

CAV-M1000ES

SERVICE MANUAL

US Model

Ver. 1.3 2006. 03



Photo : SILVER

SPECIFICATIONS

CAV-M1000ES Main Unit

Audio (each channel)

Continuous average power output (FTC)

All channels: 30 W per channel min. RMS at 8 ohms, any two channels driven from 20 Hz to 20 kHz with no more than 0.09 % THD.

40 W per channel min. RMS at 4 ohms, any two channels driven from 20 Hz to 20 kHz with no more than 0.7 % THD.

Frequency response: 5 Hz to 70 kHz $\pm$ 3dB

Input sensitivity: 160 mV for 1 W output, 650 mV for full output (30 W) with volume control set to maximum.

Input impedance: 20 k ohms

Signal-to-noise ratio: 92 dB (A-weighted)

Bass control range: 100 Hz $\pm$ 14 dB, 2 dB step

Treble control range: 10 kHz $\pm$ 14 dB, 2 dB step

SOURCE 1-8 and ZONE 1-6 AUDIO OUT

Frequency response: 5 Hz to 55 kHz $\pm$ 3dB

THD @ 2 V: 0.08 %

Signal-to-noise ratio: 102 dB (A-weighted @ 2 V)

Video

Input/output impedance:

75 ohm

Video insertion loss: 0 dB (50 Hz - 6 MHz)

General

12V trigger: 300 mA max each zone, total 1.2 A max

Power requirements: 120 V 60 Hz

Power consumption: 540 W

Dimensions: 430 $\times$ 175 $\times$ 433 mm
(16 ⁷/₈ $\times$ 6 ⁷/₈ $\times$ 17 ¹/₁₆ inches)
(w/h/d)

Mass: 24 kg (52 lbs 15 oz)

RM-TP100 RF Remote Control

Interface system: Liquid crystal touch panel

Liquid crystal size: 5.2 inches (320 $\times$ 240 dots)

Touch panel: Resistance sensible system
Analog type

Maximum range from the RF Antenna:

7 m (22 feet 11 ¹/₂ inches)

(The maximum range differs depending on the environment where you use the RF Remote Control.)

Power supply: Rechargeable (Ni-MH) battery

Maximum external dimensions:

227 $\times$ 146 $\times$ 45 mm

(9 $\times$ 5 ³/₄ $\times$ 1 ⁷/₈ inches)

(w/h/d, including projecting parts and controls)

Mass: 0.8 kg (1 lbs 13 oz)
(Main unit only, including the rechargeable battery)

Operating temperature:

5°C to 35°C (41°F to 95°F)

Composition

- CAV-M1000ES Main Unit
- RM-TP100 RF Remote Control
- RMB-TP100 Charger cradle for the RF Remote Control
- Ferrite core
- AN-M1000 RF Antenna
- AC power cord
- Plug-in 4-terminal screw-type connector for speaker (6)
- Installation Manual

Design and specifications are subject to change without notice.

CUSTOM INTEGRATED AV SYSTEM

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Sony Corporation
Home Audio Division
Published by Sony Techno Create Corporation

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

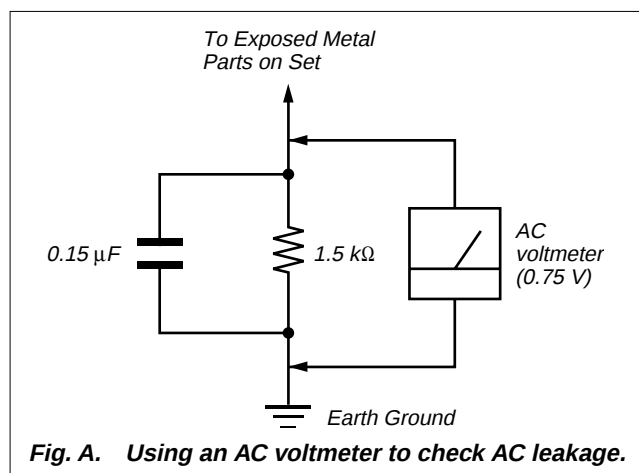
Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage.

Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes.). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)



Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

UNLEADED SOLDER

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.

(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size)



: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40 °C higher than ordinary solder.
Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
Soldering irons using a temperature regulator should be set to about 350 °C.
Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK $\triangle$ OR DOTTED LINE WITH MARK $\triangle$ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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SECTION 1 SERVICING NOTE

Main Unit

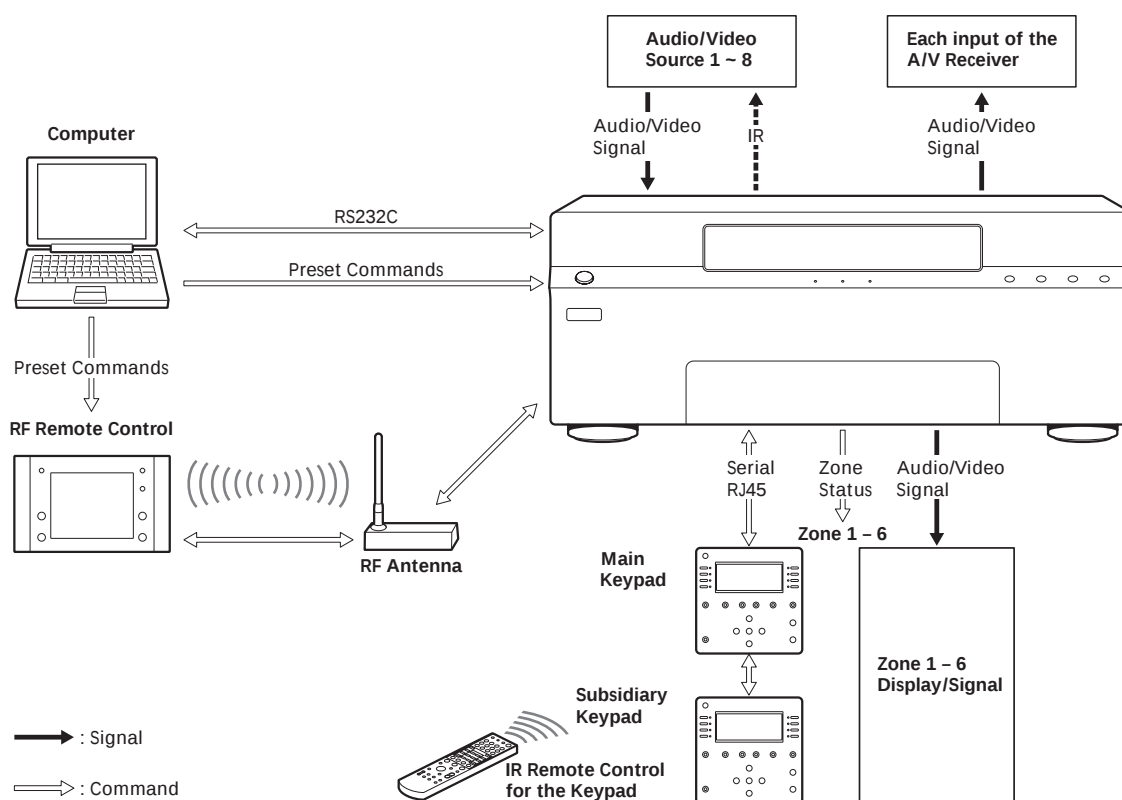
- Zones: Up to six zones receive up to eight source audio / video signals.
 - Preamp Outs: Four fixed outputs for zones 1 to 4, and two variable outputs for zones 5 and 6.
 - Amplification: All six zones have built-in stereo audio amplifiers at 30 Watts per channel.
 - Video outputs for all six zones.
 - Keypad connections: RJ45 connectors for all six zones using CAT5 cables.
- Sources: Up to eight audio / video sources can be selected by all six zones.
- Remote code entry: Remote code commands can be learned by the Main Unit.
 - on your computer
 - on the Main Unit
- 12 V trigger: Six zone-specific 12 V status outputs; each 300 mA max, total 1.2 A.
- RS232C port (Front): Allows you to connect the Main Unit to your computer to update the settings or firmware.
- RS232C ports (Rear): Allow you to connect a Sony DVD Mega Changer (ex. DVP-CX777ES) and a Sony A / V Receiver (ex. STR-DA5000ES) to the Main Unit.

Keypad

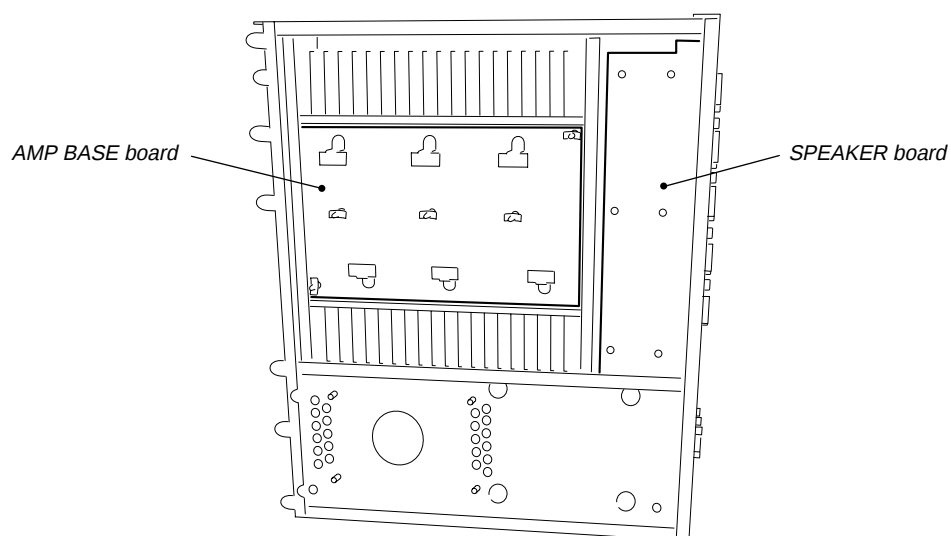
- LCD contrast adjustment.
- Connecting IR IN to an IR emitter enables you to use the IR Remote Control for the additional range.
- RJ45 connectors enable you to use two Keypads in a single zone.

RF Remote Control

- LCD panel configurable through your computer.
- Controls the audio / video sources in the main zone and the other zones.
- Customize touch panels via an RS232C cross cable connected to your computer.



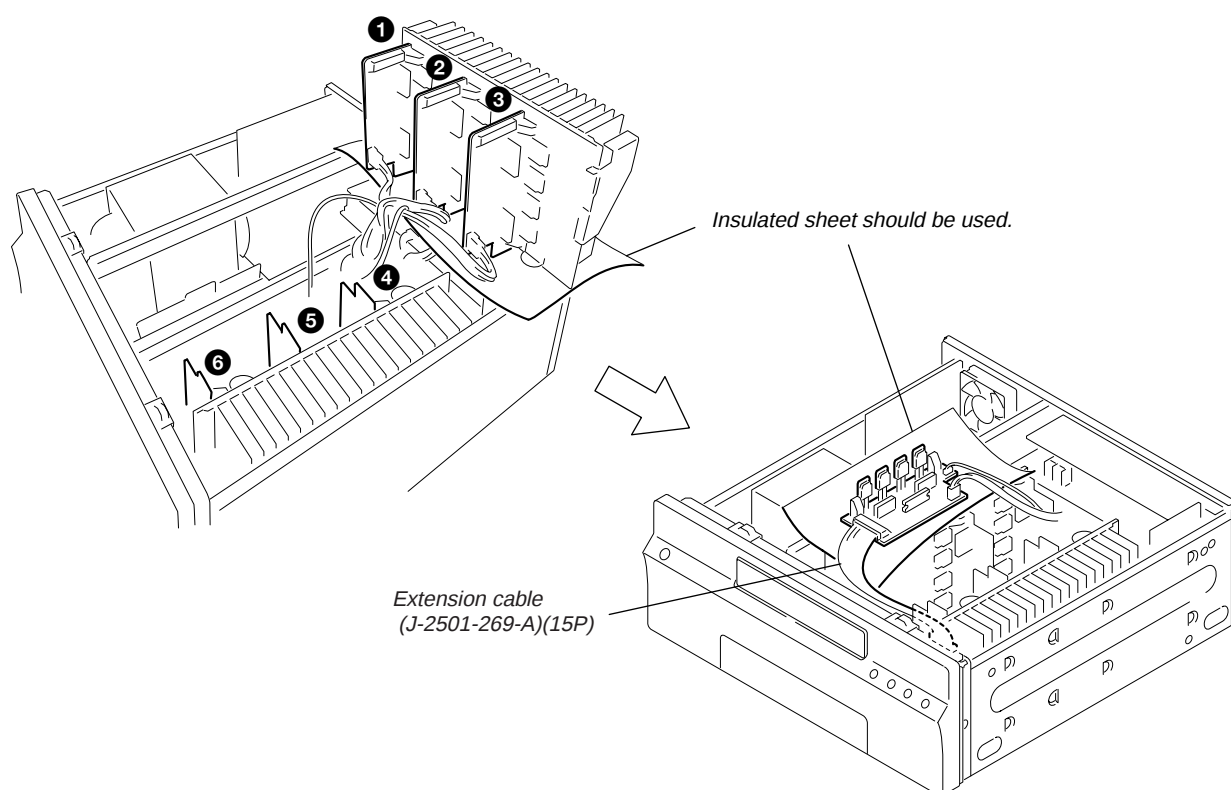
- SERVICE POSITION OF AMP BASE BOARD AND SPEAKER BOARD



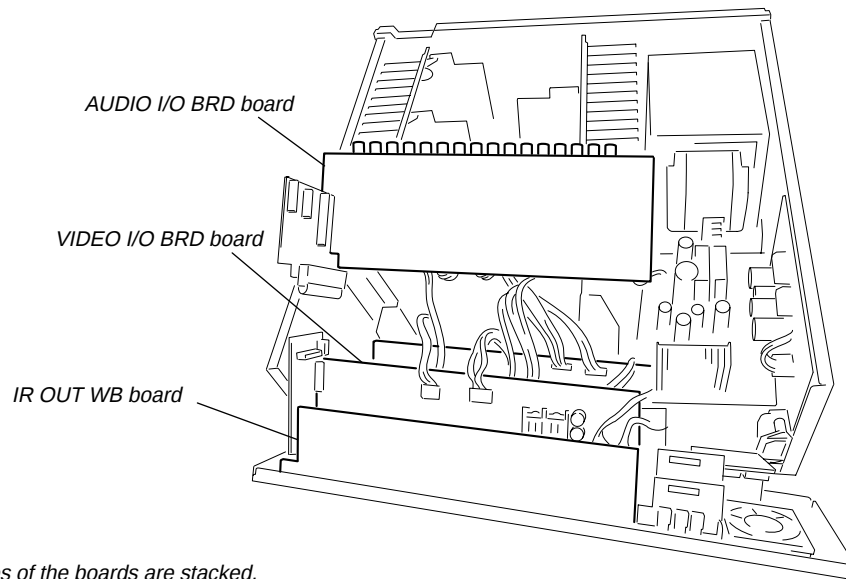
The AMP BASE board and the SPEAKER board can be checked after the bottom panel is removed from the unit.

- SERVICE POSITION OF AMP BOARD

The six pieces of the AMP board are used as shown from No. ① to ⑥ check only the defective AMP board by inserting the extension cable.



• SERVICE POSITION OF BACK PANEL SIDE BOARD

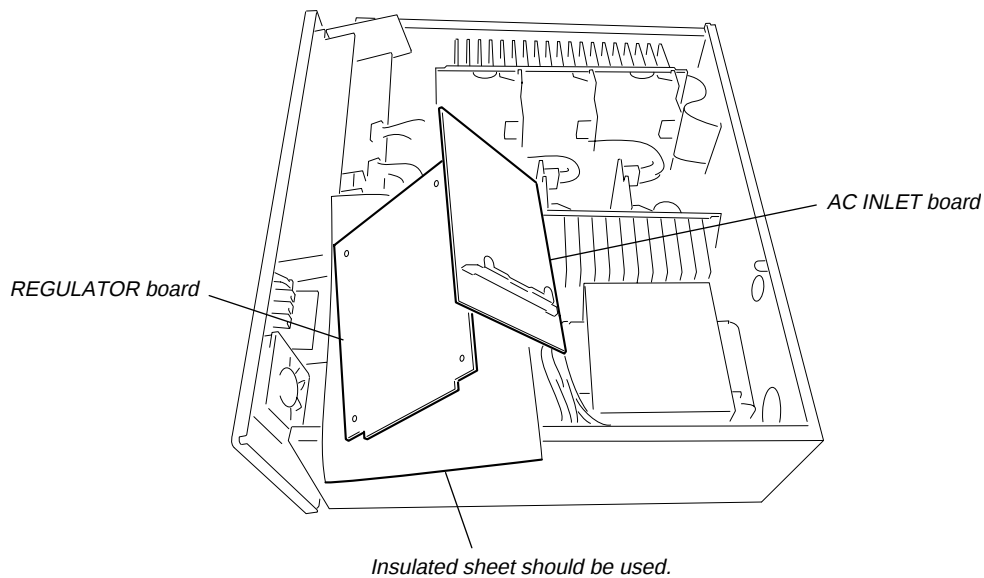


Six pieces of the boards are stacked.

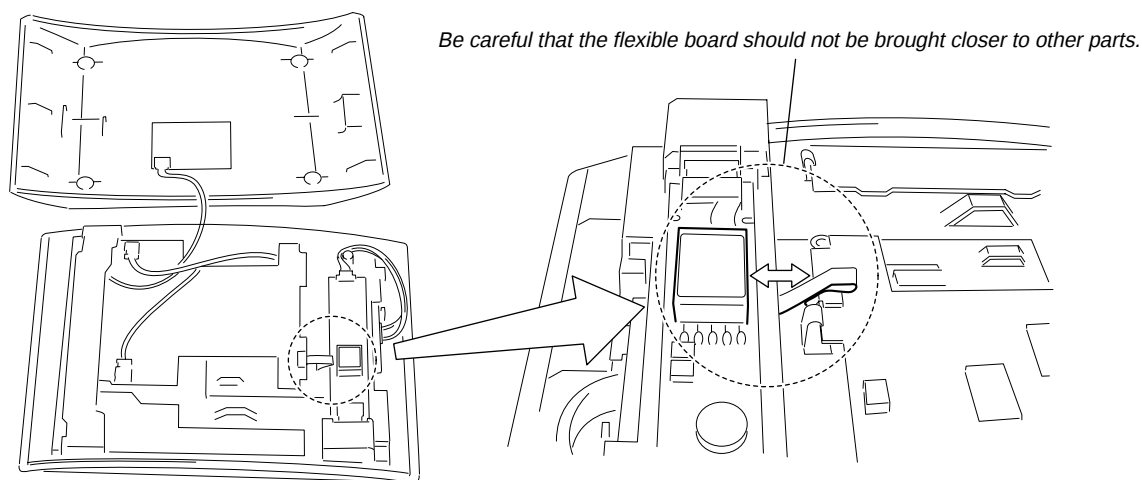
- Check the IR OUT WB board and the VIDEO I/O BRD board in the state as shown. To check the portions that are not visible from outside, remove the two boards together from the back panel and check those portions.
- Check the AUDIO I/O BRD board by removing it independently from the back panel, as shown in the illustration.
- Check the RJ45 board and the PRE OUT BRD board in the same manner as the procedure of checking the AUDIO I/O BRD board.
- Check the SPEAKER board by removing the bottom panel.

• SERVICE POSITION OF AC INLET BOARD

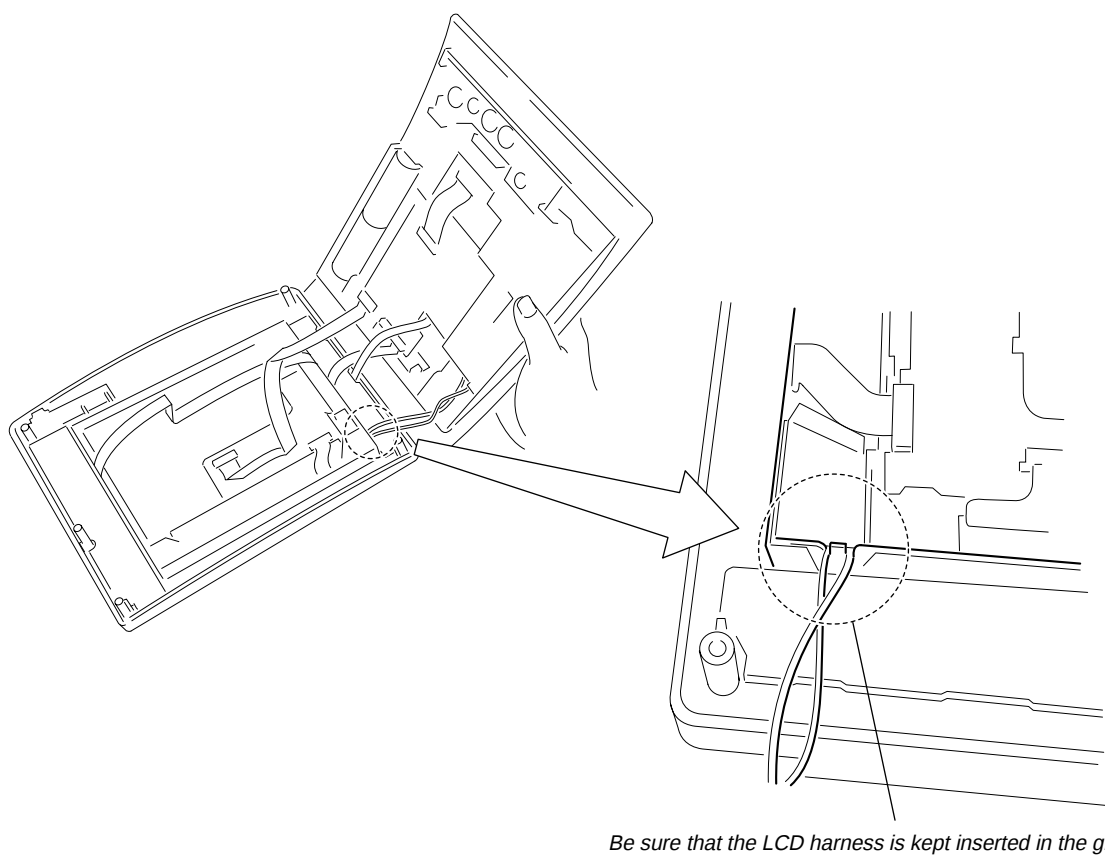
Check the AC INLET board by removing it together with the REGULATOR board from the chassis.



- CAUTIONS ON ASSEMBLING THE COVER



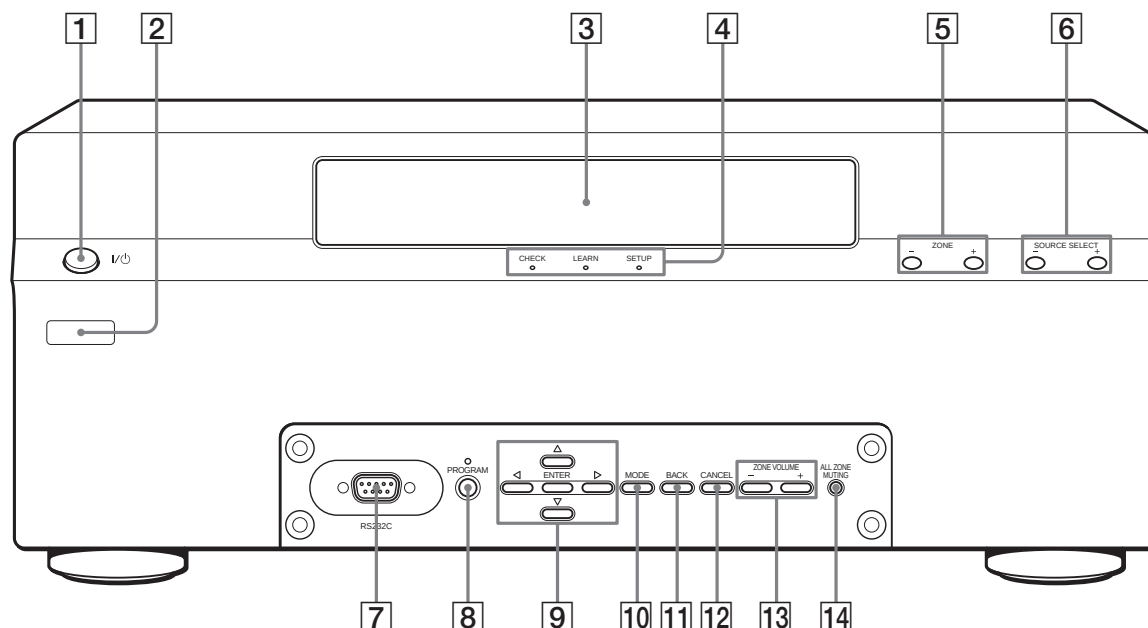
- CAUTIONS ON REPLACING THE LCD BLOCK



SECTION 2 GENERAL

This section is extracted
from instruction manual.

Front panel of the Main Unit



1 I/O (POWER) switch

Press to turn the power on or off.

2 Learning IR window

Used to input remote codes into the Main Unit.

3 Display window

Displays various information.

4 Mode indicators

Display the current mode. These indicators turn off in the NORMAL mode.

5 ZONE +/-

Press to select the zone in the NORMAL mode.

6 SOURCE SELECT +/-

Press to select the source component in the NORMAL mode.

7 RS232C connector

Used to update the firmware of the Main Unit and to upload / download setup data from a computer using an RS232C cross cable.

8 PROGRAM

Press to initiate a firm ware update.

9 Cursor/ENTER

Press to select a menu.

10 MODE

Press repeatedly to select the mode.

11 BACK

Press to return to the previous layer of the menu.

12 CANCEL

Press to cancel the present operation and return to the NORMAL mode.

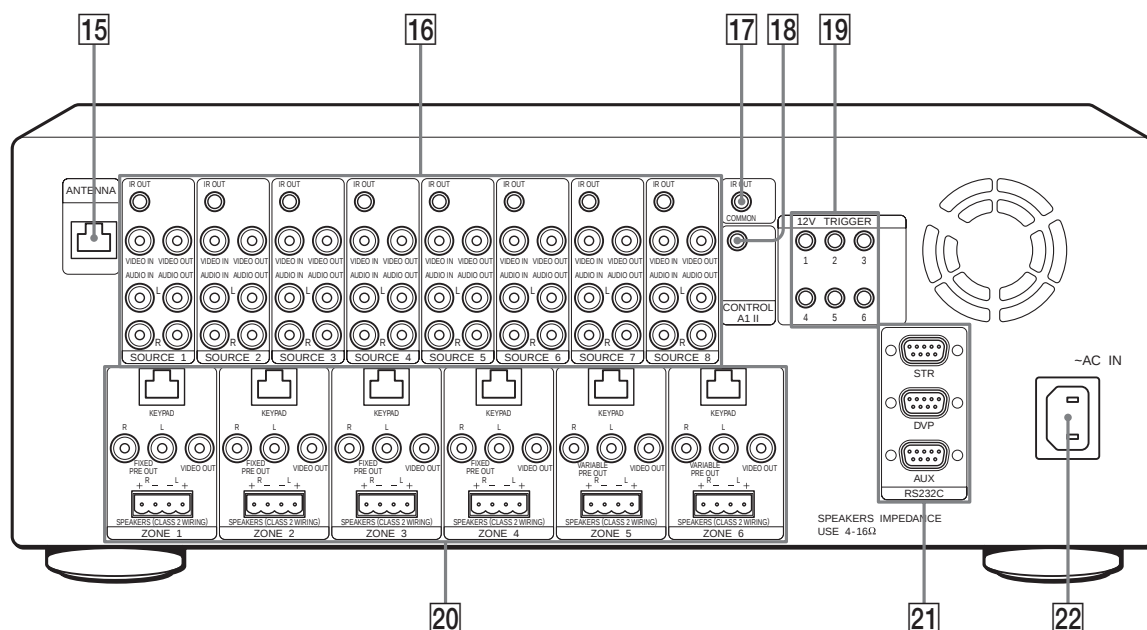
13 ZONE VOLUME +/-

Press to adjust the volume of the selected zone.

14 ALL ZONE MUTING

Press to set muting on or off in all zones.

Rear panel of the Main Unit



15 ANTENNA (page 18)

Hooks up to the RF Antenna using a shielded CAT5 cable, to operate the RF Remote Control.

16 SOURCE connection jacks

a) IR OUT (page 17)

A 3.5 mm monaural mini jack for the connection of an IR emitter to control the eight source components individually. IR signals received from a zone will be routed to the IR sensor of the source component.

b) VIDEO IN (page 17)

An RCA jack for composite video input from a source component.

c) VIDEO OUT (page 18)

An RCA jack for connecting a video source to another local component.

Note

This is a buffered video connection, and this loop-through is active even when the Main Unit is turned off, as long as the AC power cord is plugged in.

d) AUDIO IN (page 17)

RCA jacks for stereo line level audio input from a source component.

e) AUDIO OUT (page 18)

RCA jacks for connecting an audio source to another local component.

Note

This is a buffered audio connection, and this loop-through is active even when the Main Unit is turned off, as long as the AC power cord is plugged in.

17 IR OUT COMMON (page 18)

A 3.5 mm monaural mini jack for the connection of an IR emitter to control any IR-controlled component such as a lighting system or motorized screen.

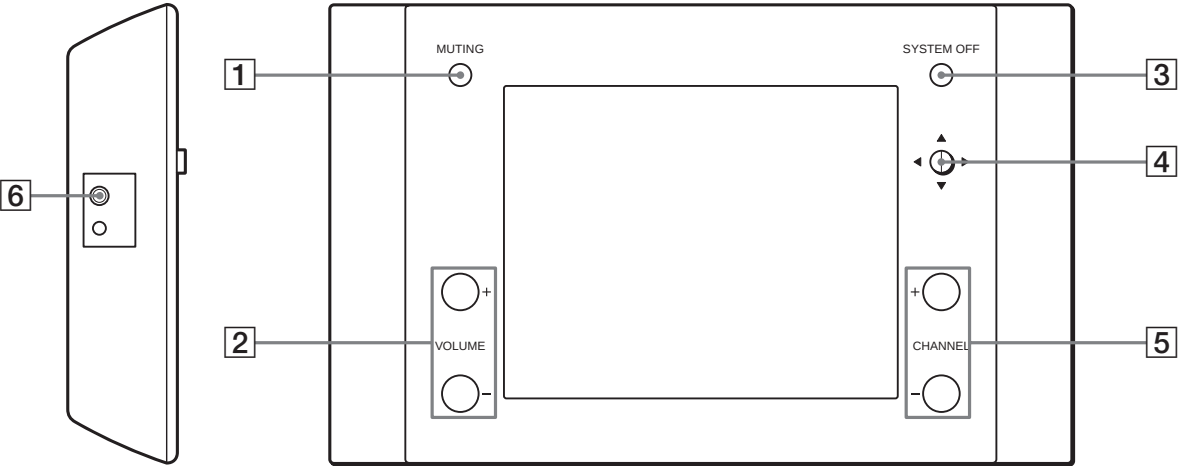
18 CONTROL A1II (page 17)

Hooks up to a Sony CD Mega Changer (ex. CDP-CX455) equipped with a matching jack allowing the Main Unit to control the source component.

19 12 V TRIGGER (page 18)

Provide control outputs of +12 V DC that turn devices on and off in sync with the zone to drive voltage sensing relay modules and AC strips.

RF Remote Control



- 1

MUTING
Press to mute the audio.
- 2

VOLUME +/-
Press to adjust the volume.
- 3

SYSTEM OFF
Press to shut down the system.
- 4

Cursor/ENTER
Press to control the source.
- 5

CHANNEL +/-
Press to control the source.
- 6

RS232C connector
Hook up a computer using the dedicated RS232C cable.

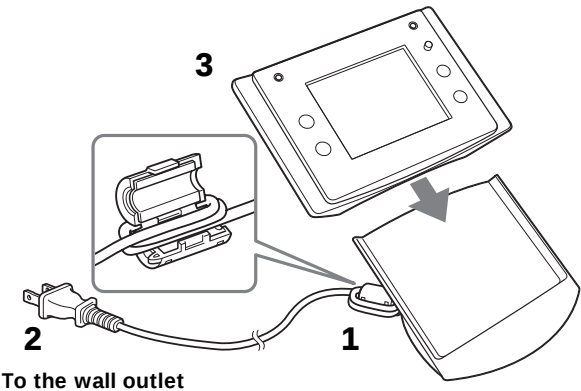
Charging the internal battery

- 1

Attach the supplied ferrite core to the AC power cord of the charger cradle, then wrap the AC power cord twice around the ferrite core.
- 2

Connect the AC power cord of the charger cradle to the wall outlet.
- 3

Place the RF Remote Control on the charger cradle.
The internal battery starts charging. It takes approximately 16 hours for full charging. Charge for considerable time when you use it for the first time.

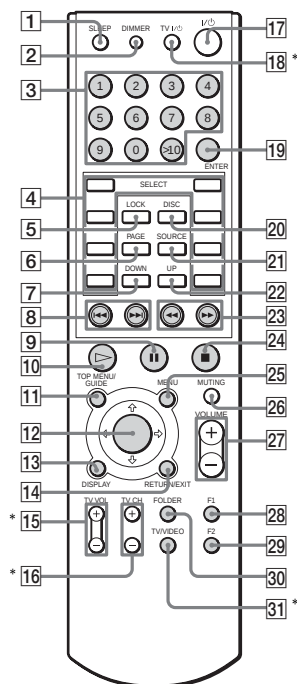


To the wall outlet

Meaning of icons shown on the top of the display window

Icon	Meaning
	Communication between the RF Remote Control and the Main Unit is completed.
	Communication between the RF Remote Control and the Main Unit has been interfered with. Or the distance from the RF Remote Control to the RF Antenna is way too far. → Place the RF Antenna closer to the RF Remote Control. → Avoid interference of metal objects such as a cabinet between the RF Antenna and the RF Remote Control. Other radio waves have been interfering. → Move the RF Remote Control about 1 inch to the left to the right or up or down. Doing so may solve the problem.
	Some kind of trouble has occurred. Contact your nearest Sony dealer.
	The internal battery is being charged on the charger cradle.
	The remaining power of the battery is low. → Charge the battery by placing the RF Remote Control on the charger cradle.

IR Remote Control for Keypads



* Only a Sony TV monitor can be controlled with these buttons.

Buttons marked in gray are used to control the source components.

1 SLEEP

Press to activate the sleep function that turns off the Keypad automatically after the specified duration. The time changes as shown below.
2:00 → 1:30 → 1:00 → 0:30 → OFF

2 DIMMER

Press repeatedly to change the brightness of the LCD backlight.

3 Numeral

Press to select a number, representing, for example, a desired track of the source.

4 SELECT

Press to select a menu on the display on the LCD, such as a source menu, a disc title list, etc.

5 LOCK

Press to lock the selected source.

6 PAGE

Press to return to the previous menu or to view the current status of the disc title list or the preset station list. If there is no list, only a source name will be displayed.

7 DOWN

Press to scroll the LCD menu down.

8 ◀◀/▶▶

Press to locate a specific track of the source or to select a preset station.

9 || (PAUSE)

Press to pause the playback of the source.

10 ▶ (PLAY)

Press to operate the selected source.

11 TOP MENU/GUIDE

Press to display the top menu while using a source component such as a DVD player.

12 CURSOR/ENTER

Press to select a menu while using a source component such as a DVD player.

13 DISPLAY

Press to display on-screen messages from equipment such as a DVD player. You cannot control commands, such as PROGRAM, SHUFFLE, REPEAT and A-B REPEAT of the DVD Mega Changer that appear on the display when you press DISPLAY.

14 RETURN/EXIT

Press to return to the previous menu screen (level) or to quit the menu function while using a source component such as a DVD player.

15 TV VOL +/-

Press to adjust the Sony TV volume.

16 TV CH +/-

Press to change the Sony TV channel.

17 I/O switch

Press to turn the Keypad on / off.

18 TV I/O switch

Press to turn the Sony TV on / off.

19 ENTER

Press to confirm the selection.

20 DISC

Press to select a disc of a DVD / CD Mega Changer.

21 SOURCE

Press to return to the source components list screen.

22 UP

Press to scroll the LCD menu up.

23 ◀◀/▶▶

Press to locate a portion you want to play within a track of the source.

24 ■ (STOP)

Press to stop the current playback.

25 MENU

Press to display a menu while using a source component such as a DVD player.

26 MUTE

Press to mute the speaker output in a zone.

27 VOLUME +/-

Press to adjust the volume in a zone.

28 F1

A button reserved for source components.

29 F2

A button reserved for source components.

30 FOLDER

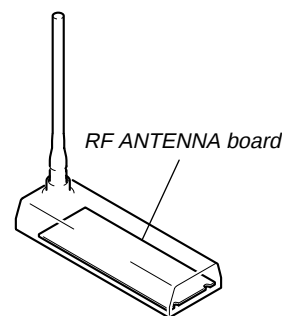
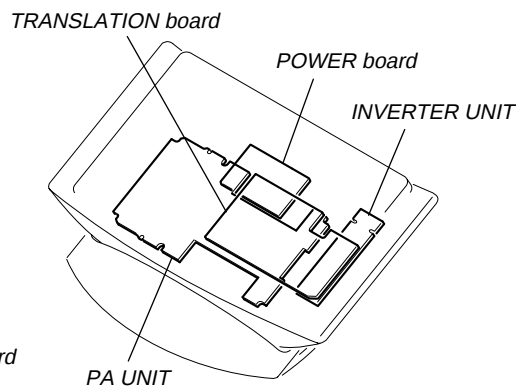
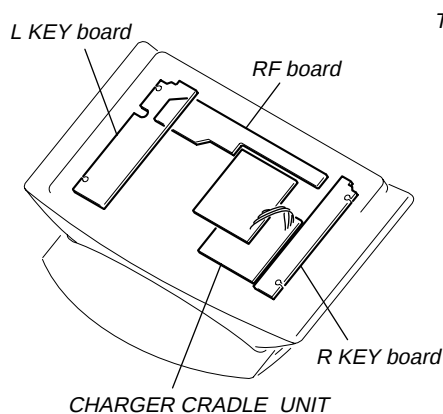
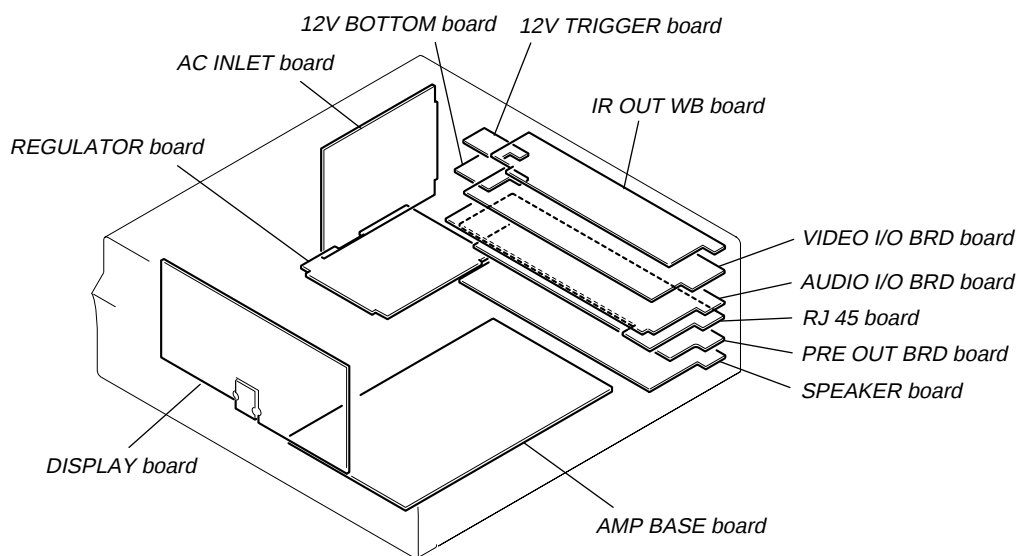
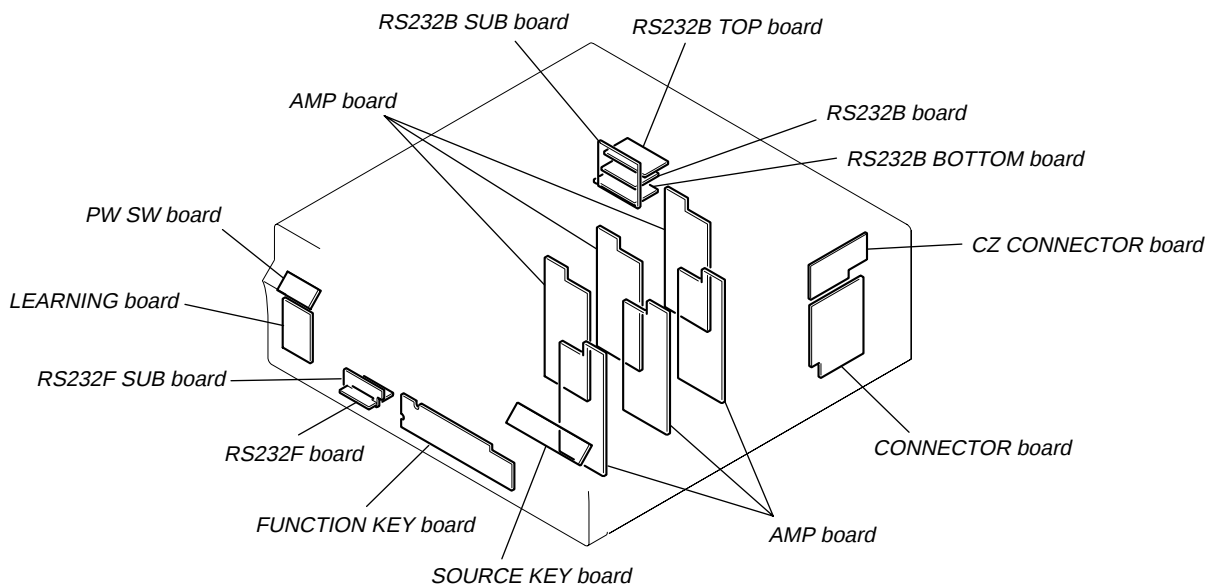
Press to move to the FOLDER screen while using a DVD player.

31 TV/VIDEO

Press to switch signals between TV input and Video input of the Sony TV monitor.

SECTION 3 DIAGRAMS

• Circuit Board Location



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For Schematic Diagrams.

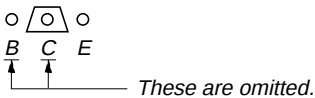
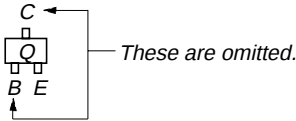
- Note:**
- All capacitors are in μF unless otherwise noted. (p: pF) 50 WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}\text{ W}$ or less unless otherwise specified.
 - % : indicates tolerance.
 - Δ : internal component.
 -  : nonflammable resistor.
 -  : fusible resistor.
 -  : panel designation.

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

-  : B+ Line.
-  : B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
No mark: POWER ON
* : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 M Ω).
Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
- Circled numbers refer to waveforms.
- Signal path.
 : AUDIO
 : VIDEO

For Printed Wiring Boards.

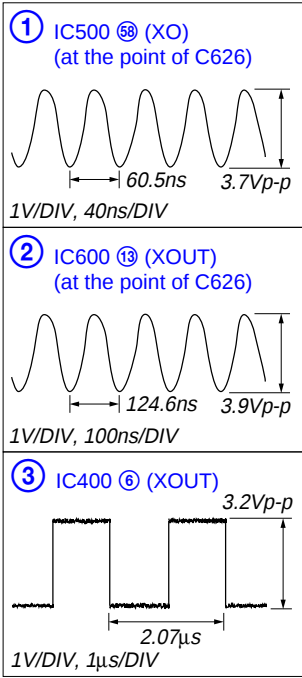
- Note:**
-  : parts extracted from the component side.
 -  : Through hole.
 - Δ : internal component.
 -  : Pattern from the side which enables seeing.



Caution:
Pattern face side: Parts on the pattern face side seen from (Side A) the pattern face are indicated.
Parts face side: Parts on the parts face side seen from (Side B) the parts face are indicated.

• Waveforms

– DISPLAY BOARD –



MEMO

3-6. BLOCK DIAGRAM — RF REMOTE/RF ANTENNA SECTION —

