Service Manual

Blu-ray Disc^{TM} Home Theater Sound System

Model No. **SA-BTT785GN**
SA-BTT785GS
SC-BTT785GN
SC-BTT785GS

SH-FX77

Remote
Control

SB-HC4010

SB-HFS4810   SA-BTT785   SB-HW6010
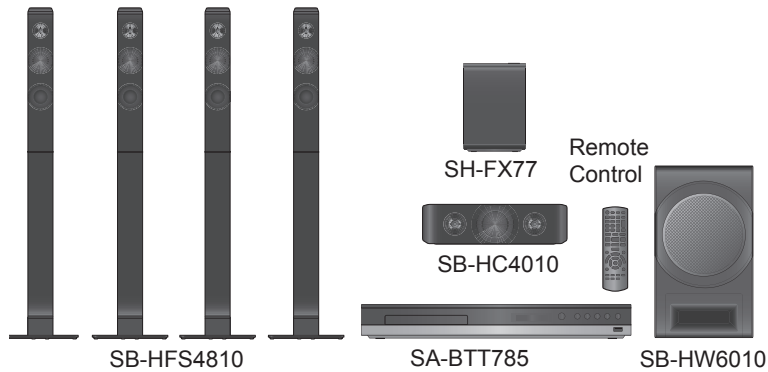
Colour:(K)..........Black Type

Notes: Please refer to the original service manual for:
• **Speaker system SB-HFS4810/HC4010, Order No:AD1403015CE**
• **Speaker system SB-HW6010, Order No:AD1404027CE**
• **Wireless system SH-FX77, Order No:AD1404031CE**

⚠ **WARNING**

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

Panasonic®

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1 Safety Precautions

1.1. General Guidelines

1. IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-RADIATION, shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

2. An Isolation Transformer should always be used during the servicing of AC Adaptor whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect AC Adaptor from being damaged by accidental shorting that may occur during servicing.

3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.

4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.

5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.2. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.

2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part onthe equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to thechassis, the reading should be between 1 MΩ and 5.2 MΩ. When the exposed metal does not have a return path to the chas-sis, the reading must be infinity.

1.3. Leakage Current Hot Check (See Figure. 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.

2. Connect a 1.5 kΩ, 10 W resistor, in parallel with a 0.15 µF capacitor, between each exposed metallic part on the set and a good earth ground, as shown in Figure. 1.

3. Use an AC voltmeter, with 1 kΩ/V or more sensitivity, to measure the potential across the resistor.

4. Check each exposed metallic part, and measure the voltage at each point.

5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.

6. The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) maybe used to make the hot checks, leakage current must not exceed 1/2 mA. In case a measurement is outside of the limitsspecified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned tothe customer.
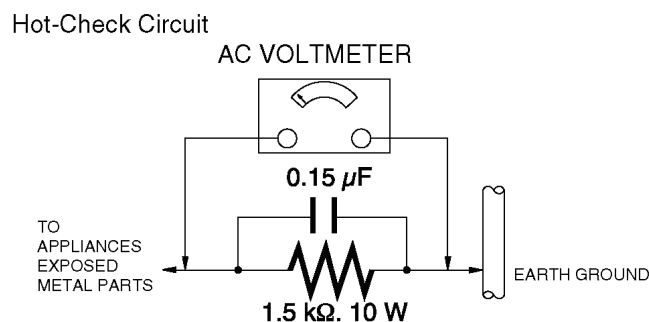
Figure. 1

1.4. Protection Circuitry

The protection circuitry may have operated if either of the following conditions are noticed:
• No sound is heard when the power is turned on.
• Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are"shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices.

> Examples of typical ES devices are IC(integrated circuits)and some field-effect transistors and semiconductor "chip" components.

The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge(ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION :
   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

═══ IMPORTANT SAFETY NOTICE ═══

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2.2. Caution for AC Cord

2.2.1. Information for Your Safety

IMPORTANT

Your attention is drawn to the fact that recording of prerecorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

To reduce the risk of fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION

To reduce the risk of fire or shock hazard and annoying interference, use the recommended accessories only.

FOR YOUR SAFETY

DO NOT REMOVE THE OUTER COVER

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

2.2.2. Caution for AC Mains Lead

For your safety, please read the following text carefully.
This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted after the fuse is replaced.
If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

If the fitted moulded plug is unsuitable for the socket outlet in your home then the fuse should be removed and the plug cut off and disposed of safety.

There is a danger of severe electrical shock if the cut off plug is inserted into any 13-ampere socket.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt, please consult a qualified electrician.

2.2.2.1. Important

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

Blue	Neutral
Brown	Live

As the colours of the wires in the mains lead of this appliancemay not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

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

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

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol.
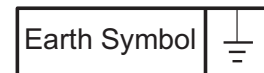
2.2.2.2. Before Use

Remove the Connector Cover as follows:
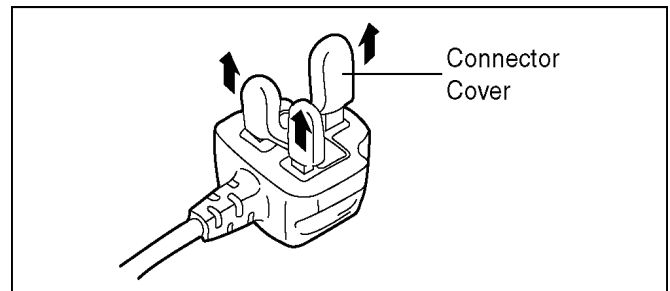
2.2.2.3. How to Replace the Fuse

1. Remove the Fuse Cover with a screwdriver.
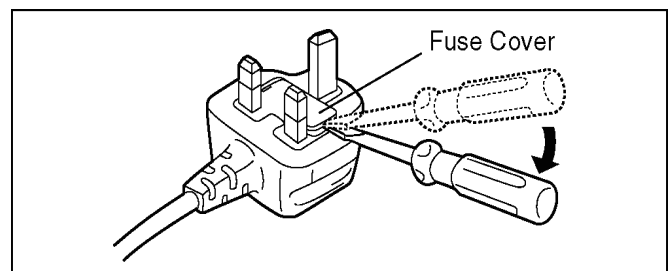
2. Replace the Fuse and attach the Fuse cover.
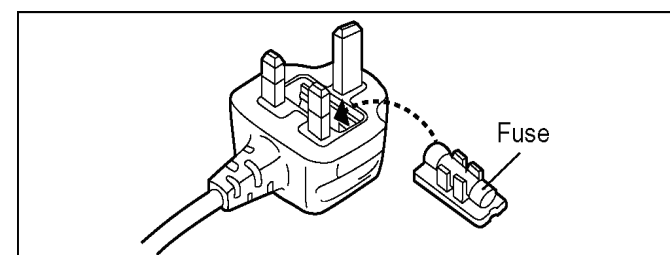
2.3. Precaution of Laser Diode

CAUTION :

This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick-up lens.
Wave length:770 to 800 nm (CDs)/645 to 660 nm (DVDs)
Maximum output radiation power from pick-up:100 µW/
VDE Laser radiation from the pick-up lens is safety level, but be sure the followings:

1. Do not disassemble the optical pick-up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pick-up unit, it was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick-up lens for a long time.

CLASS 1
LASER PRODUCT

Back of product

| CAUTION | INVISIBLE LASER RADIATION WHEN OPEN DO NOT STARE INTO BEAM. |
| DANGER | INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO THE BEAM. |
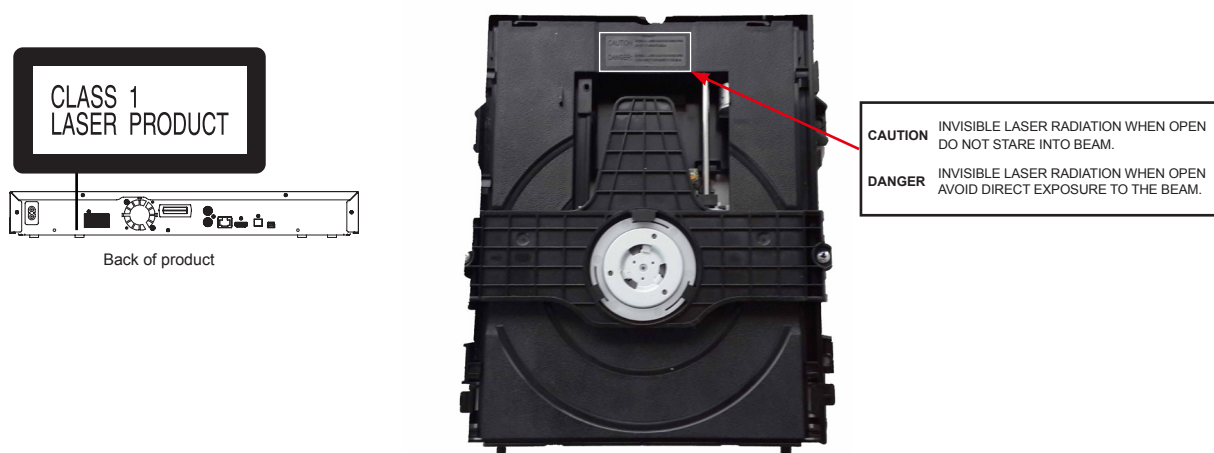
CAUTION !
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

2.4. Static Electricity Protection Measures

- The laser diode in the traverse unit (optical pick-up) may break down due to potential difference caused by static electricity of clothes or human body.
  So, be careful of electrostatic breakdown during repair of the traverse unit (optical pick-up).

2.5. Ground for Electrostatic Breakdown Prevention

- As for parts that use optical pick-up (laser diode), the optical pick-up is destroyed by the static electricity of the working environment.
  Repair in the working environment that is grounded.

2.5.1. Work table grounding

- Put a conductive material (sheet) or steel sheet on the area where the traverse unit (optical pick-up) is placed, and ground the sheet.

2.5.2. Human body grounding

- Use the anti-static wrist strap to discharge the static electricity from your body.

Wrist strap
(Anti-static bracelet)

1MΩ

Iron plate or some metals
to conduct electricity
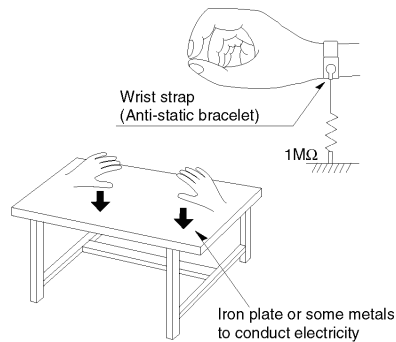
2.5.3. When exchanging the Drive

- Before remove the ESD prevention bag, make sure to use the anti-static wrist strap to discharge the static electricity when replace the Drive.
  Note:
  The ESD prevention bag is used to replace the original short-circuit point.
  It can be removed while placing the Drive.

3   Service Navigation

3.1.   Service Information

This service manual contains technical information, which allow service personnels to understand and service this model.

Please place orders with the numbers in the parts list and not the numbers in the explossion illustration.

If the circuit is changed or modified, the information will be followed by service manual to be controlled with original service manual.

Note:

The replacement parts of this model is supplied as block unit.

Please use Troubleshooting Guide for your reference of the repair.

3.2.   How to Update Firmware

The firmwareof the unit may be renewed to improve the quality including operational performance and playability.Make sure to refer the following procedure when performing version-up.

3.2.1. Confirmation of the Firmware Version

Perform following steps to checking the firmware version currently installed in the unit.

1. Turn the unit on.
2. When the home screen is display,Select [Setup] → [Settings] → [System] → [System Information] → [Firmware Version Information].
3. Firmware Version Information screen is displayed.
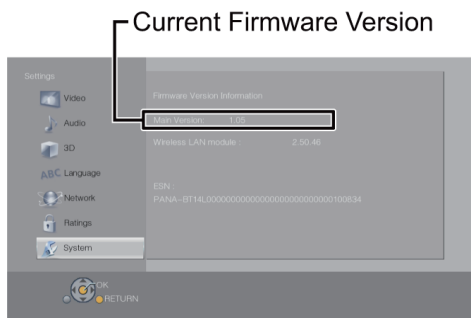
Firmware Version Information Screen

3.2.2.   Updating Firmware

This unit has 2 updating methods, one way to update via the internet, the other way to update using CD-R or USB device which is stored pre-downloaded firmware update file.

3.2.2.1.   Updating Firmware via the Internet

Occasionally, Panasonic may release updated firmware for this unit that may add or improve the way a feature operates. These updates are available free of charge.

This unit is capable of checking the firmware automatically when connected to the Internet via a broadband connection.
When a new firmware version is available, the following message is displayed.

DO NOT DISCONNECT the unit from the AC power or perform any operation while the update is in process.
After the firmware is installed, "FIn" will be displayed on the unit's display. Unit will restart and the following screen will be displayed.
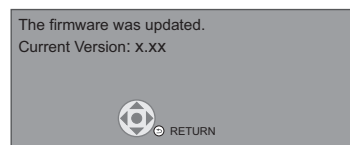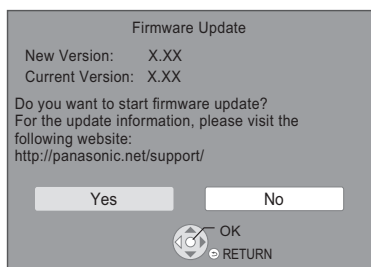
3.2.2.2. Updating firmware using the USB device

When using the USB device to update the firmware.
(When using CD-R instead of USB device, perform same the procedures)
1.Download the latest firmware file of the unit.
  The latest firmware required for version-up can be downloaded from "Support Information from NWBG/VDBG PAVC"web-
  site in "TSN system".
 Click file name to download.
  After download, click file to decompress. (Total: 1 file).
2.Decompress the downloaded file.
   The decompressed file will be named as follows.
   File Name: PANA_HTS.FRM
   Copy the file to root diretory of the USB device.
   (If using CD-R instead of USB device, burn the file to a blank CD-R by a writing software.)
3.Update the unit.
 1.Tunr the unit power on.
 2.After the home screen is displayed and ☐☐☐☐☐ appears at LED display of the front panel,insert the USB device stored
    downloaded latest firmware file to the front USB port of the unit(LED display change to ☐USB☐).(or insert the CD-R into
    the unit and playback it.)
 3.TV will show the firmware Update UI automatically and ☐Pdät is displayed at LED display.
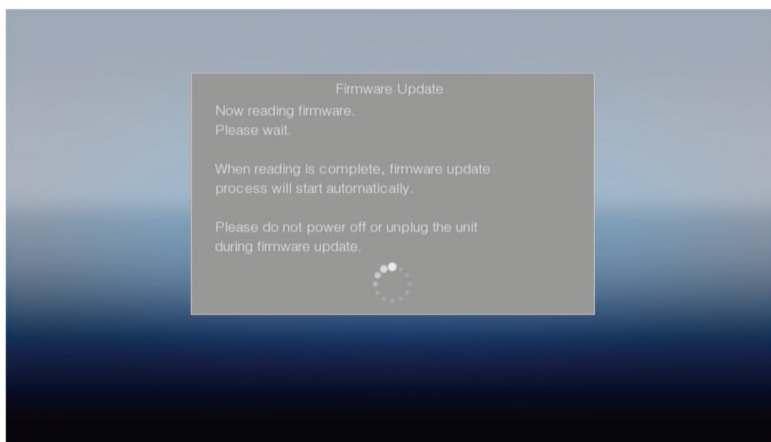
 4.Wait for the firmware update.
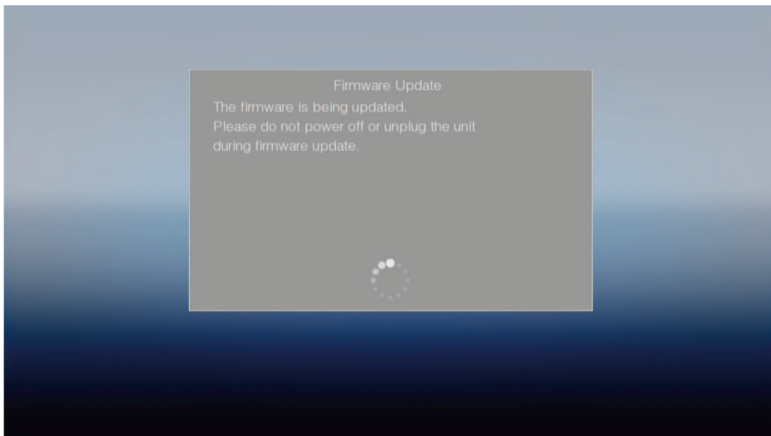
 5.when ☐☐n☐☐ is displayed,update process is finished.
    Remove the USB device (or the CD-R) and press the POWER button to turn the unit off.
 6.Turn the unit on and the home screen appears the firmware update is completed.

5.If the TV show the firmware update is complete (⊟⊟⊟⊟ is displayed at LED display).
   Remove the USB device (or the CD-R) and press the POWER button to turn the unit off.

Firmware Update
The firmware update is complete.

Eject the firmware update disc and press the power
button.
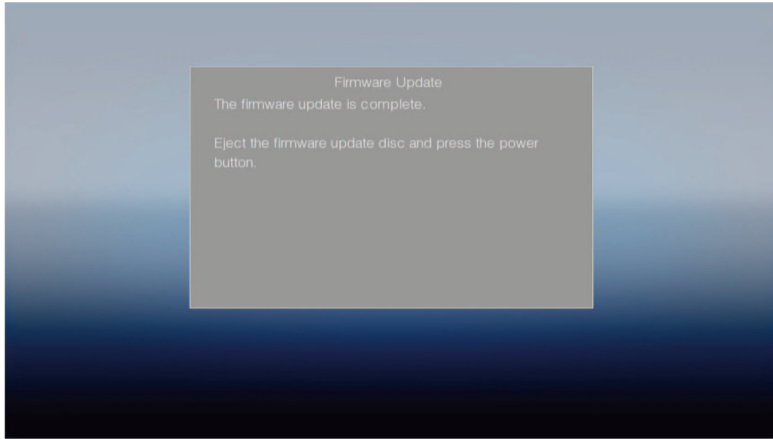
6.Turn the unit on and the home screen appears the firmware update is completed.

4 Specifications

GENERAL

Power consumption	Approx. 76W
Power consumption in standby mode	Approx. 0.5W
Power supply	AC 220V to 240V, 50/60 Hz
Dimensions (W x H x D)	430mm x 55mm x 332mm
Mass	Approx. 2.7kg
Operating temperature range	0 °C to 40 °C
Operating humidity range	35% to 80% RH (no condensation)
LASER Specification	**Class 1 LASER Product** **Wave length:** 790nm(CDs)/ 658nm(DVDs)/405nm(BDs) **Laser power**: No hazardous radiation is emitted with the safety protection

AMPLIFIER SECTION

RMS TTL POWER OUTPUT	1000W
	1 k Hz,30% total harmonic distortion FRONT: 167W per ch (4 Ω) CENTRE: 167W (4 Ω)
	55 Hz,30% total harmonic distortion SUBWOOFER: 167W (4 Ω)
Audio Input	AUX x 1
Digital Audio Input	Optical x 1
	Sampling frequency: 32kHz, 44.1kHz, 48kHz
	Audio Format: PCM, Dolby Digital, DTS®

WIRELESS SYSTEM

<AMPLIFIER SECTION>	
RMS TTL POWER OUTPUT	334 W
	1 kHz, 30 % total harmonic distortion
	SURROUND: 167 W per ch (4 Ω)
<RF SECTION>	
Wireless module	Frequency range: 2.4 GHz Band
<GENERAL>	
Power supply	For Australia and New Zealand AC 220 V to 240 V, 50 Hz For the Middle East AC 220 V to 240 V, 50 Hz/60 Hz
Power consumption	34 W
Power consumption in off mode	0.5 W
Dimensions (W×H×D)	123 mm×176 mm×129 mm
Mass	Approx. 0.8 kg
Operating temperature range	0 °C to 40 °C
Operating humidity range	35 % to 80 % RH (no condensation)

SPEAKER SECTION

	Woofer CONETYPE (cm)	Full range CONETYPE (cm)	Super tweeter Piezo type
Front	-	6.5	x 1
Centre	-	6.5	x 2
Surround	-	6.5	x 1
Subwoofer	20	-	-

	Dimensions (W(mm)x H (mm)x D (mm))	Mass (Approx. kg)
Front	270 x 1181x 270	2.7
Centre	304 x 87x 77	0.7
Surround	270 x 1181x 270	2.7
Subwoofer	232 x 416 x 319	6.3

TERMINAL SECTION

USB slot	USB 2.0 1 system
Ethernet	10BASE-T/100BASE-TX 1 system
Wireless speaker	Frequency range:2.4GHz band

Bluetooth® SECTION

Bluetooth®	Version 4.0
	Class 2
	2.4 GHz Band FH-SS
	Supported Profile: A2DP/AVRCP
	Supported Codec: SBC/AAC

FM TUNER SECTION

Frequency range	87.50 MHz to 108.00 MHz (50 kHz step)
Antenna terminals	1 with Antenna Cable (1.2 m)

VIDEO SECTION

Signal system	PAL/NTSC
HDMI AV output*	Output connector: Type A (19 pin) 1 system

*   This unit supports "HDMI CEC" function.

Specifications are subject to change without notice.

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   Contact Information: oss-cd-request@gg.jp.panasonic.com

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   http://panasonic.net/avc/oss/theater/AWTHT14A.html

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(4) Vorbis, FLAC, WPA Supplicant
The software licenses are displayed when "License" in the Setup menu is selected. (⇨ 32)

5 Location of Controls and Components
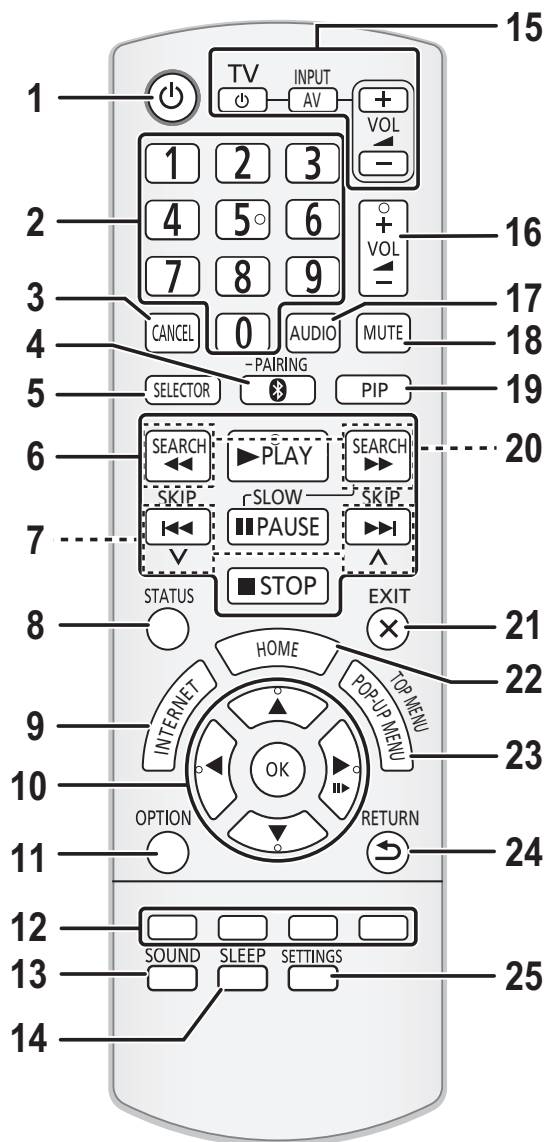
1 Turn the unit on and off
2 Select title numbers, etc./Enter numbers
3 Cancel
4 Select Bluetooth®/Enable pairing
5 Select an audio or video source
6 Basic playback control buttons
7 Select preset radio stations
8 Show the status messages
9 Show the Home Screen of the Network Service
10 [▲, ▼, ◄, ►] : Move the highlight for selection
   [OK] : Confirm the selection
   (❙❙►) : Frame-by-frame
11 Show Option menu
12 Coloured buttons (red, green, yellow, blue)
   Used for various purposes depending on the display
13 Set the sound effects
14 Set the sleep timer
   ① Press [SLEEP].
   ② While "SL ✳✳" is displayed on the unit's display, press [SLEEP] several times to select the time (in minutes).
   ● Timer selection is up to 120 minutes.
   ● Select "OFF" on the unit's display to disable the function.
   ● To confirm the remaining time
     Press the button again.
15 TV operation buttons
   [⏻ TV]: Turn the TV on and off
   [AV, INPUT]: Switch the input select
   [+ − VOL] : Adjust the volume
16 Adjust the volume of the main unit
17 Change audio
18 Mute the sound
   ● "MUtE" flashes on the unit's display, while the function is on.
   ● To cancel, press the button again or adjust the volume.
   ● Muting is cancelled if the unit is turned off.
19 Switch Secondary Video on/off (Picture-in-picture)
20 Select radio stations manually
21 Exit the Menu screen
22 Show HOME menu
23 Show Pop-up Menu/Top Menu
24 Return to previous screen
25 Show Setup menu

Main unit (Front)

1	Disc tray	6	Stop
2	Display	7	Start play
	Unit's display list	8	USB port
3	Remote control signal sensor	9	**Standby/on switch (⏻/I)**

1   Disc tray
2   Display
    Unit's display list
3   Remote control signal sensor
    Distance: Within approx. 7 m.
    Angle: Approx. 20° up and down, 30° left and right
4   Open or close the disc tray
5   Adjust the volume of the main unit

6   Stop
7   Start play
8   USB port
9   **Standby/on switch (⏻/I)**
    Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
10 NFC touch area

Main unit (Rear)
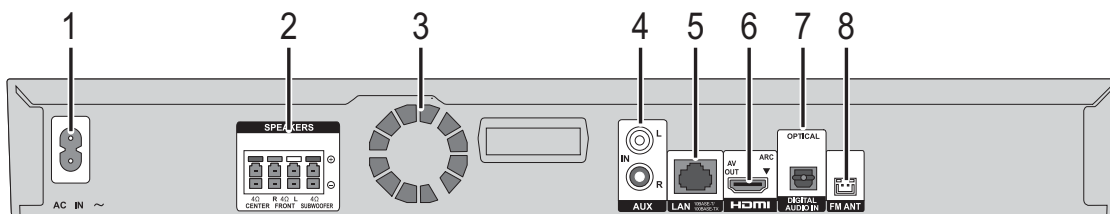
1   AC IN terminal
2   Speaker terminals
3   Cooling fan
4   AUX terminal

5   LAN port
6   HDMI AV OUT (ARC) terminal
7   DIGITAL AUDIO IN terminal
8   FM radio antenna terminal

Wireless system

Top   **Rear**
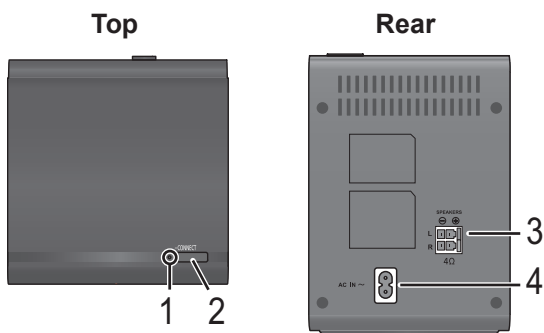
1   Wireless link indicator
    Green   lights: Wireless link is activated.
            brinks (slow):   Searching mode
            brinks (fast):   Pairing mode
    Red   lights: Sleeping mode
2   Enable pairing
3   Speaker terminals
4   AC IN terminal

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6 Installation Instructions

Turn off all equipment before connection and read the appropriate operating instructions.
Do not connect the AC power supply cord until all other connections are completed.

6.1. Speaker Connection

Connect the speaker cables to the terminals of the same color.

SH-FX77
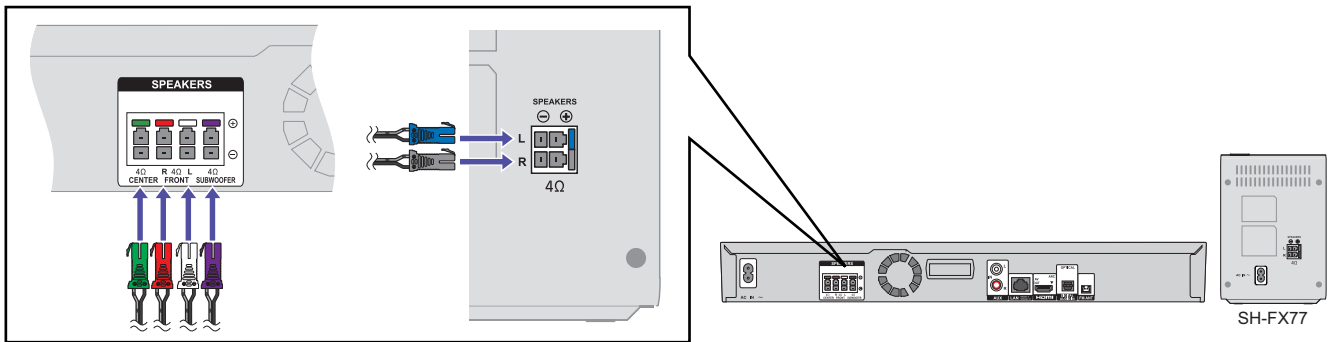
6.2. Connection to a TV

■ HDMI

● Use the ARC* compatible High Speed HDMI cables. Non-HDMI-compliant cables cannot be utilized.
It is recommended that you use Panasonic's HDMI cable. When outputting 1080p signal, please use HDMI cables 5.0 meters (16.4 ft.) or less.

---

* ARC is an abbreviation of Audio Return Channel, also known as HDMI ARC. This feature allows a home theater system to receive and play audio from the TV through a single HDMI cable without additional wiring.

STEP 1

If the HDMI terminal of your TV supports ARC, skip **STEP 2**.

HDMI cable (not supplied)

TV

STEP 2

When the HDMI terminal of your TV does not support ARC.

Audio cable (not supplied)   Optical digital audio cable (not supplied)

TV
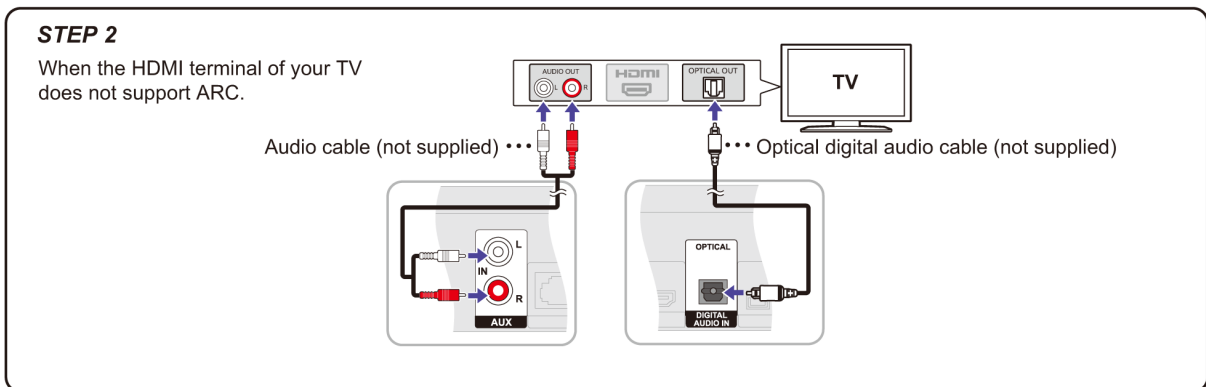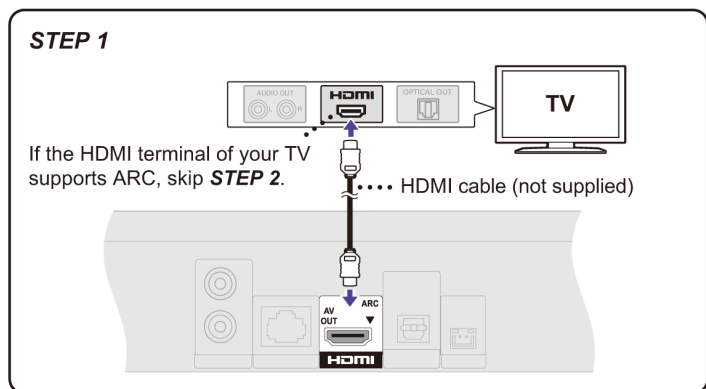
6.3. FM Antenna Connection

Affix this end of the antenna to a wall or pillar where the reception is best.
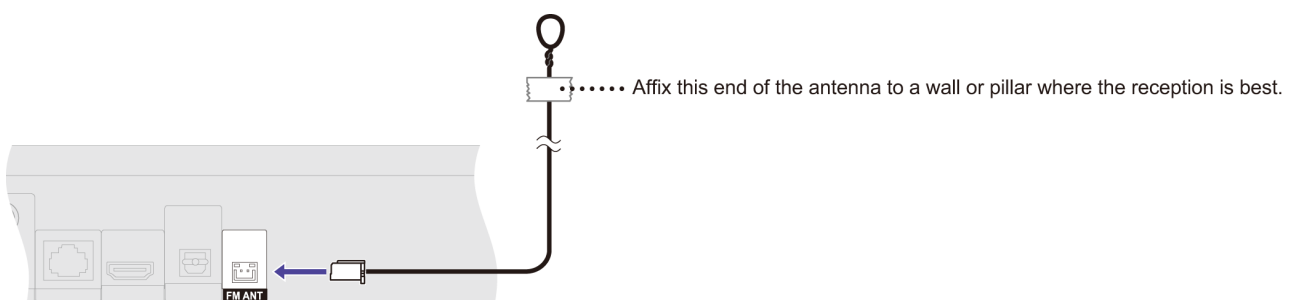
7 Operating Instruction

7.1. Take out the Disc from Drive Unit when the Disc cannot be ejected by the OPEN/CLOSE button

7.1.1. Forcible Disc Eject.

1. While the unit is on, press and hold [OK], [Yellow] and [Blue] buttons on the remote control simultaneously for 5 seconds.
   - " ⎕⎕⎕⎕⎕ (00RET)" is displayed on the unit's LED display.
2. Repeatedly press the right cursor button on the remote Control or Power button on the unit until " ⎕⎕⎕⎕⎕ (06 FTO)" is displayed on the unit's LED display.
3. Press [OK] button on the remote control or [OPEN/CLOSE] button on the unit.

7.1.2. When the Disc Eject can not be done.

1. Turn off the power and pull out AC cord.
2. Put the unit upside down so that bottom can be seen.
3. Insert the paper clip into the slot and slide the gear in the direction of the arrow to eject the tray slightly.

Paper clips, etc.
Diameter: about 1 mm
Length: about 5 cm (at Strate part)

Hole
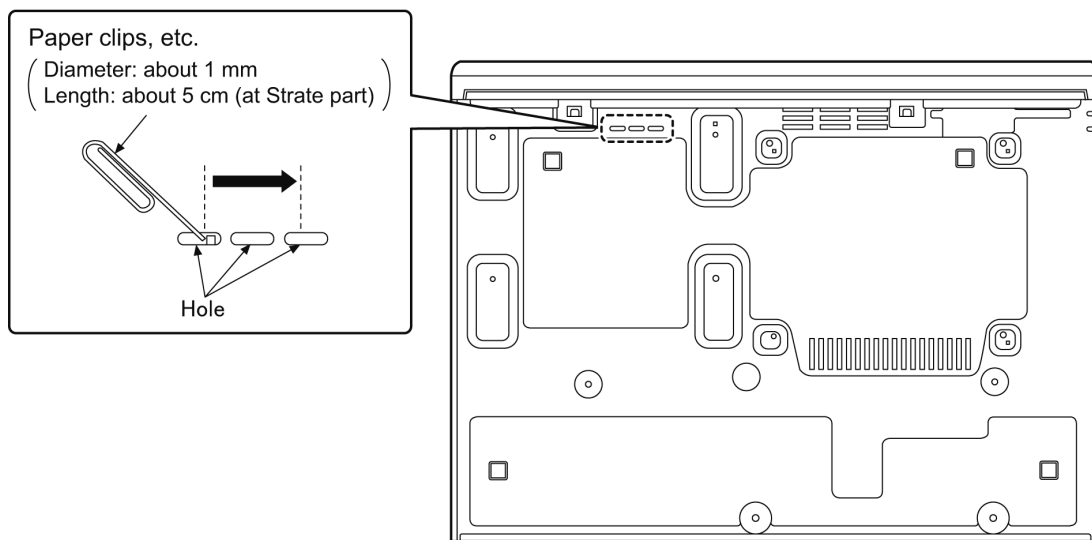
4. Pull the unit upward, and pull out the tray.

Tray
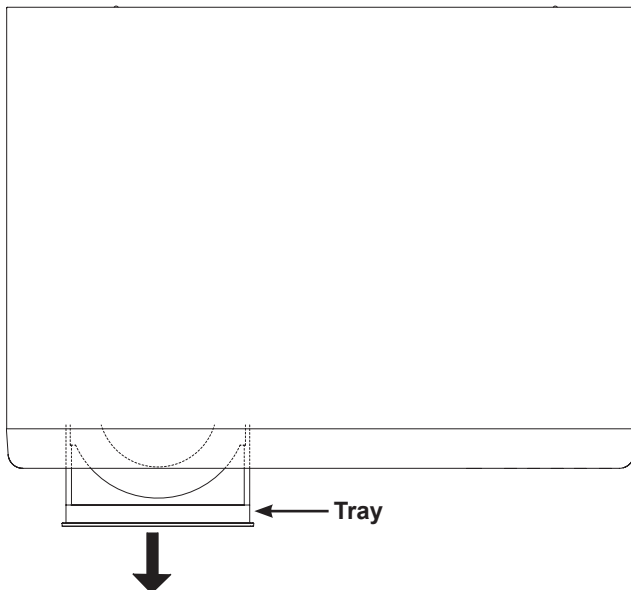
8 Multiple Pressing Function

8.1. About the Multiple Pressing of the Unit's Remote Control

The remote control which included this unit is possible pressing multiple buttons simultaneously (Multiple Pressing function), andcan operate for the customer's initial settings and the Service Mode, etc.

The Multiple Pressing function is not available for conventional models' remote control. Use the remote control included this unit.

8.2. How to enter the Special Modes using the Multiple Pressing Function of the Unit's Remote Control

For pressing the multiple buttons of the remote control, this unit can be entering each of the following special modes.
After entering each mode, and then go to the menu you want to run.

Open Mode	Privately Mode 1	Privately Mode 2
[OK] [Yellow] [Blue]	[6] [7] [Yellow]	[5] [9] [Red]

- **Move the menus for each mode:**
  Press [Right Cursor] button (Remote Cont.) or [Power] button (Unit)

- **Execute**
  Press [OK] button (Remote Cont.) or [Open/Close] button (Unit)
  * After executing the menu will automatically exit the special mode.

- **How to exit from the special modes**
  - Press the unrelated buttons for the operation.
  - No operation for 2 minutes or more.
  - Press and hold [Power] button on the unit.(Forcible Power Off)

8.2.1.   Open Mode (Remote Cont. Buttons: [OK] [Yellow] [Blue]).

When pressing the 3 buttons, [OK], [Yellow] and [Blue] simultaneously for 5 seconds, "*00rEt* (00 RET)" is displayed on the LED display.

LED display	Execute key	Function	Descriptions
00rEt (00 RET)	-	-	-
03 UL (03 VL)	[OK]	BD / DVD video viewing unrestricted	The parental control of BD Video and DVD Video are cancelled.
04PrG (04 PRG)	[OK] (Press and Hold)	Initialization of the Progressive Setting	Initialize the Progressive setting to 480p mode.
06Fto (06 FTO)	[OK]	Forced Tray Open	When the [Open/Close] button does not work, open the disc tray forcible. If still close, refer to "7. 1. 2. When the Forcible Disc Eject can not be done.".
07 dC (07 DC)	[OK] (Press and Hold)	Initialization of the Deep Colour setting	Initialize the Deep Colour setting.
08Fin (08 FIN)	[OK] (Press and Hold)	Restore the factory settings	All settings included Quick Start setting and Network settings are restored the factory settings.

8.2.2. Privately Mode 1 (Remote Cont. Buttons: [6] [7] [Yellow]).

When pressing the 3 buttons, [6], [7] and [Yellow] simultaneously for 5 seconds, "⟨50 RET⟩ (50 RET)" is displayed on LED display.

LED display	Execute key	Function	Descriptions
⟨50 RET⟩ (50 RET)	-	-	-
⟨51 NOP⟩ (51 NOP)	[OK]	-	Not used in field service.
⟨52 BRE⟩ (52 BRE)	[OK]	Delete the playback history of BD-Video	While "⟨51 NOP⟩(51 NOP)" is displayed, press and hold the [Stop] button (remote control / main unit) is move to this menu. Press the [OK] button for deleting the playback history of BD-Video.

8.2.3. Privately Mode 2 (Remote Cont. Buttons: [5] [9] [Red]).

When pressing the 3 buttons, [5], [9] and [Red] simultaneously for 5 seconds, "⟨70 RET⟩ (70 RET)" is displayed on LED display

LED display	Execute key	Function	Descriptions
⟨70 RET⟩ (70 RET)	-	-	-
⟨80 SRV⟩ (80 SRV)	[OK]	Enter the Service Mode	Press the [OK] button then "⟨HELLO⟩(HELLO)" is displayed on the LED display. Wait about 30 seconds for displaying "⟨SERV⟩ (SERV)" on the LED display.
⟨81 AIG⟩ (81 AIG)	[OK]	Enter the Ageing Mode	Not used in field service.
⟨86 DST⟩ (86 DST)	[OK]	Enter the Drive Ageing Mode	Not used in field service.
⟨91 SPD⟩ (91 SPD)	[OK]	Special Display	Not used in field service.

9 Service Mode

9.1. About the Service Mode

Informations necessary for service can be displayed.

9.1.1. How to enter the Service Mode.

Press the [5], [9] and [Red] buttons of the Remote Control simultaneously for 5 seconds.

↓

"70r EE (70 RET)" is displayed on LED display.

↓

Press the Right Cursor button (Remote Cont.) or the [Power] button (Unit).

↓

"80Sr U (80 SRV)" is displayed on LED display.

↓

Press the [OK] button (Remote Cont.) or the [Open/Close] button (Unit).

↓

"HELLO (HELLO)" is displayed on LED display.

↓

(Wait for about 30 seconds)

↓

"SErU (SERV)" is displayed on LED display.

9.1.2. How to exit the Service Mode.

Press and hold the [Power] button (remote control or unit).
•The Service Mode is terminated and automatically turns the unit off.

9.2. Service Mode List

The display of information to each command is as follows.

Note:

    Do not use it excluding the designated command.

Key operation (remote control keys)	Mode name	Display (Example)	Descriptions
[0] [0]	Release Items	**SERV**	Item of Service Mode executing is cancelled.
[0] [1]	Self -Diagnosis Display	**HXX or FXX**	Last Error Code of U/H/F held by memory is displayed on LED display. (XX: 2 digits numeric) *Details are described in "Self-Diagnosis Functions".
[0] [2]	ROM Version Display	**NO_#$** **(NO 1A)**	#: Region of DVD (Example: 1,2 ...) $: Region of BD (Example: A,B ...) (Display for 5 seconds.)
		****_ **(3070)**	BE Main Firm Version (Display for 5 seconds.)
		****_ **(16260)**	FE Driver Firm Version (Display for 5 seconds.)
		***__ **(548)**	BootLoader Firm Version (Display for 5 seconds.)
		-	Timer Firm Version (Display for 5 seconds.)
[4] [1]	Laser Used Time Display Check laser used time (hours) of drive. When the use time exceeds 999 hours, it is displayed as **999.	**B****** **(B0000)**	BD playback laser used time ***: Hour unit
		D**** **(D0000)**	DVD playback laser used time ***: Hour unit
		C**** **(C0000)**	CD playback laser used time ***: Hour unit
[4] [9] (Please follow the procedure and operate.)	DVD Playback Jitter	******* **(078)**	The amount of the LBA jitter at the position in which the playback began from the stop is measured. [Procedure] 1. Playback start. (Use DVD-Video or BD-Video disc.) 2. Press remote control buttons [4] [9]. 3. The amount of jitter is displayed.
[6] [9]	Save the error history to USB storage device	**NOUSB**	The USB storage device cannot be recognized.
	The error and user operation history of the remote control are saved to the USB storage device.	**USBSAV**	During saving
		FIN	Save end
[9] [1]	Open and Close test of the disc tray	********** **(00003)**	Repeat the opening and closing the disc tray. (The current numbers of Open/Close is displayed on the LED display.) Press the [Power] button (Remote Control or unit) for exit the test.
[9] [5]	Initialization of the Laser Used Time	**CLR**	Laser Used Time information stored in the memory of the unit is initialized to factory setting.
[9] [9]	Initialization of the Service Mode	**CLR**	Last Drive Error, Error History and Error Code information stored on the unit are initialized to factory setting.

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9.3. Self-Diagnostics Functions

9.3.1. Self-Diagnostics Functions.

Self-Diagnosis Function provides information for errors to service personnel by Self-Diagnosis Display when any error has occurred.
U** , H** and F** are stored in memory and held.
You can check last error code by transmitting [0] [1] of Remote Control in Service Mode.
Automatic Display on FL will be cancelled when the power is turned off or AC input is turned off during self-diagnosis display is ON.

Error Code	Diagnosis contents	Description	LED display	On Screen
U59	Abnormal inner temperature detected	This error is displayed when the internal temperature of the unit exceeds the margin of safety. The power is turned off forcibly. For 30 minutes after this, the [Power] button operation is disabled.	**U59** Displays for 30 seconds.	Not displayed
U76	connection error	This error is displayed when equipment such as TV, amplifier etc. connected with this unit with the HDMI cable do not correspond to the copyright protection. (The BD/DVD video where the copyright is protected cannot be played.)	**U76**	Not displayed
U77	Illegal disc error	This error is displayed when it becomes impossible to reproduce because of copyright illegal information.	**U77**	Not displayed
ERROR	USB over current	Attached USB device is abnormal state. (Abnormally high current flows. The process is stopped because the current of 500mA or more fllows.)	**ERROR**	Not displayed
F00	No Error Code	-	**F00**	Not displayed

10 Troubleshooting Guide

10.1. About Operation of Set

The page number in this chapter does not show the page number of this service manual.

To return to the factory defaults.
➢ Select "Yes" in "Restore Default Settings" in the Setup menu. (⇨ 32)

To return all settings to the factory preset.
➢ Reset the unit as follows:
① Turn the unit on.
② Press and hold [OK], the yellow button and the blue button on the remote control at the same time for more than 5 seconds.
  −"00rEt" is displayed on the unit's display.
③ Press [▶] (right) repeatedly on the remote control until "08FIn" is displayed on the unit's display.
④ Press and hold [OK] for at least 5 seconds.

The remote control does not work properly.
➢ Change the batteries in the remote control. (⇨ 9)
➢ Depending on the condition of the unit, [SELECTOR] and [🅑] may not respond. Display the HOME menu and try again.

The TV tuner mode is not displayed when the TV is turned on.
➢ This phenomenon may occur, depending on the TV setting, when "Quick Start" is set to "On".

You have forgotten your ratings password.
You want to cancel the ratings level.
➢ The ratings level returns to the factory defaults.
① Turn the unit on.
② Press and hold [OK], the yellow button and the blue button on the remote control at the same time for more than 5 seconds.
  −"00rEt" is displayed on the unit's display.
③ Press [▶] (right) repeatedly on the remote control until "03 VL" is displayed on the unit's display.
④ Press [OK].

The TV screen turns black.
➢ When "24p Output" is set to "On", HDMI authentication takes place and a black screen is displayed.

This unit does not recognize the USB connection correctly.
➢ Disconnect and re-connect the USB cable. If it still does not recognize the connection, turn this unit off and on again.
➢ USB devices may not be recognized by this unit when connected using the following :
  −a USB hub
  −a USB extension cable other than the supplied with the Wireless LAN Adaptor DY-WL5 (optional)
➢ If you connect USB HDD to this unit, use the USB cable that is supplied with the HDD.

The unit switches to standby mode.
➢ This unit will automatically turn to standby mode after 30 minutes if it is inactive. (⇨ 16)
➢ When the time set for the sleep timer has passed, the main unit will be turned off. (⇨ 9)
➢ One of the unit's safety devices is activated. Press [⏻/I] on the main unit to turn the unit on.

Unit's display list

This list only contains displays that are difficult to read.

Display	Reading	Display	Reading
bYE	BYE	OPEn	OPEN
rEAd	READ	PLAY	PLAY
StOP	STOP	SEtUP	SETUP
Photo	PHOTO	SLIdE	SLIDE
dISC	DISC	USb	USB
AUH	AUX	ArC	ARC
d-In	D-IN	FM	FM
BLUEtootH	BLUETOOTH	SEtOU	SET OK
tUnEd	TUNED	nEt	NET
StErEO	STEREO	F In	FIN (Finish)
Error	ERROR	-----	No DISC, No PLAY, No READ, UNSUPPORT
MUtE	MUTE		

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10.2. After Servicing
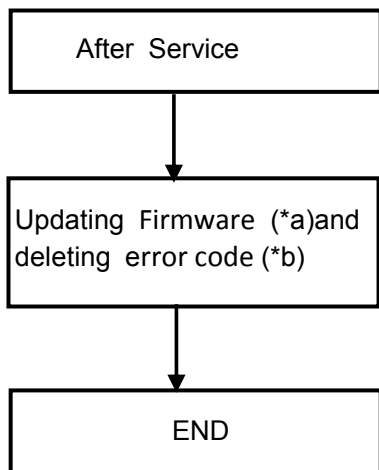
```
┌─────────────────────────┐
│                         │
│     After  Service      │
│                         │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ Updating  Firmware (*a)and │
│ deleting  error code (*b) │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│                         │
│          END            │
│                         │
└─────────────────────────┘
```

(*a)

This unit is capable of checking the firmware automatically when connected to the Internet via a broadband connection.

When a new firmware version is available, the following message is displayed.

```
┌──────────────────────────────────────┐
│           Firmware Update            │
│                                      │
│  New Version:      X.XX              │
│  Current Version:  X.XX              │
│                                      │
│  Do you want to start firmware update? │
│  For the update information, please visit the │
│  following website:                  │
│  http://panasonic.net/support/       │
│                                      │
│   ┌──────────┐    ┌──────────┐      │
│   │   Yes    │    │   No     │      │
│   └──────────┘    └──────────┘      │
│                                      │
│              ─ OK                    │
│              ↩ RETURN                │
└──────────────────────────────────────┘
```
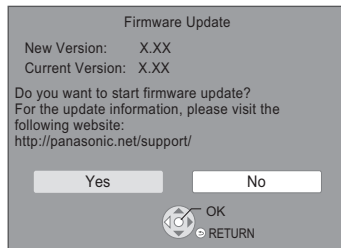
● **If downloading on this unit fails or this unit is not connected to the Internet, then you can download the latest firmware from the following website and burn it to a CD-R to update the firmware.**
http://panasonic.jp/support/global/cs/
(This site is in English only.)
To show the firmware version on this unit. (⇨ 32, "Firmware Version Information")

(*b)
1. Power on.
2. Press [5][9] and [Red] on remote control simultaneously for 5 sec.
3. *70REE* (70RET) is disply on LED display.
4. Press [▶] on remote control .
5. *80SRU* (80SRV) is disply on LED display.
6. Press [OK] on remote control
7. Wait for about 30 sec.
8. *SERUB* (SERV) is disply on LED display.
9. Press [9][9] on remote control .
10. Error code be delelted .
11. Press and hold [Power] on (remote control or unit) and exit the service mode.

About Circuit

```
                    ┌─────────────────────────┐
                    │                         │
                    │         Start           │
                    │                         │
                    └─────────────────────────┘
                                 │
                                 ▼
                         ╱───────────────╲
                        ╱  Remove the Power ╲
                       ╱  Cable and  reInsert it ╲        ┌──────────────────────┐
                      ◄   after 10 sec  check the  ►──────►│ Refer to Other Symptom │
                       ╲  Symptom?           ╱     NG     │  (See next pages)     │
                        ╲                   ╱             └──────────────────────┘
                         ╲───────┬───────╱
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │                         │
                    │       No Symptom        │
                    │                         │
                    └─────────────────────────┘
```

Symptom -1

VOLTAGE DATA(measurement value)

```
┌─────────────────┐
│    No power     │
└────────┬────────┘
         │
         ▼
    ╱─────────────╲
   ╱ Check AC inlet ╲──NG──► Exchange the
   ╲ unit.(cutting  ╱        AC inlet unit
    ╲ or damage…etc.)╱
         │OK
         ▼
    ╱─────────────╲
   ╱ Check the AC ╲──NG──► Exchange the
   ╲ cord.(cutting ╱        AC cord
    ╲ or damage…etc.)╱
         │OK
         ▼
    ╱─────────────╲
   ╱ Check the Power ╲──NG──► Exchange the
   ╲ supply P.C.B. is ╱        Power supply P.C.B.
    ╲ Fuse-resistor  ╱
     (F501) broken?
         │OK
         ▼
    ╱─────────────╲
   ╱ Check the     ╲──NG──► Exchange the
   ╲ Digital P.C.B. ╱        Power supply P.C.B.
    ╲ connector    ╱
     voltage.*1
         │OK
         ▼
    ╱─────────────╲
   ╱ Check the     ╲──NG──► Exchange the
   ╲ Digital P.C.B. ╱        Digital P.C.B.
    ╲ connector    ╱
     voltage.*2
         │OK
         ▼
    ╱─────────────╲
   ╱ Check the FFC ╲──NG──► Exchange the FFC
    ╲─────────────╱
         │OK
         ▼
┌──────────────────────┐
│ Exchange the Front P.C.B.│
└──────────────────────┘
```

REF.NO.	PIN NO.	XP10
*1	1	2.8V
	2	NC
	3	GND
	4	GND
	5	11.9V
	6	11.9V
	7	GND
	8	GND
	9	GND
	10	34.0V
	11	34.0V
	12	34.0V

REF.NO.	PIN NO.	XP9
*2	1	3.3V
	2	3.3V
	3	1.7V
	4	PIO9
	5	PIO11
	6	PIO13
	7	GND
	8	3.3V
	9	GND
	10	3.3V
	11	0V
	12	0V
	13	3.3V
	14	3.3V
	15	3.3V
	16	3.3V
	17	3.3V
	18	11.9V
	19	GND
	20	BT_L
	21	GND
	22	BT_R
	23	GND
	24	NFC_FD

CHECK POINT LOCATION

F501   ***1**   **FFC**   ***2**

Symptom -2

```
┌─────────────────────────────────┐
│ Disc Tray Can not OPEN or CLOSE │
└─────────────────────────────────┘
```

Check the
OPEN/CLOSE SW.
(Break or click feeling ...etc.) ──NG──▶ Exchange the Front P.C.B.

OK

Check the Front Panel
(Broken ...etc.) ──NG──▶ Exchange Front Panel

OK

Check the Digital P.C.B.
connector XP4 voltage.*3 ──NG──▶ Exchange the Digital P.C.B.

OK

```
┌─────────────────────────────┐
│ Exchange the Mechanism unit │
└─────────────────────────────┘
```

CHECK POINT LOCATION

*3

VOLTAGE DATA (measurement value)

REF.NO.	PIN NO.	XP4
*3	1	5.2V
	2	3.4V
	3	GND
	4	3.2V

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Symptom -3

No LED Display/Keys does not work

↓

Check the Digital P.C.B. connector XP9 voltage.*2 — NG → Exchange the Digital P.C.B.

↓ OK

Exchange the Front P.C.B.

CHECK POINT LOCATION

*2

VOLTAGE DATA (measurement value)

REF.NO.	PIN NO.	XP9
*2	1	3.3V
	2	3.3V
	3	1.7V
	4	PIO9
	5	PIO11
	6	PIO13
	7	GND
	8	3.3V
	9	GND
	10	3.3V
	11	0V
	12	0V
	13	3.3V
	14	3.3V
	15	3.3V
	16	3.3V
	17	3.3V
	18	11.9V
	19	GND
	20	BT_L
	21	GND
	22	BT_R
	23	GND
	24	NFC_FD

Symptom -4

```
┌─────────────────────────────┐
│ Remote Control does not work │
└─────────────────────────────┘
              │
              ▼
        ╱─────────────╲
       ╱ Check the     ╲      NG    ┌──────────────┐
      ╱ battery of      ╲──────────▶│ Exchange the │
       ╲ the Remote    ╱            │ battery      │
        ╲ Control     ╱             └──────────────┘
         ╲───────────╱
              │ OK
              ▼
        ╱─────────────╲
       ╱ Check the     ╲      NG    ┌──────────────┐
      ╱ Digital P.C.B.  ╲──────────▶│ Exchange the │
       ╲ connector XP9  ╱           │ Digital P.C.B.│
        ╲ voltage.*2   ╱            └──────────────┘
         ╲───────────╱
              │ OK
              ▼
┌──────────────────┐
│ Exchange the     │
│ Front P.C.B.     │
└──────────────────┘
```

CHECK POINT LOCATION

*2

VOLTAGE DATA (measurement value)

REF.NO.	PIN NO.	XP9
	1	3.3V
	2	3.3V
	3	1.7V
	4	PIO9
	5	PIO11
	6	PIO13
	7	GND
	8	3.3V
	9	GND
*2	10	3.3V
	11	0V
	12	0V
	13	3.3V
	14	3.3V
	15	3.3V
	16	3.3V
	17	3.3V
	18	11.9V
	19	GND
	20	BT_L
	21	GND
	22	BT_R
	23	GND
	24	NFC_FD

Symptom -5

```
            ┌─────────────────┐
            │    No Picture   │
            └─────────────────┘
                     │
                     ▼
           ◇ Check the Input Source ◇ ──NG──▶ ┌──────────────────────┐
                     │                         │ Choose Correct Source │
                    OK                         └──────────────────────┘
                     ▼
           ◇ Check the Setup    ◇ ──NG──▶ ┌──────────────────────┐
             of HOME menu                 │ Setup  Deepclolor and │
                     │                     │ Progressive off  (*c) │
                    OK                     └──────────────────────┘
                     ▼
           ◇ Check the HDMI Cable ◇ ──NG──▶ ┌──────────────────────┐
                     │                       │ Exchange the HDMI Cable │
                    OK                       └──────────────────────┘
                     ▼
       ┌──────────────────────────┐
       │ Exchange the Digital P.C.B. │
       └──────────────────────────┘
```

Symptom -6

```
            ┌─────────────────┐
            │    No  Sound    │
            └─────────────────┘
                     │
                     ▼
           ◇ Check the Connection ◇ ──NG──▶ ┌──────────────────────┐
                     │                       │  reconnect  correctly │
                    OK                       └──────────────────────┘
                     ▼
           ◇ Check the Speaker Box ◇ ──NG──▶ ┌──────────────────────────┐
                     │                        │ Exchange the Speaker Box │
                    OK                        └──────────────────────────┘
                     ▼
           ◇ Check the Fan Operation ◇ ──NG──▶ ┌──────────────────┐
                     │                          │ Exchange the fan │
                    OK                          └──────────────────┘
                     ▼
       ┌──────────────────────────┐
       │ Exchange theDigital P.C.B. │
       └──────────────────────────┘
```

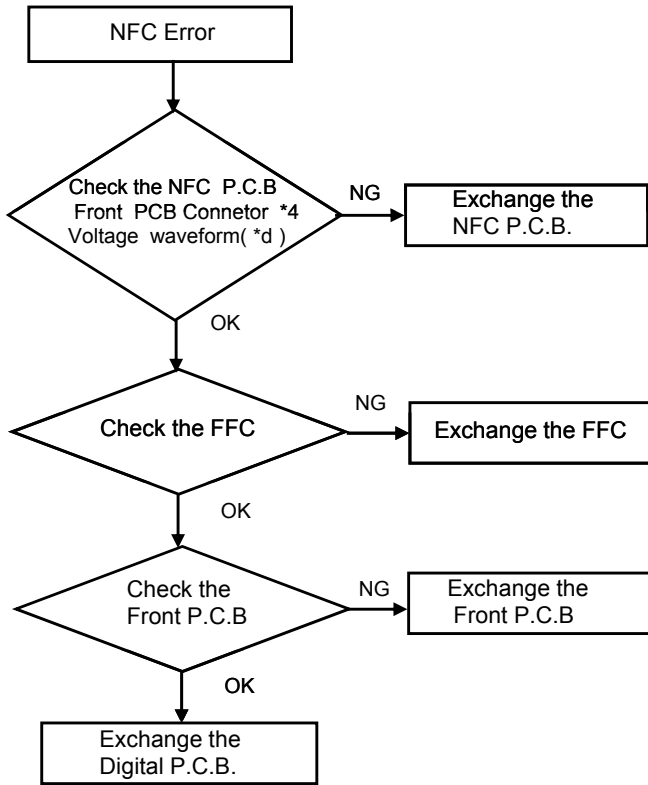## *(c) Description from O/I.

Picture

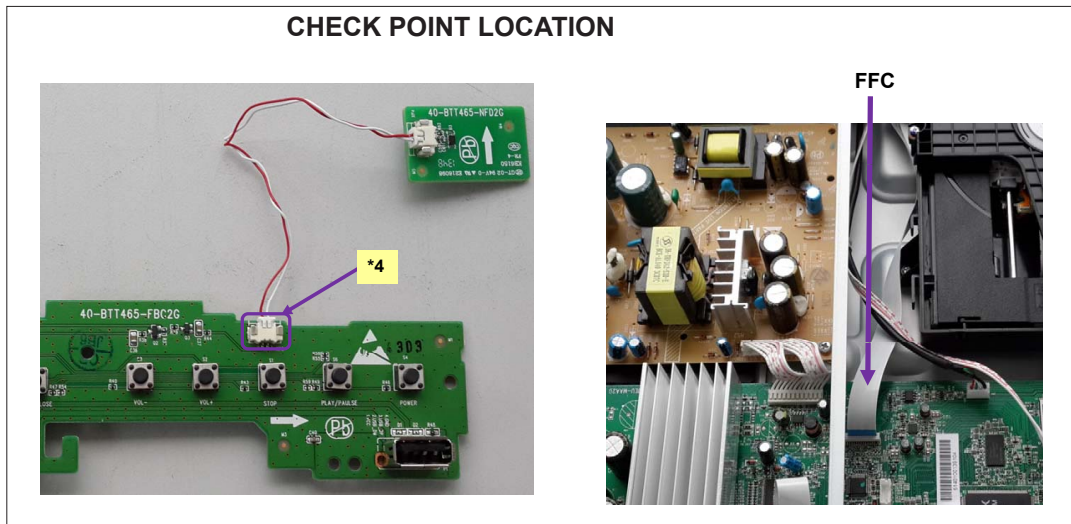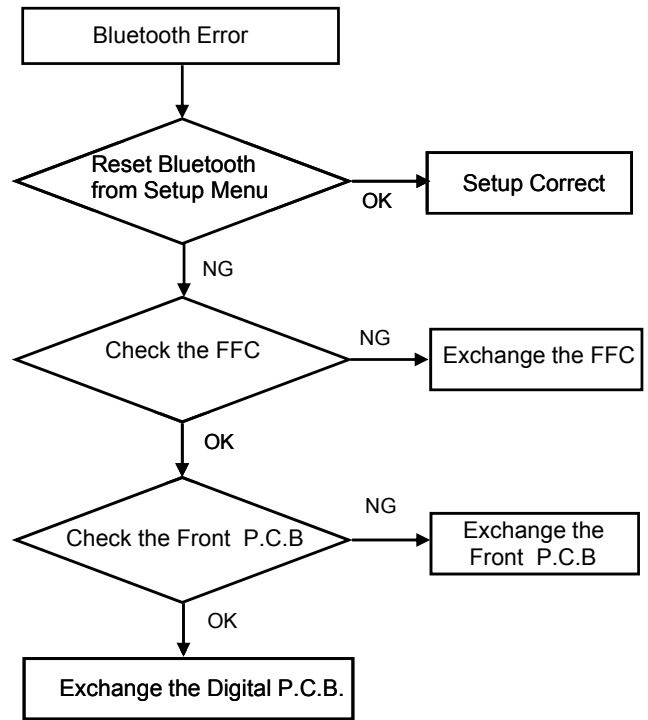**The images from this unit do not appear on the TV.**
Picture is distorted.
Jittering occurs.

➢ An incorrect resolution is selected in "HDMI Resolution". Reset the setting as follows:

① Turn the unit on.
② Press and hold [OK], the yellow button and the blue button on the remote control at the same time for more than 5 seconds.
   −"00rEt" is displayed on the unit's display.
③ Press [▶] (right) repeatedly on the remote control until "04PrG" and "07DC" is displayed on the unit's display.
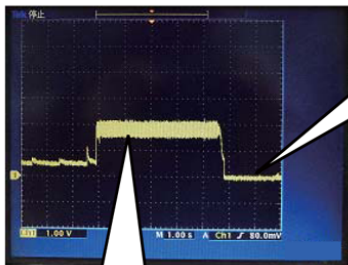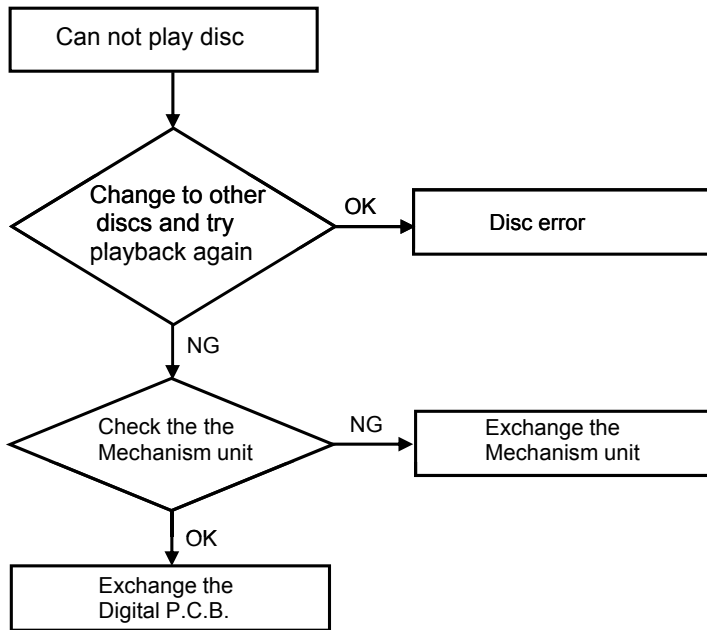④ Press and hold [OK] for at least 5 seconds. Set the item again.

Symptom -7

```
┌─────────────────────┐
│     NFC Error       │
└─────────────────────┘
          │
          ▼
     ╱─────────────╲          ┌──────────────────┐
    ╱ Check the NFC  ╲   NG   │   Exchange the   │
   ╱  P.C.B           ╲──────▶│   NFC P.C.B.     │
   ╲ Front PCB Connetor *4   └──────────────────┘
    ╲ Voltage waveform(*d) ╱
     ╲─────────────╱
          │ OK
          ▼
     ╱─────────────╲          ┌──────────────────┐
    ╱               ╲   NG   │   Exchange the   │
   ╱  Check the FFC  ╲──────▶│   FFC            │
    ╲               ╱        └──────────────────┘
     ╲─────────────╱
          │ OK
          ▼
     ╱─────────────╲          ┌──────────────────┐
    ╱  Check the     ╲   NG   │   Exchange the   │
   ╱   Front P.C.B    ╲──────▶│   Front P.C.B    │
    ╲               ╱        └──────────────────┘
     ╲─────────────╱
          │ OK
          ▼
┌─────────────────────┐
│   Exchange the      │
│   Digital P.C.B.    │
└─────────────────────┘
```

Symptom -8

```
┌─────────────────────┐
│   Bluetooth Error   │
└─────────────────────┘
          │
          ▼
     ╱─────────────╲          ┌──────────────────┐
    ╱  Reset Bluetooth╲  OK   │  Setup Correct   │
   ╱   from Setup Menu ╲─────▶│                  │
    ╲               ╱        └──────────────────┘
     ╲─────────────╱
          │ NG
          ▼
     ╱─────────────╲   NG     ┌──────────────────┐
    ╱  Check the FFC ╲───────▶│ Exchange the FFC │
     ╲─────────────╱          └──────────────────┘
          │ OK
          ▼
     ╱─────────────╲   NG     ┌──────────────────┐
    ╱ Check the Front╲───────▶│   Exchange the   │
     ╲   P.C.B      ╱          │   Front P.C.B    │
     ╲─────────────╱          └──────────────────┘
          │ OK
          ▼
┌─────────────────────┐
│  Exchange the Digital│
│       P.C.B.        │
└─────────────────────┘
```

CHECK POINT LOCATION

FFC

(*d)

Waveform (Pin1: NFC)

The voltage drops when the NFC compatible device is disengaged.

When the NFC compatible device is touched and connection started, the voltage rises up to about 2V.
If the NFC compatible device touches, but the voltage is not changed, the NFC P.C.B. Unit is defected.
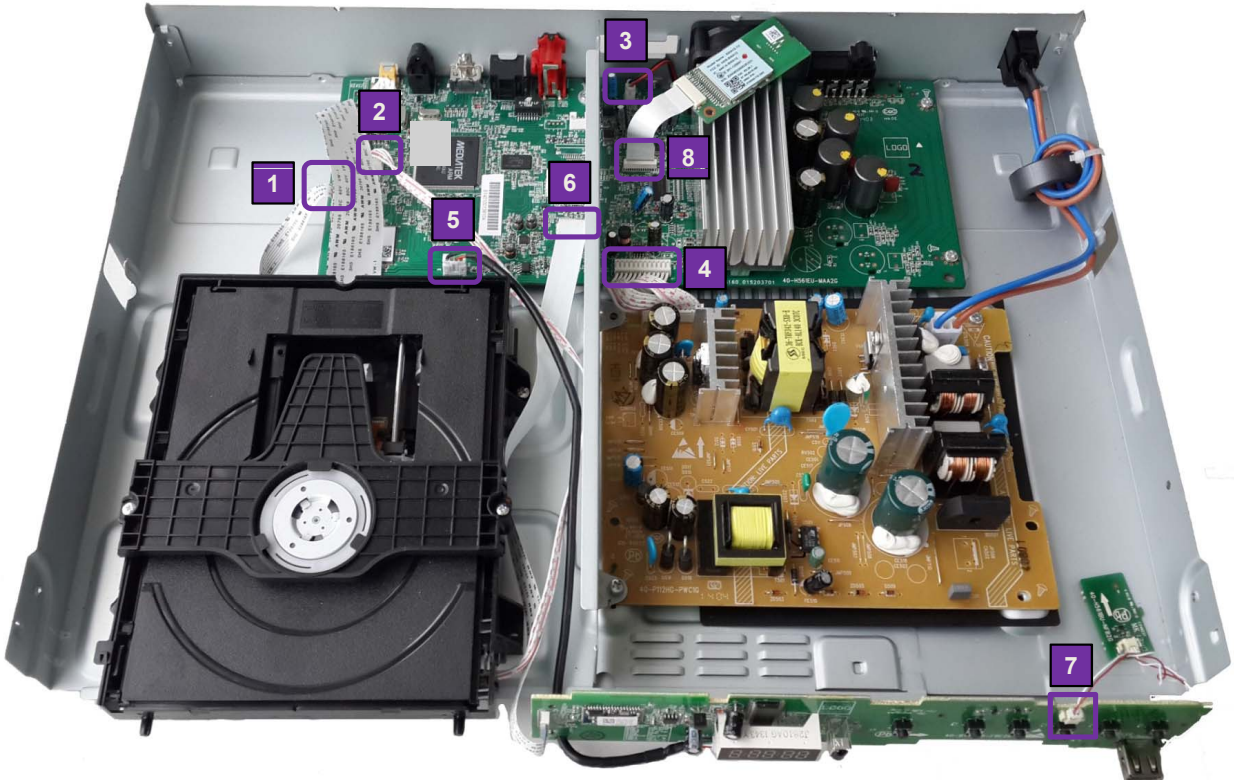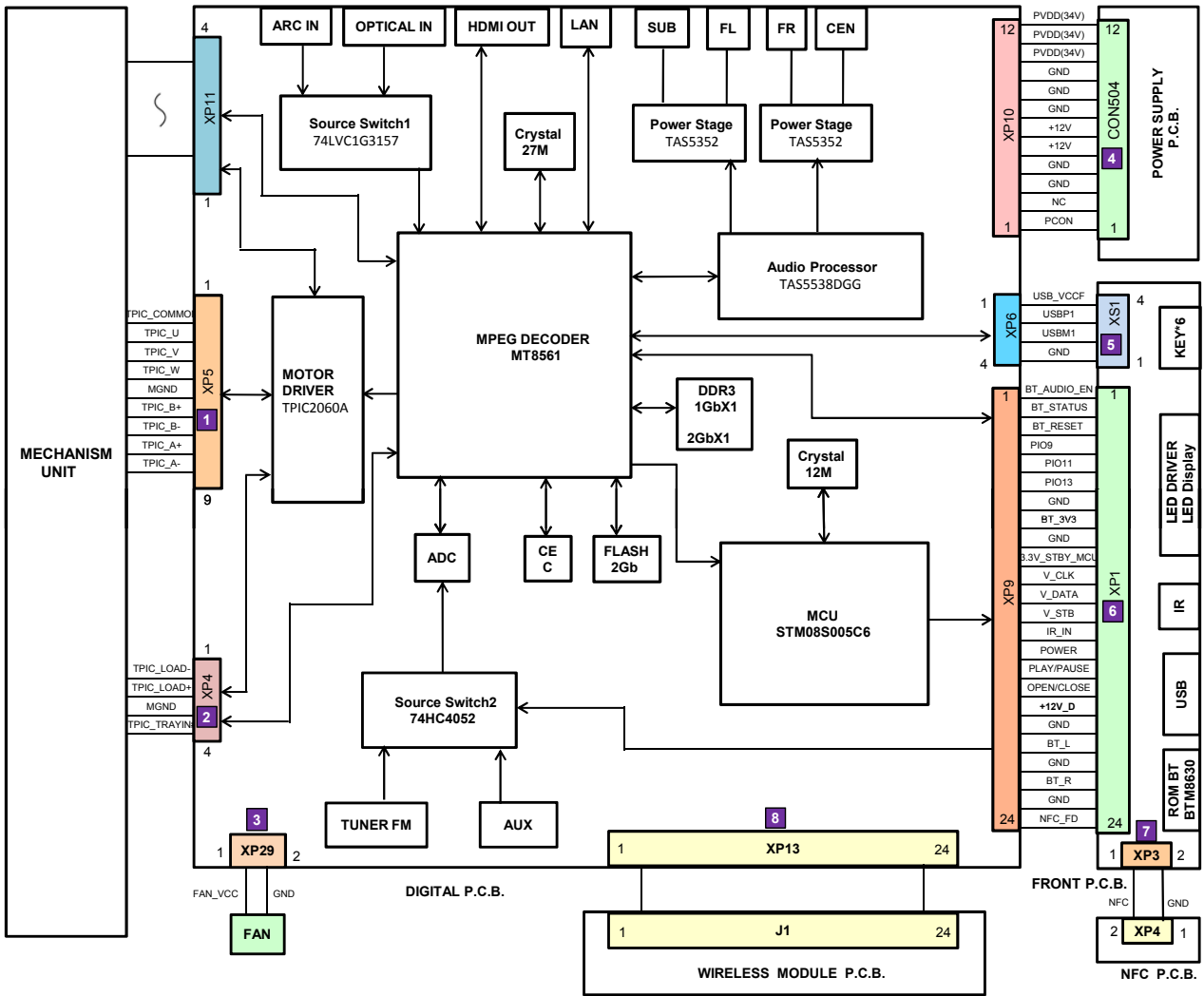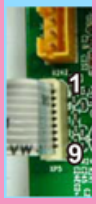
Symptom -9

```
┌─────────────────────┐
│  Can not play disc  │
└─────────────────────┘
           │
           ▼
        ◇ Change to other
          discs and try ───OK──▶ ┌──────────────┐
          playback again │        Disc error    │
        ◇               └──────────────┘
           │ NG
           ▼
        ◇ Check the the ───NG──▶ ┌──────────────┐
          Mechanism unit │        Exchange the  │
        ◇               │        Mechanism unit │
           │ OK          └──────────────┘
           ▼
┌─────────────────────┐
│   Exchange the      │
│   Digital P.C.B.    │
└─────────────────────┘
```

Symptom -10

```
┌─────────────────────┐
│   Fan does not work │
└─────────────────────┘
           │
           ▼
        ◇ Set the VOL to 100 ───OK──▶ ┌──────────────┐
        ◇                  │            Fan is OK     │
           │ NG             └──────────────┘
           ▼
        ◇ Check the voltage of ───OK──▶ ┌──────────────┐
          XP29.1: ≥11V?      │          Exchange the fan │
        ◇                  └──────────────┘
           │ NG
           ▼
┌─────────────────────┐
│   Exchange the      │
│   Digital P.C.B.    │
└─────────────────────┘
```
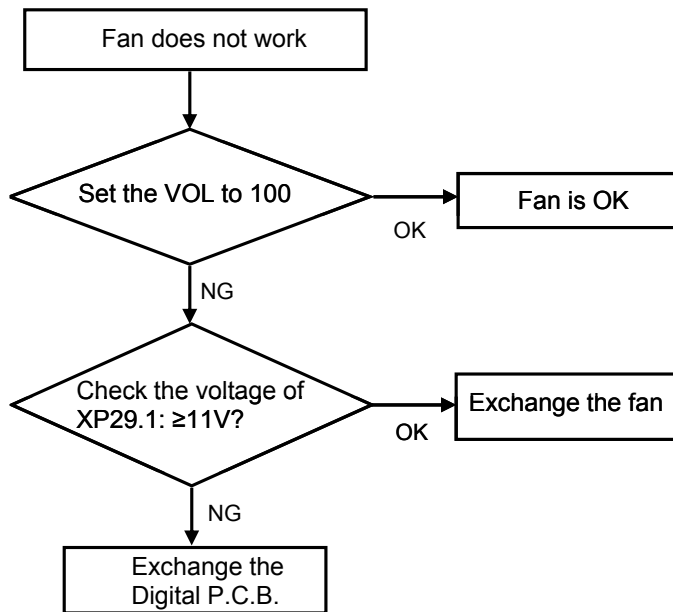
11 Wiring Connection and Voltage Data

Block	Signals
XP11 (4→1)	
ARC IN	
OPTICAL IN	
HDMI OUT	
LAN	
SUB	
FL	
FR	
CEN	

Source Switch1
74LVC1G3157

Crystal
27M

Power Stage
TAS5352

Power Stage
TAS5352

MPEG DECODER
MT8561

Audio Processor
TAS5538DGG

MOTOR
DRIVER
TPIC2060A

DDR3
1GbX1
2GbX1

Crystal
12M

ADC

CEC

FLASH
2Gb

MCU
STM08S005C6

Source Switch2
74HC4052

TUNER FM

AUX

MECHANISM
UNIT

XP5 (1→9)
TPIC_COMMON
TPIC_U
TPIC_V
TPIC_W
MGND
TPIC_B+
TPIC_B-
TPIC_A+
TPIC_A-

XP4 (1→4)
TPIC_LOAD-
TPIC_LOAD+
MGND
TPIC_TRAYIN

XP29 (1→2)
FAN_VCC   GND

FAN

DIGITAL P.C.B.

XP10 (12→1)
PVDD(34V)
PVDD(34V)
PVDD(34V)
GND
GND
GND
+12V
+12V
GND
GND
NC
PCON

CON504 (12→1)
POWER SUPPLY P.C.B.

XP6 (1→4) / **XS1 (4→1)**
USB_VCCF
USBP1
USBM1
GND
KEY*6

XP9 (1→24) / **XP1 (1→24)**
BT_AUDIO_EN
BT_STATUS
BT_RESET
PIO9
PIO11
PIO13
GND
BT_3V3
GND
3.3V_STBY_MCU
V_CLK
V_DATA
V_STB
IR_IN
POWER
PLAY/PAUSE
OPEN/CLOSE
+12V_D
GND
BT_L
GND
BT_R
GND
NFC_FD

LED DRIVER
LED Display

IR

USB

ROM BT
BTM8630

FRONT P.C.B.

XP3 (1→2)
NFC   GND

XP4 (2→1) NFC P.C.B.

XP13 (1→24)

J1 (1→24)
WIRELESS MODULE P.C.B.

32

VOLTAGE DATA (measurement value)

1 XP5	PIN NO.	VALUE
	1	-
	2	-
	3	-
	4	-
	5	GND
	6	-
	7	-
	8	-
	9	-

2 XP4	PIN NO.	VALUE
	1	5.3V
	2	3.5V
	3	GND
	4	(See Fig. 1)

3 XP29	PIN NO.	VALUE
	1	11.0V
	2	GND

8 XP13	PIN NO.	VALUE
	1	5.1V
	2	5.1V
	3	-
	4	-
	5	-
	6	-
	7	-
	8	-
	9	-
	10	-
	11	-
	12	GND
	13	-
	14	-
	15	-
	16	-
	17	-
	18	-
	19	-
	20	-
	21	-
	22	-
	23	-
	24	GND

4 XP10	PIN NO.	VALUE
	1	(See Fig. 2)
	2	NC
	3	GND
	4	GND
	5	11.9V
	6	11.9V
	7	GND
	8	GND
	9	GND
	10	34.0V
	11	34.0V
	12	34.0V

5 XP6	PIN NO.	VALUE
	1	5.1V
	2	0V
	3	0V
	4	GND

7 XP3	PIN NO.	VALUE
	1	(See Fig. 3)
	2	GND

6 XP9	PIN NO.	VALUE
	1	3.4V
	2	3.4V
	3	1.7V
	4	-
	5	-
	6	-
	7	GND
	8	3.4V
	9	GND
	10	3.4V
	11	0V
	12	0V
	13	3.3V
	14	3.4V
	15	3.4V
	16	3.4V
	17	3.4V
	18	11.9V
	19	GND
	20	-
	21	GND
	22	-
	23	GND
	24	-

(Fig.1) — When tray open.

(Fig.2) — Power off. Power on.

(Fig.3)
- The voltage rises and/or drops when the NFC compatible device is approached.
- The voltage rises up to 2V when the NFC compatible device is touched and connection started.
- The voltage drops when the NFC compatible device is disengaged.
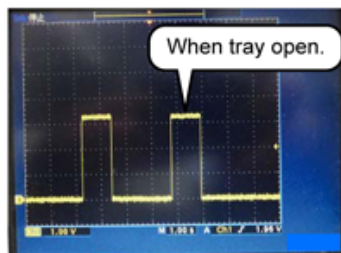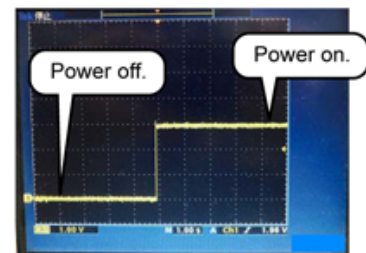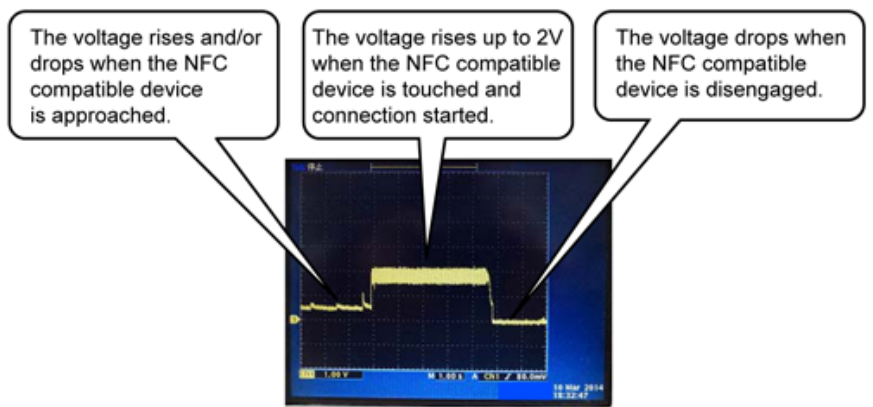
12 Disassembly and Assembly Instructions

12.1. Disassembly Flow Chart

The following chart is the procedure of disassembling the casing and inside parts for internal inspection when carrying out the servicing.
To assemble the unit, reverse the steps shown in the chart below.

```
┌─────────────────────┐
│ 1. Top  Panel       │
└─────────────────────┘
     │         │                              │
     ▼         ▼                              ▼
┌──────────────────┐  ┌──────────────────────┐  ┌──────────────────┐
│ 2 . Front Panel  │  │ 6. Wireless Module   │  │ 9.  AC Inlet Unit│
│     Unit         │  │    P.C.B./           │  │                  │
│                  │  │    Fan Motor Unit    │  │                  │
└──────────────────┘  └──────────────────────┘  └──────────────────┘
     │       │                       │
     ▼       ▼                       ▼
     │  ┌──────────────────────┐  ┌──────────────────┐
     │  │ 3. Front P.C.B.      │  │ 8. Mechanism Unit│
     │  │    Unit/NFC P.C.B.   │  │                  │
     │  └──────────────────────┘  └──────────────────┘
     ▼
┌─────────────────────┐
│ 4 . Body Chassis    │
└─────────────────────┘
     │
     ▼
┌─────────────────────┐
│ 5.  Power Supply    │
│     P.C.B.          │
└─────────────────────┘
     │
     ▼
┌─────────────────────┐
│ 7.  Digital P.C.B.  │
│     Unit            │
└─────────────────────┘
```

12.2.   P.C.B. Positions

34
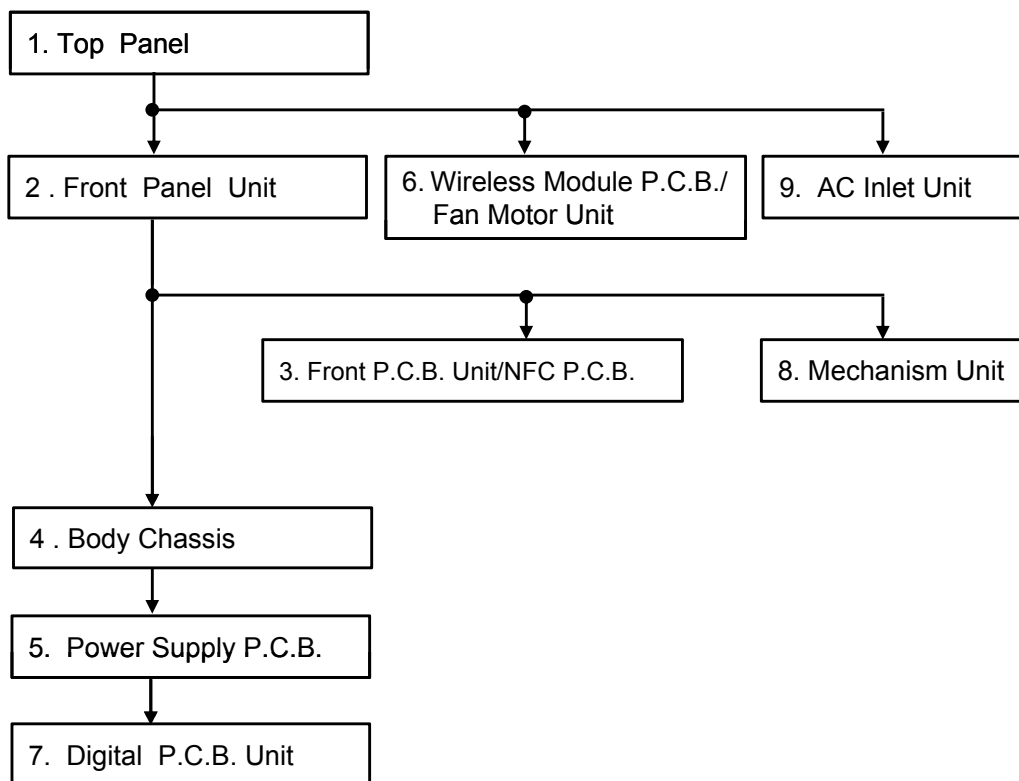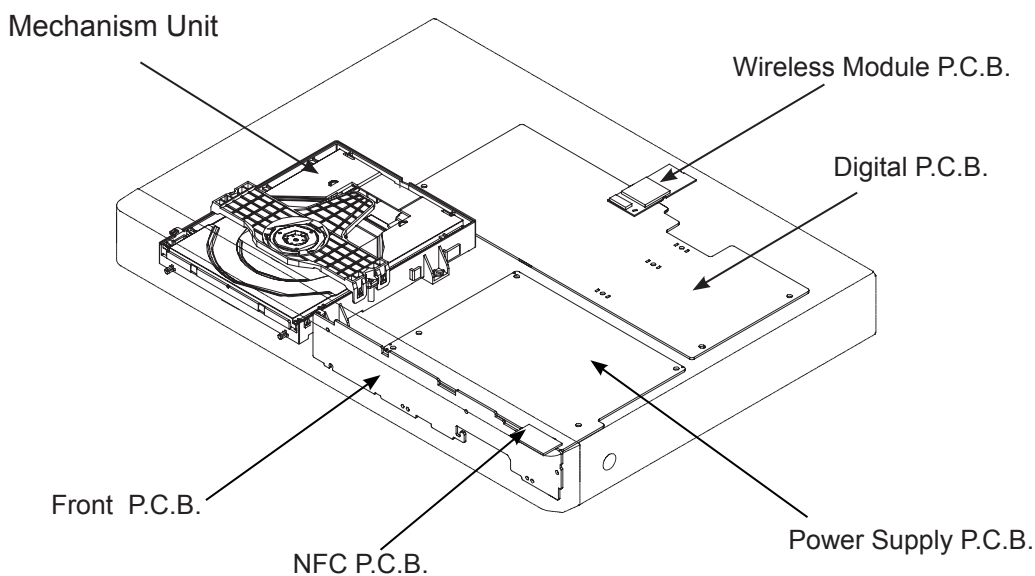
12.3. Disassembly Procedure

12.3.1. Top Panel

1. Remove 6 Screws (A).
2. Open the both ends at the rear side of the Top Panel in the direction of arrow (1), then pull up the top panel in the direction of arrow (2) to remove it.
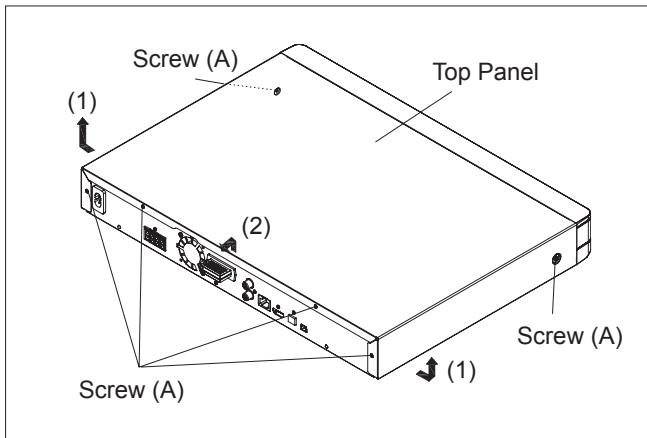
12.3.2. Front Panel Unit

12.3.2.1. Tray Ornament

1. Insert paper clips, etc. into the hole on the unit bottom, then slide the gear in the direction of arrow (1) to eject the tray slightly.
2. Unlock 2 tabs.
3. Pull the Tray Ornament in direction of arrow (2).
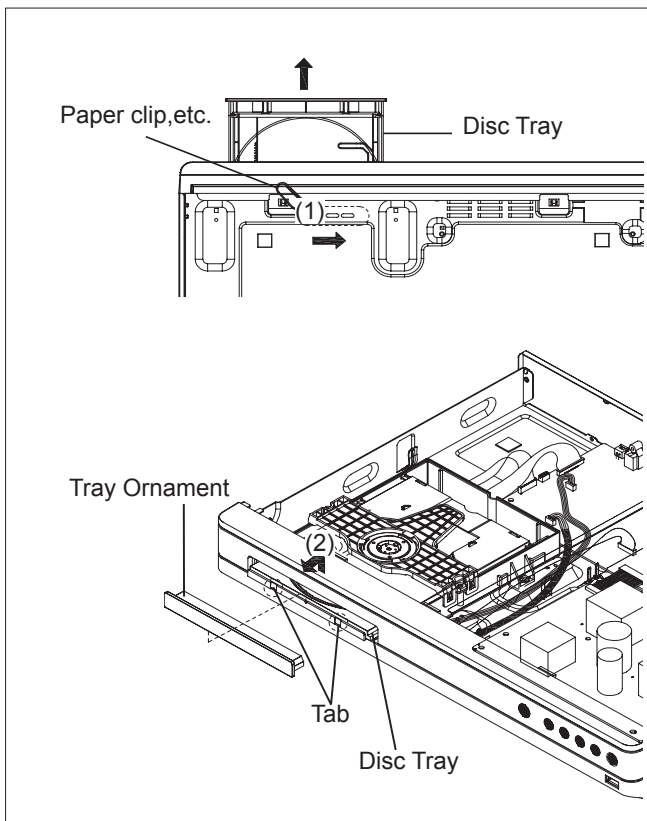
12.3.2.2. Front Panel Unit

1. Disconnect the connector (A) and FFC cable.
2. Unlock 5 tabs (A) - (E) turn.
3. Pull the Front Panel in the direction of your side.
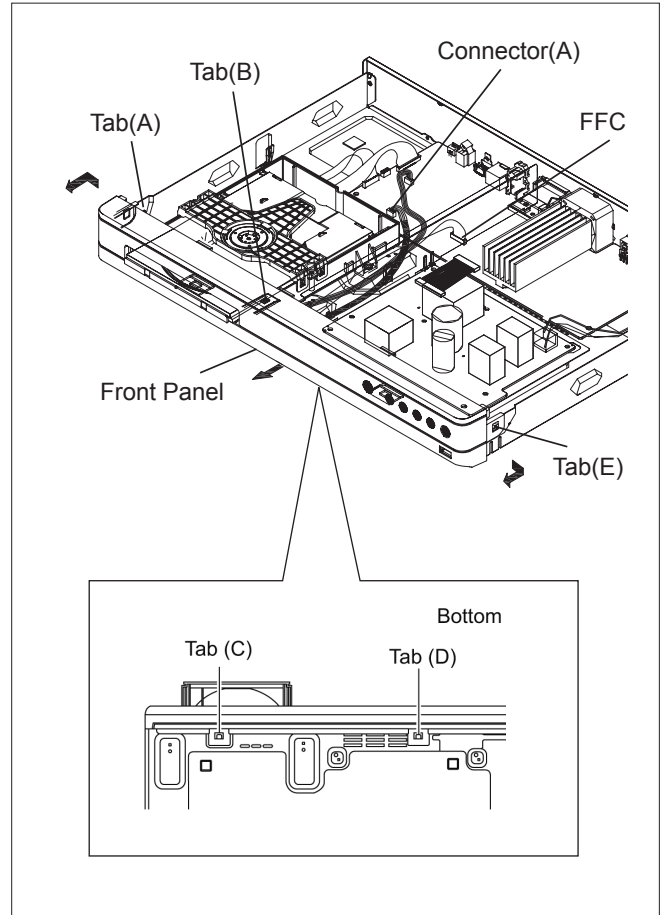
12.3.3. Front P.C.B.Unit and NFC P.C.B Unit

1. Remove the 5 Screws (A).
2. Remove the 2 Metal Plates .
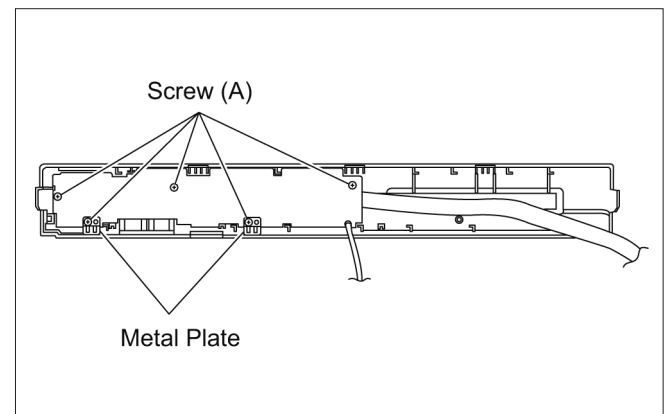
3. Pull out the Front P.C.B. Unit, then remove the connector (A).

4. Pull out the NFC P.C.B. Unit..

Connector (A)

Front P.C.B. Unit

NFC P.C.B. Unit

Thin brade driver, etc.
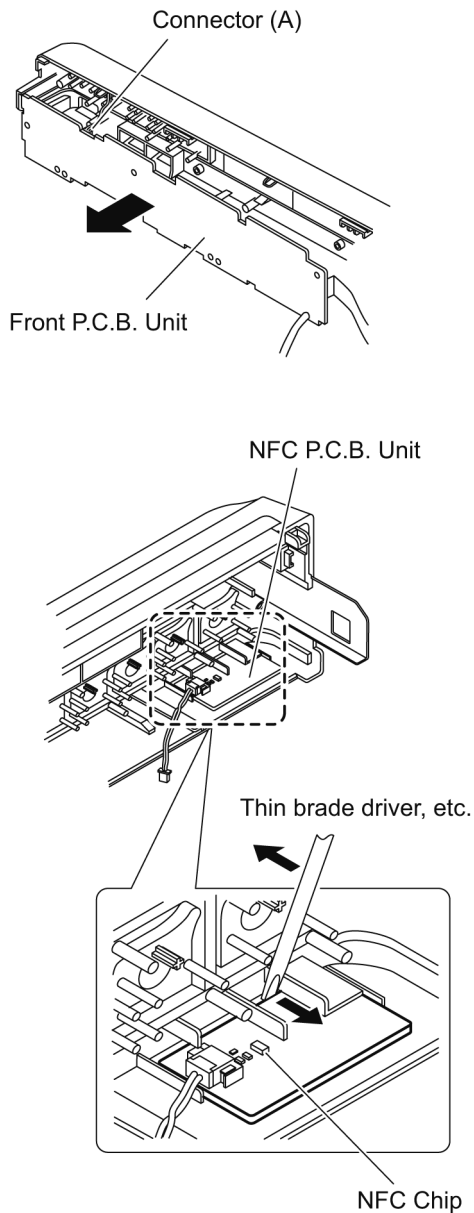
NFC Chip

NOTE: (When Removing)
• When attaching the tip of driver, take care
  not to damage onboard devices (NFC chip, etc.)
  and board patterns of the NFC P.C.B. Unit.

12.3.4. Body Chassis

1. Detach the lead wires fixed at hooking part of the Body
   Chassis.
2. Remove 3 Screws (A) to remove the Body Chassis

Screw (A)

Body Chassis

Screw (A)

Hooking part
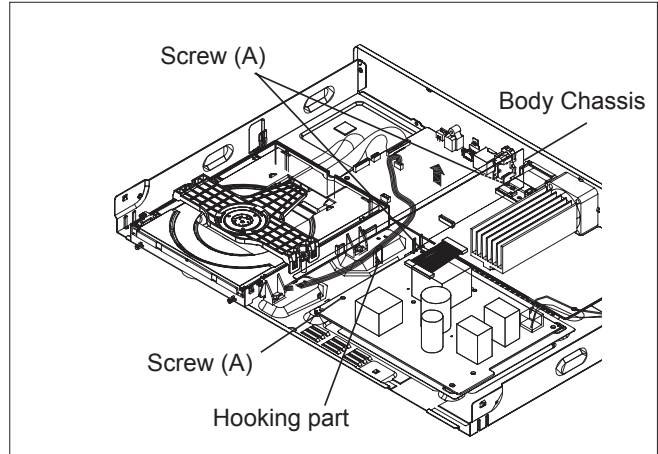
12.3.5. Power Supply P.C.B.Unit

1. Disconnect the connector (A) and connect (B).
2. Remove the 2 screws (A), then remove the Power
   Supply P.C.B. Unit.

Connector (A)

Connector (B)

Power Supply P.C.B.
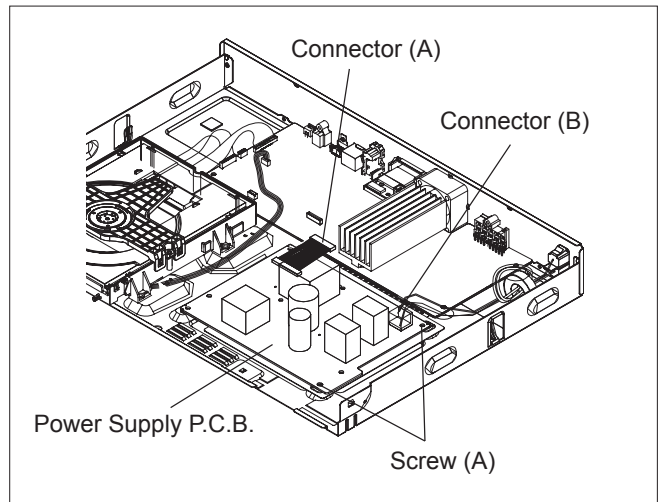
Screw (A)

12.3.6. Wireless Module P.C.B Unit/Fan Motor Unit

1. Remove 1 Screw (A) and disconnect FFC cabel to remove Wireless Module P.C.B..
2. Press tab (A) on the Wireless Module P.C.B Bracket simultaneously in the direction of arrows(2) to pull the Wireless Module P.C.B Bracket out from the Back Panel.
3. Remove 2 Screws (B) and disconnect connector (A) .
4. Then remove the Fan Motor Unit in directon of (1).
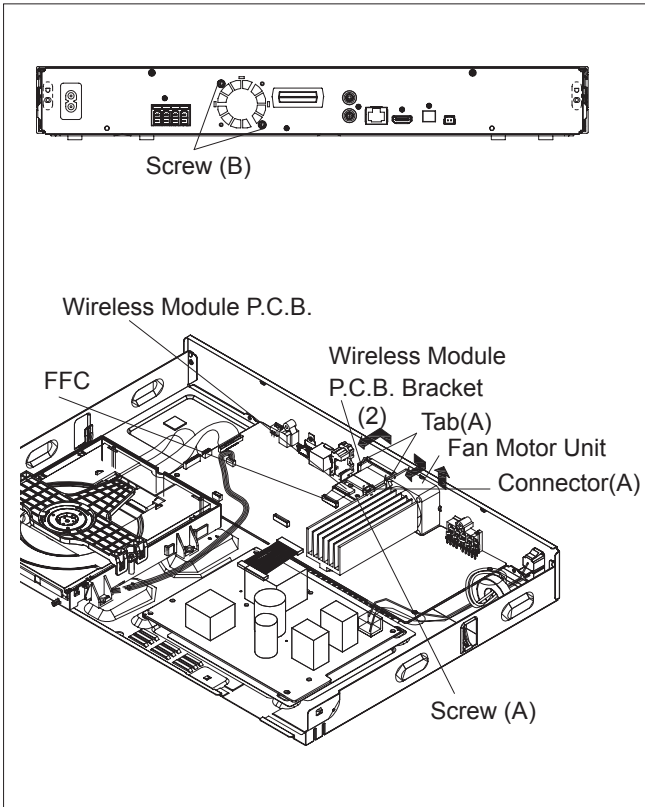
12.3.7. Digital P.C.B.Unit

> **Caution:**
>
> If the Digital P.C.B. Unit and/or Mechanism Unit is exchanged,the drive adjustment is required because of the adjustment data is stored in Digital P.C.B.Unit. Perform the driver adjustment accordance with "13.1. When Replacing the Mechanism Unit and/or Digital P.C.B.Unit".

1. Remove the 4 Screws (A).and Screw (B).
2. Disconnect 2 FFC cabels and connector (A) .
3. Remove the FFC (B), and isolate it with an ESD prevention bag (RPFC0114).
4. Remove the 3 Screws (C) to remove it.
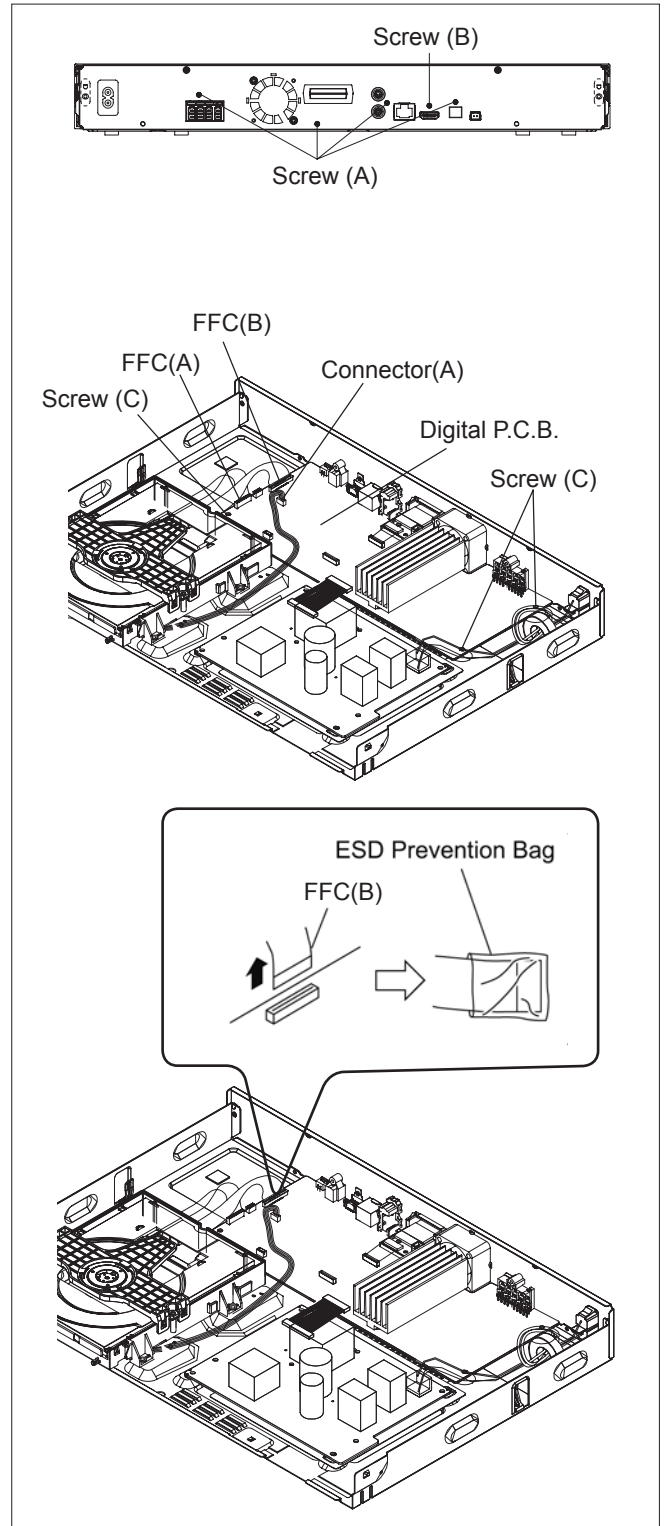
12.3.8. Mechanism Unit

Caution:

If the Digital P.C.B. Unit and/or Mechanism Unit is exchanged,the drive adjustment is required because of the adjustment data is stored in Digital P.C.B.Unit. Perform the driver adjustment accordance with "13.1. When Replacing the Mechanism Unit and/or Digital P.C.B.Unit".

1.Remove the 2 screws (A) then remove the Mechanism Unit.
  (When assembling, first set the Mechanism unit to tabs (A) then tighten the 2 screws (A).
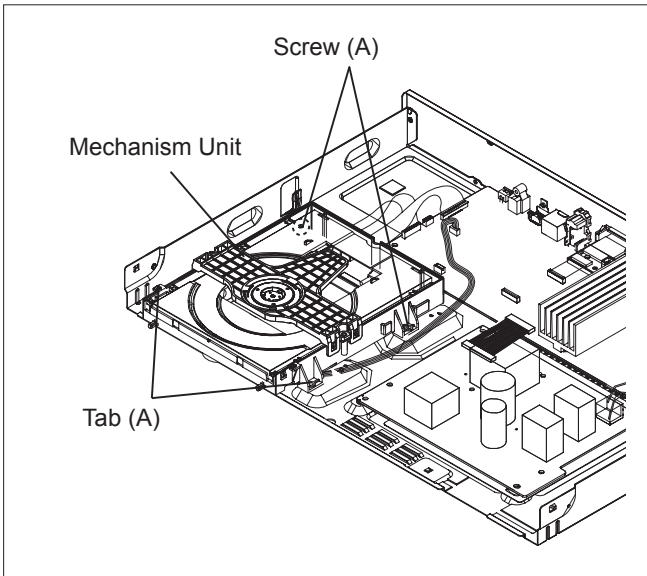
12.3.9. AC Inlet Unit

1.Cut the cable tie.
2.Detach the lead wires fixed at hooking part.
3.Remove the Ferrite Core from the cable.
4.Press tab (A) on the AC cord connector simultaneously in the direction of arrows to pull the AC cord out from the Back Panel.
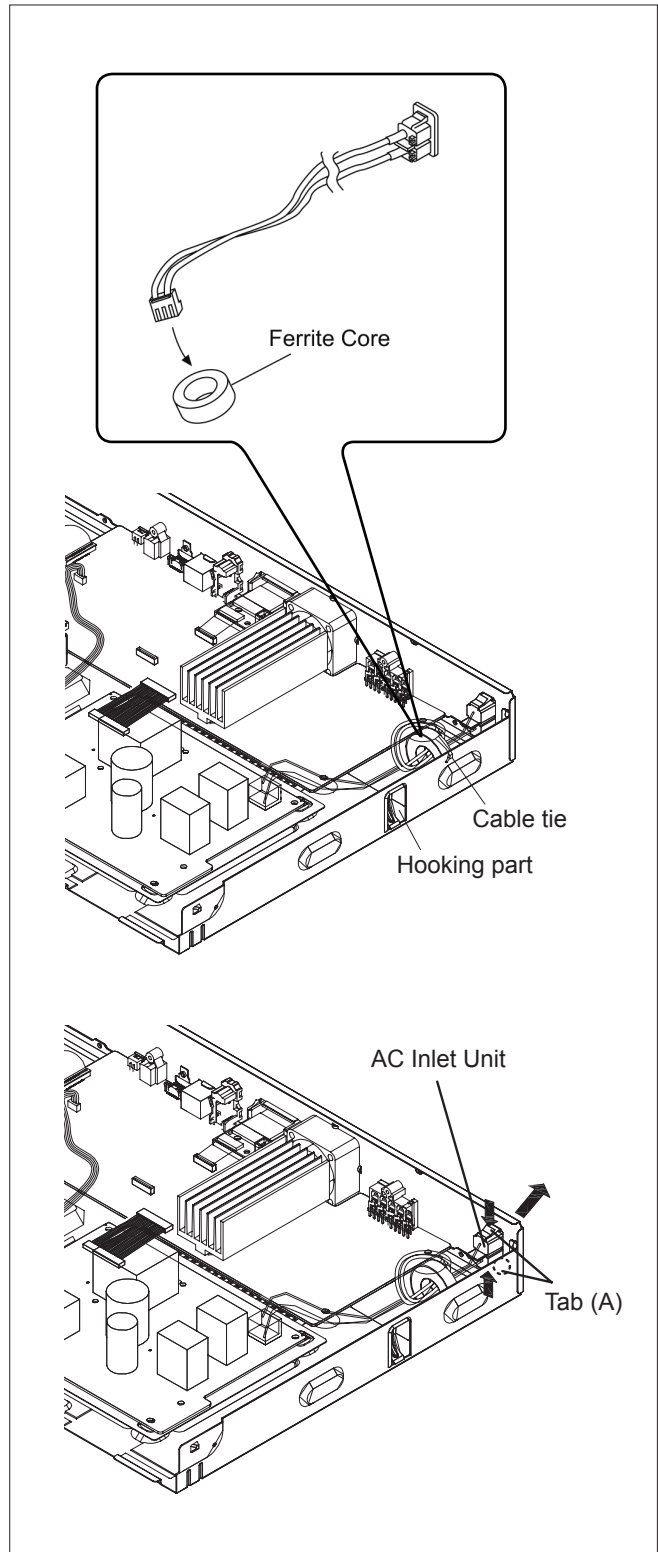
13 Measurements and Adjustments

13.1. When Replacing the Mechanism Unit and/or Digital P.C.B. Unit

When replacing the mechanism unit, Digital P.C.B. Unit or both, the drive adjustment is required. The adjustment is performs reading QR coded adjustment value by web camera and writing the value to Digital P.C.B. Unit.

> **There are 2 method for adjustment value writing:**
>
> (1) Using PC: ⇨ "Using PC Method"
>
>   Set the adjustment value to memory on the Digital P.C.B.Unit using <u>writing software on PC.</u>
>
> (2) Using Remote Control (supplied with the unit): ⇨ "Using Remote Control Method".
>
>   Set the adjustment value to memory on the Digital P.C.B.Unit using <u>the Remote Control.</u>

13.1.1. List of Service Tools

13.1.1.1. Adjustment/Inspection Tools for Using PC method

No.	Part No.	Uses	Pcs	Compatibility
1	RFKZ0139	Serial Card (PC - Main Unit) (for using PC method)	1	Same as previous model
2	RFKZ0602	Conversion Cable (6P - 4P Connector) (for using PC method)	1	Same as previous model

*The above parts are supplied by AVC-CSC-SPC.

13.1.1.2. Commercial Tools Required for both methods

| No.	Part No.	Uses	Pcs	Compatibility
1	-	PC	1	-
2	-	Web camera (For reading the QR code label pasted to the back of the mechanism unit) Recommended Web camera: Logitech Webcam C200 (The same camera as using to read QR code of Mountbox unit for DSLM(Digital Single Lens Mirrorless))	1	• Web camera of 300,000 pixels or more that closeup photography is possible up to several centimeters (It is enough usually by 300,000 pixels). The focus function recommends manual. • It recognizes it automatically only by the connection to PC. Web Camera for USB video class (UVC) that doesn't need special device driver. A lot of marketed commodities correspond to the USB video class.

13.1.1.3. Preparation

Before starting the adjustment, install the software for adjustment (QR code reading software for Web camera and the software for the code writing to Digital P.C.B.).
**Note:**
 The adjustment software can be downloaded from "Support Information from NWBG/VDBG-AVC" web-site in"TSN system",together with instructions of "Adjustment Software" including preparations and connections etc.

13.1.2. Using PC method

1. Set the serial card (RFKZ0139) switch to "OFF" position, then connect to PC's serial port.
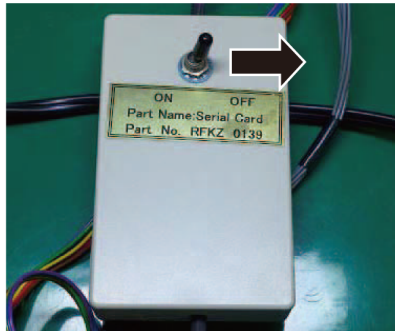
2. Connect the web camera to PC.
3. Connect the serial card to 4-pin serial port connector on the Digital P.C.B. Unit via 6p-4p conversion cable (RFKZ0602).

4-pin Serial Port Connector

6p-4p Conversion Cable (RFKZ0602)
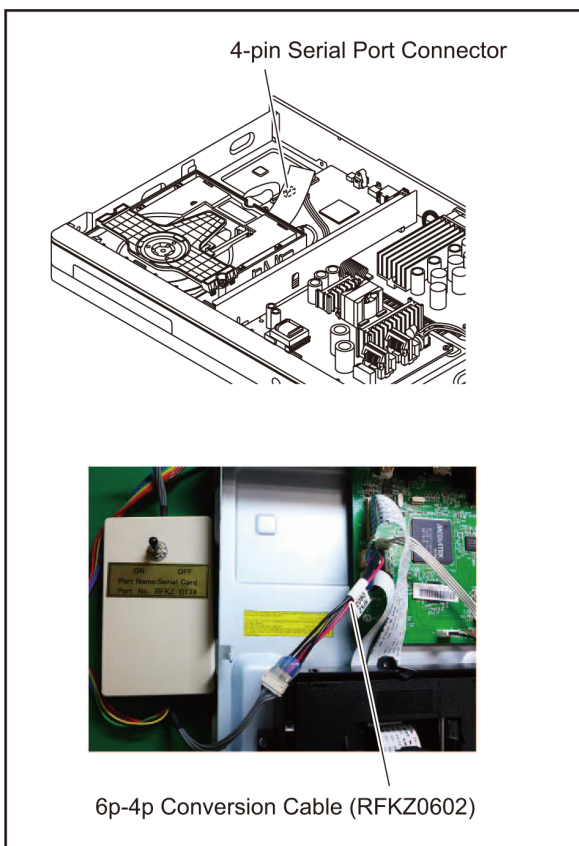
4. Click file name (Rpower_2.9.71(KEM480)_for Pana) and Execute Adjustment Software (FERpower.exe) on PC.

Name	Date modified	Type	Size
2E.dat	2/11/2014 10:54 A...	dat files	1 KB
cfg.ini	10/24/2013 3:53 PM	Configuration setti...	10 KB
cfg.ini.bak	10/24/2013 3:41 PM	BAK File	10 KB
Config.ini	2/11/2014 10:54 A...	Configuration setti...	1 KB
E0.dat	2/11/2014 10:54 A...	dat files	1 KB
example_barcode_for_Pana.txt	9/18/2012 4:45 PM	Text Document	1 KB
FERpower.exe	10/24/2013 4:52 PM	Application	901 KB
log.hex	2/11/2014 10:53 A...	HEX File	0 KB
opu.txt	2/11/2014 10:54 A...	Text Document	1 KB
Sony_KEM460.ini	10/23/2013 3:54 PM	Configuration setti...	12 KB
Sony_KEM470.ini	10/23/2013 3:52 PM	Configuration setti...	12 KB
Sony_KEM480.ini	10/24/2013 4:56 PM	Configuration setti...	11 KB

5. Set ComPort matching to the available PC Port No..

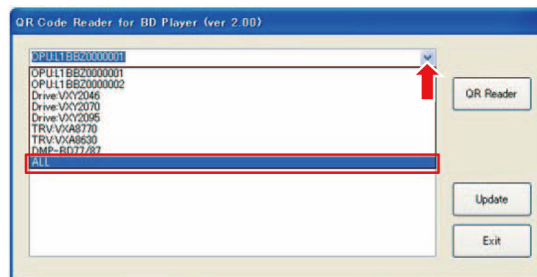Select ComPort No. that the serial card (RFKZ0139) is connected to.
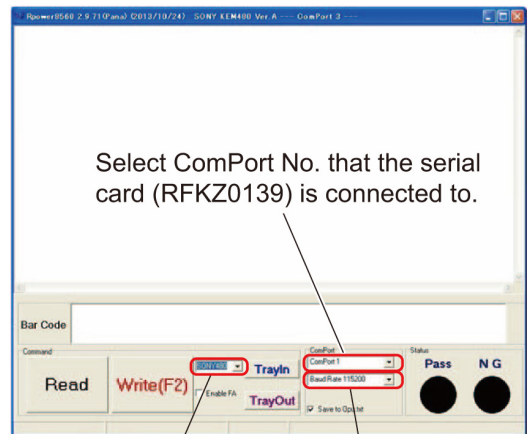
SONY 480 (Default)
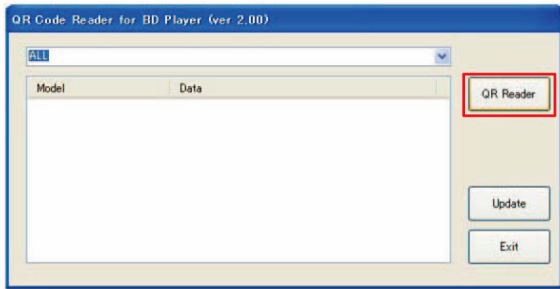
Baud Rate 115200 (Default)

6. Execute QR Reader software.

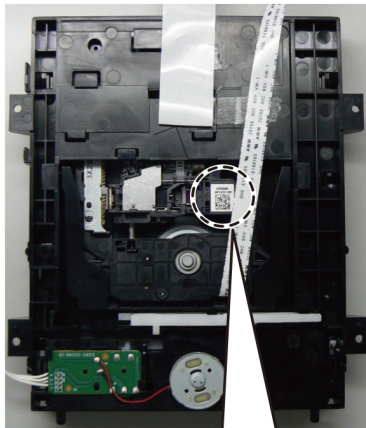7. After staring up, select "ALL" from the pull-down menu.
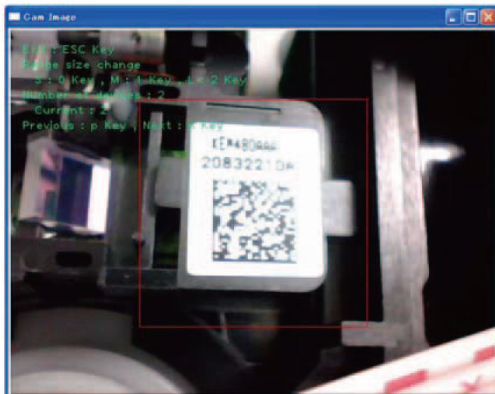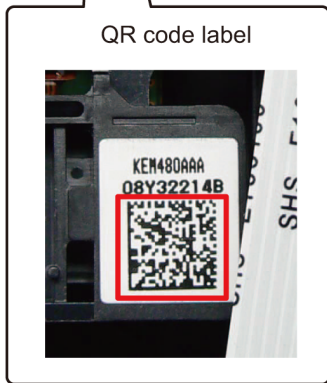

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8. Click "QR Reader" button.

9. Read QR code on the Mechanism Unit bottom side.

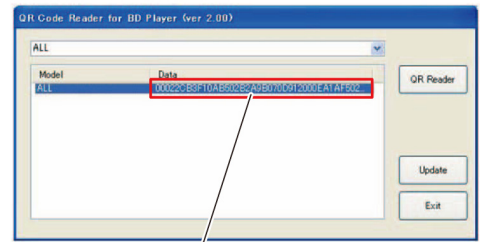Bottom side of the Mechanism Unit
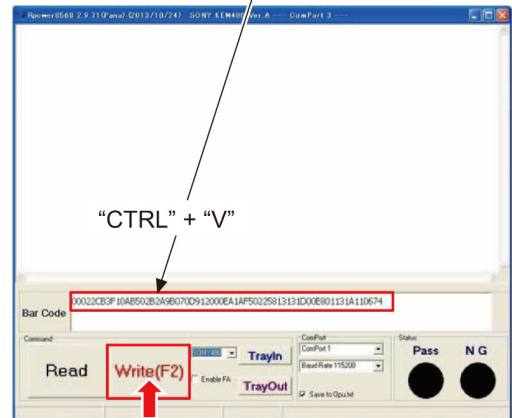

QR code label

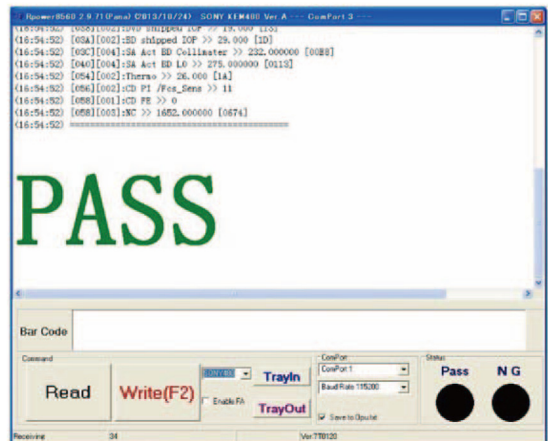KEM480AAA
08Y32214B

10. Turn on the Main Unit.
11. Select QR code and copy by using "CTRL" + "C" and then paste to "Bar Code" field by using "CTRL" + "V". Then click "Write (F2)" button.
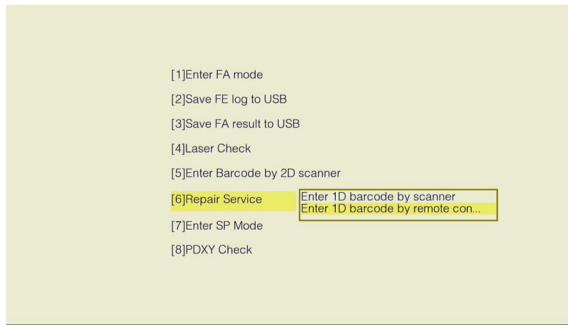

"CTRL" + "V"

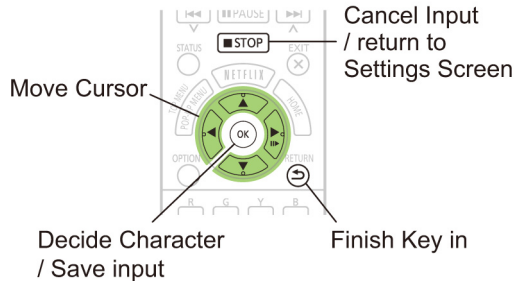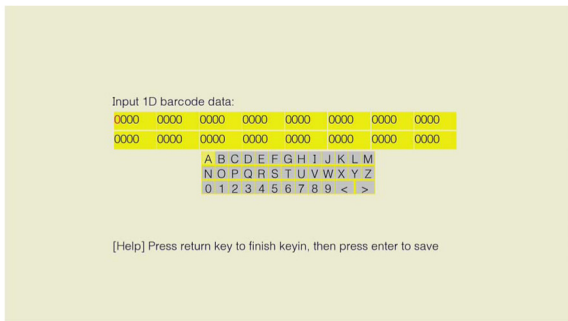12. Check "PASS" is lit green, then it's OK. ("PASS" is displayed about 1 second. Don't miss "PASS" display.)

PASS

13. NG example (NG is lit red)
    • ComPort setting is wrong.
      (ComPort No. selection is wrong and/or Baud Rate selection is wrong.)

NG is displayed.

Set correct ComPort No.

NG lit red.

Set correct Baud Rate.

14. NG example (NG is lit red)
    • Main unit is not turned on.

NG is displayed.

NG lit red.

15. Set correct settings and start over the adjustment.
16. "PASS" is displayed, then turns the Main Unit OFF then ON. The drive adjustment is completed.

13.1.3.   Using Remote control Method

• Perform the Step 6 to Step 10 of "13.1.2. Using PC Method" to read QR code of Mechanism Unit. Or read QR code using smartphone's QR code reader.

Enter this reading results using the remote control and perform drive adjustment.

1. Connect the Main Unit to TV, then turn the Main Unit on.
2. After start up, make the Main Unit go to the Setting UI using Remote Control.

3. Press "5" "1" "7" "7" "OK" key of Remote Control, the FA mode screen is displayed.

4. Press down cursor key of Remote Control 5 times to select "[6] Repair Service", then press "OK" key.

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5. Press cursor key to select "Enter 1D barcode by remotecon...", then press "OK" key.

[1]Enter FA mode
[2]Save FE log to USB
[3]Save FA result to USB
[4]Laser Check
[5]Enter Barcode by 2D scanner
[6]Repair Service   Enter 1D barcode by scanner
                     Enter 1D barcode by remote con...
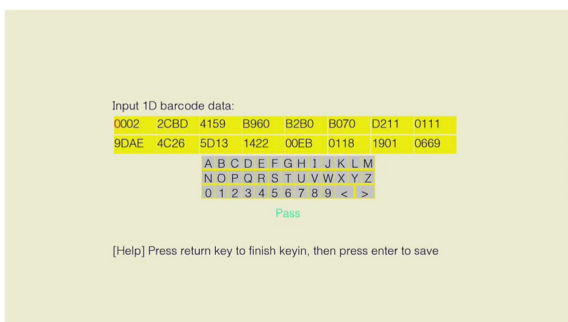[7]Enter SP Mode
[8]PDXY Check

6. "Input 1D barcode data" screen is displayed. Pressing cursor key to select character, then pressing "OK" key to decide and enter selected character.
   If entering 64 character of barcode finished, press "RETURN" key to finish key in, then press "OK" key to save inputs.
   • To Cancel Adjustment / Return to Settings Screen: Press "STOP" key.

Input 1D barcode data:
0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000
          A B C D E F G H I J K L M
          N O P Q R S T U V W X Y Z
          0 1 2 3 4 5 6 7 8 9 < >

[Help] Press return key to finish keyin, then press enter to save

Cancel Input / return to Settings Screen

Move Cursor

Decide Character / Save input

Finish Key in

7. When the drive adjustment is completed, "Pass" is displayed. Press "STOP" key twice, the screen is return to Settings screen.

Input 1D barcode data:
0002 2CBD 4159 B960 B2B0 B070 D211 0111
9DAE 4C26 5D13 1422 00EB 0118 1901 0669
          A B C D E F G H I J K L M
          N O P Q R S T U V W X Y Z
          0 1 2 3 4 5 6 7 8 9 < >
                    Pass

[Help] Press return key to finish keyin, then press enter to save

• If the drive adjustment is failed, "Fail" is displayed.

Fail

13.2. When replacing the Front P.C.B. Unit and/or NFC P.C.B. Unit

When replacing the Front P.C.B. Unit, NFC P.C.B. Unit or both, the MAC address of bluetooth module on Front P.C.B. Unit registration to NFC tag on NFC P.C.B. Unit. Perform the following procedures to register.
(In this manual, the screenshots are using of Android 4.4.2..The display may vary depending on the version of Android.)

13.2.1. List of Service Tools

13.2.1.1. Commercial Tools Required

No.	Part No.	Uses	Pcs.	Compatibility
1	-	NFC compatible Android device	1	Android 4.1 or higher

13.3.1.2. Tag writer Software Installation

Preparation:
Download NFC tag writer software (TCL BT TAG writerV1.4.apk) from "Support Information from NWBG/ VDBG-AVC" web-site in "TSN system", then send it to NFC compatible Android device. You can send it as an attachment by email or other methods.
1. Open the [Settings] screen of the Android device, then tap [Security] to open the [Security] screen.
2. Check the ☐ of [Unknown sources].

3. When below confirming information appears, tap [OK]. Make sure the [Unknown sources] being checked.
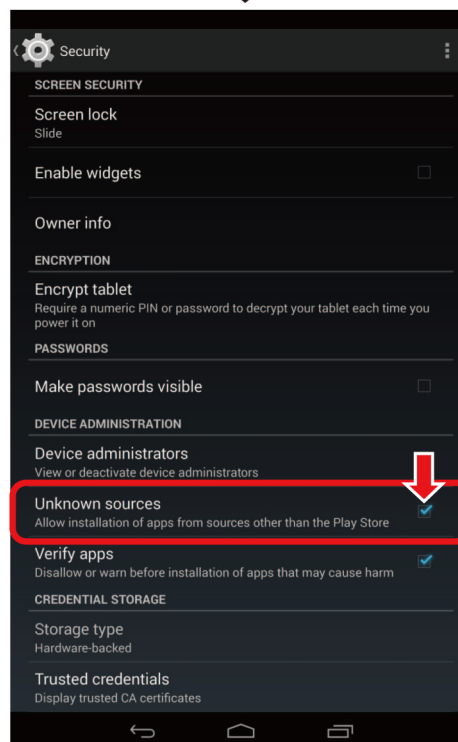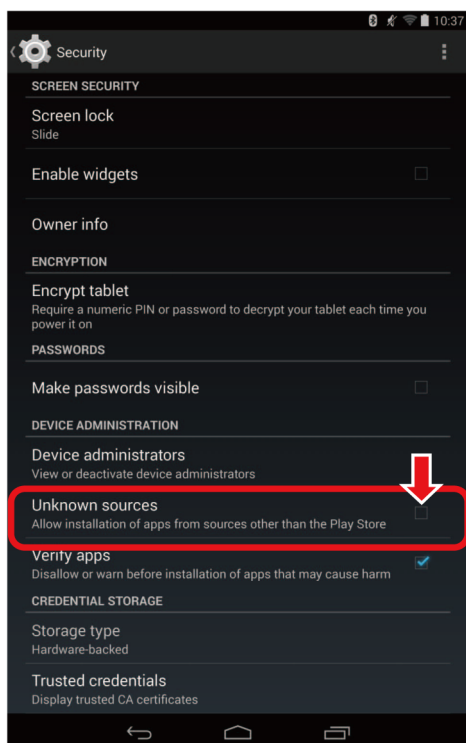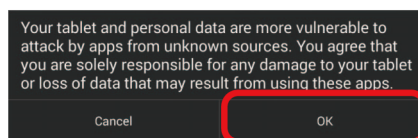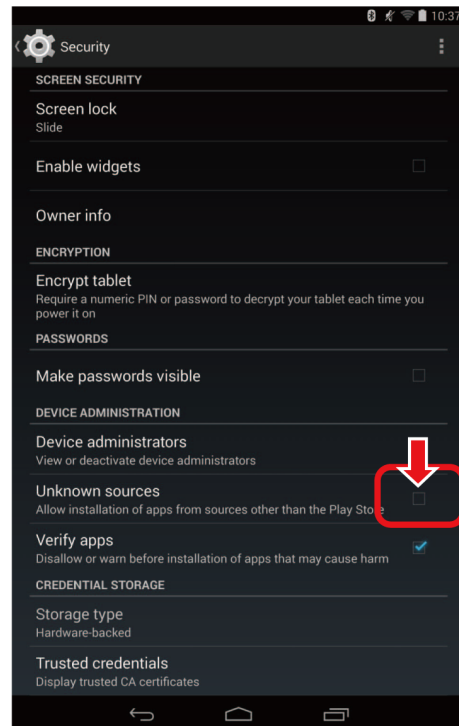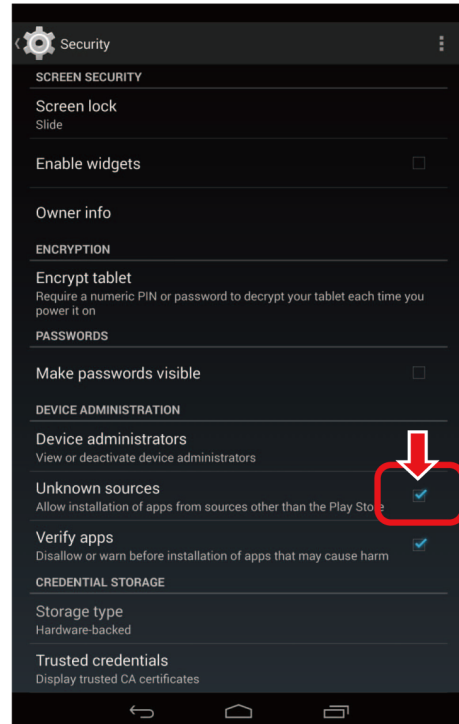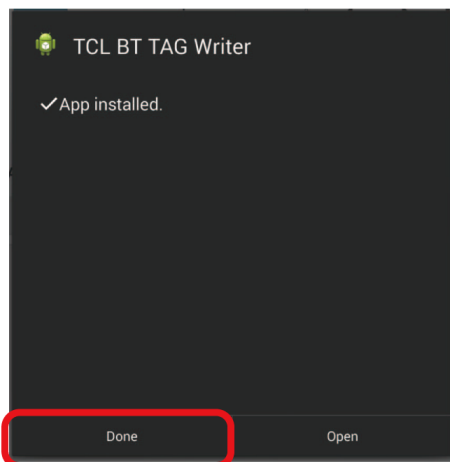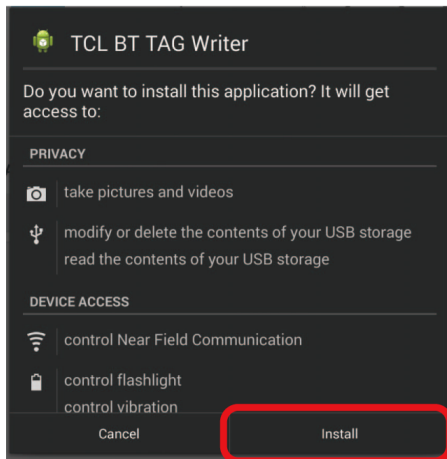
4. Tap the "TCL BT TAG writer V1.4.apk" your Android device has received.

TCL BT TAG writer V1.4.apk

5. Tap [Install], then tap [Done].
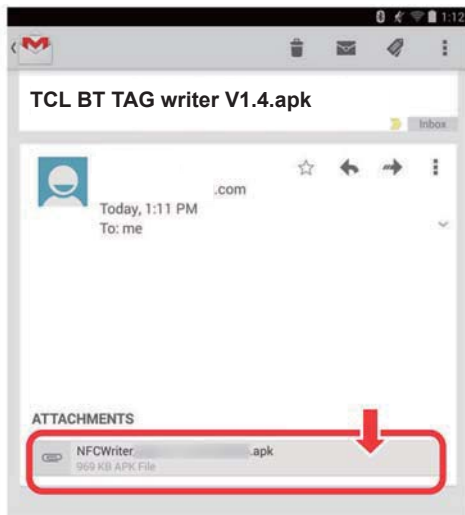
6. When the installation is finished, below icon will appear on the Android device.

TCL BT TAG Writer

7. Open the [setting] screen again. Tap [Security] to open the [security] screen.
8. Tap the ☑ of [Unknown sources] to cancel the checkmark.
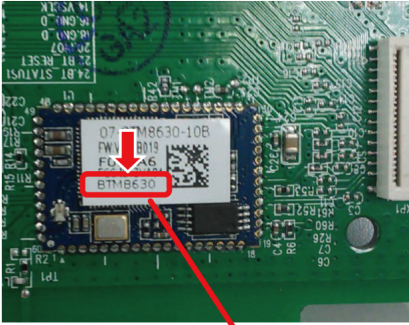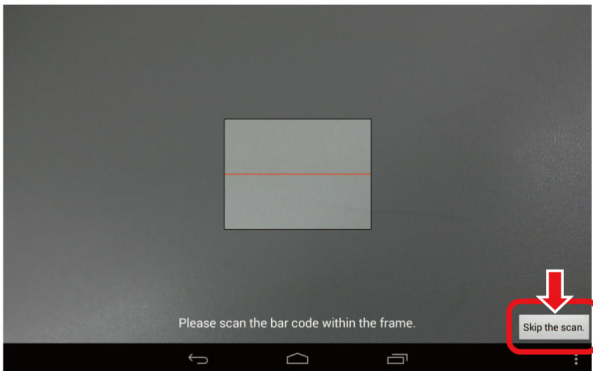
## 13.2.2. How to write the Blue tooth MAC address to NFC module

1. Tap the "TCL BT TAG Writer" icon ( ) to execute.

2. Select the BT module type (It is printed on the label which is pasted on the Bluetooth module of Front P.C.B. Unit. (For example: BTM8630.) and tap it.
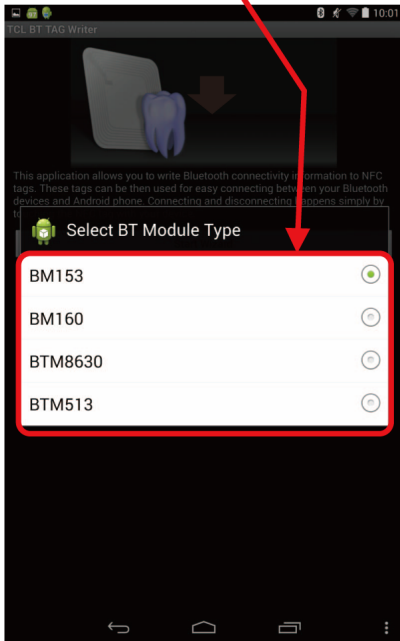
3. After selecting the module type, QR code scan screen is displayed. Tap [Skip the scan.] to skip this screen.

4. MAC Address and Device Name inputting screen appears. Please input 6 digits numbers on the right of "40:ef:4c:" in MAC ADDRESS column (the 6 digits numbers are printed on the label which pasted on the Bluetooth module of Front P.C.B. and the ":"will appear automatically when you input.)

   DEVICE NAME will appear automatically, but you also can delete it and input "Panasonic BTT". (Once you do it after Tag writer software has been installed, the default device name always displayed as "Panasonic BTT".)
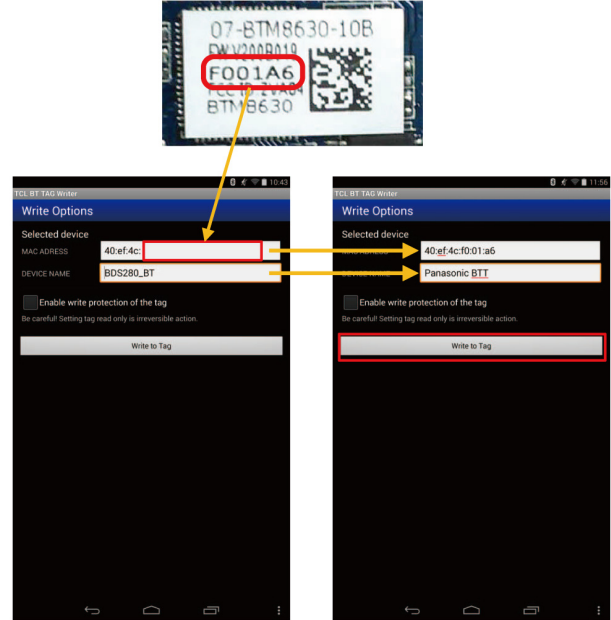
5. Tap [Write to Tag]. then move the NFC part of your Android device close to the NFC antenna part of NFC P.C.B. unit and hold it until a beep sound is heard.which means the Android device is recognized by the NFC module.

6. When [Tag written successfully!] appears, Tap [Exit].

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13.3.   Caution for Replacing Parts

13.3.1.   Standard Inspect Specifications after Repairs

After repairing Digital P.C.B. Unit and Mechanism Unit, it is recommended to perform the following inspection to ensure normaloperation of main unit.

No.	Procedures	Item to Check
1	Turn on the power, and confirm items pointed out.	Items pointed out should reappear.
2	If a problem is caused by a BD-Video disc, DVD-R, DVD Video, Audio-CD, or MP3, playback the test disc.	No abnormality should be seen in the picture, sound or operation.
3	After checking and making repairs, upgrade the firmware to the latest version.	Make sure that [UPD OK] appears on the LED displays. * [UNSUPPORT] display means the unit is already updated to newest same version. Then version up is not necessary.
4	Transfer [9] [9] in the service mode setting, and initialize the service settings (return various settings and error information to their default values. The laser time is not included in this initialization).	Make sure that [CLR] appears on the LED display. After checking it, turn the power off.
5	After replacing the Mechanism Unit, transfer [9] [5] in the service mode setting, and initialize the laser used time.	Make sure that [CLR] appears on the LED display. After checking it, turn the power off.

Use the following checklist to establish the judgment criteria for the picture and sound.

Item	Contents	Check
Picture	Block noise	
	Crosscut noise	
	Dot noise	
	Picture disruption	
	Not bright enough	
	Too bright	
	Flickering colour	
	Color fading	

Item	Contents	Check
Sound	Distorted sound	
	Noise (static, background noise, etc.)	
	The sound level is too low.	
	The sound level is too high.	
	The sound level changes.	

14 Exploded View and Replacement Parts List

14.1. Replacement Parts List

Notes:

*Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.

When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

*Parts marked with [PJM] in the remarks column are supplied by PAVCJM,others are supplied by PHK.

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
⚠	1	VXY2206	MECHANISM UNIT	1	
	2	REP0785AA	DIGITAL P.C.B.UNIT	1	BTT785GN
	2	REP0785BA	DIGITAL P.C.B.UNIT	1	BTT785GS
⚠	3	REP4651B	POWER SUPPLY P.C.B. UNIT	1	
	4	REP1785C	WIRELESS MODULE P.C.B. UNIT	1	
	5	REP4652BT	FRONT P.C.B. KIT	1	
	6	REP4653BT	NFC P.C.B. KIT	1	
	7	RYP2009G-K	FRONT PANEL UNIT	1	
	8	RGK2582-K	TRAY ORNAMENT	1	
	9	REZ2118	FFC (A)	1	
	10	REZ2128	FFC (B)	1	
	11	REX1830	CORD (A)	1	
	12	RMC0830	METAL PLATE	1	
	13	RMC0830	METAL PLATE	1	
	14	RMV0438	INSULATION SHEET	1	
	15	L6FAYYYH0308	FAN MOTOR UNIT	1	
⚠	16	REK0122	AC INLET UNIT	1	
	17	J0KE00000213	FERRITE CORE	1	
⚠	18	RKM0762-K	TOP PANEL	1	
	19	RGQ0848-K	WIRELESS MODULE P.C.B. UNIT BRACKET	1	
	20	RGR0465F-A	REAR CABINET	1	BTT785GN
	20	RGR0465F-B	REAR CABINET	1	BTT785GS
	21	RMK0882	BOTTOM CABINET	1	
	22	RMV0439	BODY CHASSIS	1	
	23	RKA0327-K	RUBBER LEG	1	
	24	RKA0327-K	RUBBER LEG	1	
	25	RKA0327-K	RUBBER LEG	1	
	26	RKA0327-K	RUBBER LEG	1	
	101	RHD30210	BLACK SCREW	1	
	102	RHD30210	BLACK SCREW	1	
	103	RHD30210	BLACK SCREW	1	
	104	RHD30210	BLACK SCREW	1	
	105	RHD30210	BLACK SCREW	1	
	106	RHD30210	BLACK SCREW	1	
	121	RHD30211	SILVER SCREW (A)	1	
	141	RHD26077	SILVER SCREW (B)	1	
	142	RHD26077	SILVER SCREW (B)	1	
	143	RHD26077	SILVER SCREW (B)	1	
	144	RHD26077	SILVER SCREW (B)	1	
	145	RHD26077	SILVER SCREW (B)	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	161	RHD40041	SILVER SCREW (C)	1	
	162	RHD40041	SILVER SCREW (C)	1	
	181	RHD30212	SILVER SCREW (D)	1	
	182	RHD30212	SILVER SCREW (D)	1	
	183	RHD30212	SILVER SCREW (D)	1	
	184	RHD30212	SILVER SCREW (D)	1	
	185	RHD30212	SILVER SCREW (D)	1	
	186	RHD30212	SILVER SCREW (D)	1	
	187	RHD30212	SILVER SCREW (D)	1	
	188	RHD30212	SILVER SCREW (D)	1	
	189	RHD30212	SILVER SCREW (D)	1	
	190	RHD30212	SILVER SCREW (D)	1	
	191	RHD30212	SILVER SCREW (D)	1	
	192	RHD30212	SILVER SCREW (D)	1	
	193	RHD30212	SILVER SCREW (D)	1	
	194	RHD30212	SILVER SCREW (D)	1	
	195	RHD30212	SILVER SCREW (D)	1	
	A1	N2QAYB000970	REMOTE CONTROLLER	1	
⚠	A2	VQT5F61	OPERATING INSTRUCTIONS (En)	1	
⚠	A2	VQT5F64	OPERATING INSTRUCTIONS (Ar/Pe)	1	BTT785GS
⚠	A3	VQT5H03	QSG (En/Ar/Pe)	1	
⚠	A4	K2CJ2YY00100	AC CORD	1	BTT785GN
⚠	A4	K2CQ2YY00130	AC CORD	1	BTT785GS
⚠	A4	K2CT2YY00106	AC CORD	1	BTT785GS
	A5	RSA0044	FM ANTENNA	1	
	A6	RQCXA1002	SPEAKER CABLE STICKER	1	PJM
	A7	K1HA19CY0001	HDMI CABLE	1	
	P1	RPG0M77	PACKING CASE	1	BTT785GN
	P1	RPG0M78	PACKING CASE	1	BTT785GS
	P2	SVKU000020	POLYFOAM (L)	1	
	P3	SVKU000021	POLYFOAM (R)	1	
	P4	RPF0730	MIRROR BAG	1	

14.2. Casing Parts & Mechanism Section
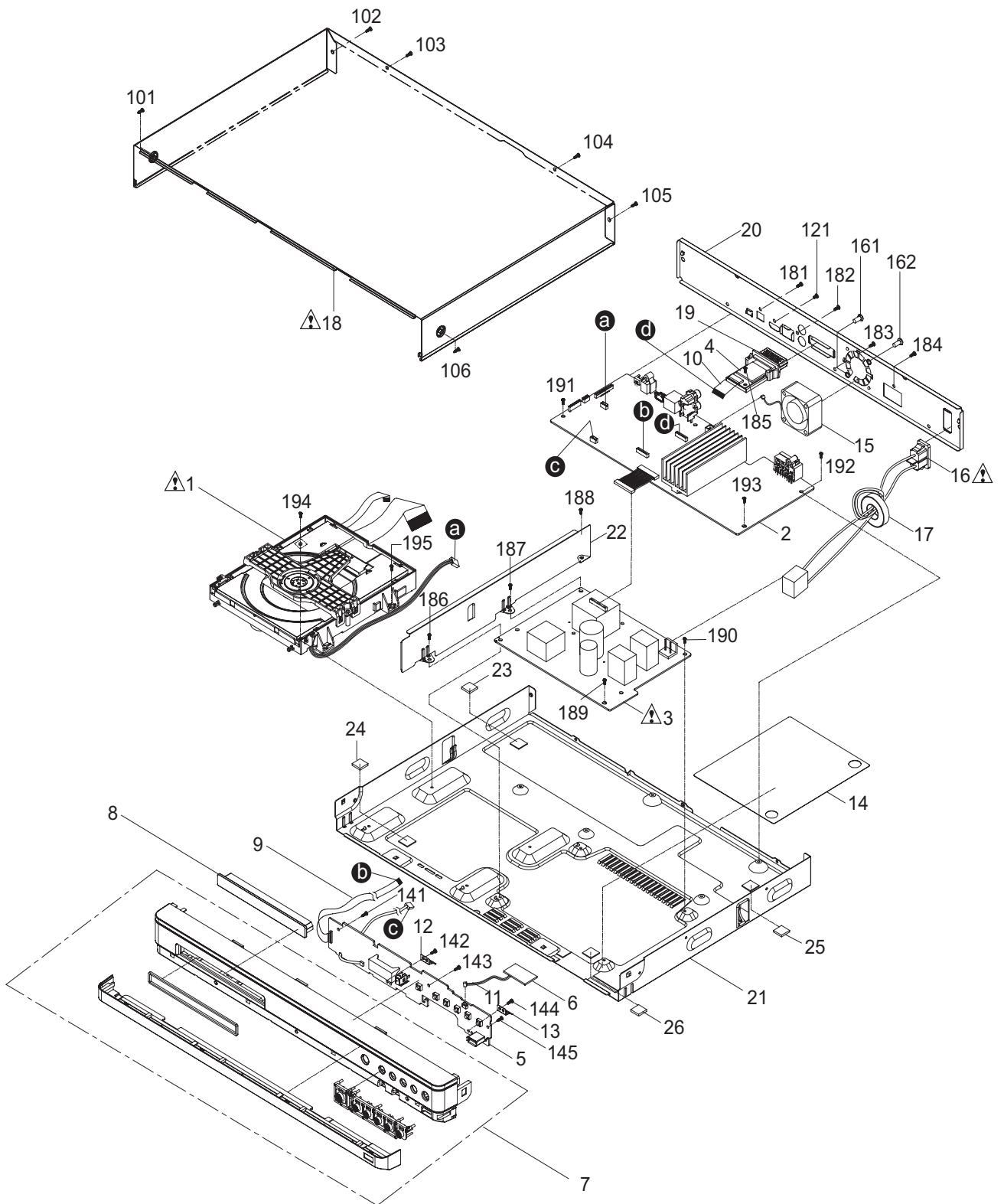
14.3. Packing & Accessories Section

ACCESSORIES BAG	
⚠ A2	OI BOOK
⚠ A3	QSG（OI PREPARATIOPN VER.）
A5	FM INDOOR ANTENNA
	BATTERIES (NOT SUPPLIED)
A6	SPEAKER STICKERS
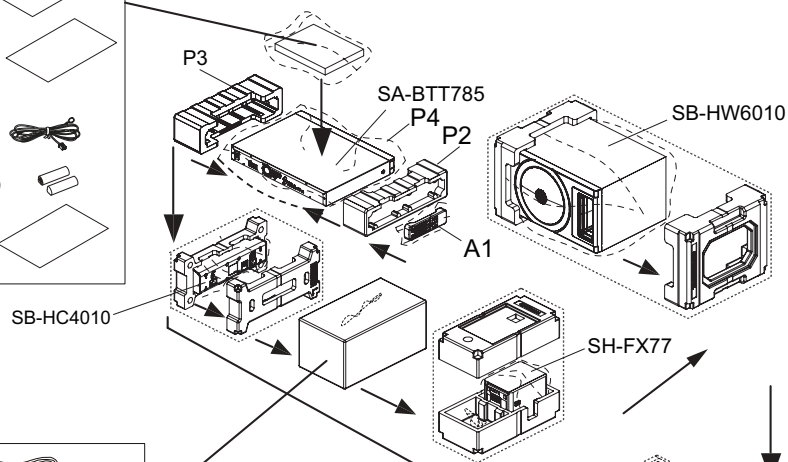
⚠ A4	AC CORD (FOR GS ONLY)
⚠ A4	AC CORD (FOR GS ONLY)
⚠ A4	AC CORD (FOR GN ONLY)
	Speaker Connection Cables
A7	HDMI CABLE

P3

SA-BTT785
P4
P2

A1

SB-HW6010

SB-HC4010

SH-FX77

SB-HFS4810

SB-HFS4810

P1

Front