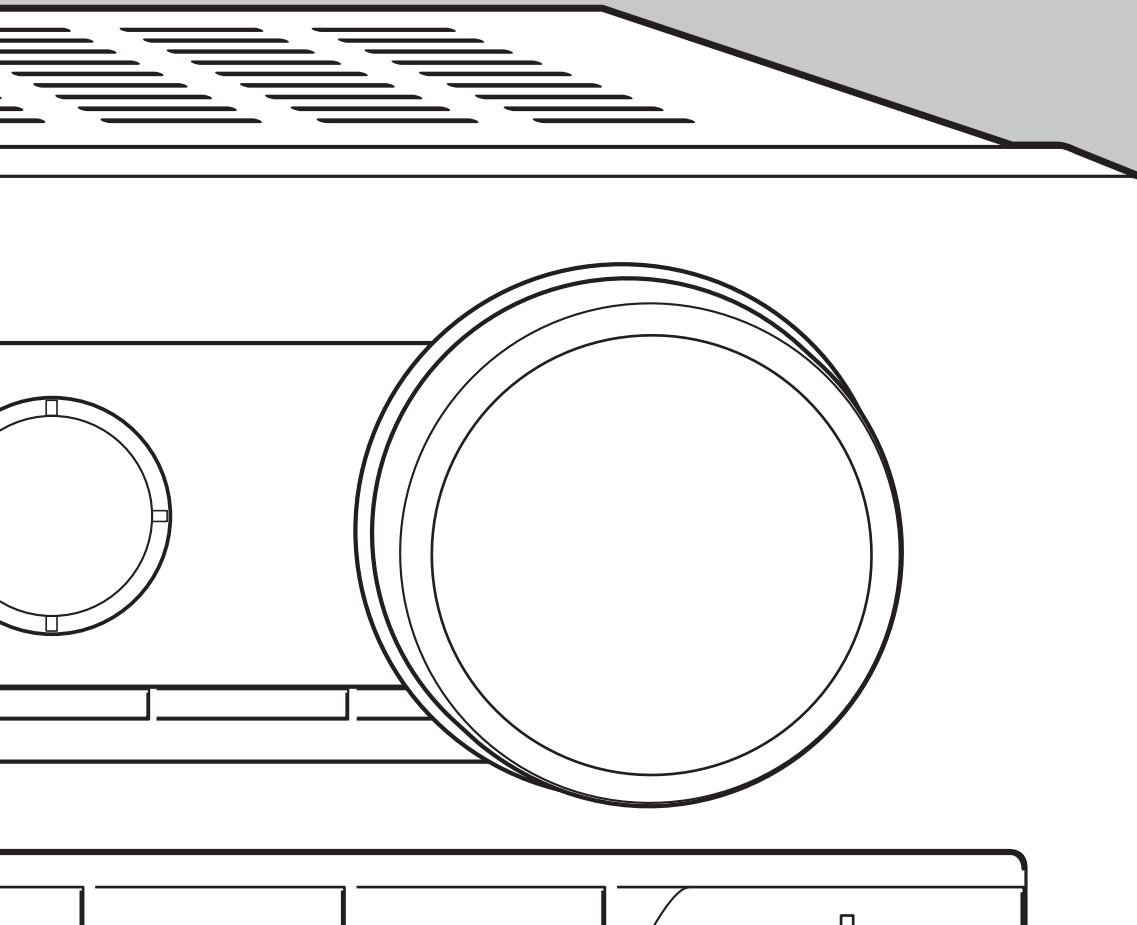


# ONKYO

# TX-NR646

## AV RECEIVER

## Basic Manual



This manual includes information needed when starting up and also instructions for frequently used operations. The Advanced Manual is published on the web for ecological reasons and has more detailed information and advanced settings.

Advanced Manual  
found here



<http://www.onkyo.com/manual/txnr646/adv/en.html>

En

# Features

- Equipped with 7 ch amplifier
- Supports playback in Dolby Atmos format which provides 360-degree placement and movement of sounds including overhead sound
- Supports playback in DTS:X, which is DTS's next-generation object-based surround sound technology that includes height to deliver a fully-immersive listening experience to your living room
- Dolby Surround listening mode expands 2 ch, 5.1 ch or 7.1 ch source to available speaker configurations
- Equipped with 4K compatible HDMI IN/OUT jacks
- Equipped with 2 HDMI output jacks
- Supports the HDMI Standby Through function which allows signal transmission from players to the TV in standby state
- Supports HDCP2.2, a strict copy-protection for providing high quality content (HDMI IN1 to IN3/HDMI OUT MAIN/SUB)
- Supports ARC (Audio Return Channel)
- Supports USB storage playback
- Supports variety of network functions such as Internet Radio, DLNA, AirPlay etc.
- Supports Wi-Fi and Bluetooth®
- Equipped with a PHONO jack enabling connection with a turntable
- Bi-Amping capability
- A/V Sync Function to correct deviation of audio and video
- Multi-zone function which allows you to play a different source in another room from the main room
- 32 bit DSP (Digital Signal Processor) with excellent calculation performance
- Music Optimizer™ for compressed digital music files
- Phase Matching Bass System
- Automatic speaker setup available using supplied calibrated microphone (AccuEQ Room Calibration)
- Supports playback of MP3, WMA, WMA Lossless, FLAC, WAV, Ogg Vorbis, Apple Lossless, DSD, Dolby TrueHD via network and USB storage device (the supported formats will differ depending on the use environment)

Refer to the back cover for supplied accessories.

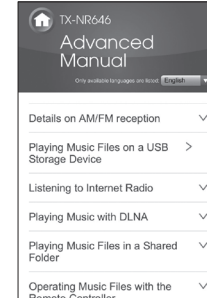
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## Advanced Manual (on the web)

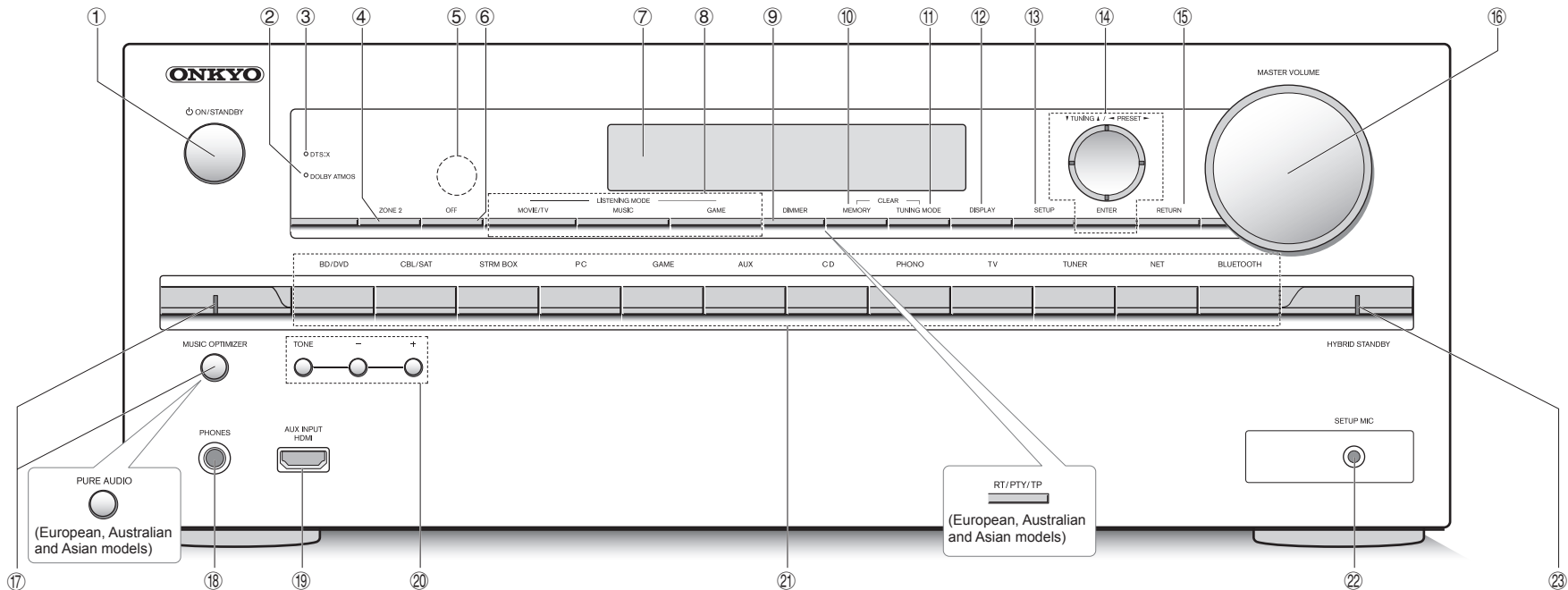
The Advanced Manual, published as an e-manual on the web, has more detailed information and advanced settings. The Advanced Manual is created in a format that makes it easy to read on a PC or Smartphone. The Advanced Manual has the following content:



- Details on AM/FM reception
- Playing Music Files on a USB Storage Device
- Listening to Internet Radio
- Playing Music with DLNA
- Playing Music Files in a Shared Folder
- Operating Music Files with the Remote Controller
- Listening Mode
- Advanced Settings
- Operating Other Components with the Remote Controller
- Advanced speaker connections
- Connecting and Operating Onkyo RI Components
- Firmware Update
- Troubleshooting
- Reference Information

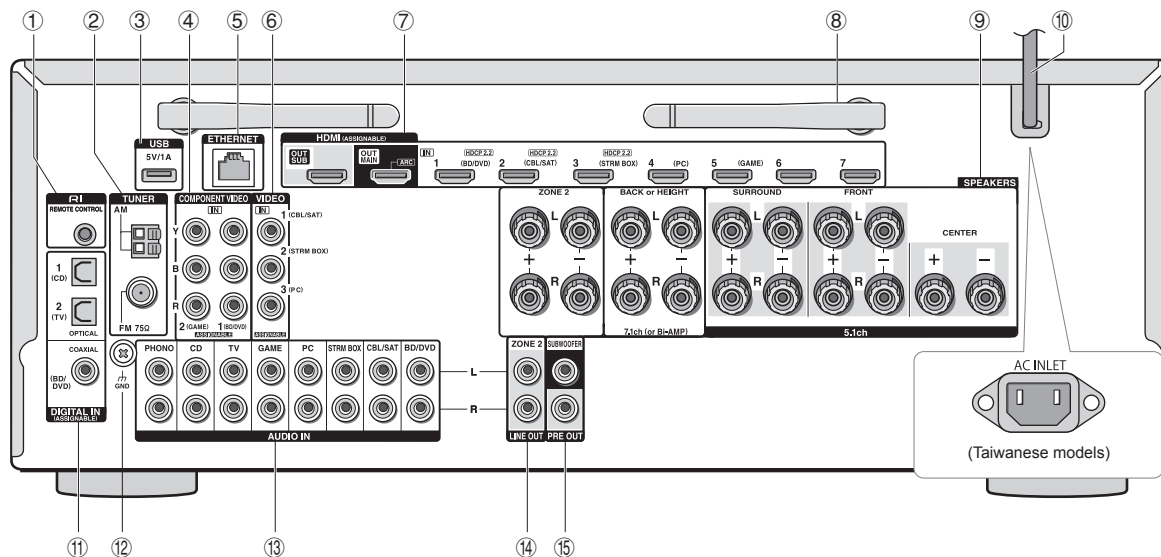


Advanced Manual found here  
<http://www.onkyo.com/manual/txnr646/adv/en.html>

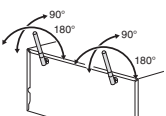


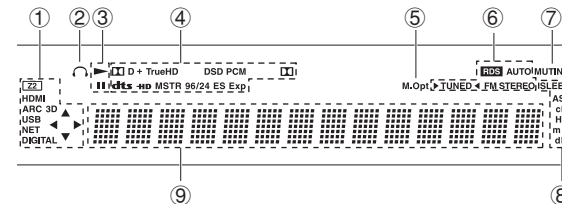
## Front Panel

- ① **ON/STANDBY button:** Turns the unit on or into standby mode.
- ② **DOLBY ATMOS indicator:** Lights when playing Dolby Atmos.
- ③ **DTS:X indicator:** Lights when playing DTS:X.
- ④ **ZONE2 button:** Controls the multi-zone function.
- ⑤ **Remote control sensor:** Receives signals from the remote controller.
- ⑥ **OFF button:** Switches the multi-zone function off.
- ⑦ **Display**
- ⑧ **LISTENING MODE buttons:** Allow you to select the listening mode.
- ⑨ **DIMMER button (North American and Taiwanese models):** Switches the brightness of the display.  
**RT/PTY/TP button (European, Australian and Asian models):** Can be used when receiving the station transmitting text information.
- ⑩ **MEMORY button:** Registers a station.
- ⑪ **TUNING MODE button:** Switches the tuning mode.
- ⑫ **DISPLAY button:** Switches the information on the display.
- ⑬ **SETUP button:** Used when making settings.
- ⑭ **Cursor buttons, ▼TUNING▲ button, ◀PRESET▶ button and ENTER button:** Move the cursor and confirms the selection. When listening to AM/FM broadcasting, tune in to the station with ▼TUNING▲ or select the registered station with ◀PRESET▶.
- ⑮ **RETURN button:** Returns the display to the previous state.
- ⑯ **MASTER VOLUME:** Allows you to adjust the volume.
- ⑰ **MUSIC OPTIMIZER button/indicator (North American and Taiwanese models):** Turns on/off the MUSIC OPTIMIZER function that improves the quality of the compressed audio.  
**PURE AUDIO button/indicator (European, Australian and Asian models):** The display and analog video circuits are turned off to switch the unit to Pure Audio mode and provide purer sound.
- ⑱ **PHONES jack:** Stereo headphones with a standard plug are connected.
- ⑲ **AUX INPUT HDMI jack:** A HD camera or such other device is connected.
- ⑳ **TONE and Tone Level buttons:** Adjust the high tone and low tone.
- ㉑ **Input selector buttons:** Switch the input to be played.
- ㉒ **SETUP MIC jack:** The supplied speaker setup microphone is connected.
- ㉓ **HYBRID STANDBY indicator:** Lights if the unit enters standby mode when the HDMI Standby Through, USB Power Out at Standby, Network Standby or Wakeup from Bluetooth function is enabled.



## Rear Panel

- ① **RI REMOTE CONTROL jack:** An Onkyo product with RI jack can be connected and synchronized with this unit.
- ② **TUNER AM/FM (75Ω) terminal:** The supplied antennas are connected.
- ③ **USB port:** A USB storage device is connected so that music files stored in it can be played. USB devices can be supplied with power when connected with a USB cable.
- ④ **COMPONENT VIDEO IN jack:** Component video input jack
- ⑤ **ETHERNET port:** Used for LAN connection
- ⑥ **COMPOSITE VIDEO IN jacks:** Analog video signals are input.
- ⑦ **HDMI IN/OUT jacks:** Digital video signals and audio signals are transmitted between the unit and the connected devices.
- ⑧ **Wireless antenna:** Used for Wi-Fi connection or when using a Bluetooth-enabled device. Adjust their angles according to the connection status.
 
- ⑨ **SPEAKERS terminals:** Speakers are connected. To use the Multi-zone function, connect the speakers in the separate room to the ZONE2 speaker terminals.
- ⑩ **Power cord (North American, European, Australian and Asian models)**  
**AC INLET (Taiwanese models):** The supplied power cord is connected.
- ⑪ **DIGITAL IN COAXIAL/OPTICAL jacks:** Digital audio signals are input.
- ⑫ **GND terminal:** The ground wire of the turntable is connected.
- ⑬ **COMPOSITE AUDIO IN jacks:** Analog audio signals are input.
- ⑭ **LINE OUT ZONE 2 jack:** Audio output jack connected to the pre-main amplifier for multi-zone playback in a separate room.
- ⑮ **PRE OUT SUBWOOFER jack:** A subwoofer with built-in amplifier is connected.



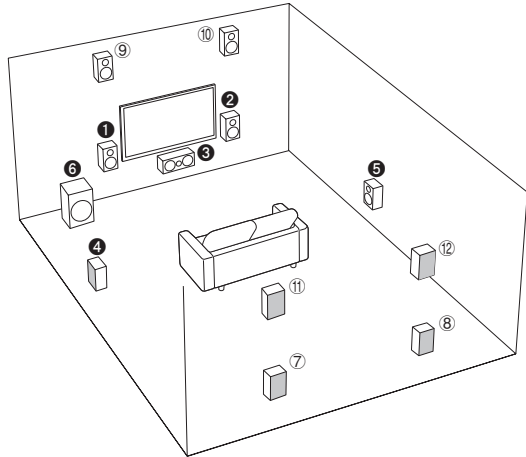
## Display

- ① Lights in the following conditions. "Z2": Zone 2 output is on. / "HDMI": HDMI signals are input and HDMI input selector is selected. / "ARC": Audio signals are input from ARC compatible TV and TV input selector is selected. / "3D": Input signals are 3D. / "USB" (\*): "NET" input is selected and USB storage device is connected. / "NET" (\*): "NET" input is selected and the unit is connected to the network. / "DIGITAL": Digital signals are input and the digital input selector is selected. / Cursor indicators: NET or USB is controlled.  
\* "USB" and "NET" will flash if the connection is not correct.
- ② Stays lit when headphones are connected.
- ③ Lights when NET or USB is controlled.
- ④ Lights according to the type of input digital signals and the listening mode.
- ⑤ Stays lit when Music Optimizer is enabled.
- ⑥ Lights in the following conditions. "AUTO": Tuning mode is auto. / "▶TUNED◀": Receiving AM/FM radio. ▶◀ flashes while tuning is automatically performed. / "FM STEREO": Receiving FM stereo. / "RDS" (European, Australian and Asian models): Receiving RDS broadcasting.
- ⑦ "MUTING": Flashes when muting is on.
- ⑧ Lights in the following conditions. "SLEEP": Sleep timer has been set. / "ASb" (Auto Standby): Auto Standby is on. / "ch": Channel is being set. / "Hz": Crossover frequencies are being set. / "m/ft": Speaker distances are being set. / "dB": Speaker volume is being set.
- ⑨ Displays various information of the input signals. Pressing DISPLAY displays the type of input digital signals and the listening mode.

# Step 1: Connections

## 1 Connecting speakers

### Speaker layout



**Important:** The power cord must be connected only after all other connections are completed.

- ① ② Front speakers
- ③ Center speaker
- ④ ⑤ Surround speakers
- ⑥ Subwoofer
- ⑦ ⑧ Back speakers
- ⑨ ⑩ Height speakers (Front High)
- ⑪ ⑫ Height speakers (Rear High)
- 5.1 ch: ①②③④⑤⑥
- 7.1 ch: ①②③④⑤⑥+⑦⑧ or ①②③④⑤⑥+⑨⑩ or ①②③④⑤⑥+⑪⑫
- ⑦⑧ speakers, ⑨⑩ speakers and ⑪⑫ speakers share the same speaker terminals. Select either of the groups.

- To enjoy the Dolby Atmos listening mode, height speakers or back speakers need to be installed. There are a variety of height speakers apart from this type. see the next section for details.
- To use the multi-zone function, see "Multi-zone" in "Step 3: Playing Back".

### Characteristics of speaker types

①② output front stereo sound and ③ output center sound such as dialogs and vocals. ④⑤ create back sound field. ⑥ reproduces bass sounds and creates rich sound field.

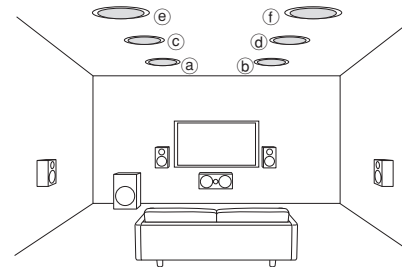
Connecting ⑦⑧ speakers, ⑨⑩ speakers or ⑪⑫ speakers enables playback in 7.1 ch configuration. ⑦⑧ (back) speakers improve sense of envelopment created by back sound field as well as seamlessness of back sounds, providing more natural sound experiences in the sound field. ⑨⑩ or ⑪⑫ (height) speakers produce surround effects on a height plane. This unit can perform optimal sound field processing for the type of height speakers actually installed and registered in "Initial Setup".

Dolby Surround listening mode. Install Top Front speakers so that they are positioned at a point between directly above the listening position and directly above the front speakers. Install Top Middle speakers so they are directly above the listening position and directly above the back speakers. You can select (a)(b), (c)(d) or (e)(f) on the unit. For connection with the unit, use the SPEAKER BACK or HEIGHT terminals.

- Dolby Laboratories recommends placing the speakers as described in "Installing speakers in ceiling" to obtain the best Dolby Atmos effect.

### Height speaker types

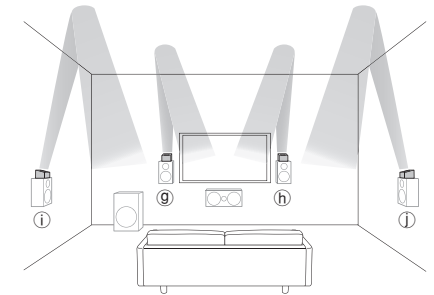
#### Installing speakers in ceiling



- (a) (b) Top Front
- (c) (d) Top Middle
- (e) (f) Top Rear

Ceiling speakers, etc. are used for maximizing effects in Dolby Atmos or

### Using Dolby Enabled Speakers



- (g) (h) Dolby Enabled Speakers (Front)
- (i) (j) Dolby Enabled Speakers (Surround)

A Dolby Enabled Speaker is specially designed to be used as a height speaker. There are two types of Dolby Enabled Speakers; one type is designed to be placed on top of other speakers such as front speakers and surround speakers,

and the other type is designed to be integrated with normal speakers. Dolby Enabled Speakers placed with their diaphragms facing toward the ceiling create higher effect in the Dolby Atmos and Dolby Surround listening modes by providing sounds echoing off the ceiling. You can select (9)(h) or (i)(d) on the unit. For connection with the unit, use the SPEAKERS BACK or HEIGHT terminals.

When playing Dolby Atmos, the speakers required depend on how you have setup your back speakers or height speakers. The following shows combinations of speakers for reproducing Dolby Atmos.

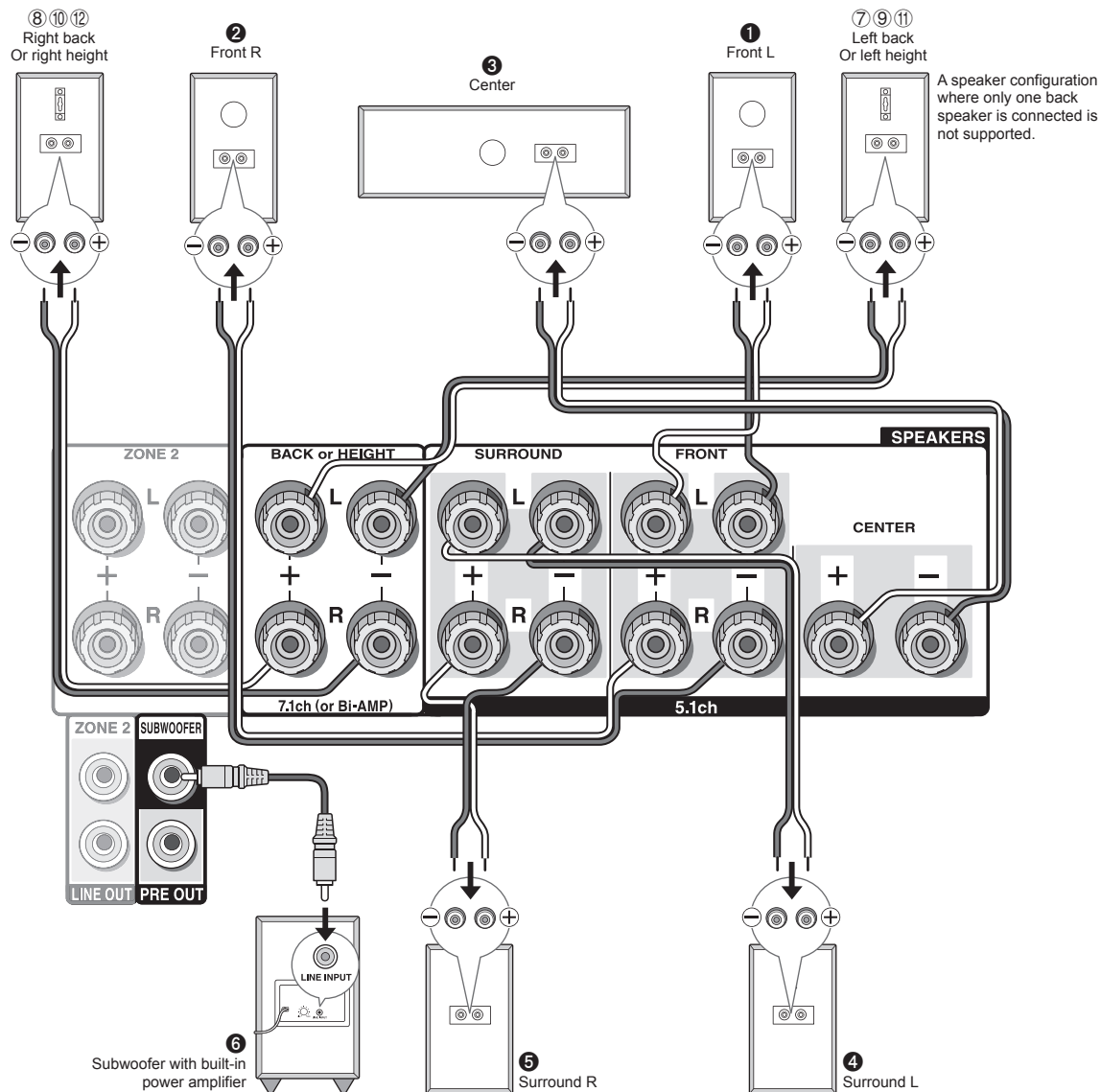
Connection pattern	Back or Height	Front		
		Center	Surround	Subwoofer
1	Back	⊗	○	⊗
2	Front High	⊗	○	○
3	Rear High	⊗	○	○
4	Top Front	⊗	○	○
5	Top Middle	⊗	○	○
6	Top Rear	⊗	○	○
7	Dolby Enabled Speaker (Front)	⊗	○	○
8	Dolby Enabled Speaker (Surround)	⊗	○	⊗

⊗: Required, ○: Optional

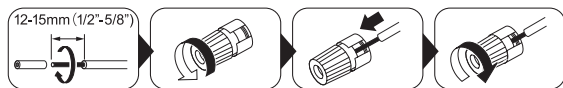
\* Connection of a subwoofer is optional.

**Important:** (North American and Taiwanese models)  
Connect speakers with 6 Ω to 16 Ω impedance. Using a speaker with less impedance than the supported value may result in failure.

**Important:** (European, Australian and Asian models)  
Connect speakers with 4 Ω to 16 Ω impedance. You have to change the setting if any of the speakers have 4 Ω or more to less than 6 Ω impedance. Using a speaker with less impedance than the setting may result in failure. You can set up by viewing the guidance displayed on the TV screen. Select the item with the cursor buttons of the remote controller and press ENTER to confirm your selection. To return to the previous screen, press RETURN. Press **RECEIVER** and then **SETUP** on the remote controller. Select "2. Speaker" - "Configuration" - "Speaker Impedance" and change the default value from "6ohms" to "4ohms".

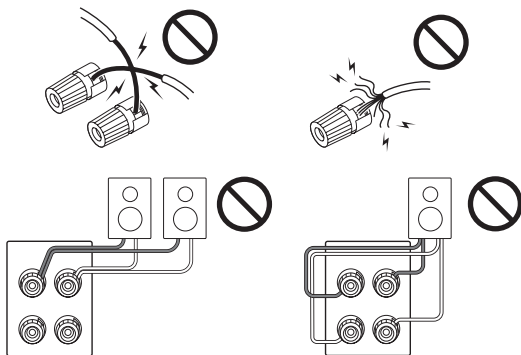
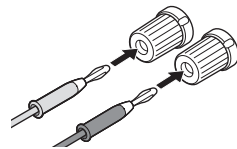


### Instructions on how to connect speakers



Cut and remove the plastic coating from the end of the speaker cable, twist the core and connect it to the terminal. Be sure to make correct connection between the unit's jacks and speaker's jacks (+ to + and - to -) for each channel. If connection is wrong, a bass sound may become poor due to reverse phase. Up to two subwoofers with built-in power amplifier can be connected to the subwoofer jacks. Set the cut-off filter selection switch of the subwoofer to DIRECT. If the subwoofer does not have a cut-off filter selection switch but has a cut-off frequency adjusting dial, turn it to the maximum frequency. If your subwoofer does not have built-in power amplifier, you can connect a power amplifier between the unit and the subwoofer.

- The speaker setting is 7.1 channels at the time of purchase. You can change it manually or by using automatic speaker setting.
- Short-circuiting the + cable and - cable or contacting the cable core to the rear panel of the unit may cause failure. Also do not connect two or more cables to one speaker terminal or one speaker to several terminals.

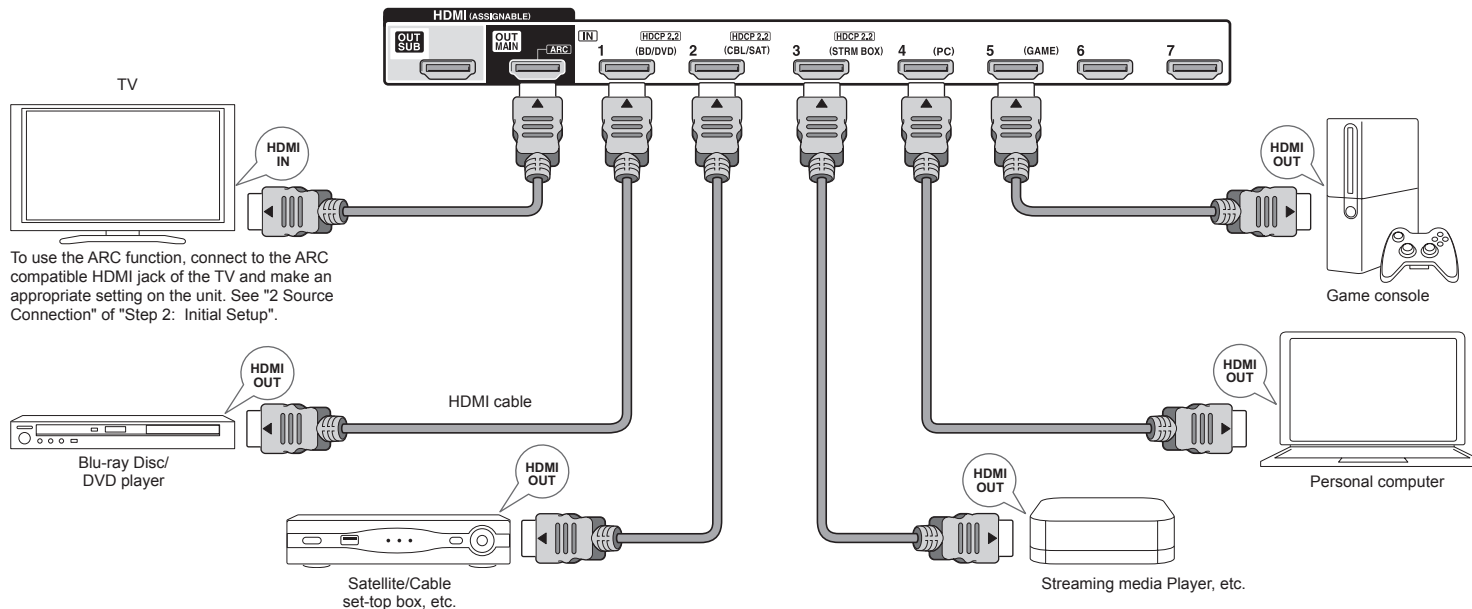


### When using commercially available banana plugs:

tighten the speaker terminals to the end and then insert the banana plugs. Do not insert the core of speaker cable directly into the hole for banana plug of speaker terminal. (North American models)



## 2 Connecting the TV and players



### HDMI cable connection

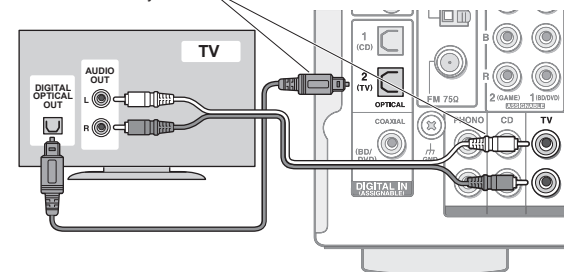
The unit has many HDMI jacks on its rear panel and each of them corresponds to an input selector button of the same name on the front panel. For example, a Blu-ray Disc player will be connected to the HDMI IN1 jack and the BD/DVD button on the front panel will be used to listen to the playback sound (if the player is CEC compliant, input will be switched automatically when play is started). If you add another Blu-ray Disc player, you can use any other jack than HDMI IN1. It is possible to change assignment of the input jacks and input selector buttons. For how to make settings, see the Advanced Manual.

To connect the TV and the unit, connect the HDMI OUT MAIN jack of the unit and the HDMI IN jack of the TV using a HDMI cable. With this connection, it becomes possible to display the setting screen of the unit on the TV or transmit

video/audio signals from the player to the TV. If your TV supports ARC (Audio Return Channel), it is possible to play the TV sound with the AV receiver's speakers with this connection only. If your TV does not support ARC, you need, in addition to the HDMI OUT MAIN jack connection, a digital optical cable connection between the digital audio out optical jack of the TV and the DIGITAL IN OPTICAL jack of the unit or an analog audio cable connection between the audio output jack of the TV and the AUDIO IN TV jack of the unit.

### ● Audio connection with a TV not supporting ARC

\* Select an appropriate connection for your TV.



The unit supports the HDMI Standby Through function that allows video and audio signal transmission from players to the TV even if the unit is in standby. You have to

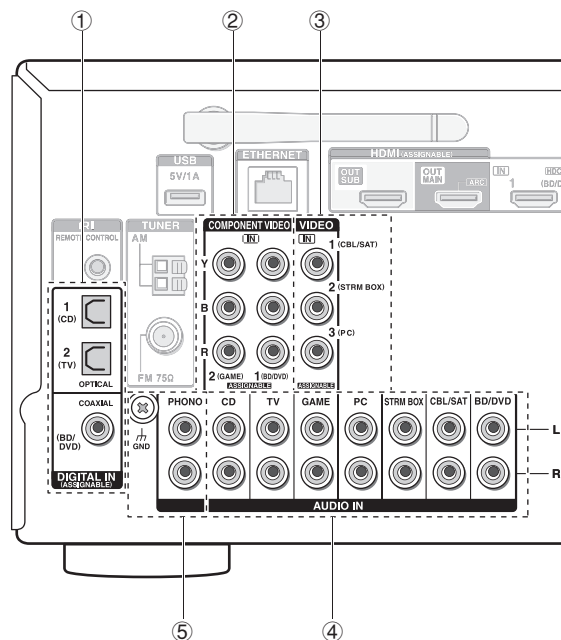


modify the settings to enable the input selection link with CEC (Consumer Electronics Control) compliant device, connection with ARC compatible TV, and HDMI Standby Through function. See "2 Source Connection" of "Step 2: Initial Setup".


- Another TV can be connected to the HDMI OUT SUB jack.
- To enjoy HDCP2.2 protected video, connect the player to one of the HDMI IN1 to IN3 jacks and connect the unit and the TV via HDMI. You will be unable to view images protected by HDCP2.2 if your TV does not have a HDCP2.2 compatible input jack.
- To play 4K or 1080p video, use a high speed HDMI cable or high speed HDMI with Ethernet cable.


### Connecting Components without HDMI

If your AV component does not have HDMI jack, use an available jack of your component for cable connection with this unit.




- ① A player with a digital audio out jack can be connected.

 Digital optical cable (OPTICAL)  
\* As the digital in optical jack of the unit has a cover, push in the cable against the cover as it is turned inside.

 Digital coaxial cable (COAXIAL)

- ② A player with component video output jacks can be connected.


 Component video cable  
\* Its transmitted video has higher quality than that of composite video cable.

- ③ A player with a composite video output jack can be connected.

 Composite video cable

- ④ A player with analog audio out jacks can be connected. When using jacks ② and ③ for video input, connect to the audio input jacks corresponding to the jacks connected at ② and ③. (For example, when video input connection is to the ② BD/DVD jack, the audio input connection should also be to the ④ BD/DVD jacks.)

- \* It is possible to change assignment of the input jacks and input selector buttons. For how to make settings, see the Advanced Manual.
- \* To enjoy multi-zone playback with a player, connect player to either ① or ④ jacks.

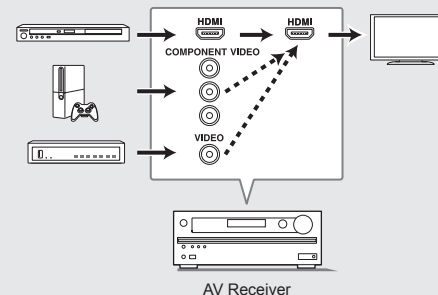
 Analog audio (RCA) cable

- ⑤ Connect a turntable that uses an MM type cartridge and does not have a built-in audio equalizer. If the connected turntable has a built-in audio equalizer, connect it to the ④ CD jack.

- \* If it uses an MC type cartridge, install an audio equalizer compatible with MC type cartridge between the unit and the turntable by connecting it to the ④ CD jack. For details, refer to the turntable's instruction manual.
- \* If the turntable has a ground wire, connect it to the GND terminal of this unit. If connecting the ground wire increases noise, disconnect it.

### Video upconversion function

Video signals input to the composite video input jack or the COMPONENT VIDEO IN jacks will be upconverted to HDMI signals and then output from the HDMI output jack.

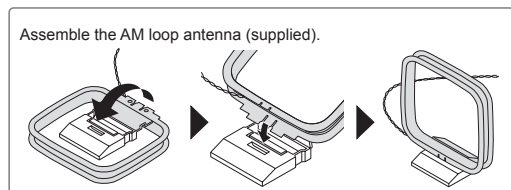
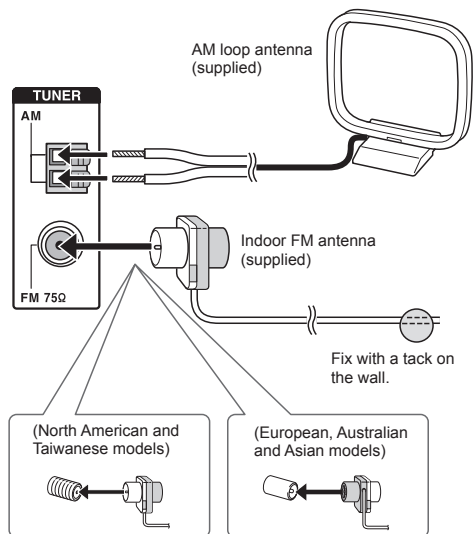


- \* When you upconvert video signals input to the COMPONENT VIDEO IN jacks and output them from the HDMI OUT jack, set the output resolution of the player to 480i or 576i. If the input has 480p/576p or higher resolution, a message prompting you to change the resolution setting will appear. If your player does not support 480i or 576i output, use the composite video jack.
- \* If multiple video signal inputs are put into one input system, the output will be made in the order of HDMI, COMPONENT VIDEO/composite video.

### 3 Other connections

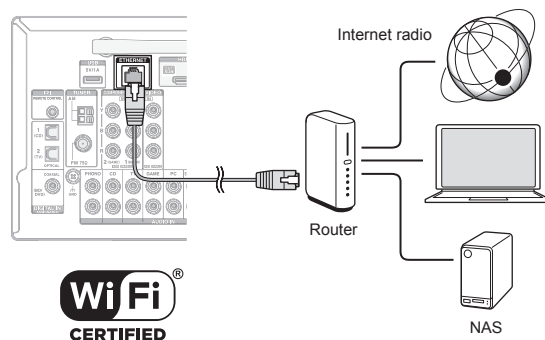
#### AM/FM antenna connections

Connect the antennas to listen to AM/FM broadcast. When listening to the broadcast for the first time, adjust the antenna position and orientation to get the best reception.



#### Network connection

You can enjoy Internet radio, DLNA and AirPlay by connecting the unit to LAN. The unit can be connected to the router with an Ethernet cable or to the wireless LAN router with Wi-Fi connection. In case of wired connection, connect the Ethernet cable to the Ethernet port. See "4 Network Connection" of "Step 2: Initial Setup" for Wi-Fi settings.



#### Headphones connection

Connect stereo headphones with a standard plug (1/4 inch or  $\varnothing$  6.3 mm) to the PHONES jack on the front panel. Sound from the speakers will be off while you are using the headphones.

- If you selected any other listening mode than Pure Audio (European, Australian and Asian models), Stereo, Mono and Direct, connecting headphones will switch the listening mode to Stereo.

#### Power cord

Taiwanese models include removable power cords. Connect the power cord to AC INLET of the unit and then connect to the outlet. Always disconnect the outlet side first when disconnecting the power cord. When the unit is turned on, a large instantaneous current may flow affecting functionality of the computer and other devices, so it is recommended to use a separate outlet.