

YAMAHA RX-830 *ERS*

Natural Sound Stereo Receiver
70W + 70W (8Ω) RMS Output Power, 0.015%THD, 20-20,000 Hz
16-Station Random Preset Tuning
IF Count Direct PLL Synthesizer Tuning System
Multi-Mode Surround Processor
Continuously Variable Loudness Control
Rec-out Selector
High Dynamic Power, Low Impedance Drive Capability
Programmable Remote Control Transmitter

Thank you for selecting the YAMAHA model RX-830 Stereo Receiver.

CENTER

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OWNER'S MANUAL



IMPORTANT!

Please make a note of the serial number of this unit in the space indicated below.

Model: **RX-830**
Serial No.:

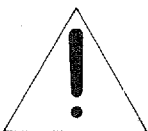
The serial number is inscribed on the rear of the unit. Keep this Owner's Manual in a safe place for future reference.



• 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.

SAFETY INSTRUCTIONS

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 placed in a built-in installation, such as a bookcase 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.

CAUTION : READ THIS BEFORE OPERATING YOUR UNIT

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.

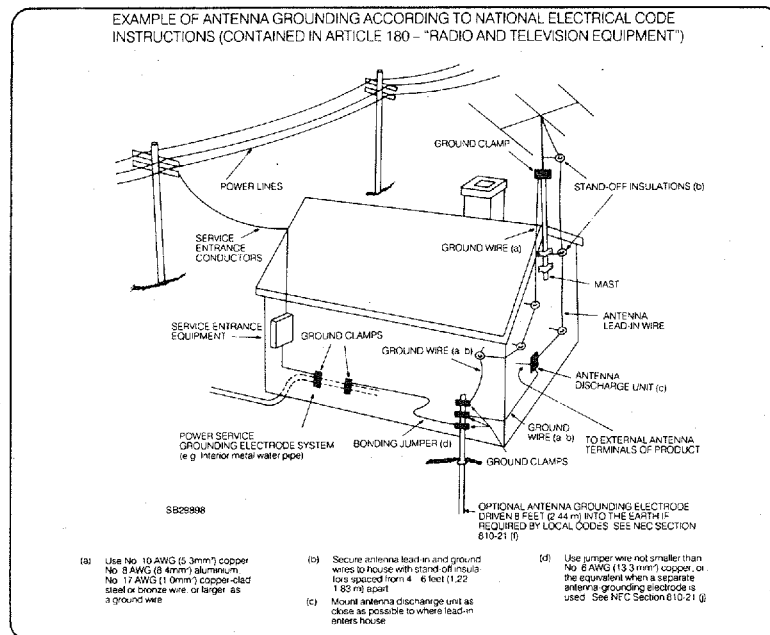
16 Servicing – The user should not attempt to service the appliance beyond those means described in the operating instructions. All other servicing should be referred to qualified service personnel.

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.

19 Outdoor Antenna Grounding – If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges.

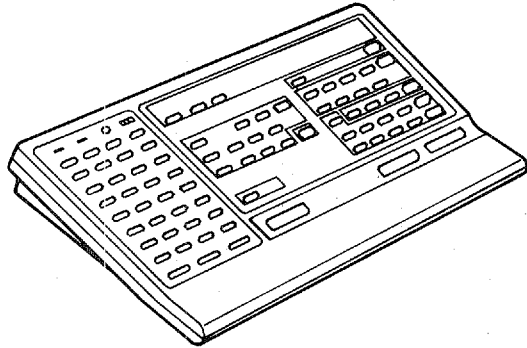
Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.



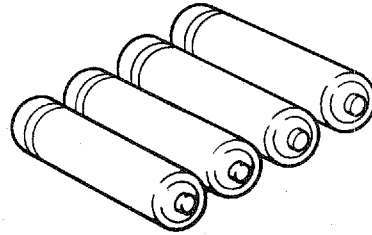
1. This unit is a sophisticated receiver. To ensure proper operation for the best possible performance, please read this manual carefully.
2. Choose the installation location of this unit carefully. Avoid placing it in direct sunlight or close to a source of heat. Also avoid locations subject to vibration and excessive dust, heat, cold or moisture. Keep it away from such sources of hum as transformers or motors.
3. Do not open the cabinet as this might result in damage to the set, or electrical shock. If a foreign object should get into the set, contact your dealer.
4. To prevent lightning damage, pull out the power cord and remove the antenna cable during an electrical storm.
5. When removing the power plug from the wall outlet, always pull directly on the plug; never pull the cord itself.
6. Do not use force when using the switches.
7. When moving the set be sure to first pull out the power plug and remove cords connected to other equipment.
8. Do not attempt to clean this unit with chemical solvent as this might damage the finish. Use a clean, dry cloth.
9. Be sure to read the "Troubleshooting" section for advice on common operating errors before concluding that this unit is faulty.
10. Keep this manual in a safe place for future reference.

1 SUPPLIED ACCESSORIES

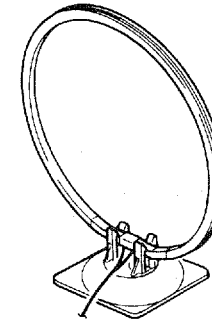
● Remote Control Transmitter



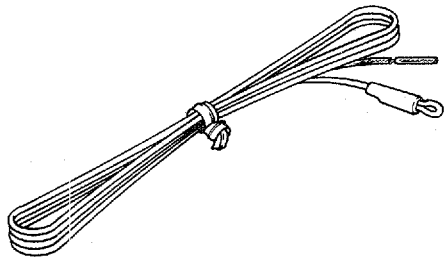
● Batteries (size "AA" R06)



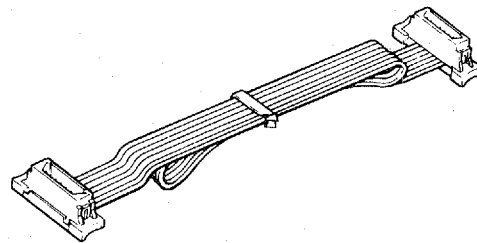
● AM Loop Antenna



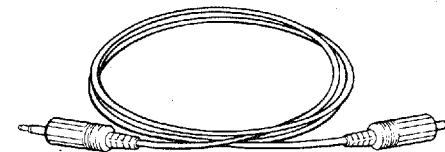
● Indoor FM Antenna



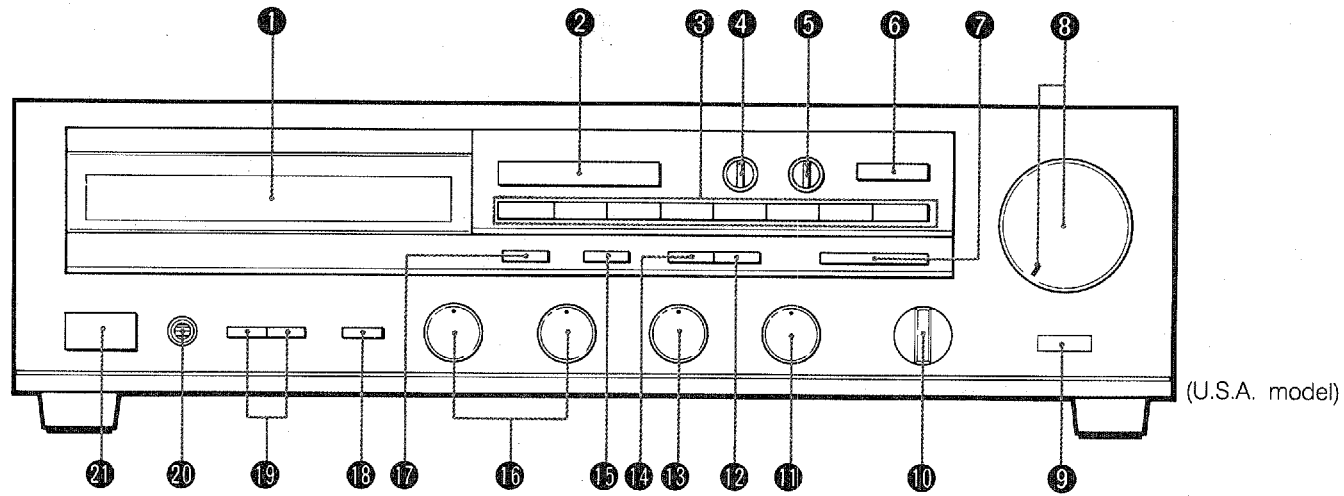
● Remote Control Cable (6-pin. cassette deck)



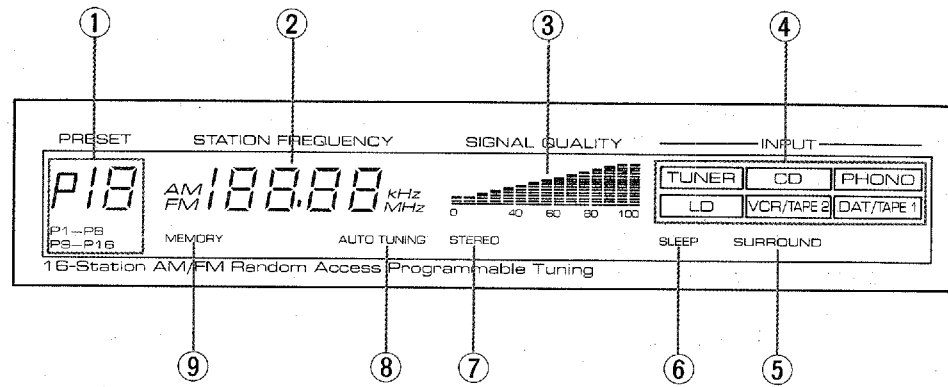
● Remote Control Cable (mini-plug, turntable)



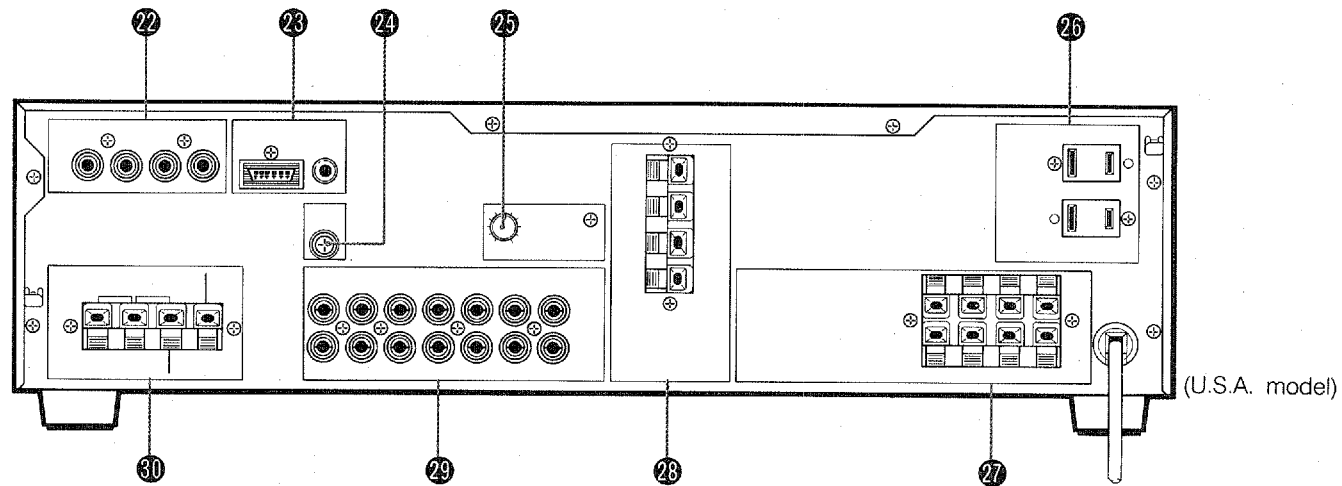
2 FRONT PANEL



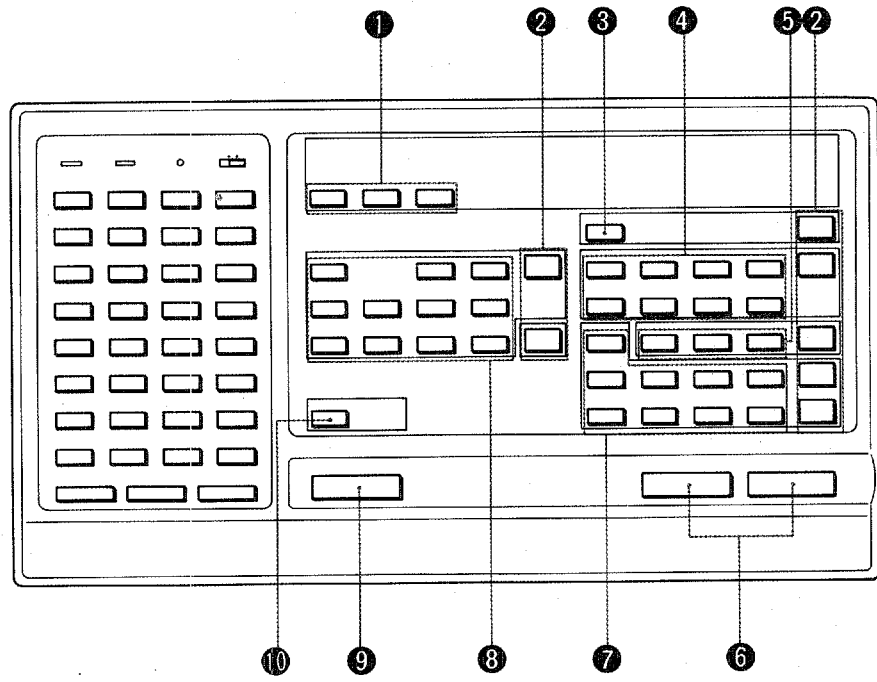
1 Display window



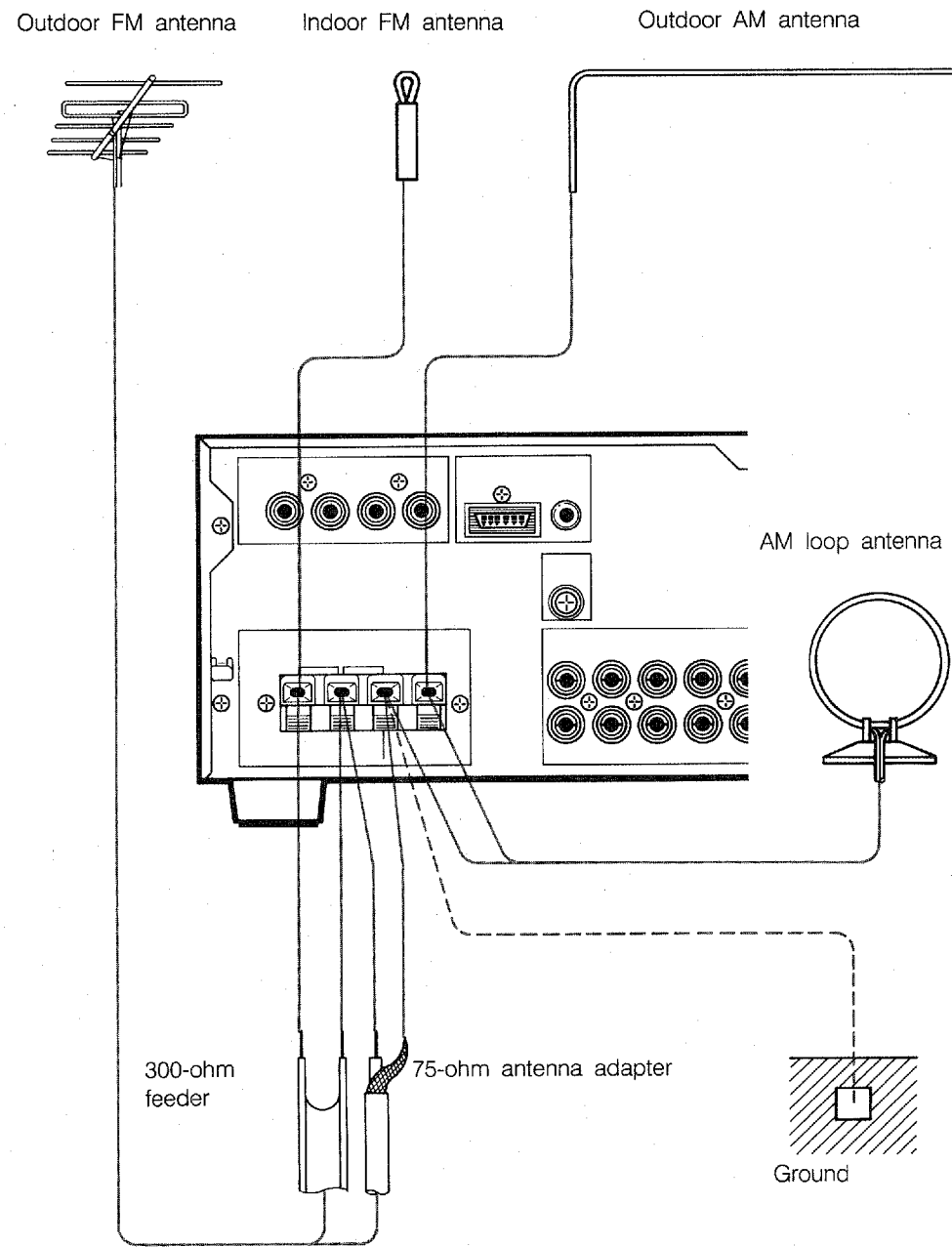
REAR PANEL

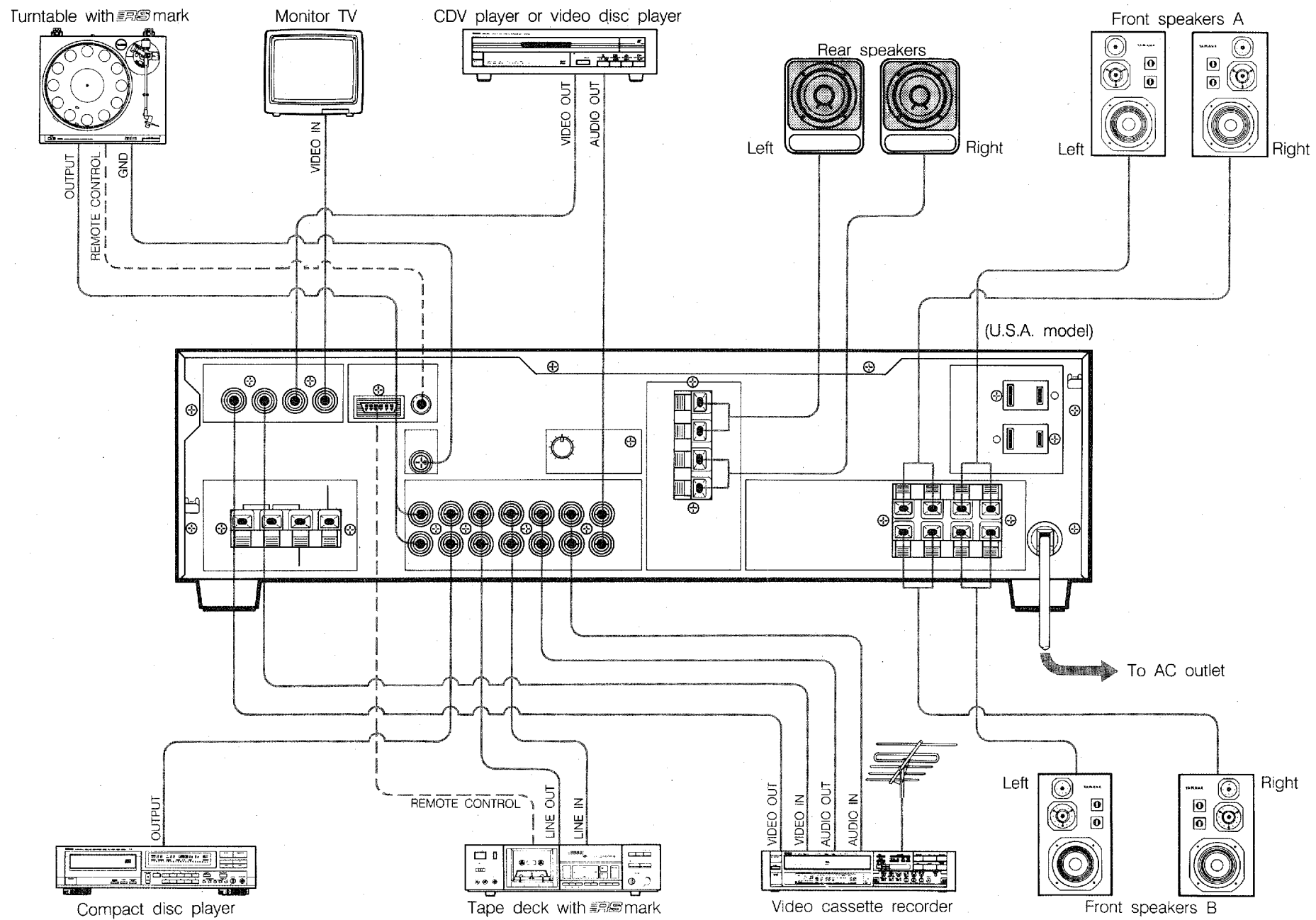


3 REMOTE CONTROL TRANSMITTER



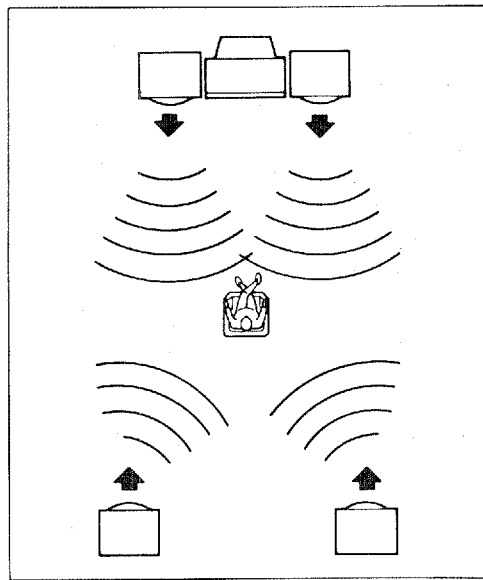
4



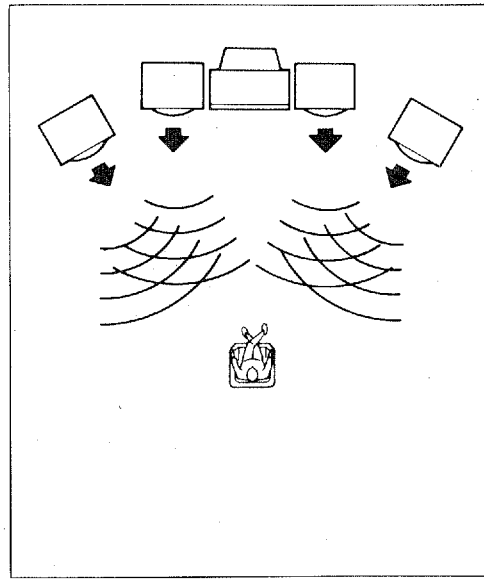


6 REAR SPEAKER PLACEMENT

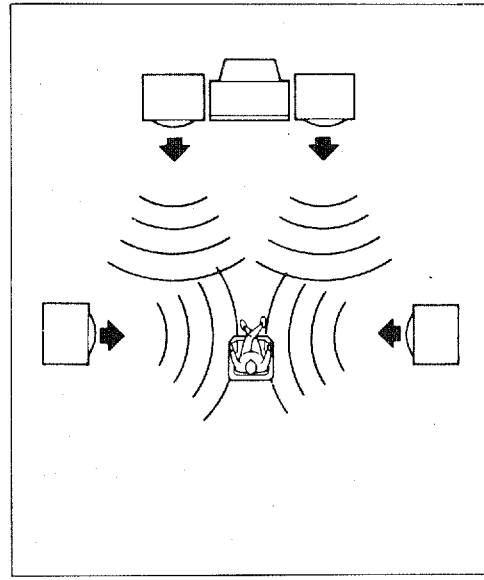
A



B



C



SUPPLIED ACCESSORIES

(See Fig. 1.)

After unpacking, check that the following parts are provided.

- Remote control transmitter
- Batteries
- Remote control cable (6-pin)
- Remote control cable (mini-plug)
- AM loop antenna
- Indoor FM antenna

CONTROL PARTS AND THEIR FUNCTIONS

(See Fig. 2.)

FRONT PANEL

① Display window

① PRESET display

Preset station indicator

Lights up to indicate the pressed preset station button.

P1-P8/P9-P16 indicators

Indicates the range (either P1-P8 or P9-P16) of selectable preset station buttons.

② STATION FREQUENCY display

Displays the band and frequency of the received radio signal.

③ SIGNAL QUALITY indicators

These indicators display the signal strength of the tuned frequency in bar-graph form. 0 marks a poor or no signal, while 100 indicates an excellent signal.

④ INPUT indicator

Indicates the program source selected by the Input selector.

⑤ SURROUND indicator

Lights up while the unit is in the surround mode by setting the SURROUND ON/OFF switch to ON.

⑥ SLEEP indicator

This indicator illuminates beginning from the time that the SLEEP key of the remote-control transmitter is pressed and until the SLEEP mode is automatically canceled one hour later.

⑦ STEREO indicator

When an FM stereo signal of sufficient strength is received the STEREO indicator lights up.

⑧ AUTO TUNING indicator

When the tuner is in automatic tuning mode, the AUTO TUNING indicator lights.

⑨ MEMORY indicator

When the MEMORY button is pressed, the MEMORY indicator blinks on and off.

② Input selector (INPUT SELECTOR)

Used to select the program source to be heard. The selected program source is indicated in the display.

③ Preset station buttons

Up to 16 station frequencies and reception modes can be stored using the preset station button.

④ REAR LEVEL control

This control raise or lower the volume at REAR SPEAKERS terminals.

⑤ SURROUND MODE selector

Used to select the surround mode according to the source played.

SIMULATED SURROUND

Natural surround effects can be given to monaural sources. While the front speakers reproduce ordinary monaural sound, the rear speakers reproduce the sound which has been distributed to the left and right speakers by the comb filter.

□□ DOLBY SURROUND

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

NATURAL SURROUND

Natural surround effects can be reproduced from ordinary stereo sources, using, YAMAHA's original surround processor circuit.

* No sound is output from the rear speakers when the played source is monaural.

⑥ SURROUND ON/OFF switch

Set this switch to ON to enable the surround mode features. Set this switch to OFF when listening to the normal 2-channel stereo sound without reverberation effect. The rear speaker signals are not output.

⑦ TUNING button

Press either side of the TUNING button to carry out auto or manual tuning.

8 VOLUME control and indicator

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

9 REMOTE CONTROL sensor

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

10 REC OUT selector

Used to select the program source to be recorded.

11 Continuous variable LOUDNESS control

This control allows you to retain full tonal range at any volume levels. Your ear loses sensitivity to high and low frequency ranges at low volume settings. This control provides an equalization curve based on human hearing.

To adjust the LOUDNESS control to your listening level, first, set the control to the FLAT position, increase the VOLUME control to your loudest listening level, then turn the LOUDNESS control counterclockwise to reduce the volume level.

12 TUNING MODE button

Used to select the tuning mode between AUTO and MAN'L FM MONO. In the MAN'L FM MONO mode, an FM stereo broadcasting is received in monaural.

13 BALANCE control

Use this control to concurrently change the left and right output volume to the speaker terminals to compensate for sound imbalance caused from speaker settings or listening room condition.

14 FM/AM button

Press this button to select the reception band between FM and AM.

15 MEMORY button

When this button is pressed, the MEMORY indicator flickers in the display for about 5 seconds. During this period, press the desired preset station button to store the displayed frequency.

16 Tone controls

BASS

Used to increase or decrease the low frequency response. The DEFEAT position produces flat response.

TREBLE

Used to increase or decrease the high frequency response. The DEFEAT position produces flat response.

17 P1-P8/P9-P16 button

Press this button to change the range of preset station buttons. When this button is pressed, the selected range of the P1-P8/P9-P16 indicators flickers for about 5 seconds.

18 TONE BYPASS switch

When this switch is set to ON, the input signal does not pass through the tone control circuitry so that it is unaffected by the tone control circuitry.

Use this switch to obtain pure sound and to check the tone control setting.

Set this switch to OFF to activate the tone control circuitry.

19 SPEAKERS selectors

Set this selector to select the front speakers A or B to be driven.

20 PHONES jack

Plug in the headphones to this jack. To shut off the sound from the speakers, set the SPEAKERS selectors to OFF.

21 POWER switch

Press this switch to turn the power on. Press the switch again to turn the power off.

REAR PANEL

22 VIDEO SIGNAL jacks

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

VCR

Connect a video recorder for both recording and playback.


LD

Connect a CDV player or a video disc player.

VIDEO OUT

Connect a monitor TV.

23 REMOTE CONTROL connectors

Use these to connect compatible YAMAHA components (with an  mark) to your receiver for remote control of each component.

TAPE 1/2

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

PHONO

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

24 GND terminal

Connect the ground wire of a turntable.

25 INPUT BALANCE control

Use this control to obtain the best surround condition. For details of the surround condition adjustment, refer to page 17.

26 AC OUTLETS

Use these to connect the power cords from your components to the receiver.

The power to the SWITCHED outlets is controlled by the receiver's POWER switch or remote control transmitter's POWER key. They will supply power to any component whenever this unit is turned on.

The power to the UNSWITCHED outlet is not controlled by the receiver. It will continually supply power to any unit connected.

The maximum power that can be connected to the SWITCHED AC OUTLET is 100 watts and to the UNSWITCHED AC OUTLET (U.S.A., Canada and General models only) is 200 watts.

REMOTE CONTROL TRANSMITTER

(See Fig. 3.)

27 FRONT SPEAKERS terminals

Two pairs of front speakers A and B can be connected to these terminals.

28 REAR SPEAKERS terminals

A pair of rear speakers can be connected to these terminals.

29 Audio signal connection jacks

Use these to connect the audio signal cords from your components to the receiver. They should be connected to the proper input/output jacks for each unit. Be sure that L and R channels are connected consistently.

LD

Connect an audio signal of the CDV player or the video disc player.

VCR/TAPE 2

Connect an audio signal of the video cassette recorder or second tape deck for both recording and playback.

DAT/TAPE 1

Connect a first tape deck for both recording and playback.

CD

Connect a compact disc player.

PHONO

Connect a turntable.

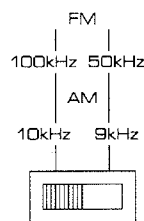
30 Antenna terminals

Connect an FM and AM antennas to these terminals.

FREQUENCY STEP switch

(General model only)

As the interstation frequency spacing differs in different areas, set the FREQUENCY STEP switch located at the rear according to the frequency spacing in your area.



The remote control transmitter supplied with your receiver is designed to control all the most commonly used features of the receiver. If the CD player, CDV/Video disc player, turntable, cassette deck and graphic equalizer connected to your receiver are YAMAHA components designed for remote control compatibility (components with an **RS** mark), 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 any compatible YAMAHA CD player, CDV/Video disc player or a compatible YAMAHA cassette deck which has a remote control sensor, can be directly operated by this remote control transmitter.

1 Graphic-equalizer keys

These keys can be used for operation of a YAMAHA graphic-equalizer (such as model EQ-630, etc.) if it includes the presetting function.

EQ ON/FLAT key

This key can be used to select whether or not to use the circuitry of a graphic-equalizer connected to the receiver.

PRESET UP/DOWN keys

These keys can be used to select any of the preset "channels".

2 Input selector keys

These keys are used to select the sound source.

3 PLAY/CUT key

This key can be used to start or stop disc play on a turntable (with the **RS** mark) connected to the receiver. This key functions in the same manner as the PLAY/CUT key on the turntable itself. Press it once to start play, and once again to stop play.

4 Compact-disc player keys

A YAMAHA compact-disc player that bears the **RS** mark can, when connected to the receiver, be directly controlled by using this remote-control transmitter.

SKIP key

Press this key to advance to the beginning of the next track on the disc.

SKIP key

Press this key to return to the beginning of the track now playing.

If this key is pressed at the beginning of a track, play will begin from the beginning of the previous track.

SEARCH key

Press this key to advance rapidly.

SEARCH key

Press this key to move rapidly in the reverse direction.

DISC UP/DOWN keys

These keys are used for selection of the disc, and are applicable only to compact-disc players that have the magazine type of automatic disc-changing mechanism.

PAUSE/STOP key

This key is used to stop (or temporarily stop: pause) the compact-disc player operation.

Play stops temporarily when the key is pressed once, and changes to a complete stop when the key is pressed again.

PLAY key

Press this key to start compact-disc play.

5 Tuner keys

These keys are used to select one of the preset broadcast stations.

P1-P8/P9-P16 key

This key is used to select one of the two preset ranges: P1 - P8 or P9 - P16. The range changes alternately each time the key is pressed.

UP key

Press this key to select the desired station within the selected range. The preset ("P") number increases by one (example: P7 to P8) each time the key is pressed. If the key is pressed while the P8 (or P16) station is being received, P8 (or P16) will change to P1 (or P9).


DOWN key

Press this key to select the desired station within the selected range. The preset ("P") number decreases by one (example: P8 to P7) each time the key is pressed. If the key is pressed while the P1 (or P9) station is being received, P1 (or P9) will change to P8 (or P16).

6 VOLUME control keys

These keys are used to adjust the volume level heard from the speakers connected to this unit. These keys also have the "learning" function. Refer to "ABOUT THE "LEARNING" FUNCTION" on page 18 for details.

7 Cassette tape deck keys

A cassette tape deck that bears the  mark can, when connected to the receiver, be controlled by using this remote-control transmitter.

DECK A/B key

Press this key to select either deck A or deck B if the cassette deck connected is a double-cassette deck.

key

Press this key to rewind the tape.

PLAY key

Press this key to start tape playback. If the deck connected is a double-cassette deck, the tape in the deck that played back most recently will begin playback when this key is pressed.

key

Press this key to fast-forward the tape.

REC/PAUSE key

Press this key to set the cassette tape deck to the recording-pause mode.

STOP key

Press this key to stop the tape movement.

REC MUTE key

Press this key to make a non-recorded space on the tape while a recording is in progress.


DIR A key (for use with a double-cassette deck only)

Press this key to change the direction of movement of the tape in cassette tape deck A.

DIR B key (for use with a double-cassette deck only)

Press this key to change the direction of movement of the tape in cassette tape deck B.

8 CDV/Video disc player keys

A YAMAHA compact-disc/video disc player (such as model CDV-1600, CDV-2000, etc.) that bears the  mark can, when connected to the receiver, be directly controlled by using this remote-control transmitter.

OPEN/CLOSE key

Press this key to open or close the disc tray.

PAUSE/STOP key

Press this key once to temporarily stop the CDV player operation; when it is pressed again, the CDV player changes to the stop mode.



PLAY key

Press this key to start the CDV disc or video disc play.



CHAPTER keys

- + When this key is pressed during CDV disc or video disc play, the beginning of the next "chapter" is detected.
- When this key is pressed during CDV disc or video disc play, the beginning of the "chapter" now playing is detected.

SEARCH keys

-  When this key is pressed during CDV disc play, compact-disc play, or video disc play, play is advanced at high speed.
-  When this key is pressed during CDV disc play, compact-disc play, or video disc play, play is reversed at high speed.

STILL keys (CAV)

-  This key is used to display a still picture or for frame-by-frame play in the forward direction during video (CAV) disc play.
-  This key is used to display a still picture or for frame-by-frame play in the reverse direction during video (CAV) disc play.

SOUND select key (Video disc)

This key can be used to select the sound to be played from the disc and which will be output from the left and right audio signal output jacks. The selected audio signal changes in the order: STEREO → 1/L-CH → 2/R-CH each time the key is pressed.

DISPLAY key

When this key is pressed during the play of a video (CAV) disc, the "chapter" and frame numbers of the picture now being viewed are displayed on the screen. When this key is pressed during the play of a video (CLV) disc, the "chapter" number and the time are displayed on the screen.

When this key is pressed during the play of a compact disc or a CDV disc, the total time, remaining time or track time is displayed on the screen.

9 POWER key

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

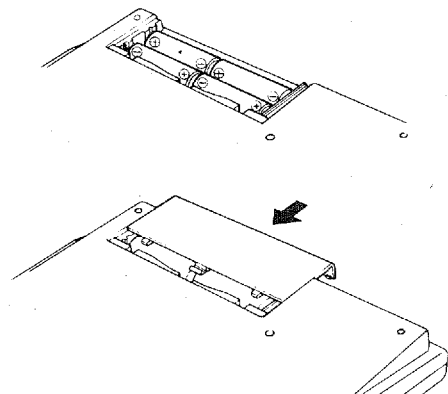
10 SLEEP key

The power to the receiver is automatically switched OFF one hour after this key is pressed.

CONNECTIONS

BATTERY INSTALLATION/REPLACEMENT

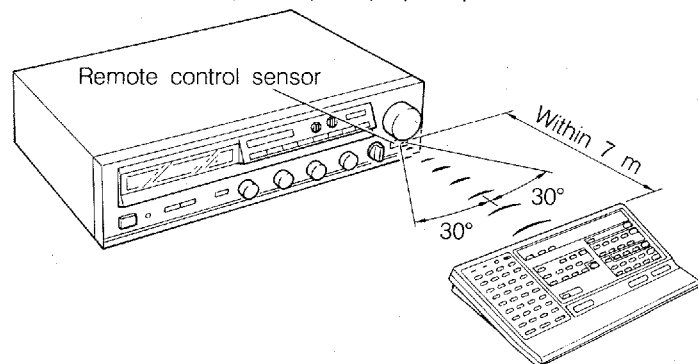
- Install the batteries as shown below.



- Be sure to follow the diagram in the battery compartment to assure proper positive (+) and negative (-) polarity.
- Do not use old and new batteries at the same time.
- If a battery leaks, dispose of all batteries; then clean the battery compartment thoroughly before installing new batteries.

OPERATION RANGE

The remote-control transmitter must be faced toward the component to be controlled, and be within a range of about 7 meters (23 feet) for proper operation.



NOTE ON CONNECTIONS

Be sure to turn off the power to all units before making any connections.

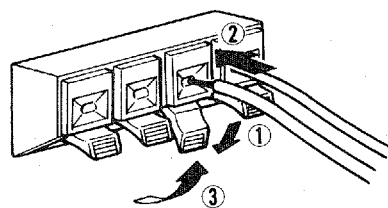
ANTENNA CONNECTIONS

(See Fig. 4.)

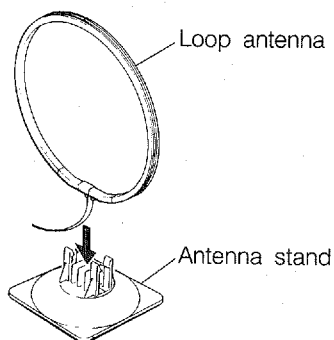
• AM loop antenna

Connect the AM loop antenna cords to the AM ANT and GND terminals.

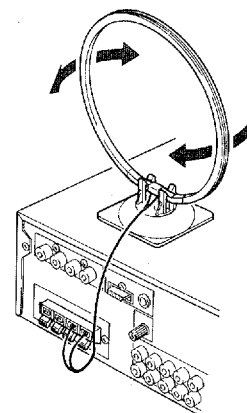
- ① Depress the tabs of AM ANT terminals.
- ② Connect the AM loop antenna leads to the AM ANT terminals.
- ③ Release the tabs. Lightly pull on the leads to confirm a good connection.



- ④ Attach the loop antenna to the antenna stand.



- ⑤ Orient the AM loop antenna so that the best reception is obtained.



* The antenna may be hung on a wall.

• Outdoor AM antenna

The end of the wire should be stripped of insulation and connected to the AM ANT terminal. At this time, keep the loop antenna connected.

• Supplied indoor FM antenna

Connect the supplied indoor antenna to either of the 300 Ω BAL. FM ANT terminals. Move the antenna for best reception.

• Outdoor FM antenna

If necessary an outdoor FM antenna may be used for improved FM reception. Either 300-ohm feeder or coaxial cable may be used. In locations troubled by electrical interference, coaxial cable is preferable.

AUDIO/VIDEO CONNECTIONS

(See Fig. 5.)

● Power cord

Connect the power cord of your receiver to an AC outlet.

● 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 are observed. If these wires are reversed, the sound will be unnatural and will lack bass. Do not coil up excess speaker wire or bundle the speaker cables with the power cords.

● Turntable

Connect the output cords of the turntable to the PHONO jacks, and connect the ground cord to the GND terminal. This should produce minimum hum, but in some cases better results are obtained with this cord disconnected.

● Compact disc player

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

● CDV/Video disc player

Connect the video output jack from a CDV player or a video disc player to the LD jack.

Connect the audio output jacks from a CDV player or a video disc player to the LD jacks.

● Tape deck 1

Connect the cords from a cassette deck to the DAT/TAPE 1 jacks. The playback (LINE OUT) jacks go to the TAPE PB jacks, and the record (LINE IN) jacks go to the REC OUT jacks.

● VCR/Tape deck 2

Connect the audio jacks of a second cassette deck or video cassette recorder to the VCR/TAPE 2 jacks in the same way.

Connect the video jacks of a video cassette recorder to the VIDEO VCR jacks in the same way.


● Monitor TV

Connect the video jack from a monitor to the VIDEO OUT jack.

● Other audio component

For extra system flexibility, this unit allows you to connect a signal processing system, such as graphic equalizer, sound processor, etc., in the signal path prior to the tone control circuitry. To connect these units, pull out the jumper pins from the PRE OUT/MAIN IN jacks, connect the inputs of the unit to the PRE OUT jacks and outputs to the MAIN IN jacks. For details, refer to the Owner's Manual attached to the unit to be connected.

● Remote control cable

The REMOTE CONTROL connectors are used when you have YAMAHA compatible components (with an  mark).

These connections allow you to control the components from the supplied remote control transmitter.

Connect the remote control cables from the components to the correct connectors on your receiver (i.e. PHONO, TAPE 1/2).

Note that no cable is necessary for a compatible CD player, or a compatible cassette deck which has a remote control sensor as the remote control transmitter operates the player directly.

TO LISTEN TO RADIO PROGRAM

Auto Tuning

If signals are strong and there is no interference, quick automatic search tuning is possible.

1. Select the reception band with FM/AM button.
2. Press the TUNING MODE button so that the AUTO TUNING indicator lights up.
3. Use the TUNING button to tune.
The tuning will start automatically and stop at broadcast station frequency with a sufficient signal strength.
4. If the station where tuning stops is not the one you want, press the TUNING button once again.

Manual Tuning

Auto tuning may be impossible if the station signal is weak. If so, use manual tuning.

1. Select the reception band with FM/AM button.
2. Press the TUNING MODE button so that the AUTO TUNING indicator goes off.
3. Use the TUNING button to tune.
The frequency will change rapidly if the TUNING button is kept pressed. Release it slightly before reaching the desired frequency, and then press it intermittently until the desired frequency is reached.

Preset Tuning

The preset station button can be used to select, at a single touch, any desired station which has been preset.

1. Tune to the desired station using auto or manual tuning mode.
2. Select the range of the preset station button with the P1-P8/P9-P16 button.

3. Press the MEMORY button and then while the MEMORY indicator is flickering, press the desired preset station button.

Note

If tuning is done in the manual mode and then MEMORY button is pressed, the preset tuning will be in Mono. Therefore prior to pressing MEMORY button, the tuning should be set to AUTO.

4. To receive the preset station, select the range of the preset station with the P1-P8/P9-P16 button and press the desired preset station button.
 - Follow the same procedure for other preset station buttons.
The new setting will be programmed in place of the former one.

Memory back-up

The memory back-up circuit will prevent the programmed information from being lost even though the power is switched OFF for timer use or other temporary power failure. If, however, the unit is not used for a long time, the memory may be erased. If so, it can be re-programmed by simply following the original procedure.

TO PLAY PROGRAM SOURCE

1. Select the program source to be heard with the INPUT SELECTOR.
2. Play the program source.
3. Adjust the VOLUME and tone controls.

For details of the surround mode, refer to "USING THE SURROUND PROCESSOR" on page 16.

TO RECORD PROGRAM SOURCE

1. Select the program source to be recorded with the REC OUT selector.
2. To listen to the program source to be recorded, press the left or right side of the INPUT SELECTOR.

3. Play the program source to be recorded and set the tape deck or video cassette recorder to record mode.
4. To listen to other program source during recording, select the program source to be listened to with the INPUT SELECTOR.

When your tape deck has three head monitoring capability, select the corresponding tape source with the INPUT SELECTOR to listen to just recorded signal. The settings of the SURROUND MODE selector, tone controls and VOLUME control do not affect the recording.

TO DUB AUDIO TAPES

1. Set the REC OUT selector to select the program source (DAT/TAPE 1 or VCR/TAPE 2) to be dubbed.
2. To listen to the program source to be recorded, press the left or right side of the INPUT SELECTOR.
3. Set the tape decks or video cassette recorders to play and record mode respectively.
4. To listen to other program source during dubbing, select the program source to be listened to with the INPUT SELECTOR.

When your tape deck has three head monitoring capability, select the corresponding tape source with the INPUT SELECTOR to listen to just recorded signal. The settings of the SURROUND MODE selector, tone controls and VOLUME control do not affect the dubbing.

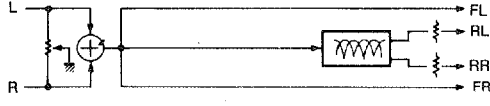
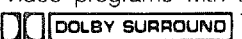

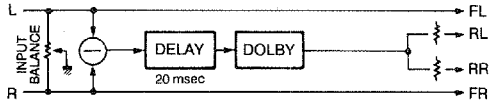
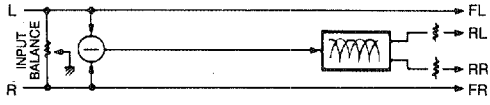
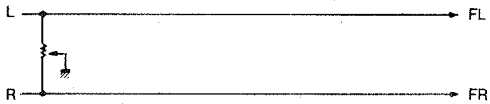
TO RECORD VIDEO SOURCES

1. Select the desired program source to be recorded with the REC OUT selector.
2. Set the VCR for recording to the record-pause mode.
3. Play the video source to be recorded and start recording with the recording VCR at the same time.

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.

- The surround processor in this unit is effective only when the unit is used with four speaker systems (including rear speaker systems).

	Source	Position	Signal processing routes	Rear speaker output
Mono sources	Video/Sound Sports programs	SIMULATED SURROUND		A comb filter distributes each band to right and left.
Stereo sources	Video programs with the  mark	 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.
All sources		OFF (The SURROUND ON/OFF switch is set to "OFF".)		The rear speaker signals are not output.

When replaying mono sources in the  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

REAR SPEAKER PLACEMENT

(See Fig. 6.)

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.

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.

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

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.

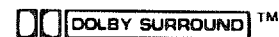
SURROUND MODES

• (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.

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



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• SIMULATED SURROUND

The Simulated Surround mode is intended for monaural audio sources, such as video and TV programs, it creates a surround sound effect, and employs a comb filter for an extra dimension of depth and imaging.

• NATURAL SURROUND


The Natural Surround is an exclusive YAMAHA surround processing mode which is effective with all music and audio sources of video sound. 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 Natural Surround mode, 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 panel controls as follows.
 - SPEAKERS (for the front setting) selectors – Set to OFF.
 - SURROUND ON/OFF switch – Set to ON.
 - SURROUND MODE selector – Set to the  DOLBY SURROUND position.
 - REAR LEVEL control – Set to the "10" (maximum) position.
2. Set the INPUT BALANCE control on the rear panel to the center position.
3. Play a monaural program source.
4. Turn up the VOLUME control so that you can hear the monaural program source through the rear speakers.
5. Then minimize the rear speakers' output by slightly turning the INPUT BALANCE control clockwise or counterclockwise until you achieve a "null" (ie., minimum output from your rear speakers).
NOTE: As you approach the "null", turn up the VOLUME control to better hear your rear speakers.

With this adjustment, the best surround balance can be obtained.

OPERATION

1. Set the SURROUND ON/OFF switch to ON.
2. Play the program source.
3. Select the surround mode with the SURROUND MODE selector.
4. Adjust the REAR LEVEL control.
5. Use the VOLUME control to adjust the whole sound level.

ABOUT THE "LEARNING" FUNCTION

The provided remote-control transmitter has a number of programmable keys.

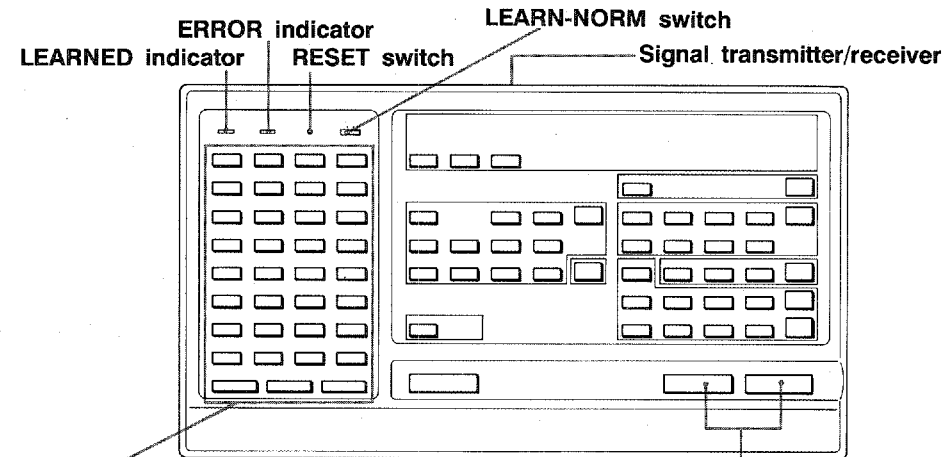
These keys can be programmed to "learn" the signal patterns from other remote-control transmitters.

By programming this unit with the signals from other remote-control transmitters, this unit can then be used in place of one or more other remote-control transmitters, thus making operation of your various audio and video components more convenient.

NOTE

There may occasionally be instances in which, due to the signal-coding and modulation systems employed by the other remote-control transmitter, that this unit will not be able to "learn" its signals.

IDENTIFICATION OF PARTS



Learning keys

These keys can be used to "learn" (program) signals from other remote-control transmitters.

Programmable preset learning keys

These keys have already been preset with signals for controlling the volume of the receiver, but, if desired, other signals can be "learned" by these keys (over the preset signals), in the same way as the ordinary learning keys.

(The "learning" method is the same as that for the ordinary learning keys.)

* These keys are convenient for programming signals for use as the master volume control of a YAMAHA digital-sound-field processor (model DSP-3000, DSP-1, etc.) and so on.

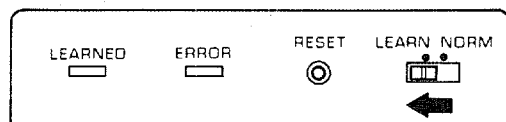
TO PROGRAM SIGNALS FROM OTHER REMOTE-CONTROL TRANSMITTERS

Before programming

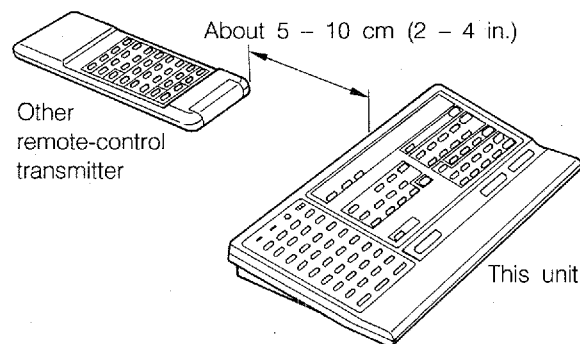
- Some learning keys are larger than others, but all keys are potentially capable of the same functions if so programmed. Keys should be programmed and used according to their positional convenience.
- Use the included seals to indicate the functions for which learning keys have been programmed. It is recommended that you first determine the best and most convenient layout of the keys for the various functions you plan to program (and attach the seals accordingly), and then program the keys correspondingly.

Follow the steps described below to program signals from other remote-control transmitters to this unit.

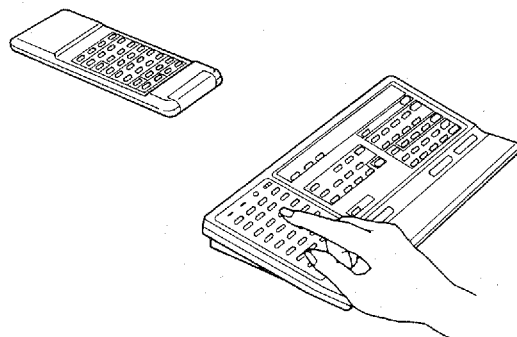
1. Set the LEARN-NORM switch to the "LEARN" position.



2. Position this unit and the other remote-control transmitter head to head.

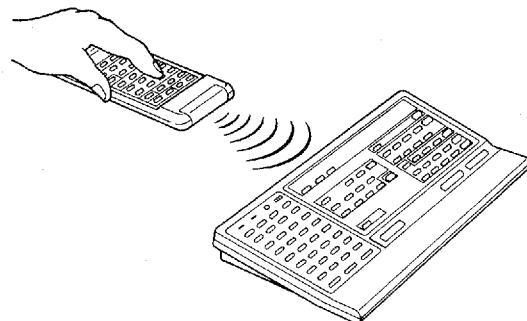


3. Press the learning key (or programmable preset learning key) on this unit to which the programming will be made.



- * If the pressed key is unprogrammed, the LEARNED indicator will flash continuously. If the key is already programmed, the LEARNED indicator will flash continuously and, at the same time, the ERROR indicator will illuminate. Then proceed to the next step if you want to change that instruction already programmed for the key. If you do not want to change it, however, press the key to be programmed next and proceed to the "learning" operation of that key.

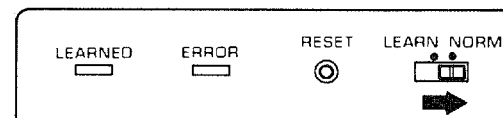
4. Press the key (on the other remote-control transmitter) for the function to be programmed.



- * The LEARNED and ERROR indicators will illuminate continuously while the signals from the other remote-control transmitter are being received by this unit. Press and hold the key on the other remote-control transmitter until the illumination of these indicators stops. The LEARNED indicator will illuminate for about two seconds when the programming of signals has been successfully completed.

5. Repeat steps 3 and 4 until the signals for all programmings you want to make are successfully programmed.

6. After all programming is completed, set the LEARN-NORM switch to the "NORM" position.



After all programming is completed, try operating this unit.

Notes

- Note that the successful programming of signals to a learning key results in the erasure of previously programmed signals and their replacement by the newly programmed signals.
- In step 4, If the key on the other remote-control transmitter is not pressed within 15 seconds after a learning key is pressed, this unit will automatically return to the status that was in effect before the learning key was pressed.

- If the signals are not successfully programmed to this unit, the ERROR indicator will flash for about two seconds. If signals to be programmed are too long and this unit cannot program them, this unit automatically expands the work area capacity to be doubled, and will then await the next entry. During this stand-by mode the LEARNED indicator flashes rapidly. If this happens, try programming again.
- Although, because this unit employs the variable length programming method, long signals can also be programmed, if all signals programmed are long signals, it might happen that the capacity of the memory area would be completely used before all keys that are programmable are actually programmed, and no further programming would be possible. If this happens, after the signals from the other remote-control transmitter is received (in step 4), the LEARNED indicator and the ERROR indicator will flash two times.

Memory back-up

All of the programmed functions will be retained while you replace the batteries. However, if no batteries are installed for a few hours, the memory will be erased and will have to be programmed again.

Trouble shooting guide

- If programming cannot be made successfully, or if this remote-control transmitter does not function even though the programming was successful, check the following points:
 - * Check whether the batteries of the other remote-control transmitter are weak. Note that even though its batteries may be strong enough to operate the component it was made for, they may be too weak to transfer signals to this unit. If so, replace the batteries of the other remote-control transmitter.
 - * Check whether the distance between the two remote-control transmitters is too long or too short.

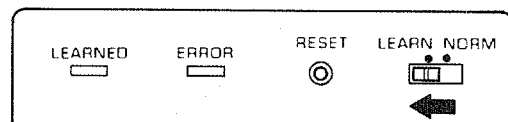
- * Check whether a strong light, such as direct sunlight, is striking the signal transmitter/receiver of this unit.
- The remote-control transmitter's batteries are too weak if the LEARNED indicator and the ERROR indicator do not illuminate or flash, or if the distance or range within which the remote-control transmitter can be used decreases. If either occurs, replace the batteries with new ones.

HOW TO CLEAR SIGNALS PROGRAMMED BY THE LEARNING OPERATION

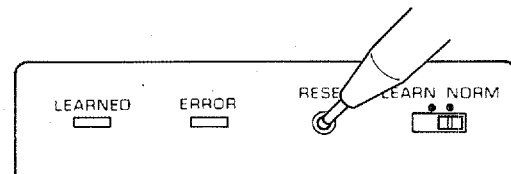
By using the RESET switch, signals that you have programmed to a learning key or to a programmable preset learning key can be canceled.

For a programmable preset learning key, there is a return to the originally preset commands for volume control of the receiver when this switch is pressed.

1. Set the LEARN-NORM switch to the "LEARN" position.



2. Press the RESET switch using the point of a mechanical pencil, etc.. The LEARNED and ERROR indicators will illuminate for 15 seconds.



3. Press and then release the learning key (or programmable preset learning key) for which you want the programmed signal to be canceled. The LEARNED indicator's illumination and the ERROR indicator's illumination will then stop. Then, when the cancellation is finished, the LEARNED indicator will illuminate for one second. This indicates the completion of the cancellation process. To cancel two or more programmings, repeat steps 2 and 3.

Note

If a learning key (or a programmable preset learning key) is not pressed within 15 seconds after the RESET switch is pressed, this unit will automatically return to the status that was in effect before the RESET switch was pressed.

REMOTE-CONTROL OPERATION

Note the following points when using this unit for operation of audio/video-equipment.

- Be sure to set the LEARN-NORM switch to the "LEARN" position.
- If this unit is faced toward the component to be operated and the key pressed correctly so that the correct signal can be transmitted, the LEARNED indicator will illuminate steadily. The ERROR indicator will illuminate if an unprogrammed key is pressed, or two or more keys are pressed simultaneously or one after another.
 - * If a short signal is transmitted by a learning key, this indicator's illumination will stop when signal transmission ends, even if the key is pressed for a longer time.

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
Amplifier	The receiver fails to turn on when the POWER switch is pressed.	Power cord is not plugged in or is not completely inserted.	Firmly plug in the power cord.
	No sound.	Incorrect output cord connections.	Connect cord properly. If the problem persists, the cables may be defective.
		Incorrect receiver operation.	Set the receiver controls to the correct input selection.
	Sound "hums".	Incorrect cord connections.	Firmly connect the audio plugs. If the problem persists, the cord may be defective.
	No picture.	Incorrect cord connections. Wrong video unit selected. Video unit not turned on.	Connect the video plugs correctly. Select correct video unit. Turn video unit on.
FM	FM stereo reception is noisy.	Because of the characteristics of FM stereo broadcasts, this is limited to cases where the transmitter is far away or the antenna input is poor.	Check the antenna connections. Try using a multiple element FM antenna.
	There is distortion and clear reception cannot be obtained even with a good FM antenna.	There is multipath interference.	Adjust antenna placement to eliminate multipath interference.
	A desired station cannot be tuned in with Auto tuning.	The station is too weak.	Use Manual tuning mode. Use high quality directional FM antenna.
AM	A desired station cannot be tuned in with Auto tuning.	Weak signal or loose antenna connections.	Tighten the AM loop antenna connections and rotate it for best reception.
			Use Manual tuning mode.
	There are continuous crackling and hissing noises.	These noise result from lightning, fluorescent lamps, motors, thermostats and other electrical equipment.	Use an outdoor antenna and a ground wire. This will help some what but it is difficult to eliminate all noise.
	There are buzzing and whining noises (especially in the evening).	A television set is being used nearby.	Move the television away.

SPECIFICATIONS

AUDIO SECTION

Minimum RMS Output Power per Channel (Front)	
8 ohms, 20 Hz to 20 kHz, 0.015% THD	70 W
6 ohms, 20 Hz to 20 kHz, 0.03% THD	
[U.S.A., Canada and General models]	75 W
Output Power per Channel (Rear)	
8 ohms, 1 kHz, 0.1% THD, rear amp direct measurement	15 W
Dynamic Power per Channel (IHF)	
8/6/4/2 ohms	115/140/156/180 W
Power Band Width	
8 ohms, 35 W, 0.1% THD	10 Hz to 50 kHz
Damping Factor	
8 ohms, 1 kHz	50
Input Sensitivity/Impedance	
[U.S.A., Canada and General models]	
PHONO	2.5 mV/47 k-ohms
CD/TAPE/VCR/LD	150 mV/47 k-ohms
Input Sensitivity (New IHF)	
PHONO	0.3 mV
CD/TAPE/VCR/LD	17.9 mV
Maximum Input Signal Level (1 kHz, 0.01% THD)	
PHONO	110 mV
Output Level/Impedance	
REC OUT	150 mV/1 k-ohms
Headphone Jack Rated Output/Impedance	
8 ohms, 0.02 % THD	0.8 V/220 ohms
Frequency Response (20 Hz to 20 kHz)	
CD/TAPE/VCR/LD	±0.5 dB
RIAA Equalization Deviation	
PHONO	±0.5 dB
Total Harmonic Distortion (20 Hz to 20 kHz)	
PHONO to REC OUT (3 V)	0.007%
CD/TAPE/VCR/LD to SP OUT	
(35 W/8 ohms)	0.009%

Intermodulation Distortion	
CD/TAPE/VCR/LD (Rated Output/8 ohms)	0.01%
Signal-to-Noise Ratio (IHF-A Network)	
PHONO (5 mV Input Shorted)	88 dB
CD/TAPE/VCR/LD (Shorted)	96 dB
Residual Noise (IHF-A Network)	200 µV
Channel Separation (1 kHz/10 kHz, Vol. -30 dB)	
PHONO (Input Shorted)	59 dB
CD/TAPE/VCR/LD	
(Input 5.1 k-ohms Terminated)	57 dB
Tone Control Characteristics	
BASS: Boost/cut	±10 dB (50 Hz)
Turnover Frequency	350 Hz
TREBLE: Boost/cut	±10 dB (20 kHz)
Turnover Frequency	3.5 kHz
Continuous Loudness Control	-40 dB (1 kHz)
(Level related equalization)	

VIDEO SECTION

Input Sensitivity/Impedance	1 V/75 ohms
Output Level/Impedance	1 V/75 ohms
Maximum Input Level/Impedance	More than 1.5 V/75 ohms

FM SECTION

Tuning Range	
[U.S.A., Canada and General models]	
	87.5 to 107.9 MHz
[Australia model]	87.5 to 108 MHz

50 dB Quieting Sensitivity	
[U.S.A., Canada and General models]	
Mono	1.55 µV (15.1 dBf)
Stereo	21 µV (37.7 dBf)
Usable Sensitivity	
IHF Mono, 1 kHz, 100% mod., 75 ohms	
[U.S.A., Canada and General models]	
	0.8 µV (9.3 dBf)
DIN, Mono (S/N 26 dB) [Australia model]	0.9 µV
DIN, Stereo (S/N 46 dB) [Australia model]	24 µV
Limiting Sensitivity	0.94 µV
Image Response Ratio	45 dB
IF Response Ratio	80 dB
Spurious Response Ratio	70 dB
AM Suppression Ratio	55 dB
Capture Ratio	1.5 dB
Alternate Channel Selectivity	
[U.S.A., Canada and General models]	55 dB
Selectivity (two signals, 40 kHz Dev.)	
[Australia model]	50 dB
Signal-to-Noise Ratio	
(IHF) Mono/Stereo	
[U.S.A., Canada and General models]	81/76 dB
(DIN-weighted, 40 kHz Dev.) Mono/Stereo	
[Australia model]	75/70 dB
Harmonic Distortion (1 kHz)	
Mono/Stereo	0.07%
Stereo Separation (1 kHz)	52 dB
Frequency Response	
30 Hz to 15 kHz	0 ±0.5 dB

AM SECTION

Tuning Range	
[U.S.A., Canada and General models]	530 to 1,610 kHz
[Australia model]	531 to 1,611 kHz
Usable Sensitivity	100 μ V/m
Selectivity	32 dB
Signal-to-Noise Ratio	50 dB
Image Response Ratio	40 dB
Spurious Response Ratio	50 dB
Harmonic Distortion (400 Hz)	0.3%

AUDIO SECTION

Output Level/Impedance	
FM (100% mod., 1 kHz)	
[U.S.A., Canada and General models]	500 mV/3.3 k-ohms
[Australia model]	400 mV/3.3 k-ohms
AM (30% mod., 400 Hz)	
[U.S.A., Canada and General models]	150 mV/3.3 k-ohms
[Australia model]	150 mV/3.3 k-ohms

GENERAL

Power Supply	
[U.S.A. and Canada models]	AC 120 V, 60 Hz
[Australia model]	AC 240 V, 50 Hz
[General model]	AC 110-120/220-240 V, 60/50 Hz
Power Consumption	
[U.S.A., Canada and General models]	350 W
[Australia model]	450 W
AC Outlets	
[U.S.A., Canada and General models]	
Switched	100 W max.
Unswitched	200 W max.
[Australia model]	
Switched	100 W max.
Dimensions (W x H x D)	435 x 126 x 289 mm (17-1/8" x 4-15/16" x 11-3/8")
Weight	7.5 kg (16 lbs. 8 oz.)
Accessories	AM loop antenna x 1 Indoor FM antenna x 1 Remote control cable (mini-plug) x 1 Remote control cable (6-pin) x 1 Remote control transmitter x 1 Battery x 4

Specifications subject to change without notice.

YAMAHA