

# YAMAHA AV-50

*Natural Sound Stereo Amplifier*

*6 Audio Inputs, 2 Video Inputs*

*Surround Sound Processor*

*Audio and Video Rec Monitor*

*Total System Remote Control*

*Thank you for purchasing the YAMAHA AV-50 stereo amplifier.*

## CONTENTS

SAFETY INSTRUCTIONS .....	1
CAUTION: READ THIS BEFORE OPERATING YOUR AMPLIFIER .....	2
SUPPLIED ACCESSORIES .....	3
CONTROLS AND THEIR FUNCTIONS .....	4
CONNECTIONS .....	11
USING THE REMOTE CONTROL TRANSMITTER .....	15
OPERATIONS .....	16
SPECIFICATIONS .....	20
TROUBLESHOOTING .....	21

CENTER

OWNER'S MANUAL



### IMPORTANT

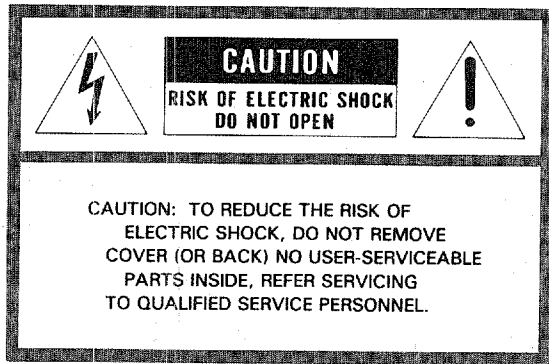
Please check your unit's rear panel serial number and record it in the space below

Model: **AV-50**

Serial No:

Keep this owner's manual in a safe place for future reference.

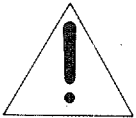
# SAFETY INSTRUCTIONS



## • Explanation of Graphical Symbols



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

## WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

**1** Read Instructions — All the safety and operating instructions should be read before the appliance is operated.

**2** Retain Instructions — The safety and operating instructions should be retained for future reference.

**3** Heed Warnings — All warnings on the appliance and in the operating instructions should be adhered to.

**4** Follow Instructions — All operating and other instructions should be followed.

**5** Water and Moisture — The appliance should not be used near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

**6** Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.

**6A** An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.



**7** Wall or Ceiling Mounting — The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.

**8** Ventilation — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface, that may block the ventilation openings; or cabinet that may impede the flow of air through the ventilation openings.

**9** Heat — The appliance should be situated away from heat sources such as radiators, stoves, or other appliances that produce heat.

**10** Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

**11** Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

**12** Cleaning — The appliance should be cleaned only as recommended by the manufacturer.

**13** Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

**14** Object and Liquid Entry — Care should be taken so that objects do not fall into and liquids are not spilled into the inside of the appliance.

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**CAUTION: READ THIS BEFORE OPERATING YOUR AMPLIFIER**

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**15** Damage Requiring Service — The appliance should be serviced by qualified service personnel when:

- A. The power-supply cord or the plug has been damaged; or
- B. Objects have fallen, or liquid has been spilled into the appliance; or
- C. The appliance has been exposed to rain; or
- D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
- E. The appliance has been dropped, or the cabinet damaged.

**16** Servicing — The user should not attempt to service the appliance beyond those means described in the operating instructions. All other servicing should be referred to qualified service personnel.

**17** Power Lines — An outdoor antenna should be located away from power lines.

**18** Grounding or Polarization — The precautions that should be taken so that the grounding or polarization of an appliance is not defeated.

**1** To ensure the finest performance, please read this manual carefully. Keep it in a safe place for future reference.

**2** Install your unit in a cool, dry, clean place away from windows, heat sources, vibration, dust, moisture, and cold. Avoid sources of hum (transformers, motors, etc.). To prevent fire or electric shock, do not expose to rain and water.

**3** Do not operate the amplifier upside-down. The unit may over heat, resulting in damage and unit failure.

**4** Never open the unit. If an object falls into the unit, contact your service center.

**5** Do not place records or other obstructing objects on the amplifier, this will block the ventilation holes. This will cause the internal temperature to rise and may result in unit failure.

**6** Do not force switches, knobs, or cords. When moving the set, first turn the power to OFF. Then gently disconnect all plugs and cords attached to other equipment. Never pull on the cord, always pull on the plug.

**7** Do not clean the unit with chemical solvents; this may damage the finish. Use a clean, dry cloth.

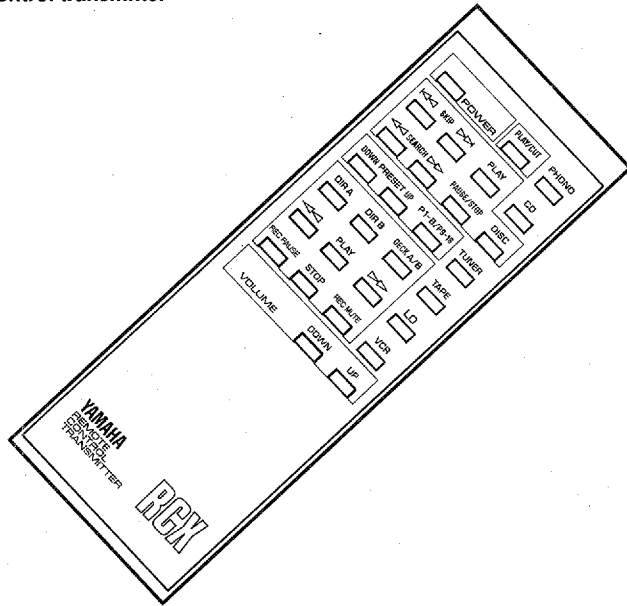
**8** Be sure to read the TROUBLESHOOTING section on common operating errors before concluding that the unit is faulty.

**9** Do not connect audio equipment to the AC outlets on the rear panel if that equipment requires more power than the outlets are rated to provide.

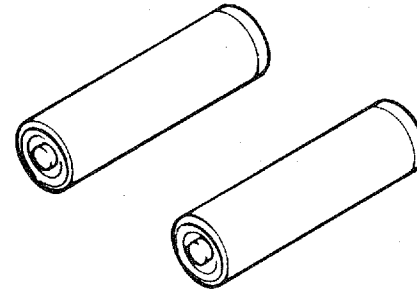
## SUPPLIED ACCESSORIES

After unpacking, check that the following parts are included.

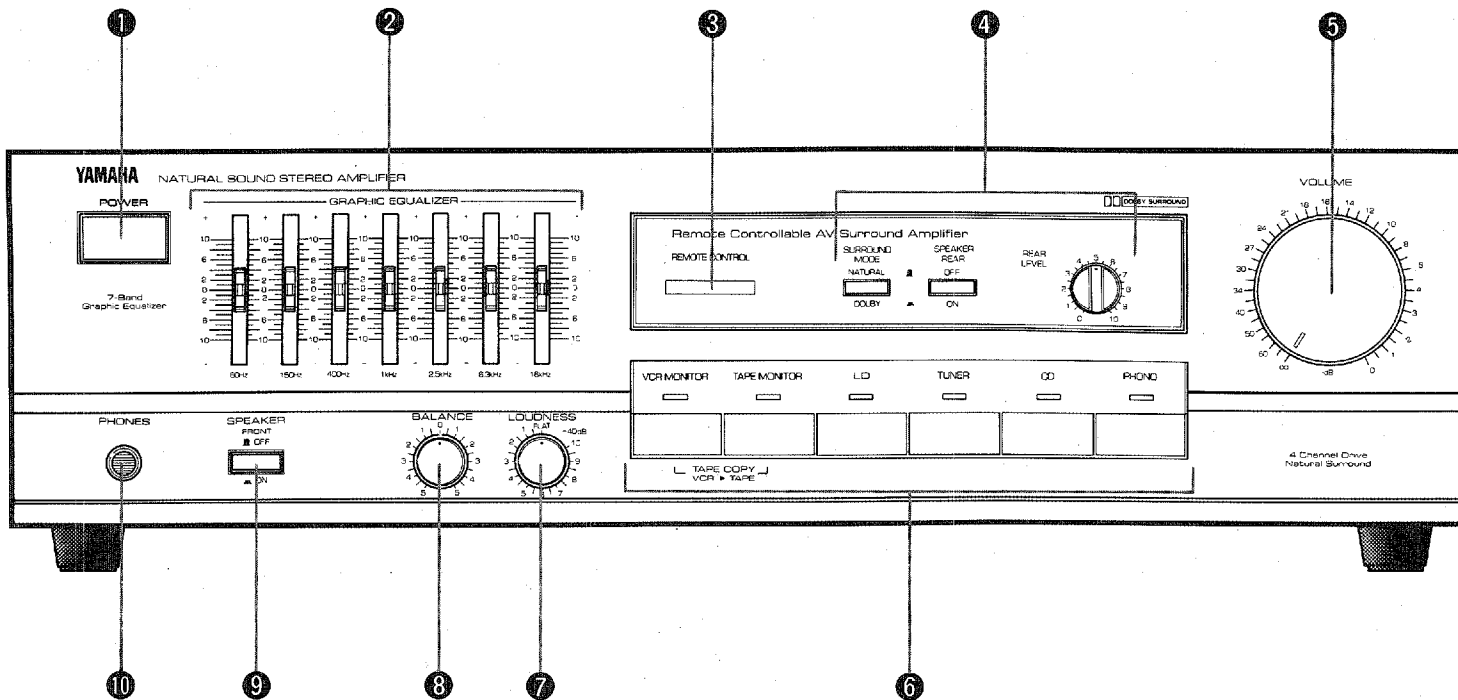
- Remote control transmitter



- Batteries (size "AA")



FRONT PANEL



### ❶ **POWER switch**

Press this switch to turn the power on. The power indicator on the volume control lights. Press the switch again to turn the power off.

### ❷ **GRAPHIC EQUALIZER controls**

These seven independent slide controls are used to tailor, each over a  $\pm 12$  dB range, the overall output frequency response of the amplifier. The seven bands cover the complete audible sound spectrum and are centered on 60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.5 kHz, 6.3 kHz and 16 kHz frequencies. To set these controls properly, first the LOUDNESS control must be set to 0 and the VOLUME control set to the desired listening level.

To increase a specific frequency response (boost), slide the control upward (toward the "+" direction). To decrease a specific frequency response (cut), slide a control downward (toward the "-" direction).

### ❸ **REMOTE CONTROL sensor and indicator**

This is used to receive signals from the remote control transmitter.


### ❹ **SURROUND PROCESSING MODE controls**

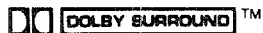
These controls are used to implement the following SURROUND SOUND features:

#### **NATURAL/DOLBY selector**

Use this selector to set the surround mode according to the source played.

#### • **DOLBY SURROUND**

Set to this position when playing the program source having a "  " marking.



\* Manufactured under license from Dolby Laboratories Licensing Corporation. Additionally under one or more of the following patents: U.S. numbers 3,632,886, 3,746,792, and 3,959,590; Canadian numbers 1,004,603 and 1,037,887. "Dolby" and the Double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

### • **NATURAL SURROUND**

When the NATURAL/DOLBY selector button is in the NATURAL position, natural surround effects can be reproduced from stereo sources, using YAMAHA's original surround sound processor circuit.

#### **REAR SPEAKERS ON/OFF switch**

Set this switch to the ON position when listening to either of the above mentioned SURROUND sources (DOLBY/NATURAL).

Set this switch to the OFF position when listening to normal 2-channel stereo sound without reverberation effect or when listening to monaural sources. The rear speaker signals are not output.

#### **REAR LEVEL control**

This control is used to raise or lower the output volume level of the rear speakers.

### ❺ **VOLUME control and power indicator**

This control is used to adjust the output volume level. Turning the control clockwise increases the sound level and turning it counter clockwise decreases the sound level. It acts as the master volume control: increasing or decreasing the signal level to both the front and rear speaker pairs. The built-in indicator lights when the POWER switch is set to ON.

### ❻ **Input selector switches and indicators**

Used to select the audio or video source to be heard and watched.

#### **LD, TUNER, CD, PHONO audio switches**

Use these buttons to select either the laser vision disc player (LD), tuner (TUNER), compact disc player (CD), or turntable (PHONO). The corresponding indicator will light. Of these four sources, only one may be selected at a time.

#### **NOTE:**

If the LD is playing, its video signal is always output to the MONITOR OUT terminal regardless of which audio switch is selected. However, if the VCR MONITOR function is activated the playing VCR's video signal will be output.

### **VCR MONITOR switch**

Press this switch once to monitor the VCR's audio and video signals. When it is activated its indicator will light. Pressing the switch once more will deactivate the VCR MONITOR function and its indicator will go out.

#### **NOTE:**

The VCR MONITOR has priority over the LD video signal and the LD, TUNER, CD, and PHONO audio signals. Therefore, when the VCR MONITOR function is activated the VCR video and audio signals will be monitored regardless of any other activated source (expect TAPE MONITOR. See below).

### **TAPE MONITOR switch**

Press this switch once to monitor the tape deck's audio signal. When it is activated its indicator will light. Pressing the switched again will deactivate the TAPE MONITOR function and its indicator will go out.

#### **NOTE:**

The TAPE MONITOR has priority over the LD, TUNER, CD, PHONO, and even the VCR audio signals. Therefore, when the TAPE MONITOR is activated the tape deck's audio signals will be heard regardless of any other activated source. The video signals are not affected, however.

### **7 LOUDNESS control**

This control provides a continuously variable control, over a 0 (FLAT) to -40 dB (1 kHz) range, of the loudness response of the amplifier. The human ear has reduced sensitivity to extremely low and high frequencies at low volume levels. The LOUDNESS control is used to compensate for this by lowering the volume of the mid-range frequencies over a continuously variable range to maintain proper tonal perspective when listening at low volume levels. To use this correctly, turn the control to FLAT and then set the VOLUME control to your loudest desirable listening level. Then turn the loudness control counterclockwise to reduce the overall volume while still retaining the natural balance of the high and low frequencies.

### **8 BALANCE control**

This control adjusts the relative volume levels of the left and right speakers. Rotating the control to the right (clockwise) direction shifts the sound image to the right. Conversely, rotating the control to the left (counterclockwise) direction shifts the sound image to the left. Use this control to compensate for unbalanced listening conditions due to furniture arrangement, speaker placement, etc. Set this control to 0 for equal volume from left and right channels.

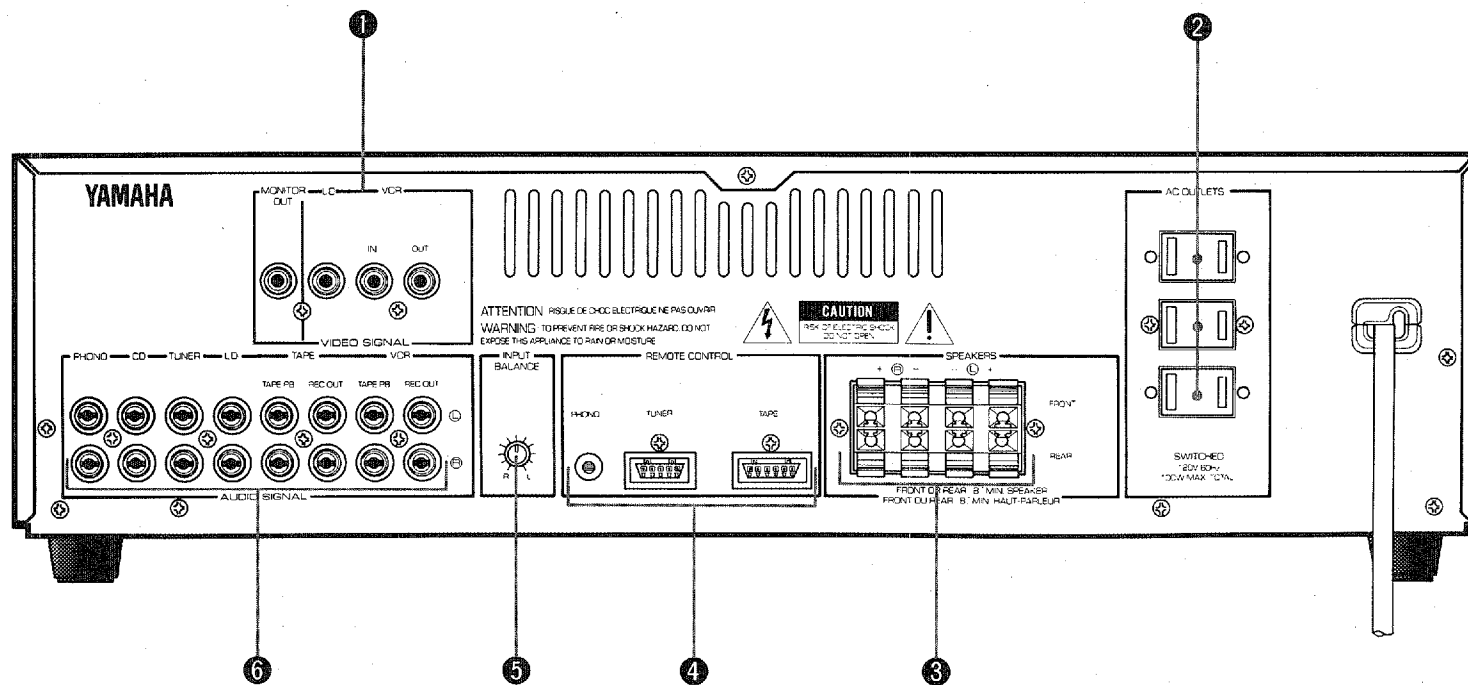
### **9 SPEAKERS switch**

This switch is used to control the speaker output. To listen to the connected speakers, set this switch to ON. If sound from the speakers is not desired (when using headphones, for example) set this switch to OFF.

### **10 Head PHONES jack**

Insert the headphone plug into this jack for private listening. To cut off output from the speakers, set the SPEAKERS switch to OFF.

■ REAR PANEL





### ① Video signal jacks

Use these to connect the video signal cords from your components to the amplifier. They should be connected to the proper input/output jacks for each unit.

#### **MONITOR OUT**

Connect to the video in jack of a video monitor.

#### **LD**

Connect the video out jack of a LD player to this jack.

#### **VCR**

Connect a video recorder to these jacks for both recording and playback.

### ② AC OUTLETS

Use these to connect the power cords from other components to the amplifier.

The power to the SWITCHED outlets is controlled by the amplifier's POWER switch. They will supply power to any component only when the amplifier's power is ON. The total maximum power consumption of the components attached to these outlets must not exceed 100 watts.

Note that the OUTLETS are size-coded for polarity, so insert polarized plugs correctly.

### ③ SPEAKERS terminals

Connect speakers to these terminals. See the Connections section of this manual for details on speaker connections.

### ④ REMOTE CONTROL connectors

Use these to connect compatible YAMAHA components Tuner T-33, turntable P-31, and cassette deck K-40 or K-45 to your amplifier for remote control of each component.

#### **PHONO**

Connect to a turntable using a cable with mini-plug connectors.

#### **TUNER**

Connect to a tuner using a cable with 5 pin connectors.

#### **TAPE**

Connect to a cassette tape deck using a cable with 6-pin connectors.

### ⑤ INPUT BALANCE

Use this control to set the input balance level for the best surround listening condition. Disconnect the front speakers and adjust this control so that the center sound image of the rear speakers is minimal. For normal operation set this control to the center setting. Turning the control towards R (counterclockwise) decreases the left channel's input level. Turning the control towards L (clockwise) decreases the right channel's input level. Setting the control in the center position will not affect the balance of the input signals.

### ⑥ Audio signal connection jacks

Use these to connect the audio signal cords from your components to the amplifier. They should be connected to the proper input/output jacks for each unit. Be sure to observe the proper polarity. That is, connect the right channels of the amplifier to the corresponding right channels of the component, etc.

#### **PHONO**

Connect a turntable.

#### **CD**

Connect a compact disc player.

#### **TUNER**

Connect a tuner.

#### **LD**

Connect an audio signal of the LD player.

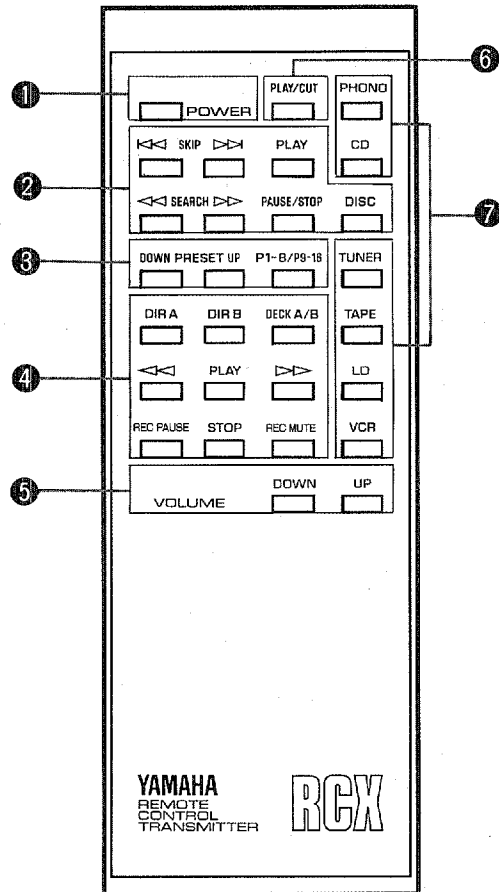
#### **TAPE**

Connect a tape deck for both recording and playback.

#### **VCR**

Connect the audio portion of a VCR to these jacks for audio recording and playback.

## ■ REMOTE CONTROL TRANSMITTER



### ❶ POWER key

Press this key to turn the power of amplifier ON and OFF.

### ❷ CD control keys

The CD player can be controlled directly with the remote control transmitter.



Press to return to the beginning of the current tune. When this key is pressed at the beginning of the tune, the play will start at the beginning of the previous tune.



Press to advance to the beginning of the next tune.

### PLAY

Press this key to start play.



Press this key to play the tune in reverse at high speed.



Press this key to play the tune forward at high speed.

### PAUSE/STOP

Used to set the CD player to pause or stop mode. Pressing the key once to stop play temporarily and pressing it again stops play.

### DISC

Used to select disc in the auto-changer CD player.

### ❸ Tuner preset keys

These keys are used to select the broadcast station preset on the tuner connected to this unit.

### DOWN

Press to select the broadcast station preset on the tuner. Each time this key is pressed, the preset number is decreased by one. (Ex: P4 → P3)

When the key is pressed while the P1 (P9) station is selected, the preset number will be changed to P8 (P16).

## **UP**

Press to select the broadcast station preset on the tuner. Each time this key is pressed, the preset number is increased by one. (Ex: P7 → P8)  
When the key is pressed while the P8 (P16) station is selected, the preset number will be changed to P1 (P9).

## **P1-8/9-16**

Each time this key is pressed, the preset station range is changed between P1-8 and P9-16 alternately.

## **④ Tape deck function keys**

These keys are used to operate the cassette deck connected to this unit.

### **DECK A/B**

Press to select the deck to be operated; either deck A or B on the double cassette deck.

### **DIR B**

Press to change the play direction of tape deck B.

### **DIR A**

Press to change the play direction of tape deck A.



Press to rewind the tape.

## **PLAY**

Press to start tape play or to begin recording from the record/pause mode. When the double cassette deck is used, pressing the key starts tape play on the last deck played.



Press to fast forward the tape.

## **REC/PAUSE**

Press to set to record/pause mode.

## **STOP**

Press to stop the tape.

## **REC MUTE**

Press to make a blank section during recording.

## **⑤ VOLUME control keys**

These keys are used to adjust the volume level heard from the speakers connected to this unit. The UP key increases the volume. The DOWN key decreases the volume.

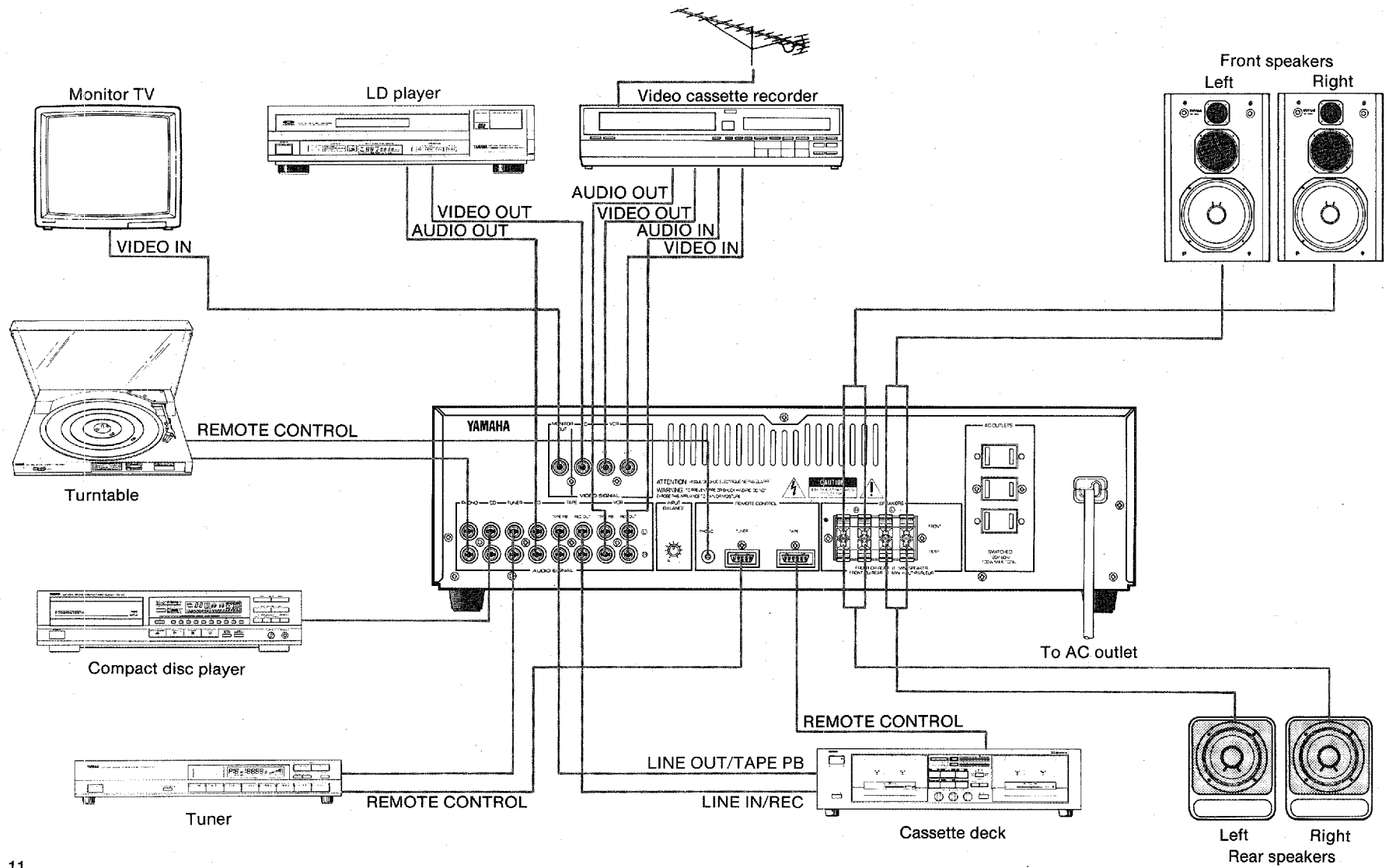
## **⑥ PLAY/CUT key**

This key is used to control the start and stop operations of a turntable.

## **⑦ Input selector keys**

Press these keys to select the corresponding input source (PHONO, CD, TUNER, TAPE, LD or VCR).

# CONNECTIONS



## ■ NOTES ON CONNECTIONS

- Be sure to turn off the power to all units before making any connections.
- Be sure to observe the proper polarity when connecting all stereo components. That is, connect the right channel of the this amplifier to the corresponding right channels of the component, etc.

## ■ TURNTABLE

Connect the output cords of the turntable to the PHONO jacks.

## ■ COMPACT DISC PLAYER

Connect the output jacks of the compact disc player to the CD jacks.

## ■ TUNER

Connect the output jacks of the tuner to the TUNER jacks.

## ■ LD PLAYER

Connect the video output jack from a LD player to the VIDEO SIGNAL LD jack.

Connect the audio output jacks from a LD player to the LD jacks.

## ■ TAPE DECK

Connect the cords from a cassette deck to the TAPE jacks. The playback (LINE OUT) jacks of the tape deck go to the TAPE PB jacks, and the record (LINE IN) jacks of the tape deck go to the REC OUT jacks.

## ■ VCR

Connect the video jacks of a video cassette recorder to the VIDEO SIGNAL VCR jacks. The playback (VIDEO OUT) signal of a VCR goes to the VCR IN jack, and the record signal (VIDEO IN) of a VCR goes to the VCR OUT jack.

Connect the audio output jacks of a video cassette recorder to the VCR jacks. The playback (AUDIO LINE OUT) jacks of the VCR go to the VCR TAPE PB jacks, and the record (AUDIO LINE IN) jacks go to the VCR REC OUT jacks.

## ■ MONITOR OUT

Connect the video jack from a monitor to the MONITOR OUT jack. Note that the audio connections to the monitor are not necessary as the audio portion of the signal is sent to your speakers through the amplifier.

## ■ REMOTE CONTROL CABLE

The REMOTE CONTROL connectors are used when you have YAMAHA compatible components (tuner T-33, turntable P-31, cassette deck K-40 or K-45). These connections allow you to control the components with the supplied remote control transmitter.

Connect the remote control cables from the components to the correct connectors on your amplifier (i.e. PHONO, TUNER, TAPE). Note that no cable is necessary for a compatible CD player as the remote control transmitter operates the player directly.

## ■ SPEAKERS

Connect the SPEAKERS terminals to your front and rear speakers with the proper gauge of wire, cut to be as short as possible. Press the speaker wire terminal tabs down, then insert the bare wires and secure them by releasing the tabs. If these connections are faulty, no sound will be heard from the speakers. Make sure that the polarity of the speaker wires is correct, that is, that the + and - markings of both the amplifier and speakers are observed. If these wires are reversed (reversed polarity), the sound will be unnatural and will lack bass (out of phase). Do not coil up excess speaker wire or bundle the speaker wires with the power cords.

## ■ POWER CORDS

Connect the power cord of your amplifier to an AC outlet. Connect the power cords of your tuner, cassette deck, and other components to the 3 SWITCHED AC OUTLETS to automatically turn them on when the amplifier is turned on. The maximum total power consumption of the components connected to the SWITCHED AC OUTLETS must not exceed 100 watts.

Make sure that the power cords are not tied together with the input/output cords or the speaker wires.

## ■ REAR SPEAKER PLACEMENT

The placement of a rear speaker pair in the listening room will greatly affect the overall sound field created. A small pair of speakers is all that is really required to create the full effect, and the most basic speaker placement configuration is the one shown in Fig. A. This setup is ideal for creating a theater-like atmosphere for movies and other video programs.

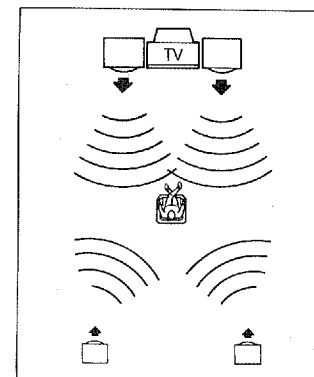


Fig. A

The "B" setup creates a sound field with added depth, much like that experienced in a live concert hall, where all the sound is coming at you from the front. It is most appropriate for musical sources, rather than videos.

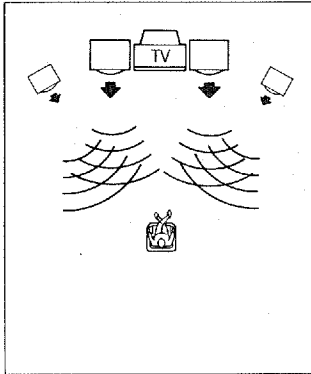


Fig. B

The "C" speaker placement configuration effectively "widens" the sound field, and is suitable for movies and other video programs.

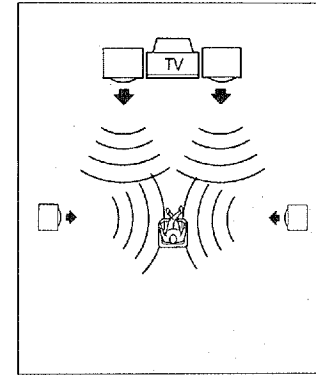


Fig. C

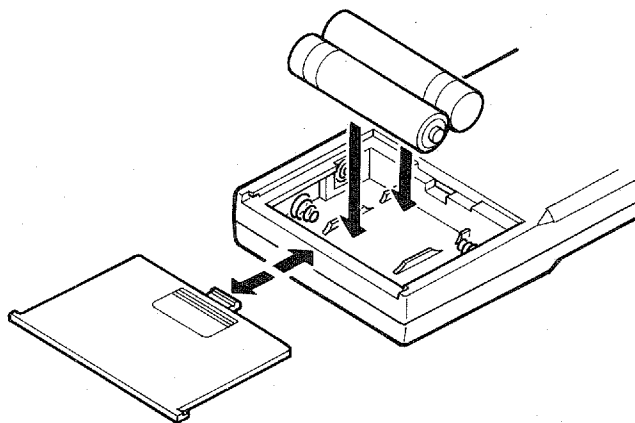
While the most basic speaker placement setup is recommended at first, by experimenting with different speaker placements for each musical or video source, and with each surround mode, you will be able to create a wide variety of sound field effects suited to your listening environment, and to your own particular tastes.

## USING THE REMOTE CONTROL TRANSMITTER

The remote control transmitter supplied with your amplifier is designed to control all the most commonly used features of the amplifier. If the CD player, tuner, turntable and cassette deck connected to your amplifier are YAMAHA components designed for remote control compatibility (tuner T-33, turntable P-31, cassette deck K-40 or K-45 components), then this remote control transmitter will also control various functions of each component. Please consult your YAMAHA dealer for information on which components are compatible with the remote control transmitter. Note that this remote control will directly operate any compatible YAMAHA CD player.

### ■ BATTERY INSTALLATION

The remote control unit uses 2 batteries (size "AA", R06). Install them according to the following illustration. Be sure that they are installed correctly.



### ■ BATTERY REPLACEMENT

When the remote controllable distance decreases the batteries are exhausted. Replace with two new batteries. Install the batteries with the correct (+) and (-) polarities as indicated in the battery compartment.

### BATTERY PRECAUTIONS

Incorrect use of a battery may result in personal injury or remote control transmitter damage. Be aware of the following measures:

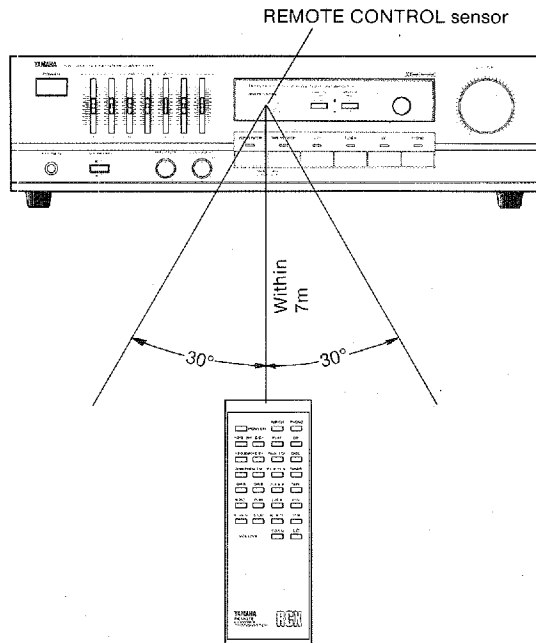
- Read all safety labels on batteries.
- Do not use an old battery with a new one.
- Do not mix battery types (alkaline, heavy duty, carbon, nickel cadmium, etc.).
- When the remote control transmitter will not be used for a long period of time, remove the batteries and store them in a cool, dry place.
- Do not short circuit, heat, disassemble, or dispose of batteries into a fire.
- If leakage occurs, thoroughly wipe off all electrolyte residue from the battery compartment. Replace with new batteries.



## OPERATIONS

### ■ OPERATION RANGE

The remote control unit should point toward the amplifier and be within 7 meters (23 feet) and 30 degrees to the perpendicular of the amplifier for proper operation.



- When selecting program sources to be heard with the INPUT SELECTOR switches, keep in mind the priority of the selected input sources.  
Audio priority: 1) TAPE MONITOR, 2) VCR MONITOR, 3) LD, TUNER, CD or PHONO.  
For example, a source with priority "1" (tape deck) will be heard regardless of what other input sources (priorities 2 and 3) are selected. Thus, if a priority "3" source is desired, the TAPE MONITOR, priority "1", and the VCR MONITOR, priority "2", must not be activated.  
Video priority: 1) VCR MONITOR, 2) LD.  
In this case, if the VCR MONITOR is activated, the VCR's video signal will be visible on the TV/monitor even if the LD selector is also activated.

### ■ TO PLAY A PROGRAM SOURCE

1. Press the POWER switch.
2. For video sources, turn the TV/monitor ON.
3. Select the program source to be heard or watched with the input selector switches.
4. Play the program source.
5. Adjust the VOLUME control.
6. Adjust the GRAPHIC EQUALIZER controls as desired.  
For details of the surround mode, refer to "USING THE SURROUND PROCESSOR" on page 13 and 18.

### ■ TO RECORD A PROGRAM SOURCE ONTO AUDIO/ VIDEO TAPE

1. Press the POWER switch.
2. Select the program source to be recorded with the INPUT SELECTOR switches.
3. Play the program source to be recorded and set the tape deck or video cassette recorder to record mode.  
\* Note: The settings of the SURROUND PROCESSING MODE control, VOLUME control or equalizer do not affect the recording.

### ■ TO DUB VIDEO SOURCE SIGNALS ONTO AUDIO TAPES

1. Press the POWER switch to ON.
2. Activate the selector of the video source (VCR or LD) whose audio signals are to be recorded.
3. Set the video source to play mode and set the tape deck to record mode.
4. The audio portion of the video source will be recorded onto the audio tape.

The settings of the SURROUND PROCESSING MODE controls, VOLUME control or equalizer do not affect the dubbing.

### ■ TO RECORD MIXED VIDEO AND AUDIO SOURCES WITH THE VCR

1. Press the POWER switch to ON.
2. Select the desired program source to be recorded with the INPUT SELECTOR.  
Note: It is not possible to record a mix including the cassette deck's audio signal onto the VCR.
3. Set the VCR to the record-pause mode.
4. Play the video or audio source to be recorded and simultaneously start recording with the recording VCR.

## ■ USING THE SURROUND PROCESSOR

This unit incorporates a sophisticated, multi-mode surround processing circuitry which allows you to expand the audio sound field for a theater-like experience in the listening/viewing room.

Source		Position	Signal processing routes	Rear speaker output
All sources		REAR SPEAKERS OFF		The rear speaker signals are not output.
Stereo sources	 For video programs with the Dolby Surround mark.	DOLBY surround		Dolby surround decoder reverberation components are delayed, and output via the rear, left and right speakers.
	Video/Sound Sports programs	NATURAL surround		Reverberation components are divided between the rear, left and right speakers by a comb filter. This results in a naturally expansive sound with a broad band.

When replaying mono sources in the DOLBY SURROUND or NATURAL SURROUND positions, no sound is heard from the rear speakers.

- FL: Front left speaker output
- FR: Front right speaker output
- RL: Rear left speaker output
- RR: Rear right speaker output

## ■ DOLBY surround

With a great number of movies made today, the sound track is specially encoded with the Dolby surround mode for playback in movie theaters equipped with Dolby surround processing sound systems. This is responsible for the incredibly lifelike effect you experience at movie theaters: while dialogue comes at you from the front speakers, sound effects, background noise, and other ambient noise in the sound track comes at you from behind as well. You are literally surrounded in sound. Dolby surround is encoded on the sound track of commercially available video cassettes and video discs as well. When you play tapes encoded with Dolby surround on your home video system, the Dolby surround mode on this unit decodes the signal and feeds the sound effects, background noise, ambient noise, etc. through your rear speakers in your living room.

The Dolby surround mode will have no effect on video sources not encoded with Dolby surround.

## ■ NATURAL SURROUND

The Natural Surround is an exclusive YAMAHA surround processing mode which is effective with all music and video sources. It creates a natural, lifelike surround effect without the use of delay circuitry, adding considerable depth and imaging to all audio sources. It is recommended for both music listening and for viewing stereo video sources.

### NOTE

If a monaural sound source is used in the DOLBY or NATURAL SURROUND modes, no sound will be heard from the rear speakers.

## INPUT BALANCE CONTROL ADJUSTMENT

To obtain the best surround condition, be sure to adjust the rear panel INPUT BALANCE control.

1. Set the front SPEAKERS switch to off so that the sound from the front speakers will not be heard.
2. Set the front panel controls as follows.  
SURROUND PROCESSING MODE button --- DOLBY surround  
REAR LEVEL volume control --- maximum.
3. Play a monaural program source (such as an FM mono station).
4. Turn up the VOLUME control so that you can hear the monaural program source through the rear speakers.
5. Then minimize the rear speaker's output by slightly turning the INPUT BALANCE control until you achieve a "null" (i.e., minimum output from your rear speakers).

### NOTE:

As you approach the "null", turn up the VOLUME to better hear your rear speakers.

## ■ REAR SPEAKERS ON

When the switch is set to ON, surround processing is in effect.

## ■ REAR SPEAKERS OFF

When the switch is set to OFF, no surround processing is in effect.

### OPERATION

1. Play the program source.
2. Select the surround mode with the NATURAL/DOLBY selector.
3. Set the REAR SPEAKERS switch to ON.
4. Adjust the REAR LEVEL control.
5. Use the VOLUME control to adjust the overall sound level.

## SPECIFICATIONS

### AUDIO SECTION

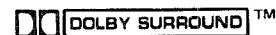
<b>Minimum RMS Output Power per Channel</b>	
Front: 8 ohms, 20 Hz to 20 kHz, 0.05% THD	105W
8 ohms, 1 kHz, 0.1% THD	115W
Rear: 8 ohms, 1 kHz, 0.9% THD	15W
<b>Dynamic Power per Channel</b>	
(IHF, 8 ohms)	145W
(IHF, 6 ohms)	180W
(IHF, 4 ohms)	240W
<b>Dynamic Headroom</b>	
8 ohms	1.6 dB
<b>Damping Factor (8 ohms, 1 kHz)</b>	
	50
<b>Input Sensitivity/Impedance</b>	
PHONO	2.5 mV/47k-ohms
CD/TAPE/TUNER/LD/VCR	150 mV/47 k-ohms
VIDEO(LD/VCR)	1 Vp-p/75 ohms
<b>Input Sensitivity (New IHF)</b>	
PHONO	0.25 mV
AUDIO(CD/TAPE/TUNER/LD/VCR)	15 mV
<b>Maximum Input Level (1 kHz)</b>	
PHONO (0.02% THD)	80 mV
<b>Output Level/Impedance</b>	
REC OUT	150 mV/470 ohms
<b>Frequency Response (20 Hz to 20 kHz)</b>	
CD/TAPE/TUNER/LD/VCR	±0.5 dB
<b>RIAA Equalization Deviation</b>	
PHONO	±0.5 dB
<b>Total Harmonic Distortion (20 Hz to 20 kHz)</b>	
PHONO (3 V)	0.009%
CD/TAPE/TUNER to SP OUT (50W/8 ohms)	0.02%
<b>Signal to Noise Ratio</b>	
(IHF-A Network)	
PHONO (5 mV Input Shorted)	79 dB
CD/TAPE/TUNER/LD/VCR (Shorted)	100 dB

<b>(New IHF)</b>	
PHONO	75 dB
CD/TAPE/TUNER/LD/VCR	80 dB
<b>Power Band Width (0.1% THD, 50W, 8 ohms)</b>	10 Hz — 60 kHz
<b>Headphones Jack Rated Output/Impedance</b>	
(0.05% THD, 8 ohms)	0.81V/270 ohms
<b>Residual Noise</b>	
(IHF-A Network)	250 $\mu$ V
<b>Channel Separation</b>	
PHONO Input Shorted (1 kHz/10 kHz)	70 dB/60 dB
CD/TAPE Input 5.1 k-ohms Terminated (1 kHz/10 kHz)	70 dB/60 dB
<b>Graphic Equalizer (boost/cut, 60, 150, 400 Hz, 1, 2.5, 6.3, 16 kHz)</b>	
	±12 dB
<b>Continuous Loudness Control (Attenuation)</b>	
	-40 dB (1 kHz)
	(Level related equalization)
<b>Gain Tracking Error</b>	2 dB

### GENERAL

<b>Power Supply</b>	120 V, 60 Hz
<b>Power Consumption</b>	360W
<b>AC Outlets</b>	
Switched x 3	100W MAX TOTAL
<b>Dimensions (W x H x D)</b>	
	435 x 122.5 x 300.5 mm
	(17 - 1/8" x 4 - 13/16" x 11 - 7/8")
<b>Weight</b>	
	7.5 kg
	(16 lb 8 oz)
<b>Accessories</b>	
	Remote control transmitter x 1
	Battery x 2

Specifications subject to change without notice.



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## TROUBLESHOOTING

If the unit fails to operate normally, check the following points to determine whether the fault can be corrected by the simple measures suggested. If it cannot be corrected, or if the fault is not listed in the SYMPTOM column, disconnect the power cord and contact your dealer or service center for help.

SYMPTOM	CAUSE	REMEDY
<b>The amplifier fails to turn on when the POWER switch is pressed.</b>	<ul style="list-style-type: none"> <li>● Power cord is not plugged in or is not completely inserted.</li> </ul>	<ul style="list-style-type: none"> <li>● Firmly plug in the power cord.</li> </ul>
<b>No sound.</b>	<ul style="list-style-type: none"> <li>● Incorrect output cord connections.</li> </ul>	<ul style="list-style-type: none"> <li>● Connect cord properly. If the problem persists, the cables may be defective.</li> </ul>
	<ul style="list-style-type: none"> <li>● Incorrect amplifier operation.</li> </ul>	<ul style="list-style-type: none"> <li>● Paying close attention to source priority, set the amplifier controls to the correct input selection.</li> </ul>
<b>Humming sound.</b>	<ul style="list-style-type: none"> <li>● Incorrect cord connections.</li> </ul>	<ul style="list-style-type: none"> <li>● Firmly connect the audio plugs. If the problem persists, the cord may be defective.</li> </ul>
<b>No picture.</b>	<ul style="list-style-type: none"> <li>● Incorrect cord connections.</li> <li>● Wrong video unit selected.</li> <li>● Video unit not turned on.</li> </ul>	<ul style="list-style-type: none"> <li>● Connect the video plugs correctly.</li> <li>● Select correct video unit.</li> <li>● Turn video unit on.</li> </ul>



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VH02700-0

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BWgg, BB  Printed in Japan