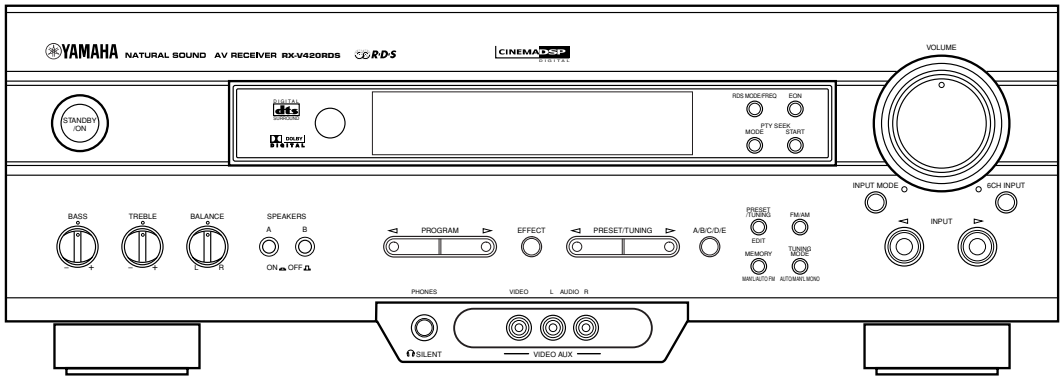
AV RECEIVER
RX-V420/RX-V420RDS/ HTR-5440/HTR-5440RDS
SERVICE MANUAL



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.

■ CONTENTS

このサービスマニュアルは、エコマーク認定の再生紙を使用しています。
This Service Manual uses recycled paper.

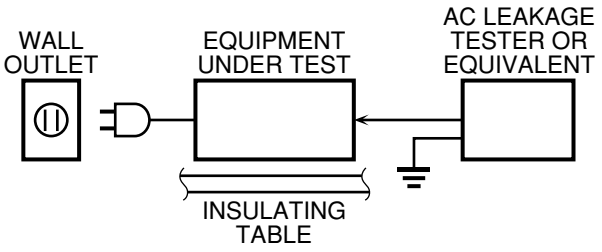
100754

YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan

■ TO SERVICE PERSONNEL

1. Critical Components Information
   Components having special characteristics are marked ⚠ 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 0.15µF.
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



WARNING: CHEMICAL CONTENT NOTICE!

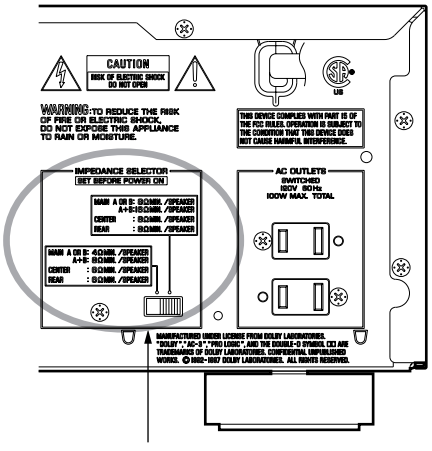
The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and /or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects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

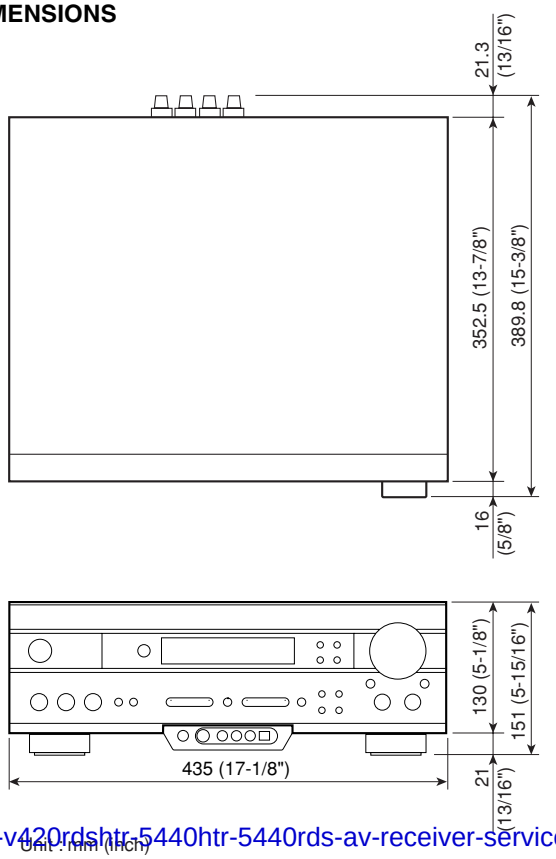
■ IMPEDANCE SELECTOR



IMPEDANCE SELECTOR

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

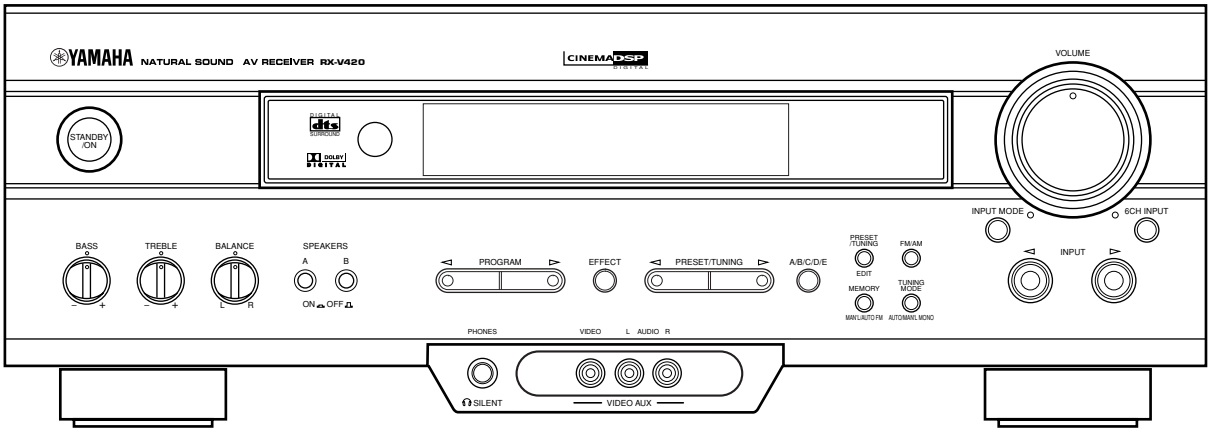
• DIMENSIONS



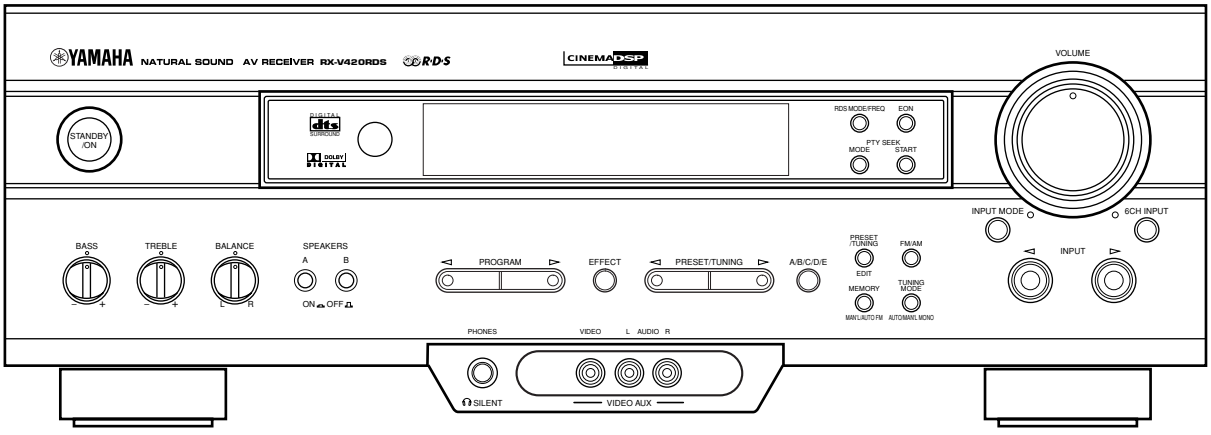
Unit : mm (inch)

■ FRONT PANELS

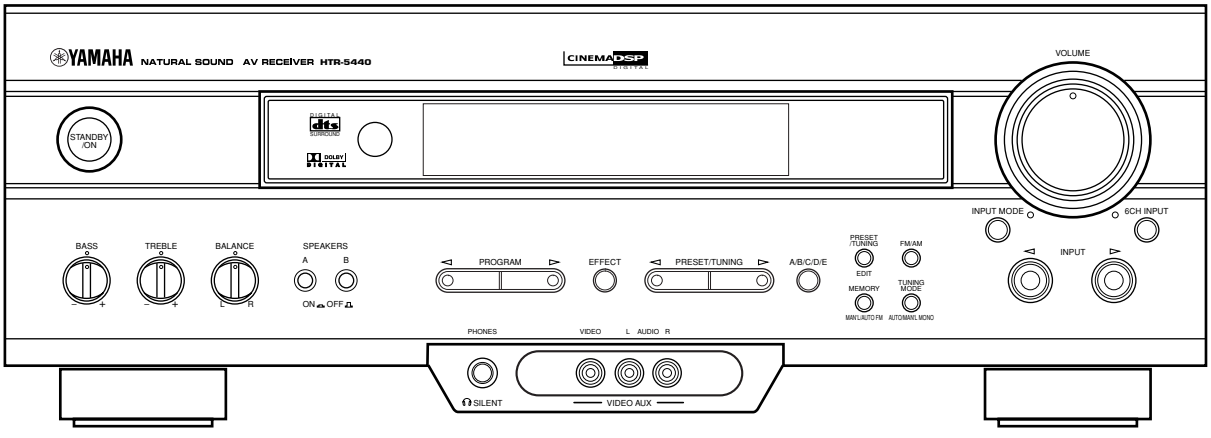
RX-V420 (U, C, A, R, T models)



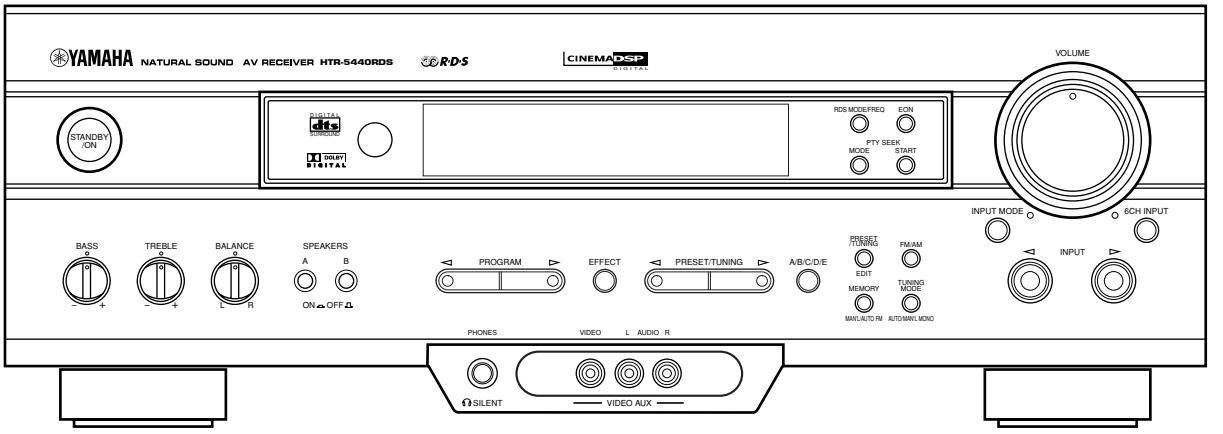
RX-V420RDS (B, G models)



HTR-5440 (U, C, A, R, T models)

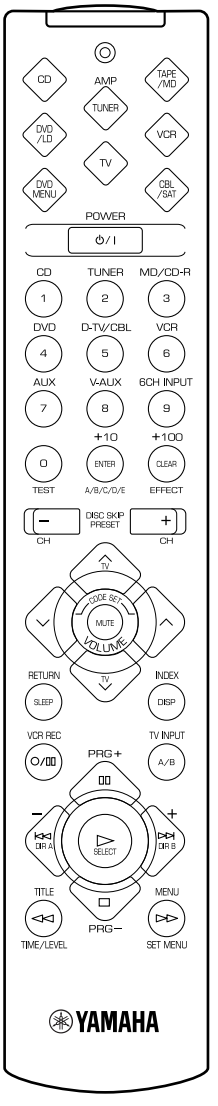


HTR-5440RDS (G model)

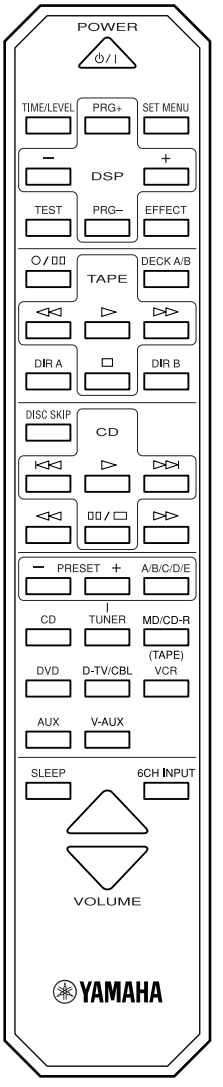


■ REMOTE CONTROL TRANSMITTER

U, C, A, R, T models

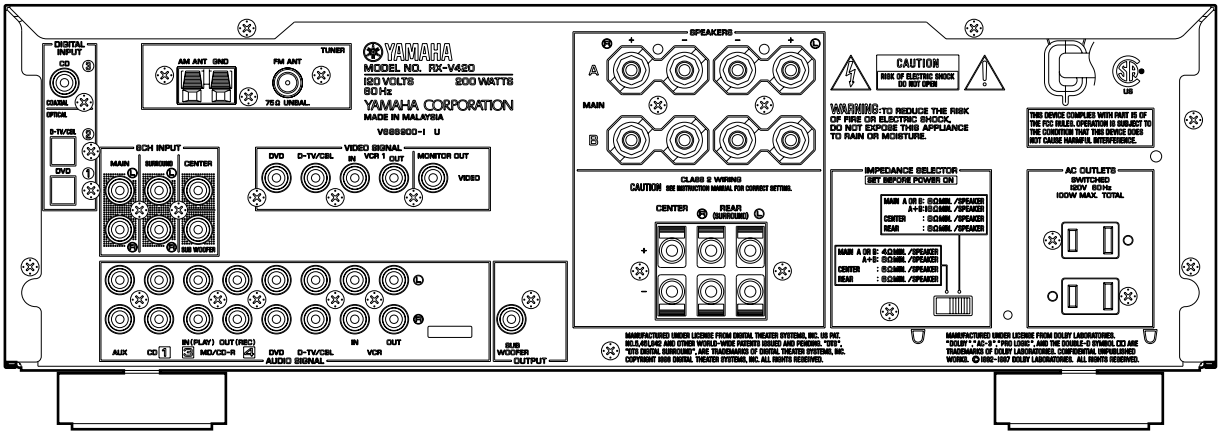


B, G models

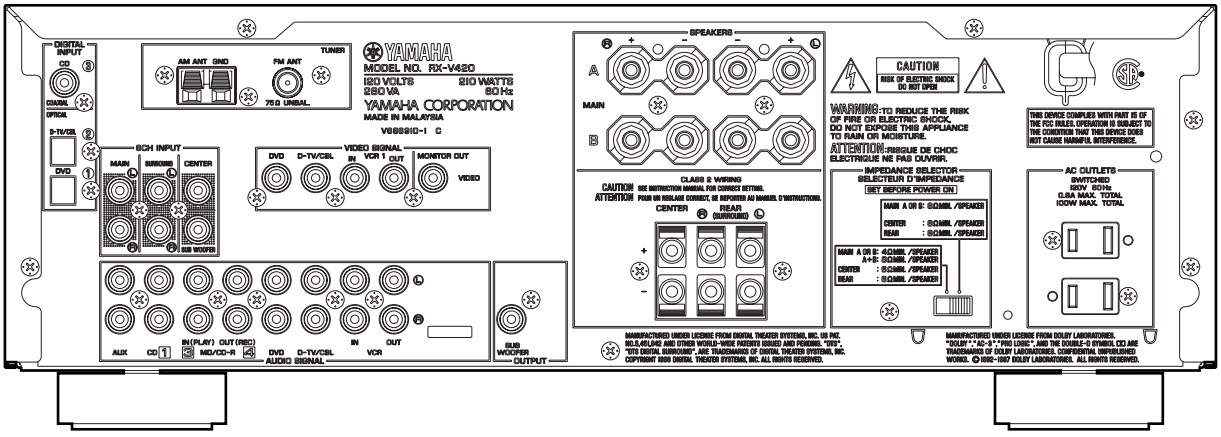


■ REAR PANELS

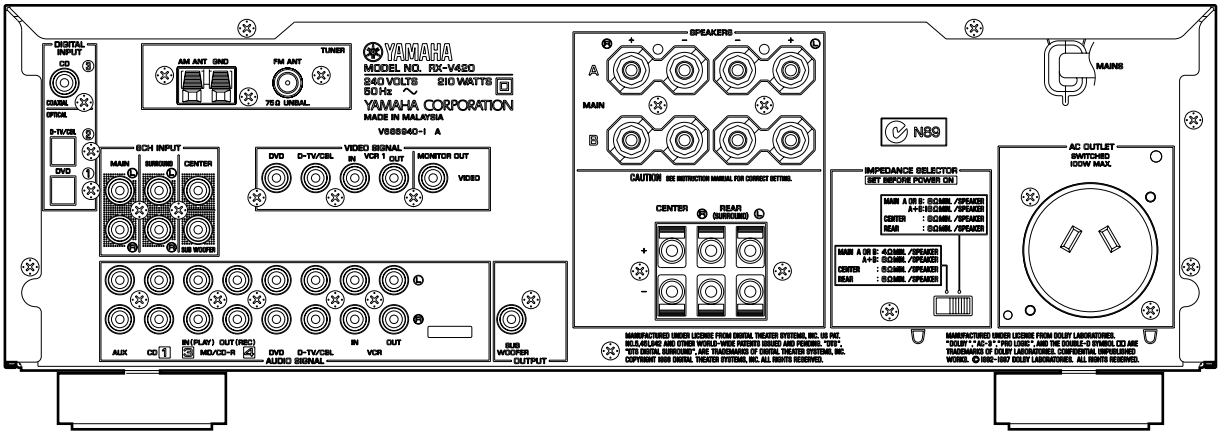
U model



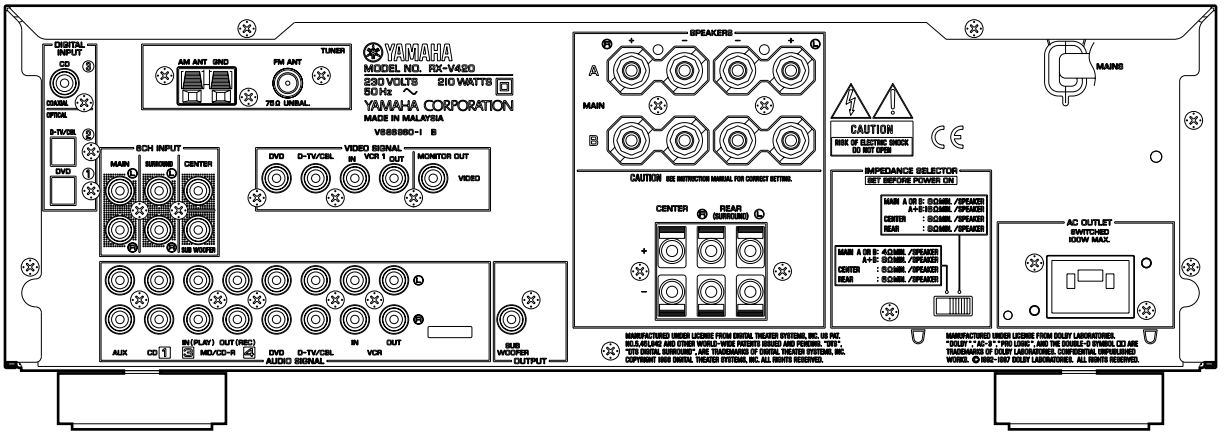
C model



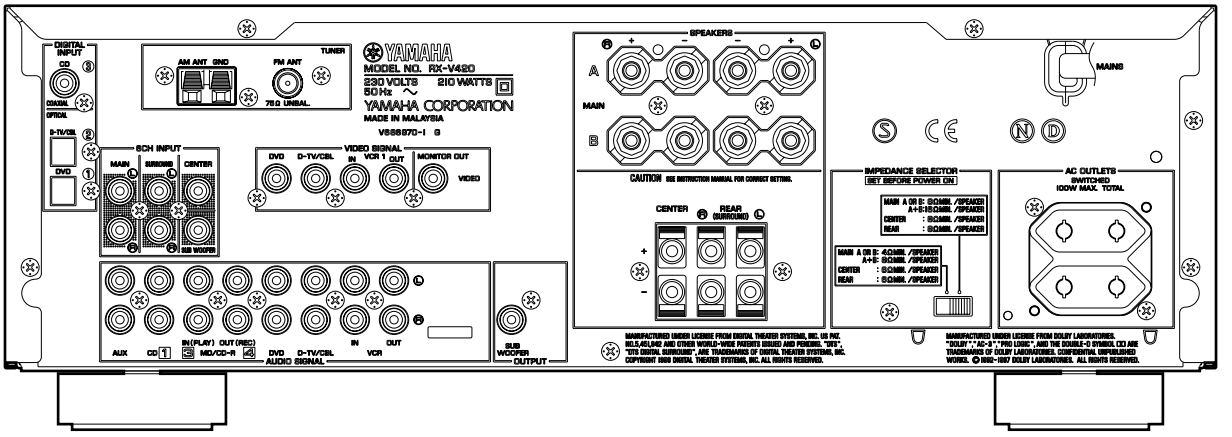
A model



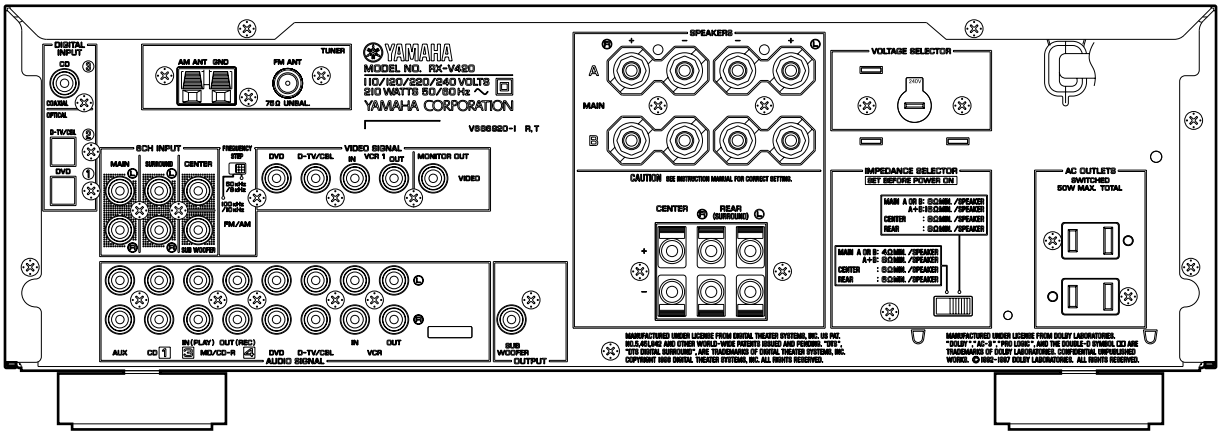
B model



G model



R, T model



■ SPECIFICATIONS

■ Audio Section

Minimum RMS Output Power (Power Amp. Section)
(20 Hz to 20 kHz, 0.06% THD, 8 ohms)
MAIN ..... 65W + 65W
CENTER 65W
REAR ..... 65W + 65W
(1 kHz, 0.09% THD, 8 ohms)
MAIN ..... 70W + 70W
CENTER 70W
REAR ..... 70W + 70W

Maximum Power (EIAJ) [R, T models]
(1 kHz, 10% THD, 8 ohms)
MAIN ..... 95W + 95W
CENTER 95W
REAR ..... 95W + 95W

Dynamic Power Per Channel (IHF)
MAIN L/R (8/6/4/2 ohms)
[U model] ..... 95/115/135/155 W
[C, A, B, G, R, T models] ..... 90/110/130/150 W

DIN Standard Output Power Per Channel
MAIN L/R (1 kHz, 0.7% THD, 4 ohms)
[G model] ..... 95W + 95W

Dynamic Headroom
8 ohms
[U, C models] ..... 1.18 dB

IEC Power
MAIN L/R (1 kHz, 0.06% THD, 8 ohms)
[G model] ..... 67W + 67W

Damping Factor
MAIN L/R (20 Hz to 20 kHz, 8 ohms) ..... 60 or more

Input Sensitivity / Input Impedance
CD, etc. ..... 150 mV / 47 k-ohms
EXT. DECODER
MAIN L/R ..... 150 mV / 47 k-ohms
CENTER, SURROUND L/R, SUBWOOFER ... 150 mV / 40 k-ohms

Maximum Input Signal Level
CD, etc. (1 kHz, 0.5% THD, Effect On) ..... 2.2 V

Output Level / Output Impedance
REC OUT ..... 150 mV / 1.2 k-ohms
SUB WOOFER [MAIN SP: Small] ..... 4 V/1.2 k-ohms

Headphone Jack Rated Output / Impedance
1 kHz, 150 mV, 8 ohms ..... 0.47 V / 390 ohms

Frequency Response
CD, etc. to MAIN (20 Hz to 20 kHz) ..... 0 ± 0.5 dB

Total Harmonic Distortion
(20 Hz to 20 kHz, 35 W / 8 ohms)
CD, etc. (EFFECT OFF) to MAIN SP OUT ..... 0.025% or less

Signal to Noise Ratio (IHF-A network)
CD, etc. (Input shorted, Effect Off) to MAIN SP OUT
150 mV ..... 96 dB or more
250 mV ..... 100 dB or more

Residual Noise (IHF-A netwok)
MAIN L/R SP OUT ..... 150 µV or less

Channnel Separation
(Vol -30 dB, Effect Off)
CD, etc. (Input 5.1 k-ohms terminated, 1 kHz) ..... 60 dB or more
CD, etc. (Input 5.1 k-ohms terminated, 10 kHz) ..... 45 dB or more

Tone Control Characteristics
Bass: Boost/Cut ..... ±10 dB (50 Hz)
Turnover Frequency ..... 350 Hz
Treble: Boost/Cut ..... ±10 dB (20 kHz)
Turnover Frequency ..... 3.5 kHz

Filter Characteristics
MAIN, Rear SP Small (H.P.F.) ..... 90 Hz, 12 dB/oct.
SUBWOOFER (L.P.F.) ..... 90 Hz, 18 dB/oct.

■ Video Section

Video Signal Type
[U, C, R, T models] ..... NTSC
[A, B, G models] ..... PAL

Video Signal Level
..... 1 Vp-p / 75 ohms

Maximum Input Level
..... 1.5 Vp-p

Signal to Noise Ratio
..... 50 dB or more

Monitor Out Frequency Response
S-Video Signal Level ..... 5 Hz to 10 MHz, -3 dB

■ FM Section

Tuning Range
[U, C models] ..... 87.5 to 107.9 MHz
[A, B, G models] ..... 87.5 to 108.0 MHz
[R, T models] ..... 87.5 to 108.0 / 87.50 to 108.00 MHz

50 dB Quieting Sensitivity (IHF)
(100% Mod)
Mono ..... 2.0 µV (17.3 dBf)
Stereo ..... 25 µV (39.2 dBf)

Usable Sensitivity (IHF)
Mono ..... 1.0 µV (11.2 dBf)

Selectivity
at 400 kHz ..... 70 dB

Signal to Noise Ratio (IHF)
Mono / Stereo ..... 76 dB / 70 dB

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

Stereo Separation
1 kHz ..... 45 dB

Frequency Response
20 Hz to 15 kHz ..... +0.5 / -2 dB

Antenna Input
..... 75 ohms unbalanced

■ AM Section

Tuning Range
[U, C models] ..... 530 to 1,710 kHz
[A, B, G models] ..... 531 to 1,611 kHz
[R, T models] ..... 530 to 1,710 / 531 to 1,611 kHz

Usable Sensitivity
..... 300 µV/m

Antenna
..... Loop Antenna

■ General

Power Supply
[U, C models] ..... AC 120 V, 60 Hz
[R, T models] ..... AC 110/120/220/240 V, 50/60 Hz
[A model] ..... AC 240 V, 50 Hz
[B, G models] ..... AC 230 V, 50 Hz

Power Consumption
[U model] ..... 200 W
[C model] ..... 210 W / 280 VA
[R, T, A, B, G models] ..... 210 W

Maximum Power Consumption
(5ch Drive, 10% THD)
[R model] ..... 480 W

AC Outlets
2 switched outlets
[U, C, G models] ..... 100W max., total
[R, T models] ..... 50W max., total
1 switched outlet
[A, B models] ..... 100W max.

Dimensions (W x H x D)
..... 435 x 151 x 390 mm (17-1/8" x 5-15/16" x 15-3/8")

Weight
..... 9.5 kg (20 lbs. 15 oz.)

Accessories
Remote control transmitter, Manganese batteries, Indoor FM antenna, AM loop antenna

* Specifications are subject to change without notice due to product improvements.

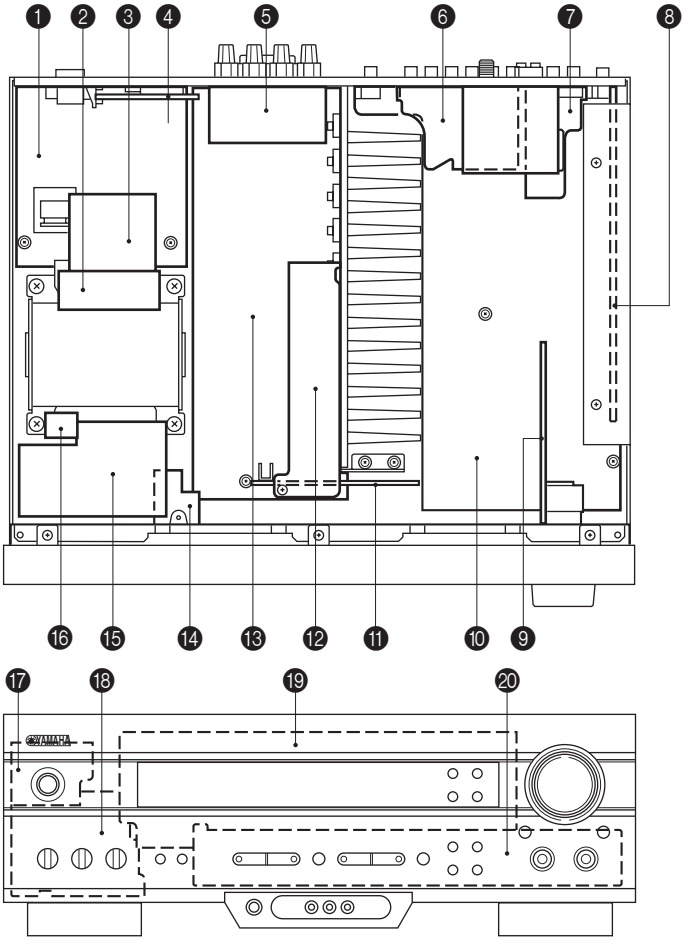
U ..... U.S.A. model
A ..... Australian model
G ..... European model
T ..... China model
C ..... Canadian model
B ..... British model
R ..... General model

• 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	LFE/BASS OUT	BOTH	SUBWOOFER/MAIN/BOTH
1E	MAIN LEVEL	NORMAL	NORMAL/–10dB
2.	HP TONE CTRL	BASS : 0dB	–6dB — +3dB (1dB step)
		TREBLE : 0dB	–6dB — +3dB
3.	I/O ASSIGNING		
3A	OPTICAL IN	(1) : DVD	CD, DVD, D-TV/CBL, VCR, AUX
		(2) : D-TV/CBL	CD, D-TV/CBL, VCR, AUX
3B	COAXIAL IN	(3) : CD	CD, MD/CD-R, DVD, D-TV/CBL, VCR, V-AUX, AUX
4.	INPUT MODE	DVD : AUTO	AUTO/LAST
5.	DOLBY DIGITAL SET		
5A	LFE LEVEL	SPEAKER : 0dB	–20dB — 0dB
5B	DYNAMIC RANGE	SPEAKER : MAX	MAX/STD/MIN
6.	DTS SET		
	LFE LEVEL	SPEAKER : 0dB	–10dB — +10dB
7.	SPEAKER DELAY TIME	CENTER : 0ms	0ms — 5ms (1ms step)
8.	DISPLAY SET	DIMMER : 0	–4 — 0
9.	MEMORY GUARD	OFF	ON/OFF

■ INTERNAL VIEW

❶ MAIN (2) P.C.B.
❷ MAIN (7) P.C.B.
❸ MAIN (5) P.C.B.
❹ MAIN (8) P.C.B.
❺ MAIN (4) P.C.B.
❻ INPUT (3) P.C.B.
❼ INPUT (6) P.C.B.
❽ DSP P.C.B.
❾ OPERATION (4) P.C.B.
❿ INPUT (1) P.C.B.
⓫ OPERATION (3) P.C.B.
⓬ INPUT (4) P.C.B.
⓭ MAIN (1) P.C.B.
⓮ MAIN (6) P.C.B.
⓯ INPUT (5) P.C.B.
⓰ OPERATION (8) P.C.B.
⓱ OPERATION (7) P.C.B.
⓲ OPERATION (6) P.C.B.
⓳ OPERATION (1) P.C.B.
⓴ OPERATION (2) P.C.B.



■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)
Disconnect the power cord from the AC outlet.

1. Removal of Top Cover (Fig. 1)
a. Remove 4 screws (①) and 4 screws (②).
b. Slide the Top Cover rearward to remove it.

2. Removal of Front Panel (Fig. 1)
a. Remove the VOLUME control knob.
b. Remove 8 screws (③) and 1 screw (④).
c. Remove the Front Panel forward while releasing 2 claws at the bottom.

3. Removal of Sub Chassis (Fig. 1)
Remove 4 screws (⑤) and then remove the Sub Chassis forward.

4. Removal of DSP P.C.B. (Fig. 2)
a. Remove 6 screws (⑥) and 3 screws (⑦).
b. Remove the DSP P.C.B. upward together with the Shield Case.

5. Removal of MAIN (4) P.C.B. (Fig. 2)
Remove 2 screws (⑧). The Main (4) PCB can then be removed.

6. Removal of MAIN (1) P.C.B.
a. Remove 3 screws (⑦), 2 screws (⑧), 2 screws (⑨) and 11 screws (⑩). (Fig. 2)
b. Remove 2 screws (⑪) and 1 screw (⑫). (Fig. 3)
c. To check the MAIN (1) P.C.B., spread a rubber sheet and a cloth over it. Then place the MAIN (1) P.C.B. upside down on the cloth for checking it. (Fig. 4)

Note:
When DSP P.C.B., MAIN (4) P.C.B. and MAIN (1) P.C.B. have been removed from the chassis, the ground connection becomes open. Connect the ground of each P.C.B. to the chassis by using a lead wire.

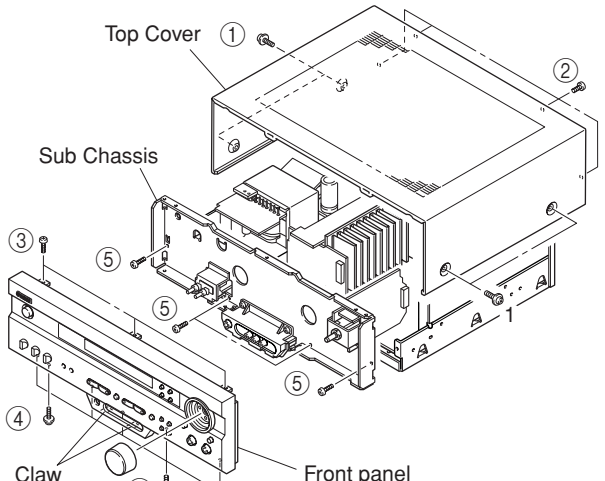


Fig. 1

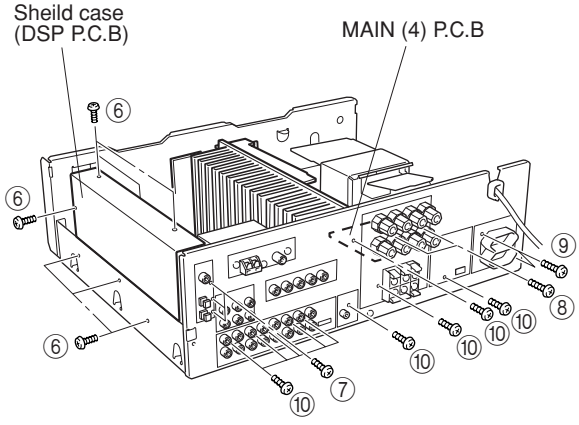


Fig. 2

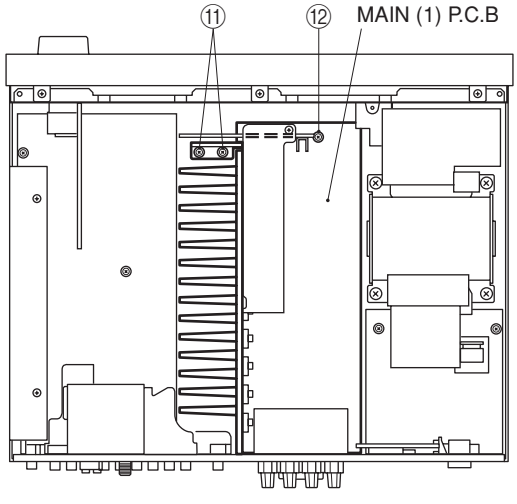


Fig. 3

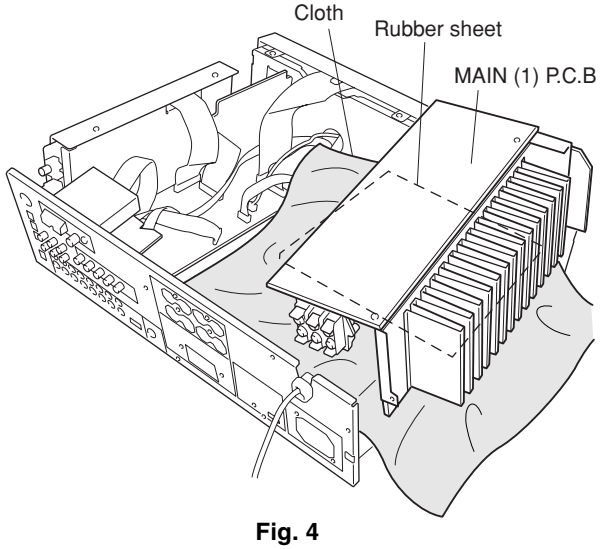


Fig. 4

■ SELF DIAGNOSIS FUNCTION (DIAG)

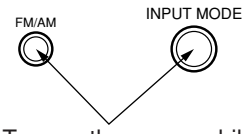
There are 14 DIAG menu items each of which has sub-menu items. Listed in the table below are menu items and sub-menu items.

No	DIAG menu	sub-menu	Remote control code (key)
1	DSP THROUGH 1.ANALOG BYPAS	1. ANALOG BYPASS	7A-88 (PRG 1)
		2. M, C, R, SW CH	7A-89 (PRG 2)
		3. Main HPF	7A-8A (PRG 3)
		4. FULL BIT	–
		5. FULL BIT F	–
2	FRONT CH 2.FRONT NORMAL	1. FRONT NORMAL	7A-8B (PRG 4)
		2. FRONT MIX	7A-8C (PRG 5)
3	RAM THROUGH 3.RAM 0DB	RAM 0dB (2ch/Multi)	7A-10 (PRESET+)
4	PRO LOGIC 4.PRO LOGIC	YSS928	7A-8D (PRG 6)
5	MARGIN CHECK 5.MAIN 3DB	1. MAIN 3dB Margin	7A-11 (PRESET-)
		2. MAIN 12dB Margin	7A-12 (P. PAGE)
		3. MAIN 18dB Margin	7A-0C (CD FW)
6	MAIN MIX 6.CENTER->MAIN	1. CENTER -> MAIN	7A-00 (TAPE PLAY)
		2. SW -> MAIN	7A-8E (PRG 7)
7	OTHER INPUT 7.EXTERNAL DEC	EXTERNAL DECODER	7A-8F (PRG 8)
8	DISPLAY CHECK	1. VFD DISP OFF (All segments OFF)	7A-01 (TAPE RW)
		2. VFD DISP ALL (All segments ON 100%)	7A-02 (TAPE FW)
		3. VFD DIMMER (All segments ON 50%)	–
		4. CHECKED PATTERN1 (ON in lattice)	7A-03 (TAPE STOP)
		5. CHECKED PATTERN2 (ON in lattice)	–
9	MANUAL TEST 9. TEST ALL	1. TEST ALL	7A-90 (PRG 9)
		2. TEST MAIN L	7A-04 (TAPE PAUSE)
		3. TEST CENTER	7A-05 (TAPE MUTE)
		4. TEST MAIN R	7A-06 (TAPE A/B)
		5. TEST REAR R	7A-07 (TAPE DIR A)
		6. TEST REAR L	7A-08 (CD PLAY)
		7. TEST LFE	7A-09 (CD STOP)
10	PRESET 10.PRESET INHI	1. PRESET INHIBIT (memory initialization inhibited)	–
		2. PRESET RESERVED (memory initialized)	7A-57 (SLEEP)
11	AD DATA CHECK DC:007 PS:025	1. DC/PS (protection)	7A-0B (CD SKIP-)
		2. IMP/PL (impedance/power limiter)	–
		3. 0/1/2 (panel key)	–
12	IF STATUS IST:3300020000	1. IST (internal status)	–
		2. CS1 (channel status 1)	–
		3. CS2 (channel status 2)	–
		4. CS3 (channel status 3)	–
		5. CS4 (channel status 4)	–
		6. CS5 (channel status 5)	–
		7. BI1 (BSI-DD 1)	–
		8. BI2 (BSI-DD 2)	–
		9. BI3 (BSI-DD 3)	–
		10. BI4 (BSI-DD 4)	–
		11. BS1 (BSI-DTS 1)	–
		12. BS2 (BSI-DTS 2)	–
		13. BS3 (BSI-DTS 3)	–
		14. BS4 (BSI-DTS 4)	–
		15. YS1 (YSS928-1)	–
		16. YS2 (YSS928-2)	–
		17. YS3 (YSS928-3)	–
13	DSP RAM CHECK BUS CHECK:NOER	BUS CHECK	7A-0A (CD SKIP+)
14	VERSION/CHECK SUM/PORT VER:B111A FS62	1. VER. (Version information)	7A-0D (CD REW)
		2. 1/2 (Checksum 1/2)	–
		3. PORT (Port check)	–

• Starting DIAG

Press the “POWER ” (STANDBY/ON) key of the main unit while pressing the “FM/AM ” key and the “INPUT MODE ” key simultaneously, and DIAG will be activated.

Keys of main unit



Turn on the power while pressing these keys.

• Starting DIAG in the protection cancel mode

If the protection function activates and causes hindrance to trouble diagnosis, disable 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 disabled.)

Press the “POWER" (STANDBY/ON) key while pressing the “FM/AM" key and the “INPUT MODE" key simultaneously. At this time, keep pressing the “FM/AM" key and the “INPUT MODE" for 3 seconds or longer.

In this mode, “SLEEP” in the FL display of the main unit flashes.

CAUTION!

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

• Canceling DIAG

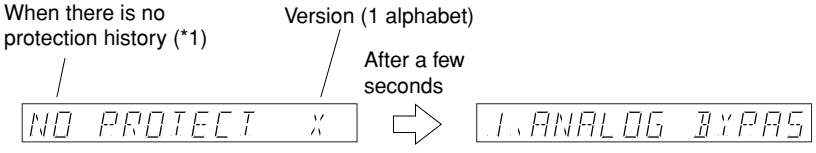
Turn off the power by pressing the “POWER” (STANDBY/ON) key of the main unit or the “STANDBY” key of the remote control unit.

CAUTION: When canceling this function, check that DIAG menu No.10 PRESET (memory initialization inhibited/reserved) has been set. [To keep the user memory, be sure to select “INHI” (initialization inhibited) from the No.10 PRESET menu before canceling the DIAG function.]

• Display at the start of DIAG

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

Opening message **DIAG menu display**

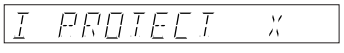


(*1) If a protection function history has been recorded, the type of the protection function and the voltage value recorded last are displayed.

If the protection function activates after DIAG has been started and the power is turned off;

When the protection function (*2) activates, the protection function history appears on the 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 display

(When the power is turned on without this abnormality corrected, the protection function activates the moment the power relay is turned on to shut off the power relay. The display will not light.)

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.

PS PRT :000 %

PS PRT display

(When the power is turned on without this abnormality corrected, the protection function activates about 1 second later to shut off the power relay. Display may not light 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 the following sources is detected, it is possible to determine where an abnormality exists.

Main (5): Transformer secondary winding
CB222 (AC voltage)

Input (4): Regulated power supplies
±25, +12A, +12B, -12, +5D

DC PRT :000 %

DC PRT display

(When the power is turned on without this abnormality corrected, the protection function activates about 3 seconds later to shut off the power relay.)

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

Besides the above possible causes, the cause may be a disconnected connector or around the CPU.
PS PRT and DC 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.11 AD DATA CHECK.

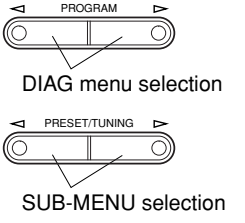
• Protection history

When the protection function has activated, its history is stored in memory with a memory 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 should always be cleared before returning the unit from service.

The protection history is cleared when DIAG is cancelled by selecting "RSRV" (Memory initialization) from the setting items of the DIAG menu No.10 PRESET or when the backup data is erased.

• Operation procedure of DIAG menu and SUB-MENU

There are 14 MENU items and some SUB-MENU items as well.



DIAG menu selection

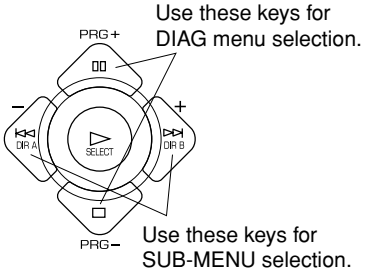
Main unit: Select the menu using ∞ (Forward) and ◁ (Reverse) keys of PROGRAM.

Remote control unit: Select the menu using ▯▯ (Forward) and ▭ (Reverse) keys.

SUB-MENU selection

Main unit: Select the sub-menu using ∞ (Forward) and ◁ (Reverse) keys of PRESET/TUNING.

Remote control unit: Select the sub-menu using ▷▷| (Forward) and |◁◁ (Reverse) keys.



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

• Functions available during DIAG

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

- Input selection, 6CH input
- Center/Rear/Sub-woofer level adjustment
- Muting
- Power on/off operation

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

* It is possible to confirm Menu No.12 "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 : DVD (6CH INPUT OFF)
- Center/Rear/Sub-woofer level : 0dB
- Audio mute : OFF
- Speaker settings
  - MAIN, CENTER, REAR : LARGE
  - BASS OUT : BOTH
  - MAIN LEVEL : Normal (0dB)
- DIAG menu : DSP THROUGH (1. ANALOG BYPASS)

• Details of DIAG menu

1. DSP THROUGH

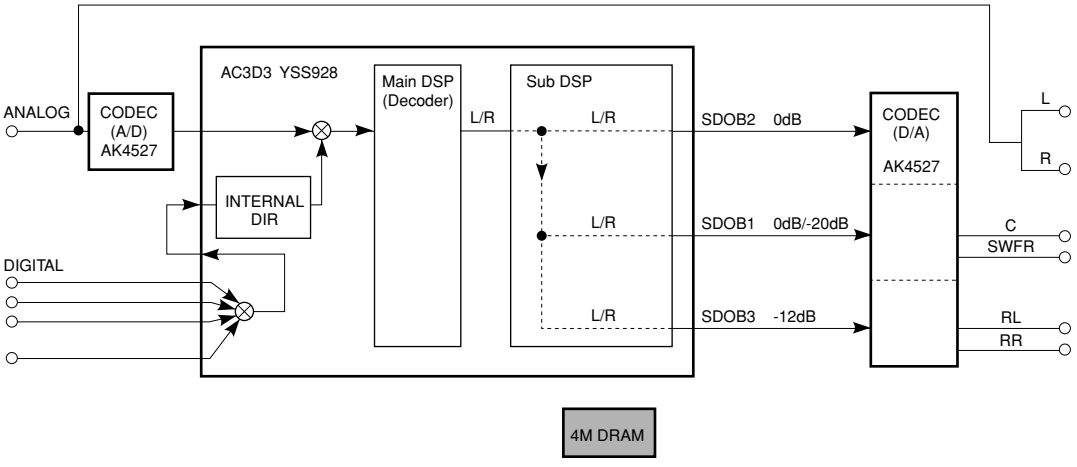
There are 5 sub-menu items.

ANALOG BYPASS [Remote control code: 7A-88 (PRG 1)]

- 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 block.

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	13.5 dBV	- ∞	- ∞	- ∞



SDOxx represents a terminal name of AC3D3.

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

M, C, R, SW CH [Remote control code: 7A-89 (PRG 2)]

- 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/SWF, RL/RR signals are output through DSP (see the signal path in the figure below) without using the external DRAM. (Head margin included)

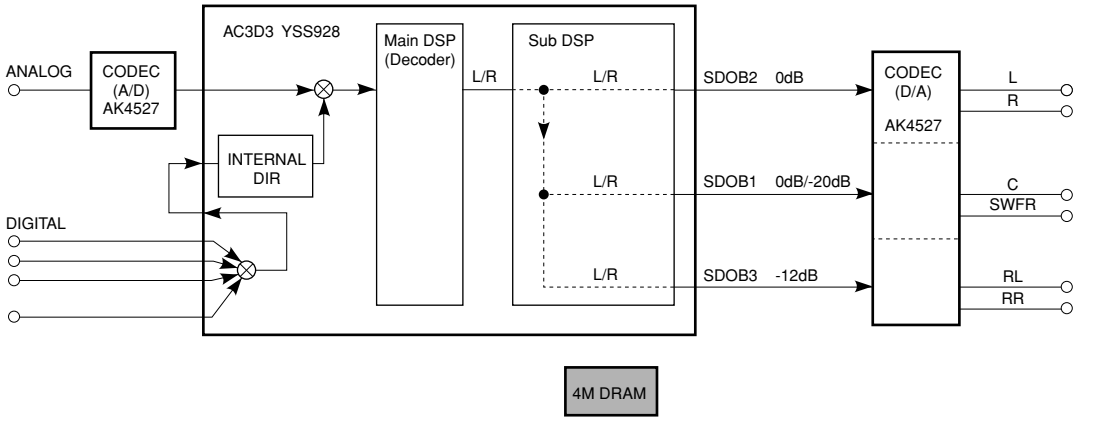
Head margin:

L/R: 0dBFS, Center: 0dBFS, RL/RR: -12dBFS, SWFR: Add L/R signal at -20dBFS.

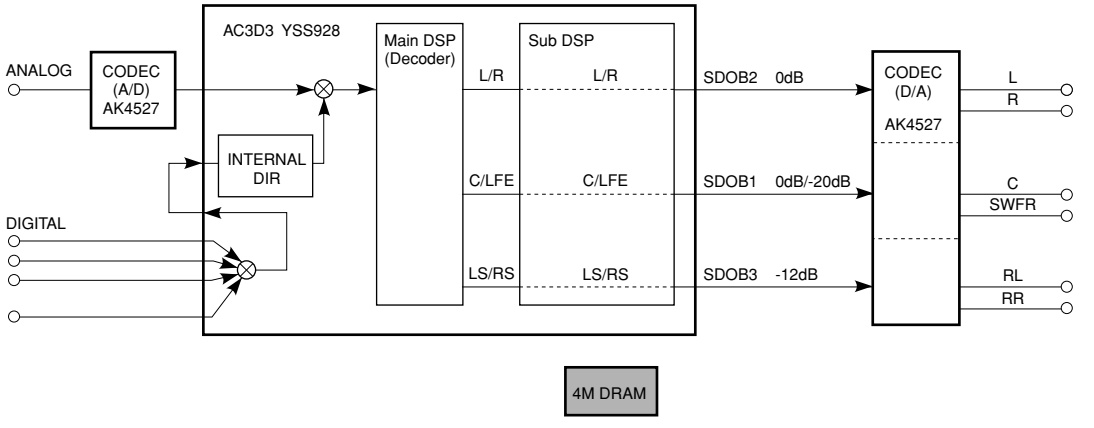
Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	22.5 dBV	12.5 dBV	10.0 dBV	-6.5 dBV

[2ch source]



[Multi ch source] AC3D3 outputs signals using DOLBY DIGITAL/dts decode operation.



SDOxx represents a terminal name of AC3D3.

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

MAIN HPF [Remote control code: 7A-8A (PRG 3)]

1.MAIN HPF

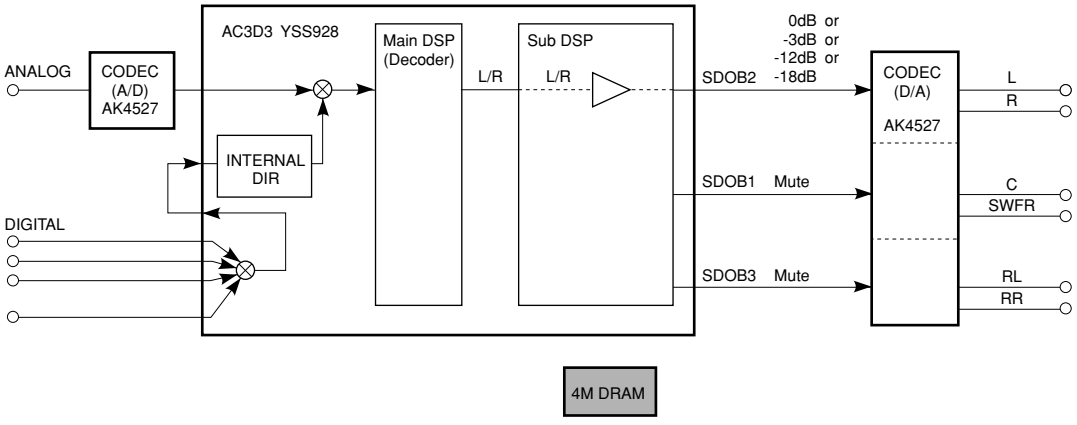
- MAIN HPF is turned on and output. (Head margin included)

Head margin:
L/R: 0/-3/-12/-18dBFS, Center: Mute, RL/RR: Mute, SWFR: Mute.

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	22.5 dBV	- ∞	- ∞	- ∞

[2ch/Multi] *Multi: Lo/Ro Down Mix



SDOxx represents a terminal name of AC3D3.

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

FULL BIT [Remote control code: –]

1.FULL BIT

- The signal is output in digital full bit without including the head margin.
- The same applies as “M, C, R, SW CH” except that the digital data is output in full bit at D/A.

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	22.5 dBV	16.0 dBV	22.0 dBV	13.5 dBV

FULL BIT F [Remote control code: –]

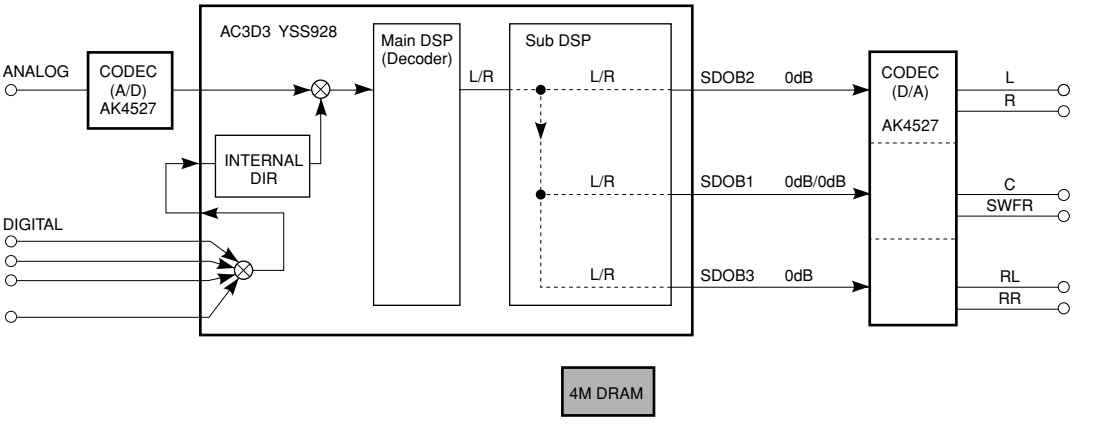
1.FULL BIT F

- The front channel signal is output in full bit to the main channel.

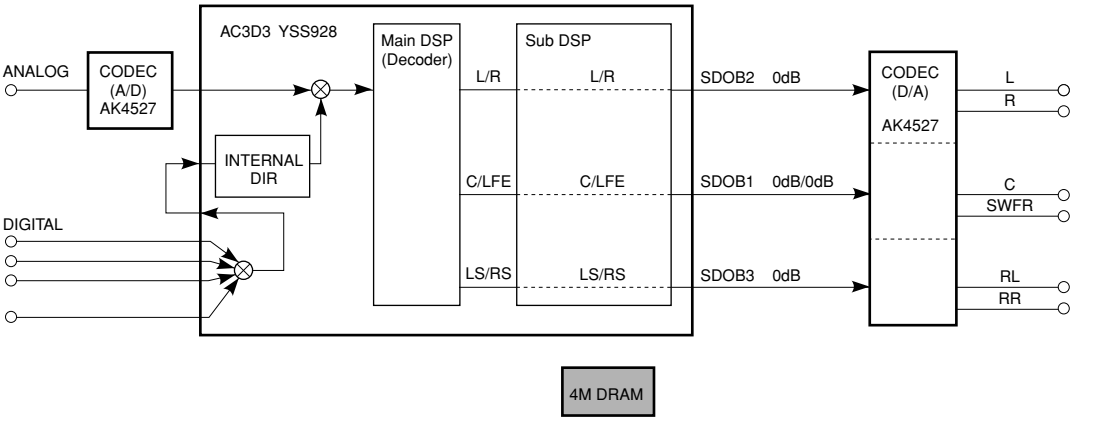
Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	22.5 dBV	16.0 dBV	22.0 dBV	13.5 dBV

[2ch source]



[Multi ch source] AC3D3 outputs signals using DOLBY DIGITAL/dts decode operation.



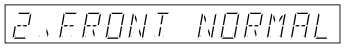
SDOxx represents a terminal name of AC3D3.

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

2. FRONT CH

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 front channel signal is output in full bit to the main channel.
Signals are output through DSP (see the signal path in the figure below) without using the external DRAM. (Head margin included)

FRONT NORMAL [Remote control code: 7A-8B (PRG 4)]



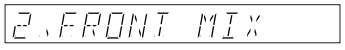
- The head margin is included and the front channel signal is output to the main channel.

Head margin:
L/R: Mute, Center: Mute, RL/RR: Mute, SWFR: Mute.

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	- ∞	- ∞	- ∞	- ∞

FRONT MIX [Remote control code: 7A-8C (PRG 5)]



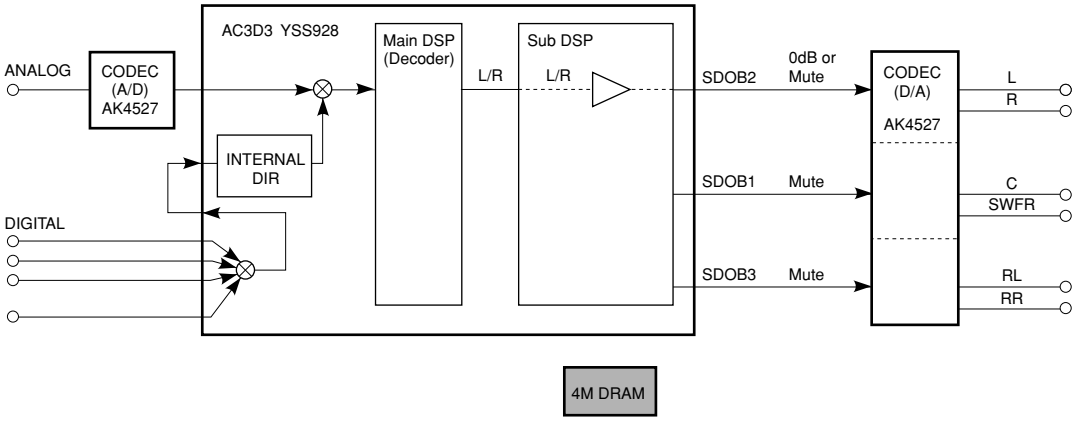
- The head margin is included and the front channel signal is output to the main channel.

Head margin:
L/R: 0dBFS, Center: Mute, RL/RR: Mute, SWFR: Mute.

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	22.5 dBV	- ∞	- ∞	- ∞

[2ch/Multi] *Multi: Lo/Ro Down Mix



SDOxx represents a terminal name of AC3D3.

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

3. RAM THROUGH

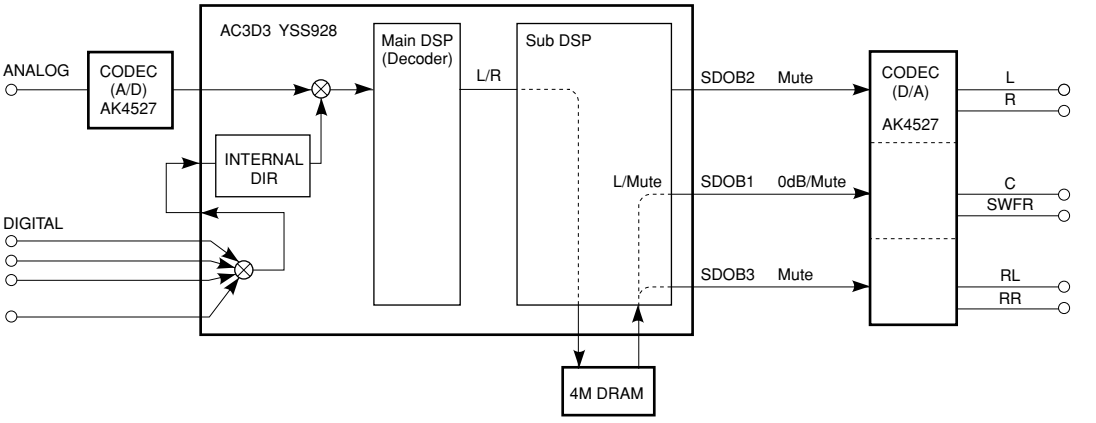
The input signal is automatically identified and switched in the priority order of dts ➔ DOLBY DIGITAL ➔ PCM AUDIO ➔ Analog (A/D) according to the signal detection.
The Center and RL/RR signals are output through the external DRAM.

RAM 0dB [REMOTE CONTROL CODE: 7A-10 (PRESET+)]

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	-1.4 dBV	16.0 dBV	- ∞	- ∞

[2ch/Multi] *Multi: Lo/Ro Down Mix



4. PRO LOGIC [YSS928]

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.
Operation conforming to the ordinary Dolby Normal sound field is provided.

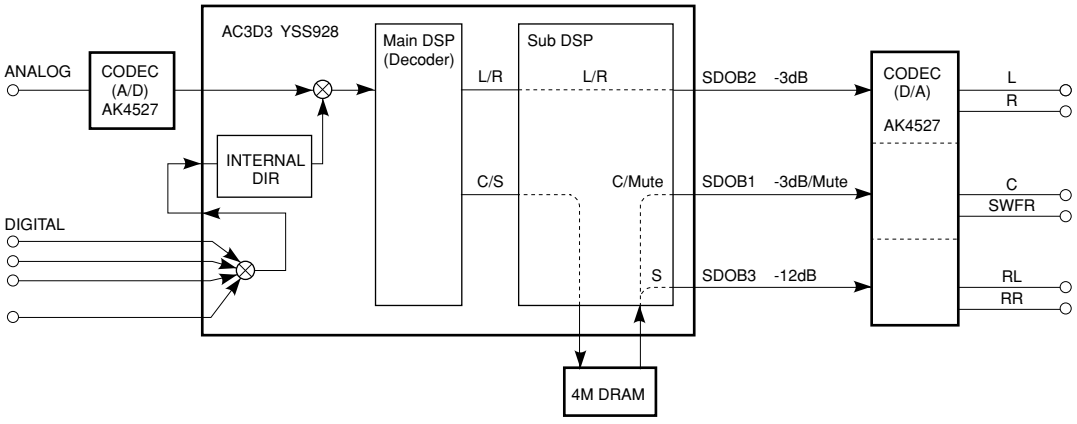
[REMOTE CONTROL CODE: 7A-8D (PRG 6)]

- Same as ordinary Pro Logic except that the auto input balance function is off.

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	-18.0 dBV	16.0 dBV	- ∞	- ∞

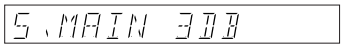
[2ch] *Multi: All Mute



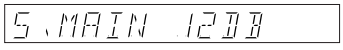
5. MARGIN CHECK

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 3 sub-menu items.
The head margin of the main channel can be set to -3dB/-12dB/-18dB.

MAIN 3dB Margin [Remote control code: 7A-11 (PRESET-)]



MAIN 12dB Margin [Remote control code: 7A-12 (P. PAGE)]

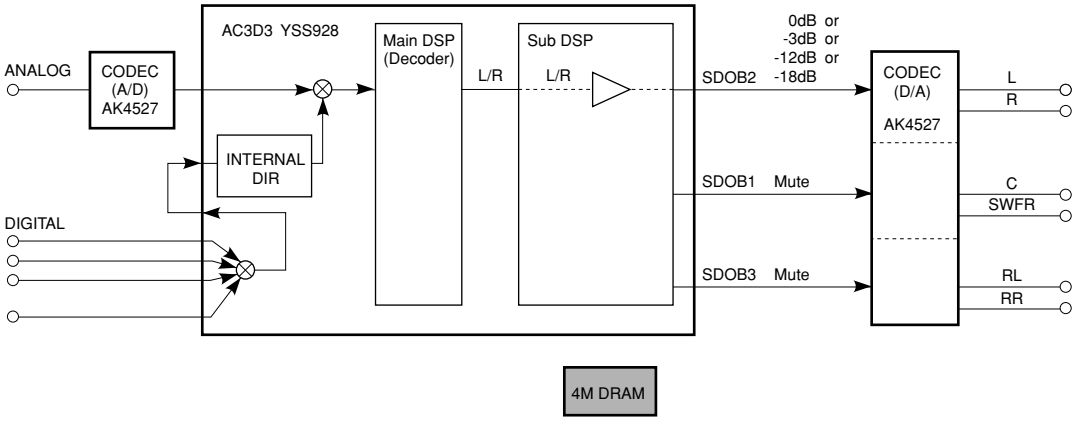


MAIN 18dB Margin [Remote control code: 7A-0C (CD FW)]

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Sub-menu	Condition	L/R	CENTER	RL/RR	SWFR
MAIN 3dB	Both ch, -20 dBV, volume -10 dB	20 dBV	- ∞	- ∞	- ∞
MAIN 12dB	Both ch, -20 dBV, volume -10 dB	10.5 dBV	- ∞	- ∞	- ∞
MAIN 18dB	Both ch, -20 dBV, volume -10 dB	4.8 dBV	- ∞	- ∞	- ∞

[2ch/Multi] *Multi: Lo/Ro Down Mix



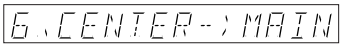
SDOxx represents a terminal name of AC3D3.

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

6. MAIN MIX

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 2 sub-menu items.
The center and SW signals are output through the main channel.

CENTER -> MAIN [Remote control code: 7A-00 (TAPE PLAY)]

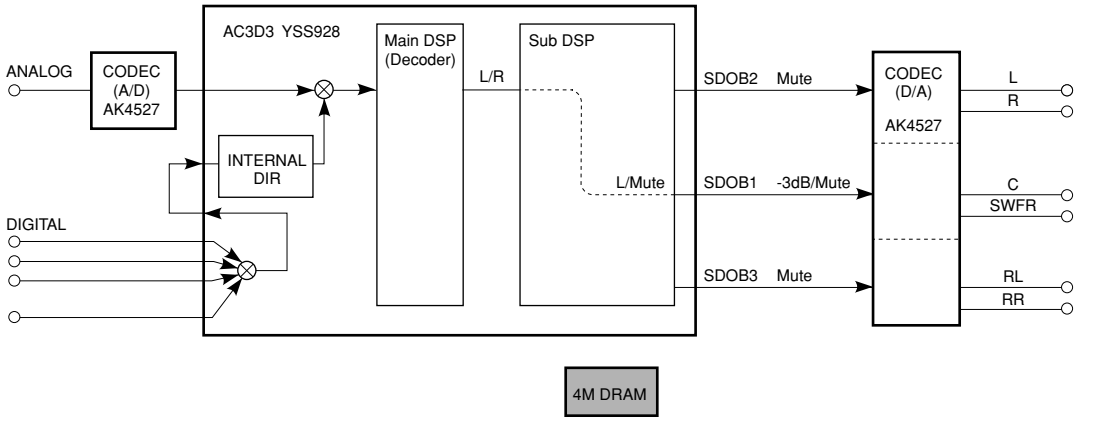


- The center signal is output through the main channel.

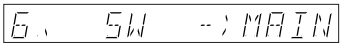
Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	0 dBV	13.0 dBV	- ∞	- ∞

[2ch/Multi] *Multi: Lo/Ro Down Mix



SW -> MAIN [Remote control code: 7A-8E (PRG 7)]

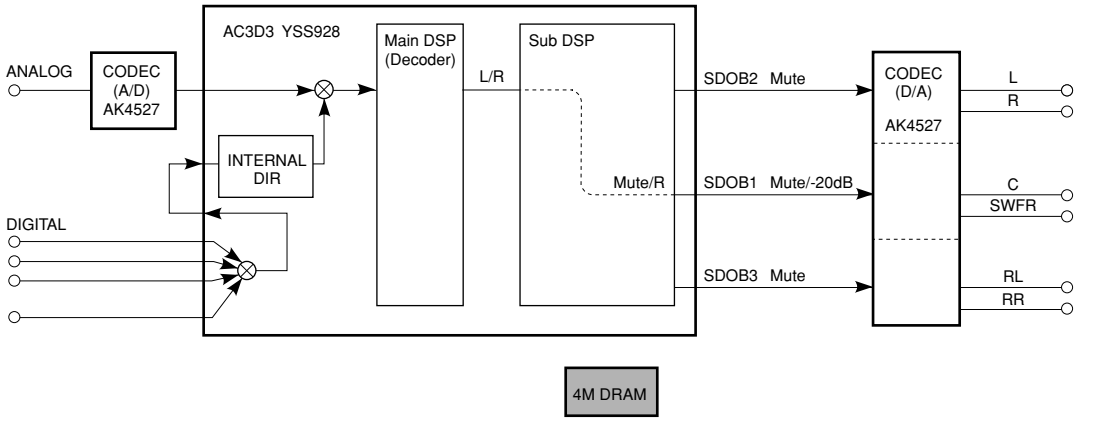


- The SW signal is output through the main channel.

Reference data
INPUT: DVD ANALOG
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	- ∞	- ∞	- ∞	-7.0 dBV

[2ch/Multi] *Multi: Lo/Ro Down Mix



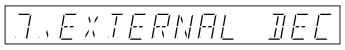
SDOxx represents a terminal name of AC3D3.

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

7. OTHER INPUT

The signal inputted through the 6CH INPUT terminals is output.

EXTERNAL DECODER [Remote control code: 7A-8F (PRG 8)]



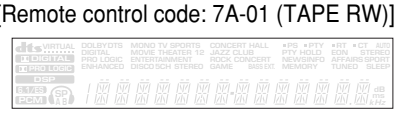
Reference data
INPUT: 6CH INPUT
SWFR: 50Hz, Others: 1kHz

Condition	MAIN L/R	CENTER	RL/RR	SWFR
Both ch, -20 dBV, volume -10 dB	13.5 dBV	13.5 dBV	13.5 dBV	-7.0 dBV

8. DISPLAY CHECK

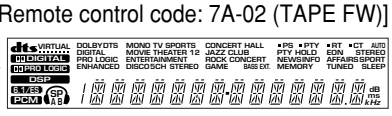
This program is used to check the FL display section. The display condition varies as shown below according to the sub-menu operation. The signals are processed using EFFECT OFF (The L/R signal is output using ANALOG MAIN BYPASS.)

[Remote control code: 7A-01 (TAPE RW)]

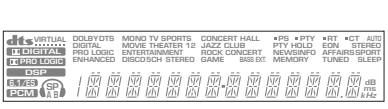


All segments OFF

[Remote control code: 7A-02 (TAPE FW)]

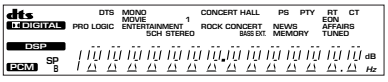


All segments ON (dimmer 100%)

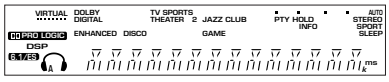


All segments ON (dimmer 50%)

[Remote control code: 7A-03 (TAPE STOP)]



Lighting of segments in lattice 1



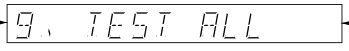
Lighting of segments in lattice 2

Segment conditions of the FL driver 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 lattice).

9. MANUAL TEST

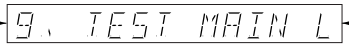
The noise generator with a built-in DSP outputs the test noise through the channels specified by the sub-menu.
The noise frequency for LFE is 35 to 250 Hz. Other than that, the center frequency is 800Hz.

ALL
[Remote control code: 7A-90 (PRG 9)]



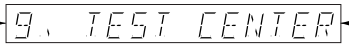
Noise is output from all channels.

MAIN L
[Remote control code: 7A-04 (TAPE PAUSE)]



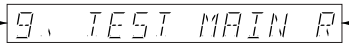
Noise is output from the MAIN L channel.

CENTER
[Remote control code: 7A-05 (TAPE MUTE)]



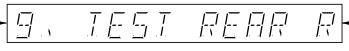
Noise is output from the CENTER channel.

MAIN R
[Remote control code: 7A-06 (TAPE A/B)]



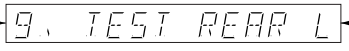
Noise is output from the MAIN R channel.

REAR R
[Remote control code: 7A-07 (TAPE DIR A)]



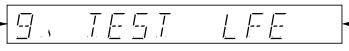
Noise is output from the REAR R channel.

REAR L
[Remote control code: 7A-08 (CD PLAY)]



Noise is output from the REAR L channel.

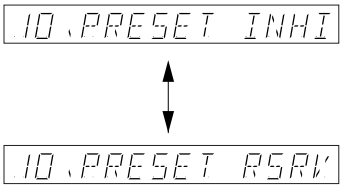
LFE
[Remote control code: 7A-09 (CD STOP)]



Noise is output from the SUB WOOFER channel.

10. PRESET

This menu is used to reserve and inhibit initialization of the back-up RAM. The signals are processed using EFFECT OFF. (The L/R signal is output using ANALOG MAIN BYPASS.)



PRESET INHIBIT (Initialization inhibited) [REMOTE CONTROL CODE: –]
RAM initialization is not executed. Select this sub-menu to protect the values set by the user.

PRESET RESERVED (Initialization reserved) [REMOTE CONTROL CODE: 7A-57 (SLEEP)]
Initialization of the back-up RAM is reserved. (Actually, initialization is executed next time when the power is turned on.) Select this sub-menu to reset when shipped out of the factory or to reset RAM.

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

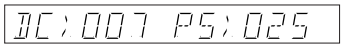
STATION		FM FACTORY PRESET DATA (MHz)	
PAGE	NO.	U, C, R, T	R, T, A, B, G
A/C/E	1	87.5	87.5
	2	90.1	90.1
	3	95.1	95.1
	4	98.1	98.1
	5	107.9	108.0
	6	88.1	88.1
	7	106.1	106.1
	8	107.9	108.0

STATION		AM FACTORY PRESET DATA (kHz)	
PAGE	NO.	U, C, R, T	R, T, A, B, G
B/D	1	630	630
	2	1080	1080
	3	1440	1440
	4	530	531
	5	1710	1611
	6	900	900
	7	1350	1350
	8	1400	1404

11. AD DATA CHECK

This menu is used to display the A/D conversion value of the main CPU which detects panel keys of the main unit and protection functions in % using the sub-menu. (Reference voltage 5V as 100%) During signal processing, the condition before execution is maintained.

When in 0/1/2 page, it is not possible to operate the keys of the main unit because the values of all keys are detected. During signal processing, the condition before execution of this menu is maintained.

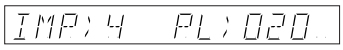


DC/PS (Detection of the protection function) [REMOTE CONTROL CODE: 7A-0B (CD SKIP-)]

DC: DC detect protection value (Normal value: 3 to 35)

PS: Power voltage protection value (Normal value: 120 to 170)

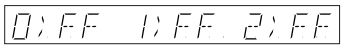
* If DC or PS is out of the normal value range, the protection function activates to turn off the power relay.



IMP/PL (Detection of impedance/Power limit) [Remote control code: –]

KY2: Detection of impedance switch

PL: The value of the power limit



0/1/2 (Panel key of main unit) [Remote control code: –]

A/D of the key fails to function properly when the standard value is deviated by ±4%. In this case, check the constant of partial pressure resistor, solder condition, etc. Refer to table 1.

[Table 1]

Display	K0	K1	K2
00	SEEK MODE	MEMORY	◁ PROGRAM
27	SEEK START	TUNING MODE	PROGRAM ∞
3F	EON	FM/AM	EFFECT
5A	RDS MODE	EDIT	INPUT MODE
73	–	A/B/C/D/E	◁ INPUT
8C	–	PRESET/TUNING ∞	INPUT ∞
A7	–	◁ PRESET/TUNING	6CH INPUT
FF	KEY OFF	KEY OFF	KEY OFF

12. IF STATUS

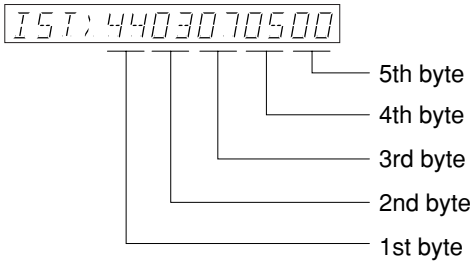
Using the sub-menu, the status data is displayed one after another in the hexadecimal notation.

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

* Numeric values in the figure example are for reference.

IST (Internal status) [REMOTE CONTROL CODE: –]

Indicates the status information of the microprocessor.



<1st byte> Digital input/output setting value

Upper 4 bits: REC OUT selected/lower 4 bits: INPUT selected

Numeric value	Selection	Numeric value	Selection	Numeric value	Selection	Numeric value	Selection
0	NONE	4	OPT3 (D-TV/CBL)	8	COAX1 (CD)	C	COAX3
1	FRONT (VIDEO AUX)	5	OPT4	9	COAX2	D	RF
2	OPT1 (MD/CDR)	6	OPT5	A	COAX4		
3	OPT2 (DVD)	7	OPT6	B	COAX5		

<2nd byte> Fs information of reproduction signal

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

<3rd byte> Audio code mode information of reproduction signal

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

<4th byte> Format information of reproduction signal

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

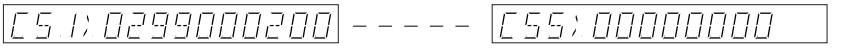
Display	Signal format
00	Analog (Unlock)
01	Incorrect digital (*1)
02	Digital Data
03	IEC1937 Data
04	PCM Audio
05	Dolby Digital
06	D.D.Karaoke
07	D.D.EX
08	RED dts
09	ORANGE dts
0A	dts ES
0B	NONE PCM

<5th byte> Signal processing status information

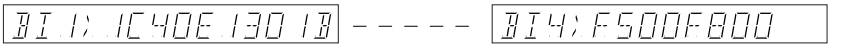
(*2): With digital signals other than 32kHz, 44.1kHz and 48kHz, through processing method is used for reproducible signals.

bit7	MUTE request	bit3	–
bit6	Red dts flashing	bit2	Through & bypass (*2)
bit5	6.1ch. field being processed	bit1	–
bit4	FULL MUTE (ON: 1)	bit0	dts analog mute

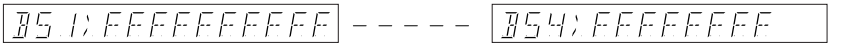
CS1-5 [Remote control code: -]: Indicates channel status information of the input signal (IEC60958).



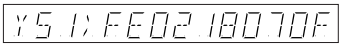
BI1-4 [Remote control code: -]: Indicates bit stream information included in the DOLBY DIGITAL signal.



BS1-4 [Remote control code: -]: Indicates bit stream information included in the dts signal.

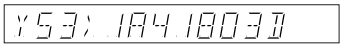


YS1-3 [Remote control code: -]: Indicates device status information of YSS928 (IC801). * The numeric value in the figure is an example for reference.



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

Byte No.	Function
1	IEC 1937 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

13. DSP RAM CHECK

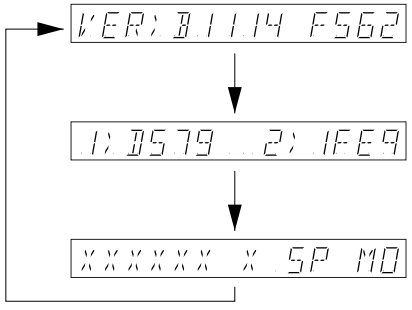
This menu is used to self-diagnose whether or not bus connection of YSS928 (IC801) and the external RAM (IC802) is made properly.
During signal processing, the status before execution of this menu is maintained.

Bus Check [Remote control code: 7A-0A (CD SKIP+)]
The address bus and the data bus are checked and the connection condition is displayed.
When no error is detected, "NOER" appears on display.

Display	Description
WAIT	Bus being checked.
NOER	No error detected.
DATA	Data bus shorted or open.
ADDR	Address bus shorted or open.

14. MICROPROCESSOR INFORMATION

There are 3 sub-menu items.
The version, checksum and the port specified by the microprocessor are displayed. The signal is processed using EFFECT OFF. The checksum is obtained by adding the data at every 16 bits for each program area and expressing the result as a 4-figure hexadecimal data.



Version [Remote control code: 7A-0D (CD REW)]
Release 1 figure / Main 2 figures / DSP 2 figures / Communication 1 figure / Boot manufacturer 1 figure / Boot 232c 1 figure

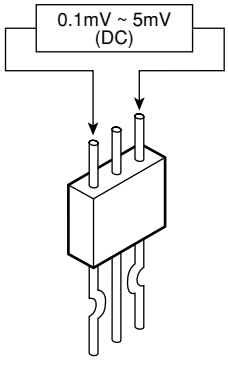
Checksum [Remote control code: –]
1 : All 2 : Program area

Port indication [Remote control code: –]
Model name, Destination, Headphone detection, FM stereo

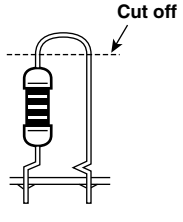
■ AMP ADJUSTMENT

Confirmation and Adjustment of Idling Current of Main (1) P. C. B.

- Right after the power is turned on, confirm that the voltages at R53, R55, R59, R65 and R67 are between 0.1mV and 5mV.
- If any exceed 5mV, cut R27, R33, R39, R43 or R47.
- Reconfirm that they are between 0.1mV and 5mV.
- The voltages should be 0.1mV ~ 5mV after the power has been on for 60 minutes.



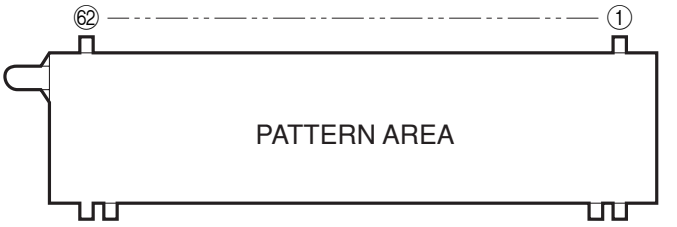
R53 (MAIN Lch)
R55 (MAIN Rch)
R67 (CENTER)
R59 (REAR Lch)
R65 (REAR Rch)



R27 (MAIN Lch)
R33 (MAIN Rch)
R47 (CENTER)
R39 (REAR Lch)
R43 (REAR Rch)

■ DISPLAY DATA

● **V301 : 10-BT-235GNK (V6840400)**



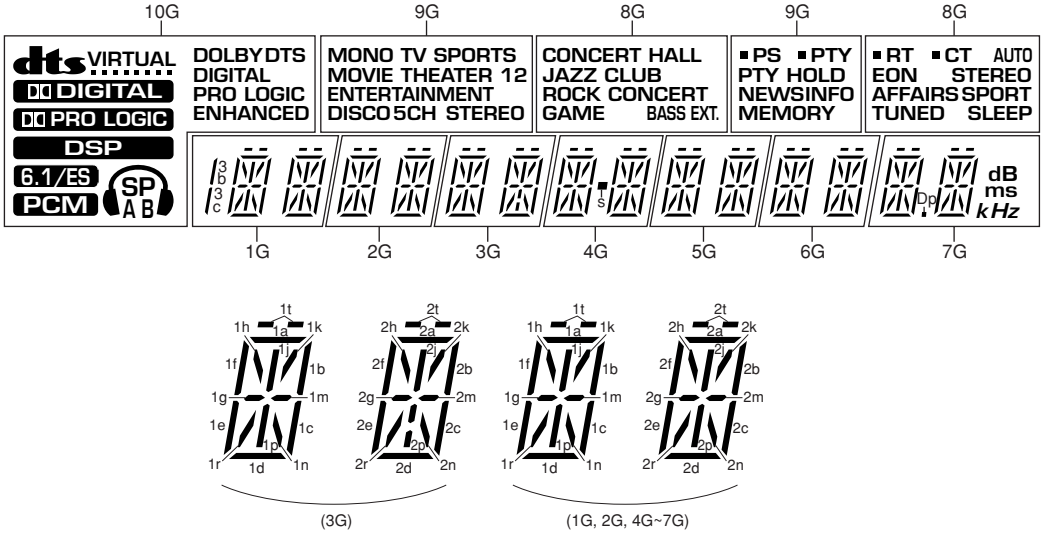
● **PIN CONNECTION**

Pin No.	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26
Connection	9G	10G	NX	NX	NX	NX	NX	NX	NX	NX	NX	P35	P34	P33	P32	P31	P30	P29	P28	P27	P26	P25	P24	P23	P22

Pin No.	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Connection	P21	P20	P19	P18	P17	P16	P15	P14	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	NP	NP	F1	F1

Note : 1) F1, F2 ..... Filament 2) NP ..... No pin 3) NX ..... No extend pin 4) DL ..... Datum Line 5) 1G ~ 10G ..... Grid

● **GRID ASSIGNMENT**

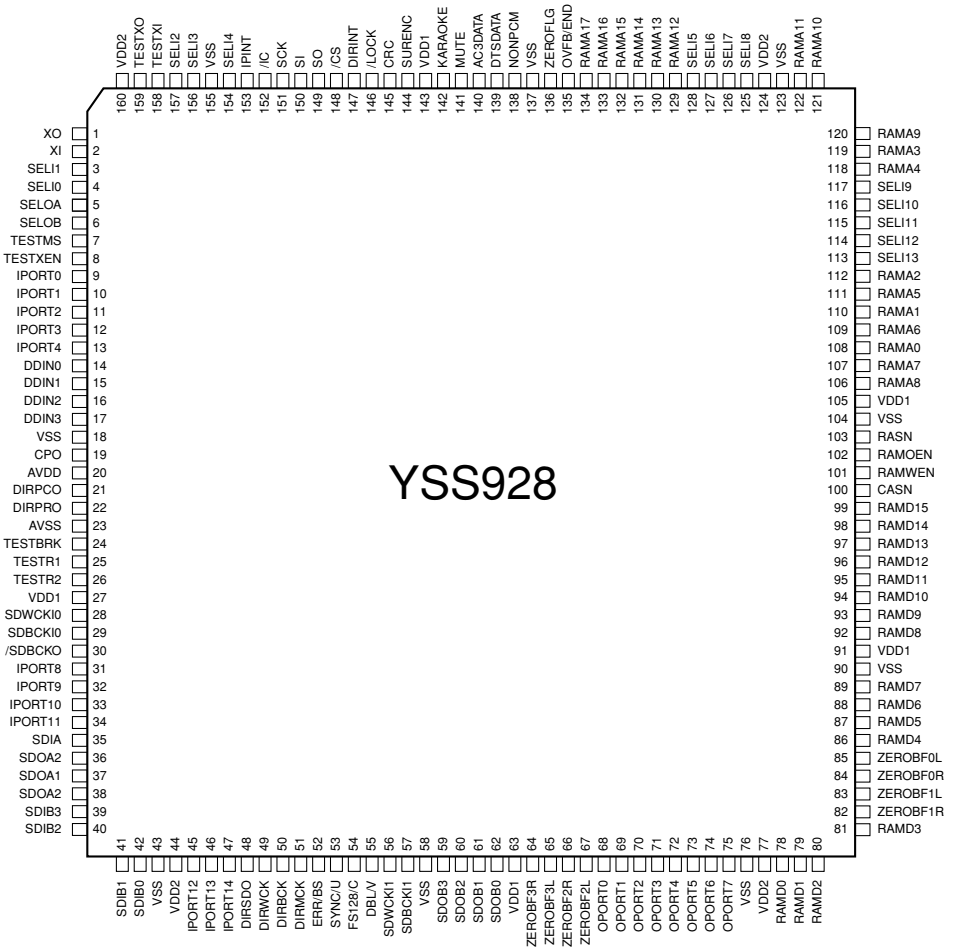


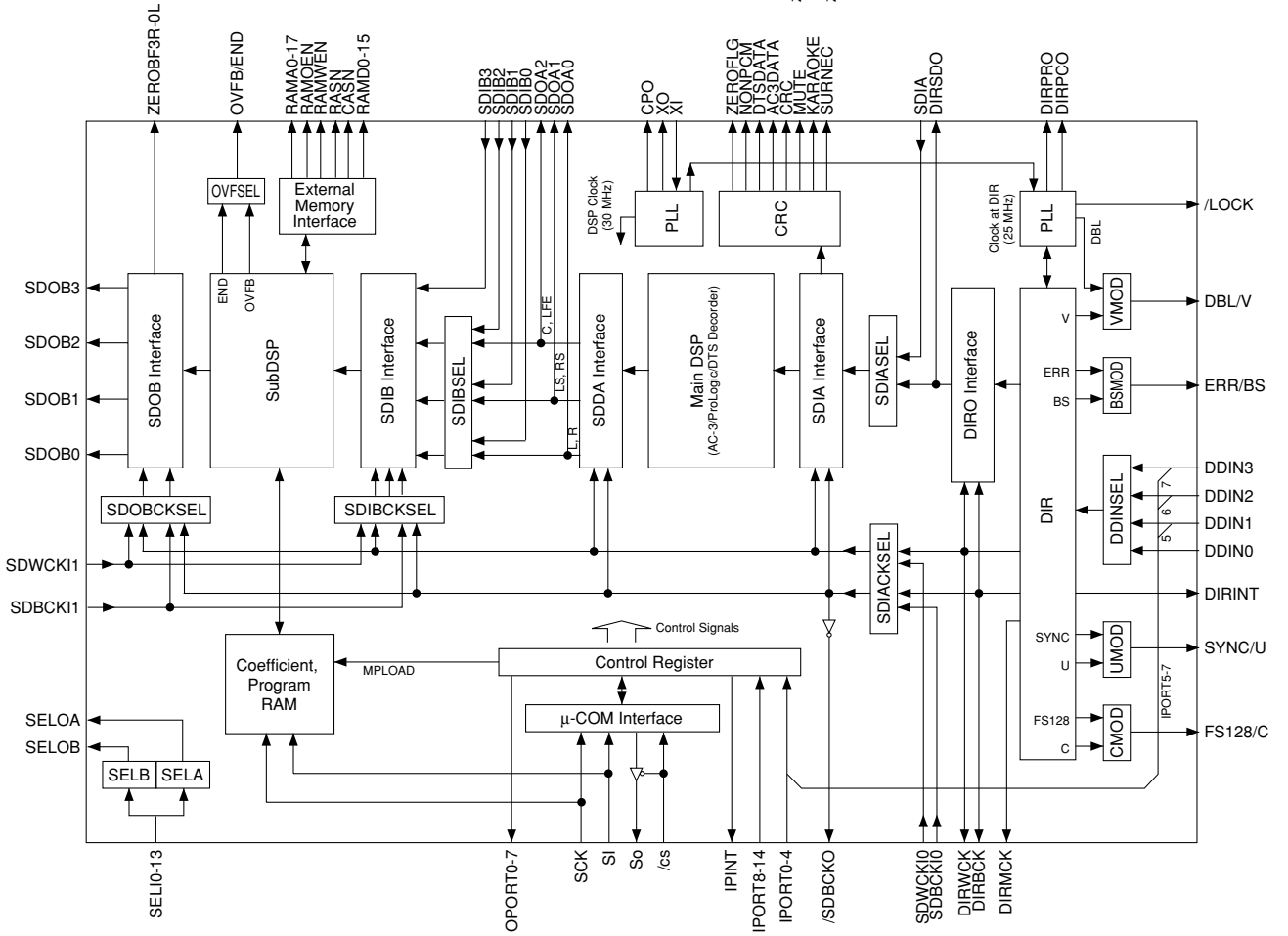
● **ANODE CONNECTION**

	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	dts	MONO	CONCERT HALL	1t	1t	1t	1t	1t	1t	1t
P2	VIRTUAL	TV SPORTS	JAZZ CLUB	1a	1a	1a	1a	1a	1a	1a
P3	DIGITAL	MOVIE	ROCK CONCERT	1b	1b	1b	1b	1b	1b	1b
P4	PRO LOGIC	THEATER	GAME	1h	1h	1h	h1	1h	1h	1h
P5	DSP	1	BASS EXT.	1j	1j	1j	1j	1j	1j	1j
P6	6.1/ES	2	■ (RT)	1k	1k	1k	1k	1k	1k	1k
P7	PCM	ENTERTAINMENT	RT	1f	1f	1f	1f	1f	1f	1f
P8		DISCO	■ (CT)	1g	1g	1g	1g	1g	1g	1g
P9	SP	5CH STEREO	CT	1m	1m	1m	1m	1m	1m	1m
P10	A	■ (PS)	AUTO	1c	1c	1c	1c	1c	1c	1c
P11	B	PS	EON	1n	1n	1n	1n	1n	1n	1n
P12	DOLBY	■ (PTY)	STEREO	1p	1p	1p	1p	1p	1p	1p
P13	DTS	PTY	AFFAIRS	1r	1r	1r	1r	1r	1r	1r
P14	DIGITAL	PTY HOLD	SPORT	1e	1e	1e	1e	1e	1e	1e
P15	PRO LOGIC	NEWS	TUNED	1d	1d	1d	1d	1d	1d	1d
P16	ENHANCED	INFO	SLEEP	2t	2t	2t	2t	2t	2t	2t
P17	–	MEMORY	–	2a	2a	2a	2a	2a	2a	2a
P18	–	–	–	2b	2b	2b	2b	2b	2b	2b
P19	–	–	–	2h	2h	2h	2h	2h	2h	2h
P20	–	–	–	2j	2j	2j	2j	2j	2j	2j
P21	–	–	–	2k	2k	2k	2k	2k	2k	2k
P22	–	–	–	2f	2f	2f	2f	2f	2f	2f
P23	–	–	–	2g	2g	2g	2g	2g	2g	2g
P24	–	–	–	2m	2m	2m	2m	2m	2m	2m
P25	–	–	–	2c	2c	2c	2c	2c	2c	2c
P26	–	–	–	2n	2n	2n	2n	2n	2n	2n
P27	–	–	–	2p	2p	2p	2p	2p	2p	2p
P28	–	–	–	2r	2r	2r	2r	2r	2r	2r
P29	–	–	–	2e	2e	2e	2e	2e	2e	2e
P30	–	–	–	2d	2d	2d	2d	2d	2d	2d
P31	–	–	–	Dp	–	–	s	–	–	3b, 3c
P32	–	–	–	*k*	–	–	–	–	–	–
P33	–	–	–	*Hz*	–	–	–	–	–	–
P34	–	–	–	ms	–	–	–	–	–	–
P35	–	–	–	dB	–	–	–	–	–	–

■ IC DATA

IC801 : YSS928
DSP





IC801 : YSS928
Pin Description

No.	Name	I/O	Function	
1	XO	O	Crystal oscillator connecting terminal	
2	XI	I	Crystal oscillator connecting terminal (24.576MHz)	
3	SELI1	I+	Built-in selector input 1	(AXD)
4	SELI0	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 (unconnected)	
11	IPORT2	I+	General purpose input terminal (unconnected)	
12	IPORT3	I+	General purpose input terminal (unconnected)	
13	IPORT4	I+	General purpose input terminal (unconnected)	
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	(GND)
17	DDIN3	Is	DIR: Digital audio interface data input terminal 3/General purpose input terminal	(Pull up)
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 (Unconnected)	
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	(SDAD)
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) (Unconnected)	
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)

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 (Unconnected)	
69	OPORT1	O	General purpose output terminal	(/RINH1)
70	OPORT2	O	General purpose output terminal (Unconnected)	
71	OPORT3	O	General purpose output terminal	(/ICCDC)
72	OPORT4	O	General purpose output terminal	(DFS)
73	OPORT5	O	General purpose output terminal	(DPL)
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	