

# YAMAHA R-7

*Natural Sound AM/FM Stereo Receiver*

*Low Impedance Drive*

*High Dynamic Power*

*New Continuously Variable Loudness Control*

*New Computer Servo Lock Tuning System*

*Rec Out Selector*

*16-Station Random Preset Tuning*

*Wireless Remote Control Capability*

CENTER

61.6.24 ULJ-222 18番追加訂正

Thank you for purchasing the YAMAHA R-7 AM/FM stereo receiver.

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## OWNER'S MANUAL

### IMPORTANT!

Please record the serial number of your unit in the space below:

Model : R-7

Serial No. :

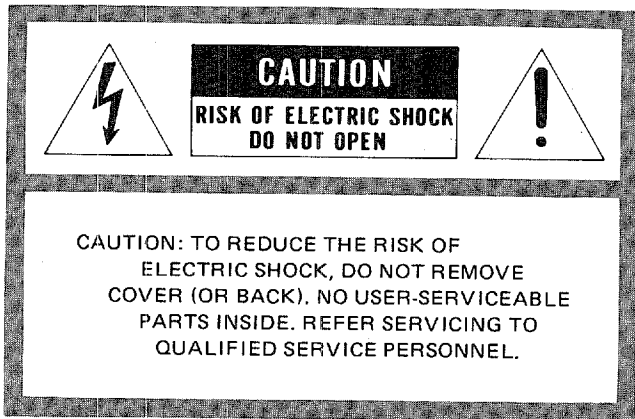
The serial number is located on the rear of the unit.

Retain this Owner's Manual in a safe place for future reference.

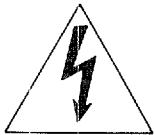
### WARNING

To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

## 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.

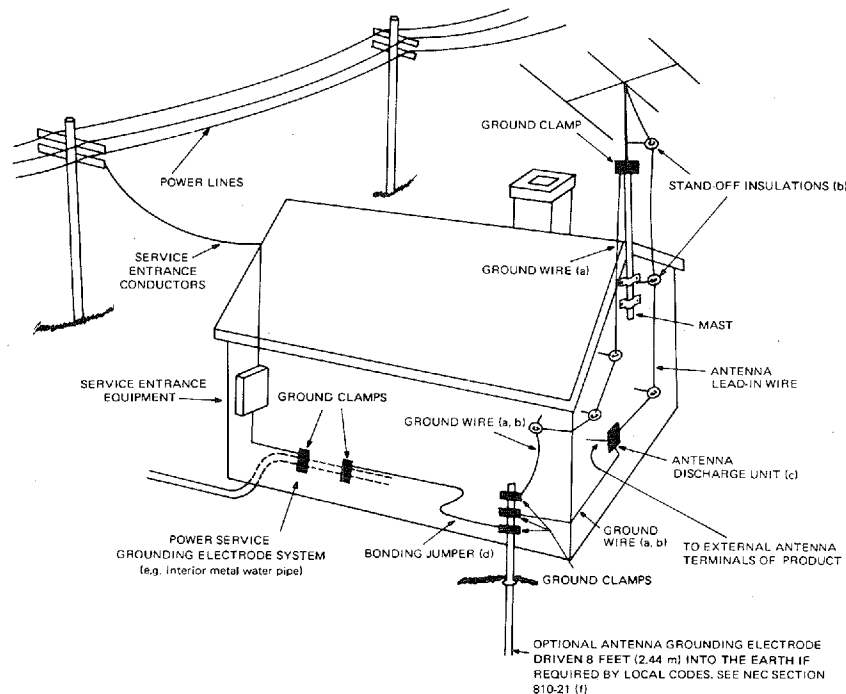
- 1** Read Instructions — All the safety and operating instructions should be read before the appliance is operated.
- 2** Retain Instructions — The safety and operating instructions should be retained for future reference.
- 3** Heed Warnings — All warnings on the appliance and in the operating instructions 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** Wall or Ceiling Mounting — The appliance should not be mounted on a wall or ceiling.
- 7** 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 placed 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.
- 8** Heat — The appliance should be situated away from heat sources such as radiators, stoves or other appliances that produce heat.
- 9** 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.
- 10** 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.
- 11** Cleaning — The appliance should be cleaned only as recommended.
- 12** Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
- 13** 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.
- 14** 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 on, 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.
- 15** 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.
- 16** Power Lines — An outdoor antenna should be located away from power lines.

**17** 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.

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

EXAMPLE OF ANTENNA GROUNDING ACCORDING TO NATIONAL ELECTRICAL CODE INSTRUCTIONS (CONTAINED IN ARTICLE 810 — "RADIO AND TELEVISION EQUIPMENT")



(a): Use No. 10 AWG (5.3mm<sup>2</sup>) copper, No. 8 AWG (8.4mm<sup>2</sup>) aluminium, No. 17 AWG (1.0mm<sup>2</sup>) copper-clad steel or bronze wire, or larger, as a ground wire.

(b): Secure antenna lead-in and ground wire to house with stand-off insulators spaced from 4 – 6 feet (1.22 – 1.83 m) apart.  
(c): Mount antenna discharge unit as closely as possible to where lead-in enters house.

(d): Use jumper wire not smaller than No. 6 AWG (13.3mm<sup>2</sup>) copper, or the equivalent when a separate antenna-grounding electrode is used. See NEC Section 810-21 (j).



**CAUTION : READ THIS BEFORE  
OPERATING YOUR R-7**

**1**

The R-7 is a sophisticated stereo receiver. To ensure proper operating for the best possible performance, please read this manual carefully.

**2**

Choose the installation of your R-7 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 away from such sources of hum as transformers or motors.

**3**

To ensure that the unit operates properly, be sure to set it on a level surface, and do not cover the heat vents on the top. If temperature becomes too high, a thermal protector will cut off the power.

**4**

If speaker impedance is too low, a protection relay circuit will cut off the output signal. Use speakers inside the rated impedance range.

**5**

The back-up power supply will keep the preset stations memorized for one week if power fails or the set is unplugged. In order to keep the back-up power supply fully charged, turn the power switch on once a week even if you are not using the unit. Even if the preset stations are erased, the memory still functions: merely preset the stations again.

**6**

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.

**7**

Do not place records or other objects on top of the receiver so that the ventilation holes are blocked. This will cause the internal temperature to rise and may result in a failure.

**8**

When removing the power plug from the wall outlet, always pull the plug directly; never pull the cord itself.

**9**

To prevent lightning damage, pull out the power cord and remove the antenna cable in case of an electrical storm.

**10**

Do not use force when using the switches and knobs.

**11**

When moving the set be sure to first pull out the power plug and remove cords connecting to other equipment.

**12**

Always set the volume control to "—∞" while lowering the tonearm to play a record, then turn the volume up after the stylus is in the record groove.

**13**

Do not attempt to clean the R-7 with chemical solvents as this might damage the surface finish. Use a clean, dry cloth.

**14**

Do not input more than the maximum allowable level to the input jacks.

**15**

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.

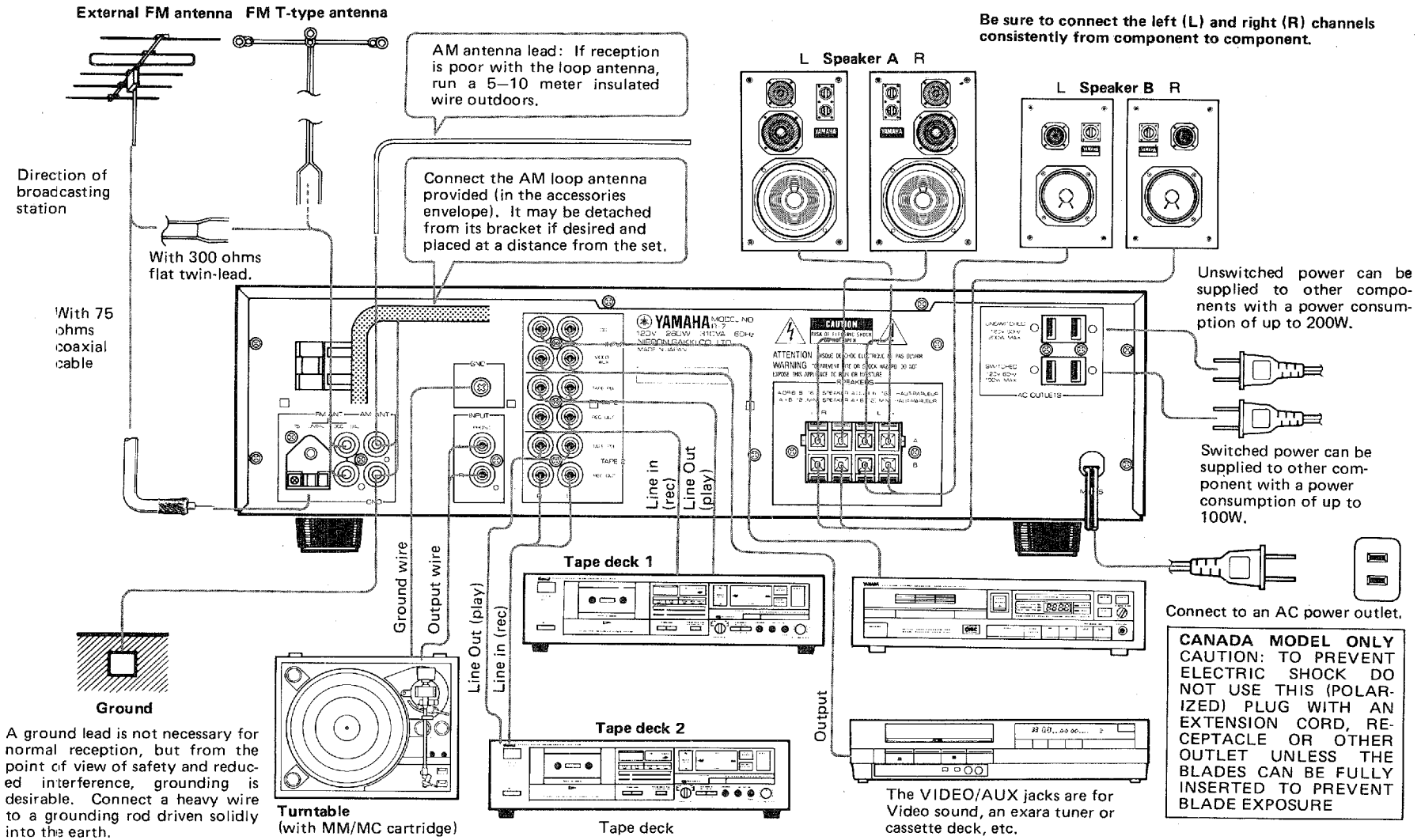
**16**

Be sure to read the "troubleshooting" section for advice on common operating errors before concluding that your R-7 is faulty.

**17**

Keep this manual in a safe place for future reference.

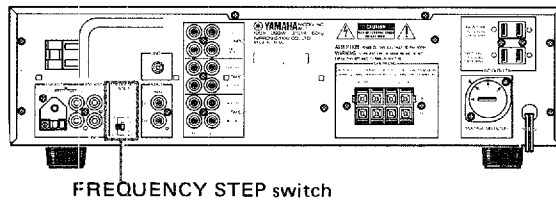
## CONNECTION



## REGURAR MODEL (rear panel)

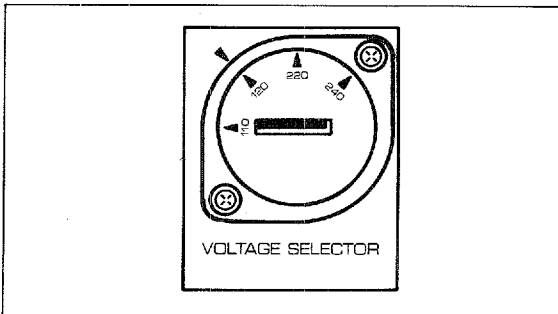
### ABOUT THE FREQUENCY STEP SWITCH

Areas other than the United States and Canada; because interstation frequency spacing is different in different areas, please set rear panel FREQUENCY STEP switch to agree with the station spacing in your area (50 kHz FM/9 kHz AM or 100 kHz FM/10 kHz AM).



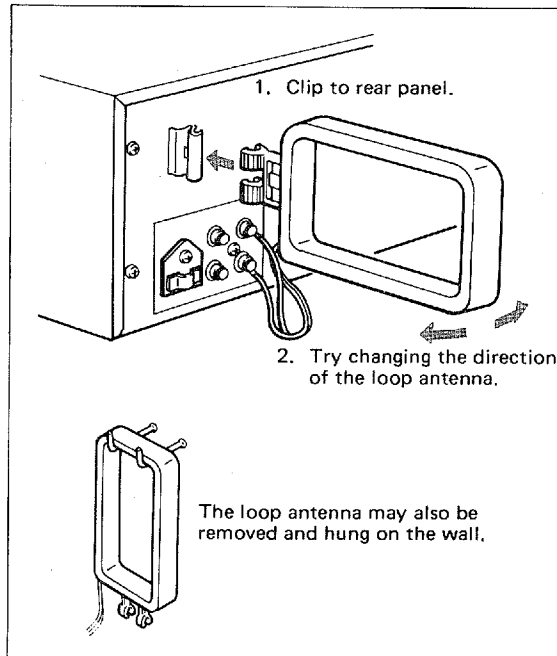
### VOLTAGE SELECTOR

The voltage selector switch on the rear panel of the R-7 must be set for your local voltage BEFORE plugging in the AC mains supply. Voltages are 110/120/220/240 V AC, 50/60 Hz.



## AM ANTENNA

In many cases it will be possible to get excellent AM reception with the provided AM loop antenna. Attach the antenna leads to the GND and AM ANT terminals and rotate the antenna in its bracket for best reception. The loop antenna may also be removed and hung on the wall.

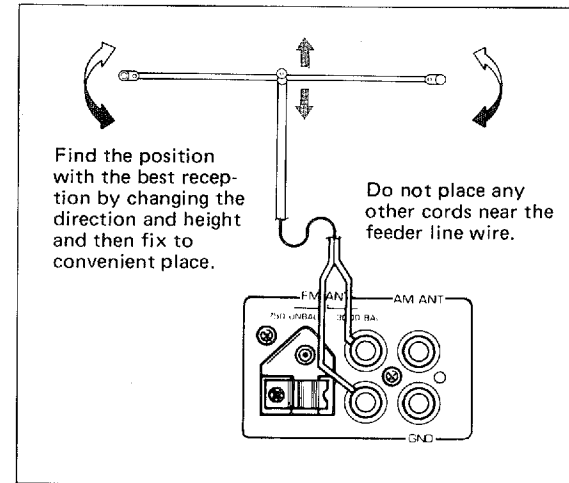


If necessary, an outdoor antenna may be used for improved AM reception. Connect a 5 – 10 meter length of insulated wire to the AM ANT terminal and run it outdoors.

## FM ANTENNA

Choose an FM antenna that is appropriate to the local reception conditions. Consider the distance from the broadcast station and possible interfering objects such as surrounding tall buildings.

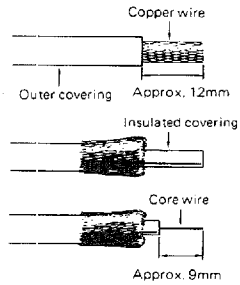
In cases where there is a strong signal from a local station, the supplied T-type antenna is usually adequate. Connect the feeder wire to the 300Ω terminals, stretch the wire out tight, and turn to obtain optimum reception. Attach to a suitable support such as a wall.



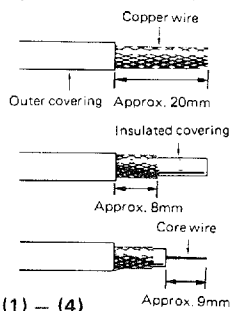
In all but the best reception conditions, an outdoor FM antenna is necessary for best results. Either 300Ω flat twin-lead wire or 75Ω coaxial cable may be used. In locations where electrical interference is a problem, coaxial cable is preferable.

Note: Do not connect indoor FM T-type antenna and outdoor FM antenna simultaneously.

Outer covering diameter less than 6 mm:

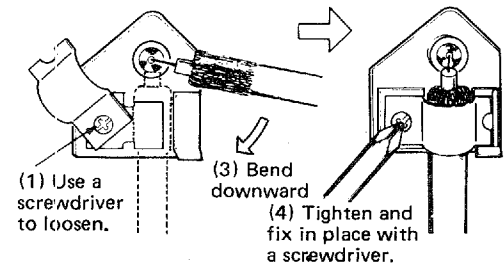


Outer covering diameter greater than 6 mm:

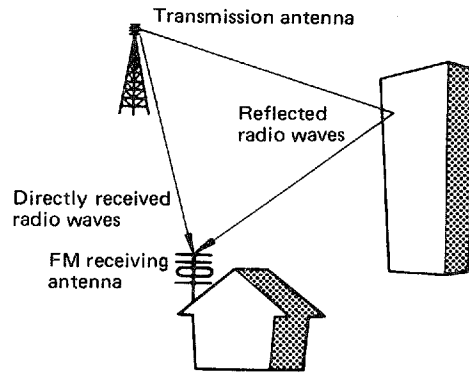


Connect in accordance with (1) – (4) in the drawing below.

(2) Insert the core wire through the hole.



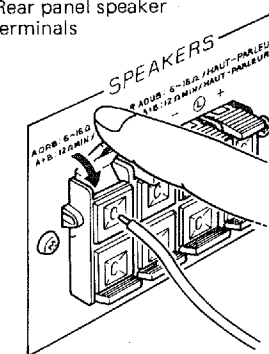
Multipath is an effect similar to television ghosting; it distorts the received signal and also causes poor stereo separation and noise. Radio waves which travel directly from the transmitter to the receiving antenna are mixed with waves which reflect off nearby objects such as buildings.



## CONNECTING SPEAKERS

1. Connect the cords going to the left speakers to the L terminals and the right speaker cords to the R terminals, making sure that the "+" and "-" markings are observed. If the "+" and "-" wires are reversed at either speaker, the sound will be unnatural and lack bass. Speaker cords should be cut as short as possible; do not coil up excess wire on the floor. Also, do not bundle with cords from other system components.
2. Push in on the lever at the terminal, insert the exposed wire of the speaker cord into the hole and then pull the lever. The cord will be locked into position. If these connections are faulty, no sound will be heard from the speakers.
3. A second pair of speakers may be connected in the same way if desired. Use the speaker "B" terminals provided.

Rear panel speaker terminals



Press the lever, insert the wire, and pull.

Red is +, black is -,  
Make the speaker cords as short as possible,  
and the same length for the two channels.

## FRONT PANEL CONTROLS AND FUNCTIONS

### ■ CONNECTING TURNTABLE

Connect the output cord of the turntable to the receiver's PHONO jacks with correct channel polarities, and connect the ground wire to the GND terminal. Normally, connecting the ground wire produces minimum hum, but in some cases better results are obtained with the ground wire disconnected.

### ■ CONNECTING TAPE DECK

Two tape decks can be connected to this receiver (TAPE 1 and TAPE 2). Connect the TAPE PB jacks to the tape deck's Line Out jacks, and the REC OUT jacks to the tape deck's Line in jacks with correct channel polarities.

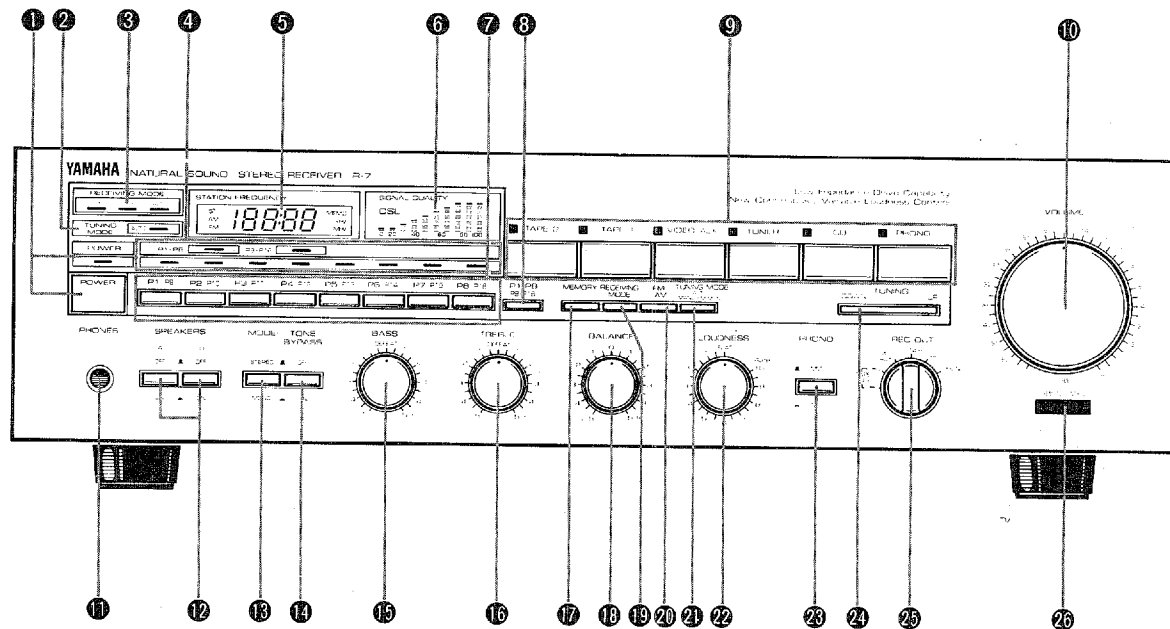
### ■ CONNECTING CD PLAYER

Connect the output jacks of the CD player to the CD jacks of the receiver with correct channel polarities.

- Do not connect the CD player to the PHONO jacks of the receiver.

### ■ CONNECTING TO THE VIDEO/AUX AND CD JACKS

The VIDEO/AUX and CD jacks can be used for connecting additional equipment such as a second tuner, a compact disc player, etc. Note that a turntable cannot be connected to the VIDEO/AUX jacks as there is no RIAA equalization.



#### ① POWER SWITCH AND INDICATOR

Press the switch to turn the power on. The indicator lights up.

Press the switch again to turn the power off.

#### ② TUNING MODE INDICATOR

The AUTO indicator lights when the TUNING MODE button is set to AUTO, and remains off when the TUNING MODE button is set to MAN'L FM MONO.

#### ③ RECEIVING MODE INDICATORS

Indicates which receiving mode selected with the RECEIVING MODE selector.

#### ④ P1-P8/P9-P16 INDICATOR

Indicates which range of the preset station button is selected.

#### ⑤ DIGITAL FREQUENCY DISPLAY

Indicates the frequency and reception mode of the station tuned in.

When an FM stereo broadcast with sufficient signal strength is being received with the MODE switch set to STEREO, the ST indicator automatically light.

Pressing the MEMORY button flickers MEMO indicator for 5 seconds. During this interval, memory presetting may be performed.



## ⑥ SIGNAL QUALITY INDICATOR

Indicates the strength of the received signal. When making an antenna connection, adjust the antenna's height and direction for maximum signal indication.

## ⑦ PRESET STATION BUTTONS

Up to 16 station frequencies and reception modes (selectable between FM only, AM only, or FM and AM combined) can be programmed by using the preset station button together with the P1–P8/P9–16 selector button. Once the station is preset, it can be tuned in simply by lightly touching the proper preset station button.

## ⑧ P1–P8/P9–P16 SELECTOR BUTTON

Each time this button is pressed, the preset station range will be switched between the P1–P8 and the P9–P16 range.

## ⑨ INPUT SELECTOR BUTTONS

Select the program source to be listened to.

## ⑩ VOLUME CONTROL

Used to adjust overall sound level.

## ⑪ PHONES JACK

Used for plugging in headphones. When it is desired to listen to headphones only, SPEAKER selectors A, B and C should all be set to the OFF position.

## ⑫ SPEAKERS SELECTORS

With these SELECTORS you can select either or both of two pairs of speakers.

## ⑬ MODE SELECTOR

Allows switching between stereo and mono operation. Normally it should be set to the STEREO position; mono is useful for setting the balance between speakers, checking speaker phasing, checking stereo effect, etc. For listening to a monaural source, set this selector to MONO position to listen to the sound from both speakers.

## ⑭ TONE BYPASS SWITCH

When this switch is depressed, the tone control circuits are completely disconnected from the signal path and an absolutely flat frequency response is obtained. Release the switch to adjust the BASS and TREBLE controls. Note that this switch can be used to check the effect of the BASS and TREBLE control settings.

## ⑮ BASS CONTROL

Adjusts bass response. The center, detented, DEFEAT position is for normal response.

## ⑯ TREBLE CONTROL

Adjusts treble response. The center, detented, DEFEAT position is for normal response.

## ⑰ MEMORY BUTTON

Used to preset station frequencies into the programmable memory. Pressing the button flickers the MEMO indicator for about 5 seconds. While the indicator is lit, press the numbered preset station button corresponding to the memory location it is desired to set. The frequency currently displayed will be set into the memory.

## ⑱ BALANCE CONTROL

Used to adjust the relative volume of the left and right speakers. You can thus compensate for imbalances caused by speaker placement, room furniture, or your listening position.

## ⑲ RECEIVING MODE SELECTOR

Pressing this button allows you to switch between DX (distant), Local, and Auto tuner reception modes. In the Auto position, the strength of the received signal is continuously monitored, and if it falls below a certain level a high gain, high selectivity circuit is switched in to provide the best possible reception of weak, noisy stations. When the signal is strong, this circuit is deactivated, for lower distortion and better stereo separation. The local position provides best reception from strong, local stations. Accurate music reproduction with low distortion and good stereo separation will be achieved. In the DX position, the high selectivity circuit is switched in for best possible reception from weak, distant stations.

## ⑳ FM/AM SELECTOR

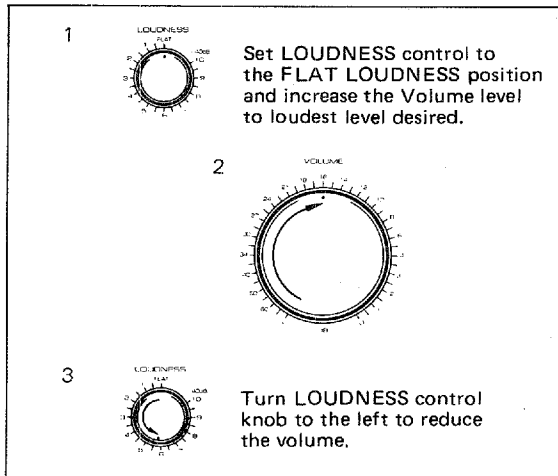
Press to select FM or AM band.

## ㉑ TUNING MODE SELECTOR

In the AUTO mode, the tuner will automatically scan the frequency band when the UP or DOWN side of the TUNING button is pressed. In addition, when set to the AUTO position, a stereo FM broadcast with sufficient signal strength will be received in stereo. In the MAN'L FM MONO mode, the tuner will advance one step at a time when the TUNING button is pressed once, and continuously when it is pressed continuously. If the station is weak, however, and interference is heard, setting the selector to the MAN'L FM MONO position will help to bring the station in clearer without, of course, the stereo effect.

## 22 LOUDNESS CONTROL

Compensates for our ears' reduced sensitivity to the extreme high and low frequencies at low volumes. Set it to the Flat position with the VOLUME control set to the loudest level at which you listen. Then, when you want to listen at lower volume levels, rotate the LOUDNESS control to the left instead of using the VOLUME control. This will retain the natural balance of the high and low frequencies.



## 23 PHONO SWITCH

Set to MM (Moving Magnet) or MC (Moving Coil) to match the type of cartridge you are using.

## 24 TUNING BUTTON

This button is used to scan the FM or AM band for stations, with the TUNING MODE button set to AUTO, pushing the UP side of the button causes the tuner to scan to progressively higher frequencies until a station is found and then to lock the station in. Pushing the DOWN side causes it to scan down the band. If the end of the band is reached without finding station, the auto-search circuit instantly shifts to the opposite end of the band and the search continues in the same direction. With the TUNING MODE button set to MAN'L FM MONO, pushing the up button once will cause the tuner to move one step in the up or down direction (one step equals 0.1 MHz in FM and 10 kHz in AM).

Keeping the button pressed will cause the tuner to scan continuously.

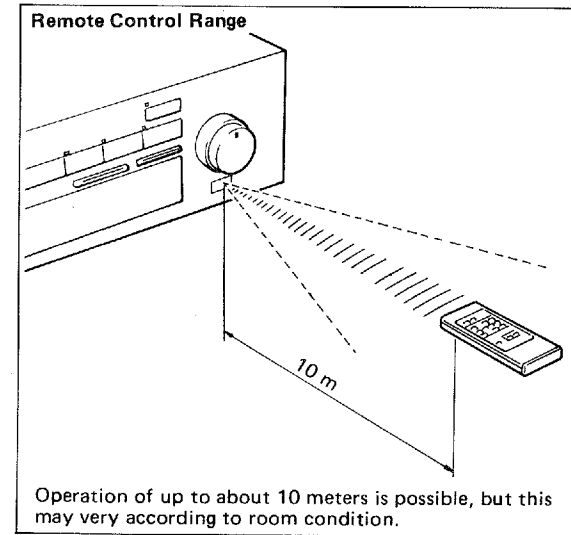
- This receiver incorporates a last station memory. When turned on, it will tune to the last station that was tuned is before it was turned off.
- To accurately tune, use the FINE TUNING button.

## 25 REC OUT SELECTOR

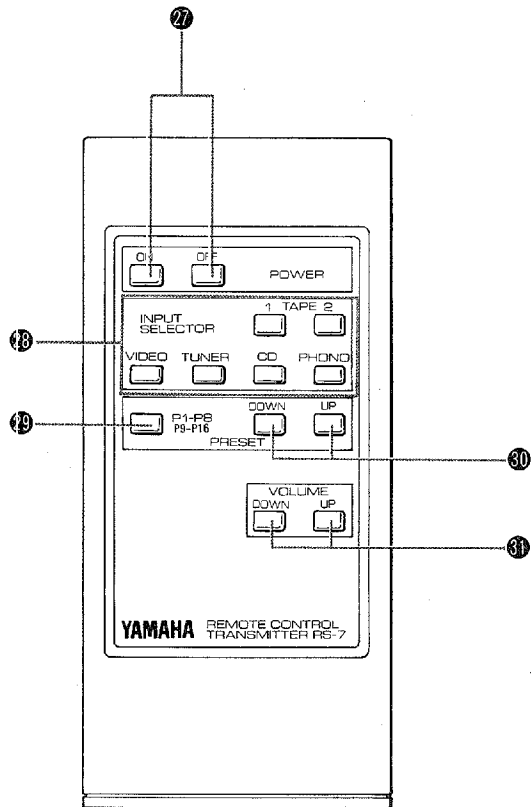
Used for selecting the recording source (regardless of the position of the Input Selector buttons). Set the Input Selector to the same source if you wish to monitor the source as you record, or to any other source to listen to that source while recording. If your tape deck has three-head monitoring capability, you can monitor the signal just recorded on the tape by pressing the TAPE button.

## 26 REMOTE CONTROL WINDOW

Point the remote control transmitter to this window for remote control operation.



## REMOTE CONTROL TRANSMITTER



### 27 ON/OFF BUTTONS

Used to turn the R-7 ON or OFF.

### 28 INPUT SELECTOR BUTTONS

Used to select the program source to be listened to.

### 29 P1-P8/P9-P16 SELECTOR BUTTON

Selects the range of the preset station buttons.

### 30 UP/DOWN BUTTONS

Press either button to scan the FM or AM band for station.

### 31 VOLUME UP/DOWN BUTTONS

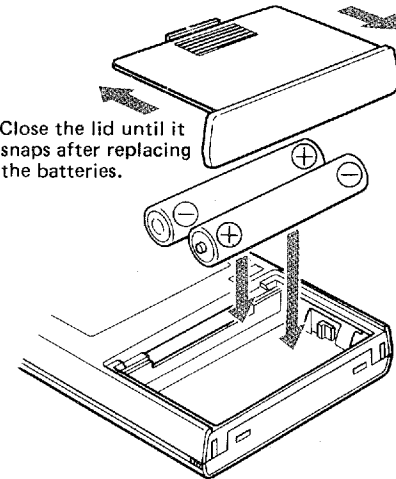
Press either button to adjust the volume level.

## BATTERY INSTALLATION

### Battery Replacement

(1) Remove the lid.

(3) Close the lid until it snaps after replacing the batteries.



(2) Two "AA, R6" type dry cell batteries should be used. Be sure the batteries are inserted with the negative and positive ends correctly positioned.

When the battery gets weak, the distance at which the remote control operates becomes shorter. When this occurs, the battery should be changed.

## OPERATION

### AUTO TUNING

1. Press the TUNER button.
2. Press the FM/AM selector to select AM or FM.
3. Set the TUNING MODE button to AUTO.
4. Press either the UP or the DOWN side of the TUNING button for 2 or 3 seconds. The receiver will automatically scan the AM or FM band in the selected direction. When a station is found, the scan will stop and the station will be locked in automatically. Use the TUNING button repeatedly to tune in your desired station.
5. When the FM station is in stereo the ST indicator will light, while for mono stations the indicator will remain off.
  - When listening to a weak, distant FM station or when there is interference from another station, setting the TUNING MODE button to MAN'L FM MONO position will cause the FM station to be received in mono and considerably reduce noise.
6. Adjust the volume, tone, balance, and loudness levels to your preference.

### MANUAL TUNING

1. Press the TUNER button.
2. Press the FM/AM selector to select AM or FM.
3. Set the TUNING MODE button to MAN'L FM MONO.
4. Press either the UP or DOWN side of the TUNING button to display the frequency of the desired station. When the TUNING button is kept pressed, the frequency display changes rapidly.
5. Use the FINE TUNING button to accurately tune in.
6. Adjust the volume, tone, balance, and loudness levels to your preference.

### PRESET TUNING

1. Receive a station to be preset, referring to the AUTO TUNING or MANUAL TUNING procedures.
2. Press the P1—P8/P9—P16 selector button to select the range of the preset station button.
3. Press the MEMORY button. The MEMO indicator flickers for about 5 seconds.
4. While this period, press the preset station button. The display frequency of the station is stored in the pressed preset station button.
5. Repeat these steps for other preset station buttons.
6. To recall the preset station, simply press the proper preset station button.
7. Adjust the volume, tone, balance, and loudness levels to your preference.

### LISTENING TO OTHER SOURCES

1. Select the desired program source with the appropriate input selector button (PHONO, CD, VIDEO/AUX or TAPE).
2. When the PHONO input is selected, set the PHONO button to MM or MC to match your cartridge.
3. Play the program source.
4. Adjust the volume, tone, balance and loudness levels to your preference.
  - When lowering the stylus onto the record or raising the stylus from the record, turn the VOLUME control all the way to "—∞".

### RECORDING TAPES

1. Set the REC OUT selector to the position of source to be recorded.
2. Start the music from the selected source.
3. Set the recording level, etc. of the tape deck, and begin recording.
4. To monitor the sound to be recorded, press the corresponding Input Selector button.
  - If your tape deck has three heads, pushing the appropriate TAPE button will allow you to monitor the recorded material.
  - Adjusting the tone controls or the VOLUME control during recording has no effect on the material being recorded.

### TAPE DUBBING

Dubbing from the deck connected to the rear panel TAPE 1 jacks to the deck connected to the TAPE 2 jacks is possible.

1. Set the REC OUT selector to the COPY 1→2 position.
2. Set deck 1 to play and deck 2 to record.

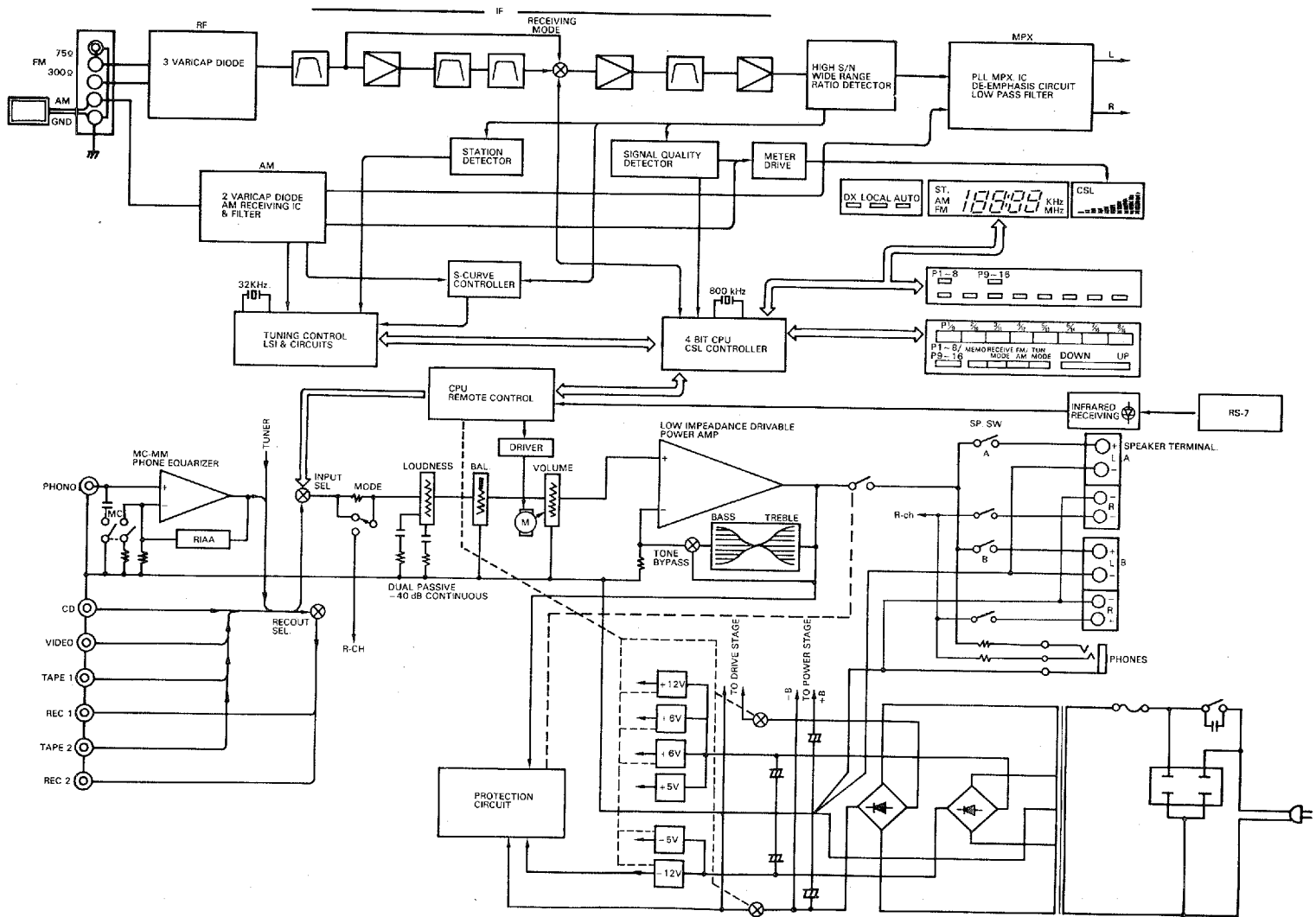
To dub from deck 2 to deck 1, set the REC OUT selector to the COPY 2→1 position, set deck 2 to play and 1 to record.

## TROUBLESHOOTING

Before assuming that your receiver is faulty, check following the troubleshooting list which details the corrective action you can take yourself without having to call a service engineer. If you have any doubts or questions, get in touch with your nearest Yamaha dealer.

	FAULT	CAUSE	CURE
AUDIO	Power is not applied even though the POWER switch is turned on.	The power cord is not plugged in.	Plug in the power cord.
	There is no sound even when the Input Selector button is pressed.	The speaker connections are not secure.	Set them correctly.
		The input cords are not connected securely.	Plug them in securely.
	There is no sound from one speaker.	The speaker connections are not secure.	Secure the connections.
	There is a lack of bass and no ambience.	The BALANCE control is set all the way to the left or right.	Adjust the BALANCE control correctly.
		The + and - cords have been reversed at the receiver or the speakers.	Connect the speaker cords in the correct phase (+ and -).
There is a humming sound when playing records.	The input cords are not connected securely.	Plug the input cords in securely.	
There is a howling sound when playing records at high volume.	The turntable's ground wire is not connected.	Connect the ground wire.	
	The turntable and the speakers are too close together or the turntable is not mounted on a firm surface.	Change the location of the turntable or the speakers.	
FM	Crackling sounds from time to time (especially in weak signal areas).	Ignition noise from vehicles.	The FM antenna should be put up as high as possible, away from the road, and a coaxial cable used.
		Noise from thermostats and other electrical equipment.	Attach a noise suppressor to the equipment causing the noise.
	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.
	The ST indicator flickers on and off and reception is noisy.	Insufficient antenna input.	Use an antenna appropriate for the reception conditions in your area.
		Not tuned correctly.	Tune again.
	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.
	No stereo effect even with a stereo broadcast.	The TUNING MODE selector is set to MAN'L FM MONO.	Set the selector properly.
	A desired station cannot be tuned in with Auto Tuning.	The station is too weak.	Use a high-quality directional FM antenna.
Previously preset stations can no longer be tuned in.	The receiver has been unplugged for a long period.	Repeat the preset procedure.	
AM	Insufficient sensitivity.	Weak signal or loose antenna connections.	Tighten the AM loop antenna connections and rotate it for best reception. Use an outdoor antenna.
	There are continuous crackling and hissing noises.	These noises result from lightning, fluorescent lamps, motors, thermostats and other electrical equipment.	Use an outdoor antenna and a ground wire. This will help somewhat but it is difficult to eliminate all noise.
		Another station is interfering with the received station.	This is impossible to remedy.
	There are buzzing and whining noises.	A monitor TV is being used nearby.	Move the monitor TV a distance away.

## BLOCK DIAGRAM



## SPECIFICATIONS

### AUDIO SECTION

#### Continuous Power Per Channel

8 ohms, 20 Hz to 20 kHz, 0.015% THD	65 W
6 ohms, 20 Hz to 20 kHz, 0.03% THD	75 W
8 ohms, 1 kHz, 0.01% THD (IEC Rated Power)	75 W

#### Dynamic Headroom

(IHF, 8 ohms)	1.8 dB
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#### Power Bandwidth

8 ohms, 0.1% THD, 32.5 W	10 Hz to 50 kHz
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#### Damping Factor

8 ohms, 1 kHz	50
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#### Input Sensitivity/Impedance

Phono MC	160 $\mu$ V/220 ohms
MM	2.5 mV/47 k-ohms
Aux./Tape/Tuner	150 mV/47 k-ohms

#### Input Sensitivity (New IHF)

Phono MC	20 $\mu$ V
MM	0.31 mV
Aux./Tape/Tuner	18.6 mV

#### Maximum Input Signal

(0.0% THD)	
Phono MC	8 mV
MM	110 mV

#### Output Level/Impedance

Rec Out	150 mV/470 ohms
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#### Headphone Output/Impedance

(0.0% THD)	0.8 V/8 ohms
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#### Frequency Response

CD/Tape/Video (20 Hz to 20 kHz)	$\pm$ 0.5 dB
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#### RIAA Equalization Deviation

Phono MC (30 Hz to 20 kHz)	$\pm$ 0.5 dB
MM (20 Hz to 20 kHz)	$\pm$ 0.3 dB

#### Total Harmonic Distortion (20 Hz to 20 kHz)

Phono MC to Rec Out (3V)	0.005%
MM to Rec Out (3V)	0.003%
CD/Tape/Video to Sp Out (30 W/8 ohms)	0.015%
(32.5 W/8 ohms)	0.015%

#### Intermodulation Distortion

CD/Tape/Video (Rated Output/8 ohms)	0.01%
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#### Signal-to-Noise Ratio (IHF-A-Network)

Phono MC (500 $\mu$ V, Input Shorted)	75 dB
MM (5 mV, Input Shorted)	92 dB
Aux./Tape/Tuner (AM position, Input Shorted)	103 dB

#### Signal-to-Noise Ratio (New IHF)

Phono MC	75 dB
MM	76 dB
Aux./Tape/Tuner (AM position)	82 dB

#### Residual Noise

(IHF-A-Network)	140 $\mu$ V
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#### Channel Separation (1 kHz)

Phono MM (Input Shorted)	60 dB
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#### CD/Tape/Video

(5.1 k-ohms)	60 dB
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#### Filter Characteristics

Low (Subsonic, Built-in)	10 Hz, -12 dB/oct
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#### Tone Control Characteristics

Bass Boost/Cut	$\pm$ 10 dB (50 Hz)
Turnover Frequency	350 Hz
Treble Boost/Cut	$\pm$ 10 dB (20 kHz)
Turnover Frequency	3.5 kHz

#### Continuous Loudness Control (1 kHz)

(Level-related Equalization)	
Attenuation	40 dB

### FM SECTION

Tuning Range	87.5 to 108.0 MHz
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#### 50 dB Quieting Sensitivity (IHF, 75 ohms)

Mono	1.55 $\mu$ V (15.1 dBf)
Stereo	2.1 $\mu$ V (37.7 dBf)

#### Usable Sensitivity (30 dB S/N Quieting,

75 ohms, Mono)	0.8 $\mu$ V (9.3 dBf)
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#### Image Response Ratio

	40 dB
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#### IF Response Ratio

	90 dB
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#### Spurious Response Ratio

	70 dB
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#### AM Suppression Ratio

	55 dB
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#### Capture Ratio

Local	1.2 dB
DX	2.5 dB

#### Alternate Channel Selectivity

(IHF)	85 dB
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#### Signal-to-Noise Ratio (IHF)

Mono	85 dB
Stereo	81 dB

#### Harmonic Distortion

Mono 100 Hz	0.05%
1 kHz	0.05%
6 kHz	0.1%
Stereo 100 Hz	0.07%
1 kHz	0.07%
6 kHz	0.15%

#### Stereo Separation (IHF)

50 Hz/1 kHz/10 kHz	45 dB/50 dB/45 dB
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#### Frequency Response

30 Hz to 13 kHz	$\pm$ 0.5 dB
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### AM SECTION

Tuning Range	510 kHz to 1,620 kHz (U, C, R) 513kHz to 1,620kHz (R)
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#### Usable Sensitivity

	250 $\mu$ V/m
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#### Selectivity

	24 dB
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#### Signal-to-Noise Ratio

	50 dB
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#### Image Response Ratio

	40 dB
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#### Spurious Response Ratio

	50 dB
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#### Harmonic Distortion (400 Hz)

	0.3%
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#### Output Level/Impedance

FM 100% mod, 1 kHz	500 mV/2.8 k-ohms
AM 30% mod, 400 Hz	150 mV/2.8 k-ohms

### GENERAL

Power Supply	120 V/60 Hz (U, C) 110-120-220-240 V/ 50/60 Hz (R)
Power Consumption	260 W
AC Outlet	Switched x 1 . . . . . 100 W max. Unswitched x 1 . . . . . 200 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	6.3 kg (13 lbs, 14 oz.)

Specifications subject to change without notice.

