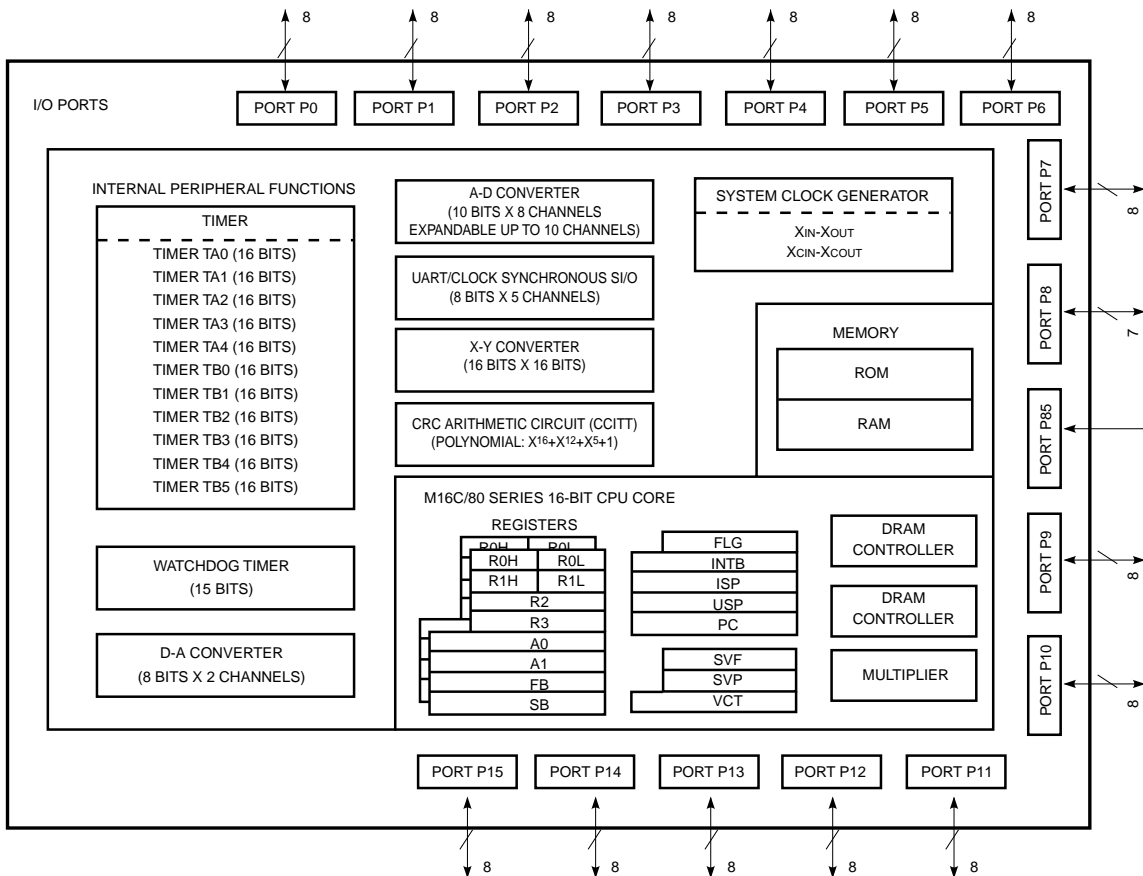
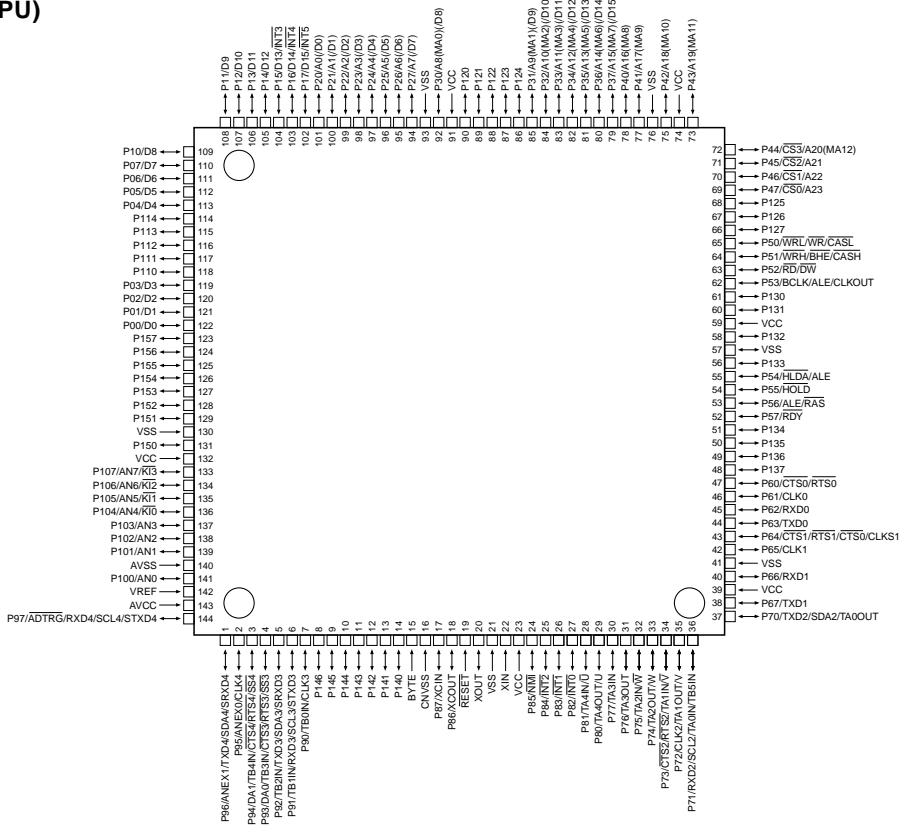
### Test Point



IC DATA

IC526 : M30802SGP (FUNCTION P.C.B.)

16 bit μ-COM (CPU)



## IC526 : M3080SGP (FUNCTION P.C.B.)

16 bit  $\mu$ -COM (CPU)

No.	PORT	Name	Function	Power On	Power Off	Backup
1	TXD4	TXDR	232C Transmission Data	O	OL	OL
2	P95	RTS	232C RTS out	I/O	OL	OL
3	CTS4	CTS	232C CTS input	I	I	OL
4	DA0	FAN	Fan Control	I	I	OL
5	P92	SDTN	SDT for Non Audio	SO	OL	OL
6	P91	RXRDS	RDS Reception/Frequency Switch (Note 1)	SI	I	OL
7	P90	SCKN	SCK for Non Audio	SCK	OL	OL
8	P146	I/E	Internal/External Synchronous output	O	OL	OL
9	P145	CEB	CE for BU2092/ZONE2 function (0: Not, 1: Exist)	O	OL	OL
10	P144	/FLR	FL IC Reset	O	OL	OL
11	P143	CEM0	CE for FL1	O	OL	OL
12	P142	CEM1	CE for FL2	O	OL	OL
13	P141	RDSE	CE for RDS/RDS function (0: Not, 1: Exist)	O	OL	OL
14	P140	CES	CE for On Screen/Video format (0: NTSC, 1: PAL)	O	OL	OL
15	BYTE	BYTE	External data bus width select input (16bit width: VSS)	VSS	VSS	VSS
16	CNVSS	CNVSS	Microprocessor mode select input (Microprocessor mode: VCC)	VCC	VCC	VCC
17	P87	MODEL	Model detect (0 : RX-V3000, 1 : DSP-AX2)	I	I	OL
18	P86	BOOT	232C Boot terminal (Not used)	I	I	OL
19	RESET	/RES	Reset input	---	---	---
20	XOUT	XO	Clock output	---	---	---
21	VSS	VSS	Ground	---	---	---
22	XIN	XI	Clock input	---	---	---
23	VCC	VCC	+ 5V	---	---	---
24	NMI	NMI	Not used (pull-up VCC)	---	---	---
25	INT2	REM	Remote in (Low Edge : Interrupt)	I	I	OL
26	INT1	PSW	Power Switch (High Edge : Interrupt)	I	I	OL
27	INT0	PDT	Power Detect (Low Edge : Interrupt)	I	I	I
28	P81	VSX	Video Vertical Sync	I	I	OL
29	P80	/ICD	IC for YSS928/DA/DF/CODEC/DEM	O	OL	OL
30	P77	RXDR	232C Reception Data (Connection pin 144)	I	I	OL
31	P76	DMT	Digital Full Mute	O	OL	OL
32	P75	INT928	YSS928 IPINT/MUTE/DIR	I	I	OL
33	P74		Unconnected	O	OL	OL
34	P73	CEP	CE for Tuner PLL IC	O	OL	OL
35	P72	SCKP	SCK for Tuner PLL IC	O	OL	OL
36	P71	RDTP	Reception Data for Tuner PLL IC	I	I	OL
37	P70	SDTP	Transmission Data for Tuner PLL IC	O	OL	OL
38	P67	SDM	Transmission Data for YSS928	SO	OL	OL
39	VCC	VCC	+ 5V	---	---	---
40	P66	SDD	Reception Data for YSS928	SI	I	OL
41	VSS	VSS	Ground	---	---	---
42	P65	SCK	CLK for YSS928	SCK	OL	OL
43	P64	CSY	CE for YSS928	O	OL	OL
44	P63	DTC	SDT for CS3310	SO	OL	OL
45	P62	CEC	CE for CS3310	O	OL	OL
46	P61	CKC	SCK for CS3310	SCK	OL	OL
47	P60	CSV	Power control for CS3310	O	OL	OL
48	P137	/CSM	Reset for CS3310	O	OL	OL
49	P136	VRB	Volume Rotary B	I	I	OL
50	P135	VRA	Volume Rotary A	I	I	OL
51	P134	PRI	I Protection	I	I	I
52	/RDY	/RDY	While the input level of the RDY pin is "L", the microcomputer is in the ready state	---	---	HI
53	ALE	ALE	Unconnected	---	---	HI
54	/HOLD	/HOLD	While the input level at the HOLD pin is "L", the microcomputer is placed in the hold state	---	---	HI
55	/HLDA	HLDA	Unconnected	---	---	HI

**IC526 : M30802SGP (FUNCTION P.C.B.)**

**16 bit  $\mu$ -COM (CPU)**

No.	PORT	Name	Function	Power On	Power Off	Backup
56	P133	/BEC	Bass Extension Control	O	OL	OL
57	VSS	VSS	Ground	---	---	---
58	P132	/Z2MT	ZONE2 Mute	O	OL	OL
59	VCC	VCC	+ 5V	---	---	---
60	P131	/HPMT	Head Phone Mute	O	OL	OL
61	P130	/FMTF	Full Mute (FL/FR)	O	OL	OL
62	BCLK	BCLK	Unconnected	---	---	HI
63	/RD	/RD	OE for Flash Memory	---	---	HI
64	/BHE	BHE	Unconnected	---	---	HI
65	/WR	/WR	WE for Flash Memory	---	---	HI
66	P127	/FMST	Full Mute (SWL/SWR/SW MONO)	O	OL	OL
67	P126	/FMTC	Full Mute (CENTER)	O	OL	OL
68	P125	/FMTC	Full Mute (L/R/RL/RC/RR)	O	OL	OL
69	/CS0	CS0	CE for Flash Memory	---	---	---
70	/CS1	CS1	Unconnected	---	---	---
71	/CS2	CS2	Unconnected	---	---	---
72	/CS3	CS3	Unconnected	---	---	---
73	A19	A19	Unconnected	---	---	---
74	VCC	VCC	+ 5V	---	---	---
75	A18	A18	Address bus	---	---	---
76	VSS	VSS	Ground	---	---	---
77	A17	A17	Address bus	---	---	---
78	A16	A16	Address bus	---	---	---
79	A15	A15	Address bus	---	---	---
80	A14	A14	Address bus	---	---	---
81	A13	A13	Address bus	---	---	---
82	A12	A12	Address bus	---	---	---
83	A11	A11	Address bus	---	---	---
84	A10	A10	Address bus	---	---	---
85	A9	A9	Address bus	---	---	---
86	P124	SCKA	SCK for Audio IC	O	OL	OL
87	P123	SDTA	SDT for Audio IC	O	OL	OL
88	P122	CEL	CE for Audio IC (Sanyo)	O	OL	OL
89	P121	LD	Power limiter A	O	OL	OL
90	P120		Unconnected	O	OL	OL
91	VCC	VCC	+ 5V	---	---	---
92	A8	A8	Address bus	---	---	---
93	VSS	VSS	Ground	---	---	---
94	A7	A7	Address bus	---	---	---
95	A6	A6	Address bus	---	---	---
96	A5	A5	Address bus	---	---	---
97	A4	A4	Address bus	---	---	---
98	A3	A3	Address bus	---	---	---
99	A2	A2	Address bus	---	---	---
100	A1	A1	Address bus	---	---	---
101	A0	A0	Unconnected	---	---	---
102	D15	D15	Data bus	---	---	---
103	D14	D14	Data bus	---	---	---
104	D13	D13	Data bus	---	---	---
105	D12	D12	Data bus	---	---	---
106	D11	D11	Data bus	---	---	---
107	D10	D10	Data bus	---	---	---
108	D9	D9	Data bus	---	---	---
109	D8	D8	Data bus	---	---	---
110	D7	D7	Data bus	---	---	---



## IC526 : M30802SGP (FUNCTION P.C.B.)

16 bit  $\mu$ -COM (CPU)

No.	PORT	Name	Function	Power On	Power Off	Backup
111	D6	D6	Data bus	---	---	---
112	D5	D5	Data bus	---	---	---
113	D4	D4	Data bus	---	---	---
114	P114	/MLV	Main Level Select (0/-10dB)	O	OL	OL
115	P113	PRY	Power Relay	O	OL	OL
116	P112	SPE	Speaker Relay Effect	O	OL	OL
117	P111	SPB	Speaker Relay Main B	O	OL	OL
118	P110	SPA	Speaker Relay Main A	O	OL	OL
119	D3	D3	Data bus	---	---	---
120	D2	D2	Data bus	---	---	---
121	D1	D1	Data bus	---	---	---
122	D0	D0	Data bus	---	---	---
123	P157	TUN0	Tuner Mode 0 (Note 2)	I	I	OL
124	P156	TUN1	Tuner Mode 1 (Note 2)	I	I	OL
125	P155	PRB/D	DSP PROGRAM Selector B	I	I	OL
126	P154	PRA/B	DSP PROGRAM Selector A	I	I	OL
127	P153	/HPI	Head Phone Detect	I	I	OL
128	P152	/TMT	Tuner Mute	O	OL	OL
129	P151	TUNED	Tuner Meter	I	I	OL
130	VSS	VSS	Ground	---	---	---
131	P150	/ST	Tuner Stereo	I	I	OL
132	VCC	VCC	+ 5V	---	---	---
133	AN7	LMV	Power Limiter Market Detect	I	I	I
134	AN6	REC	REC OUT Selector	I	I	I
135	AN5	PRMT	Power Limiter Detect	I	I	I
136	AN4	KY1	Key State 1	I	I	I
137	AN3	KY0	Key State 0	I	I	I
138	AN2	THM	Thermal Detect	I	I	I
139	AN1	PRD	Power Amp DC Protection	I	I	I
140	AVSS	AVSS	Ground for AD	VSS	VSS	VSS
141	AN0	PRV	V Protection	I	I	I
142	VREF	VREF	Reference voltage for AD	VCC	VCC	VCC
143	AVCC	AVCC	Power Supply for AD	VCC	VCC	VCC
144	RXD4	RXDR	232C Reception Data	I	I	OL

## (Note 1) Pin 6 Frequency Switch (R, T only)

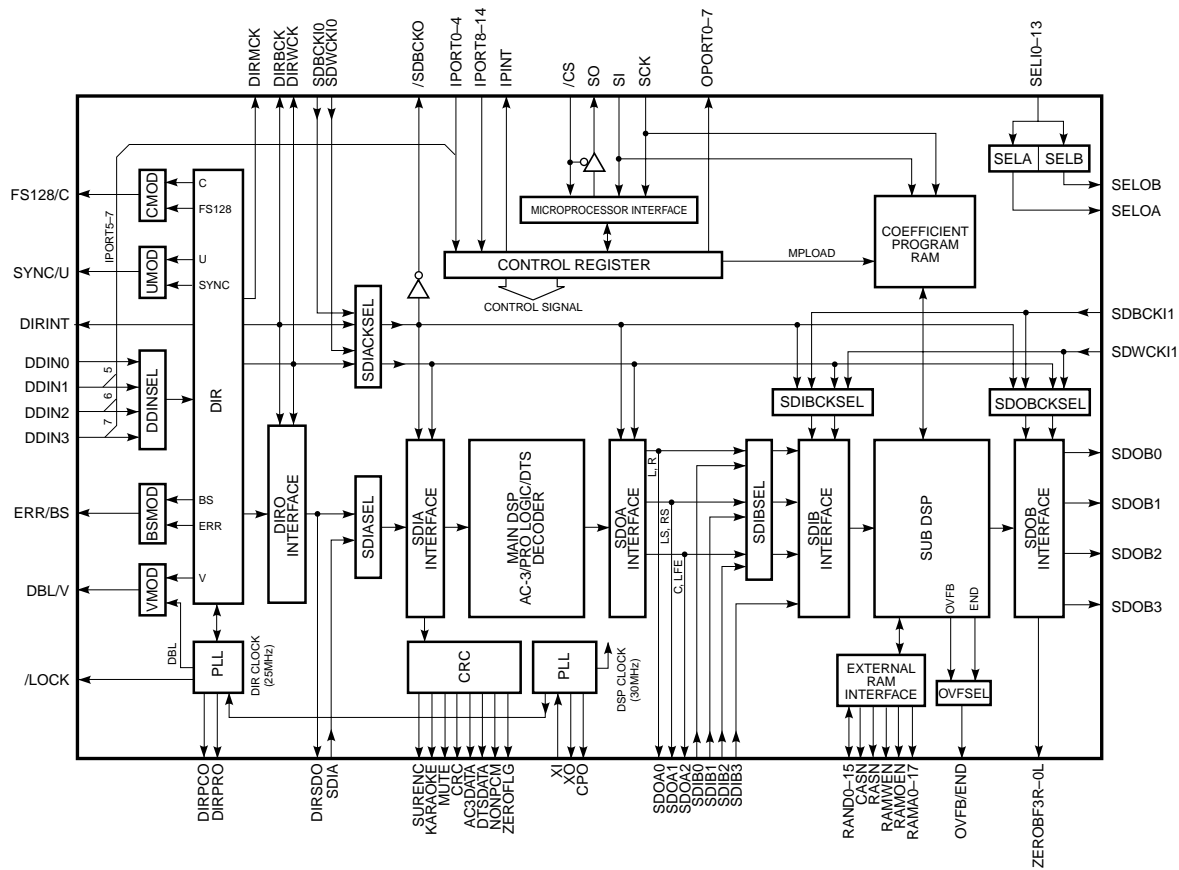
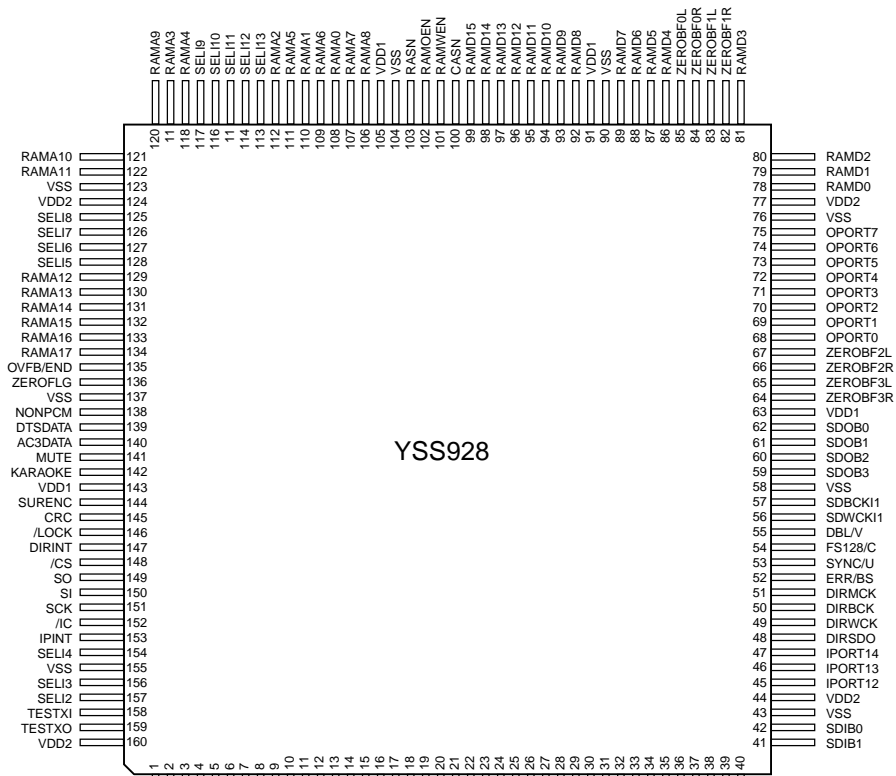
1	AM : 531-1611kHz(9kHz step)	FM : 87.5-108.0MHz(50kHz step)
0	AM : 530-1710kHz(10kHz step)	FM : 87.5-108.0MHz(100kHz step)

## (Note 2) Pin 123, 124 Tuner Mode 0 and 1

Tuner Mode 1	Tuner Mode 0	Tuner Frequency	Market
0	0	AM : 531-1611kHz(9kHz step) FM : 76.0-90.0MHz(100kHz step)	J
0	1	AM : 530-1710kHz(10kHz step) FM : 87.5-107.9MHz(200kHz step)	U, C
1	0	AM : 531-1611kHz(9kHz step) FM : 87.5-108.0MHz(50kHz step)	A, L, G
1	1	Tuner Frequency is selected by Port 6 (Note 1)	

IC501 : YSS928 (DSP P.C.B.)

AC3D3



## IC501 : YSS928 (DSP P.C.B.)

## AC3D3

No.	Name	I/O	Function
1	XO	O	Crystal oscillator connecting terminal
2	XI	I	Crystal oscillator connecting terminal (24.576MHz )
3	SEL11	I+	Built-in selector input 1 (AXD)
4	SEL10	I+	Built-in selector input 0 (GND)
5	SELOA	O+	Built-in selector output A (ISEL)
6	SELOB	O+	Built-in selector output B (RSEL)
7	TESTMS	I+	Test terminal (unconnected)
8	TESTXEN	I+	Test terminal (unconnected)
9	IPORT0	I+	General purpose input terminal (CXDTA)
10	IPORT1	I+	General purpose input terminal (CXDTB)
11	IPORT2	I+	General purpose input terminal (CXDTE)
12	IPORT3	I+	General purpose input terminal (MUTE)
13	IPORT4	I+	General purpose input terminal
14	DDIN0	Is	DIR: Digital audio interface data input terminal 0 (ISEL)
15	DDIN1	Is	DIR: Digital audio interface data input terminal 1/General purpose input terminal (Pull down)
16	DDIN2	Is	DIR: Digital audio interface data input terminal 2/General purpose input terminal (Pull up)
17	DDIN3	Is	DIR: Digital audio interface data input terminal 3/General purpose input terminal (Pull down)
18	VSS		Ground terminal
19	CPO	A	PLL filter connecting terminal
20	AVDD		+3.3V power terminal (for DIR)
21	DIRPCO	A	DIR: PLL filter connecting terminal
22	DIRPRO	A	DIR: PLL filter connecting terminal
23	AVSS		Ground terminal (for DIR)
24	TESTBRK	I+	Test terminal (unconnected)
25	TESTR1	I+	PLL initialization signal input terminal for DSP (/ICD)
26	TESTR2	I+	Test terminal (unconnected)
27	VDD1		+3.3V power terminal (for terminal section)
28	SDWCKI0	I+	Word clock input terminal for SDIA, SDOA, SDIB, SDOB interface (Unconnected)
29	SDBCKI0	I+	Bit clock input terminal for SDIA, SDOA, SDIB, SDOB interface (Unconnected)
30	/SDBCK0	O	DIRBCK or SDBCKI0 invert clock output terminal (Unconnected)
31	IPORT8	I+	IPINT general purpose input terminal (Pull down)
32	IPORT9	I+	IPINT general purpose input terminal (NONPCM)
33	IPORT10	I+	IPINT general purpose input terminal (NONPCM)
34	IPORT11	I+	IPINT general purpose input terminal (MUTE)
35	SDIA	I	AC-3/DTS bit stream (or PCM) data input terminal to Main DSP
36	SDOA2	O	PCM output terminal from Main DSP (C/LFE output) (Unconnected)
37	SDOA1	O	PCM output terminal from Main DSP (LS/RS output) (Unconnected)
38	SDOA0	O	PCM output terminal from Main DSP (L/R output)
39	SDIB3	I+	PCM input terminal 3 to Sub DSP (Unconnected)
40	SDIB2	I+	PCM input terminal 2 to Sub DSP (Unconnected)
41	SDIB1	I+	PCM input terminal 1 to Sub DSP (Unconnected)
42	SDIB0	I+	PCM input terminal 0 to Sub DSP (Unconnected)
43	VSS		Ground terminal
44	VDD2		+2.5V power terminal (for internal circuit)
45	IPORT12	I+	IPINT general purpose input terminal (DBL)
46	IPORT13	I+	IPINT general purpose input terminal (DBL)
47	IPORT14	I+	IPINT general purpose input terminal (DIRINT)
48	DIRSDO	O	AC-3/DTS bit stream (or PCM) data output terminal from DIR (Unconnected)
49	DIRWCK	O	DIR: Serial data word clock (fs) output terminal (WCK)
50	DIRBCK	O	DIR: Serial data bit clock (64fs) output terminal (BCK)
51	DIRMCK	O	DIR: Serial data master clock (256fs or 128fs) output terminal (MCK)
52	ERR/BS	O	DIR: Data error detect output/block start output terminal (Unconnected)
53	SYNC/U	O	DIR: Serial data synchronous timing output/user data output terminal (Unconnected)
54	FS128/C	O	DIR: Serial data master clock 128fs output/channel status output terminal (Unconnected)
55	DBL/V	O	DIR: Double rate clock output/validity flag output terminal (DBL)

## IC501 : YSS928 (DSP P.C.B.)

## AC3D3

No.	Name	I/O	Function
56	SDWCKI1	I+	Word clock input terminal for SDIB, SDOB interface (Unconnected)
57	SDBCKI1	I+	Bit clock input terminal for SDIB, SDOB interface (Unconnected)
58	VSS		Ground terminal
59	SDOB3	O	PCM output terminal from Sub DSP
60	SDOB2	O	PCM output terminal from Sub DSP
61	SDOB1	O	PCM output terminal from Sub DSP
62	SDOB0	O	PCM output terminal from Sub DSP
63	VDD1		+3.3V power terminal (for terminal section)
64	ZEROBF3R	O+	SDOB3 Rch zero flag output terminal (ZF3R)
65	ZEROBF3L	O+	SDOB3 Lch zero flag output terminal (ZF3L)
66	ZEROBF2R	O+	SDOB2 Rch zero flag output terminal (ZF2R)
67	ZEROBF2L	O+	SDOB2 Lch zero flag output terminal (ZF2L)
68	OPORT0	O	General purpose output terminal (DASEL)
69	OPORT1	O	General purpose output terminal (/RINH1)
70	OPORT2	O	General purpose output terminal (/RINH2)
71	OPORT3	O	General purpose output terminal (/ICCDC)
72	OPORT4	O	General purpose output terminal (DFS)
73	OPORT5	O	General purpose output terminal (Unconnected)
74	OPORT6	O	General purpose output terminal (Unconnected)
75	OPORT7	O	General purpose output terminal (Unconnected)
76	VSS		Ground terminal
77	VDD2		+2.5V power terminal (for internal circuit)
78	RAMD0	I+/O	Sub DSP: External memory data terminal 0
79	RAMD1	I+/O	Sub DSP: External memory data terminal 1
80	RAMD2	I+/O	Sub DSP: External memory data terminal 2
81	RAMD3	I+/O	Sub DSP: External memory data terminal 3
82	ZEROBF1R	O+	SDOB1 Rch zero flag output terminal (ZF1R)
83	ZEROBF1L	O+	SDOB1 Lch zero flag output terminal (ZF1L)
84	ZEROBF0R	O+	SDOB0 Rch zero flag output terminal (ZF0R)
85	ZEROBF0L	O+	SDOB0 Lch zero flag output terminal (ZF0L)
86	RAMD4	I+/O	Sub DSP: External memory data terminal 4
87	RAMD5	I+/O	Sub DSP: External memory data terminal 5
88	RAMD6	I+/O	Sub DSP: External memory data terminal 6
89	RAMD7	I+/O	Sub DSP: External memory data terminal 7
90	VSS		Ground terminal
91	VDD1		+3.3V power terminal (for terminal section)
92	RAMD8	I+/O	Sub DSP: External memory data terminal 8
93	RAMD9	I+/O	Sub DSP: External memory data terminal 9
94	RAMD10	I+/O	Sub DSP: External memory data terminal 10
95	RAMD11	I+/O	Sub DSP: External memory data terminal 11
96	RAMD12	I+/O	Sub DSP: External memory data terminal 12
97	RAMD13	I+/O	Sub DSP: External memory data terminal 13
98	RAMD14	I+/O	Sub DSP: External memory data terminal 14
99	RAMD15	I+/O	Sub DSP: External memory data terminal 15
100	CASN	O	Sub DSP: Column address strobe output terminal for external DRAM
101	RAMWEN	O	Sub DSP: Write enable terminal for external memory
102	RAMOEN	O	Sub DSP: Output enable terminal for external memory
103	RASN	O	Sub DSP: Low address strobe output terminal for external DRAM
104	VSS		Ground terminal
105	VDD1		+3.3V power terminal (for terminal section)
106	RAMA8	O	Sub DSP: External memory address terminal 8
107	RAMA7	O	Sub DSP: External memory address terminal 7
108	RAMA0	O	Sub DSP: External memory address terminal 0
109	RAMA6	O	Sub DSP: External memory address terminal 6
110	RAMA1	O	Sub DSP: External memory address terminal 1

## IC501 : YSS928 (DSP P.C.B.)

## AC3D3

No.	Name	I/O	Function
111	RAMA5	O	Sub DSP: External memory address terminal 5
112	RAMA2	O	Sub DSP: External memory address terminal 2
113	SELI13	I+	Built-in selector input 13 (AC3RF)
114	SELI12	I+	Built-in selector input 12 (CXE)
115	SELI11	I+	Built-in selector input 11 (Unconnected)
116	SELI10	I+	Built-in selector input 10 (Unconnected)
117	SELI9	I+	Built-in selector input 9 (CXB)
118	RAMA4	O	Sub DSP: External memory address terminal 4
119	RAMA3	O	Sub DSP: External memory address terminal 3
120	RAMA9	O	Sub DSP: External memory address terminal 9 (Unconnected)
121	RAMA10	O	Sub DSP: External memory address terminal 10 (Unconnected)
122	RAMA11	O	Sub DSP: External memory address terminal 11 (Unconnected)
123	VSS		Ground terminal
124	VDD2		+2.5V power terminal (for internal circuit)
125	SELI8	I+	Built-in selector input 8 (CXA)
126	SELI7	I+	Built-in selector input 7 (Unconnected)
127	SELI6	I+	Built-in selector input 6 (OPTF)
128	SELI5	I+	Built-in selector input 5 (OPTE)
129	RAMA12	O	Sub DSP: External memory address terminal 12 (Unconnected)
130	RAMA13	O	Sub DSP: External memory address terminal 13 (Unconnected)
131	RAMA14	O	Sub DSP: External memory address terminal 14 (Unconnected)
132	RAMA15	O	Sub DSP: External memory address terminal 15 (Unconnected)
133	RAMA16	O	Sub DSP: External memory address terminal 16 (Unconnected)
134	RAMA17	O	Sub DSP: External memory address terminal 17 (Unconnected)
135	OVFB/END	O	Sub DSP: Overflow/program end detect terminal (Unconnected)
136	ZEROF LG	O	Main DSP: Zero flag output terminal (Unconnected)
137	VSS		Ground terminal
138	NONPCM	O	Main DSP: Non-PCM data detect terminal
139	DTSDATA	O	Main DSP: DTS data detect terminal (Unconnected)
140	AC3DATA	O	Main DSP: AC3 data detect terminal (Unconnected)
141	MUTE	O	Main DSP: Auto mute detect terminal
142	KARAOKE	O	Main DSP: AC3 KARAOKE data detect terminal (Unconnected)
143	VDD1		+3.3V power terminal (for terminal section)
144	SURENC	O	Main DSP: AC-3 2/0 mode Dolby surround encode input detect terminal (Unconnected)
145	CRC	O	Main DSP: AC3 CRC error detect terminal (Unconnected)
146	/LOCK	O	DIR: PLL lock detect terminal (Unconnected)
147	DIRINT	O	DIR: Interrupt output terminal
148	/CS	Is	Microprocessor interface chip select input terminal (CSY)
149	SO	Ot	Microprocessor interface data output terminal
150	SI	Is	Microprocessor interface data input terminal (SDM)
151	SCK	Is	Microprocessor interface clock input terminal
152	/IC	Is	Initial clear input terminal (/ICD)
153	IPINT	O+	Interrupt output terminal by IPORT 8-14
154	SELI4	I+	Built-in selector input 4 (OPTD)
155	VSS		Ground terminal
156	SELI3	I+	Built-in selector input 3 (OPTC)
157	SELI2	I+	Built-in selector input 2 (OPTB)
158	TESTXI	I	Test terminal (should be always connected to VSS)
159	TESTXO	O	Test terminal (Unconnected)
160	VDD2		+2.5V power terminal (for internal circuit)

Is: Schmidt trigger input terminal

I+: Input terminal with pull-up resistor

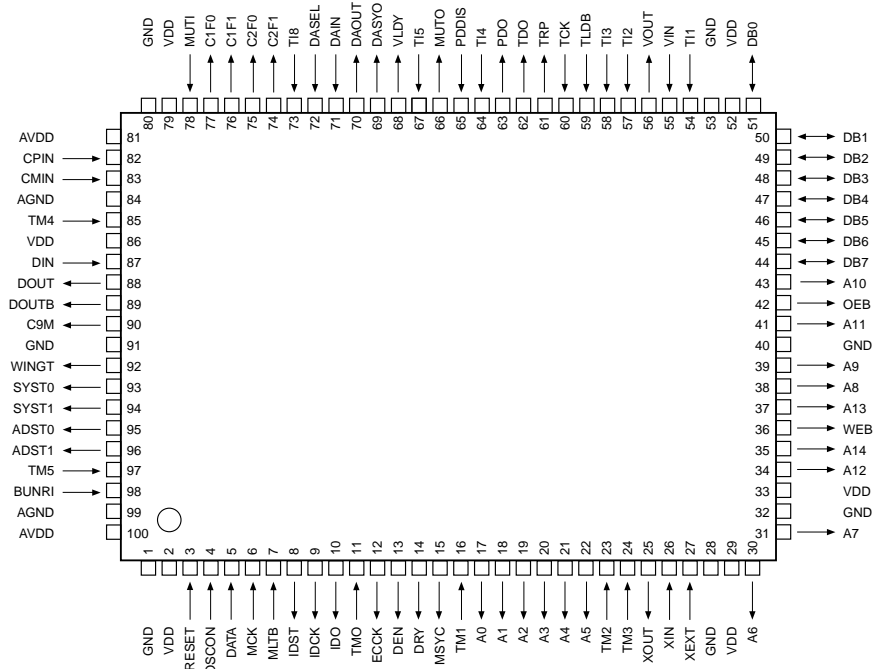
O: digital output terminal

Ot: Tri-state digital output terminal

A: Analog terminal

IC503 : PM4007A (DSP P.C.B.)

AC-3 RF Demodulator



No.	Name	I/O	Function
1	GND		Ground (0V)
2	VDD		+5V power supply
3	RESET	I	System resetting terminal (reset at "L")
4	OSCON	I	Oscillation control terminal. Oscillation ON at "H", set to "H" normally and to "L" when in standby state
5	DATA	I	IC test terminal, normally connected to ground (or unconnected)
6	MCK	I	IC test terminal, normally connected to ground (or unconnected)
7	MLTB	I	IC test terminal, normally connected to ground (or unconnected)
8	IDST	O	Output terminal for IC test
9	IDCK	O	Output terminal for IC test
10	IDO	O	Output terminal for IC test
11	TM0	I	IC test terminal, normally connected to ground (or unconnected)
12	ECCK	O	Output terminal for IC test
13	DEN	O	Output terminal for IC test
14	DRY	O	Output terminal for IC test
15	MSYC	O	Output terminal for IC test
16	TM1	I	IC test terminal, normally connected to ground (or unconnected)
17	A0	O	External RAM address output. Address 0 (LSB)
18	A1	O	External RAM address output. Address 1
19	A2	O	External RAM address output. Address 2
20	A3	O	External RAM address output. Address 3
21	A4	O	External RAM address output. Address 4
22	A5	O	External RAM address output. Address 5
23	TM2	I	IC test terminal, normally connected to ground (or unconnected)
24	TM3	I	IC test terminal, normally connected to ground (or unconnected)
25	XOUT	O	Output terminal for IC test
26	XIN	I	IC test terminal, normally connected to ground (or unconnected)
27	XEXT	I	IC test terminal, normally connected to ground (or unconnected)
28	GND		Ground terminal (0V)
29	VDD		+5V power supply

## IC503 : PM4007A (DSP P.C.B.)

## AC-3 RF Demodulator

No.	Name	I/O	Function
30	A6	O	External RAM address output. Address 6
31	A7	O	External RAM address output. Address 7
32	GND		Ground terminal (0V)
33	VDD		+5V power supply
34	A12	O	External RAM address output. Address 12
35	A14	O	External RAM address output. Address 14 (MSB)
36	WEB	O	External RAM write enable signal, active at "L"
37	A13	O	External RAM address output. Address 13
38	A8	O	External RAM address output. Address 8
39	A9	O	External RAM address output. Address 9
40	GND		Ground terminal (0V)
41	A11	O	External RAM address output. Address 11
42	OEB	O	External RAM output enable signal, active at "L"
43	A10	O	External RAM address output. Address 10
44	DB7	I/O	External RAM data terminal. Data bus 7
45	DB6	I/O	External RAM data terminal. Data bus 6
46	DB5	I/O	External RAM data terminal. Data bus 5
47	DB4	I/O	External RAM data terminal. Data bus 4
48	DB3	I/O	External RAM data terminal. Data bus 3
49	DB2	I/O	External RAM data terminal. Data bus 2
50	DB1	I/O	External RAM data terminal. Data bus 1
51	DB0	I/O	External RAM data terminal. Data bus 0
52	VDD		+5V power supply
53	GND		Ground terminal (0V)
54	TI1	I	IC test terminal, normally connected to VDD
55	VIN	I	VCXO input
56	VOUT	O	VCXO output
57	TI2	I	IC test terminal, normally connected to GND (or unconnected)
58	TI3	I	IC test terminal, normally connected to GND (or unconnected)
59	TLDB	I	IC test terminal, normally connected to GND (or unconnected)
60	TCK	I	IC test terminal, normally connected to GND (or unconnected)
61	TRP	O	Output terminal for IC test
62	TDO	O	Output terminal for IC test
63	PDO	O	Output terminal for phase comparator (tri-state)
64	TI4	I	IC test terminal, normally connected to GND (or unconnected)
65	PDDIS	I	Input terminal to control PDO output. Output ON at "L"
66	MUTO	O	Muting output. Muting available at "H". Setting becomes "H" when "MUTI=H" or AC-3 is asynchronous.
67	TI5	I	IC test terminal, normally connected to GND (or unconnected)
68	VDY	O	Output terminal for IC test
69	DASYO	O	Output terminal for IC test
70	DAOUT	O	Digital out output (serial data stream output)
71	DAIN	I	Digital external input, through to DAOUT when DASEL is "H".
72	DASEL	I	Digital out select
73	TI8	I	IC test terminal, normally connected to GND (or unconnected)
74	C2F1	O	Terminal used to indicate error condition after C2 correction, whether completely corrected or not.
75	C2F0	O	Terminal used to indicate error condition after C2 correction, number of errors at C2.
76	C1F1	O	Terminal used to indicate error condition after C1 correction, whether any error exists at C1 or not.
77	C1F0	O	Terminal used to indicate error condition after C1 correction, number of errors at C1.
78	MUTI	I	Muting input. Muting available at "H"
79	VDD		+5V power supply
80	GND		Ground terminal (0V)

## IC503 : PM4007A (DSP P.C.B.)

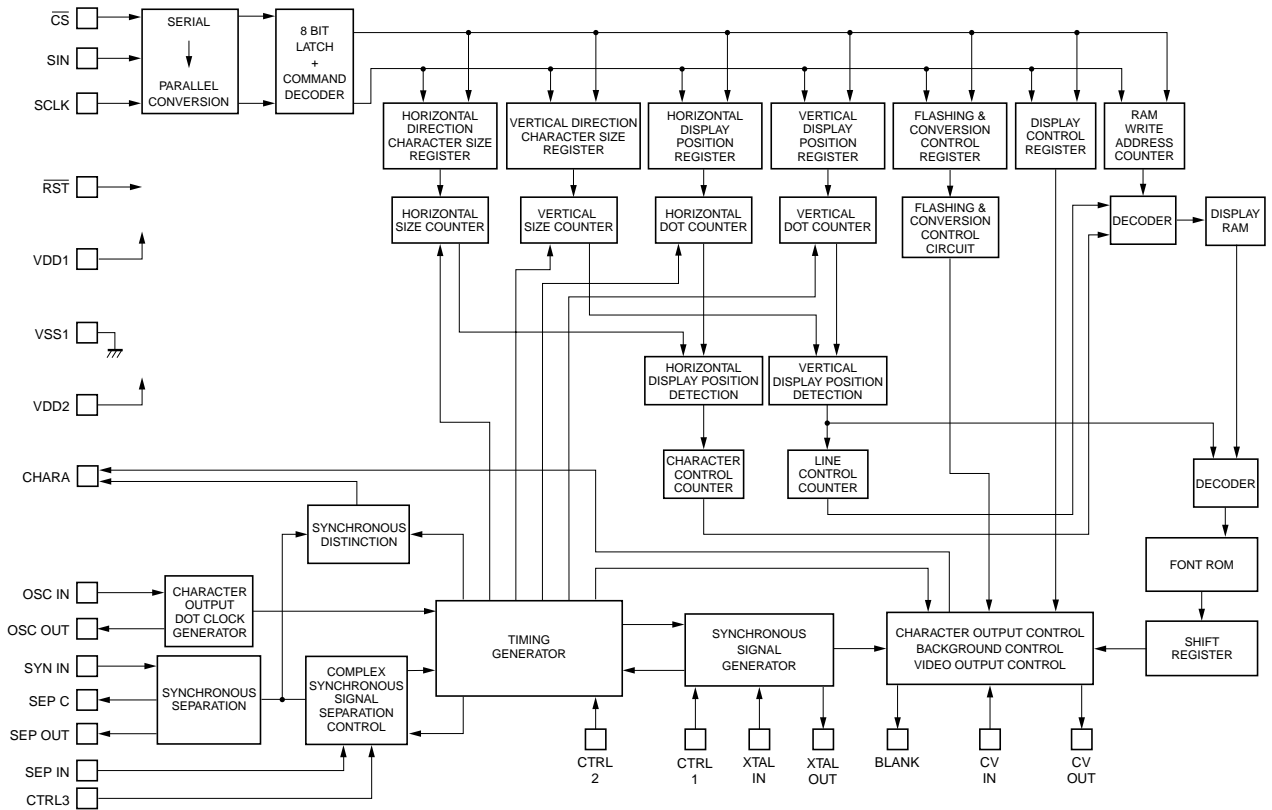
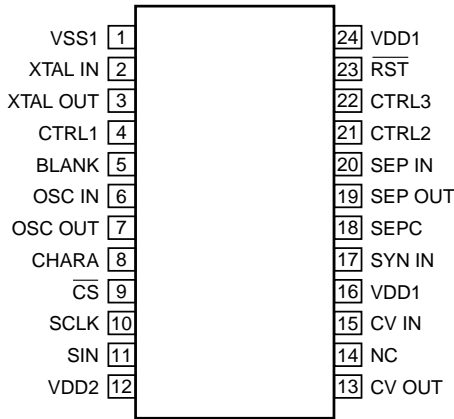
## AC-3 RF Demodulator

No.	Name	I/O	Function
81	AVDD		+5V power supply for analog comparator
82	CPIN	I	Analog comparator input, positive side (Non-reverse side: QPSK input)
83	CMIN	I	Analog comparator input, negative side (reverse side)
84	AGND		Ground terminal for analog comparator (0V)
85	TM4	I	IC test terminal, normally connected to GND (or unconnected)
86	VDD		+5V power supply
87	DIN	I	IC test terminal, normally connected to GND (or unconnected)
88	DOUT	O	Analog comparator result output
89	DOUTB	O	Analog comparator result reverse output
90	C9M	O	9.216MHz output, output divided into 2 at VIN (No.55 pin)
91	GND		Ground terminal (0V)
92	WINGT	O	Output for IC test
93	SYST0	O	Output for IC test
94	SYST1	O	Output for IC test
95	ADST0	O	Output for IC test
96	ADST1	O	Output for IC test
97	TM5	I	IC test terminal, normally connected to GND (or unconnected)
98	BUNRI	I	IC test terminal, normally connected to GND (or unconnected)
99	AGND		Ground terminal (0V) for 46.08MHz oscillator
100	AVDD		+5V power supply for 46.08MHz oscillator



IC610 : LC74781-9798 (VIDEO P.C.B.)

Superimpose



## IC610 : LC74781-9798 (VIDEO P.C.B.)

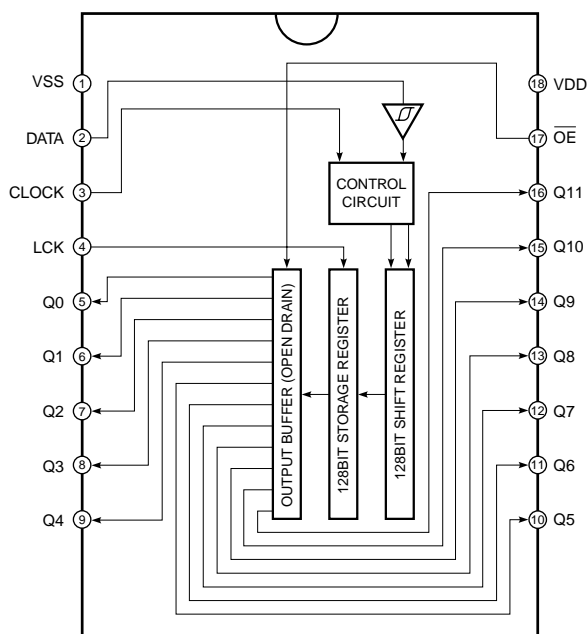
## Superimpose

Pin No.	Symbol	Terminal name	Function
1	VSS1	Ground terminal	Connection to GND (Digital system ground terminal)
2	XTAL IN	Crystal oscillation terminal	Terminal to connect the crystal of the crystal oscillator for internal synchronous signal generation and a capacitor or to input an external clock. (2fsc or 4fsc)
3	XTAL OUT		
4	CTRL1	Crystal oscillation input switching terminal	Switching terminal between the mode to input a clock externally and the mode for crystal oscillation. [L] = Crystal oscillation, [H] = External clock input
5	BLANK	Blank output terminal	Terminal to output the blank signal (character and bordering OR signal) (MOD0 : complex synchronous signal output at [H]). When resetting (RST terminal = [L]), a crystal oscillation clock is output (but not when resetting by the command).
6	OSC IN	LC oscillation terminal	Terminal to connect the coil of the oscillator for character output dot clock generation and a capacitor.
7	OSC OUT		
8	CHARA	Character output terminal	Terminal to output a character signal (MOD0 : It becomes an output terminal to judge the external synchronous signal at [H] and outputs the result after judging existence of the external synchronous signal. When a synchronous signal exists, [H] is output.) When resetting (RST terminal = [L]), a dot clock (LC oscillation) is output (but it is not output when reset by the command.)
9	/CS	Enable input terminal	Serial data input enable input terminal. The serial data input becomes enable at [L]. A pull-up resistor is built in (hysteresis input).
10	SCLK	Clock input terminal	Input terminal of clock for serial data input. A pull-up resistor is built in (hysteresis input).
11	SIN	Data input terminal	Serial data input terminal. A pull-up resistor is built in (hysteresis input).
12	VDD2	Power supply terminal	Power supply terminal for complex image signal level adjustment (Power supply for analog system)
13	CV OUT	Video signal output terminal	Output terminal for complex image signal.
14	NC		Connected to GND or unconnected.
15	CV IN	Video signal input terminal	Input terminal for complex image signal.
16	VDD1	Power supply terminal	Power supply terminal (+5V : power supply for digital system)
17	SYN IN	Synchronous separation circuit input terminal	Video signal input terminal of the built-in synchronous separation circuit (When the built-in synchronous separation circuit is not used, it becomes a horizontal synchronous signal input or a complex synchronous signal input.)
18	SEP C	Synchronous separation circuit bias voltage terminal	Terminal to monitor built-in synchronous separation circuit bias voltage.
19	SEP OUT	Complex synchronous signal output terminal	Terminal to output a complex synchronous signal of built-in synchronous separation circuit ([H] when internally synchronized at MOD1 : [H], [L] output when externally synchronized) (When the built-in synchronous separation circuit is not used, SYNIN input signal is output.)
20	SEP IN	Vertical synchronous signal input terminal	Terminal to input a vertical synchronous signal by integrating the output signal of SEPOUT terminal. Connect the integration circuit between SEPOUT terminals. Fix it to VDD1 when not used.
21	CTRL2	NTSC/PAL-M switching input terminal	Pin setting has a priority over switching of NTSC/PAL/PAL-M/PAL-N method. The NTSC method is selected after [L]= reset. NTSC/PAL/PAL-M/PAL-N method setting by a command is effective. [H] = PAL-M method.
22	CTRL3	SEPIN input control terminal	Terminal to control whether or not to input VSYNC signal into SEPIN input terminal. [L] = VSYNC inputted, [H] = VSYNC not inputted.
23	/RST	Reset input terminal	System reset input terminal. A pull-up resistor is built in (hysteresis input).
24	VDD1	Power supply terminal (+5V)	Power supply terminal (+5V : power supply for digital system)

● Extension Port

IC611 : BU2092 (VIDEO P.C.B.)

12-bit Serial In/Parallel Out Driver



No.	PORT	Name	Function	Power On	Power Off	Backup
1	VSS	VSS	Ground	---	---	---
2	DATA	DATA	Serial Data Input	I	I	I
3	CLOCK	CLOCK	Shift Clock of Data (Rise Edge Trigger)	I	I	I
4	LCK	LCK	Latch Clock of Data (Rise Edge Trigger)	I	I	I
5	Q0	VIA	VIDEO INPUT A	O	OL	OL
6	Q1	VIB	VIDEO INPUT B	O	OL	OL
7	Q2	VIC	VIDEO INPUT C	O	OL	OL
8	Q3	VRA	VIDEO REC OUT A	O	OL	OL
9	Q4	VRB	VIDEO REC OUT B	O	OL	OL
10	Q5	VRC	VIDEO REC OUT C	O	OL	OL
11	Q6	/VR1	VCR 1 REC OUT INHIBIT	O	OL	OL
12	Q7	/VR2	VCR 2 REC OUT INHIBIT	O	OL	OL
13	Q8	CMP0	VIDEO COMPONENT 0	O	OL	OL
14	Q9	CMP1	VIDEO COMPONENT 1	O	OL	OL
15	Q10	R/Z	REC/ZONE 2 (1/0)	O	OL	OL
16	Q11		Unconnected	O	OL	OL
17	/OE	/OE	Output Enable (Output "H" Level is OFF)	I	I	I
18	VDD	VDD	+5V	---	---	---



## ● ANODE CONNECTION

	16GA	15GA~1GA		16GB	15GB~1GB
P1A		1-1	P1B	MEMORY	1-1
P2A		2-1	P2B	TUNED	2-1
P3A		3-1	P3B	<input type="checkbox"/> (PS)	3-1
P4A		4-1	P4B	PS	4-1
P5A		5-1	P5B	<input type="checkbox"/> (PTY)	5-1
P6A		1-2	P6B	PTY	1-2
P7A		2-2	P7B	<input type="checkbox"/> (RT)	2-2
P8A		3-2	P8B	RT	3-2
P9A		4-2	P9B	<input type="checkbox"/> (CT)	4-2
P10A	A	5-2	P10B	CT	5-2
P11A	B	1-3	P11B	STEREO	1-3
P12A	-	2-3	P12B	AUTO	2-3
P13A	-	3-3	P13B	EON	3-3
P14A	▷ (PHONO)	4-3	P14B	PTY HOLD	4-3
P15A	▷ (CD)	5-3	P15B	NEWS	5-3
P16A	▷ (TUNER)	1-4	P16B	INFO	1-4
P17A	▷ (CD-R)	2-4	P17B	AFFAIRS	2-4
P18A	▷ (MD/TAPE)	3-4	P18B	SPORT	3-4
P19A	▷ (DVD)	4-4	P19B	BASS	4-4
P20A	◁ (D-TV/LD)	5-4	P20B	P. DIRECT	5-4
P21A	◁ (CABLE)	1-5	P21B	ZONE 2	1-5
P22A	◁ (SAT)	2-5	P22B	SLEEP	2-5
P23A	◁ (VCR1)	3-5	P23B	-	3-5
P24A	◁ (VCR2/DVR)	4-5	P24B	-	4-5
P25A	◁ (V-AUX)	5-5	P25B	-	5-5
P26A	S1	1-6	P26B	-	1-6
P27A	-	2-6	P27B	-	2-6
P28A	-	3-6	P28B	-	3-6
P29A	-	4-6	P29B	-	4-6
P30A	-	5-6	P30B	-	5-6
P31A	-	1-7	P31B	-	1-7
P32A	-	2-7	P32B	-	2-7
P33A	-	3-7	P33B	-	3-7
P34A	-	4-7	P34B	-	4-7
P35A	-	5-7	P35B	-	5-7