HOME THEATER PACKAGE YHT-196
RECEIVER / SPEAKERS
HTR-2064 /
NS-B20/NS-C20/NS-SWP20

SERVICE MANUAL

The YHT-196 consists of the HTR-2064, NS-B20, NS-C20 and NS-SWP20.

Note:

- When the following parts are replaced, the destination MUST be written to the back-up IC (EEPROM: IC222 on DIGITAL P.C.B.) to have proper operation. (For details, refer to No. 22 SOFT SWITCH menu of the self-diagnostic function.)

  DIGITAL P.C.B.
  EEPROM: IC222 on DIGITAL P.C.B.

- When the power amplifier IC (IC 1 or IC 2 on MAIN P.C.B.) requires to be replaced, be sure to refer to “POWER AMPLIFIER IC REPLACEMENT” before its replacement.

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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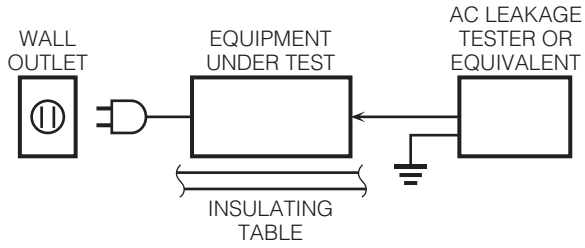
YAMAHA CORPORATION
P.O.Bo 1, Hamamatsu, apan
'11.12

■ 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 ohms shunted by 0.15 µF.



- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



For U model

"CAUTION"

"F1501: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 6A, 125V FUSE."

For C model

CAUTION

F1501: REPLACE WITH SAME TYPE 6A, 125V FUSE.

ATTENTION

F1501: UTILISER UN FUSIBLE DE RECHANGE DE MÉME TYPE DE 6A, 125V.

WARNING: CHEMICAL CONTENT NOTICE!

This product contains chemicals known to the State of California to cause cancer, 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.

About lead free solder

All of the P.C.B.s installed in this unit and solder joints are soldered using the lead free solder.

Among some types of lead free solder currently available, it is recommended to use one of the following types for the repair work.

- Sn + Ag + Cu (tin + silver + copper)
- Sn + Cu (tin + copper)
- Sn + Zn + Bi (tin + zinc + bismuth)

Caution:

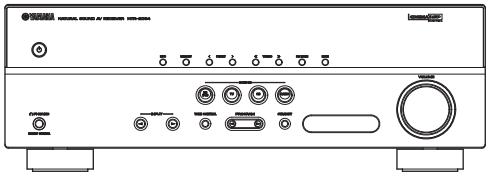
As the melting point temperature of the lead free solder is about 30°C to 40°C (50°F to 70°F) higher than that of the lead solder, be sure to use a soldering iron suitable to each solder.

■ SYSTEM COMPOSITION

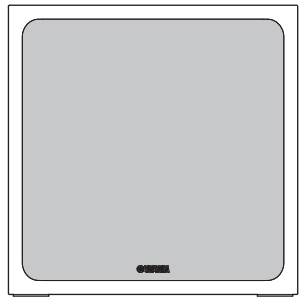
The YHT-196 consists of the HTR-2064, NS-B20 x4, NS-C20 x1 and NS-SWP20 x1.

YHT-196

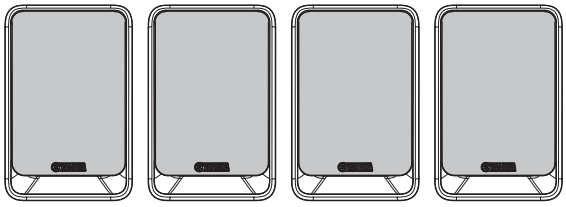
HTR-2064 x 1



NS-SWP20 x 1



NS-B20 x 4



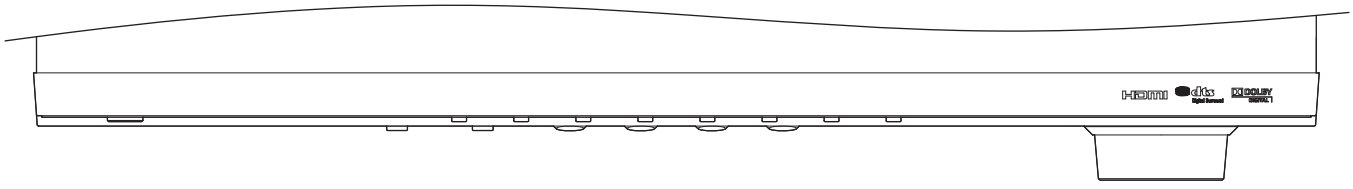
NS-C20 x 1



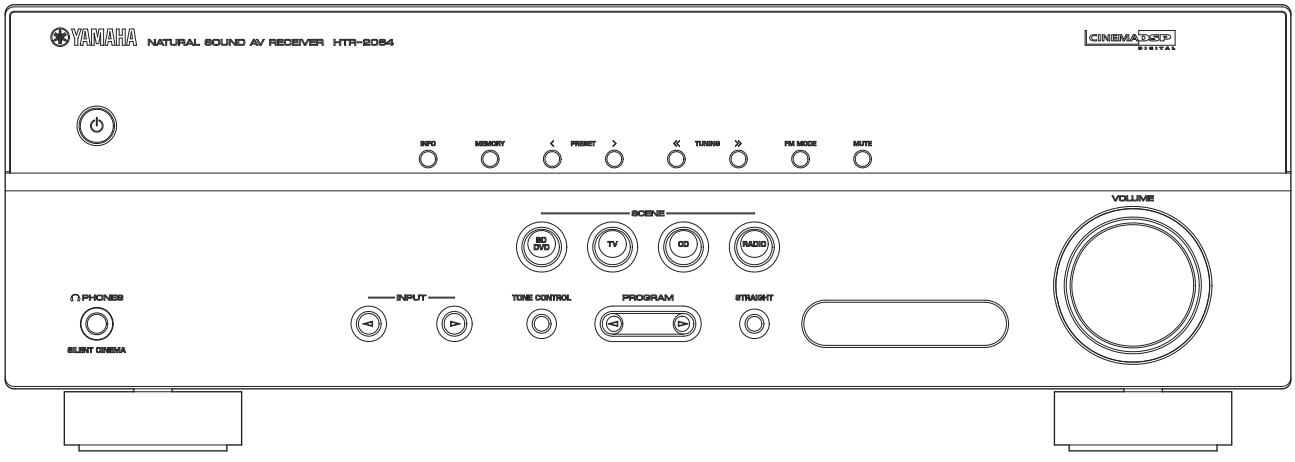
■ FRONT PANELS

HTR-2064

Top view (U, C, R, A, B, G, F, L models)

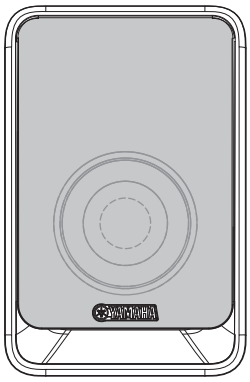


Front view (U, C, R, A, B, G, F, L models)

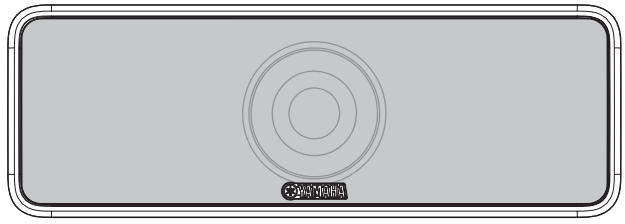


NS-B20/NS-C20/NS-SWP20

NS-B20

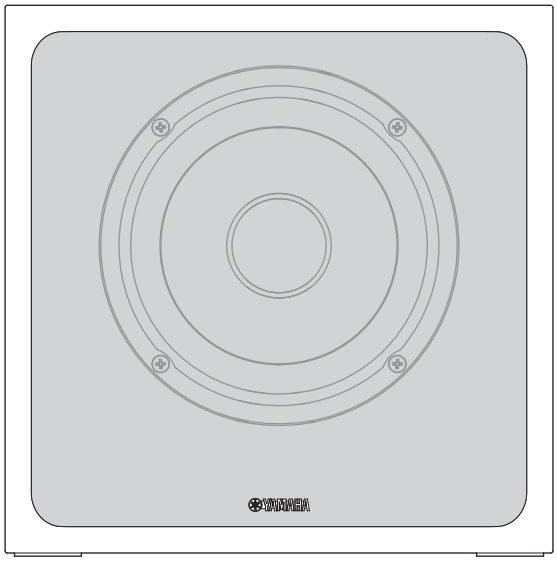


NS-C20

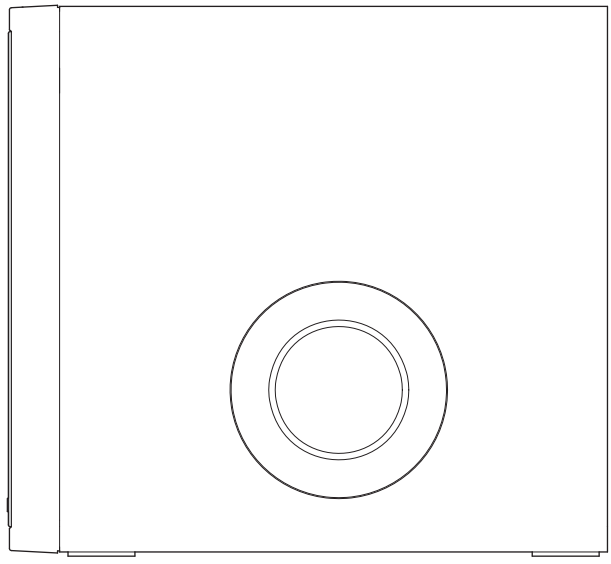


NS-SWP20

Front view



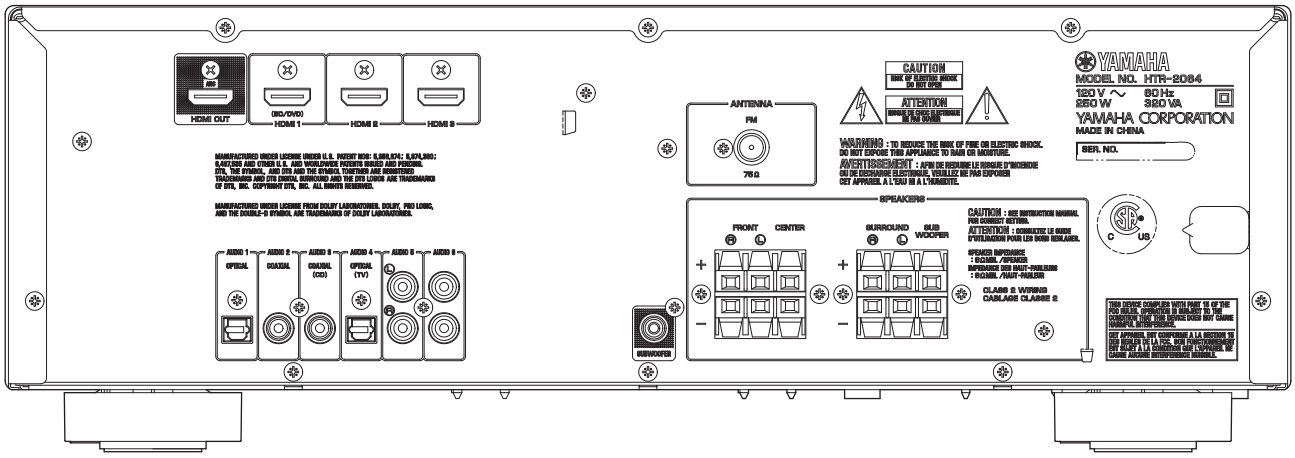
Side view



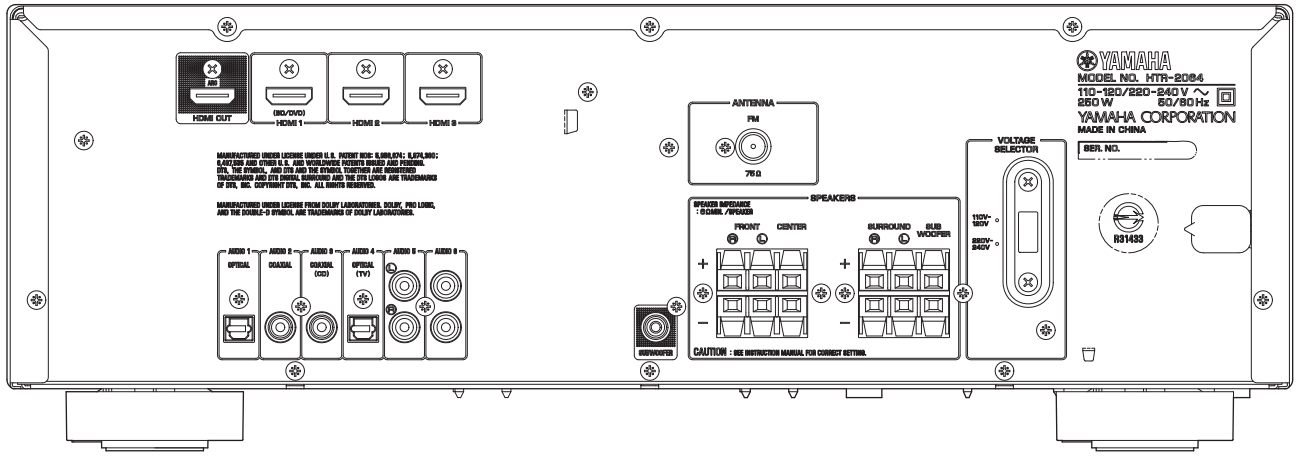
■ REAR PANELS

HTR-2064

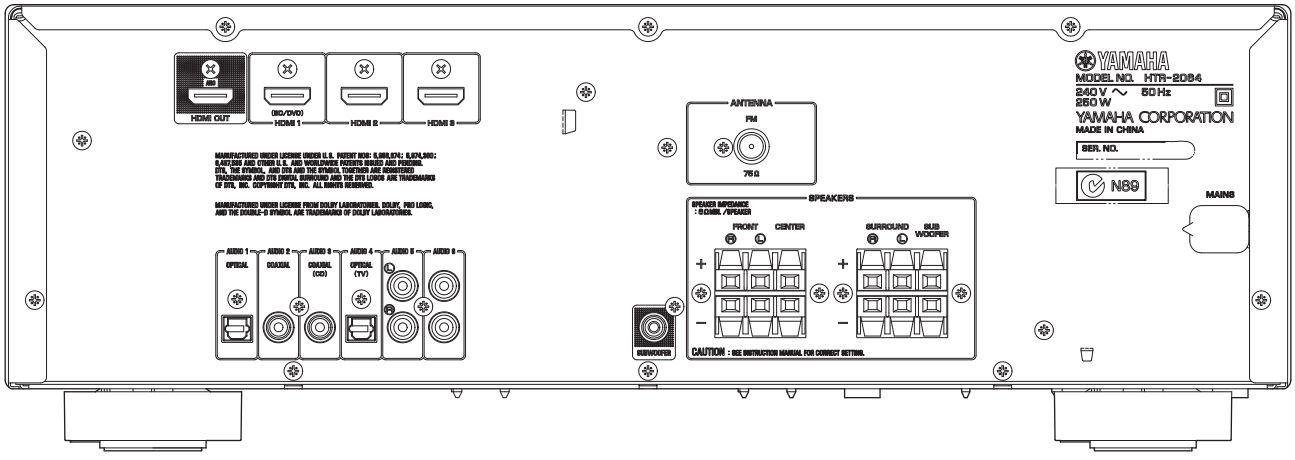
U, C models



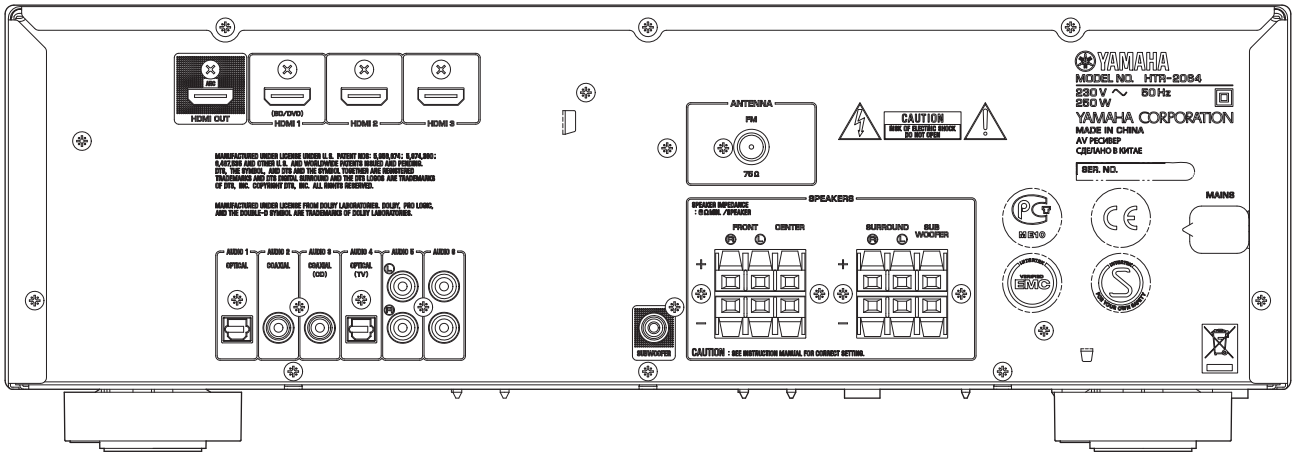
R model



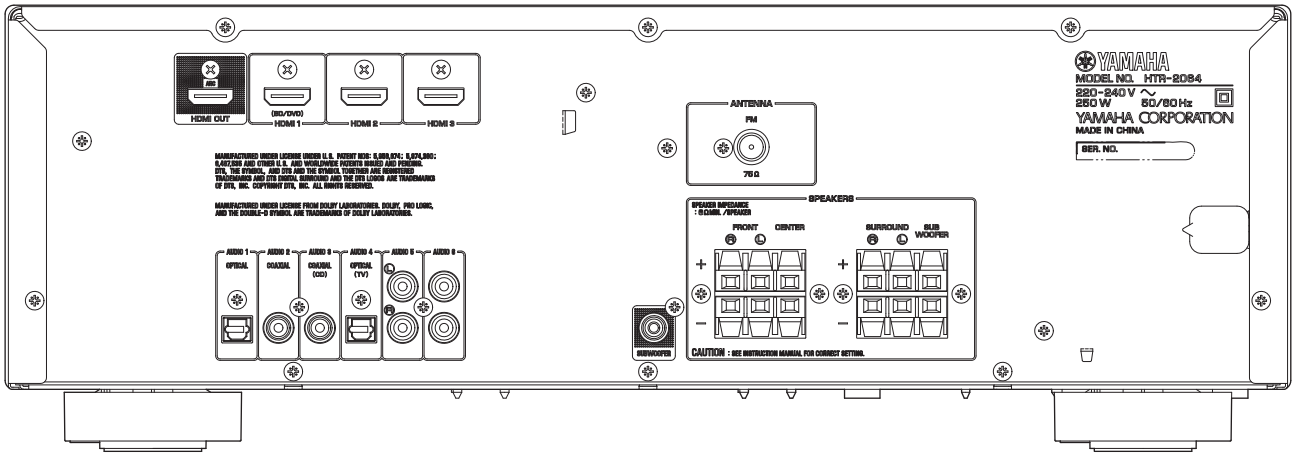
A model



B, G, F models

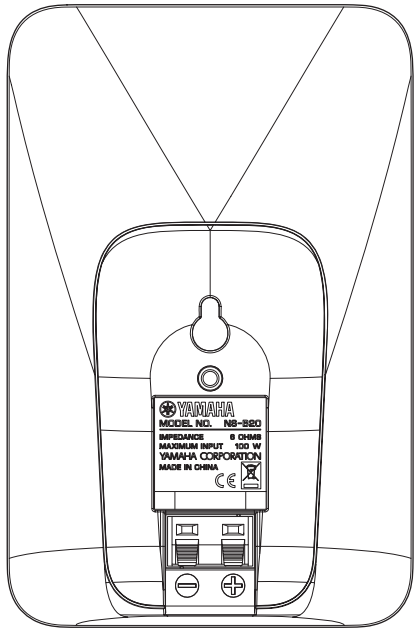


L model

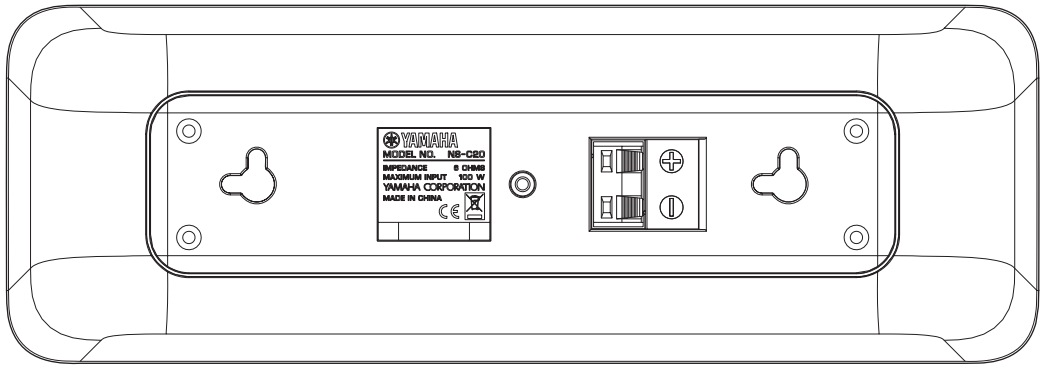


NS-B20/NS-C20/NS-SWP20

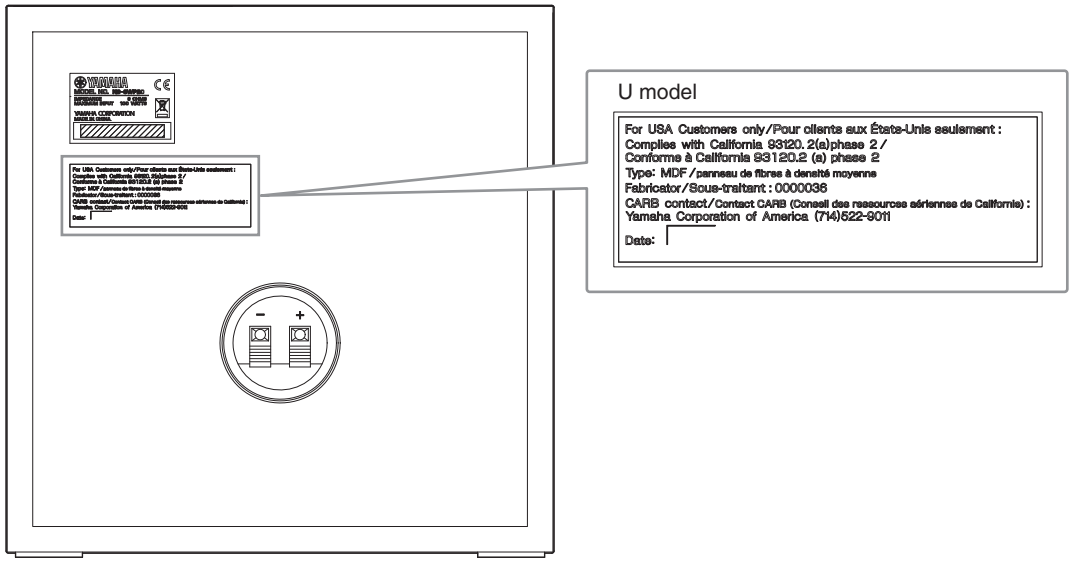
NS-B20



NS-C20



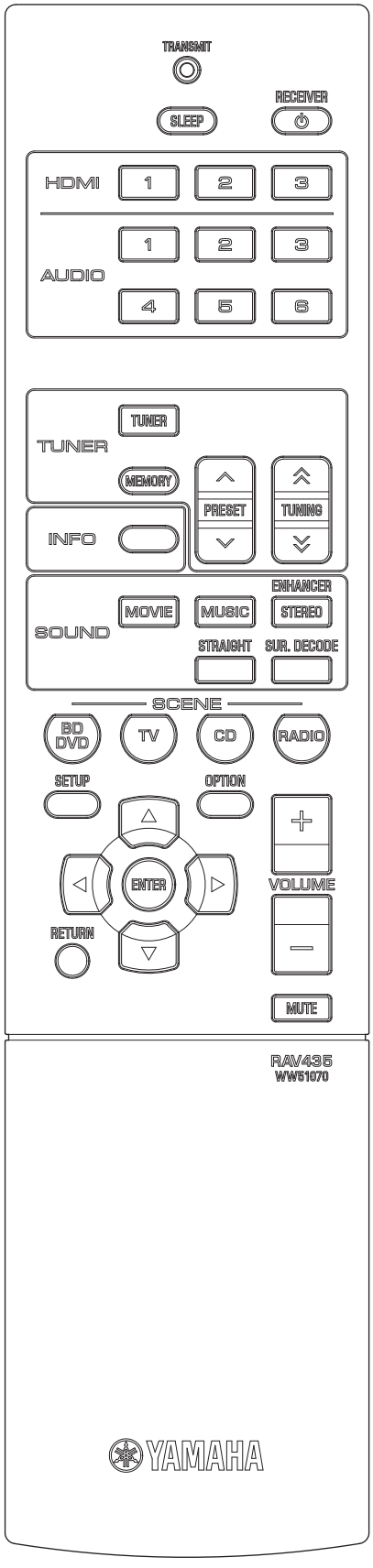
NS-SWP20



■ REMOTE CONTROL PANEL

RAV435

(U, C, R, A, B, G, F, L models)



■ SPECIFICATIONS

HTR-2064

■ Audio Section

Rated Output Power (0.9 % THD, 6 ohms)

– 2 channel driven – (U, C models)
- FRONT L/R (1 kHz) .....80 W + 80 W
- CENTER (1 kHz) ..... 80 W
- SURROUND L/R (1 kHz) .....80 W + 80 W
- SUBWOOFER (50 Hz) ..... 80 W

– 1 channel driven –
- FRONT L/R (1 kHz) ..... 100 W/ch
- CENTER (1 kHz) ..... 100 W
- SURROUND L/R (1 kHz) ..... 100 W/ch
- SUBWOOFER (50 Hz) ..... 100 W

Maximum Effective Output Power (1 channel driven, JEITA)
(10 % THD, 6 ohms) [R, L models]
- FRONT L/R (1 kHz) .....135 W + 135 W
- CENTER (1 kHz) ..... 135 W
- SURROUND L/R (1 kHz) .....135 W + 135 W
- SUBWOOFER (50 Hz) ..... 135 W

Dynamic Power Per Channel (1 channel driven, IHF)

FRONT L/R

U, C models
- 6/4/2 ohms ..... 130/160/180 W

R, A, B, G, F, L models
- 6/4/2 ohms ..... 105/130/150 W

Dynamic Headroom [U, C models]
- 6 ohms .....0.23 dB

Input Sensitivity/Input Impedance (1 kHz, 100 W / 6 ohms)
- AUDIO5, etc. ..... 200 mV / 47 k-ohms

Maximum Input Signal (1 kHz, 0.5 % THD, Effect on)
- AUDIO5, etc. ..... 2.3 V

Output Level/Output Impedance
- SUBWOOFER (2 ch STEREO and FRONT speaker: Small) ..... 1 V / 1.2 k-ohms

Headphone Jack Rated Output/Impedance (1 kHz, 50 mV)
- AUDIO5, etc. input ..... 100 mV / 470 ohms

Frequency Response (10 Hz to 100 kHz)
- AUDIO5, etc. to FRONT L/R .....0 / -3.0 dB

Total Harmonic Distortion (1 kHz, 50 W, 6 ohms)
- AUDIO5, etc. (straight) to FRONT speaker out .....0.06 % or less

Signal to Noise Ratio (IHF-A Network)
- AUDIO5, etc. (STEREO)
  - Input shorted (250 mV) to speaker out ..... 98 dB or more

Residual Noise (IHF-A Network)
- FRONT L/R to speaker out.....150 µV or less

Channel Separation
- AUDIO5, etc. (Input 5.1 k-ohms shorted, 1 kHz / 10 kHz) ..... 60 dB or more / 45 dB or more

Volume Control
- ..... MUTE / -80 dB to +16.5 dB / 0.5 dB step

Tone Control Characteristics * FRONT L/R channel only

BASS
Boost/Cut ..... ±6 dB / 0.5 dB step / 50 Hz
Turnover frequency ..... 350 Hz

TREBLE
Boost/Cut ..... ±6 dB / 0.5 dB step / 20 kHz
Turnover frequency ..... 3.5 kHz

Filter Characteristics

FRONT, CENTER, SURROUND (H.P.F.)
..... fc=40/60/80/90/100/110/120/160/200 Hz, 12 dB/oct.

SUBWOOFER (L.P.F.)
..... fc=40/60/80/90/100/110/120/160/200 Hz, 24 dB/oct.

■ FM Section

Tuning Range

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

50 dB Quieting Sensitivity (IHF) (1 kHz, 100 % Mod.)
Mono ..... 3 µV (20.8 dBf)

Signal to Noise Ratio (IHF)
Mono / Stereo ..... 72 dB / 70 dB

Harmonic Distortion (1 kHz)
Mono / Stereo ..... 0.3 % / 0.5 %

Antenna Input
..... 75 ohms unbalanced

■ General

Power Supply

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

Power Consumption

U, C models ..... 250 W / 320 VA
R, A, B, G, F, L models ..... 250 W

Standby Power Consumption

U, C, A, B, G, F, L models ..... 0.5 W or less
R model ..... 1.0 W or less

Maximum Power Consumption
..... 440 W

Dimensions (W x H x D)
..... 435 x 151 x 315 mm (17-1/8" x 6" x 12-3/8")

Weight
..... 7.3 kg (16.1 lbs.)

Finish
U, C, R, A, B, G, F, L models ..... Black color

Accessories

Remote control ..... x 1
Batteries (R03, AAA, UM-4) ..... x 2
FM antenna (1.4 m) ..... x 1

* Specifications are subject to change without notice.

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NS-B20/NS-C20/NS-SWP20

■ NS-B20/NS-C20

Type .....Full-range acoustic suspension speaker system
Non-magnetic shielding type

Driver
Full-range ..... 7 cm (2-3/4") cone type x 1

Frequency Response
[NS-B20] .....70 Hz to 25 kHz (-10 dB)
to 45 kHz (-30 dB)
[NS-C20] .....65 Hz to 25 kHz (-10 dB)
to 45 kHz (-30 dB)

Impedance .....6 ohms

Nominal Input ..... 30 W

Maximum Input ..... 100 W

Sensitivity
[NS-B20] ..... 83 dB/2.83 V/m
[NS-C20] ..... 84 dB/2.83 V/m

Input Terminal .....Push type

Dimensions (W x H x D)
[NS-B20] .....115 mm x 176 mm x 88 mm
(4-1/2" x 6-7/8" x 3-1/2")
[NS-C20] .....291 mm x 101 mm x 103 mm
(11-1/2" x 4" x 4")

Weight
[NS-B20] .....0.48 kg (1.06 lbs.)
[NS-C20] .....0.68 kg (1.50 lbs.)

■ NS-SWP20

Type .....Bass reflex speaker system
Non-magnetic shielding type

Driver
Subwoofer ..... 16 cm (6-1/2") cone type x 1

Frequency Response .....30 Hz to 2 kHz (-10 dB)
to 9 kHz (-30 dB)

Impedance .....6 ohms

Nominal Input ..... 30 W

Maximum Input ..... 100 W

Sensitivity ..... 86 dB/2.83 V/m

Input Terminal .....Push type

Dimensions (W x H x D)
.....262 mm x 264 mm x 287 mm
(10-3/8" x 10-3/8" x 11-1/4")

Weight .....5.2 kg (11.5 lbs.)

■ General

Finish
U, C, R, A, B, G, F, L models ..... Black color

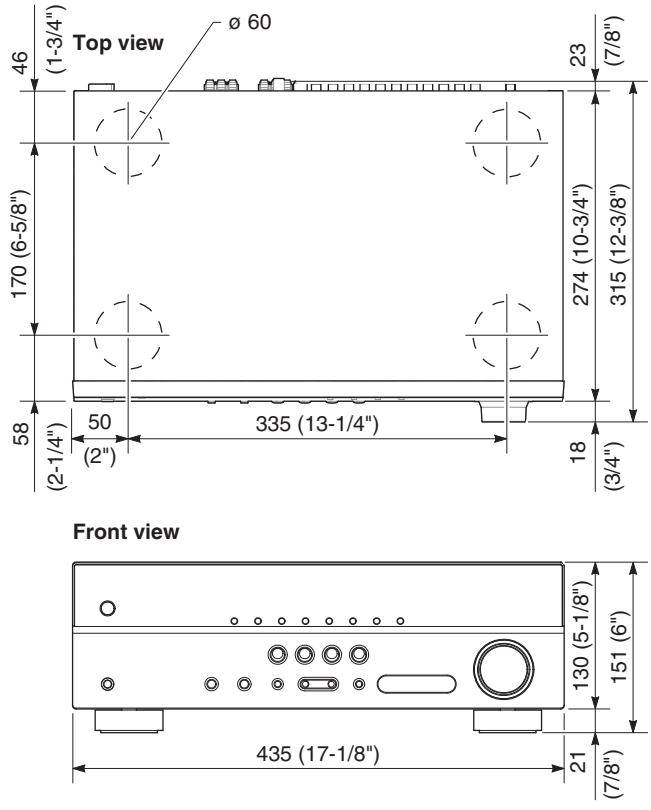
Accessory
Speaker cable (25 m) .....x 1
Nonskid pad (NS-B20/NS-C20) .....x 24

* Specifications are subject to change without notice.

U*.....*U.S.A. model
C*.....*Canadian model
R*.....*General model
A*.....*Australian model
B*.....*British model
G*.....*European model
F*..... *Russian model
L*.....*Singapore model

- **DIMENSIONS**

HTR-2064

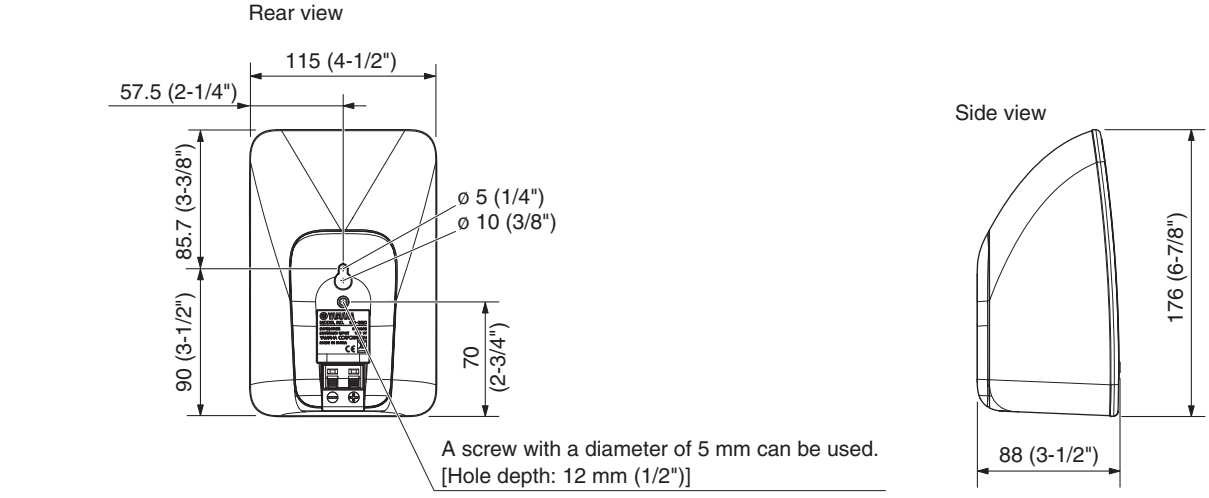


Unit: mm (inch)

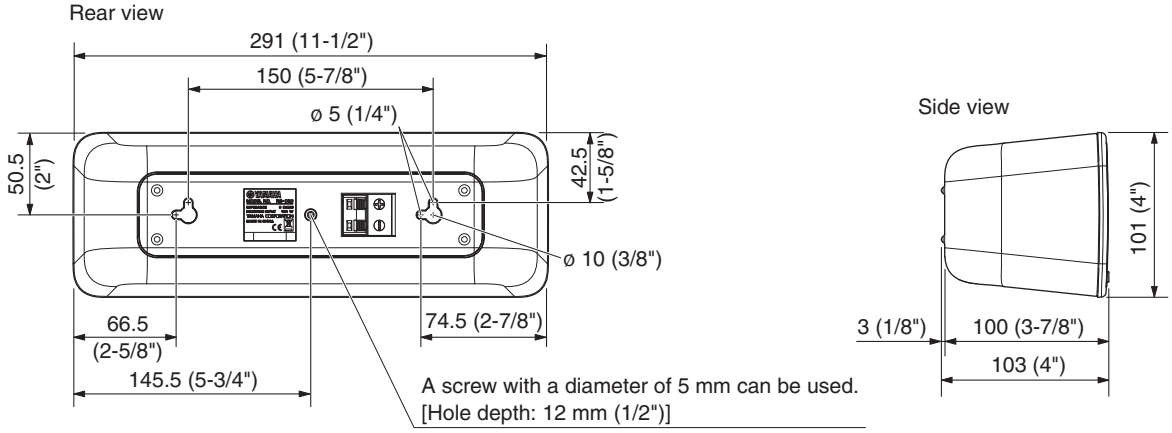
NS-B20/NS-C20/NS-SWP20

Unit: mm (inch)

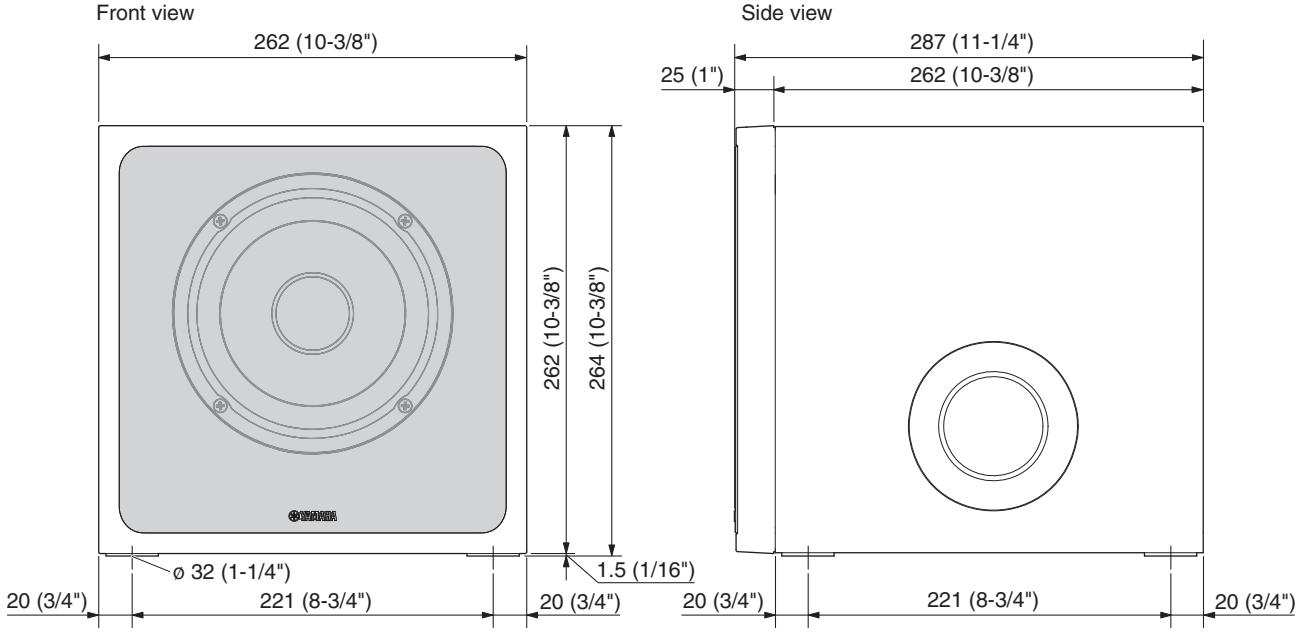
▼ NS-B20



▼ NS-C20



▼ NS-SWP20



- **SELECT MENU**

  Sound field parameters

Category	Program	Parameter: Decode Type	DSP Level: -6dB to +3dB, [0 dB]	Center Level: 0 to 100%, [100%]	Surround L Level: 0 to 100%, [100%]	Surround R Level: 0 to 100%, [100%]	Direct: Auto/Off, [Auto]	Effect Level: High/Low, [High]	Panorama: On/Off, [Off]	Center Width: 0 to 7, [3]	Dimension: -3 to +3, [0]	Initialize
MOVIE	Standard		●									●
	Spectacle		●									●
	Sci-Fi		●									●
	Adventure		●									●
	Drama		●									●
	Mono Movie		●									●
	Sports		●									●
	Action Game		●									●
	Roleplaying Game		●									●
MUSIC	Hall in Munich		●									●
	Hall in Vienna		●									●
	Chamber		●									●
	Cellar Club		●									●
	The Roxy Theatre		●									●
	The Bottom Line		●									●
	Music Video		●									●
STEREO	2ch Stereo						●					●
	5ch Stereo			●	●	●						●
MUSIC ENHANCER	Straight Enhancer							●				●
	5ch Enhancer							●				●
SUR. DECODE	SUR. DECODE	● *1							△			●
STRAIGHT												

△ : Setting is possible only when Pro Logic II Music is selected using decode type.

*1 Decode Type

Decode Type	Dolby Pro Logic
	Dolby PL II Movie
	Dolby PL II Music
	Dolby PL II Game

• SET MENU TABLE

MAIN MENU	SUB-MENU	PARAMETER	VALUE [INITIAL VALUE]
1 Speaker Setup			
	1 Config	Subwoofer	[Yes] / None
		Front speaker	[Small] / Large
		Center speaker	None / [Small] / Large
		Surround speaker L/R	
		Crossover	40 / 60 / 80 / 90 / 100 / 110 / 120 / [160] / 200 Hz
		Subwoofer Phase	[NRM] / REV
		Extra Bass	[Off] / On
	2 Level	FL (Front speaker L)	-10.0 to +10.0 dB, [0 dB], 0.5 dB step
		FR (Front speaker R)	
		C (Center speaker)	-10.0 to +10.0 dB, [-1.0 dB], 0.5 dB step
		SL (Surround speaker L)	
		SR (Surround speaker R)	
		SWFR (Subwoofer)	-10.0 to +10.0 dB, [0 dB], 0.5 dB step
	3 Distance	Unit	U, C models: meters (m) / [feet (ft)] R, A, B, G, F, L models: [meters (m)] / feet (ft)
		Front L (Front speaker L)	0.30 to 24.00 m, [3.00 m], 0.1 m step 1.0 to 80.0 ft, [10.0 ft], 0.5 ft step
		Front R (Front speaker R)	
		Center (Center speaker)	0.30 to 24.00 m, [2.60 m], 0.1 m step 1.0 to 80.0 ft, [8.5 ft], 0.5 ft step
		Sur. L (Surround speaker L)	0.30 to 24.00 m, [2.40 m], 0.1 m step 1.0 to 80.0 ft, [8.0 ft], 0.5 ft step
		Sur. R (Surround speaker R)	
		SWFR (Subwoofer)	0.30 to 24.00 m, [3.00 m], 0.1 m step 1.0 to 80.0 ft, [10.0 ft], 0.5 ft step
	4 Equalizer	EQ Type Select	[GEQ] / Off
		GEQ	* “GEQ” is available only when “EQ Type Select” is set to “GEQ”.
		Front L 63 Hz ·····||····· 0 dB	-6.0 to +6.0 dB, [0 dB], 0.5 dB step
		Front R 160 Hz ·····||····· 0 dB	
		Center 400 Hz ·····||····· 0 dB	
		Sur. L 1 kHz ·····||····· 0 dB	
		Sur. R 2.5 kHz ·····||····· 0 dB	
		6.3 kHz ·····||····· 0 dB	
		16 kHz ·····||····· 0 dB	
	5 Test Tone		[Off] / On
2 Sound Setup			
	1 Lipsync	HDMI Auto	Off / [On]
		Auto	0 to 240 ms, 1 ms step
		Manual	0 to 240 ms, [0 ms], 1 ms step
	2 Adaptive DRC		[Off] / On
	3 D.Range		Min / Std / [Max]
	4 Max Volume		-30.0 to +15.0 dB / +16.5 dB (Maximum volume), [+16.5 dB], 5.0 dB step
	5 Init. Volume		Off, Mute, -80 dB to +16.5 dB [Off], 0.5 dB step
3 HDMI Setup			
	1 Control		[Off] / On
	2 TV Audio		AUDIO1 / AUDIO2 / AUDIO3 / [AUDIO4] / AUDIO5 / AUDIO6
	3 ARC		Off / [On]
	4 Audio		[Amp] / TV / Amp+TV
4 Function Setup			
	1 Input Rename		Input is possible to 9 characters Input possible Character type Capital : A to Z Small : a to z Figure : 0 to 9 Symbols : # * + , - etc. Space
	2 Auto Power Down		U, C, R, A, L models: [Off] / 4 hours / 8 hours / 12 hours B, G, F models: Off / 4 hours / [8 hours] / 12 hours
	3 Dimmer		-4 to 0, [0]

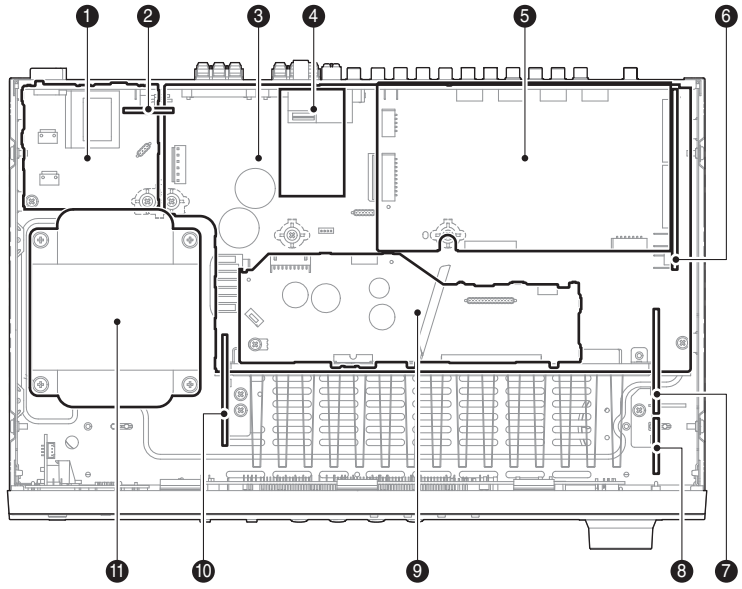
MAIN MENU	SUB-MENU	PARAMETER	VALUE [INITIAL VALUE]
5 DSP Parameter			
MOVIE	Standard	[2], [11]	
	Spectacle		
	Sci-Fi		
	Adventure		
	Drama		
	Mono Movie		
	Sports		
	Action Game		
	Roleplaying Game		
MUSIC	Hall in Munich	[2], [11]	
	Hall in Vienna		
	Chamber		
	Cellar Club		
	The Roxy Theatre		
	The Bottom Line		
	Music Video		
STEREO	2ch Stereo	[6], [11]	
	5ch Stereo	[3], [4], [5], [11]	
MUSIC ENHANCER	Straight Enhancer	[7], [11]	
	5ch Enhancer	[7], [11]	
SUR. DECODE	SUR. DECODE	[1], [8], [11]	
STRAIGHT			

[1]	Decode Type	Dolby Pro Logic, Dolby PL II Movie, Dolby PL II Music, Dolby PL II Game, Neo:6 Cinema, Neo:6 Music
[2]	DSP Level	-6 to +3 dB, [0 dB]
[3]	Center Level	0 to 100 %, [100 %]
[4]	Surround L Level	
[5]	Surround R Level	
[6]	Direct	[Auto] / Off
[7]	Effect Level	[High] / Low
[8]	Panorama	[Off] / On
[9]	Center Width	0 to 7, [3]
[10]	Dimension	-3 to +3, [0]
[11]	Initialize	

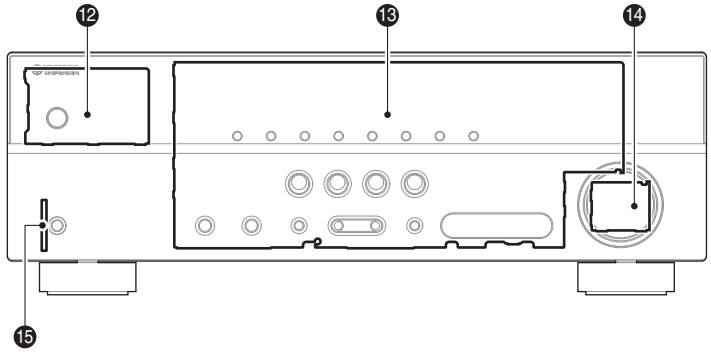
6 Memory Guard	[Off] / On

■ INTERNAL VIEW

Top view



Front view



❶ OPERATION (3) P.C.B.
❷ MAIN (2) P.C.B. (R model)
❸ MAIN (1) P.C.B.
❹ FM TUNER
❺ DIGITAL P.C.B.
❻ OPERATION (4) P.C.B.
❼ MAIN (3) P.C.B.
❽ OPERATION (9) P.C.B.
❾ OPERATION (2) P.C.B.
❿ OPERATION (8) P.C.B.
⓫ POWER TRANSFORMER
⓬ OPERATION (7) P.C.B.
⓭ OPERATION (1) P.C.B.
⓮ OPERATION (6) P.C.B.
⓯ OPERATION (5) P.C.B.

■ SERVICE PRECAUTIONS

Safety measures

- Some internal parts in this product contain high voltages and are dangerous.
  Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there.
  Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity.
  The time required for discharging is about 30 seconds per each.

  C1318–C1320 on OPERATION (2) P.C.B.

  C55, C56 on MAIN (1) P.C.B.

  For details, refer to “PRINTED CIRCUIT BOARDS”.

■ POWER AMPLIFIER IC REPLACEMENT

In the middle of production, the power amplifier IC has been changed from Y type to N type. At the same time, their peripheral electrical parts also have been altered.

Y type:	Parts No. X8190B00	STK433-330Y-E	Initial production
N type:	Parts No. YD936A00	STK433-330N-E	Middle production and after Service replacement part

Therefore, when replacing Y type with N type, their peripheral electrical parts also MUST be altered at the same time.

Replacement procedure

Perform the following procedure according to the type name of installed power amplifier IC.

Top view

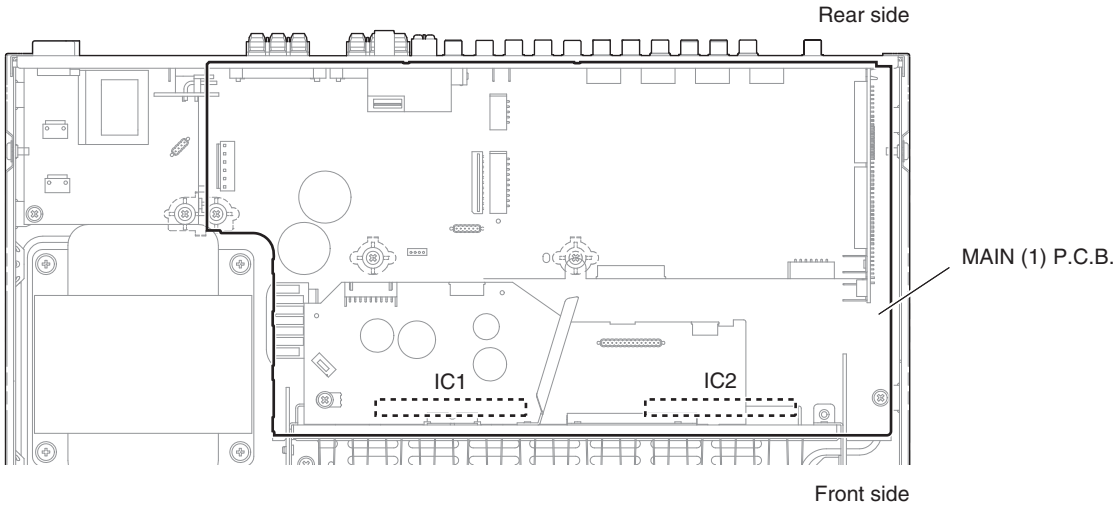


Fig. 1

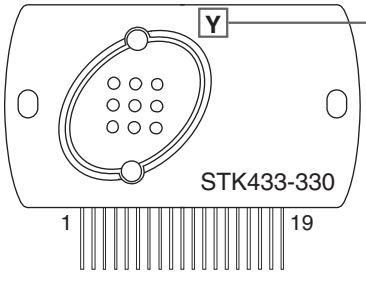


Fig. 2

When "Y" is printed

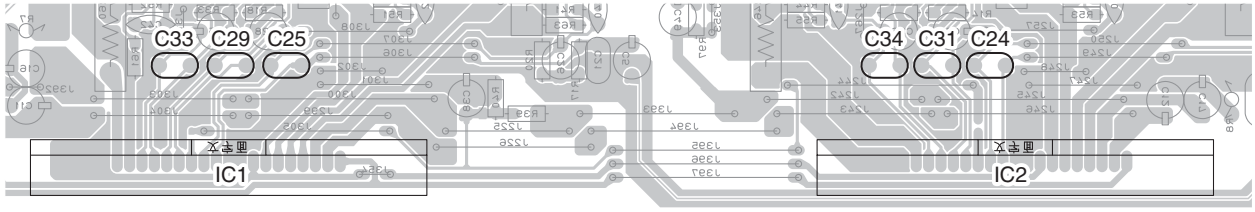
<IC1>
Remove C25, C29 and C33.
Replace R23 with 4.7 k-ohms.
Replace IC1 with N type.

<IC2>
Remove C24, C31 and C34.
Replace R25 with 4.7 k-ohms.
Replace IC2 with N type.

When "N" is printed

Replace IC1/IC2 with N type.

MAIN (1) P.C.B. top view



MAIN (1) P.C.B. bottom view

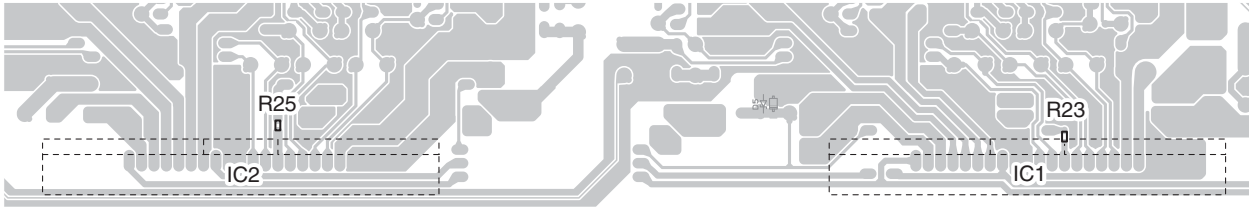


Fig. 3

Schematic diagrams

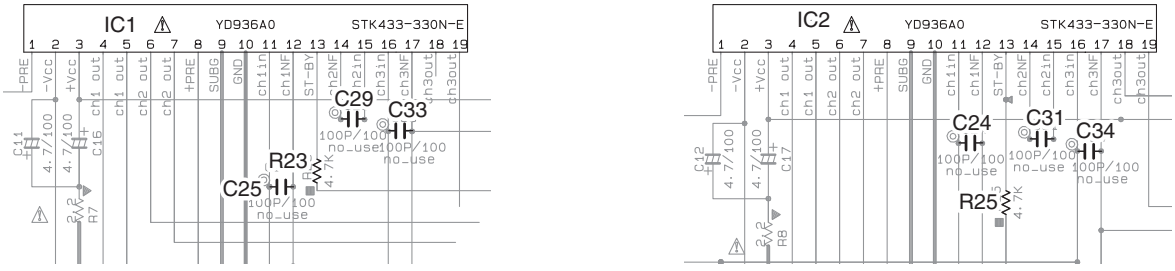


Fig. 4

■ DISASSEMBLY PROCEDURES

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

1. Removal of Top Cover

a. Remove 5 screws (①) and 4 screws (②). (Fig. 1)
b. Slide the top cover rearward to remove it. (Fig. 1)

2. Removal of Front Panel Unit

a. Remove 7 screws (③). (Fig. 1)
b. Remove CB166, CB193 and CB221. (Fig. 1)
c. Unlock and remove CB136. (Fig. 1)
d. Release hook and then remove the front panel unit. (Fig. 1)

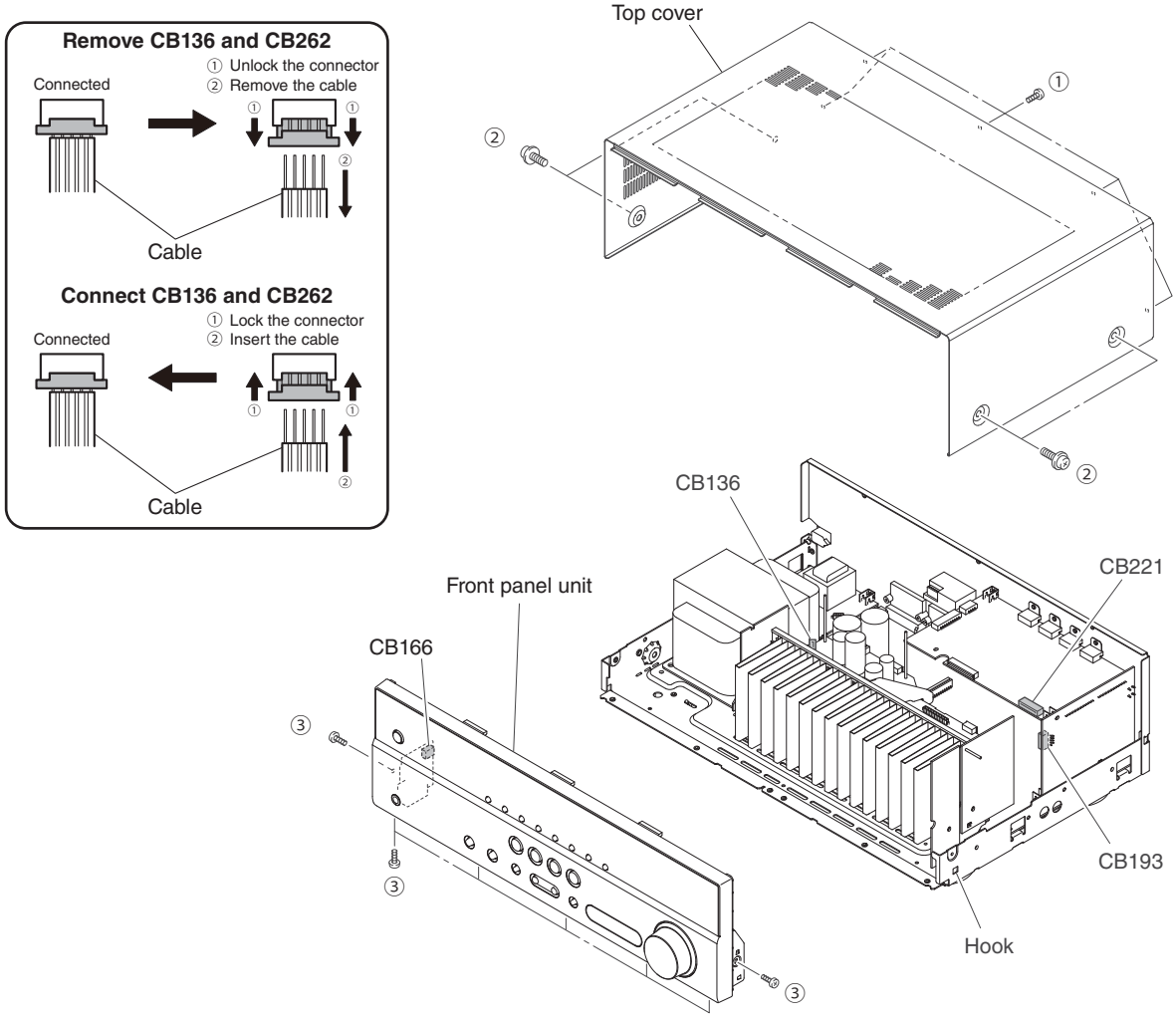


Fig. 1

3. Removal of DIGITAL P.C.B.

a. Remove CB222 and CB223. (Fig. 2)
b. Unlock and remove CB262. (Fig. 2)
c. Remove screw (④). (Fig. 2)
d. Remove screw (⑤) and 4 screws (⑥). (Fig. 3)
e. Remove the DIGITAL P.C.B. which is connected directly to the OPERATION (4) P.C.B. with board-to-board connectors. (Fig. 2)

4. Removal of OPERATION (4) P.C.B.

a. Remove screw (⑦). (Fig. 3)
b. Remove screw (⑧). (Fig. 2)
c. Remove the OPERATION (4) P.C.B. which is connected directly to the MAIN (1) P.C.B. with board-to-board connectors. (Fig. 2)

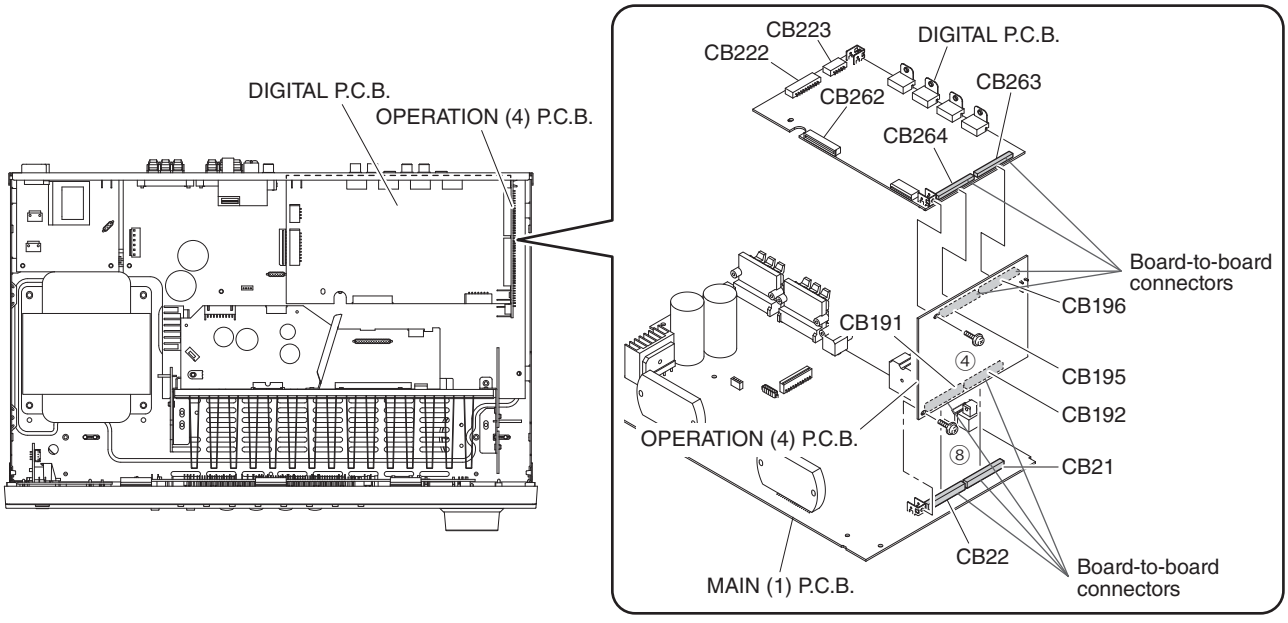


Fig. 2

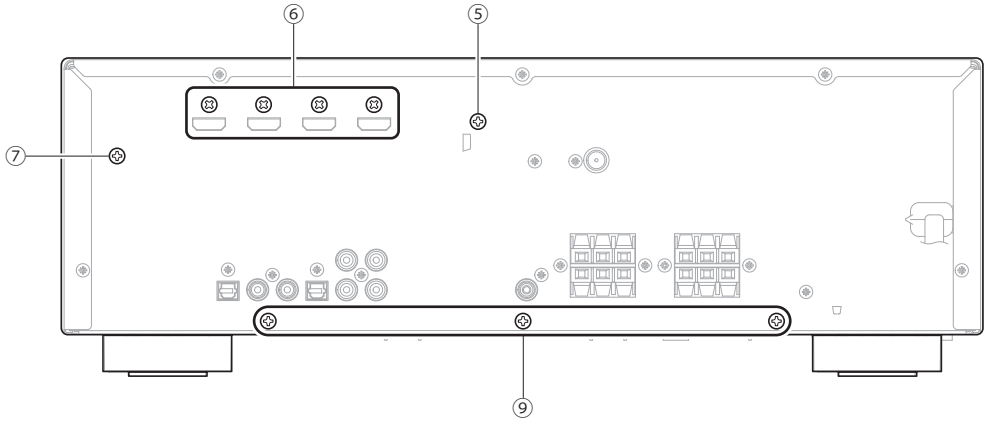


Fig. 3

When checking the DIGITAL P.C.B.

- Put the rubber sheet and cloth over this unit, and place the DIGITAL P.C.B. on them. (Fig. 4)
- Connect ST201 on DIGITAL P.C.B. to the chassis with a ground lead or the like. (Fig. 4)
- Reconnect all cables (connectors) that have been disconnected. Be sure to use the P.C.B. CHECKING JIG (Part No. WW483800) to connect between the following connectors.
  CB263 on DIGITAL P.C.B. – CB196 on OPERATION (4) P.C.B.
  CB264 on DIGITAL P.C.B. – CB195 on OPERATION (4) P.C.B.
- When connecting the flexible flat cable, be careful with polarity.

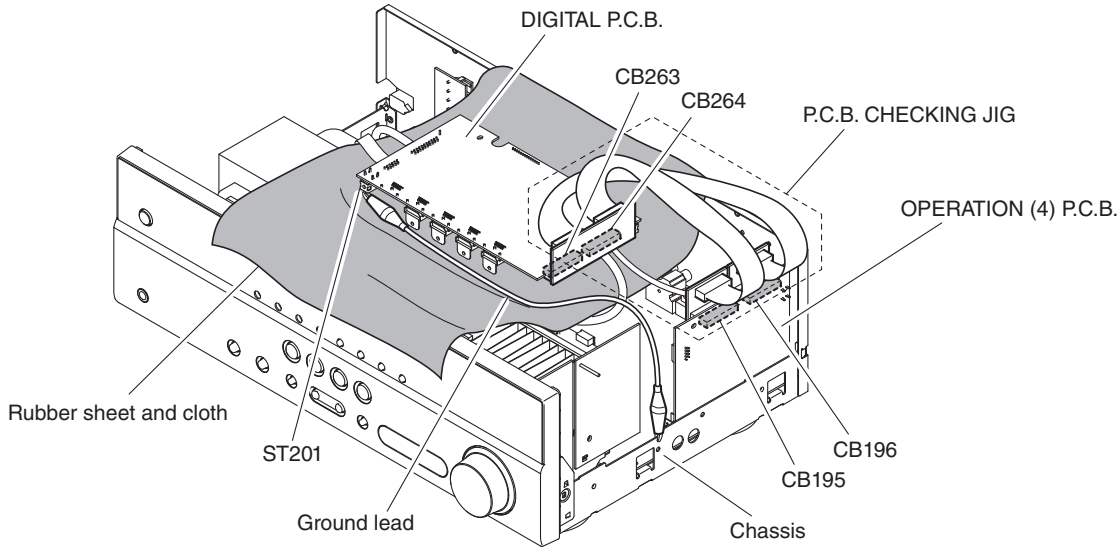


Fig. 4

When checking the MAIN (1) P.C.B.

a. Remove the top cover. (Fig. 1)
b. Remove 3 screws (⑨). (Fig. 3)
c. Remove 5 screws (⑩) and 4 screws (⑪). (Fig. 5)
d. Place the P.C.B.s (with rear panel) upright. (Fig. 6)
e. Connect the heatsink, rear panel and MAIN (1) P.C.B. (G3) to the chassis with a ground lead or the like. (Fig. 6)

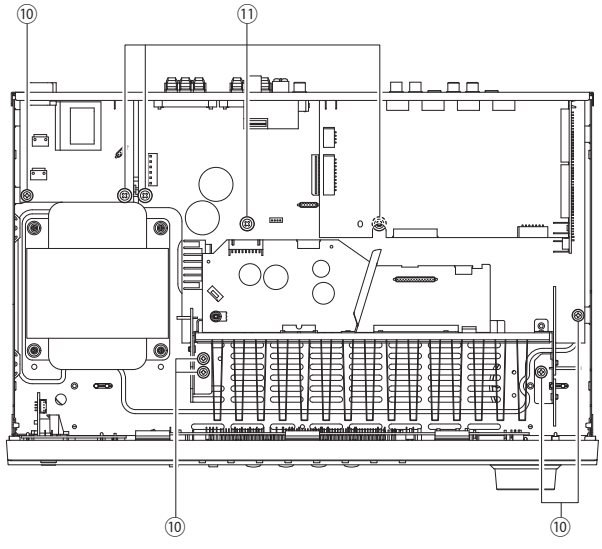


Fig. 5

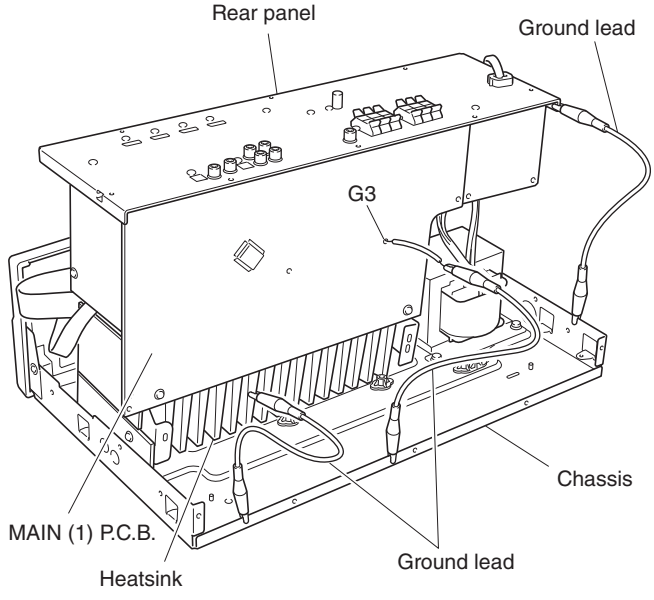


Fig. 6

■ UPDATING FIRMWARE

When the following parts are replaced, the firmware must be updated to the latest version.

DIGITAL P.C.B.

DSP FLASH ROM (IC243 on DIGITAL P.C.B.)

● Confirmation of firmware version and checksum

Before and after updating the firmware, check the firmware version and checksum by using the self-diagnostic function menu.

Start up the self-diagnostic function and select “25. ROM VER/SUM/PORT” menu.

Using the sub-menu, have the firmware version and checksum displayed, and note them down.
(For details, refer to “SELF-DIAGNOSTIC FUNCTION”)

* When the firmware version is different from written one after updating, perform the updating procedure from the beginning again.

● Initializing the back-up IC (EEPROM: IC222 on DIGITAL P.C.B.)

After updating the firmware, the back-up IC MUST be initialized by the following procedure to store the setting information (soundfield parameters, system memory and tuner presetting, etc.) properly.

Start up the self-diagnostic function and select “24. FACTORY PRESET” menu. (For details, refer to “SELF-DIAGNOSTIC FUNCTION”)

Select “24. PRESET RSRV”, press the “⏻” (Power) key to turn off the power once and turn on the power again. Then the back-up IC is initialized.

● Required Tools

- CD, DVD or BD player (with DIGITAL OUTPUT (OPTICAL or COAXIAL) jack)

* The following models can be used as a tool to update the firmware.

CD player: CD-C600/CD-S1000/CD-S2000/CD-S300/CD-S700/CDX-496/CDX-596/CDX-890

DVD player: DV-C6760/DVD-840/DVD-C740/DVD-C750/DVD-C940/DVD-C950/DVD-CX1/DVD-S1200/DVD-S1800/DVD-S2300(MKII)/DVD-S2700/DVD-S30/DVD-S510/DVD-S520/DVD-S530/DVD-S540/DVD-S550/DVD-S657/DVD-S700/DVD-S80/DVD-S840

BD player: BD-940/BD-S1065/BD-S1900/BD-S2900/BD-S671

Others: CDR-D651/CDR-HD1000/CDR-HD1300/CDR-HD1500/DV-SL100/CDX-E100/CRX-430/CRX-E150/RDX-E700

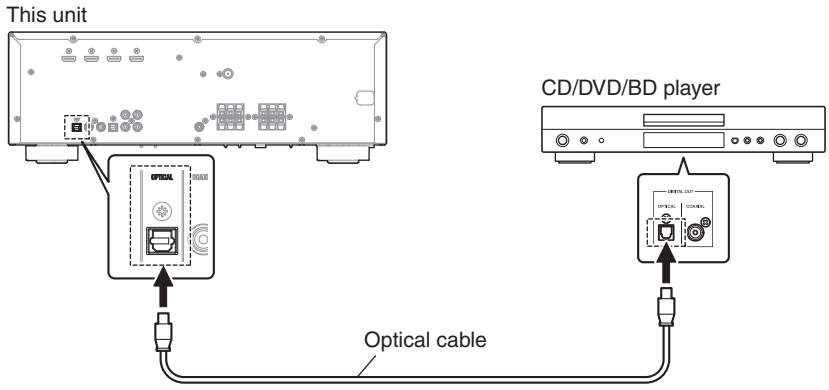
- Optical cable (when OPTICAL jack is used)
- Digital audio pin cable (when COAXIAL jack is used)
- Firmware CD

  Download the latest firmware from the specified download source and create the firmware CD.

● Connection

Connect a CD/DVD/BD player to this unit as shown below. (Fig. 1)

Example of connection between digital OPTICAL jacks



Example of connection between digital COAXIAL jacks

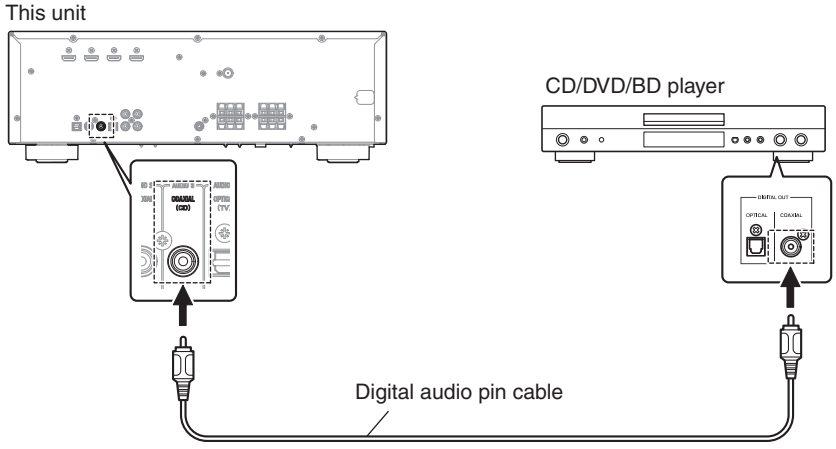
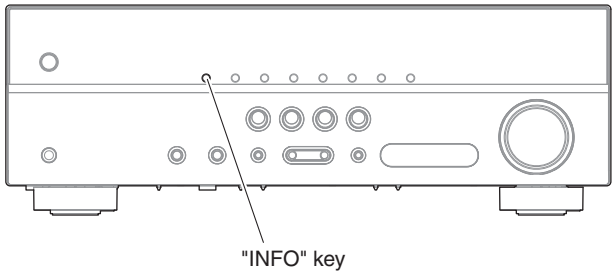


Fig. 1

● Operation Procedures

1. While pressing the “INFO” key, connect the power cable to the AC outlet. (Fig. 2)
   The FIRMWARE UPDATE mode is activated and “CDDA Upgrader” is displayed. (Fig. 2)



Display

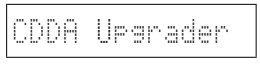


Fig. 2

2. Play the firmware CD on the CD/DVD/BD player. Writing of the firmware starts automatically. (Fig. 3)
3. When writing of the firmware is completed, “Update Success”, “Please...” and “Power off!!” are displayed repeatedly. (Fig. 3)

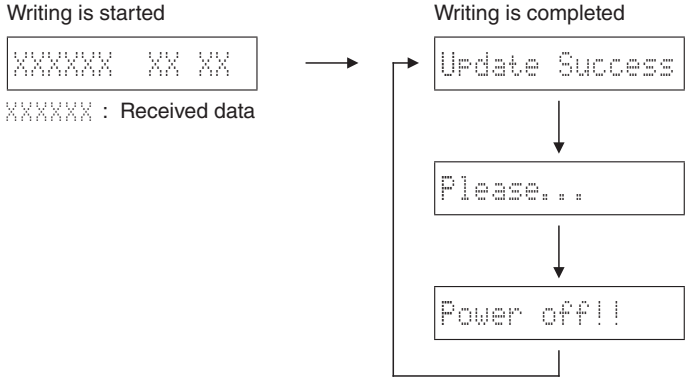


Fig. 3

* If the display remains unchanged for more than 10 seconds after starting the firmware CD play procedure, perform the firmware CD play procedure again from the beginning.
If “FILE CORRUPTED” is displayed after “Address:XXXXXX”, make sure that the data written to the firmware CD is not corrupted and perform Steps 1 to 3 of “Operation Procedures” again.
If “Upgrade Failed” is displayed, perform “operation procedures” from the beginning again.

4. Press the “⏻” (Power) key to turn off the power.
5. Eject the firmware CD from the CD/DVD/BD player.
6. Start up the self-diagnostic function and check that the firmware version and checksum are the same as written ones. (See “Confirmation of firmware version and checksum”)

■ SELF-DIAGNOSTIC FUNCTION

This unit has self-diagnostic functions that are intended for inspection, measurement and location of faulty point.
There are 26 main menu items, each of which has sub-menu items.
Listed in the table below are main menu items and sub-menu items.
Note: Some of the menu items listed below may not apply to the models covered in this service manual.

No.	Main menu	Sub-menu	
1	BYPASS	1	ANALOG BYPASS
2	RAM THROUGH	1	RAM MARGIN
		2	RAM FULL ALL
		3	RAM FULL CENTER
		4	RAM FULL SURROUND
		5	RAM FULL SURROUND BACK (Not for service)
		6	RAM FULL SUBWOOFER
3	HDMI AUDIO	1	SPDIF
		2	Multi
		3	DSD
		4	ARC
4	SPEAKERS SET	1	FRONT: SML 0dB
		2	CENTER: NONE
		3	LFE/BASS: FRNT
		4	TONE: MAX
		5	TONE: MIN
		6	SPEAKER 6-ohms (Not for service)
5	LIMITER CONTROL (Not for service)	1	AC_B: Hi
		2	AC_B: Lo
		3	LIM/PLDET/THM
6	NO MENU	Invalidity	
7	VFD CHECK	1	INITIAL DISPLAY
		2	ALL SEGMENT OFF
		3	ALL SEGMENT ON
		4	DIMMER 50%
		5	CHECK PATTERN
8	MANUAL TEST	1	TEST ALL
9	AD DATA CHECK	1	PS/DC
		2	TH1/TH2
		3	TH3
		4	AMP/DK (Not for service)
		5	K1/K2
10	VIDEO CHECK	1	I2C
		2	DIGITAL COMPONENT (Not for service)
		3	DIGITAL CVBS (Not for service)
		4	DIGITAL Y/C (Not for service)
		5	ANALOG BYPASS (Not for service)
11	NO MENU	Invalidity	

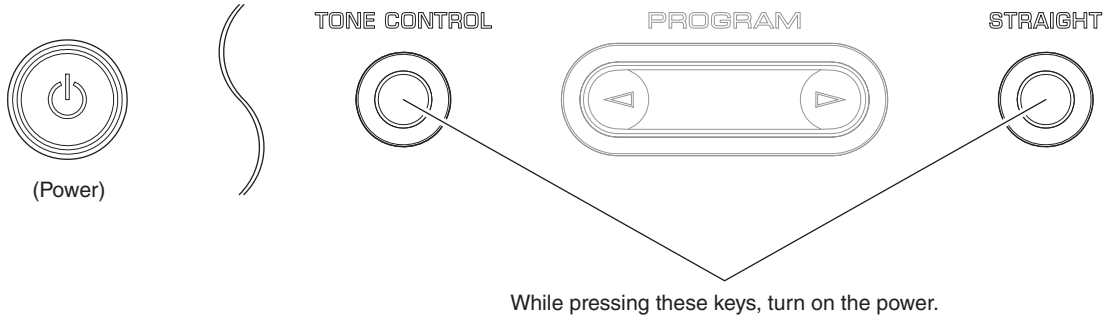
No.	Main menu	Sub-menu	
12	NO MENU	Invalidity	
13	NO MENU	Invalidity	
14	NO MENU	Invalidity	
15	HDMI INFORMATION	1	MODEL NAME
		2	PRODUCT ID
		3	VENDOR NAME
16	HDMI SELECT	1	HDMI NONE
		2	HDMI IN 1
		3	HDMI IN 2
		4	HDMI IN 3
17	NO MENU	Invalidity	
18	IF STATUS (Not for service)	1	DSP STATUS
19	BUS CHECK	1	TI BUS:
		2	EEPROM:
20	NO MENU	Invalidity	
21	PROTECTION HISTORY	1	HISTORY 1
		2	HISTORY 2
		3	HISTORY 3
		4	HISTORY 4
22	SOFT SWITCH	1	SWITCH MODE
		2	MODEL
		3	DESTINATION
23	UPDATE (Not for service)	1	TI FLASH BOOT
24	FACTORY PRESET	1	PRESET INHIBIT
		2	PRESET RESERVED
25	ROM VER/SUM/PORT	1	FIRMWARE VERSION
		2	ALL CHECKSUM
		3	TI (DSP) FLASH ROM VERSION
		4	TI (DSP) FLASH ROM CHECKSUM
		5	MODEL/DESTINATION
		6	Verify (Not for service)
26	MODEL/DESTINATION (Not for service)	1	MODEL/DEST
		2	M/D:

● Starting Self-Diagnostic Function

While pressing the “TONE CONTROL” and “STRAIGHT” keys, press the “⏻” (Power) key to turn on the power.

The self-diagnostic function mode is activated.

Keys of this unit



● Starting Self-Diagnostic Function in the protection cancel mode

If the protection function works and causes hindrance to troubleshooting, cancel the protection function by the procedure below, and it will be possible to enter the self-diagnostic function mode.
(The protection functions other than the excess current detect function will be disabled.)

While pressing the “TONE CONTROL” and “STRAIGHT” keys, press the “⏻” (Power) key to turn on the power and keep pressing those 2 keys and the “⏻” (Power) key for 3 seconds or longer.

The self-diagnostic function mode is activated with the protection functions disabled.

In this mode, the “SLEEP” segment of the FL display flashes to indicate that the mode is self-diagnostic function mode with the protection functions disabled.

CAUTION!
Using this unit with the protection function disabled may cause further damage to this unit. Use special care for this point when using this mode.

● Canceling Self-Diagnostic Function

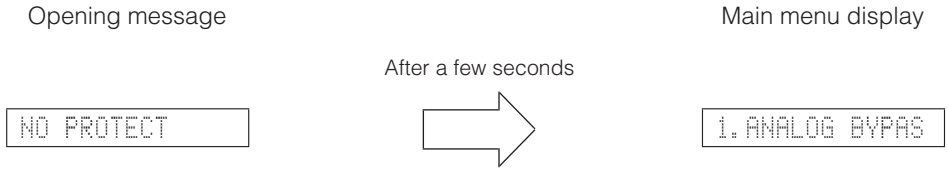
1. Before canceling self-diagnostic function, execute setting for FACTORY PRESET of main menu No.24. (Memory initialization inhibited or Memory initialized).
   * In order to keep the user memory preserved, be sure to select PRESET INHIBITED (Memory initialization inhibited).
2. Press the “⏻” (Power) key to turn off the power.

● Display provided when Self-Diagnostic Function started

The display is as described below depending on the situation when the power to this unit is turned off.

1. When the power is turned off by usual operation:

"NO PROTECT" is displayed. Then "1. ANALOG BYPAS" is displayed in a few seconds.



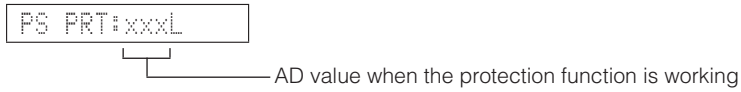
2. When the protection function worked to turn off the power:

The information of protection function which worked at that time is displayed. Then "1.ANALOG BYPAS" is displayed in a few seconds.

Note: At that time if you restart the self-diagnostic function after turning off the power once, "NO PROTECT" will be displayed. That is because that situation is equal to "1. When the power is turned off by usual operation:".

However history of the protection function is stored in a back-up IC. For details, refer to "21. PROTECTION HISTORY" menu.

2-1. When the protection function worked due to excess current.



Cause: An excessive current flowed through the power amplifier.
Supplementary information: As current of the power amplifier is detected, the abnormal channel can be identified by checking the current detect transistor.

Turning on the power without correcting the abnormality will cause the protection function to work immediately and the power supply will instantly be shut off.

Notes:

- **Applying the power to this unit without correcting the abnormality can be dangerous and cause additional circuit damage. To avoid this, if "PS" and "DC" protection function works 3 times consecutively, the power will not turn on even when the "⏻" (Power) key is pressed.**
  In order to turn on the power again, disconnect the power cable from the AC outlet once and then reconnect it again.
- **The output transistors in each amplifier channel should be checked for damage before applying power to this unit.**
- **Amplifier current should be monitored by measuring DC voltage across the emitter resistors for each channel.**

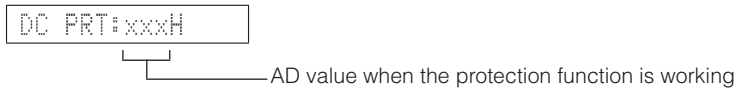
2-2. When the protection function worked due to a short between speaker terminals.



Cause: The line between speaker terminals is shorted.
Supplementary information: As the excess current is detected after operation of the speaker relay, the shorted speaker terminal and the connected speaker can be identified.

Turning on the power without correcting the abnormality will cause the protection function to work immediately and the power supply will instantly be shut off.

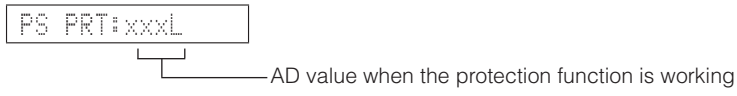
2-3. When the protection function worked due to abnormal DC output.



Cause: DC output of the power amplifier is abnormal.
Supplementary information: The protection function worked due to a DC voltage appearing at the speaker terminal. A cause could be a defect in the amplifier.

Turning on the power without correcting the abnormality will cause the protection function to work in 3 seconds and the power supply will be shut off.

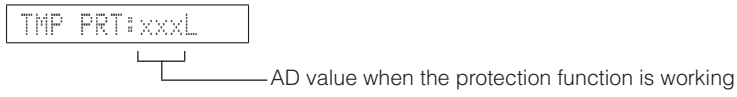
2-4. When the protection function worked due to abnormal voltage in the power supply section.



Cause: The voltage in the power supply section is abnormal.
Supplementary information: The protection function worked due to a defect or overload in the power supply.

Turning on the power without correcting the abnormality will cause the protection function to work in 1 seconds and the power supply will be shut off.

2-5. When the protection function worked due to excessive heatsink temperature.



Cause: The temperature of the heatsink is excessive.
Supplementary information: The protection function worked due to the temperature limit being exceeded.
Causes could be poor ventilation or a defect related to the thermal sensor.

Turning on the power without correcting the abnormality will cause the protection function to work in 1 seconds and the power supply will be shut off.

* For detection of each protection function, refer to main menu described later.

● **History of protection function**

When the protection function has worked, its history is stored in memory as backup data.

Even if no abnormality is noted while servicing this unit, an abnormality which has occurred previously can be defined as long as the backup data has been stored.

The history of the protection function will be initialized when self-diagnostic function is cancelled with “24-2. PRESET RESERVED” (Memory initialized) menu selected.

● Operation procedure of Main menu and Sub-menu

There are 26 main menu items, each of which has sub-menu items.

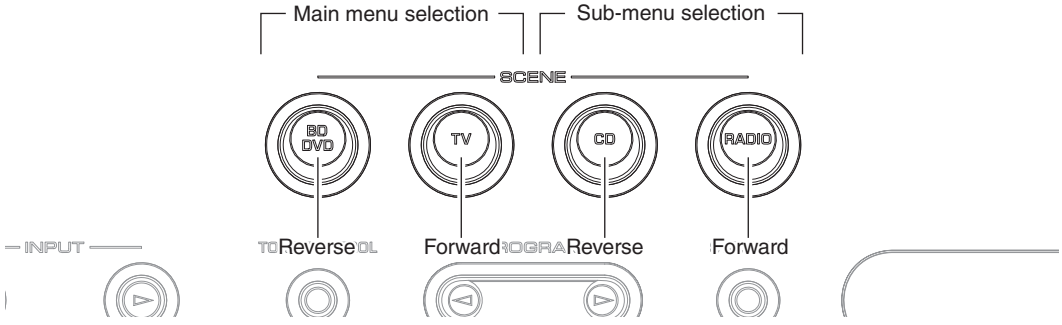
Main menu selection

Select the main menu using “SCENE TV” (forward) and “SCENE BD/DVD” (reverse) keys.

Sub-menu selection

Select the sub-menu using “SCENE RADIO” (forward) and “SCENE CD” (reverse) keys.

Keys of this unit



● Functions in Self-Diagnostic Function mode

In addition to the self-diagnostic function menu items, functions listed below are available.

- Power ON/OFF
- Master volume
- Muting
- Input selection

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

● Initial settings when Self-Diagnostic Function started

The following initial settings are used when self-diagnostic function is started.
When self-diagnostic function is canceled, these settings are restored to those before starting self-diagnostic function.

- Master volume: -20 dB
- Input: AUDIO5
- Main menu: 1. ANALOG BYPASS
- Speaker setting: LARGE, Bass out to SWFR (All channels)

● Details of Self-Diagnostic Function menu

1. BYPASS

This menu is used to check audio signal route of analog bypass.

1-1. ANALOG BYPASS

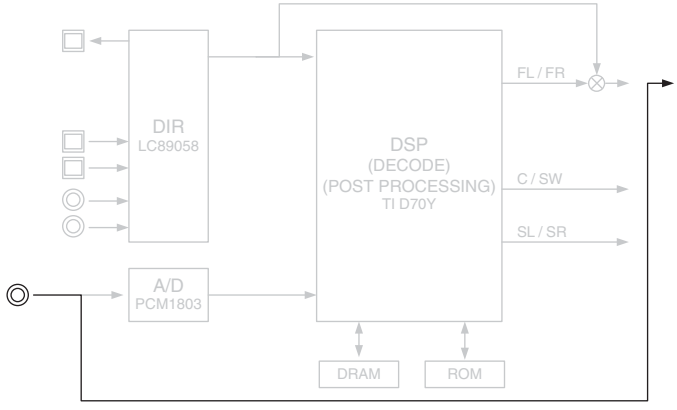
The analog input audio signal is output to FRONT L/R in DIRECT mode.

1.ANALOG BYPAS

INPUT: AUDIO5 ANALOG
SPEAKER OUT: 1 kHz, SUBWOOFER OUTPUT: 50 Hz

Input level	Volume	SPEAKER OUTPUT			
		FRONT	CENTER	SURROUND	SUBWOOFER
Both ch, -20 dBm	+6.5 dB	+11.5 dBm	-∞	-∞	-∞

ANALOG BYPASS



(Shaded items not used in this example)

2. RAM THROUGH

This menu is used to check audio signal route via DSP.

2-1. RAM MARGIN

The audio signal is output including the head margin.

2.RAM MARGIN

INPUT: AUDIO5 ANALOG
SPEAKER OUT: 1 kHz, SUBWOOFER OUTPUT: 50 Hz

Input level	Volume	SPEAKER OUTPUT			
		FRONT	CENTER	SURROUND	SUBWOOFER
Both ch, -20 dBm	+6.5 dB	+11.5 dBm	+11.5 dBm	+11.5 dBm	0.0 dBm

2-2. RAM FULL ALL

The SUBWOOFER signal is output including the head margin.
The audio signal other than SUBWOOFER is output without including the head margin.

2.RAM FULL ALL

INPUT: AUDIO5 ANALOG
SPEAKER OUT: 1 kHz, SUBWOOFER OUTPUT: 50 Hz

Input level	Volume	SPEAKER OUTPUT			
		FRONT	CENTER	SURROUND	SUBWOOFER
Both ch, -20 dBm	+6.5 dB	+11.5 dBm	+11.5 dBm	+11.5 dBm	0.0 dBm

2-3. RAM FULL CENTER

The audio signal is output to only CENTER channel in digital full bit without including the head margin.

2.RAM FULL C

INPUT: AUDIO5 ANALOG
SPEAKER OUT: 1 kHz, SUBWOOFER OUTPUT: 50 Hz

Input level	Volume	SPEAKER OUTPUT			
		FRONT	CENTER	SURROUND	SUBWOOFER
Both ch, -20 dBm	+6.5 dB	-∞	+11.5 dBm	-∞	-∞

2-4. RAM FULL SURROUND

The audio signal is output to only SURROUND L/R channels in digital full bit without including the head margin.

2.RAM FULL SUR

INPUT: AUDIO5 ANALOG
SPEAKER OUT: 1 kHz, SUBWOOFER OUTPUT: 50 Hz

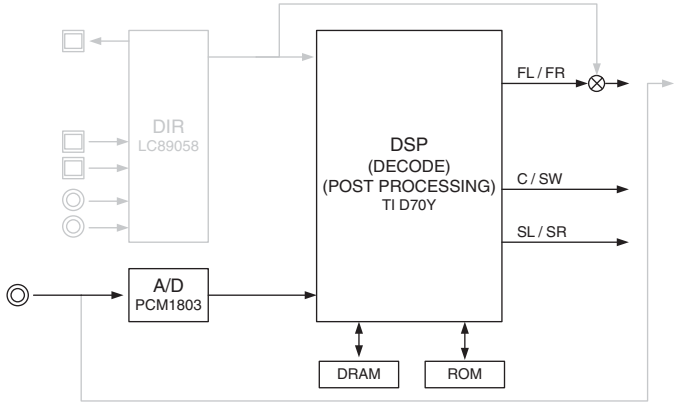
Input level	Volume	SPEAKER OUTPUT			
		FRONT	CENTER	SURROUND	SUBWOOFER
Both ch, -20 dBm	+6.5 dB	-∞	-∞	+11.5 dBm	-∞

2-5. RAM FULL SURROUND BACK

Not for service.

2.RAM FULL SB

RAM THROUGH



(Shaded items not used in this example)

2-6. RAM FULL SUBWOOFER

The audio signal is output to only SUBWOOFER channel in digital full bit without including the head margin.

2.RAM FULL SW

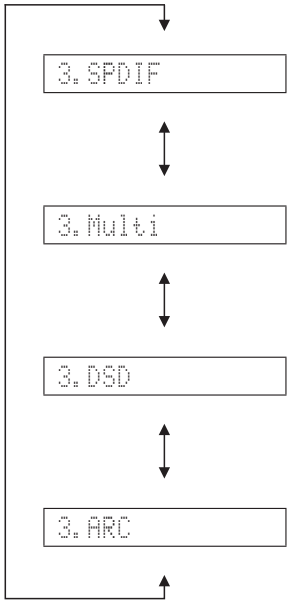
INPUT: AUDIO5 ANALOG
SPEAKER OUT: 1 kHz, SUBWOOFER OUTPUT: 50 Hz

Input level	Volume	SPEAKER OUTPUT			
		FRONT	CENTER	SURROUND	SUBWOOFER
Both ch, -20 dBm	+6.5 dB	-∞	-∞	-∞	0.0 dBm

3. HDMI AUDIO

This menu is used to check the route of audio signal input to HDMI IN/OUT.

* Before check using “3-3. DSD” menu, be sure to connect a CD player equipped with Direct Stream Digital output to this unit in advance.
* Before check using “3-4. ARC” menu, be sure to connect a TV monitor equipped with Audio Return Channel function to this unit in advance.



3-1. SPDIF
SPDIF signal is output.

3-2. Multi (DVD-Audio)
Multi signal is output.

3-3. DSD (Direct stream digital)
DSD signal is output.

3-4. ARC (Audio return channel)
The audio signal input from HDMI OUT is output.

4. SPEAKER SET

This menu is used to check the speaker output.

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

	FRONT	CENTER	SURROUND	SUBWOOFER
FRONT : SML 0dB	SMALL	LARGE	LARGE	SWFR
CENTER : NONE	LARGE	NONE	LARGE	SWFR
LFE/B : FRONT	LARGE	SMALL	SMALL	FRONT
TONE : MAX	LARGE	LARGE	LARGE	SWFR
TONE : MIN	LARGE	LARGE	LARGE	SWFR
SPEAKER 6-ohms	LARGE	LARGE	LARGE	SWFR

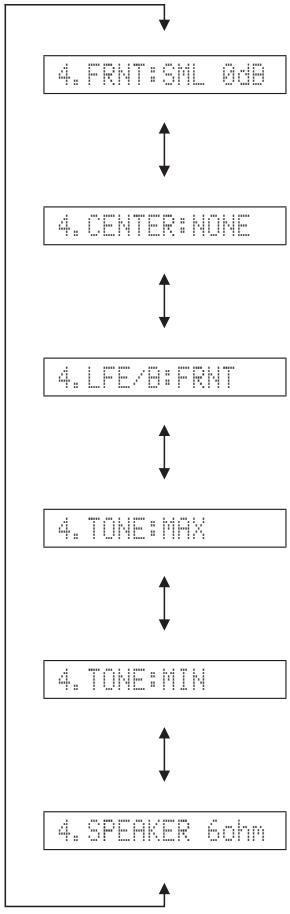
LARGE: This mode is used for a speaker with high bass reproduction performance (a large unit). Full bandwidth signals are output.

SMALL: This mode is used for a speaker with low bass reproduction performance (a small unit).
The signals of 90 Hz or less are mixed into the channel specified by LFE/BASS.

NONE: This mode is used for no center speaker.
The center content is reduced by 3 dB and distributed to FRONT L/R.

SWFR: LFE of 5.1 channel signal or LFE/BASS lower than 90 Hz is output through SUBWOOFER OUT.

FRONT: LFE of 5.1 channel signal or LFE/BASS lower than 90 Hz is distributed to FRONT L/R.



4-1. FRONT: SML 0dB

The FRONT L/R signal, when 90 Hz or lower, is mixed to the channel specified by LFE/BASS.

4-2. CENTER: NONE

The CENTER signal is distributed to FRONT L/R.

4-3. LFE / BASS: FRONT

The LFE/BASS signal is distributed to FRONT L/R.

4-4. TONE: MAX

The audio signal is output with the tone control “BASS +10 dB”, “TREBLE +10 dB”.

4-5. TONE: MIN

The audio signal is output with the tone control “BASS -10 dB”, “TREBLE -10 dB”.

4-6. SPEAKER 6 ohms

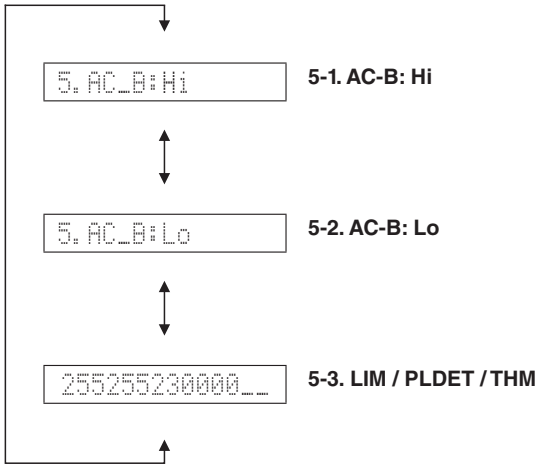
Not for service.

INPUT: AUDIO5 ANALOG
SPEAKER OUT: 1 kHz, SUBWOOFER OUTPUT: 50 Hz

Sub-menu	Input level	Volume	SPEAKER OUTPUT			
			FRONT	CENTER	SURROUND	SUBWOOFER
FRNT : SML 0dB	Both ch, -20 dBm	+6.5 dB	+11.5 dB	+11.5 dB	+11.5 dB	0.0 dB
CENTER : NONE	Both ch, -20 dBm	+6.5 dB	+16.0 dB	-∞	+11.5 dB	0.0 dB
LFE/B : FRNT	Both ch, -20 dBm	+6.5 dB	-∞	+11.5 dB	+11.5 dB	-∞
TONE : MAX	Both ch, -20 dBm	+6.5 dB	+14.0 dB	+11.5 dB	+11.5 dB	0.0 dB
TONE : MIN	Both ch, -20 dBm	+6.5 dB	+8.5 dB	+11.5 dB	+11.5 dB	0.0 dB
SPEAKER 6 ohms	Both ch, -20 dBm	+6.5 dB	+11.5 dB	+11.5 dB	+11.5 dB	0.0 dB

5. LIMITER CONTROL

Not for service.

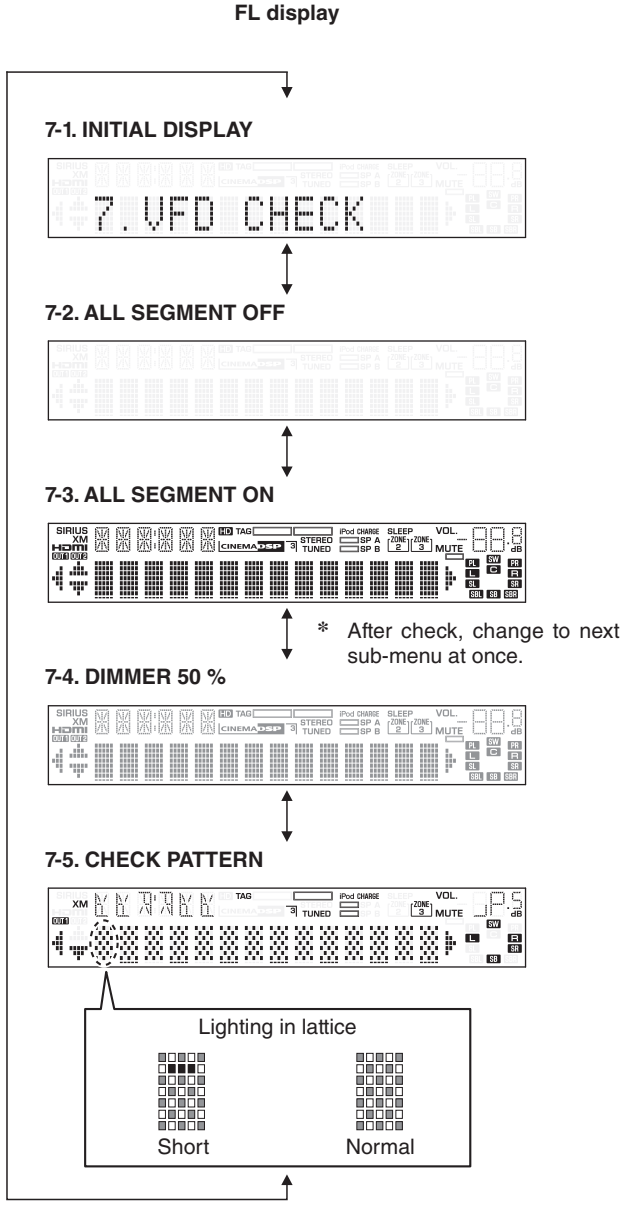


6. NO MENU



7. VFD CHECK

This menu is used to check operation of the FL display.



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).
(In the above example, the segments in the second row from the top are shorted.)

8. MANUAL TEST

The built-in noise generator of DSP outputs the test noise through the channels specified by using the sub-menu.

	Test noise
for SUBWOOFER	30 Hz to 80 Hz, pink noise
for other than SUBWOOFER	500 Hz to 2 kHz, pink noise

8-1. TEST ALL

The test noise is output to all channels.



9. A/D DATA CHECK

This menu is used to display the A/D conversion value of the microprocessor which detects panel keys and protection functions by using the sub-menu.

When “9-5. K1/K2” menu is selected, keys become inoperable due to detection of the values of all keys.

However, it is possible to advance to the next menu by turning the “VOLUME” knob.

* Numeric values in the figure are given as reference only.

9-1. PS/DC

PS: Power supply voltage protection detection

Detected: AC2, ±12A, S9, +7D, +5A, -VP

Detection port: 93 pin (PS_PRT)

Normal value: 101 to 155
(Reference voltage: 3.3 V=255)

DC: Power amplifier DC (DC voltage) output is detected.

Detection port: 87 pin (DC_PRT)

Normal value: 30 to 70
(Reference voltage: 3.3 V=255)

* If PS or DC becomes out of the normal value range, the protection function works to turn off the power.



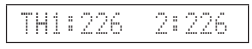
9-2. TH1/TH2

Temperature of the heatsink is detected.

Detection port: 89 pin (THM1)
90 pin (THM2) (U, C models)

Normal value: 87 to 255
(Reference voltage: 3.3 V=255)

* If TH1 or TH2 becomes out of the normal value range, the protection function works to turn off the power.



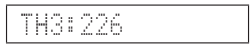
9-3. TH3

Temperature of the bridge diode (D24 on MAIN P.C.B.) is detected.

Detection port: 63 pin (THM3)

Normal value: 88 to 255
(Reference voltage: 3.3 V=255)

* If TH3 becomes out of the normal value range, the protection function works to turn off the power.



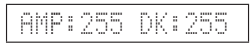
9-4. AMP/DK

AMP: Power amplifier output level is detected.

Detection port: 88 pin (AMP_OLV)

Normal value: 128 to 255
(Reference voltage: 3.3 V=255)

DK: Not for service.



9-5. K1/K2

Panel key is detected.

When the A/D conversion value of the panel key becomes out of the specified range, normal operation will not be available.

In that case, check the constant of voltage dividing resistor, solder condition, etc. Refer to table.
(Reference voltage: 3.3 V=255)

* When “9-5. K1/K2” menu is selected, keys become inoperable due to detection of the values of all keys. However, it is possible to advance to the next menu by turning the “VOLUME” knob.



Display	K1
0 – 11	STRAIGHT
12 – 37	MUTE
38 – 64	FM MODE
65 – 88	TUNING >>
79 – 113	TUNING <<
114 – 139	PRESET >
140 – 164	PRESET <
165 – 186	MEMORY
187 – 226	INFO
255	Key off

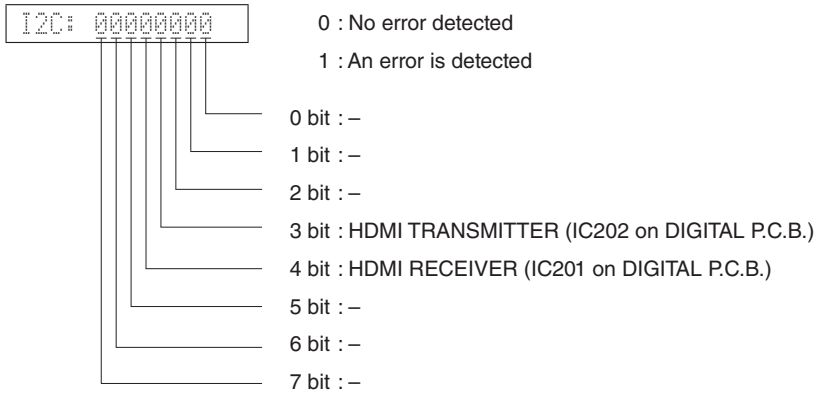
Display	K2
0 – 11	RADIO (SCENE4)
12 – 32	CD (SCENE3)
33 – 54	TV (SCENE2)
55 – 75	BD/DVD (SCENE1)
76 – 96	PROGRAM >
97 – 119	PROGRAM <
120 – 142	INPUT >
143 – 163	INPUT <
164 – 181	–
182 – 197	⏻ (Power)
198 – 209	TONE CONTROL
255	Key off

10. VIDEO CHECK

This menu is used to check operation of the video control section.

10-1. I2C check

The I2C (Inter integrated circuit) bus line connection is checked.



11. NO MENU

11.Invalidity

12. NO MENU

12.Invalidity

13. NO MENU

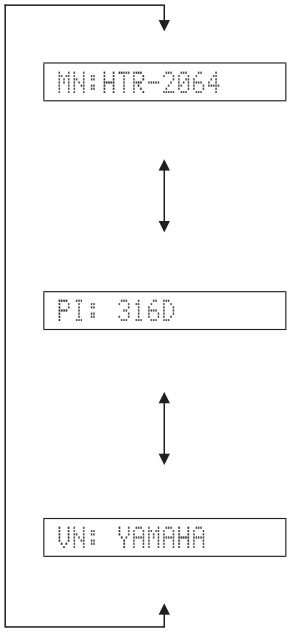
13.Invalidity

14. NO MENU

14.Invalidity

15. HDMI INFORMATION

This menu is used to display information about HDMI.



15-1. HDMI model name

The model name of this unit written to HDMI module is displayed.

HTR-2064

15-2. HDMI product ID

The product ID of this unit written to HDMI module is displayed.

HTR-2064: 316D

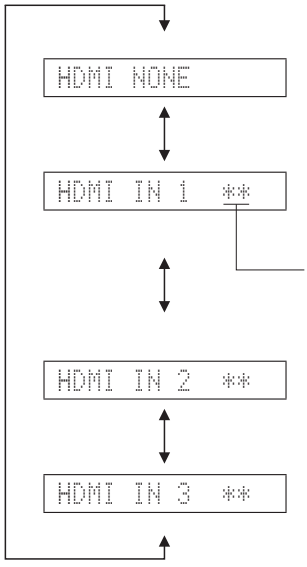
15-3. HDMI vendor name

"YAMAHA", the vendor name of this unit written to HDMI module, is displayed.

16. HDMI SELECT

This menu is used to display information of the HDMI input signal.

* Support audio is set to "OTHER".



16-1. HDMI none

No signal is output.

16-2. HDMI in 1

The signal input to HDMI "IN 1" is output.

** When deep color video signals are input, "30" bit or "36" bit is displayed.

16-3. HDMI in 2

The signal input to HDMI "IN 2" is output.

16-4. HDMI in 3

The signal input to HDMI "IN 3" is output.

17. NO MENU



18. IF STATUS (Input function status)

Not for service.



19. BUS CHECK

This menu is used to check the communication and bus line connection between devices on the DIGITAL P.C.B.

19-1. TI (DSP) BUS check

Communication and bus line connection between microprocessor (IC221) and TI (IC241) are checked.



NoEr: No error detected.

BOOT: When “Boot” is displayed for a few seconds or “Boot” and “NoEr” are displayed alternately, there is a possibility that an error had occurred.

19-2. EEPROM BUS check

Communication and bus line connection between microprocessor (IC221) and EEPROM (IC222) are checked.



OK: No error detected.

NG: An error is detected.

20. NO MENU

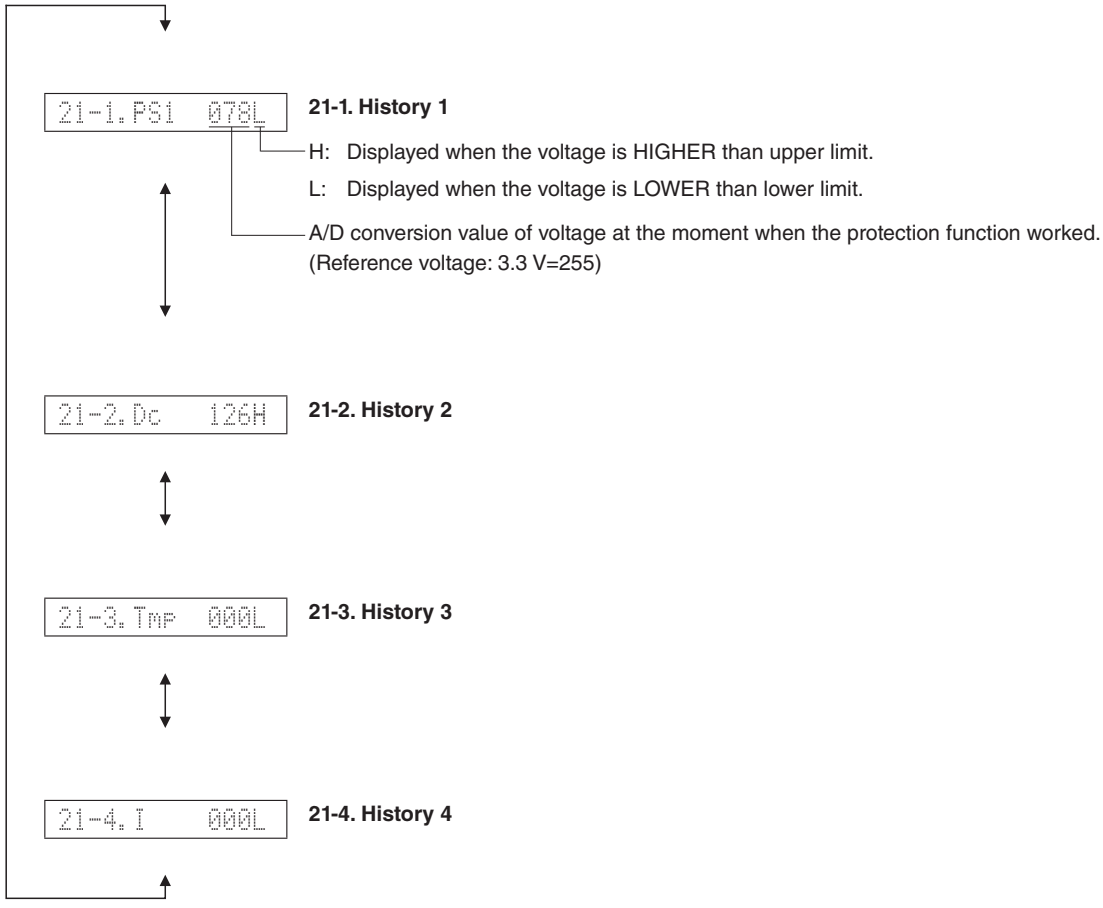


21. PROTECTION HISTORY

This menu is used to display the history of protection function.

All history of protection function will be erased by pressing the “STRAIGHT” key.

* Numeric values in the figure are given as reference only.



22. SOFT SWITCH

This menu is used to write the destination to the back-up IC (EEPROM: IC222 on DIGITAL P.C.B.).

When the following parts are replaced, the destination MUST be written by using this menu to have proper operation.

DIGITAL P.C.B.

EEPROM: IC222 on DIGITAL P.C.B.

To write the destination, first switch to the destination write mode by using the "22-1. SWITCH MODE" menu and then select desired destination by using the "22-3. DESTINATION" menu.

22-1. SWITCH MODE

Pressing the "STRAIGHT" key will change the display alternately as shown below. When "22 SW :MODEL" is displayed, this unit is in the destination write mode.



Note: After writing of the destination is completed, be sure to change to "22 SW :PCB".

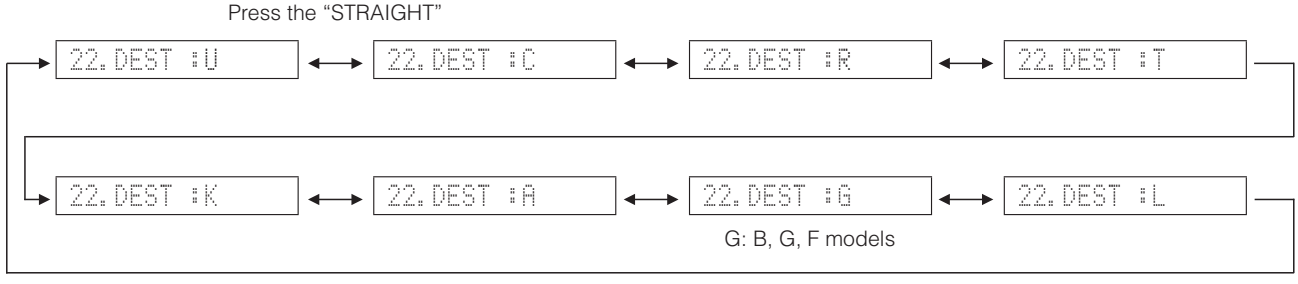
22-2. MODEL

Not for service.



22-3. DESTINATION

Press the "STRAIGHT" key repeatedly to select desired destination. Then the selected destination is written automatically.



23. UPDATE TI

Not for service.



24. FACTORY PRESET

This menu is used to reserve/inhibit initialization of the back-up IC (EEPROM: IC222 on DIGITAL P.C.B.).



24-1. PRESET INHIBIT (Initialization inhibited)

Initialization of the back-up IC is not executed. Select this sub-menu to protect the values set by the user.



24-2. PRESET RESERVED (Initialization reserved)

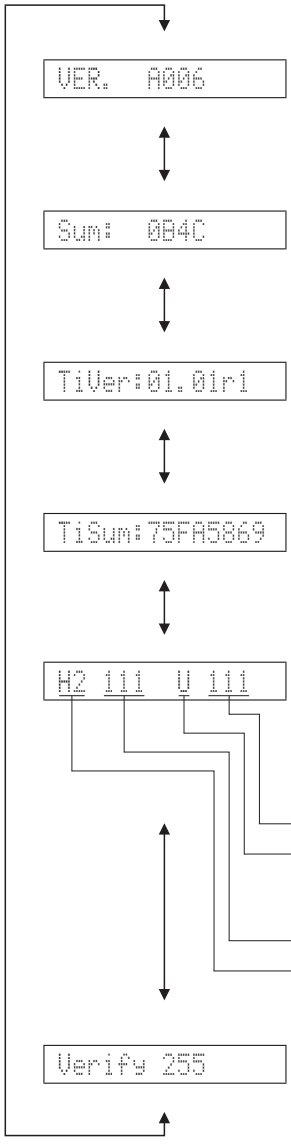
Initialization of the back-up IC is reserved. (Actual initialization is executed when the power is turned on next.) To reset to the original factory settings or to reset the backup IC, select this sub-menu and press the "⏻" (Power) key to turn off the power.

CAUTION: Before setting to the PRESET RESERVED, write down the existing preset memory content of the tuner. (This is because setting to the PRESET RESERVED will cause the user memory content to be erased.)

25. ROM VER/SUM/PORT

The firmware version, checksum values, model name and destination are displayed.

* Numeric values in the figure are given as reference only.



25-1. Firmware version

The firmware version of microprocessor (IC221 on DIGITAL P.C.B.) is displayed.

25-2. All checksum

The checksum value of microprocessor (IC221 on DIGITAL P.C.B.) is displayed.

25-3. TI (DSP) FLASH ROM version

The firmware version of TI (DSP) FLASH ROM (IC243 on DIGITAL P.C.B.) is displayed.

25-4. TI (DSP) FLASH ROM checksum

The checksum value of TI (DSP) FLASH ROM (IC243 on DIGITAL P.C.B.) is displayed.

25-5. MODEL/DESTINATION

The model name and destination are displayed.

DESTINATION detection value

Detection value	111	222	333	444	555	666	777	888
Destination	U	C	R	T	K	A	G (B, G, F)	L

MODEL detection value

Detection value	111
Model name	**H2** (HTR-2064)

25-6. VERIFY

Not for service.

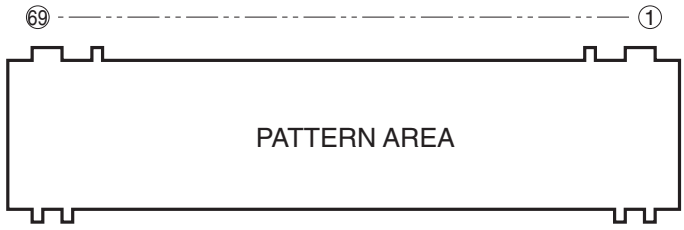
26. MODEL/DESTINATION

Not for service.



■ DISPLAY DATA

● V1001 : 18-MT-09GNK (OPERATION P.C.B.)



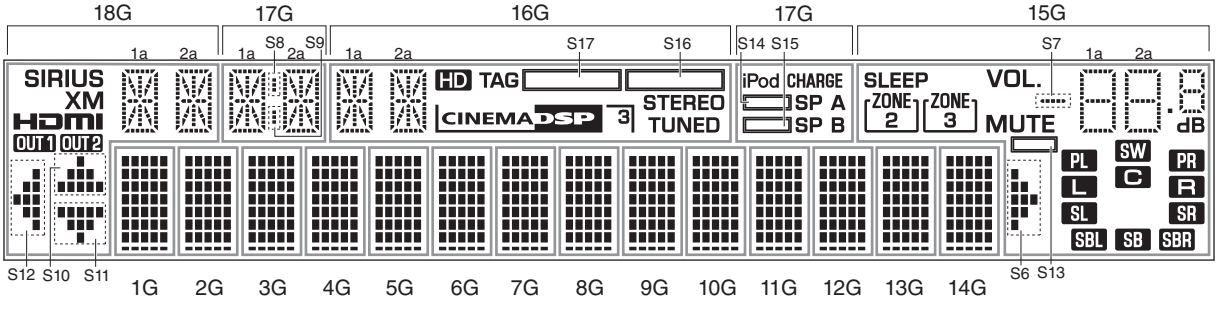
● PIN CONNECTION

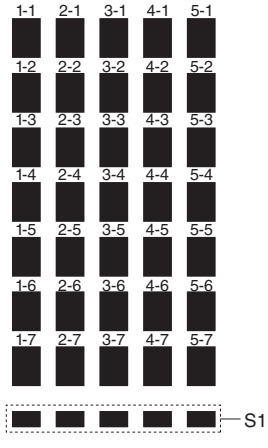
Pin No.	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
Connection	F2	NX	NP	NP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29	P30	P31

Pin No.	34	33	32	31	30	29	28	27	26	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	P32	P33	P34	P35	P36	NX	NX	NX	NX	NX	NX	NX	18G	17G	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G	NP	NP	NX	F1

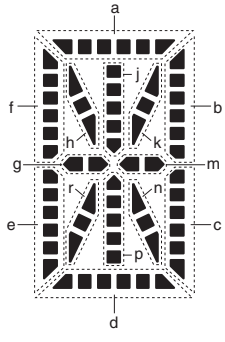
Note : 1) F1, F2 ..... Filament pin 2) NP ..... No pin 3) NX ..... No extend pin 4) 1G-18G ..... Grid pin

● GRID ASSIGNMENT

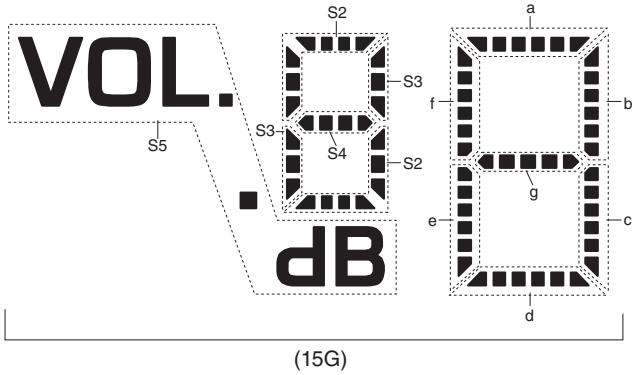




(1G-14G)



(18G-16G)



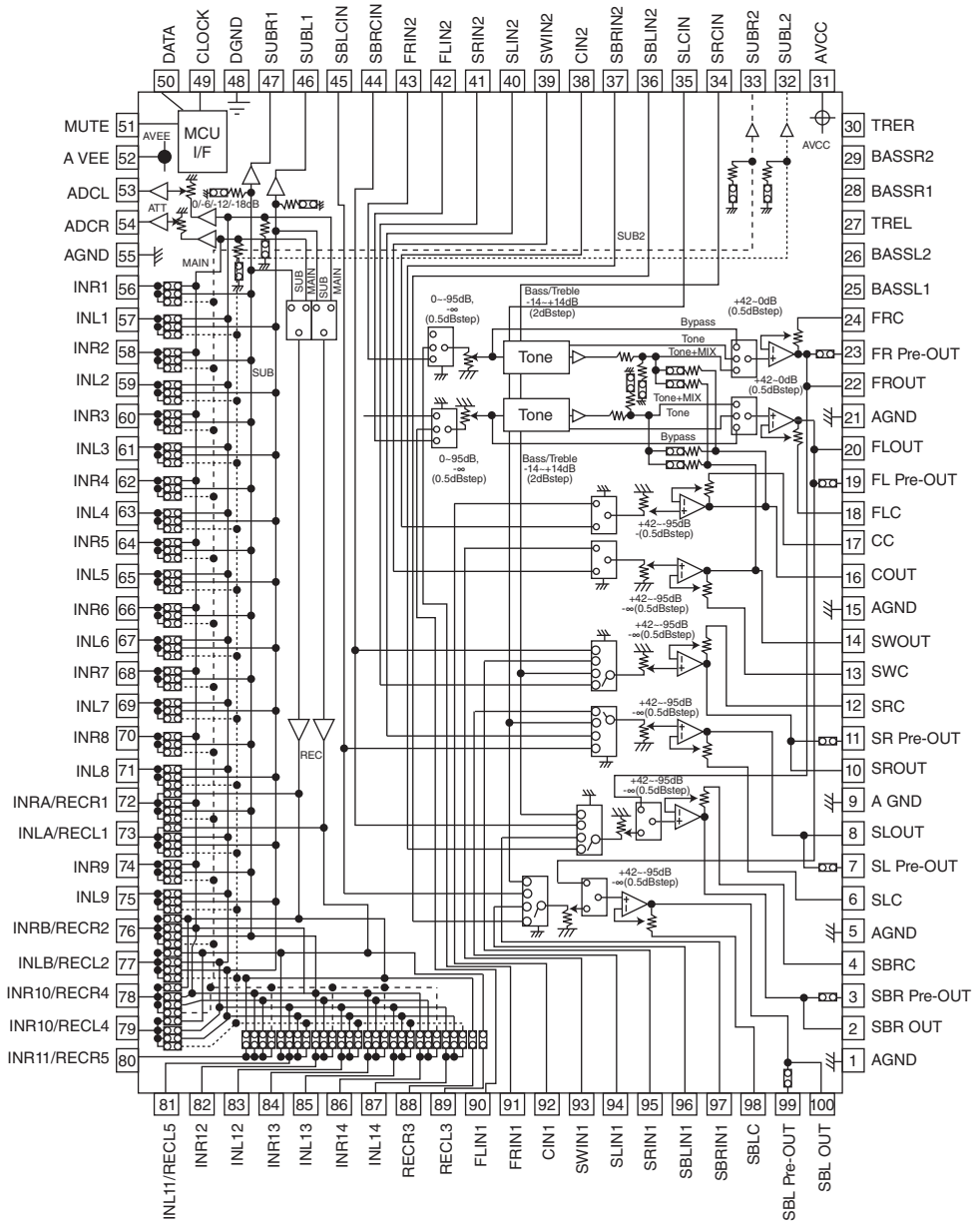
(15G)

● **ANODE CONNECTION**

	18G	17G	16G	15G	1G-14G
P1	1a	1a	1a	S5	1-1
P2	1h	1h	1h	S7	2-1
P3	1j	1j	1j	1d	3-1
P4	1k	1k	1k	2d	4-1
P5	1b	1b	1b	S2	5-1
P6	1f	1f	1f	1e	1-2
P7	1m	1m	1m	2e	2-2
P8	1g	1g	1g	S3	3-2
P9	1c	1c	1c	1c	4-2
P10	1e	1e	1e	2c	5-2
P11	1r	1r	1r	S4	1-3
P12	1p	1p	1p	1g	2-3
P13	1n	1n	1n	2g	3-3
P14	1d	1d	1d	1f	4-3
P15	2a	2a	2a	2f	5-3
P16	2h	2h	2h	1b	1-4
P17	2j	2j	2j	2b	2-4
P18	2k	2k	2k	1a	3-4
P19	2b	2b	2b	2a	4-4
P20	2f	2f	2f	PL	5-4
P21	2m	2m	2m	SW	1-5
P22	2g	2g	2g	PR	2-5
P23	2c	2c	2c	L	3-5
P24	2e	2e	2e	C	4-5
P25	2r	2r	2r	R	5-5
P26	2p	2p	2p	SL	1-6
P27	2n	2n	2n	SR	2-6
P28	2d	2d	2d	SBL	3-6
P29	SIRIUS	S8	HD	SB	4-6
P30	XM	S9	TAG	SBR	5-6
P31	HDMI	iPod CHARGE	CINEMA DSP	S6	1-7
P32	OUT1	SP B	3	S13	2-7
P33	OUT2	S15	STEREO	MUTE	3-7
P34	S12	SP A	TUNED	ZONE 2	4-7
P35	S10	S14	S17	ZONE 3	5-7
P36	S11	–	S16	SLEEP	S1

■ IC DATA

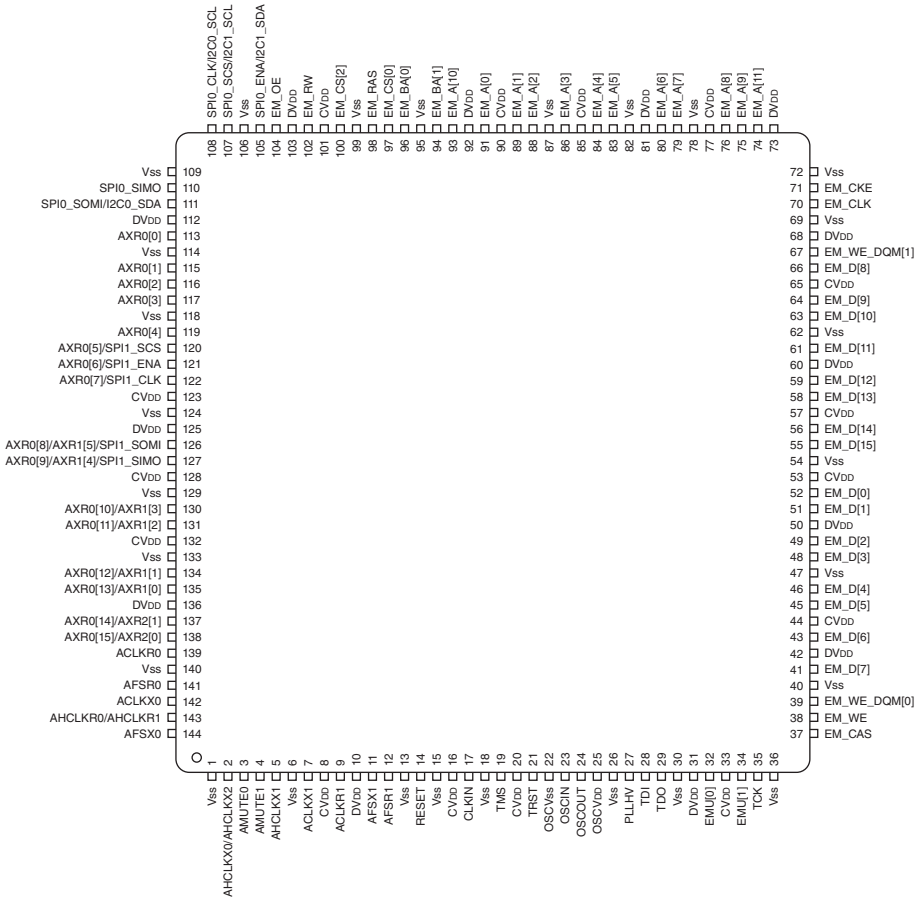
IC21: R2A15220FP (MAIN P.C.B.)
8-channel electronic volume with 11 input selector and tone control

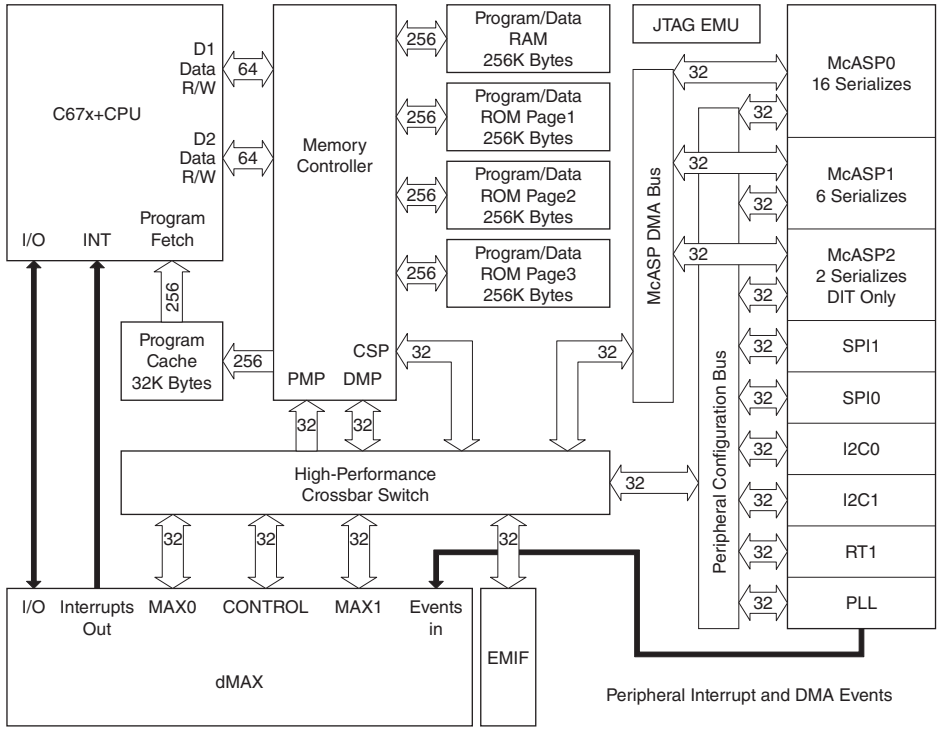


Pin No.	Port Name	Function Name	Detail of Function
1	AGND	AE	Analog ground of internal circuit
2	SBROUT	VOSBL	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel
3	SBR Pre-OUT	VOPSBL	Pre-output pin of FL/FR/SL/SR/SBL/SBR channel
4	SBRC	AE	Connects capacitor for reducing click noise of L/R/C/SW/SL/SR/SBL/SBR channel volume
5	AGND	AE	Analog ground of internal circuit
6	SLC	VOPSR	Connects capacitor for reducing click noise of L/R/C/SW/SL/SR/SBL/SBR channel volume
7	SL Pre-OUT	VOSR	Pre-output pin of FL/FR/SL/SR/SBL/SBR channel
8	SLOUT	AE	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel
9	AGND	AE	Analog ground of internal circuit
10	SROUT	VOSL	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel
11	SR Pre-OUT	VOPSL	Pre-output pin of FL/FR/SL/SR/SBL/SBR channel
12	SRC	AE	Connects capacitor for reducing click noise of L/R/C/SW/SL/SR/SBL/SBR channel volume
13	SWC	AE	
14	SWOUT	VOSW	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel
15	AGND	AE	Analog ground of internal circuit
16	COUT	VOC	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel
17	CC	AE	Connects capacitor for reducing click noise of L/R/C/SW/SL/SR/SBL/SBR channel volume
18	FLC	AE	
19	FL Pre-OUT	VOPFR	Pre-output pin of FL/FR/SL/SR/SBL/SBR channel
20	FLOUT	VOFR	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel
21	AGND	POE	Analog ground of internal circuit
22	FROUT	VOFL	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel
23	FR Pre-OUT	VOPFL	Pre-output pin of FL/FR/SL/SR/SBL/SBR channel
24	FRC	AE	Connects capacitor for reducing click noise of L/R/C/SW/SL/SR/SBL/SBR channel volume
25	BASSL1	AE	Frequency characteristic setting pin of L/R channel tone control (Bass)
26	BASSL2	AE	
27	TREL	AE	Frequency characteristic setting pin of L/R channel tone control (Treble)
28	BASSR1	AE	Frequency characteristic setting pin of L/R channel tone control (Bass)
29	BASSR2	AE	
30	TRER	AE	Frequency characteristic setting pin of L/R channel tone control (Treble)
31	AVCC	VCC	Positive power supply to internal circuit
32	SUBL1	N.C.	Output pin for L/R channel SUB1/SUB2 output
33	SUBL2	N.C.	
34	SRCIN	N.C.	3rd multi input pin for SBL/SBR/SL/SR channel volume that is able to swap SBR/SBL with SR/SL
35	SLCIN	N.C.	
36	SBLIN2	8SBR	Multi input pin of L/R/C/SW/SL/SR/SBL/SBR channel (Multi IN 1/2)
37	SBRIN2	8SBL	
38	CIN2	8C	
39	SWIN2	8SW	
40	SLIN2	8SR	
41	SRIN2	8SL	
42	FLIN2	8FR	
43	FRIN2	8FL	
44	SBRCIN	Z2L	3rd multi input pin for SBL/SBR/SL/SR channel volume that is able to swap SBR/SBL with SR/SL
45	SBLCIN	Z2R	
46	SUBL1	Z2R	Output pin for L/R channel SUB1/SUB2 output
47	SUBR1	Z2L	
48	DGND	MG	Digital ground of internal circuit
49	DATA	VOL_SCK	Input pin of control data
50	CLOCK	VOL_MOSI	Input pin of control clock

Pin No.	Port Name	Function Name	Detail of Function
51	MUTE	AE	Outside mute control pin
52	AVEE	–	Negative power supply to internal circuit
53	ADCL	ADR	Output pin for L/R channel ADC
54	ADCR	ADL	
55	AGND	AE	Analog ground of internal circuit
56	INR1	AU2L	Input pin of L/R channel (Input selector)
57	INL1	AU2R	
58	INR2	AU1L	
59	INL2	AU1R	
60	INR3	AV-6L	
61	INL3	AV-6R	
62	INR4	AV-5L	
63	INL4	AV-5R	
64	INR5	PHL	
65	INL5	PHR	
66	INR6	SRL	
67	INL6	SRR	
68	INR7	IPL	
69	INL7	IPR	
70	INR8	XML	
71	INL8	XMR	
72	INRA/RECR1	AV-OUT_L	Output pin for L/R channel (input selector)/Output pin for L/R channel REC output
73	INLA/RECL1	AV-OUT_R	
74	INR9	USBL	Input pin of L/R channel (Input selector)
75	INL9	USBR	
76	INRB/RECR2	AOL	Output pin for L/R channel (input selector)/Output pin for L/R channel REC output
77	INLB/RECL2	AOR	
78	INR10/RECR4	TUL	
79	INL10/RECL4	TUR	
80	INR11/RECR5	MIC	
81	INL11/RECL5	AE	
82	INR12	AUXL	Input pin of L/R channel (Input selector)
83	INL12	AUXR	
84	INR13	AE	
85	INL13	AE	
86	INR14	AE	
87	INL14	AE	
88	RECR3	N.C.	Output pin for L/R channel REC output
89	RECL3	N.C.	
90	FLIN1	DAFR	Multi input pin of L/R/C/SW/SL/SR/SBL/SBR channel (Multi IN 1/2)
91	FRIN1	DAFL	
92	CIN1	DAC	
93	SWIN1	DASW	
94	SLIN1	DASR	
95	SEIN1	DASL	
96	SBLIN1	DASBR	
97	SBRIN1	DASBL	
98	SBLC	AE	Connects capacitor for reducing click noise of L/R/C/SW/SL/SR/SBL/SBR channel volume
99	SBL Pre-OUT	VOPSBR	Pre-output pin of FL/FR/SL/SR/SBL/SBR channel
100	SBL OUT	VOSBR	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel

IC241: D70YE101BRFP266 (DIGITAL P.C.B.)
Decoder/Post processor
*** No replacement part available.**





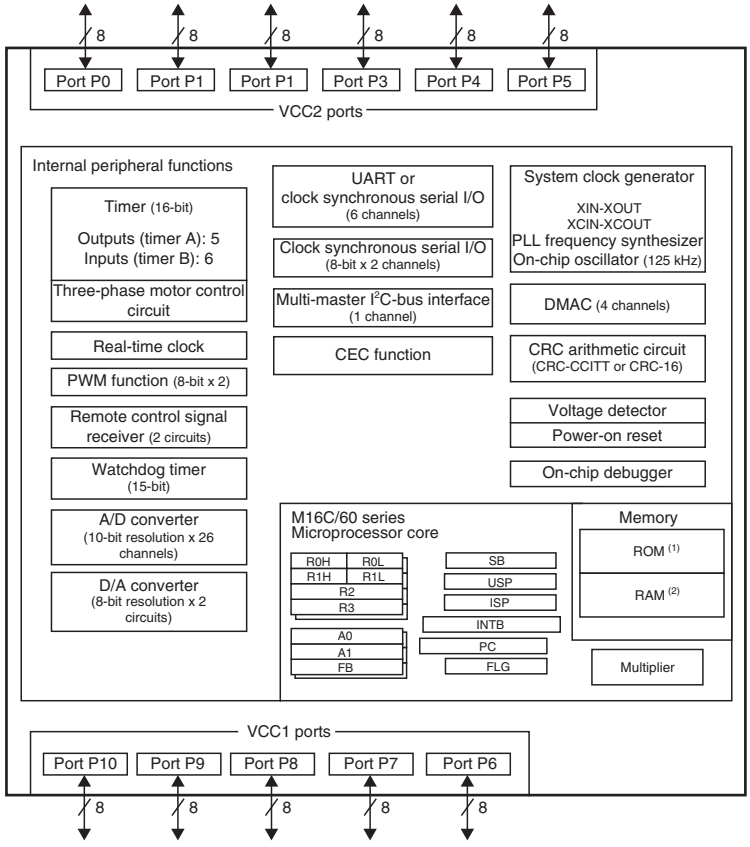
No.	Function Name (P.C.B.)	TYPE(1)	PULL(2)	GPIO(3)	Detail of Function
1	VSS				
2	AHCLKX0/AHCLKX2	IO	–	Y	McASP0 and McASP2 transmit master clock
3	AMUTE0	IO	–	Y	McASP0 mute output
4	AMUTE1	IO	–	Y	McASP1 mute output
5	AHCLKX1	IO	–	Y	McASP1 transmit master clock
6	VSS				
7	ACLKX1	IO	–	Y	McASP1 transmit bit clock
8	CVDD				
9	ACLKR1	IO	–	Y	McASP1 receive bit clock
10	DVDD				
11	AFSX1	IO	–	Y	McASP1 transmit frame Sync (L/R clock)
12	AFSR1	IO	–	Y	McASP1 receive frame Sync (L/R clock)
13	VSS				
14	RESET	IO	–	N	Device reset pin
15	VSS				
16	CVDD				
17	CLKIN	IO	–	N	Alternate clock input (3.3-V LVCMOS input)
18	VSS				
19	TMS	IO	IPU	N	Test mode select
20	CVDD				
21	TRST	IO	IPU	N	Test reset
22	OSCVSS	PWR	–	N	Oscillator Vss tap point (for filter only)
23	OSCIN	IO	–	N	1.2-V oscillator input
24	NC	O	–	N	
25	OSCVDD	PWR	–	N	Oscillator 1.2-V Vpp tap point (for filter only)
26	VSS				
27	PLLHV	PWR	–	N	PLL 3.3-V supply input (requires external filter)
28	TDI	IO	IPU	N	Test data in
29	TDO	OZ	IPU	N	Test data out
30	VSS				
31	DVDD				
32	EMU[0]	IO	IPU	N	Emulation pin 0
33	CVDD				
34	EMU[1]	IO	IPU	N	Emulation pin 1
35	TCK	IO	IPU	N	Test clock
36	Ground(Vss)				
37	EM_CAS	O	–	N	SDRAM column address strobe
38	EM_WE	O	–	N	SDRAM write enable
39	EM_WE_DQM[0]	O	–	N	Write enable or byte enable for EM_D [7:0]
40	VSS				
41	EM_D[7]	IO	–	N	EMIF data bus [lower 16-bits]
42	DVDD				
43	EM_D[6]	IO	–	N	EMIF data bus [lower 16-bits]
44	CVDD				
45	EM_D[5]	IO	–	N	EMIF data bus [lower 16-bits]
46	EM_D[4]	IO	–	N	EMIF data bus [lower 16-bits]
47	VSS				
48	EM_D[3]	IO	–	N	EMIF data bus [lower 16-bits]
49	EM_D[2]	IO	–	N	EMIF data bus [lower 16-bits]
50	DVDD				

No.	Function Name (P.C.B.)	TYPE(1)	PULL(2)	GPIO(3)	Detail of Function
51	EM_D[1]	IO	–	N	EMIF data bus [lower 16-bits]
52	EM_D[0]	IO	–	N	EMIF data bus [lower 16-bits]
53	CVDD				
54	VSS				
55	EM_D[15]	IO	–	N	EMIF data bus [lower 16-bits]
56	EM_D[14]	IO	–	N	EMIF data bus [lower 16-Bits]
57	CVDD				
58	EM_D[13]	IO	–	N	EMIF data bus [lower 16-Bits]
59	EM_D[12]	IO	–	N	EMIF data bus [lower 16-Bits]
60	DVDD				
61	EM_D[11]	IO	–	N	EMIF data bus [lower 16-Bits]
62	VSS				
63	EM_D[10]	IO	–	N	EMIF data bus [lower 16-Bits]
64	EM_D[9]	IO	–	N	EMIF data bus [lower 16-Bits]
65	CVDD				
66	EM_D[8]	IO	–	N	EMIF data bus [lower 16-bits]
67	EM_WE_DQM[1]	O	–	N	Write enable or byte enable for EM_D [15:8]
68	DVDD				
69	VSS				
70	EM_CLK	O	–	N	SDRAM clock
71	EM_CKE	O	–	N	SDRAM clock enable
72	VSS				
73	DVDD				
74	EM_A[11]	O	–	N	EMIF address bus
75	EM_A[9]	O	–	N	EMIF address bus
76	EM_A[8]	O	–	N	EMIF address bus
77	CVDD				
78	VSS				
79	EM_A[7]	O	–	N	EMIF address bus
80	EM_A[6]	O	–	N	EMIF address bus
81	DVDD				
82	VSS				
83	EM_A[5]	O	–	N	EMIF address bus
84	EM_A[4]	O	–	N	EMIF address bus
85	CVDD				
86	EM_A[3]	O	–	N	EMIF address bus
87	VSS				
88	EM_A[2]	O	–	N	EMIF address bus
89	EM_A[1]	O	–	N	EMIF address bus
90	CVDD				
91	EM_A[0]	O	–	N	EMIF address bus
92	DVDD				
93	EM_A[10]	O	–	N	EMIF address bus
94	EM_BA[1]	O	–	N	SDRAM bank address and asynchronous memory Low-Order address
95	VSS				
96	EM_BA[0]	O	–	N	SDRAM bank address and asynchronous memory Low-Order address
97	EM_CS[0]	O	–	N	SDRAM chip select
98	EM_RAS	O	–	N	SDRAM row address strobe
99	VSS				
100	EM_CS[2]	O	–	N	Asynchronous memory chip select

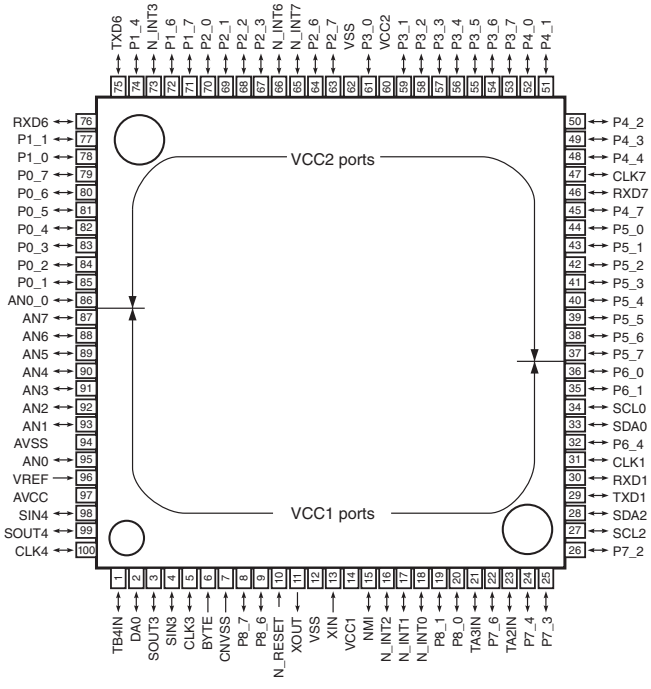
No.	Function Name (P.C.B.)	TYPE(1)	PULL(2)	GPIO(3)	Detail of Function
101	CVDD				
102	NC	O	–	N	Asynchronous memory read/not write
103	DVDD				
104	EM_OE	O	–	N	SDRAM output enable
105	SPI0_ENA/I2C1_SDA	IO	–	Y	SPI0 enable (ready) or I2c1 serial data
106	VSS				
107	SPI0_ENA/I2C1_SCL	IO	–	Y	SPI0 enable (ready) or I2c1 serial clock
108	SPI0_CLK/I2C0_SCL	IO	–	Y	SPI0 serial clock or I2c0 serial clock
109	VSS				
110	SPIO_SIMO	IO	–	Y	SPI0 data pin slave in master out
111	SPIO_SOMI/I2C0_SDA	IO	–	Y	SPI0 data pin slave out master in or I2C0 serial data
112	DVDD				
113	AXR0[0]	IO	–	Y	McASP0 serial data 0
114	VSS				
115	AXR0[1]	IO	–	Y	McASP0 serial data 1
116	AXR0[2]	IO	–	Y	McASP0 serial data 2
117	AXR0[3]	IO	–	Y	McASP0 serial data 3
118	VSS				
119	AXR0[4]	IO	–	Y	McASP0 serial data 4
120	SPI1_SCS	IO	–	Y	McASP0 serial data 5 or SPI1 slave chip select
121	SPI1_ENA	IO	–	Y	McASP0 serial data 6 or SPI1 enable (ready)
122	SPI1_CLK	IO	–	Y	McASP0 serial data 7 or SPI1 serial clock
123	CVDD				
124	VSS				
125	DVDD				
126	/SPI1_SOMI	IO	–	Y	McASP0 serial data 8 or McASP1 serial data 5 or SPI1 data pin slave out master in
127	/SPI1_SIMO	IO	–	Y	McASP0 serial data 9 or McASP1 serial data 4 or SPI1 data pin slave in master out
128	CVDD				
129	VSS				
130	AXR0[10]	IO	–	Y	McASP0 serial data 10 or McASP1 serial data 3
131	AXR0[11]	IO	–	Y	McASP0 serial data 11 or McASP1 serial data 2
132	CVDD				
133	VSS				
134	AXR0[12]	IO	–	Y	McASP0 serial data 12 or McASP1 serial data 1
135	AXR0[13]	IO	–	Y	McASP0 serial data 13 or McASP1 serial data 0
136	DVDD				
137	AXR0[14]	IO	–	Y	McASP0 serial data 14 or McASP2 serial data 1
138	AXR0[15]	IO	–	Y	McASP0 serial data 15 or McASP2 serial data 0
139	ACLKR0	IO	–	Y	McASP0 receive bit clock
140	VSS				
141	AFSR0	IO	–	Y	McASP0 receive frame Sync (L/R clock)
142	ACLKX0	IO	–	Y	McASP0 transmit bit clock
143	AHCLKR0/AHCLKR1	IO	–	Y	McASP0 and McASP1 receive master clock
144	AFSX0	IO	–	Y	McASP0 transmit frame Sync (L/R clock)

IC221: R5F364AMNFB (DIGITAL P.C.B.)
Microprocessor

*** No replacement part available.**



Notes:
1. ROM size depends on MCU type.
2. RAM size depends on MCU type.



Notes:
1. N-channel open drain output.
2. Check the position of pin 1 by referring to appendix 1, Package Dimensions.

Pin No.	Port Name	Function Name (P.C.B.)	Full on	Power off	MCU sleep	AC off	Detail of Function
1	TB4IN	N_TUN_INT	TMR	O	O	O	Tuner GPIO2 input
				Low Fix	Low Fix	Low Fix	
2	DA0	AMP_LMT	DA	O	O	O	Limiter control output
				Low Fix	Low Fix	Low Fix	
3	SOUT3	DSP_MOSI	SO	O	O	O	Synchronous data output for DSP, DIR, DAC
				Low Fix	Low Fix	Low Fix	
4	SIN3	DSP_MISO	SI	I-	I-	I-	Synchronous data input for DSP, DIR, DAC
5	CLK3	DSP_SCK	SO	O	O	O	Synchronous clock output for DSP, DIR, DAC
				Low Fix	Low Fix	Low Fix	
6	BYTE	BYTE	MCU	MCU	MCU	MCU	Data but width change input When in single chip mode: L (16 bit)
7	CNVSS	E8A_CNVSS	MCU	MCU	MCU	MCU	Processor mode select Low: Single chip mode
8	P8_7	VOL_RB	I+	I+	I+	I+	Volume rotary encoder B
9	P8_6	VOL_RA	I+	I+	I+	I+	Volume rotary encoder A
10	N_RESET	N_CPU_RST	MCU	MCU	MCU	MCU	Reset input
11	XOUT	XOUT	MCU	MCU	MCU	MCU	Oscillation circuit output
12	VSS	DGND	MCU	MCU	MCU	MCU	Microprocessor GND
13	XIN	XIN	MCU	MCU	MCU	MCU	Oscillation circuit input
14	VCC1	+3.3M	MCU	MCU	MCU	MCU	Microprocessor power supply
15	NMI	HDM_CEC	I+	I+	I+	I+	HDMI CEC input
16	N_INT2	REM_IN	IRQ	IRQ	IRQ	I	Remote control pulse input
17	N_INT1	HDM_MUT	IRQ	I-	I-	I-	HDMI mute input H: Mute
			O				
18	N_INT0	HDM_INT	IRQ	I-	I-	I-	Interrupt input from HDMI Rx
19	P8_1	N_MIC_DET	I-	I-	I-	I-	MIC detection L: MIC available
20	P8_0	HTX_PON	O	O	O	O	HDMI Tx +5V power regulator control H: Regulator ON
			High Act	Low Fix	Low Fix	Low Fix	
21	TA3IN	N_DSP_INT	TMR	I+	O	I+	Interrupt input from DSP
					Low Fix		
22	P7_6	(no use)	O	O	O	O	
			Low Fix	Low Fix	Low Fix	Low Fix	
23	TA2IN	N_PDET	TMR	I+	I+	I+	AC power detection L: Power down
24	P7_4	(no use)	O	O	O	O	
			Low Fix	Low Fix	Low Fix	Low Fix	
25	P7_3	N_FLD_RST	O	O	O	O	FL driver reset
			Low Act	Low Fix	Low Fix	Low Fix	
26	P7_2	N_FLD_CS	O	O	O	O	FL driver chip select
			Low Act	Low Fix	Low Fix	Low Fix	
27	SCL2	HDM_SCL	SI	O	O	O	HDMI Rx/Tx I2C SCL output
				Low Fix	Low Fix	Low Fix	
28	SDA2	HDM_SDA	SO	O	O	O	HDMI Rx/Tx I2C SDA input/output
				Low Fix	Low Fix	Low Fix	
29	TXD1	E8A_TXD	SO	SO	I+	I+	
30	RXD1	E8A_RXD	SI	SI	I+	I+	
31	CLK1	E8A_SCLK	O	O	I+	I+	
32	P6_4	E8A_BUSY	I-	I-	I-	I-	
33	SDA0	TUN_SDA	SI	O	O	O	Synchronous data input/output for tuner I2C
			O	Low Fix	Low Fix	Low Fix	
34	SCL0	TUN_SCL	SO	O	O	O	Synchronous clock output for tuner I2C
				Low Fix	Low Fix	Low Fix	
35	P6_1	N_HRX_RST	O	O	O	O	HDMI Rx reset
			Low Act	Low Fix	Low Fix	Low Fix	
36	P6_0	N_HTX_RST	O	O	O	O	HDMI Tx reset
			Low Act	Low Fix	Low Fix	Low Fix	

Pin No.	Port Name	Function Name (P.C.B.)	Full on	Power off	MCU sleep	AC off	Detail of Function
37	P5_7	N_DIR_RST	O	O	O	O	DIR reset
			Low Act	Low Fix	Low Fix	Low Fix	
38	P5_6	N_DIR_CS	O	O	O	O	DIR chip select
			Low Act	Low Fix	Low Fix	Low Fix	
39	P5_5	N_E8A_EPM	I-	I-	I-	I-	
40	P5_4	DIR_WCK	I	I	O	I	DIR_WCK input for CDDA writing
					Low Fix		
41	P5_3	DIR_SDO	I	I	O	I	DIR_SDO input for CDDA writing
					Low Fix		
42	P5_2	N_ADC_PDN	O	O	O	O	ADC power down
			Low Act	Low Fix	Low Fix	Low Fix	
43	P5_1	N_DAC_CS	O	O	O	O	DAC chip select
			Low Act	Low Fix	Low Fix	Low Fix	
44	P5_0	N_E8A_CE	I+	I+	I+	I+	
45	P4_7	N_DSP_RDY	I+	I+	O	I+	DSP ready input
					Low Fix		
46	P4_6	(no use)	O	O	O	O	no use
			Low Fix	Low Fix	Low Fix	Low Fix	
47	P4_5	(no use)	O	O	O	O	no use
			Low Fix	Low Fix	Low Fix	Low Fix	
48	P4_4	N_TUN_RST	O	O	O	O	Tuner reset output
			Low Act	Low Fix	Low Fix	Low Fix	
49	P4_3	(no use)	O	O	O	O	no use
			Low Fix	Low Fix	Low Fix	Low Fix	
50	P4_2	DSP_FMT	O	O	O	O	DSP full mute output
			High Act	Low Fix	Low Fix	Low Fix	H: Mute
51	P4_1	N_DSP_CS	O	O	O	O	DSP chip select
			Low Act	Low Fix	Low Fix	Low Fix	
52	P4_0	N_DSP_RST	O	O	O	O	DSP reset
			High Act	Low Fix	Low Fix	Low Fix	
53	P3_7	N_E2R_CS	O	O	O	O	EEPROM chip select
			Low Act	Low Act	Low Act	Low Act	
54	P3_6	N_HP_DET	I+	O	O	O	Headphone detection
				Low Fix	Low Fix	Low Fix	L: Headphone available
55	P3_5	R2A_MOSI	O	O	O	O	Electronic vol pattering synchronous data output
				Low Fix	Low Fix	Low Fix	
56	P3_4	R2A_SCK	O	O	O	O	Electronic vol pattering synchronous clock output
				Low Fix	Low Fix	Low Fix	
57	P3_3	I_PRT	I-	I-	I-	I-	Overcurrent protection detection
58	P3_2	TRANS_RY	O	O	O	O	Speaker impedance changing relay control / At 8 ohm: Low (Relay off, B voltage high) At 6 ohm and temperature rise: High (Relay ON, B voltage low)
				Low Fix	Low Fix	Low Fix	
59	P3_1	N_CNPT_PS	O	O	O	O	no use
			Low Act	Low Fix	Low Fix	Low Fix	
60	VCC2	VCC2	MCU	MCU	MCU	MCU	Microprocessor power supply
61	P3_0	N_VO_MT	O	O	O	O	Composite video selector mute
			Low Act	Low Fix	Low Fix	Low Fix	
62	VSS	VSS	MCU	MCU	MCU	MCU	Microprocessor GND
63	AN2_7	THM3	AD	I	I	I	Temperature detection 3
				AD standby	AD standby	AD standby	
64	P2_6	IPD_APDT	I-	I-	I-	I-	iPod accessory power detection / Low while iPod booting (about 2 seconds). Execute identification when booting seems to have completed. Change to constant input to prevent pulling between high output of iPod and Low Fix of microprocessor output.

Pin No.	Port Name	Function Name (P.C.B.)	Full on	Power off	MCU sleep	AC off	Detail of Function
65	N_INT7	N_IPD_DET	IRQ	IRQ	IRQ	O	iPod detection
						Low Fix	When inserting an iPod into the DOCK H to L
66	N_INT6	N_DIR_INT	IRQ	I	O	I	DIR interrupt input
					Low Fix		
67	P2_3	HPRY	O	O	O	O	Headphone relay control
			High Act	Low Fix	Low Fix	Low Fix	
68	P2_2	SPRY_S	O	O	O	O	Speaker relay control (Surround)
			High Act	Low Fix	Low Fix	Low Fix	H: Relay ON
69	P2_1	SPRY_EX	O	O	O	O	Speaker relay control (Center)
			High Act	Low Fix	Low Fix	Low Fix	H: Relay ON
70	P2_0	SPRY_F	O	O	O	O	Speaker relay control (Front)
			High Act	Low Fix	Low Fix	Low Fix	H: Relay ON
71	P1_7	3D_PON	O	O	O	O	PCB DIGITAL +3.3D, +1.2D regulator control
			High Act	Low Fix	Low Fix	Low Fix	H: Regulator ON
72	P1_6	5D_PON	O	O	O	O	PCB DIGITAL +5D regulator control
			High Act	Low Fix	Low Fix	Low Fix	H: Regulator ON
73	N_INT3	PSW_DET	IRQ	IRQ	IRQ	I	Power system switch (Power, Scene) detection
74	P1_4	VSEL3	O	O	O	O	Video input select
				Low Fix	Low Fix	Low Fix	
75	TXD6	IPD_MOSI	SO	O	O	O	Synchronous data output for iPod
				Low Fix	Low Fix	Low Fix	
76	RXD6	IPD_MISO	SI	I+	I+	I+	Synchronous data input for iPod
77	P1_1	VSEL2	O	O	O	O	Video input select
				Low Fix	Low Fix	Low Fix	
78	P1_0	VSEL1	O	O	O	O	Video input select
				Low Fix	Low Fix	Low Fix	
79	P0_7	N_SB_MT	O	O	O	O	Mute control (Surround back)
			Low Act	Low Fix	Low Fix	Low Fix	* Spare to use for HD audio when necessary
80	P0_6	N_SW_MT	O	O	O	O	Mute control (Subwoofer)
			Low Act	Low Fix	Low Fix	Low Fix	
81	P0_5	N_S_MT	O	O	O	O	Mute control (Surround)
			Low Act	Low Fix	Low Fix	Low Fix	
82	P0_4	N_C_MT	O	O	O	O	Mute control (Center)
			Low Act	Low Fix	Low Fix	Low Fix	
83	P0_3	N_F_MT	O	O	O	O	Mute control (Front)
			Low Act	Low Fix	Low Fix	Low Fix	
84	P0_2	PWR_RY	O	O	O	O	Power relay control
			High Act	Low Fix	Low Fix	Low Fix	H: ON
85	P0_1	N_FCT	I	I	I	I	FCT detection H: Product mode L: FCT mode
86	AN0_0	(no use)	AD	I	I	I	
				AD standby	AD standby	AD standby	
87	AN7	DC_PRT	AD	I	I	I	Power AMP DC detection
				AD standby	AD standby	AD standby	
88	AN6	AMP_OLV	AD	I	I	I	Power AMP output level detection
				AD standby	AD standby	AD standby	
89	AN5	THM1	AD	I	I	I	Temperature detection 1
				AD standby	AD standby	AD standby	
90	AN4	THM2	AD	I	I	I	Temperature detection 2 (U model)
				AD standby	AD standby	AD standby	
91	AN3	KEY2	AD	I	I	I	KEY2 AD value taken in
				AD standby	AD standby	AD standby	
92	AN2	KEY1	AD	I	I	I	KEY1 AD value taken in
				AD standby	AD standby	AD standby	
93	AN1	PS_PRT	AD	I	I	I	PS protection detection
				AD standby	AD standby	AD standby	

Pin No.	Port Name	Function Name (P.C.B.)	Full on	Power off	MCU sleep	AC off	Detail of Function
94	AVSS	AVSS	MCU	MCU	MCU	MCU	Microprocessor GND
95	AN0	IPD_TYPE	AD	I	I	I	DOCK discriminate
				AD standby	AD standby	AD standby	
96	VREF	VREF	MCU	MCU	MCU	MCU	AD reference voltage
97	AVCC	AVCC	MCU	MCU	MCU	MCU	Microprocessor power supply
98	SIN4	E2R_MISO	SI	SI	O	SI	Synchronous data input for EEPROM
99	SOUT4	FLD_MOSI	SO	SO	O	SO	FL driver/Synchronous data output for EEPROM
					Low Fix		
100	CLK4	FLD_SCK	SO	SO	O	SO	FL driver/Synchronous clock output for EEPROM
					Low Fix		

Key detection for A/D port

Key input (A/D) pull-up resistance 10 k-ohms

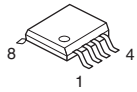
Ohm	0	+ 1.0 k	+ 1.5 k	+ 1.8 k	+ 2.2 k	+ 3.3 k	+ 4.7 k	+ 8.2 k	+ 10.0 k
Normal voltage value range	0 – 0.15	0.15 – 0.48	0.49 – 0.82	0.83 – 1.14	1.15 – 1.46	1.47 – 1.79	1.80 – 2.12	2.13 – 2.40	2.41 – 2.91
A/D value range (3.3 V=255)	0 – 11	12 – 37	38 – 64	65 – 88	89 – 113	114 – 139	140 – 164	165 – 186	187 – 226
Key name (KEY1, 92 pin)	STRAIGHT	MUTE	FM MODE	TUNING >>	TUNING <<	PRESET >	PRESET <	MEMORY	INFO

Ohm	0	+ 1.0 k	+ 1.0 k	+ 1.5 k	+ 1.5 k	+ 2.2 k	+ 3.3 k	+ 4.7 k	(22 k + 33 k)	22.0 k	33.0 k
Normal voltage value range	0 – 0.15	0.15 – 0.42	0.43 – 0.70	0.71 – 0.97	0.98 – 1.24	1.25 – 1.53	1.54 – 1.84	1.84 – 2.10	2.11 – 2.33	2.34 – 2.54	2.54 – 2.71
A/D value range (3.3 V=255)	0 – 11	12 – 32	33 – 54	55 – 75	76 – 96	97 – 119	120 – 142	143 – 163	164 – 181	182 – 197	198 – 209
Key name (KEY2, 91 pin)	SCENE RADIO	SCENE CD	SCENE TV	SCENE BD/DVD	PROGRAM >	PROGRAM <	INPUT >	INPUT <	–	⏻ (Power)	TONE CONTROL

■ PIN CONNECTION DIAGRAMS

• ICs

BD9325FJ



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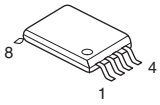

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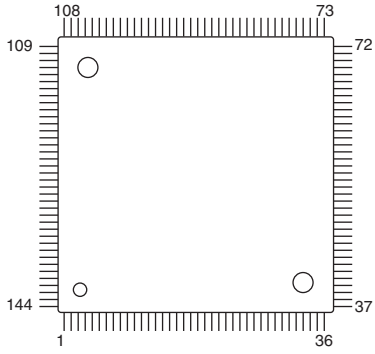

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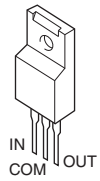

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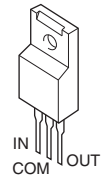

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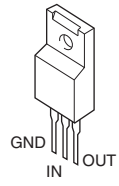

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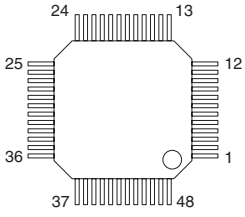

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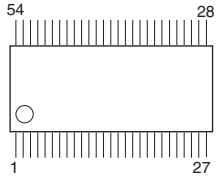

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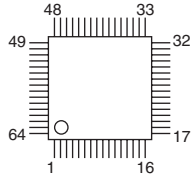

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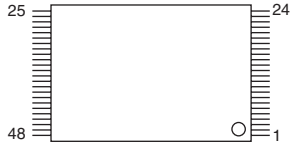

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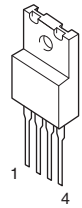

1. V_{IN}
2. V_{OUT}
3. GND
4. ON/OFF CONTROL

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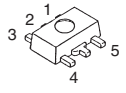
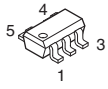
NJM2884U1-18 (TE1)



1. CONTROL (Active High)
2. GND
3. NC
4. V_{OUT}
5. V_{IN}

NJM2867F3-05



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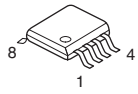

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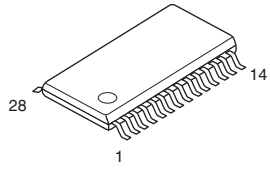

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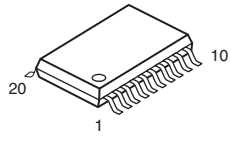

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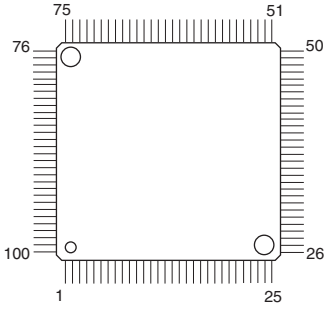

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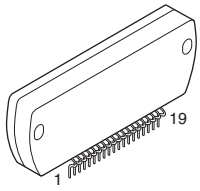

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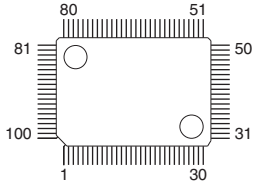

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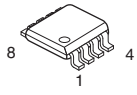

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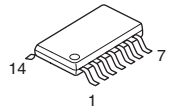
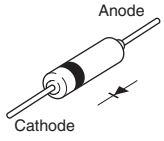
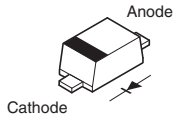
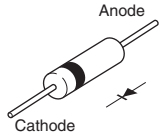
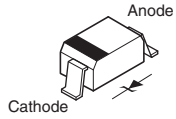
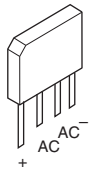
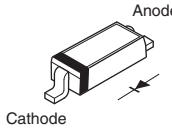
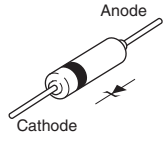
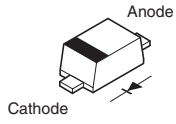
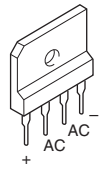
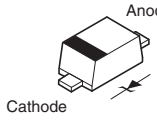
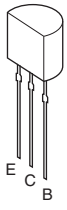
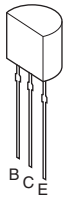
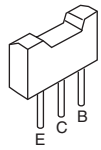
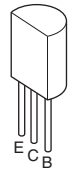
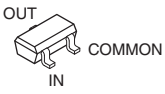
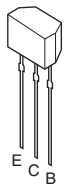
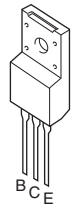
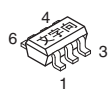


• Diodes

1N4003S 1SS133 1SS176 1SS270A 	1SS355 	1T2 	HZU3.3B2 TRF-E HZU4.3B3 TRF-E 
KBP103G 1.0A 200V 	KDS160-RTK 	MTZJ4.7A MTZJ5.6C MTZJ6.8C MTZJ39D 	RB051LA-40 RB500V-40 RB501V-40 
TS6P03G 6.0A 200V 	UDZS4.7B UDZS9.1B UDZV5.1B 		

• Transistors

2N5401C-AT/P 2SA1015-Y 	2N5551C-AT 	2SA1576A 	2SA1708 	2SC1815 Y 2SC1815 Y TP 	2SC4081 T106 
2SD2704 K 	KRA104S-RTK KRC102S-RTK KRC104S-RTK 	KRC102M-AT 	KTA1046-Y-U/P 	KTC3875S 	µPA672T-T1-A  1. Source 1 (S1) 2. Gate 1 (G1) 3. Drain 2 (D2) 4. Source 2 (S2) 5. Gate 2 (G2) 6. Drain 1 (D1)

■ BLOCK DIAGRAM

DIGITAL

• See page 77-80 → SCHEMATIC DIAGRAM

HDMI IN 1
HDMI IN 2
HDMI IN 3
29-32
33-36
37-40
IC201
HDMI Receiver
SiI9233
Port0
Port1
Port2
I2S
SPDIF
CEC
HDMI SPDIF
HDMI ARC
XL201
27MHz
I2C2
21 N_HRX_RST
22 HDM_INT
107 HDM_MUT
N_HTX_RST 25
Digital Video Data
IC202
HDMI Transmitter
SiI9134
I2S
CEC
HDMI OUT

AUDIO1 (Optical)
AUDIO2 (Optical)
AUDIO3 (Coaxial)
AUDIO4 (Optical)
AUDIO5 (Analog)
AUDIO6 (Analog)

IC204
ARC
HDMI I2S

SPDIF
IC261
DIR
LC89058WD
41 N_DIR_RST
35 N_DIR_INT

R2A_SCK 49,50
R2A_MOSI
IC21
Selector
and
E-Volume
R2A15220FP
53
1
IC262
ADC
PCM1803DBR
ADC_PDN

IC241
AUDIO DSP
D70YE101BRFP266
130 SD0
131 SD1
134 SD2
135 SD3

N_DSP_RST 14
N_DSP_CS 120
N_DSP_INT 10
N_DSP_RDY 12
DSP_FMT 82
N_DAC_CS 2

IC263
DAC
PCM1681DBQR
DA_FR 91
DA_FL 90
DA_SR 95
DA_SL 94
DA_C 92
DA_SW 93
SPI3

R2A_SCK 49 50
R2A_MOSI
IC21
Selector
and
E-Volume
R2A15220FP
20
22
22
8
10
14

N_C_MT
N_F_MT
N_S_MT
N_SW_MT
Mute ×4
IC27
NJM4566M

IC1
Power
Amplifier
STK433-330N
11
16
15
4
18
6

IC2
Power
Amplifier
STK433-130N

Speaker Relay
RY4
RY1
RY4
RY3
RY1
RY3
SPRY_F
SPRY_EX

FRONT L
CENTER
FRONT R
SURROUND L
SURROUND R
SUBWOOFER
SPEAKERS
SUBWOOFER PRE OUT
PHONES

MAIN

• See page 83, 84 → SCHEMATIC DIAGRAM

MAIN

• See page 83, 84 → SCHEMATIC DIAGRAM

OPERATION

• See page 81, 82 → SCHEMATIC DIAGRAM

FM Tuner (Analog)
I2C0
N_TUN_ST
N_TUN_TUND

FL display
N_FLD_RST
N_FLD_CS

Remote Control Sensor
REM_IN

Volume
VOL_RA
VOL_RB

Front Panel Keys
KEY1
KEY2
PSW_DET

IC222
EEPROM 32kbit
RB25S320FJ-WE2
1,8
N_E2P_CS
SPI4

IC221
Microprocessor
M16C/64A
R5F364AMNFB
ROM:512K Byte
RAM: 31k Byte
Clock : 20MHz
XL221
20MHz

<Interrupt>
HDM_INT 18
HDM_MUT 17
REM_IN 16
PWS_DET
N_DIR_INT 66
IPD_DET 65
<Timer>
N_PDET 23
N_DSP_INT 21
N_TUN_INT 1
<AD port>
IPD_TYPE 95
PS_PRT 93
KEY1 92
KEY2 91
THM1 90
THM2 89
AMP_0LV 88
DC_PRT 87
DEST 86

<Serial>
I2C0 Tuner
UART1 E8A
I2C2 HDMI Rx/Tx
SPI3 DSP/DAC/DIR
SPI4 FL Driver/EEPROM
Serial5 (P8_0, TA3INとして使用)
UART6 iPod
<PIO>
P0_1 85 MODEL
15 CEC

SP_IMP
AMP_LMT
N_SW_MT
I_PRT
DC_PRT
THM1_PRT
THM2_PRT
AMP block
and
Heatsink
and
Main Power Supply

Main Power Supply (Power Transformer)
SW151
PWR_RY
N_CPU_RST
N_PDET
Standby Power Supply (Sub-transformer)
AC IN

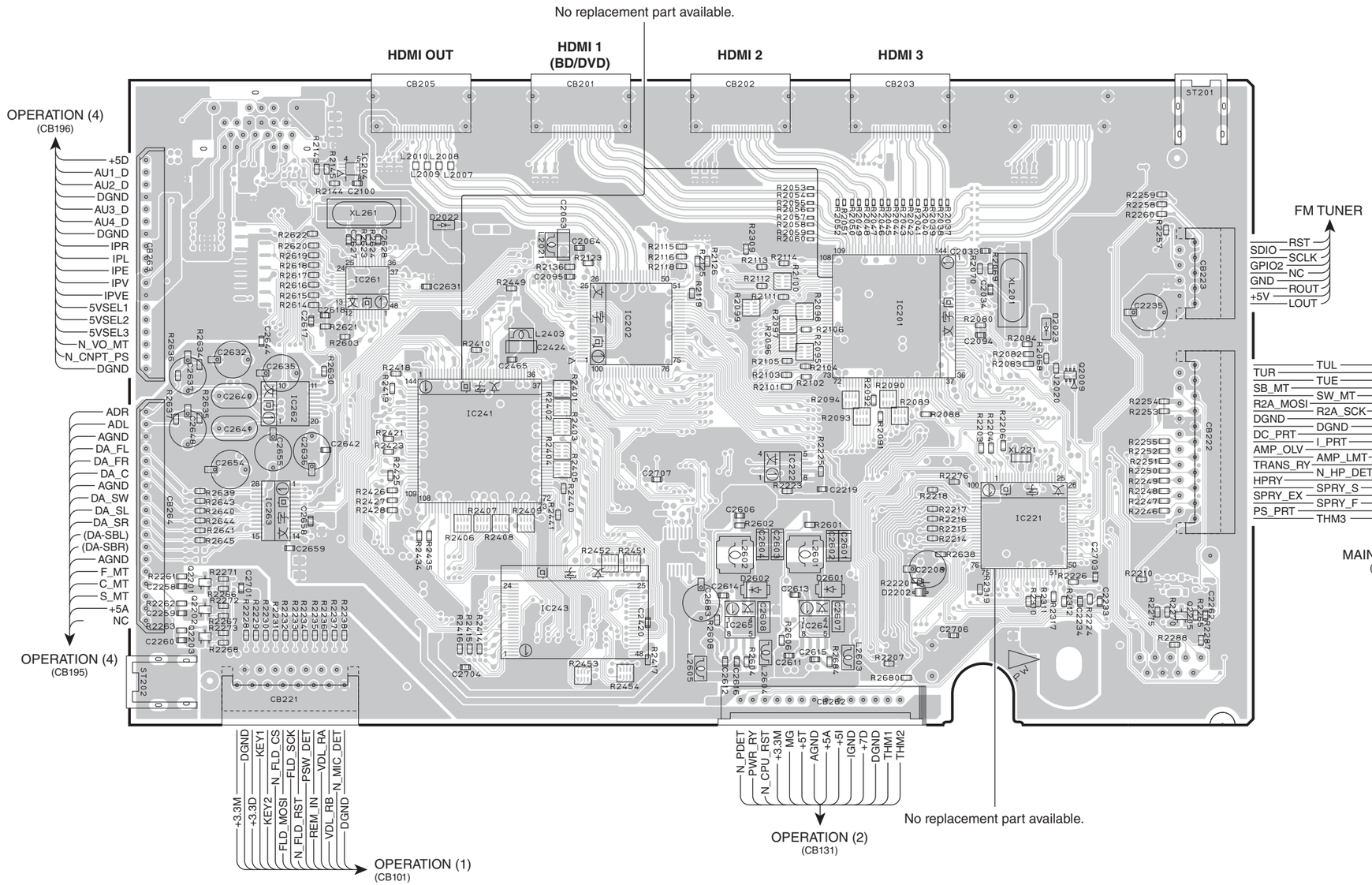
RY2
HPRY
N_HP_DET

OPERATION

• See page 81, 82 → SCHEMATIC DIAGRAM

■ PRINTED CIRCUIT BOARDS HTR-2064

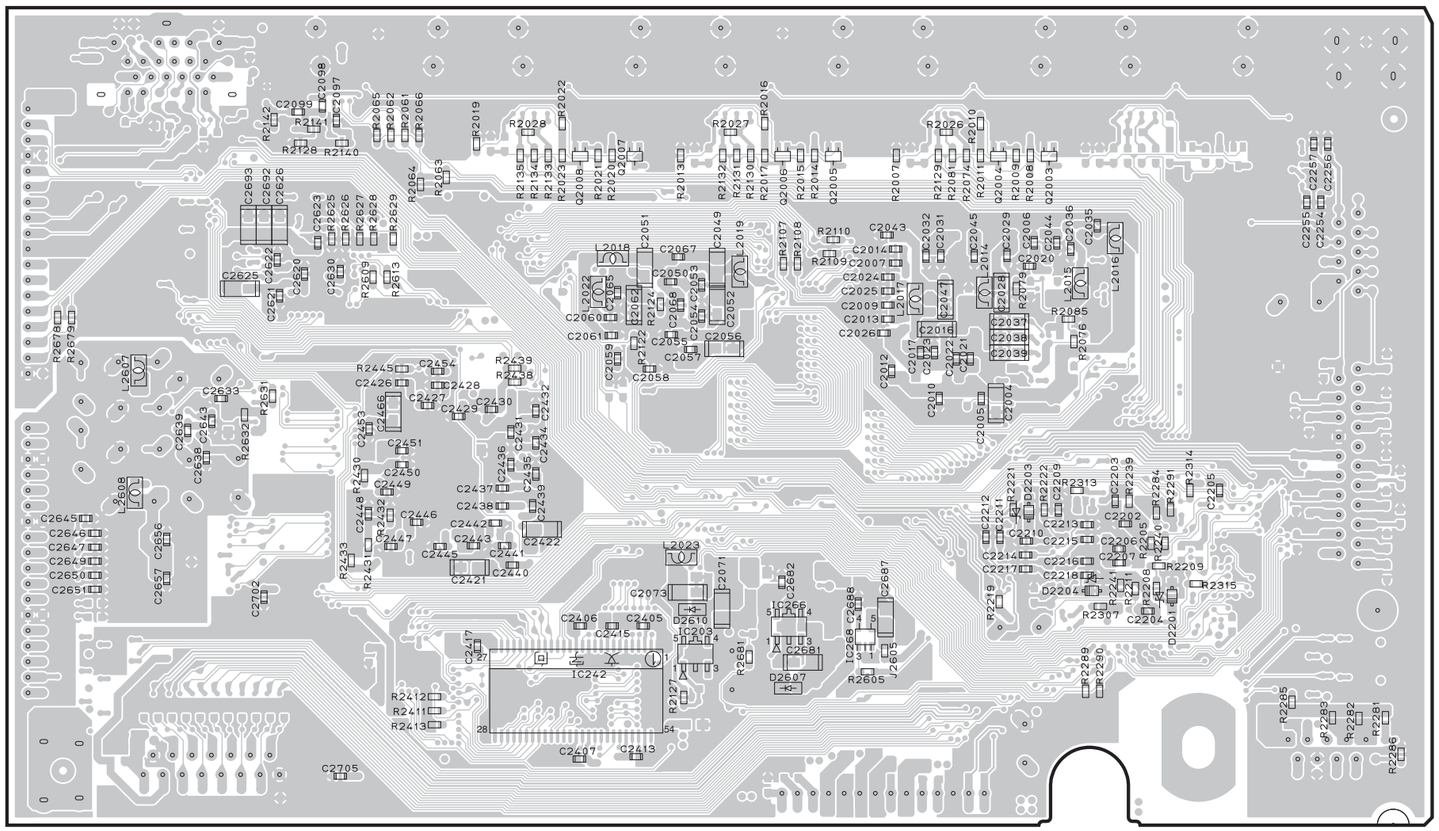
DIGITAL (Side A)



• Semiconductor Location

Ref no.	Location
D2022	D4
D2023	G4
D2202	G5
D2601	F5
D2602	F5
IC201	F4
IC202	E4
IC204	D3
IC221	G5
IC222	F5
IC241	D5
IC243	E6
IC261	D4
IC262	C4
IC263	C5
IC264	F6
IC265	F6
Q2009	G4
Q2201	C5
Q2202	C6
Q2203	C6
Q2205	H6

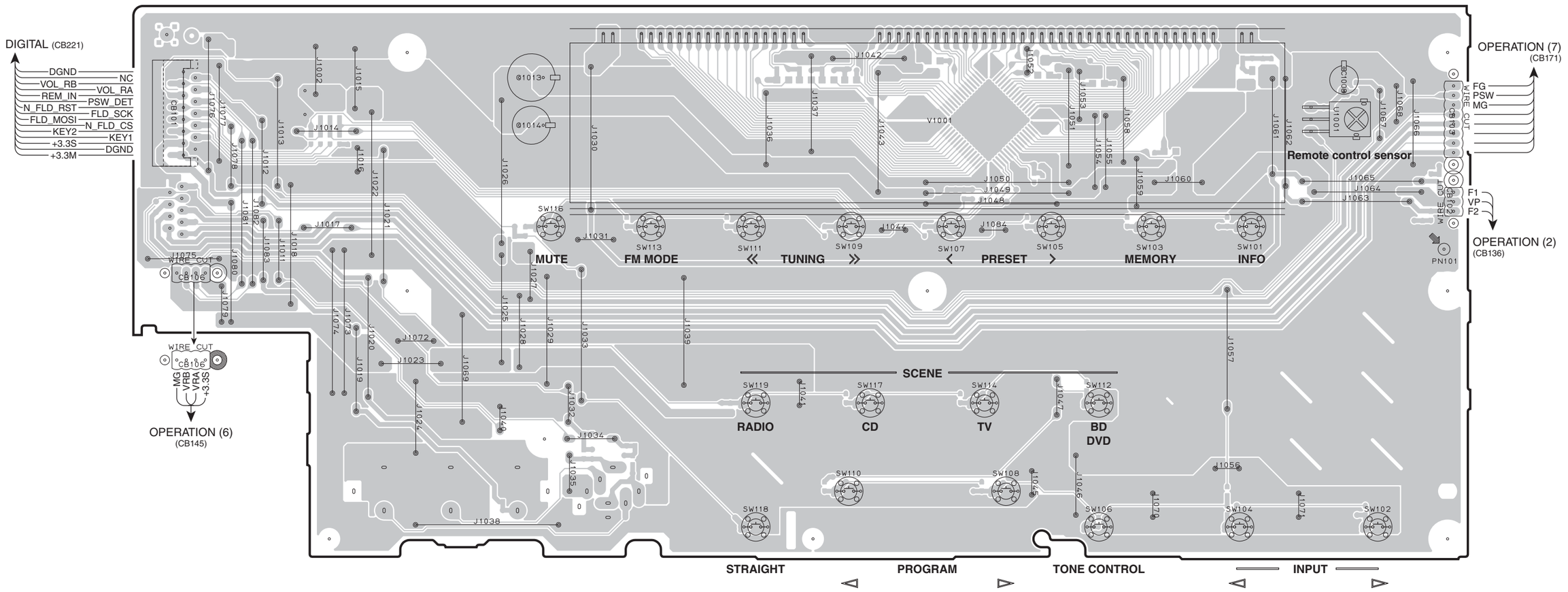
DIGITAL (Side B)



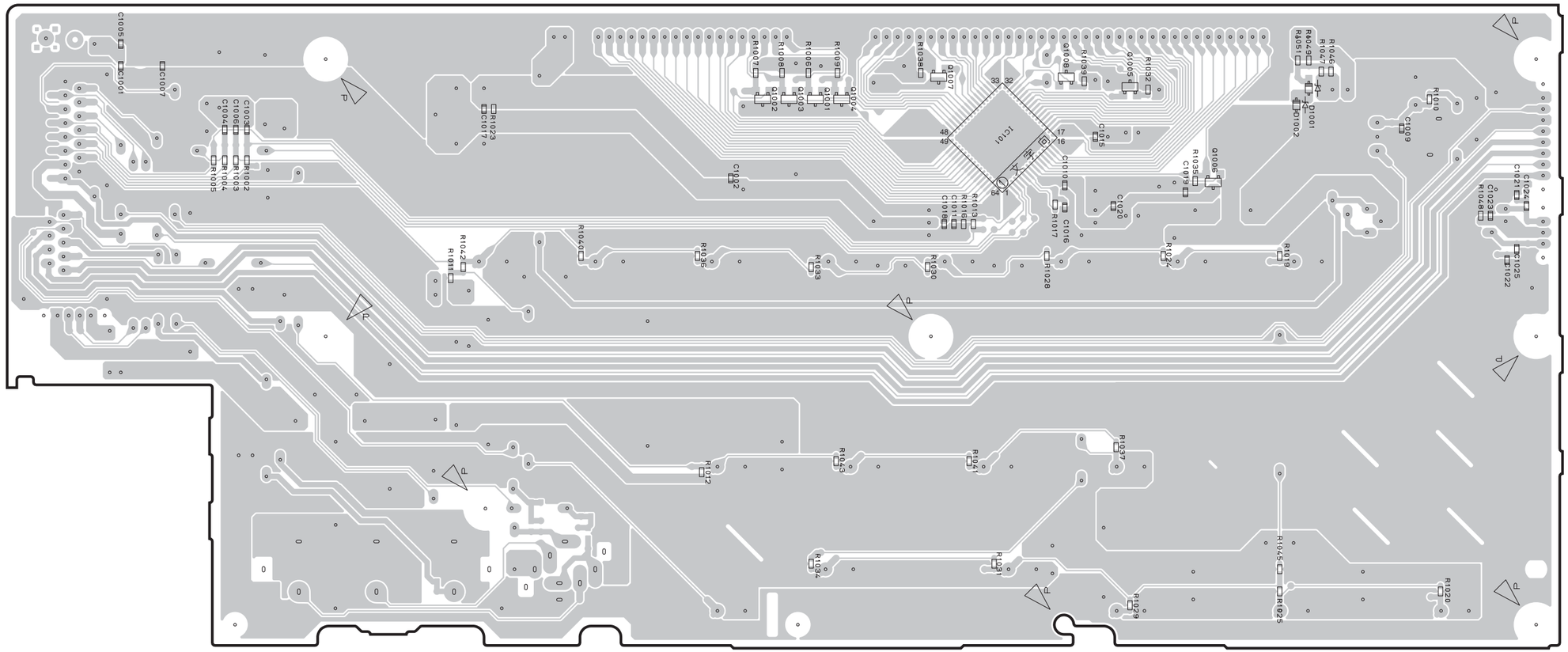
• Semiconductor Location

Ref no.	Location
D2201	G5
D2203	G5
D2204	G5
D2607	F6
D2610	E5
IC203	E5
IC242	E6
IC266	F5
IC268	F5
Q2003	G3
Q2004	F3
Q2005	F3
Q2006	F3
Q2007	E3
Q2008	E3

OPERATION (1) (Side A)



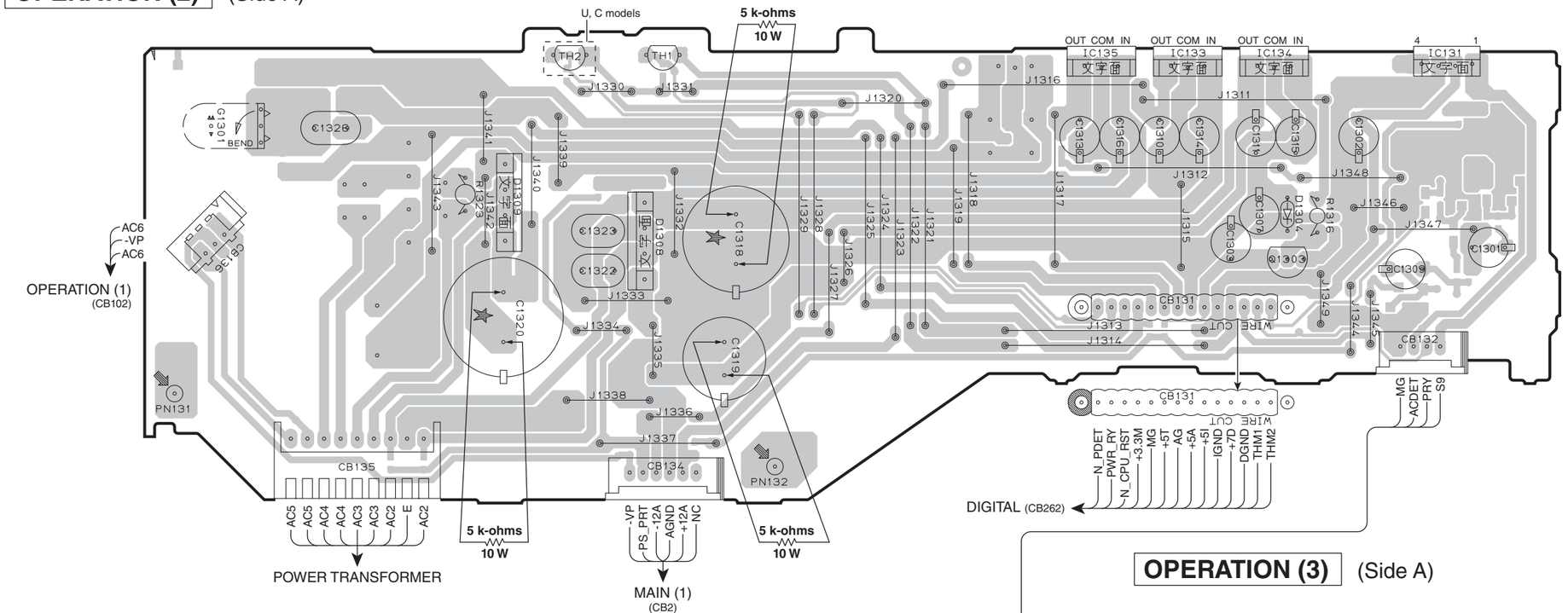
OPERATION (1) (Side B)



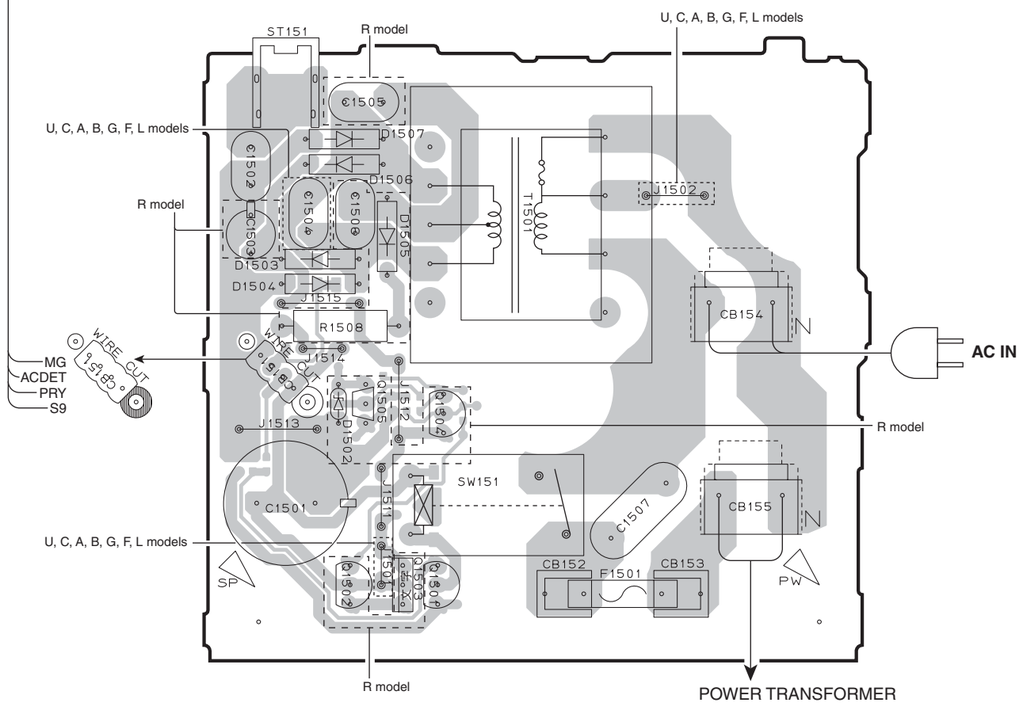
• Semiconductor Location

Ref no.	Location	Ref no.	Location
D1001	H3	Q1004	F3
D1002	H3	Q1005	G3
IC101	G3	Q1006	H3
Q1001	F3	Q1007	F3
Q1002	F3	Q1008	G3
Q1003	F3		

OPERATION (2) (Side A)



OPERATION (3) (Side A)



Notes:

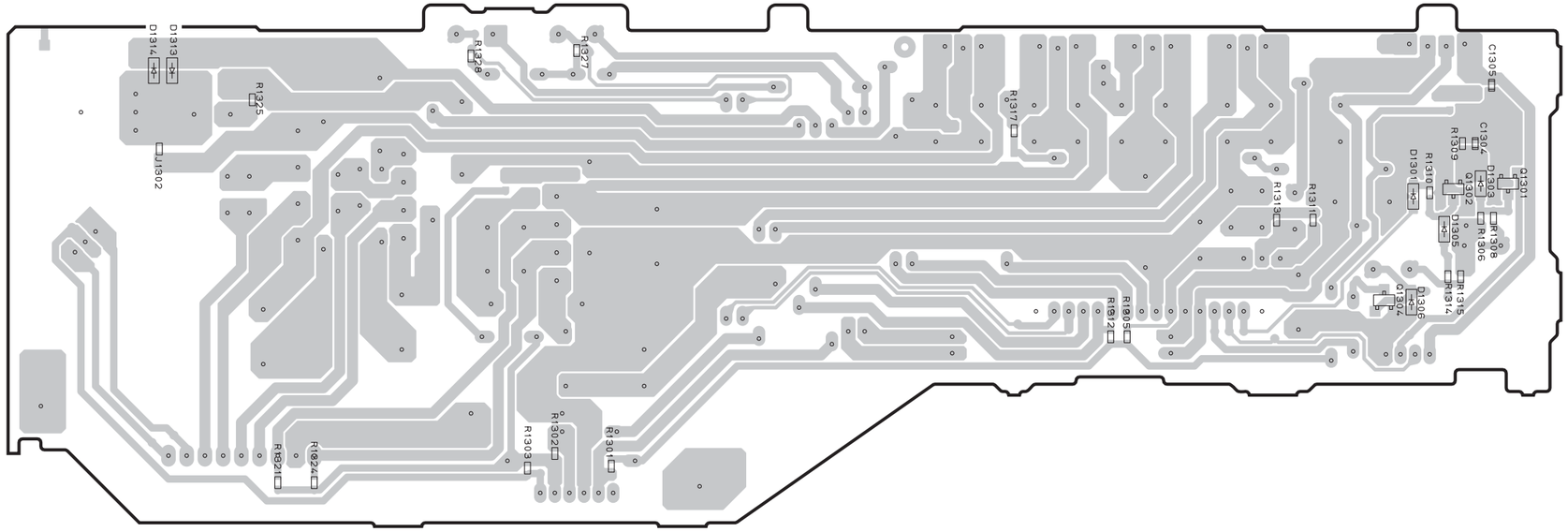
Safety measures

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each.
  C1318-1320 on OPERATION (2) P.C.B.

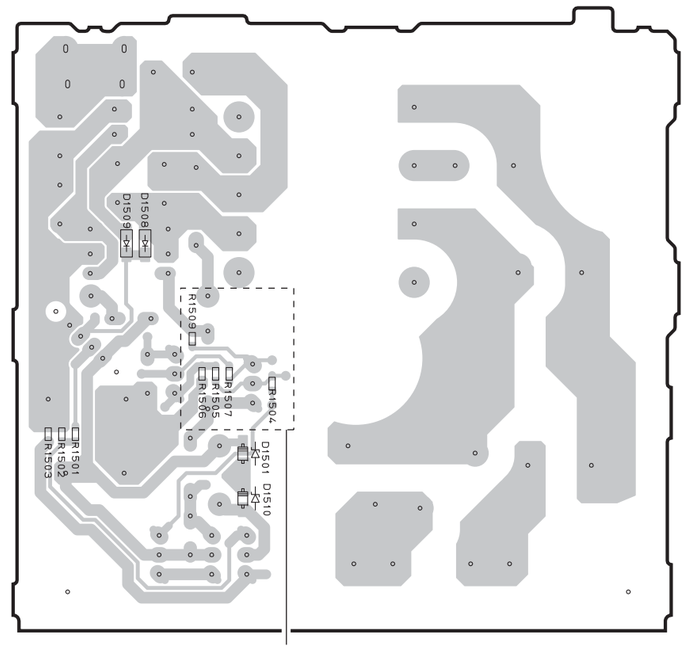
• Semiconductor Location

Ref no.	Location	Ref no.	Location
D1304	G2	IC133	G2
D1308	D3	IC134	G2
D1309	D2	IC135	G2
D1502	H6	Q1303	G3
D1503	G5	Q1501	H7
D1504	G5	Q1502	H7
D1505	H5	Q1503	H7
D1506	H5	Q1504	H6
D1507	H5	Q1505	H6
IC131	H2		

OPERATION (2) (Side B)



OPERATION (3) (Side B)

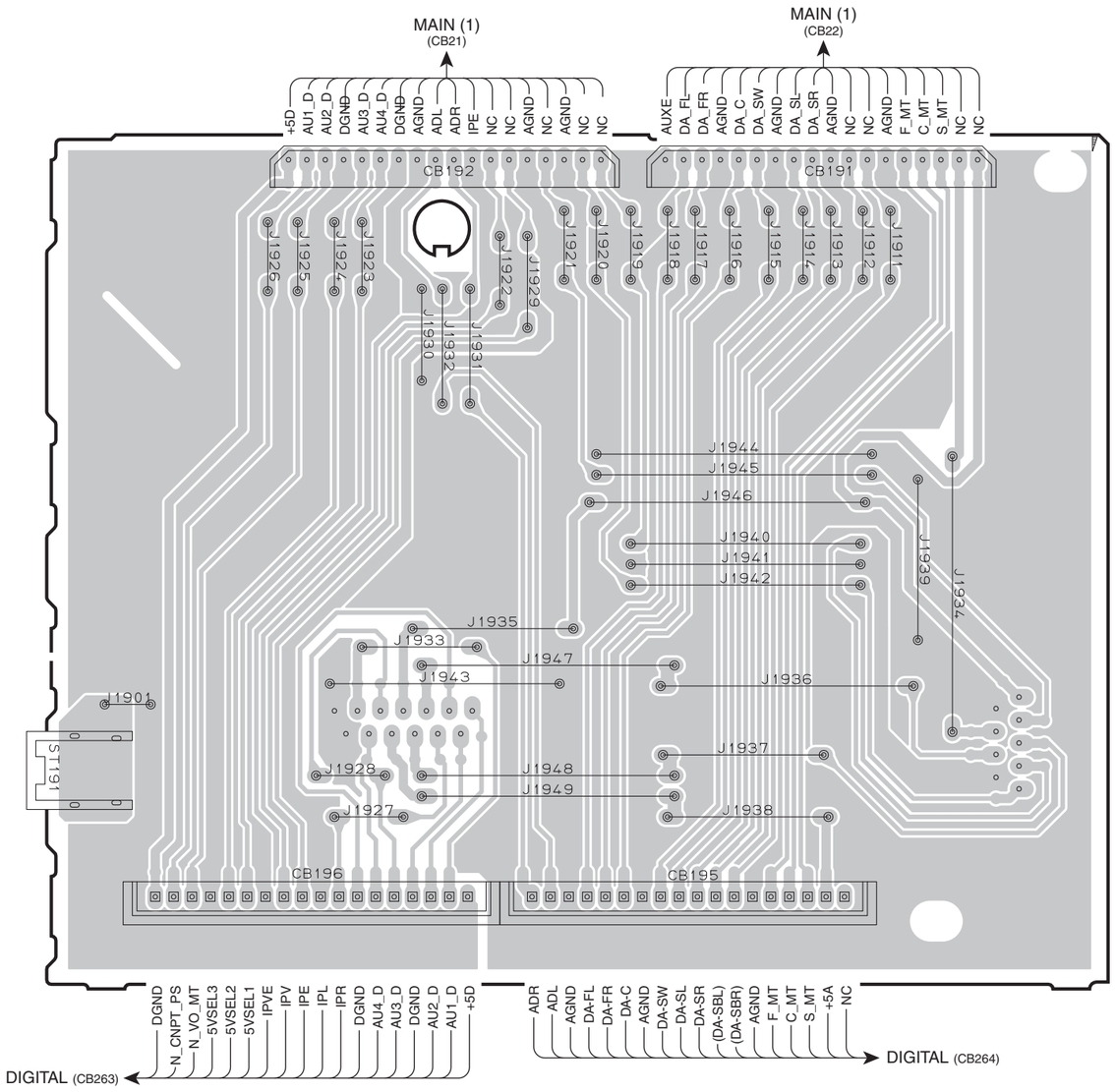


R model

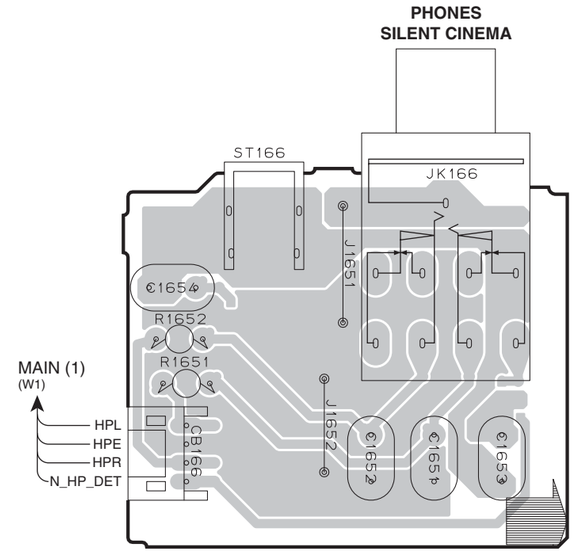
• Semiconductor Location

Ref no.	Location
D1301	H2
D1303	H2
D1305	H2
D1306	H3
D1313	C2
D1314	C2
D1501	H6
D1508	H5
D1509	G5
D1510	H6
Q1301	I2
Q1302	H2
Q1304	H3

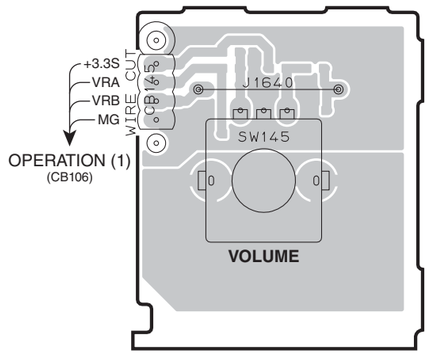
OPERATION (4) (Side A)



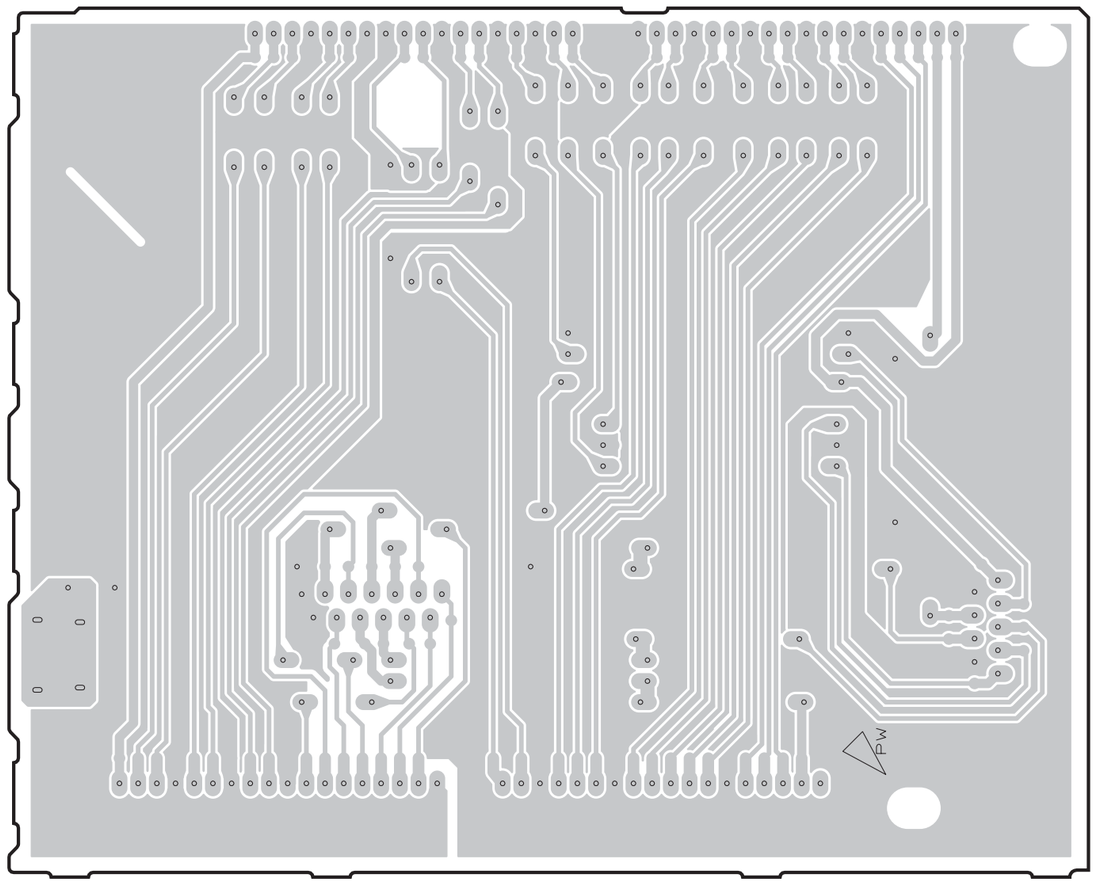
OPERATION (5) (Side A)



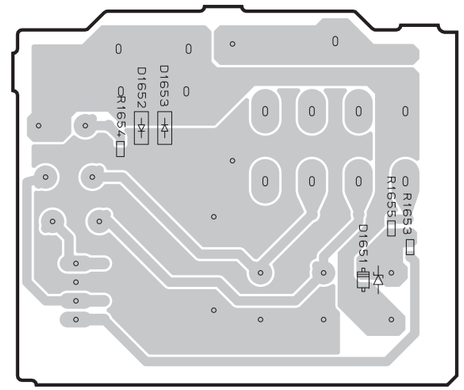
OPERATION (6) (Side A)



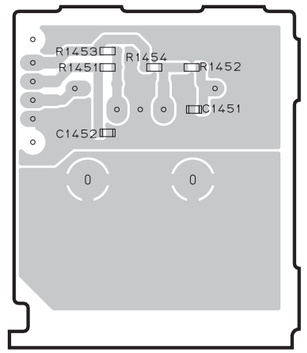
OPERATION (4) (Side B)



OPERATION (5) (Side B)



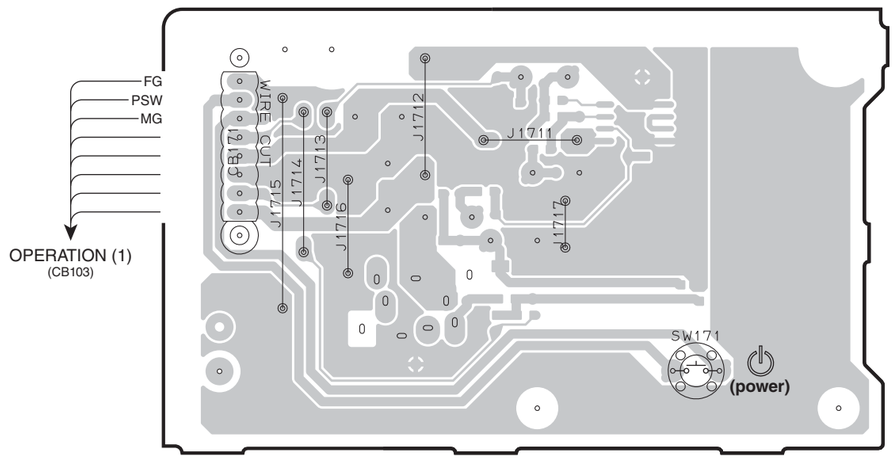
OPERATION (6) (Side B)



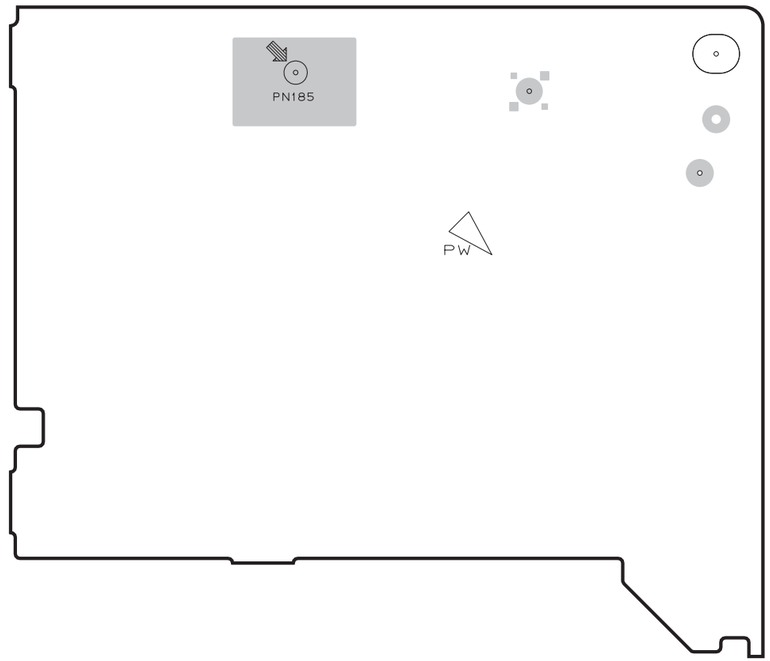
• Semiconductor Location

Ref no.	Location
D1651	I3
D1652	H3
D1653	H3

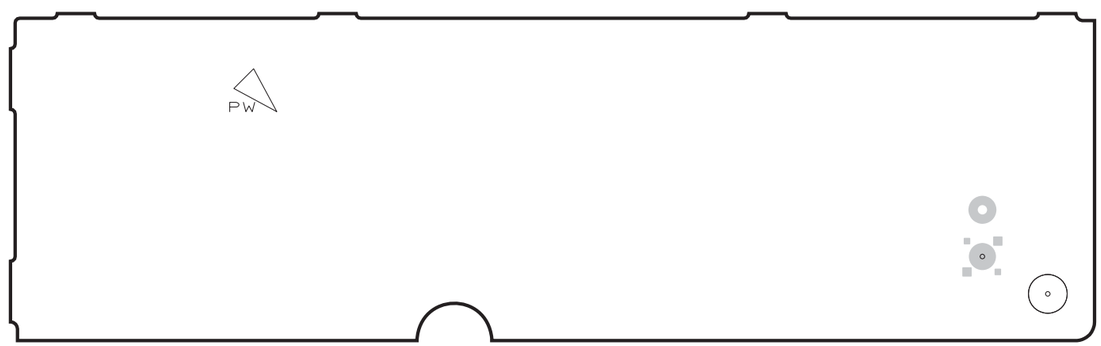
OPERATION (7) (Side A)



OPERATION (8) (Side A)

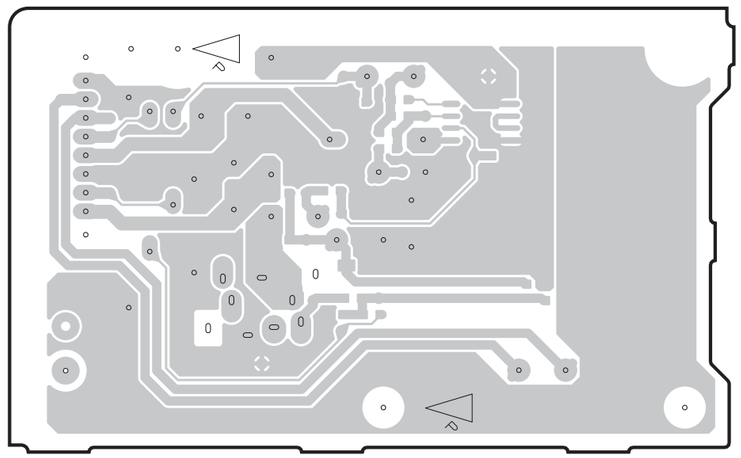


OPERATION (9) (Side A)

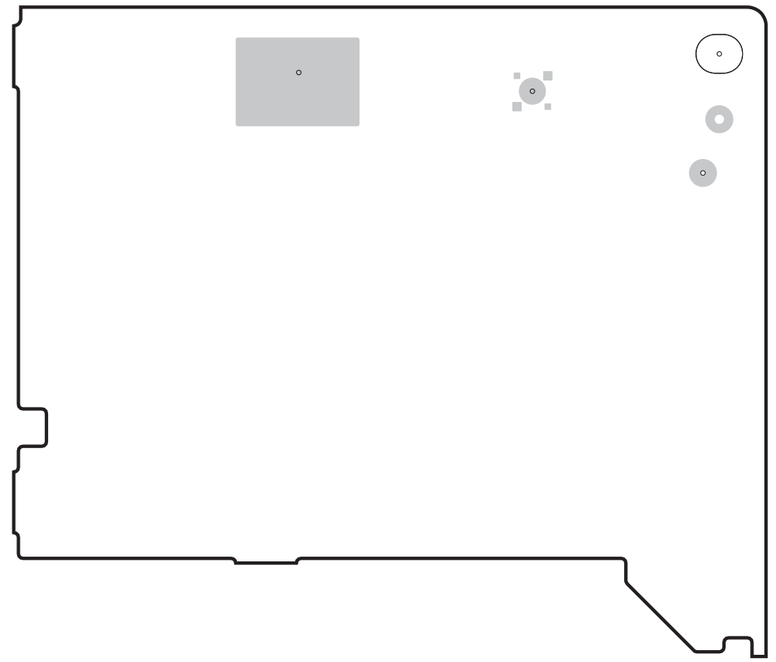


1 2 3 4 5 6 7

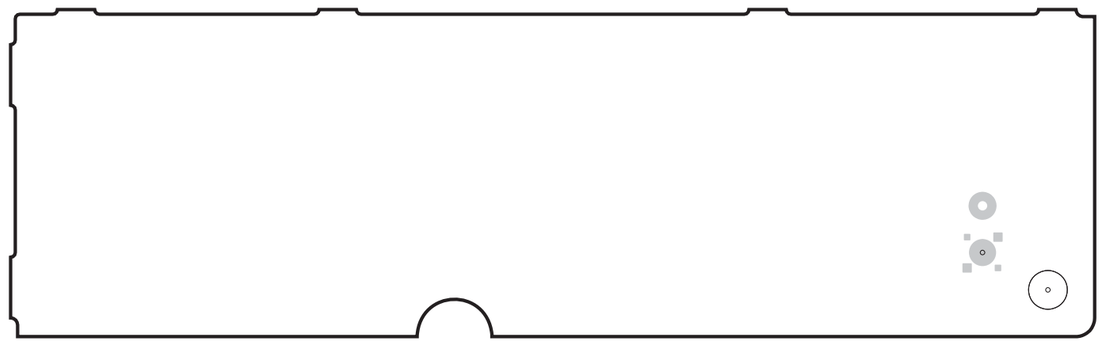
OPERATION (7) (Side B)



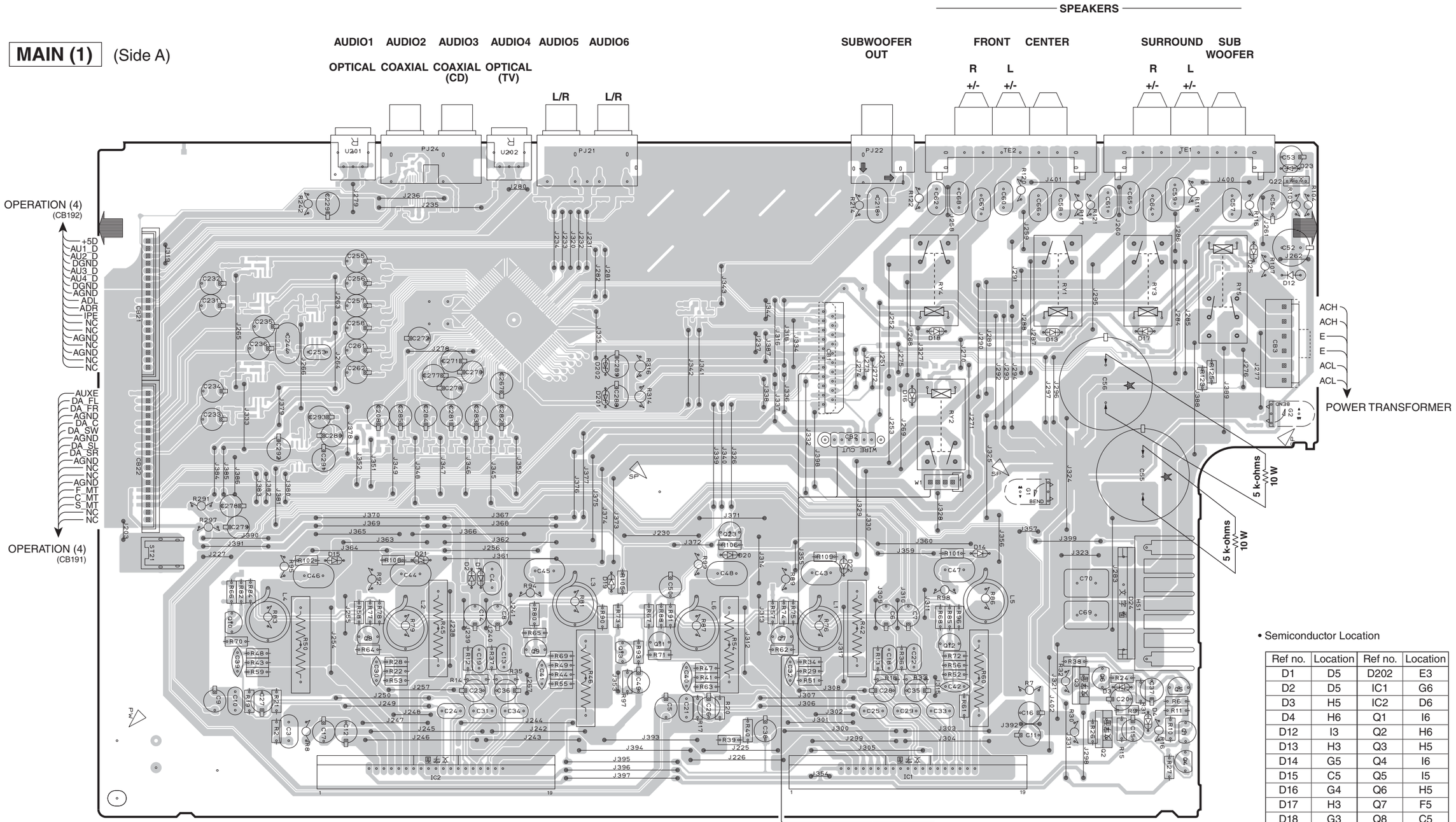
OPERATION (8) (Side B)



OPERATION (9) (Side B)



MAIN (1) (Side A)



Notes:

Safety measures

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each.
  C55, C56 on MAIN (1) P.C.B.

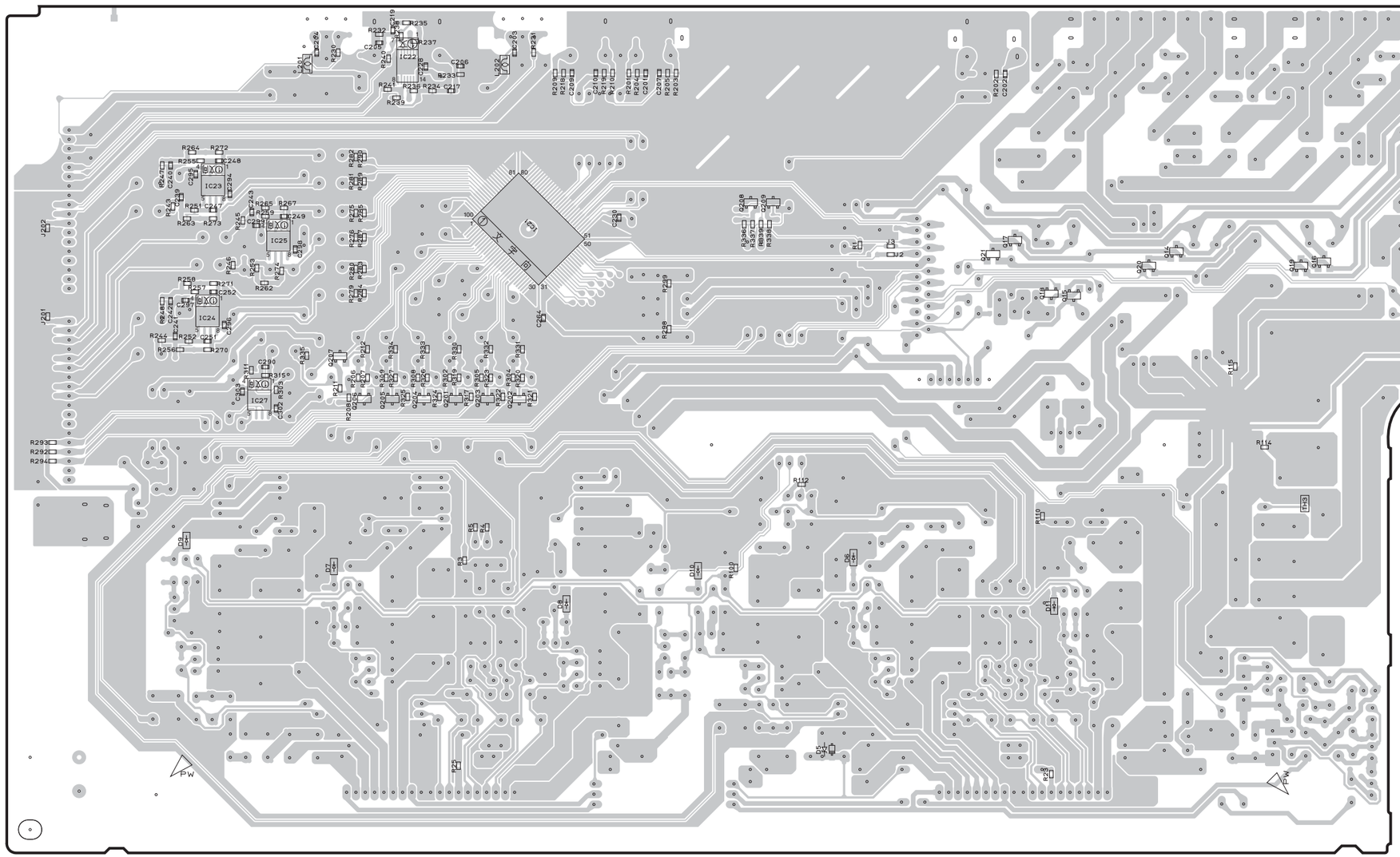
Power amplifier IC replacement

- When the power amplifier IC (IC 1 or IC 2 on MAIN P.C.B.) requires to be replaced, be sure to refer to “POWER AMPLIFIER IC REPLACEMENT” before its replacement.

- Semiconductor Location

Ref no.	Location	Ref no.	Location
D1	D5	D202	E3
D2	D5	IC1	G6
D3	H5	IC2	D6
D4	H6	Q1	I6
D12	I3	Q2	H6
D13	H3	Q3	H5
D14	G5	Q4	I6
D15	C5	Q5	I5
D16	G4	Q6	H5
D17	H3	Q7	F5
D18	G3	Q8	C5
D19	E5	Q9	D5
D20	F5	Q10	B5
D21	D5	Q11	E5
D22	F5	Q12	G5
D23	I2	Q13	E5
D24	H5	Q22	I2
D25	I3	Q23	F4
D201	E4		

MAIN (1) (Side B)

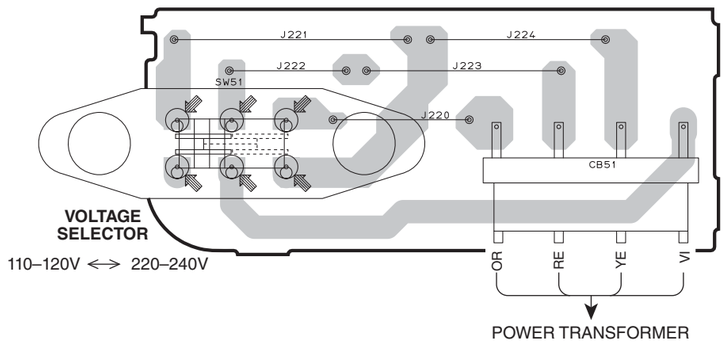


• Semiconductor Location

Ref no.	Location	Ref no.	Location
D5	F6	Q17	G3
D6	F5	Q18	G3
D7	C5	Q19	H3
D8	D5	Q20	G3
D9	B5	Q21	G3
D10	E5	Q24	I3
D11	G5	Q25	I3
IC21	D3	Q201	D4
IC22	D2	Q202	D4
IC23	C3	Q203	D4
IC24	C3	Q204	D4
IC25	C3	Q205	D4
IC27	C4	Q206	C4
Q14	H3	Q207	C4
Q15	G3	Q208	E3
Q16	H3	Q209	E3

MAIN (2) (Side A)

R model

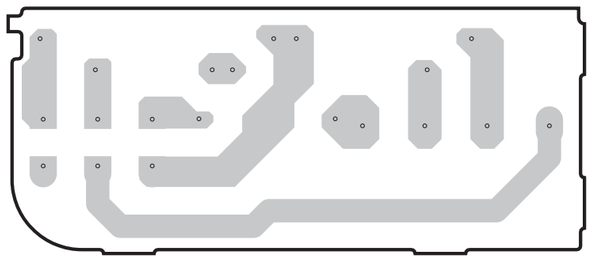


MAIN (3) (Side A)

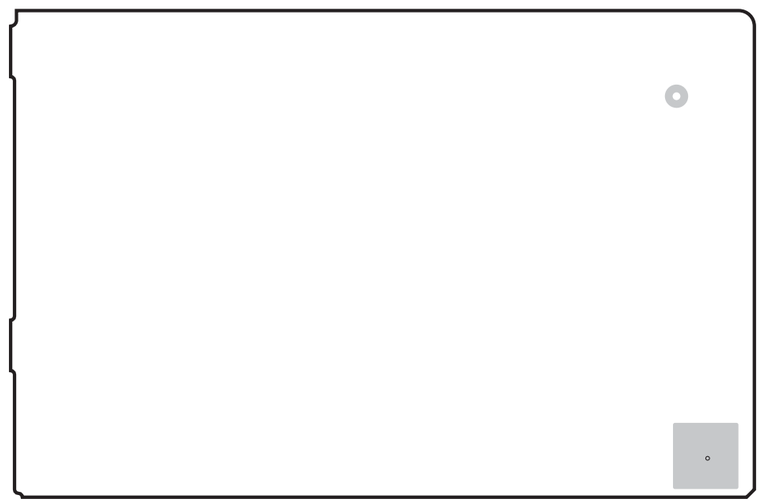


MAIN (2) (Side B)

R model

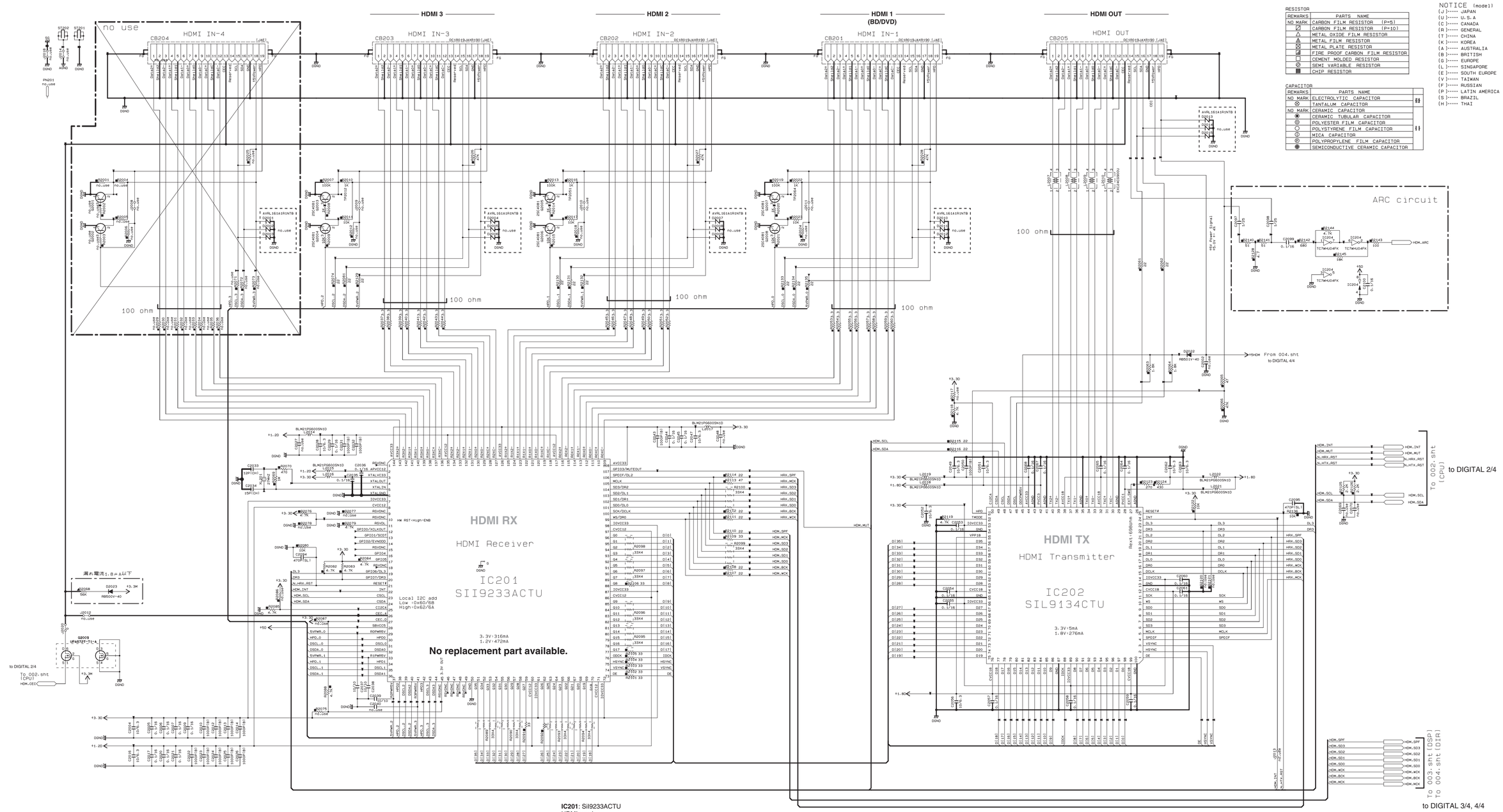


MAIN (3) (Side B)



SCHEMATIC DIAGRAMS HTR-2064

DIGITAL 1/4



RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
⊠	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
◉	CERAMIC TUBULAR CAPACITOR
◎	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
①	MICA CAPACITOR
②	POLYPROPYLENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR

NOTICE (model)
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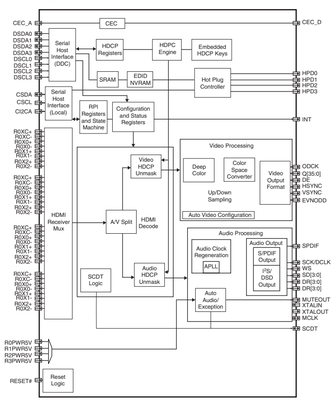
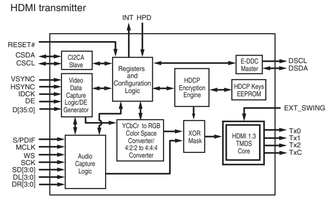
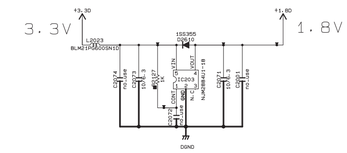
(L)····· SINGAPORE
(E)····· SOUTH EUROPE
(V)····· TAIWAN
(F)····· RUSSIAN
(P)····· LATIN AMERICA
(S)····· BRAZIL
(H)····· THAI

IC201: SII9233ACTU
HDMI receiver

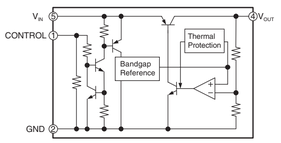


IC202: Sil9134CTU
HDMI transmitter

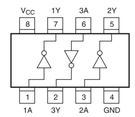




IC203: NJM2884U1-18 (TE1)
Low dropout voltage regulator



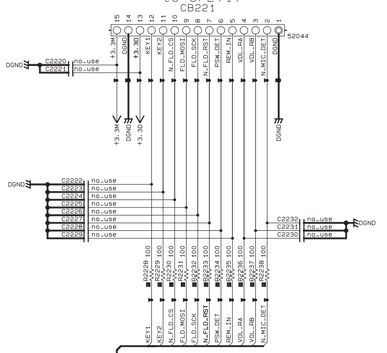
IC204: TC7WHU04FK
Triple inverter



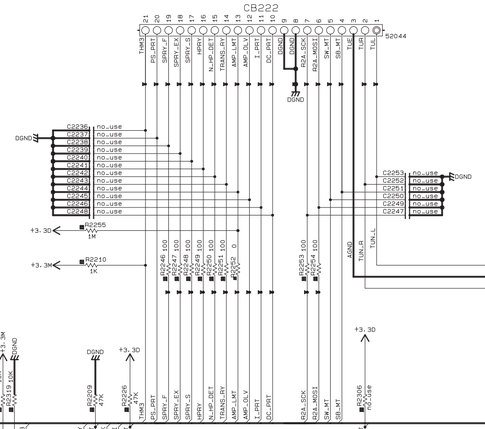
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

DIGITAL 2/4

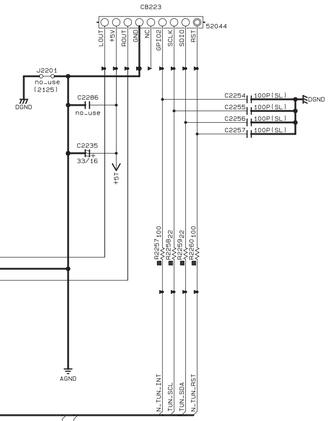
Page 81 C9
to OPERATION (1)_CB101



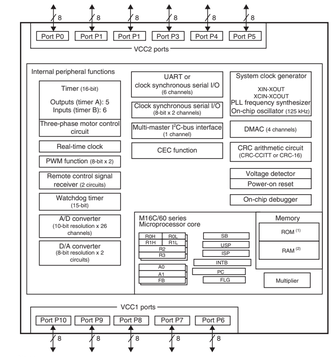
Page 83 B2
to MAIN (1)_CB1



to FM TUNER
to TUNER PACK



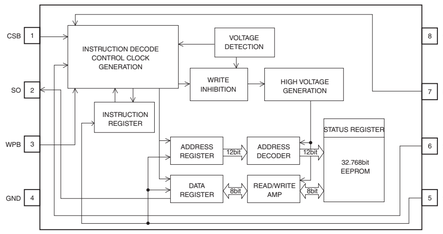
IC221: R5F364AMNFB
Single chip 16-bit microprocessor

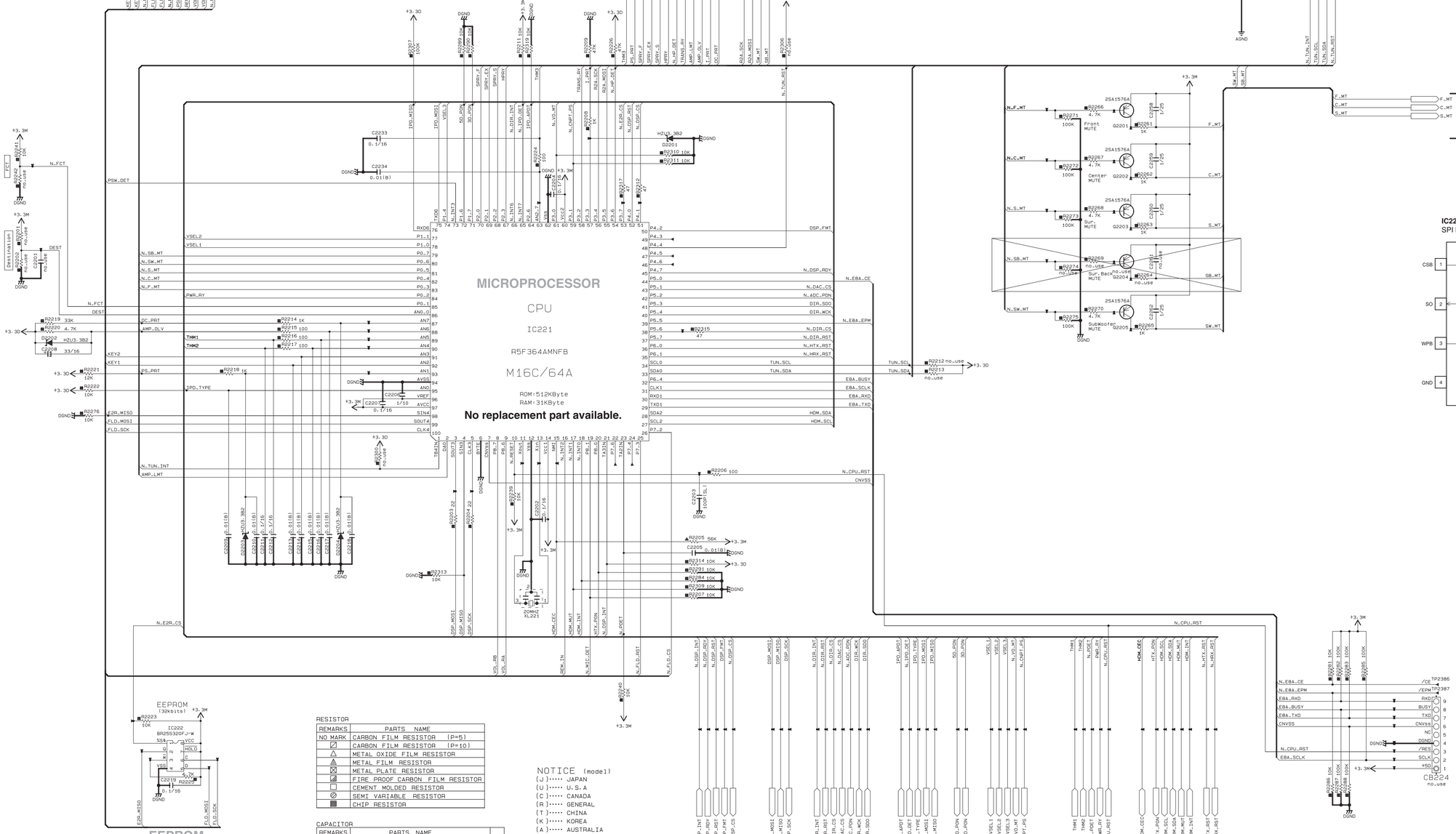


Notes:
1. ROM size depends on MCU type.
2. RAM size depends on MCU type.

to 004.sht (CB***)
to DIGITAL 4/4

IC222: BR25S320FJ-WE2
SPI BUS 32k-bit EEPROM





RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
	CARBON FILM RESISTOR (P=10)
	METAL OXIDE FILM RESISTOR
	METAL FILM RESISTOR
	METAL PLATE RESISTOR
	FIRE PROOF CARBON FILM RESISTOR
	CEMENT MOLDED RESISTOR
	SEMI VARIABLE RESISTOR
	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	‖
	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	‖
	CERAMIC TUBULAR CAPACITOR	
	POLYESTER FILM CAPACITOR	
	POLYSTYRENE FILM CAPACITOR	
	MICA CAPACITOR	
	POLYPROPYLENE FILM CAPACITOR	
	SEMICONDUCTIVE CERAMIC CAPACITOR	

NOTICE (model)
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(S)····· BRAZIL
(H)····· THAI

★ Components having special characteristics are marked △ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

DIGITAL 3/4

DIGITAL IN

to DIGITAL 1/4 — From 001.sht (HDMI Rx): HDM_WCK, HDM_SD1, HDM_SD2, HDM_SD3, HDM_SPF

to DIGITAL 4/4 — From 004.sht (DIR): DIR_MCK1, DIR_BCK, DIR_WCK, DIR_SDO, DIR_24M

to DIGITAL 2/4 — From 002.sht (CPU): N_DSP_RST, N_DSP_INT, N_DSP_RDY, DSP_FMT, N_DSP_CS, DSP_SCK, DSP_MOSI, DSP_MISO

to 004.sht (DAC): TI_BCK, TI_WCK, TI_SDF, TI_SDC, TI_SDS, TI_SDSB

to DIGITAL 4/4

AUDIO DSP

DSP

IC241

D70YE101BRFP266

No replacement part available.

Boot mode: Prallel Flash

FL/FR
C/SW
SL/SR

SDRAM
64Mbit
ESMT:X9625B0
WINBOND:X2414F0
ZENTEL:YD487A0

Flash Memory
16Mbit

Written by YES (EON) :YD777A0
Written by YES (MXIC):YD777A0
EON Blank:X8950B0
MXIC Blank:X3042E0
~~Sanyo Blank:X8934E0~~

CB241 14FMN-BMTTN-A-T no_use

RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
	CARBON FILM RESISTOR (P=10)
	METAL OXIDE FILM RESISTOR
	METAL FILM RESISTOR
	METAL PLATE RESISTOR
	FIRE PROOF CARBON FILM RESISTOR
	CEMENT MOLDED RESISTOR
	SEMI VARIABLE RESISTOR
	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
	CERAMIC TUBULAR CAPACITOR
	POLYESTER FILM CAPACITOR
	POLYSTYRENE FILM CAPACITOR
	MICA CAPACITOR
	POLYPROPYLENE FILM CAPACITOR
	SEMICONDUCTIVE CERAMIC CAPACITOR

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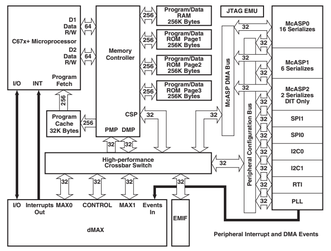
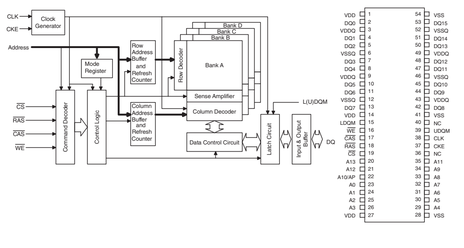
(P)····· LATIN AMERICA
(S)····· BRAZIL
(H)····· THAI

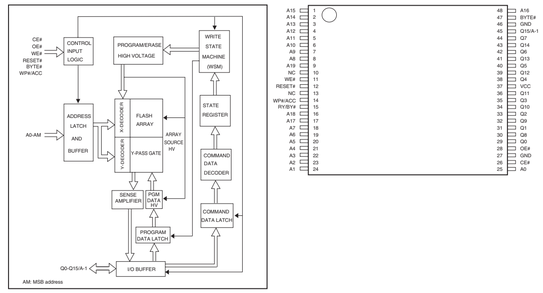
IC241: D70YE101BRFP266
Floating-point digital signal processors



IC242: M12L64164A-5TG
1M x 16-bit x 4 banks synchronous DRAM

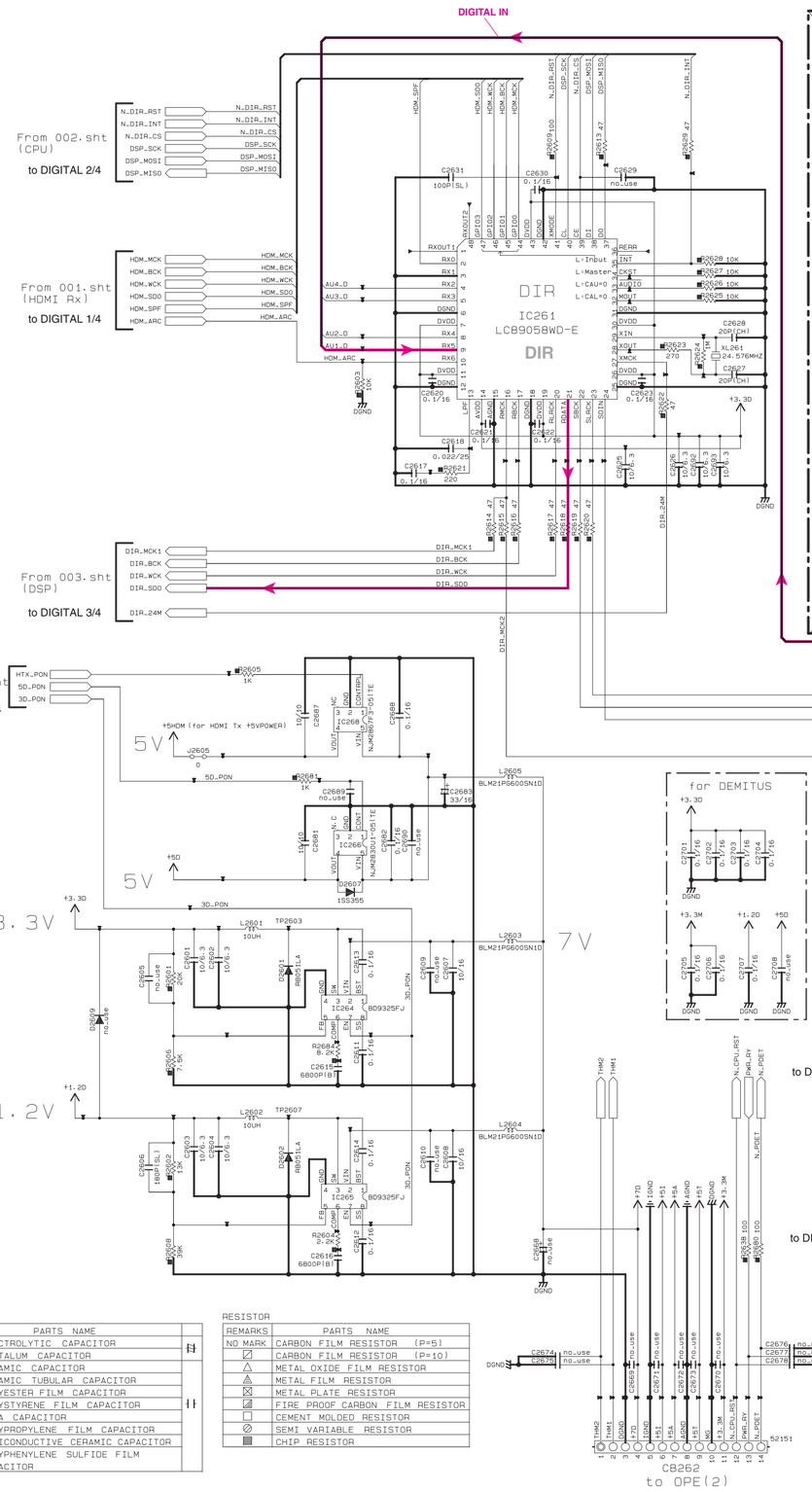


IC243: MX29LV160DBTI-70G
16M-bit 3V supply flash memory

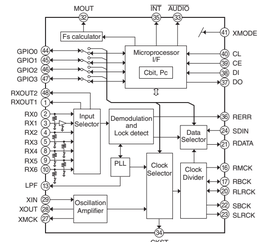


★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

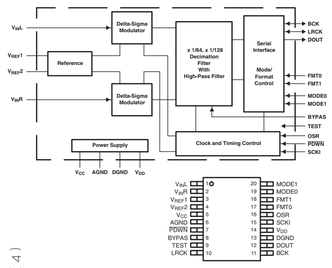
DIGITAL 4/4



IC261: LC89058WD-E
Digital audio interface receiver

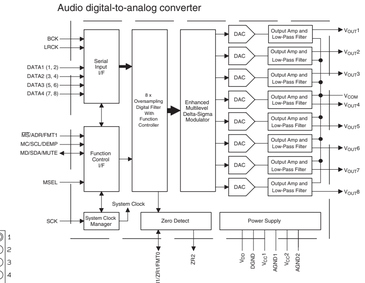


IC262: PCM1803DBR
Stereo A/D converter



Page 82 E4
to OPERATION (4)_CB196

IC263: PCM1681PWPR
Audio digital-to-analog converter



CB264
to OPE(4)
Page 82 E2
to OPERATION (4)_CB195

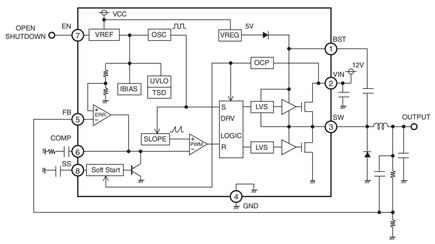
CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	‖
⊗	TANTALUM CAPACITOR	‖
NO MARK	CERAMIC CAPACITOR	‖
●	CERAMIC TUBULAR CAPACITOR	‖
◎	POLYESTER FILM CAPACITOR	‖
○	POLYSTYRENE FILM CAPACITOR	‖
Ⓘ	MICA CAPACITOR	‖
Ⓟ	POLYPROPYLENE FILM CAPACITOR	‖
◉	SEMICONDUCTIVE CERAMIC CAPACITOR	‖
Ⓢ	POLYPHENYLENE SULFIDE FILM CAPACITOR	‖

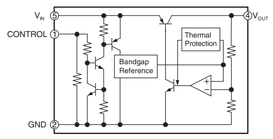
RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
☑	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
☒	METAL FILM RESISTOR
▨	METAL PLATE RESISTOR
▨	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

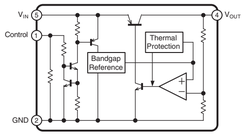
IC264, 265: BD9325FJ
2A output current integrated MOSFET step down regulator



IC266: NJM2830U1-05 (TE1)
Low dropout voltage regulator



IC268: NJM2867F3-05
Low dropout voltage regulator



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★ Schematic diagram is subject to change without notice.

OPERATION 1/2

RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
▨	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
▨	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	⫼
⊗	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	⫼
◉	CERAMIC TUBULAR CAPACITOR	
ⓞ	POLYESTER FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	
Ⓘ	MICA CAPACITOR	
Ⓟ	POLYPROPYLENE FILM CAPACITOR	
◍	SEMICONDUCTIVE CERAMIC CAPACITOR	
Ⓢ	POLYPHENYLENE SULFIDE FILM CAPACITOR	

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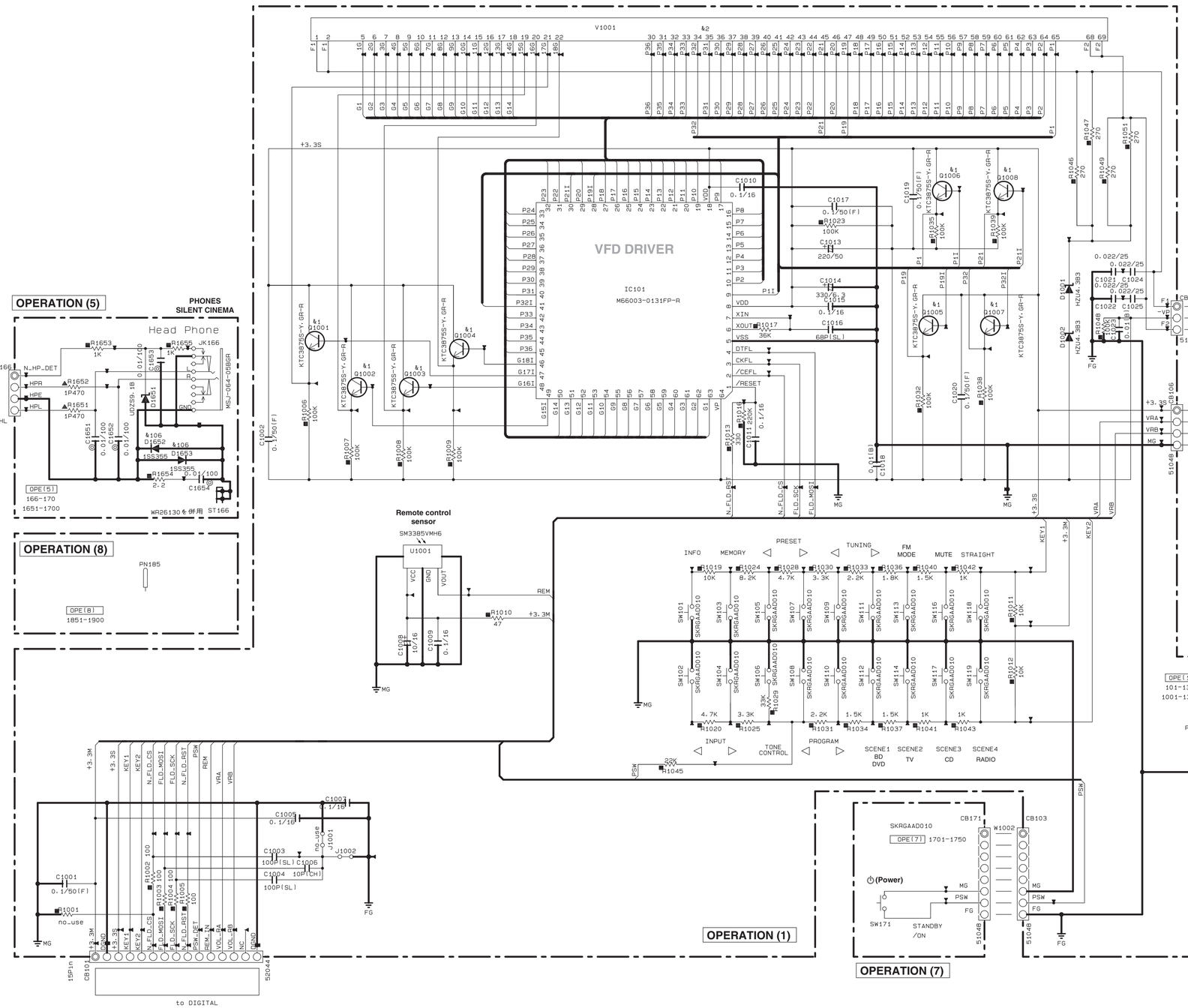
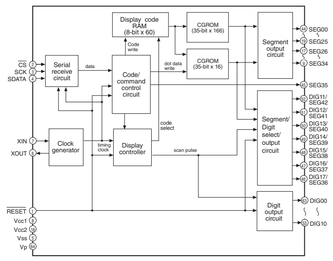


IC101: M66003-0131FP-R
18 digit 5 x 7 segment VFD controller/driver



Key detection for A/D port
Key input (A/D) pull-up resistance 10 k-ohms

Ohm	0	+ 1.0 k	+ 1.5 k	+ 1.8 k	+ 2.2 k	+ 3.3 k	+ 4.7 k	+ 8.2 k	+ 10.0 k
Normal voltage value range	0 – 0.15	0.15 – 0.48	0.49 – 0.82	0.83 – 1.14	1.15 – 1.46	1.47 – 1.79	1.80 – 2.12	2.13 – 2.40	2.41 – 2.91
A/D value range (3.3 V=255)	0 – 11	12 – 37	38 – 64	65 – 88	89 – 113	114 – 139	140 – 164	165 – 186	187 – 226
Key name (KEY1, 92 pin)	STRAIGHT	TUNING >>	TUNING <<	AM	FM	PRESET >	PRESET <	MEMORY	INFO

Ohm	0	+ 1.0 k	+ 1.0 k	+ 1.5 k	+ 1.5 k	+ 2.2 k	+ 3.3 k	+ 4.7 k	(22 k + 33 k)	22.0 k	33.0 k
Normal voltage value range	0 – 0.15	0.15 – 0.42	0.43 – 0.70	0.71 – 0.97	0.98 – 1.24	1.25 – 1.53	1.54 – 1.84	1.84 – 2.10	2.11 – 2.33	2.34 – 2.54	2.54 – 2.71
A/D value range (3.3 V=255)	0 – 11	12 – 32	33 – 54	55 – 75	76 – 96	97 – 119	12 – 142	143 – 163	164 – 181	182 – 197	198 – 209
Key name (KEY2, 91 pin)	SCENE RADIO	SCENE CD	SCENE TV	SCENE BD/DVD	PROGRAM >	PROGRAM <	INPUT >	INPUT <	–	⏻ (Power)	TONE CONTROL

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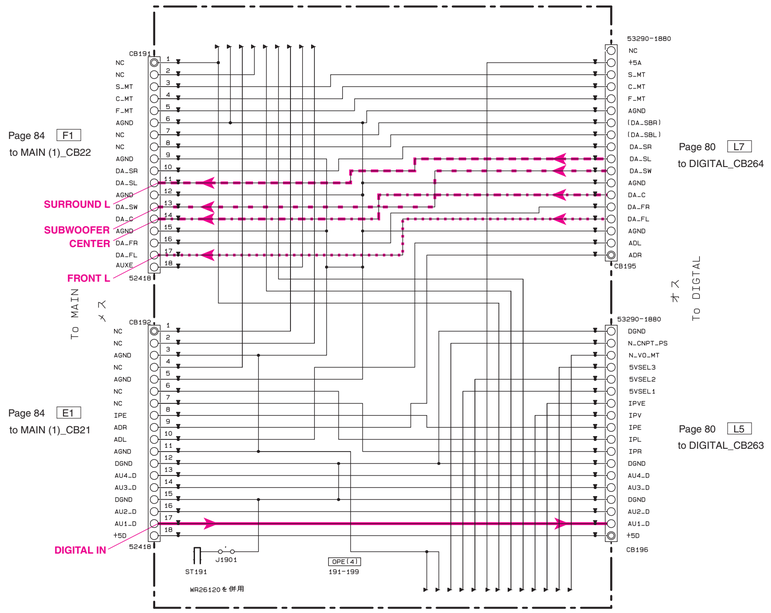
★ Schematic diagram is subject to change without notice.

OPERATION 2/2



OPERATION (4)

Destination Part List

sXX	LOC	UC	R	ABGLF
s132	TH2	WT69830 WC92NA103J1	X	X
s151	T1501	X8521A0 X8521	X8522A0 X8522	X8523A0 X8523
s152	C1505 C1506	X	WJ60500 0.01/100	X
s153	C1504	WJ60500 0.01/100	X	WJ60500 0.01/100
s154	Q1505	X	VS99780 1T2A1	X
s155	R1508	X	VC75790 2P47	X
s156	J1501	VN50000 -	X	VN50000 -
s157	Q1503	X	VP87260 A1708(S/T)	X
s158	Q1502 Q1504	X	IA10151 A1015(Y)	X
s159	Q1505	X	WC52920 KRC102M-AT/P	X
s160	R1507	X	RD35747 47K	X
s161	D1502	X	VG43700 MTZJ4.7A	X
s162	R1504	X	RD35610 1K	X
s163	R1505	X	RD35722 22K	X
s164	R1506	X	RD35647 4.7K	X
s171	F1501	WB22120 6.00A125V	WW93310 TSD5.0A250V	YV07170 3.15A250V
s178	C1503	X	UR89710 10/100	X
s179	R1509	X	RD35810 100K	X
s180	J1502	VN50000 -	X	VN50000 -
s181	C1501	UR74922 2200/25	UR75922 2200/35	UR74922 2200/25

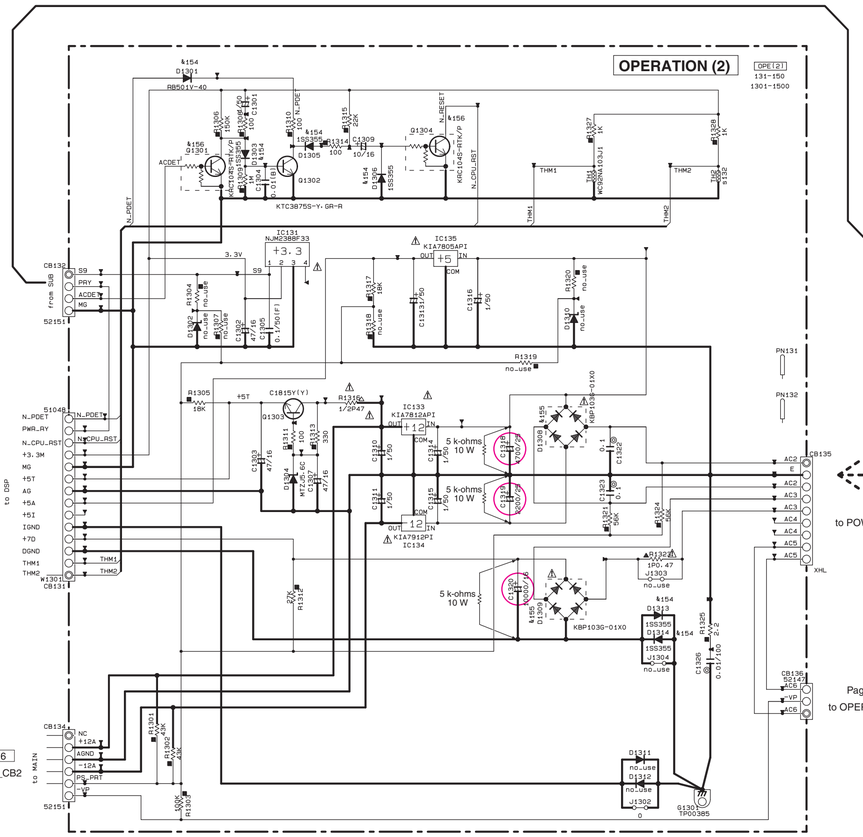
RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
◩	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
◭	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

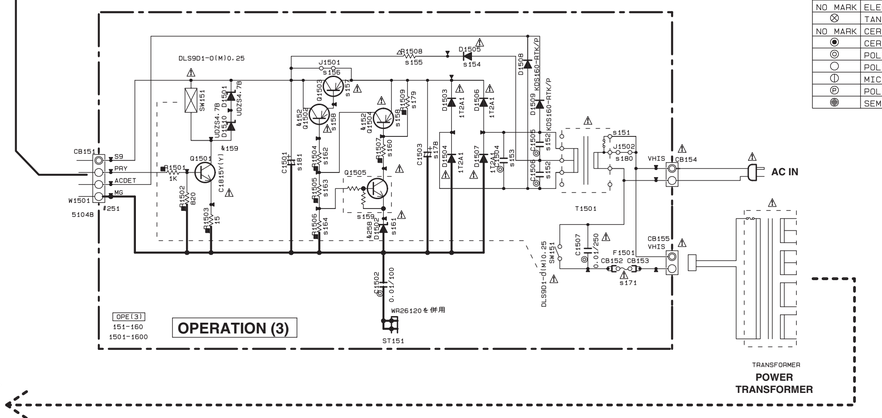
CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	∓
⊘	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	∥
◉	CERAMIC TUBULAR CAPACITOR	
◎	POLYESTER FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	
Ⓘ	MICA CAPACITOR	
Ⓟ	POLYPROPYLENE FILM CAPACITOR	
◉	SEMICONDUCTIVE CERAMIC CAPACITOR	

NOTICE (model)
(J)····· JAPAN
(U)····· U.S.A
(C)····· CANADA
(R)····· GENERAL
(T)····· CHINA
(K)····· KOREA
(A)····· AUSTRALIA
(B)····· BRITISH
(G)····· EUROPE
(L)····· SINGAPORE
(E)····· SOUTH EUROPE
(V)····· TAIWAN
(F)····· RUSSIAN
(P)····· LATIN AMERICA
(S)····· BRAZIL
(H)····· THAI

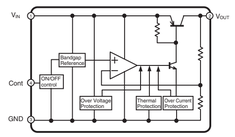


OPERATION (2)

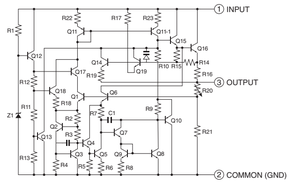


to POWER TRANSFORMER

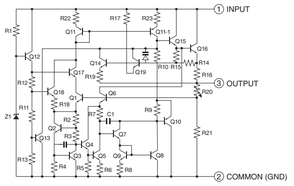
IC131: NJM2388F33
Low dropout voltage regulator with ON/OFF control



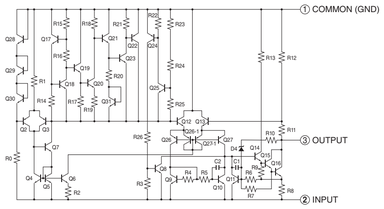
IC135: KIA7805API
Voltage regulator



IC133: KIA7812API
Voltage regulator



IC134: KIA7912PI
Voltage regulator



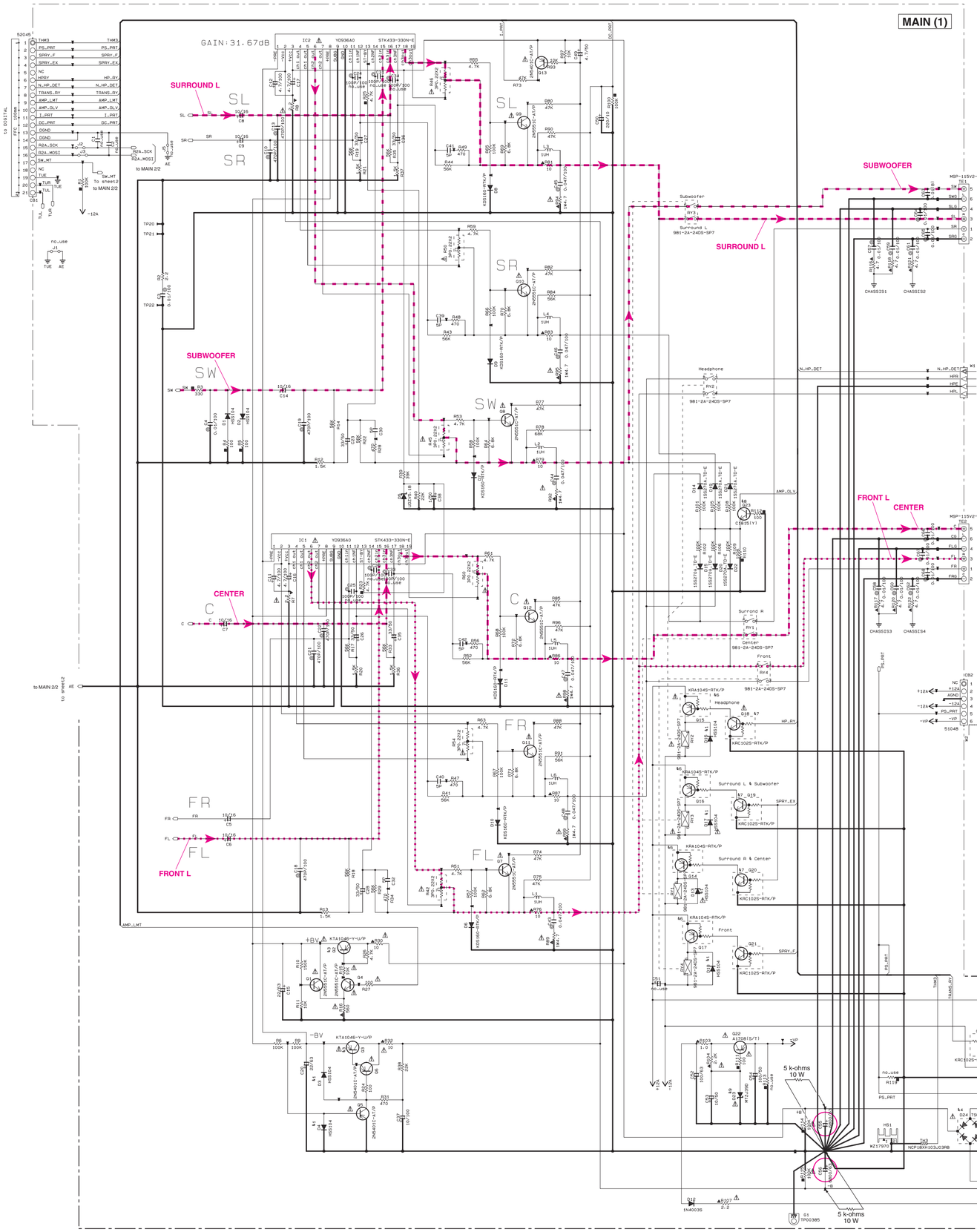
Page 81 K4
to OPERATION (1)_CB102

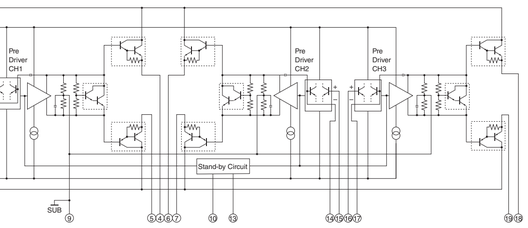
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

Notes:
Safety measures
- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each.
  C1318-1320 on OPERATION (2) P.C.B.

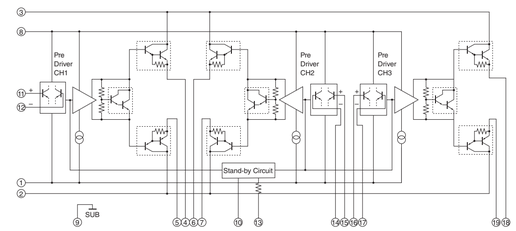
MAIN 1/2

Note:
When the power amplifier IC (IC 1 or IC 2 on MAIN P.C.B.) requires to be replaced, be sure to refer to "POWER AMPLIFIER IC REPLACEMENT" before its replacement.



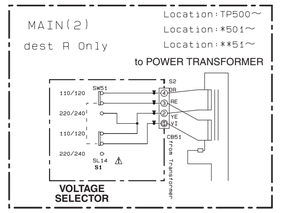


IC1, 2: STK433-330N-E
3-channel AF power amplifier, stand-by circuit built-in

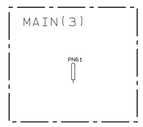


IC1, 2: STK433-330F-E
3-channel AF power amplifier, stand-by circuit built-in

MAIN (2) R model



MAIN (3)



Destination Part List

&XX	LOC	UCABGLF	R
S1	SW51	x	WV38290 SL14
S2	CB51	x	V937790 B4P75-VH

Notes:

Safety measures

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each.
  C55, C56 on MAIN (1) P.C.B.

RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
⊠	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	⊟
⊗	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	⊣⊢
◉	CERAMIC TUBULAR CAPACITOR	
◎	POLYESTER FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	
Ⓘ	MICA CAPACITOR	
⊛	POLYPROPYLENE FILM CAPACITOR	
⊛	SEMICONDUCTIVE CERAMIC CAPACITOR	
Ⓢ	POLYPHENYLENE SULFIDE FILM CAPACITOR	

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(F)····· RUSSIAN
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(H)····· THAI

★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

MAIN 2/2

Page 82 C4
to OPERATION (4)_CB192

Page 82 C2
to OPERATION (4)_CB191

MAIN(1)

MAIN (1)

Location:TP200～

Location:*201～*400

Location:**21～**40

AUDIO 1 OPTICAL AUDIO1 — DIGITAL IN

AUDIO 2 COAXIAL AUDIO2

AUDIO 3 COAXIAL (CD) AUDIO3

AUDIO 4 OPTICAL (TV) AUDIO4

AUDIO 5 AUDIO5 — ANALOG IN

AUDIO 6 AUDIO6

SUBWOOFER OUT PRE-OUT SW

[5.4dB] フィルタ定数修正（ゲインも含め）

FRONT L

SURROUND L

CENTER

SUBWOOFER

SELECTOR and E-VOLUME

IC21 R2A15220FP

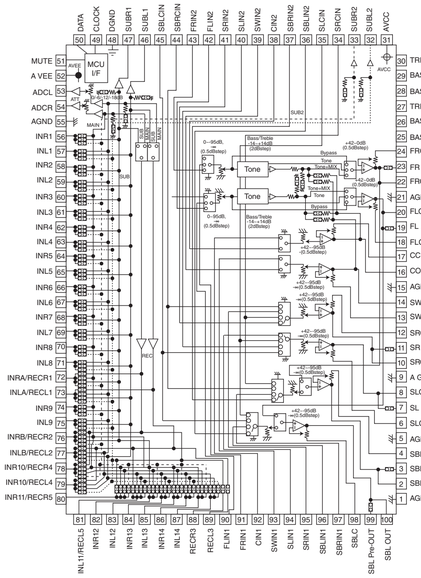
-3.9dB

4.95dB

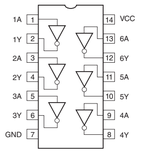
SUBWOOFER (SPEAKER OUT)

SUBWOOFER (PRE OUT)

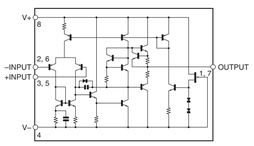
IC21: R2A15220FP
8-channel electronic volume with 11 input selector and tone control



IC22: TC74VHCU04FT
Hex inverters



IC23-25, 27: NJM4565M (TE1)
Dual operational amplifier



RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
☑	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
☒	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊘	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	⊟
⊗	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	⊣⊢
❀	CERAMIC TUBULAR CAPACITOR	
◎	POLYESTER FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	
Ⓘ	MICA CAPACITOR	
Ⓟ	POLYPROPYLENE FILM CAPACITOR	
◉	SEMICONDUCTIVE CERAMIC CAPACITOR	
Ⓢ	POLYPHENYLENE SULFIDE FILM CAPACITOR	

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(E)····· SOUTH EUROPE
(V)····· TAIWAN
(F)····· RUSSIAN
(P)····· LATIN AMERICA
(S)····· BRAZIL
(H)····· THAI

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★ Schematic diagram is subject to change without notice.

■ REPLACEMENT PARTS LIST

● ELECTRICAL COMPONENT PARTS

WARNING

- Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

C.A.EL.CHP	: CHIP ALUMI.ELECTROLYTIC CAP
C.CE	: CERAMIC CAP
C.CE.ARRAY	: CERAMIC CAP ARRAY
C.CE.CHP	: CHIP CERAMIC CAP
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP
C.CE.TUBLR	: CERAMIC TUBULAR CAP
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP
C.EL	: ELECTROLYTIC CAP
C.EL.BP	: BIPOLAR ELECTROLYTIC CAP
C.EL.CHP	: CHIP ELECTROLYTIC CAP
C.MICA	: MICA CAP
C.ML.FLM	: MULTILAYER FILM CAP
C.MP	: METALLIZED POLYESTER FILM CAP
C.MYLAR	: MYLAR FILM CAP
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP
C.NIOB.OXD	: NIOBIUM OXIDE CAP
C.PAPER	: PAPER CAPACITOR
C.PLS	: POLYSTYRENE FILM CAP
C.POL	: POLYESTER FILM CAP
C.PP	: POLYPROPYLENE FILM CAP
C.PP.CHP	: CHIP POLYPROPYLENE FILM CAP
C.TNTL	: TANTALIUM CAP
C.TNTL.CHP	: CHIP TANTALIUM CAP
C.TRIM	: TRIMMER CAP
CN	: CONNECTOR
CN.BS.PIN	: CONNECTOR,BASE PIN
CN.CANNON	: CONNECTOR,CANNON
CN.DIN	: CONNECTOR,DIN
CN.FLAT	: CONNECTOR,FLAT CABLE
CN.FFC	: CONNECTOR,FLEXIBLE FLAT CABLE
CN.HDMI	: HDMI CONNECTOR
CN.PHOTO.R	: PHOTO FIBER SENSOR,RECEIVED
CN.PHOTO.T	: PHOTO FIBER SENSOR,TRANSMITTED
DIODE.ARRAY	: DIODE ARRAY
DIODE.BRG	: DIODE BRIDGE
DIODE.CHP	: CHIP DIODE
DIODE.VAR	: VARACTOR DIODE
DIODE.ZENR	: ZENER DIODE
DIODE.Z.CHP	: CHIP ZENER DIODE
DIODE.SCHOTTKY	: SCHOTTKY BARRIER DIODE
DIODE.PHOT	: PHOTO DIODE
FER.BEAD	: FERRITE BEADS
FER.CORE	: FERRITE CORE
FET.CHP	: CHIP FET
FL.DSPLY	: FLUORESCENT DISPLAY
FLTR.CE	: CERAMIC FILTER
FLTR.COMB	: COMB FILTER MODULE
FLTR.LC.RF	: LC FILTER,EMI
FUSE.CHP	: CHIP FUSE
GND.MTL	: GROUND PLATE
GND.TERM	: GROUND TERMINAL
JUMPER.CN	: JUMPER CONNECTOR
JUMPER.TST	: JUMPER,TEST POINT
L.DTCT	: LIGHT DETECTING MODULE
LED.CHP	: CHIP LED
LED.DSPLY	: LED DISPLAY
LED.INFRD	: LED,INFRARED
PHOT.CPL	: PHOTO COUPLER
PHOT.INTR	: PHOTO INTERRUPTER
PHOT.RFLCT	: PHOTO REFLECTOR
PHOT.TR	: PHOTO TRANSISTOR
PIN.TEST	: PIN,TEST POINT
PTC.THERMISTOR	: POSITIVE TEMPERATURE COEFFICIENT THERMISTOR
R.ANTI.SURGE	: FIXED ANTI SURGE RESISTOR
R.ARRAY	: RESISTOR ARRAY
R.CAR.	: CARBON RESISTOR
R.CAR.CHP	: CHIP RESISTOR
R.CAR.FP	: FLAME PROOF CARBON RESISTOR
R.CEMENT	: CEMENT RESISTOR
R.FUS	: FUSIBLE RESISTOR
R.MTL.CHP	: CHIP METAL FILM RESISTOR
R.MTL.FLM	: METAL FILM RESISTOR
R.MTL.OXD	: METAL OXIDE FILM RESISTOR
R.MTL.PLAT	: METAL PLATE RESISTOR
RSNR.CE	: CERAMIC RESONATOR
RSNR.CRYS	: CRYSTAL RESONATOR
SCR.BND.HD	: BIND HEAD B-TIGHT SCREW
SCR.TERM	: SCREW TERMINAL
SCR.TR	: SCREW,TRANSISTOR
SURG.PRTCT	: SURGE PROTECTOR
SUPRT.PCB	: P.C.B. SUPPORT
SW.LEVER	: LEVER SWITCH
SW.MICRO	: MICRO SWITCH
SW.LEAF	: LEAF SWITCH
SW.PUSH	: PUSH SWITCH
SW.RT	: ROTARY SWITCH
SW.RT.ENC	: ROTARY ENCODER
SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
SW.SLIDE	: SLIDE SWITCH
SW.TACT	: TACT SWITCH
TERM.SP	: SPEAKER TERMINAL
TERM.WRAP	: WRAPPING TERMINAL
THRMST.CHP	: CHIP THERMISTOR
TR	: TRANSISTOR
TR.CHP	: CHIP TRANSISTOR
TR.DGT	: DIGITAL TRANSISTOR
TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
TR.PAIR	: PAIR TRANSISTOR
TRANS	: TRANSFORMER
TRANS.PULS	: PULSE TRANSFORMER
TRANS.PWR	: POWER TRANSFORMER
VARISTOR.CHP	: CHIP VARISTOR
VOLT.SELCT	: VOLTAGE SELECTOR
VR	: ROTARY POTENTIOMETER
VR.MTR	: POTENTIOMETER WITH MOTOR
VR.SLIDE	: SLIDE POTENTIOMETER
VR.SW	: POTENTIOMETER WITH SWITCH
VR.TRIM	: TRIMMER POTENTIOMETER

DIGITAL

	Ref No.	Part No.	Description		Markets
*		WZ081000	P. C. B.	DIGITAL	
	CB201-203	WW271700	CN. HDMI	19P HDMI	
	CB205	WW271700	CN. HDMI	19P HDMI	
	CB221	VM929900	CN. BS. PIN	15P	
	CB222	VQ045100	CN. BS. PIN	21P	
	CB223	VQ044400	CN. BS. PIN	9P	
	CB262	VK027300	CN. BS. PIN	14P	
	CB263-264	VQ962100	CN. BS. PIN	18P	
	C2004	WP882000	C. CE. CHP	10uF 6. 3V	
	C2005-2007	US135100	C. CE. CHP	0. 1uF 16V	
	C2009	US135100	C. CE. CHP	0. 1uF 16V	
	C2010	US063100	C. CE. CHP	1000pF 50V B	
	C2012-2014	US063100	C. CE. CHP	1000pF 50V B	
	C2016	WP882000	C. CE. CHP	10uF 6. 3V	
	C2017	US135100	C. CE. CHP	0. 1uF 16V	
	C2020-2021	US135100	C. CE. CHP	0. 1uF 16V	
	C2022-2026	US063100	C. CE. CHP	1000pF 50V B	
	C2028	WP882000	C. CE. CHP	10uF 6. 3V	
	C2029	US135100	C. CE. CHP	0. 1uF 16V	
	C2031-2032	US063100	C. CE. CHP	1000pF 50V B	
	C2033	US061120	C. CE. CHP	12pF 50V B	
	C2034	US061150	C. CE. CHP	15pF 50V B	
	C2035-2036	US135100	C. CE. CHP	0. 1uF 16V	
	C2037-2039	WD758300	C. CE. CHP	10uF 10V	
	C2043	US063100	C. CE. CHP	1000pF 50V B	
	C2044-2045	US135100	C. CE. CHP	0. 1uF 16V	
	C2047	WP882000	C. CE. CHP	10uF 6. 3V	
	C2049	WP882000	C. CE. CHP	10uF 6. 3V	
	C2050	US063100	C. CE. CHP	1000pF 50V B	
	C2051-2052	WP882000	C. CE. CHP	10uF 6. 3V	
	C2053-2055	US135100	C. CE. CHP	0. 1uF 16V	
	C2056	WP882000	C. CE. CHP	10uF 6. 3V	
	C2057-2061	US135100	C. CE. CHP	0. 1uF 16V	
	C2062-2063	WP882000	C. CE. CHP	10uF 6. 3V	
	C2064-2065	US135100	C. CE. CHP	0. 1uF 16V	
	C2067-2068	US135100	C. CE. CHP	0. 1uF 16V	
	C2071	WP882000	C. CE. CHP	10uF 6. 3V	
	C2073	WP882000	C. CE. CHP	10uF 6. 3V	
	C2094-2095	US062470	C. CE. CHP	470pF 50V B	
	C2097-2098	US046100	C. CE. CHP	1uF 25V	
	C2099	US035100	C. CE. CHP	0. 1uF 16V B	
	C2100	US135100	C. CE. CHP	0. 1uF 16V	
	C2202	US135100	C. CE. CHP	0. 1uF 16V	
	C2203	US062100	C. CE. CHP	100pF 50V B	
	C2204	US135100	C. CE. CHP	0. 1uF 16V	
	C2205	US064100	C. CE. CHP	0. 01uF 50V B	
	C2206	US126100	C. CE. CHP	1uF 10V	
	C2207	US135100	C. CE. CHP	0. 1uF 16V	
	C2208	UR837330	C. EL	33uF 16V	
	C2209-2210	US064100	C. CE. CHP	0. 01uF 50V B	
	C2211-2212	US135100	C. CE. CHP	0. 1uF 16V	
	C2213-2218	US064100	C. CE. CHP	0. 01uF 50V B	
	C2219	US135100	C. CE. CHP	0. 1uF 16V	
	C2233	US135100	C. CE. CHP	0. 1uF 16V	
	C2234	US064100	C. CE. CHP	0. 01uF 50V B	
	C2235	UR837330	C. EL	33uF 16V	
	C2254-2257	US062100	C. CE. CHP	100pF 50V B	

✻ New Parts

	Ref No.	Part No.	Description		Markets
	C2258-2260	US046100	C. CE. CHP	1uF 25V	
	C2262	US046100	C. CE. CHP	1uF 25V	
	C2405-2407	US135100	C. CE. CHP	0. 1uF 16V	
	C2413	US135100	C. CE. CHP	0. 1uF 16V	
	C2415	US135100	C. CE. CHP	0. 1uF 16V	
	C2417	US135100	C. CE. CHP	0. 1uF 16V	
	C2420	US135100	C. CE. CHP	0. 1uF 16V	
*	C2421-2422	WP882000	C. CE. CHP	10uF 6. 3V	
*	C2424	WP882000	C. CE. CHP	10uF 6. 3V	
	C2426-2432	US135100	C. CE. CHP	0. 1uF 16V	
	C2434-2443	US135100	C. CE. CHP	0. 1uF 16V	
	C2445-2451	US135100	C. CE. CHP	0. 1uF 16V	
	C2453	US135100	C. CE. CHP	0. 1uF 16V	
	C2454	US062100	C. CE. CHP	100pF 50V B	
	C2465	US135100	C. CE. CHP	0. 1uF 16V	
	C2466	WP882000	C. CE. CHP	10uF 6. 3V	
	C2601-2604	WP882000	C. CE. CHP	10uF 6. 3V	
	C2606	US062180	C. CE. CHP	180pF 50V B	
	C2607-2608	WK004400	C. CE. M. CHP	10uF 16V	
	C2611-2614	US135100	C. CE. CHP	0. 1uF 16V	
	C2615-2616	US063680	C. CE. CHP	6800pF 50V B	
	C2617	US035100	C. CE. CHP	0. 1uF 16V B	
	C2618	US044220	C. CE. CHP	0. 022uF 25V B	
	C2620-2623	US135100	C. CE. CHP	0. 1uF 16V	
	C2625-2626	WP882000	C. CE. CHP	10uF 6. 3V	
	C2627-2628	US061200	C. CE. CHP	20pF 50V B	
	C2630	US135100	C. CE. CHP	0. 1uF 16V	
	C2631	US062100	C. CE. CHP	100pF 50V B	
	C2632	UR867100	C. EL	10uF 50V	
	C2633	US135100	C. CE. CHP	0. 1uF 16V	
	C2635-2637	UR867100	C. EL	10uF 50V	
	C2638-2639	US135100	C. CE. CHP	0. 1uF 16V	
	C2640-2641	WJ608800	C. MYLAR	820pF 100V	
	C2642	US064100	C. CE. CHP	0. 01uF 50V B	
	C2643	US135100	C. CE. CHP	0. 1uF 16V	
	C2644	US035100	C. CE. CHP	0. 1uF 16V B	
	C2645-2647	US062100	C. CE. CHP	100pF 50V B	
	C2648	UR867100	C. EL	10uF 50V	
	C2649-2651	US062100	C. CE. CHP	100pF 50V B	
	C2654	UR848100	C. EL	100uF 25V	
	C2655	UR867100	C. EL	10uF 50V	
	C2656-2658	US126100	C. CE. CHP	1uF 10V	
	C2659	US064100	C. CE. CHP	0. 01uF 50V B	
	C2681	WD758300	C. CE. CHP	10uF 10V	
	C2682	US135100	C. CE. CHP	0. 1uF 16V	
	C2683	UR837330	C. EL	33uF 16V	
	C2687	WD758300	C. CE. CHP	10uF 10V	
	C2688	US135100	C. CE. CHP	0. 1uF 16V	
	C2692-2693	WP882000	C. CE. CHP	10uF 6. 3V	
	C2701-2707	US135100	C. CE. CHP	0. 1uF 16V	
	D2022	VV220700	DIODE. SCHOTTKY	RB501V-40	
	D2023	V2376600	DIODE. SCHOTTKY	RB500V-40	
	D2201-2204	WS692300	DIODE. ZENR	HZU3. 3B2 TRF-E	
	D2601-2602	WR452500	DIODE. SCHOTTKY	RB051LA-40	
	D2607	VT332900	DIODE	1SS355	
	D2610	VT332900	DIODE	1SS355	
	IC202	X8560A00	IC. HDMI	SIL9134CTU HDMI	

✻ New Parts

DIGITAL and OPERATION

	Ref No.	Part No.	Description		Markets
	IC203	YC394A00	IC	NJM2884U1-18(TE1)	
	IC204	X8385A00	IC	TC7WHU04FK TE85L	
*	IC222	YD833A00	IC. MEMORY	BR25S320FJ-WE2	
	IC242	X9625B00	IC. MEMORY	M12L64164A-5TG	
*	IC243	YD777A00	IC. MEMORY	MX29LV160DBTI-70G	(written)
	IC261	YA399A00	IC	LC89058WD-E	
	IC262	X7357A00	IC	PCM1803DBR	
	IC263	X9870A00	IC	PCM1681PWPR	
	IC264-265	YC391A00	IC	BD9325FJ	
	IC266	YC604A00	IC	NJM2830U1-05(TE1)	
	IC268	X7741A00	IC	NJM2867F3-05(TE1)	
	Q2003-2008	VQ986700	TR	2SC4081 T106	
	Q2009	WE834500	FET	UPA672T-T1-A	
	Q2201-2203	VR936300	TR	2SA1576A T106	
	Q2205	VR936300	TR	2SA1576A T106	
	XL201	WU058300	RSNR. CRYS	27MHz	
	XL221	WF997400	RSNR. CE	20MHz	
	XL261	WJ625200	RSNR. CRYS	24.576MHz	
*		WZ080700	P. C. B.	OPERATION	UC
*		WZ080800	P. C. B.	OPERATION	R
*		WZ080900	P. C. B.	OPERATION	ABGFL
	CB101	VM929900	CN. BS. PIN	15P	
	CB132	VK026300	CN. BS. PIN	4P	
	CB134	VK026500	CN. BS. PIN	6P	
	CB135	LB919090	CN. BS. PIN	9P	
	CB136	VK024700	CN. BS. PIN	3P	
	CB152-153	WN077700	CLIP. FUSE	CLIP PFC5000-0202F	
⚠	CB154-155	VG879900	CN. BS. PIN	2P	
	CB166	VB858300	CN. BS. PIN	4P	
	CB191-192	VQ962100	CN. BS. PIN	18P	
	CB195-196	VQ963900	CN. BS. PIN	18P	
	C1001-1002	US065100	C. CE. CHP	0.1uF 50V B	
	C1003-1004	US062100	C. CE. CHP	100pF 50V B	
	C1005	US135100	C. CE. CHP	0.1uF 16V	
	C1006	US061100	C. CE. CHP	10pF 50V B	
	C1007	US135100	C. CE. CHP	0.1uF 16V	
	C1008	UM397100	C. EL	10uF 16V	
	C1009-1011	US135100	C. CE. CHP	0.1uF 16V	
	C1013	UR268220	C. EL	220uF 50V	
	C1014	UM388330	C. EL	330uF 6.3V	
	C1015	US135100	C. CE. CHP	0.1uF 16V	
	C1016	US061680	C. CE. CHP	68pF 50V B	
	C1017	US065100	C. CE. CHP	0.1uF 50V B	
	C1018	US064100	C. CE. CHP	0.01uF 50V B	
	C1019-1020	US065100	C. CE. CHP	0.1uF 50V B	
	C1021-1022	US044220	C. CE. CHP	0.022uF 25V B	
	C1023	US064100	C. CE. CHP	0.01uF 50V B	
	C1024-1025	US044220	C. CE. CHP	0.022uF 25V B	
	C1301	UR866100	C. EL	1uF 50V	
	C1302-1303	UR837470	C. EL	47uF 16V	
	C1304	US064100	C. CE. CHP	0.01uF 50V B	
	C1305	US065100	C. CE. CHP	0.1uF 50V B	
	C1307	UR837470	C. EL	47uF 16V	
	C1309	UR837100	C. EL	10uF 16V	

✻ New Parts

	Ref No.	Part No.	Description		Markets
	C1310-1311	UR866100	C. EL	1uF 50V	
	C1313-1316	UR866100	C. EL	1uF 50V	
	C1318	UR749470	C. EL	4700uF 25V	
	C1319	UR749220	C. EL	2200uF 25V	
	C1320	UR73A100	C. EL	10000uF 16V	
	C1322-1323	VE326000	C. MYLAR	0.1uF 50V	
	C1326	WJ605000	C. MYLAR	0.01uF 50V J	
	C1451-1452	US063100	C. CE. CHP	1000pF 50V B	
	C1501	UR749220	C. EL	2200uF 25V	UCABGFL
	C1501	UR759220	C. EL	2200uF 35V	R
	C1502	WJ605000	C. MYLAR	0.01uF 50V J	
	C1503	UR897100	C. EL	10uF 100V	R
	C1504	WJ605000	C. MYLAR	0.01uF 50V J	UCABGFL
	C1505-1506	WJ605000	C. MYLAR	0.01uF 50V J	R
⚠	C1507	WQ939400	C. CE. SAFTY	0.01uF 250V	
	C1651-1654	WJ605000	C. MYLAR	0.01uF 50V J	
	D1001-1002	WS693300	DIODE. ZENR	HZU4.3B3 TRF-E	
	D1301	VV220700	DIODE. SCHOTTKY	RB501V-40	
	D1303	VT332900	DIODE	1SS355	
	D1304	VG437800	DIODE. ZENR	MTZ J 5.6C 5.6V	
	D1305-1306	VT332900	DIODE	1SS355	
⚠	D1308-1309	WA653100	DIODE. BRG	KBP103G 1A 200V	
	D1313-1314	VT332900	DIODE	1SS355	
	D1501	VU171800	DIODE. ZENR	UDZS4.7B 4.7V	
⚠	D1502	VG437000	DIODE. ZENR	MTZJ4.7A 4.7V	R
⚠	D1503-1504	VS997800	DIODE	1T2	
⚠	D1505	VS997800	DIODE	1T2	R
⚠	D1506-1507	VS997800	DIODE	1T2	
	D1508-1509	WC398800	DIODE	KDS160-RTK	
	D1510	VU171800	DIODE. ZENR	UDZS4.7B 4.7V	
	D1651	VU172500	DIODE. ZENR	UDZS9.1B	
	D1652-1653	VT332900	DIODE	1SS355	
⚠	F1501	WB221200	FUSE	T6A 125V	UC
⚠	F1501	WM933100	FUSE	T5A 250V	R
⚠	F1501	VV071700	FUSE	3.15A 250V	ABGFL
	IC101	X6386A00	IC	M66003-0131FP	
⚠	IC131	X6248A00	IC	NJM2388F33	
⚠	IC133	X4153A00	IC	KIA7812API	
⚠	IC134	X4154A00	IC	KIA7912PI	
⚠	IC135	X4928A00	IC	KIA7805API 5V	
	JK166	V9408200	JACK. PHONE	MSJ-064-05B GR	
	Q1001-1008	WC529400	TR	KTC3875S Y GR RTK	
	Q1301	WC435100	TR. DGT	KRC104S-RTK	
	Q1302	WC529400	TR	KTC3875S Y GR RTK	
	Q1303	WJ173600	TR	2SC1815Y TP	
	Q1304	WC435100	TR. DGT	KRC104S-RTK	
⚠	Q1501	WJ173600	TR	2SC1815Y TP	
⚠	Q1502	iA101510	TR	2SA1015 Y	R
⚠	Q1503	VP872600	TR	2SA1708 S,T	R
⚠	Q1504	iA101510	TR	2SA1015 Y	R
⚠	Q1505	WC529200	TR. DGT	KRC102M-AT	R
⚠ *	R1316	WU950200	R. MTL. OXD	47Ω 1/2W	
⚠	R1323	WJ682000	R. MTL. FLM	0.47Ω 1W J	
	R1508	VC757900	R. MTL. OXD	47Ω 2W	R
	R1651-1652	WJ685600	R. MTL. FLM	470Ω 1W J	
	SW101-114	WD483100	SW. TACT	SKRGAAD010	
	SW116-119	WD483100	SW. TACT	SKRGAAD010	

✻ New Parts

OPERATION and MAIN

	Ref No.	Part No.	Description		Markets
	SW145	V9597100	SW. RT. ENC	EC12E2460802	
⚠	SW151	V9366900	RELAY	DLS9D1-0(M)0. 25W	
	SW171	WD483100	SW. TACT	SKRGAAD010	
⚠	T1501	X8521A00	TRANS. PWR		UC
⚠	T1501	X8522A00	TRANS. PWR		R
⚠	T1501	X8523A00	TRANS. PWR		ABGFL
	TH1	WT698300	THERMISTOR	WC92NA103J1	
	TH2	WT698300	THERMISTOR	WC92NA103J1	UC
	U1001	WQ600700	L. DTCT	SM3385VMH6	
	V1001	WQ842100	FL. DSPLY	18-MT-09GNK	
		WA790900	SPACER	4. 6/10/32	
*		WZ080300	P. C. B.	MAIN	UCABGFL
*		WZ080400	P. C. B.	MAIN	R
	CB1	VQ047600	CN. BS. PIN	21P	
	CB3	LB932060	CN. BS. PIN	6P	
	CB21-22	VQ963900	CN. BS. PIN	18P	
	CB51	V9377900	CN. BS. PIN	4P	R
	C3-4	WJ610200	C. MYLAR	0. 01uF 100V	
	C5-9	UR837100	C. EL	10uF 16V	
	C10	WJ608500	C. MYLAR	470pF 100V	
	C11-12	UR896470	C. EL	4. 7uF 100V	
	C13	WJ608500	C. MYLAR	470pF 100V	
	C14	UR837100	C. EL	10uF 16V	
	C15	UR877220	C. EL	22uF 63V	
	C16-17	UR896470	C. EL	4. 7uF 100V	
	C18-19	WJ608500	C. MYLAR	470pF 100V	
	C20	UR877220	C. EL	22uF 63V	
	C21-22	WJ608500	C. MYLAR	470pF 100V	
	C23	UR867330	C. EL	33uF 50V	
	C26-28	UR867330	C. EL	33uF 50V	
	C30	FG650500	C. CE	5pF 50V	
	C32	FG650500	C. CE	5pF 50V	
	C35-36	UR867330	C. EL	33uF 50V	
	C37	UR897100	C. EL	10uF 100V	
	C38	UR866100	C. EL	1uF 50V	
	C39-42	FG650500	C. CE	5pF 50V	
	C43-48	WJ611000	C. MYLAR	0. 047uF 100V	
	C49	UR866470	C. EL	4. 7uF 50V	
	C50	UR828220	C. EL	220uF 10V	
	C52	UR878100	C. EL	100uF 63V	
	C53	UR867100	C. EL	10uF 50V	
	C54	UR868100	C. EL	100uF 50V	
	C55-56	WE514200	C. EL	6800uF 63V	
	C57-62	WJ610200	C. MYLAR	0. 01uF 100V	
	C63	US064100	C. CE. CHP	0. 01uF 50V B	
	C64-68	WJ610200	C. MYLAR	0. 01uF 100V	
	C69-70	WJ611400	C. MYLAR	0. 1uF 100V J	
	C71	US064100	C. CE. CHP	0. 01uF 50V B	
	C201	US062220	C. CE. CHP	220pF 50V B	
	C202	US064100	C. CE. CHP	0. 01uF 50V B	
	C203-204	US135100	C. CE. CHP	0. 1uF 16V	
	C205-206	US061220	C. CE. CHP	22pF 50V B	
	C207	US062220	C. CE. CHP	220pF 50V B	
	C208	UR267100	C. EL	10uF 50V	

✻ New Parts

	Ref No.	Part No.	Description		Markets
	C209-210	US062220	C. CE. CHP	220pF 50V B	
	C217	US135100	C. CE. CHP	0. 1uF 16V	
	C218	VR169200	C. MYLAR	0. 47uF 50V	
	C219	US135100	C. CE. CHP	0. 1uF 16V	
	C228	US135100	C. CE. CHP	0. 1uF 16V	
	C229	UR867470	C. EL	47uF 50V	
	C230	US135100	C. CE. CHP	0. 1uF 16V	
	C231-236	UR837100	C. EL	10uF 16V	
	C239-243	US062680	C. CE. CHP	680pF 50V B	
	C244	WJ611000	C. MYLAR	0. 047uF 100V	
	C247-249	US062100	C. CE. CHP	100pF 50V B	
	C251-252	US062100	C. CE. CHP	100pF 50V B	
	C253	WJ609900	C. MYLAR	6800pF 100V	
	C255-258	UR837100	C. EL	10uF 16V	
	C261-262	UR837100	C. EL	10uF 16V	
	C264	US135100	C. CE. CHP	0. 1uF 16V	
	C267	UR838100	C. EL	100uF 16V	
	C270	UR838100	C. EL	100uF 16V	
	C271	UR837330	C. EL	33uF 16V	
	C272	UR838100	C. EL	100uF 16V	
	C276-279	UR838100	C. EL	100uF 16V	
	C280	UR867100	C. EL	10uF 50V	
	C281-283	UR267100	C. EL	10uF 50V	
	C284-285	UR867100	C. EL	10uF 50V	
	C288-289	UR867470	C. EL	47uF 50V	
	C290	US062100	C. CE. CHP	100pF 50V B	
	C291-292	UR267470	C. EL	47uF 50V	
	C293	UR267100	C. EL	10uF 50V	
	C294-299	US135100	C. CE. CHP	0. 1uF 16V	
	C302-303	US135100	C. CE. CHP	0. 1uF 16V	
⚠	D1-4	VD631600	DIODE	1SS133, 176	
	D5	WY163200	DIODE. ZENR	UDZV5. 1B	
	D6-11	WC398800	DIODE	KDS160-RTK	
	D12	WU201600	DIODE	1N4003S TP	
⚠	D13	VD631600	DIODE	1SS133, 176	
	D14-15	VN008700	DIODE	1SS270A	
⚠	D16-18	VD631600	DIODE	1SS133, 176	
⚠	D19-22	VN008700	DIODE	1SS270A	
⚠	D23	VG444700	DIODE. ZENR	MTZ J 39D 39. 0V TP	
⚠	D24	WA653200	DIODE. BRG	TS6P03G 6A 200V	
⚠	D25	VD631600	DIODE	1SS133, 176	
	D201-202	VG438400	DIODE. ZENR	MTZJ6. 8C 6. 8V	
⚠	IC1-2	YD936A00	IC. POWER. AMP.	STK433-330N-E	
	IC21	YA361B00	IC	R2A15220FP	
	IC22	XZ509A00	IC	TC74VHCU04FT INVER	
	IC23-25	X7378A00	IC	NJM4565M(TE1)	
	IC27	X7378A00	IC	NJM4565M(TE1)	
	PJ21	V7046700	JACK. PIN	4P MSP-244V1-01NI	
	PJ22	V7189700	JACK. PIN	1P	
	PJ24	V9420700	JACK. PIN	2P MSP-252V1-30NI	
⚠	Q1	WC398400	TR	2N5551C-AT	
⚠	Q2-3	WG538600	TR	KTA1046-Y-U/P	
⚠	Q4	WC398400	TR	2N5551C-AT	
⚠	Q5-6	WC397700	TR	2N5401C-AT	
⚠	Q7-12	WC398400	TR	2N5551C-AT	
⚠	Q13	WC397700	TR	2N5401C-AT	
⚠	Q14-17	WC434900	TR. DGT	KRA104S-RTK	

✻ New Parts

MAIN

	Ref No.	Part No.	Description		Markets
⚠	Q18-21	WC435000	TR. DGT	KRC102S-RTK	
⚠	Q22	VP872600	TR	2SA1708 S,T	
	Q23	iC181510	TR	2SC1815 Y	
	Q24	WC435000	TR. DGT	KRC102S-RTK	
	Q25	WC434900	TR. DGT	KRA104S-RTK	
	Q201-209	WC883400	TR	2SD2704 K	
⚠	R7-8	WW965300	R. MTL. OXD	2.2Ω 1/4W	
⚠	R16	WW971100	R. MTL. OXD	560Ω 1/4W	
⚠	R30	WW966900	R. MTL. OXD	10Ω 1/4W	
⚠	R32	WW966900	R. MTL. OXD	10Ω 1/4W	
⚠	R42	WP839400	R. CEMENT	0.22+0.22 3W	
⚠	R45-46	WP839400	R. CEMENT	0.22+0.22 3W	
⚠	R50	WP839400	R. CEMENT	0.22+0.22 3W	
⚠	R54	WP839400	R. CEMENT	0.22+0.22 3W	
	R60	WP839400	R. CEMENT	0.22+0.22 3W	
	R76	WW966900	R. MTL. OXD	10Ω 1/4W	
	R79	WW966900	R. MTL. OXD	10Ω 1/4W	
	R81	WW966900	R. MTL. OXD	10Ω 1/4W	
	R83	WW966900	R. MTL. OXD	10Ω 1/4W	
	R86-87	WW966900	R. MTL. OXD	10Ω 1/4W	
⚠	R89	WB625100	R. MTL. FLM	4.7Ω 1W J	
⚠	R92	WB625100	R. MTL. FLM	4.7Ω 1W J	
⚠	R94-95	WB625100	R. MTL. FLM	4.7Ω 1W J	
⚠	R98-99	WB625100	R. MTL. FLM	4.7Ω 1W J	
	R103	WW964500	R. MTL. OXD	1Ω 1/4W	
	R104	WW972500	R. MTL. OXD	2.2KΩ 1/4W	
	R107	WW965300	R. MTL. OXD	2.2Ω 1/4W	
	R116-118	WW966100	R. MTL. OXD	4.7Ω 1/4W	
	R120-122	WW966100	R. MTL. OXD	4.7Ω 1/4W	
	R214	WW970100	R. MTL. OXD	220Ω 1/4W	
	R242	WW964500	R. MTL. OXD	1Ω 1/4W	
	R291	WW965300	R. MTL. OXD	2.2Ω 1/4W	
	R297	WW965300	R. MTL. OXD	2.2Ω 1/4W	
	R314	WJ684700	R. MTL. FLM	82Ω 1W	
	R316	WJ684700	R. MTL. FLM	82Ω 1W	
⚠	RY1-4	WJ122400	RELAY	981-2A-24DS-SP7	
	RY5	WE648700	RELAY	DC DH24D2-O-Q	
	SW51	WV382900	SW. SLIDE	SL14	R
	TE1-2	WB214000	TERM. SP	6P PUSH MSP-115V2	
	TH3	V9760200	THRMST. CHP	NCP18XH103J03RB	
	U201-202	WU204200	CN. PHOTO. R	1P JSR1165-D	
		WE774200	SCR. BND. HD	3x10 MFZN2W3	

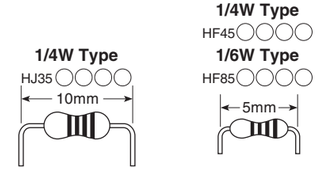
✻ New Parts

Ref No.	Part No.	Description		Markets

✻ New Parts

Carbon Resistors

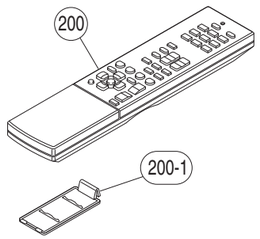
Value	**1/4W** Type Part No.	**1/6W** Type Part No.	Value	**1/4W** Type Part No.	**1/6W** Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	11 kΩ	HF45 7110	HF45 7110
1.8 Ω	HJ35 3180	✻	12 kΩ	HJ35 7120	HF85 7120
2.2 Ω	HJ35 3220	HF85 3220	13 kΩ	HF45 7130	HF45 7130
3.3 Ω	HJ35 3330	HF85 3330	15 kΩ	HF45 7150	HF45 7150
4.7 Ω	HJ35 3470	HF85 3470	18 kΩ	HF45 7180	HF45 7180
5.6 Ω	HJ35 3560	HF85 3560	22 kΩ	HF45 7220	HF45 7220
10 Ω	HF45 4100	HF45 4100	24 kΩ	HF45 7240	HF45 7240
15 Ω	HJ35 4150	HF85 4150	27 kΩ	HJ35 7270	HF85 7270
22 Ω	HF45 4220	HF45 4220	30 kΩ	HF45 7300	HF45 7300
27 Ω	HJ35 4270	HF85 4270	33 kΩ	HF45 7330	HF45 7330
33 Ω	HF45 4330	HF45 4330	36 kΩ	HF45 7360	HF45 7360
39 Ω	HJ35 4470	HF85 4390	39 kΩ	HF45 7390	HF45 7390
47 Ω	HF45 4470	HF45 4470	47 kΩ	HF45 7470	HF45 7470
56 Ω	HF45 4560	HF45 4560	51 kΩ	HF45 7510	HF45 7510
68 Ω	HF45 4680	HF45 4680	56 kΩ	HF45 7560	HF45 7560
75 Ω	HF45 4750	HF45 4750	62 kΩ	HF45 7620	HF45 7620
82 Ω	HF45 4820	HF45 4820	68 kΩ	HF45 7680	HF45 7680
91 Ω	HF45 4910	HF45 4910	82 kΩ	HF45 7820	HF45 7820
100 Ω	HF45 5100	HF45 5100	91 kΩ	HF45 7910	HF45 7910
110 Ω	HJ35 5110	HF85 5110	100 kΩ	HF45 8100	HF45 8100
120 Ω	HF45 5120	HF45 5120	110 kΩ	HF45 8110	HF45 8110
150 Ω	HF45 5150	HF45 5150	120 kΩ	HF45 8120	HF45 8120
160 Ω	HJ35 5160	✻	130 kΩ	HF45 8130	✻
180 Ω	HF45 5180	HF45 5180	150 kΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 kΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 kΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 kΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 kΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 kΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 kΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 kΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 kΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 kΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 kΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	✻
1.0 kΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 kΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 kΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 kΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 kΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	✻
2.2 kΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 kΩ	HJ35 6240	HF85 6240			
2.7 kΩ	HF45 6270	HF45 6270			
3.0 kΩ	HF45 6300	HF45 6300			
3.3 kΩ	HF45 6330	HF45 6330			
3.6 kΩ	HJ35 6360	HF85 6360			
3.9 kΩ	HF45 6390	HF45 6390			
4.7 kΩ	HF45 6470	HF45 6470			
5.1 kΩ	HF45 6510	HF45 6510			
5.6 kΩ	HF45 6560	HF45 6560			
6.8 kΩ	HF45 6680	HF45 6680			
8.2 kΩ	HF45 6820	HF45 6820			
9.1 kΩ	HF45 6910	HF45 6910			
10 kΩ	HF45 7100	HF45 7100			

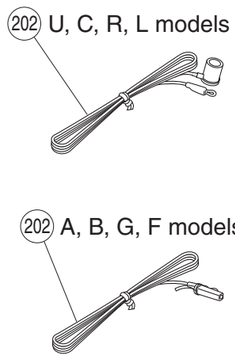


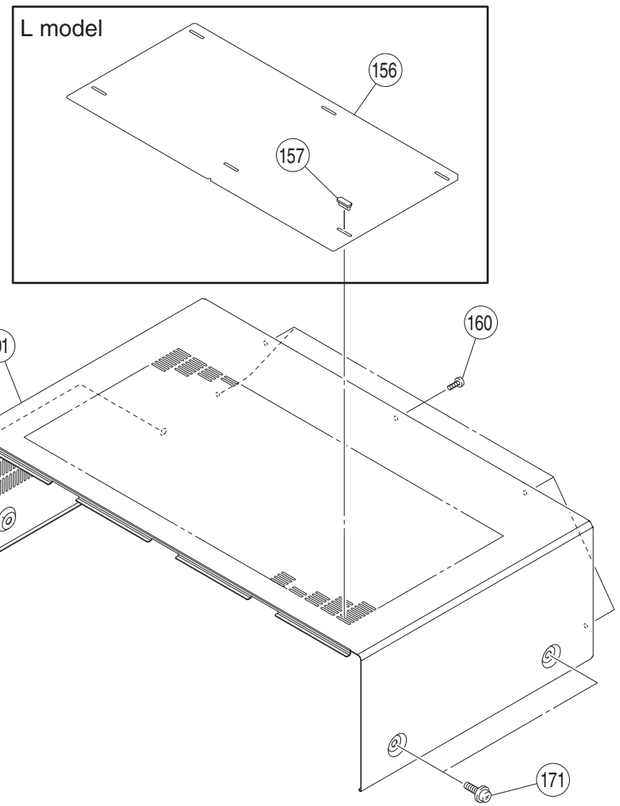
✻ : Not available

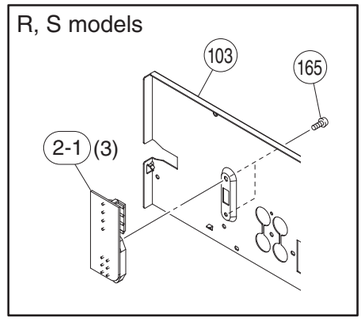
HTR-2064

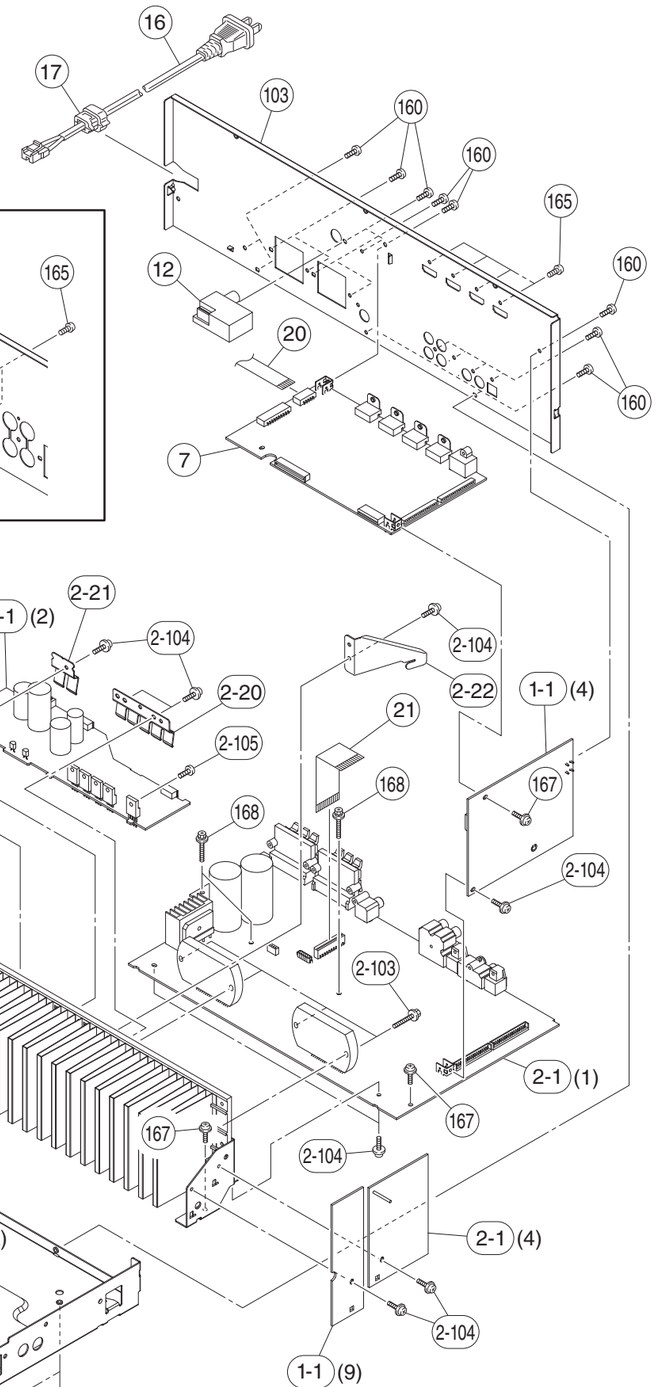
- **OVERALL ASSEMBLY**

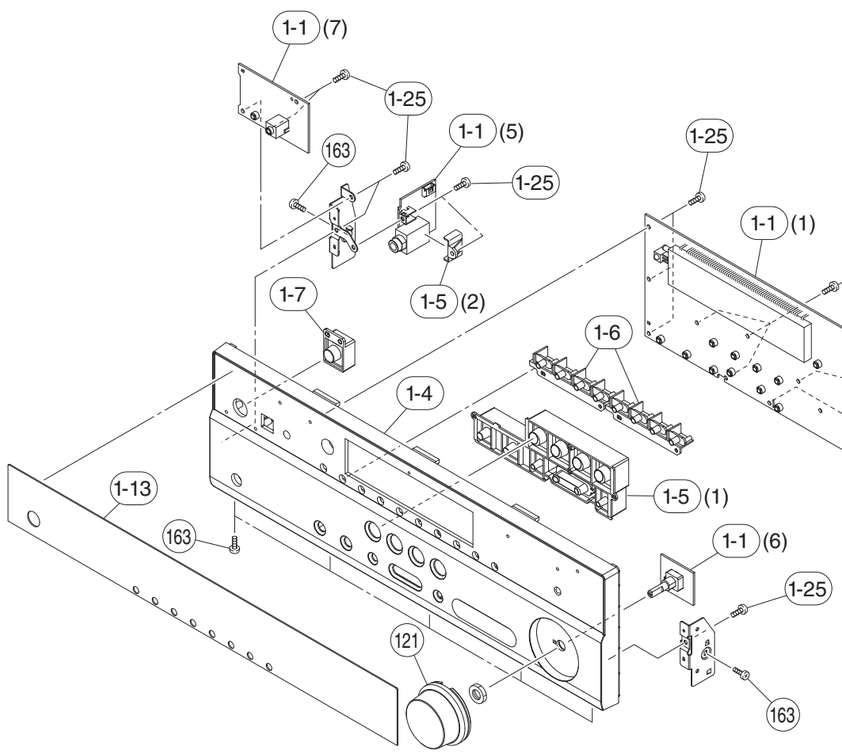


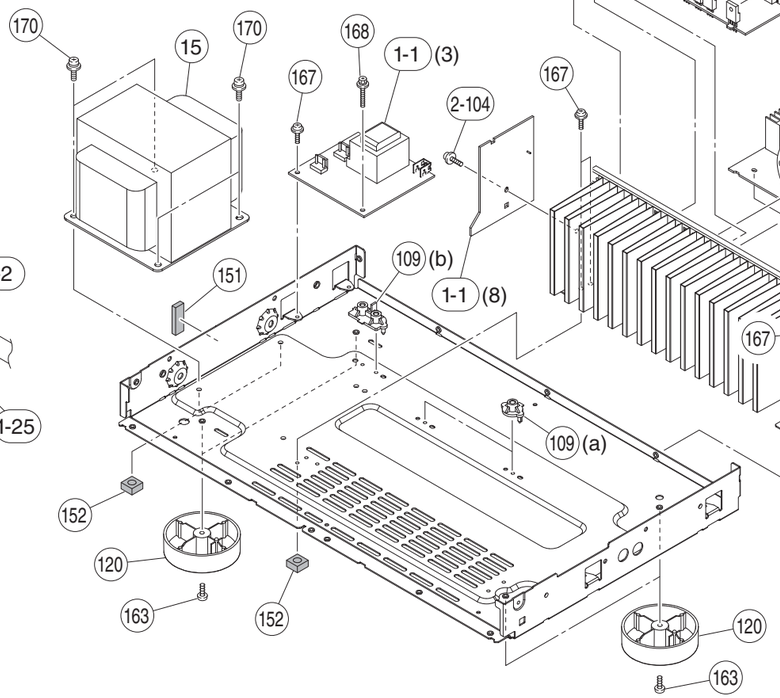












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	Ref No.	Part No.	Description	Remarks	Markets
*	1-1	WZ080700	P.C.B. ASSEMBLY OPERATION		UC
*	1-1	WZ080800	P.C.B. ASSEMBLY OPERATION		R
*	1-1	WZ080900	P.C.B. ASSEMBLY OPERATION		ABGFL
	1-2	WR389500	FLEXIBLE FLAT CABLE 15P 180mm P=1.25		
*	1-4	WY970100	FRONT PANEL		
	1-5	WT829100	BUTTON SCENE/PROGRAM		
	1-6	WT829500	BUTTON TUNER		
	1-7	WT829600	BUTTON POWER		
	1-12	WU200600	EARTH PLATE		
*	1-13	WY970200	WINDOW SHEET		
	1-25	WE774800	BIND HEAD P-TIGHT SCREW 3x8 MFZN2W3		
*	2-1	WZ080300	P.C.B. ASSEMBLY MAIN		UCABGFL
*	2-1	WZ080400	P.C.B. ASSEMBLY MAIN		R
	2-22	WW117500	P.C.B. SUPPORT		
	2-103	WE774600	IC SCREW 3x18 MFZN2W3		
	2-104	WF002600	PW HEAD B-TIGHT SCREW 3x8 MFZN2W3		
	2-105	WE774300	BIND HEAD B-TIGHT SCREW 3x8 MFZN2W3		
*	7	WZ081000	P.C.B. ASSEMBLY DIGITAL		
*	13	WY781200	FM TUNER KST-MW004FS1-S86S		UCRL
*	13	WY782900	FM TUNER KST-MW004FS1-S86		ABGF
⚠ *	15	YD754A00	POWER TRANSFORMER		UC
⚠	15	YC396A00	POWER TRANSFORMER		R
⚠	15	YC398A00	POWER TRANSFORMER		AL
⚠	15	YC399A00	POWER TRANSFORMER		BGF
⚠	16	WB120500	POWER CABLE 2m		UC
⚠	16	WC992700	POWER CABLE 2m		R
⚠	16	WC743700	POWER CABLE 2m		A
⚠	16	WB212200	POWER CABLE 2m		B
⚠	16	WB212300	POWER CABLE 2m		GFL
	17	V2438700	CORD STOPPER 10P1		
*	20	WV528500	FLEXIBLE FLAT CABLE 9P 90mm P=1.25		
	21	WR395700	FLEXIBLE FLAT CABLE 21P 100mm P=1.25		
	101	WT824900	TOP COVER		
	103	WY969500	REAR PANEL		UC
	103	WY969600	REAR PANEL		R
	103	WY969700	REAR PANEL		A
	103	WY969800	REAR PANEL		BGF
	103	WY969900	REAR PANEL		L
	109	WA796100	P.C.B. SUPPORT		
*	120	WY185000	LEG D60 H21 black		
	121	WW360600	KNOB D52 VOLUME		
	151	WB408400	DAMPER 10x30 t=4		
	152	WP126800	DAMPER SCREW MASK		
	156	WR306100	TOP SHEET		L

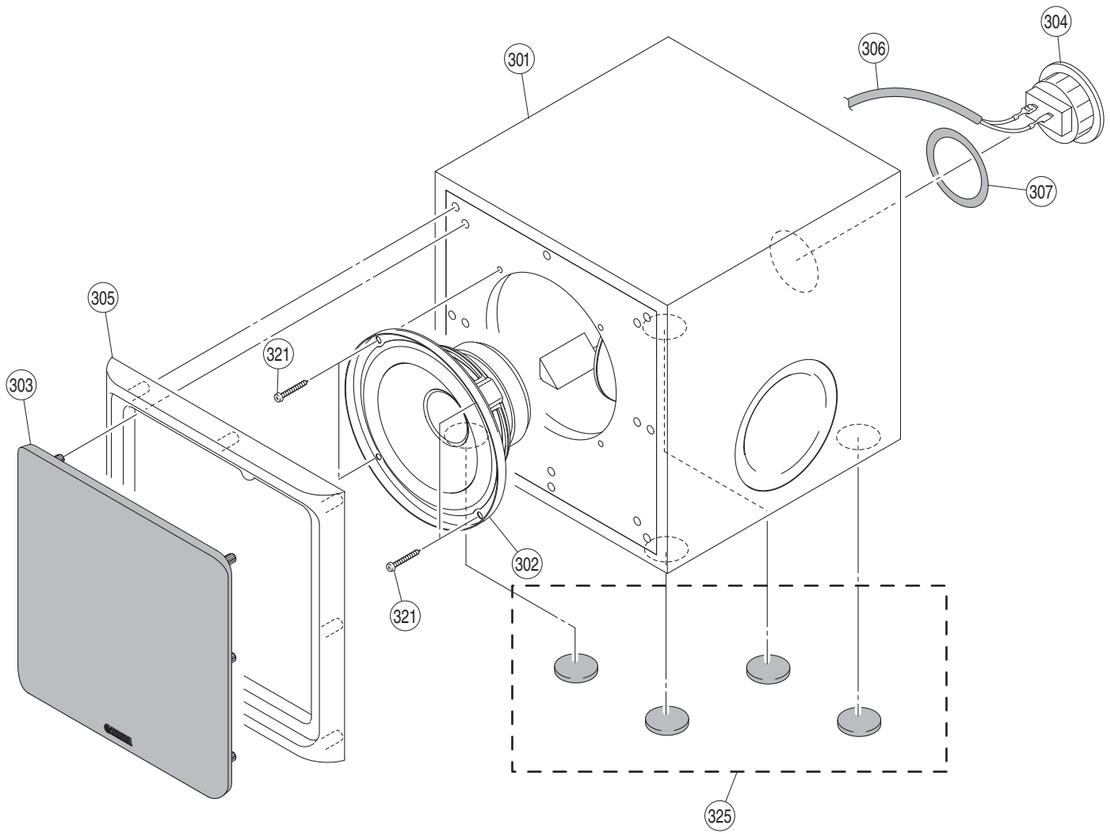
* New Parts

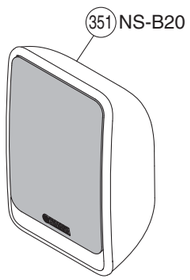
	Ref No.	Part No.	Description	Remarks	Markets
	157	WJ323900	RIVET		L
	160	WE774100	BIND HEAD BONDING B-T. SCREW 3x8 MFZN2B3		
	163	WE774300	BIND HEAD B-TIGHT SCREW 3x8 MFZN2W3		
	165	WE877900	BIND HEAD S-TIGHT SCREW 3x6 MFZN2W3		
	167	WF002600	PW HEAD B-TIGHT SCREW 3x8 MFZN2W3		
	168	WE774600	IC SCREW 3x18 MFZN2W3		
	170	WE774700	BIND HEAD S-TIGHT SCREW 4x10 MFZN2W3		
	171	VH313200	PW HEAD S-TIGHT SCREW 4x8-10 MFNI3BL		
			ACCESSORIES		
*	200	WW510700	REMOTE CONTROL RAV435	000-213260010	
	200-1	AAX82380	BATTERY COVER Black	CG-2209	
	202	WV354900	FM ANTENNA 1.4m 1pc		UCRL
	202	WV349600	FM ANTENNA 1.4m 1pc		ABGF
			BATTERY R03,AAA,UM-4 2pcs		
			SERVICE TOOL		
		WW483800	P.C.B. CHECKING JIG		

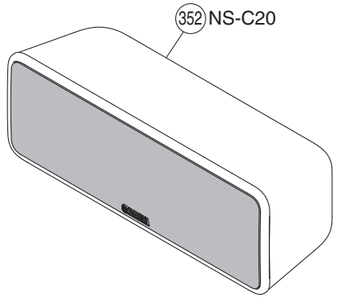
* New Parts

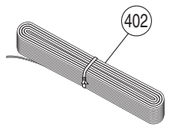
NS-B20/NS-C20/NS-SWP20

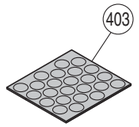
- **OVERALL ASSEMBLY**









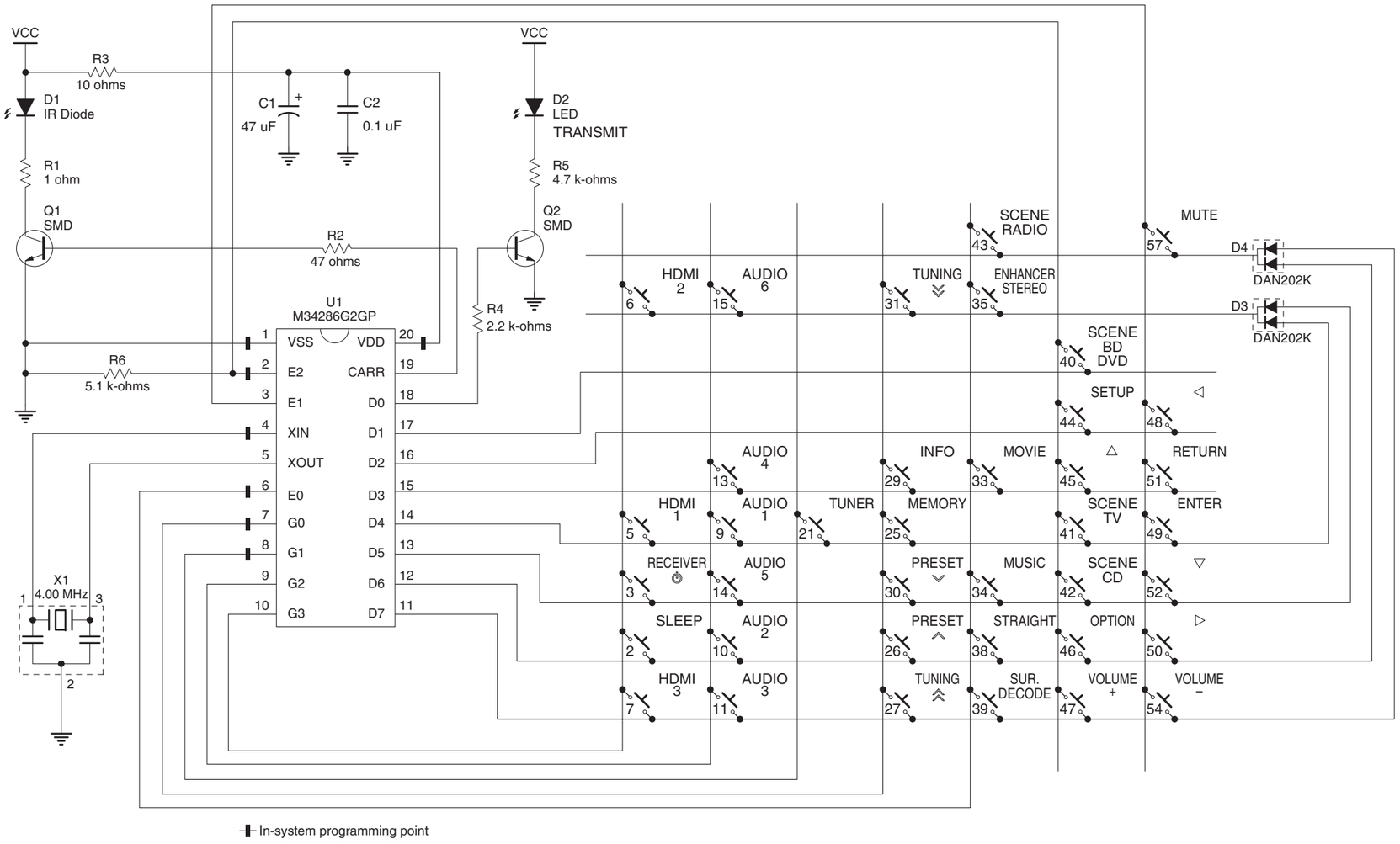


	Ref No.	Part No.	Description		Remarks	Markets
*	301	WZ118300	CABINET ASSEMBLY			
	302	YA897A00	DRIVER WOOFER	16cm 6Ω		
	303	WY603300	FRONT GRILLE ASSEMBLY			
*	304	WY587000	TERMINAL ASSEMBLY	2P, PUSH TYPE		
	305	WY263600	FRONT PANEL			
	306	WW479900	PACKING	15x175		
	307	WU037000	PACKING	3x550		
	321	WE955200	BIND HEAD TAPPING SCREW	4x20 MFZN2B3		
	325	WC731500	NONSKID PAD	D32 t2 4pcs/set		
	351	WY614200	SPEAKER FINAL ASSEMBLY	NS-B20		
	352	WY614300	SPEAKER FINAL ASSEMBLY	NS-C20		
			ACCESSORIES			
	402	WR994200	SPEAKER CABLE	25m 1pc		
	403	WY826100	NONSKID PAD	D8 t1 24pcs/set	NS-B20, NS-C20	

* New Parts

■ REMOTE CONTROL

SCHEMATIC DIAGRAM

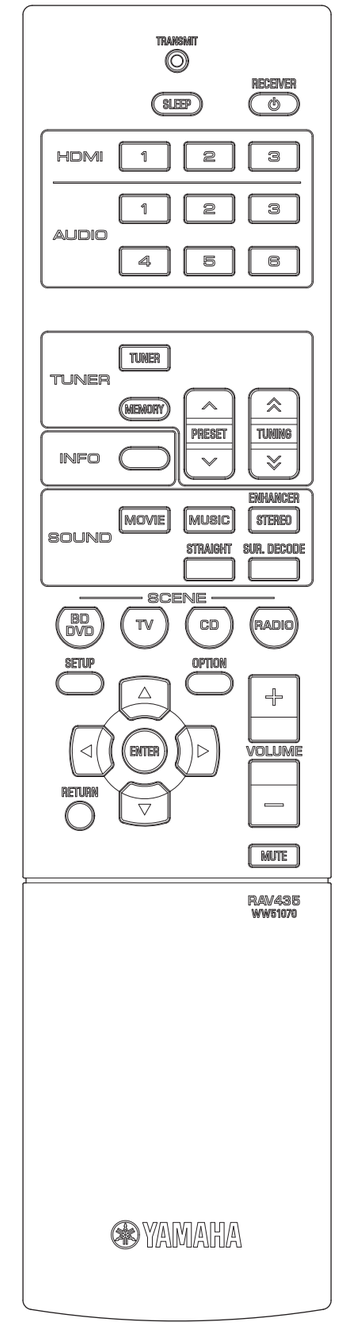


In-system programming point

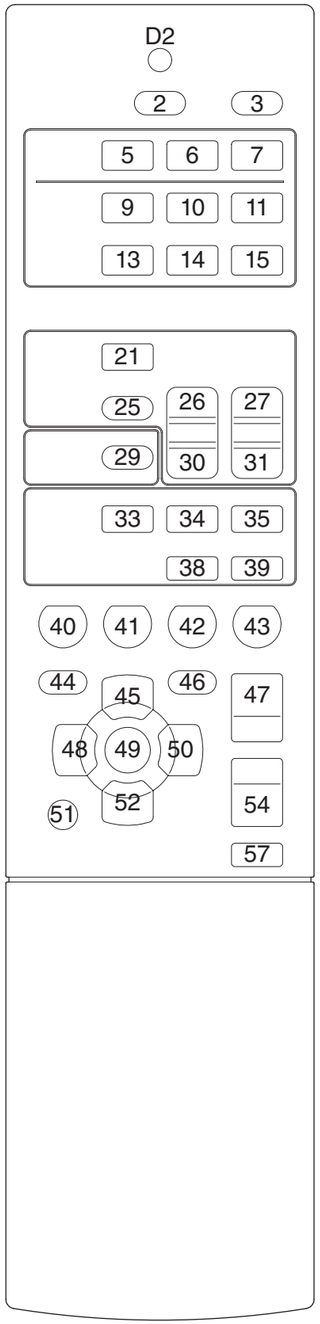
PANEL

RAV435

(U, C, R, A, B, G, F, L models)



KEY NO. LAYOUT



KEY CODE

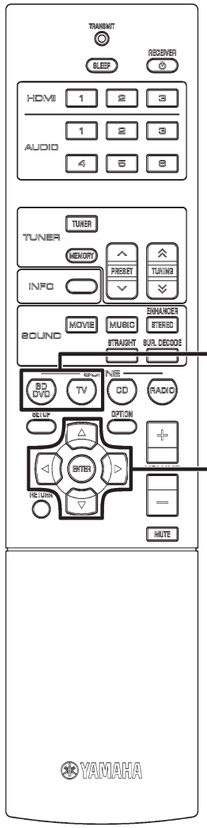
Key No.	Key Name		CODE	
			ID-1	ID-2
			MAIN	MAIN
K2	SLEEP		7A-30	7A-30CE
K3	RECEIVER ⏻		7E-2A	7E-2AD4
K5	HDMI 1		7A-4738	7A-4739
K6	HDMI 2		7A-4A35	7A-4A34
K7	HDMI 3		7A-4D32	7A-4D33
K9	AUDIO 1		7A-651A	7A-651B
K10	AUDIO 2		7A-6817	7A-6816
K11	AUDIO 3		7A-7C03	7A-7C02
K13	AUDIO 4		7A-7F00	7A-7F01
K14	AUDIO 5		7A-ACD3	7A-ACD2
K15	AUDIO 6		7A-B0CF	7A-B0CE
K21	TUNER	(TUNER)	7A-16	7A-16E8
K25	MEMORY	(TUNER)	7F01-6718	7F01-6719
K26	PRESET ∧	(TUNER)	7F01-5B24	7F01-5B25
K27	TUNING ⩓	(TUNER)	7F01-611E	7F01-611F
K29	INFO		7A-2758	7A-2759
K30	PRESET ∨	(TUNER)	7F01-5E21	7F01-5E20
K31	TUNING ⩔	(TUNER)	7F01-641B	7F01-641A
K33	MOVIE	(SOUND)	7A-88	7A-8876
K34	MUSIC	(SOUND)	7A-89	7A-8977
K35	ENHANCER/STEREO	(SOUND)	7A-94	7A-946A
K38	STRAIGHT	(SOUND)	7A-56	7A-56A8
K39	SUR. DECODE	(SOUND)	7A-8D	7A-8D73
K40	BD/DVD	(SCENE)	7A-007F	7A-007E
K41	TV	(SCENE)	7A-037C	7A-037D
K42	CD	(SCENE)	7A-0679	7A-0678
K43	RADIO	(SCENE)	7A-0976	7A-0977
K44	SETUP		7A-84	7A-847A
K45	△ (UP)		7A-9D	7A-9D63
K46	OPTION		7A-6B14	7A-6B15
K47	VOLUME +		7A-1A	7A-1AE4
K48	◁ (LEFT)		7A-9F	7A-9F61
K49	ENTER		7A-DE	7A-DE20
K50	▷ (RIGHT)		7A-9E	7A-9E60
K51	RETURN		7A-AA	7A-AA54
K52	▽ (DOWN)		7A-9C	7A-9C62
K54	VOLUME –		7A-1B	7A-1BE5
K57	MUTE		7A-1C	7A-1CE2

NOTE:

ID setting	[K48] + [K40]	[K48] + [K41]	DEFAULT
	= ID-1	= ID-2	ID-1 / MAIN
30-SEC TIMER on/off	K46 + K11 → K9	K44 or K51 + K11 → K9	
	30-SEC TIMER: off	30-SEC TIMER: on	30-SEC TIMER: on

■ ADVANCED SETUP

The Advanced Setup menu can be used for unit initialization and other useful extended functions. The Advanced Setup menu can be operated as follows.



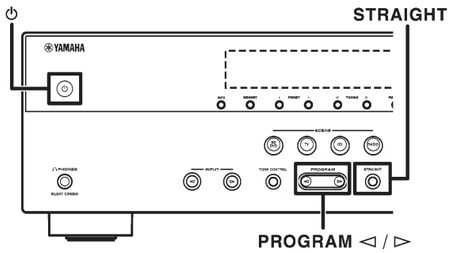
7 SCENE
9 Cursor ◁

Displaying/Setting the Advanced Setup menu

1 Set this unit to the standby mode.

2 Press ⏻ while pressing and holding STRAIGHT on the front panel.

Release the keys when “ADVANCED SETUP” is displayed on the front panel display.
After approximately 2 seconds, the top menu items are displayed.





3 Use PROGRAM to select the item to be set from the following items.

In the Advanced Setup menu, you can set the following settings.

REMOTE ID	Changes the remote control ID of a receiver.
TUNER **(R, A, L models)**	Selects one of the following FM frequency steps.
INIT	Initializes various settings for this unit.

4 Press STRAIGHT a few times to select the value you wish to change.

5 Switch this unit to the standby mode, and then switch it on again.

The settings become effective and the unit is powered on. If initialization is selected, it will be performed when the unit is powered on again.

Avoiding crossing remote control signals when using multiple Yamaha receivers



The remote control of the unit can only receive signals from a receiver which has an identical ID (remote control ID). When using multiple Yamaha AV receivers, you can set each remote control with a unique remote control ID for its corresponding receiver.
On the contrary, if you are setting the same remote control ID for all receivers, you can use one remote control to operate 2 receivers.

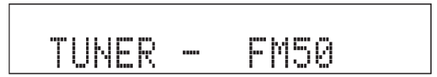
ID1 **(Default)**	Receives the remote control signals set in ID1.
ID2	Receives the remote control signals set in ID2.

■ To change the remote control ID

To set the remote control ID to this unit ID, change ID number as follows.

- To set to ID1
  Press 9**Cursor** ◁ and “BD/DVD” under 7**SCENE** for 3 seconds or longer.
- To set to ID2
  Press 9**Cursor** ◁ and “TV” under 7**SCENE** for 3 seconds or longer.

Changing FM frequency steps (R, A, L models)



You can select one of the following FM frequency steps: ❦1

FM100	You can adjust the FM frequency by steps of 100kHz.
FM50 **(Default)**	You can adjust the FM frequency by steps of 50kHz.

❦1 : For details on setting FM frequency steps, refer to “FM tuning”.

Initializing various settings for this unit



Initializes various settings stored in this unit and sets it back to default.
Select the items to be initialized from the following.

DSP PARAM	Initializes all parameters for the sound field programs.
ALL	Resets this unit to default factory settings.
CANCEL **(Default)**	Does not initialize.

HTR-2064 /
NS-B20/NS-C20/NS-SWP20

YAMAHA