



T-9090 II

Quartz Synthesized FM Stereo Tuner

Instruction Manual

• **Congratulations on your purchase of the ONKYO T-9090II Tuner.** • Please read this manual thoroughly before making connections and turning power on. • Following the instructions in this manual will enable you to obtain optimum performance and listening enjoyment from your new T-9090II. • Please retain this manual for future reference.

CONTENTS

Features	1
Important safeguards.....	1
Precautions	2
System connections	3
Rear panel facilities.....	4
Front panel facilities.....	5
Operations.....	7
Troubleshooting guide.....	9
Specifications	9

Features

- **Sonic Noise Filtering Reception**
Airborne vibrations from speakers can have a detrimental effect on tuner sound quality, a fact which most tuner designs overlook. The S.F.R (Sonic Noise Filtering Reception) feature in the T-9090 II reduces this harmful interference electrically.
- **Computer-Controlled Five-Mode APR (Automatic Precision Reception) System**
The five-mode APR system in the T-9090 II monitors the quality of the FM broadcast being received and automatically sets a total of five reception modes [antenna (A/B), RF mode (DX/local), IF bandwidth (wide/narrow/S-narrow), hi-blend (on/off) and mode (stereo/mono)] to obtain the best possible reception. All modes can also be preset in memory.
- **Full-Control 31-Key Remote Control**
The 31-Key remote control which comes with the T-9090 II gives the user complete command over all major functions, including station selection from twenty preset FM stations, preset-scan, output level (up/down), preset (up/down) and manual control over the five APR settings.
- **Top-Quality Parts for Improved Performance**
As you would expect from a tuner bearing the Integra name, the T-9090 II uses only top quality parts. This tuner is built to last, from the copper front end shielded case, pure copper bus ground lines (five in all) to the shielded casings for the digital and power supply blocks. Other noteworthy features include gold-plated antenna terminals and pin jacks and an anti-vibration steel base panel.

CAUTION:

"TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL."



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



- The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user 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 the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Important safeguards

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

"WARNING"

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

- For models having power cords with a polarized plug.

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

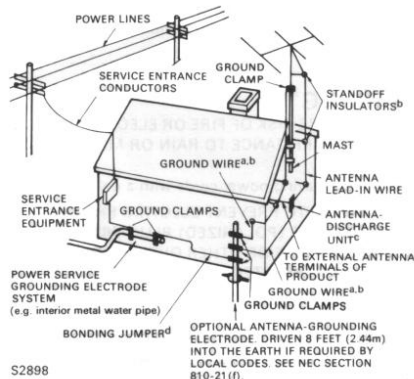
- Sur les modèles dont la fiche est polarisée.

ATTENTION: POUR PRÉVENIR LES CHOCS ÉLECTRIQUES NE PAS UTILISER CETTE FICHE POLARISÉE AVEC UN PROLONGATEUR UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ÊTRE INSÉRÉES À FOND SANS EN LAISSER AUCUNE PARTIE À DÉCOUVERT.

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, heat registers, stoves, or other appliances (including amplifiers) 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. **Grounding and Polarization** – The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
12. **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.
13. **Cleaning** – The appliance should be cleaned only as recommended by the manufacturer.
14. **Power Lines** – An outdoor antenna should be located away from power lines.
15. **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 the antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure 73.1.

FIGURE 73.1:
EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE INSTRUCTIONS CONTAINED IN ARTICLE 810 – "RADIO AND TELEVISION EQUIPMENT"



^a Use No. 10 AWG (5.3 mm²) copper, No. 8 AWG (8.4 mm²) aluminum, No. 17 AWG (1.0 mm²) copper-clad steel or bronze wire, or larger, as a ground wire.

^b Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4–6 feet (1.22–1.83 m) apart.

^c Mount antenna discharge unit as close as possible to where lead-in enters house.

^d Use jumper wire not smaller than No. 6 AWG (13.3 mm²) copper, or the equivalent, when a separate antenna-grounding electrode is used. See NEC Section 810-21 (j).

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

17. **Object and Liquid Entry** – Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

18. **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 enclosure damaged.

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

Memory Preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves the contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the Power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory, the Power switch must be turned on and off a few times each month to keep the back-up system operative.

The memory preservation period after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of a few weeks after the last time power has been turned off. This period is shorter when the unit is exposed to a humid climate.

Precautions

1. Warranty Card

The serial number is written on the rear panel of this unit. Copy the serial number and model number onto your warranty card and keep it in a safe place.

2. Care

From time to time you should wipe off the front and rear panels and the cabinet with a silicon or other soft cloth. For heavier dirt, dampen a soft cloth in a weak solution of mild detergent and water, wring it out dry, and wipe off the dirt. Following this, dry immediately with a clean cloth. Do not use rough material, thinners, alcohol or other chemical solvents or cloths since these could damage the finish or remove the panel lettering.

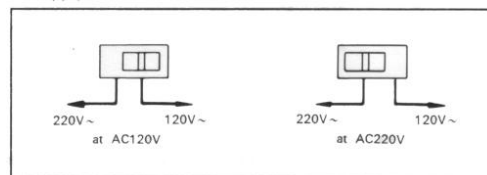
3. Power

WARNING

BEFORE TURNING ON POWER FOR THE FIRST TIME, READ THE FOLLOWING SECTION CAREFULLY.

● Voltage Selector (Rear Panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on. Models without a voltage selector can only be used in areas where the power supply is the same as that of the unit.



● De-Emphasis Switch (Rear Panel)

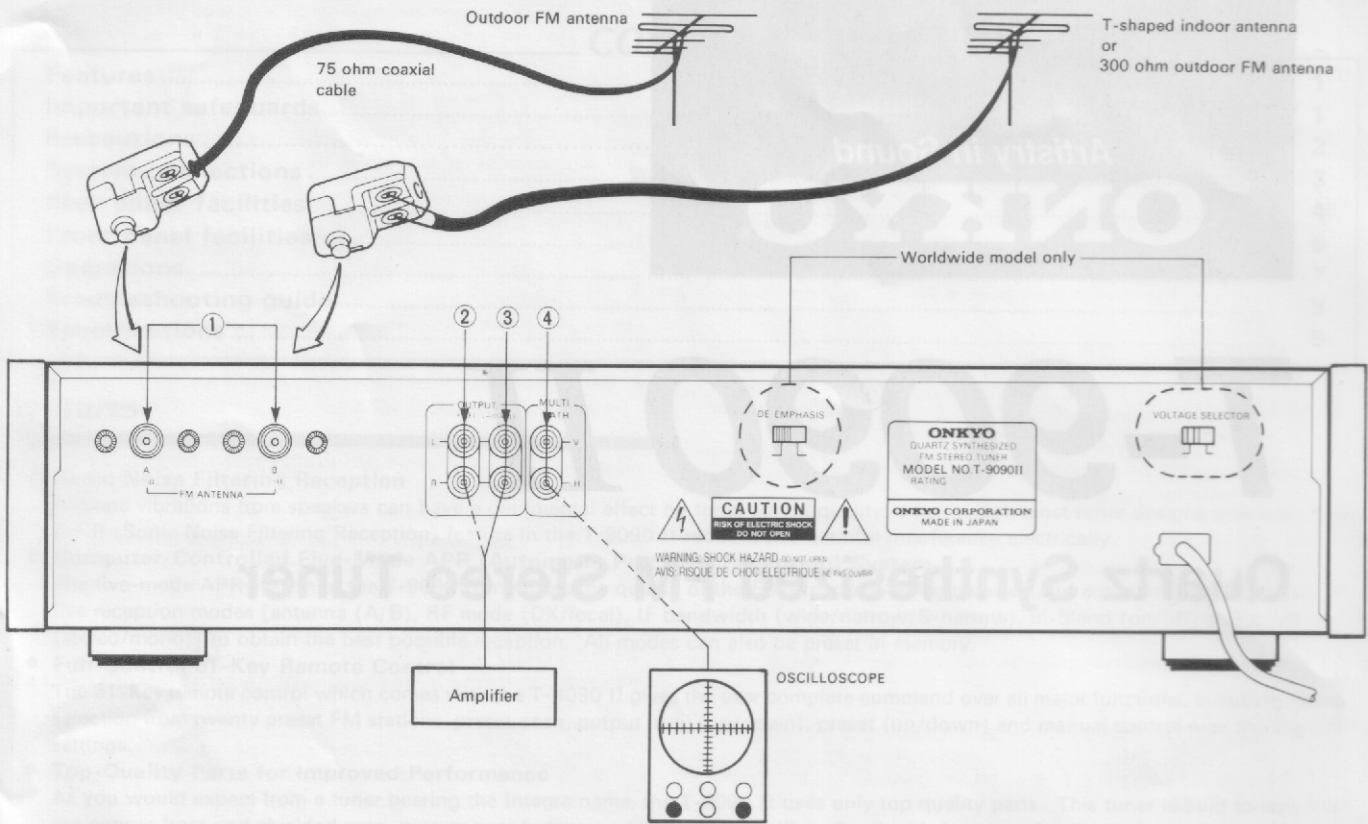
Some models are equipped with a switch that controls de-emphasis (50 μsec - 75 μsec).

Be sure to set this switch to match the de-emphasis in your area.

U.S.A 75 μsec
Other areas 50 μsec

System connections

- Do not plug in the power cord until all connections have been completed.

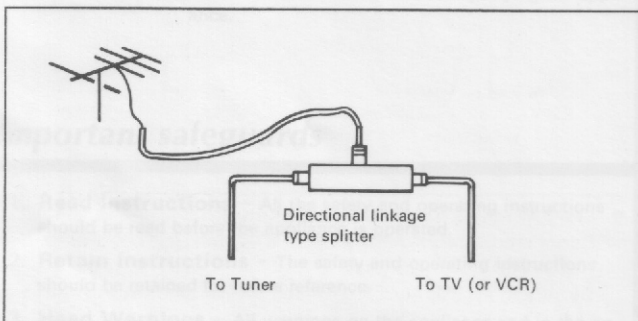


FM Antennas

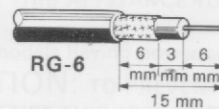
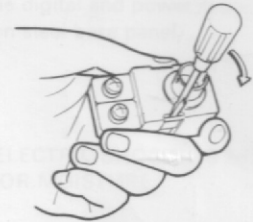
Depending on the strength and quality of FM signals in your area, the accessory T-shaped antenna may give satisfactory reception or you may need an external FM antenna. To use the T-shaped antenna, connect it to the 300 ohm (screw) side of the accessory 75/300 ohm antenna adapter, spread the antenna on a wall, preferably outside or on the ceiling, and try several positions to determine which gives the best reception. If reception with the T-shaped antenna is unsatisfactory, install a multi-element external FM antenna. Consult your Onkyo Service Center about the right type for your area.

NOTE:

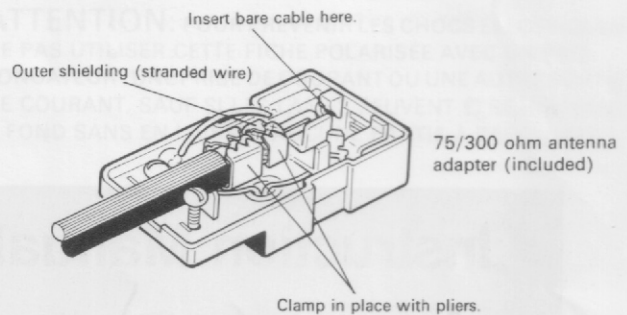
- Do not use the 75 ohm and 300 ohm terminals of the antenna adapter at the same time.
- Do not use the same antenna for both FM and TV (or VCR) reception since the FM and TV (or VCR) signals can interfere with each other. If you must use a common FM/TV (or VCR) antenna, use a directional linkage type splitter.
- Follow the directions below to connect an antenna adapter to a 75 ohm cable.



- Use a small screwdriver to open the adapter as shown in the diagram. Be careful not to remove the shielding case inside the plug cover.
- Prepare the coaxial cable as shown below.



- Connect the 75/300 ohm antenna adapter to the coaxial cable.



"Note to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical."

Rear panel facilities

- ① **FM Antenna Input (FM ANTENNA)**
Din-type terminals for use with the accessory antenna adapter.
- ② **Output Jacks (FIXED)**
- ③ **Output Jacks (VARIABLE)**
The output level of these jacks can be changed using the level control knob [15] on the front panel.
- ④ **Multipath Monitor Jacks (MULTIPATH)**
Connect an oscilloscope to these jacks to observe the severity of the multipath problem in a radio broadcast. Refer to the multipath explanation for details.

Precautions Concerning Remote Control Use

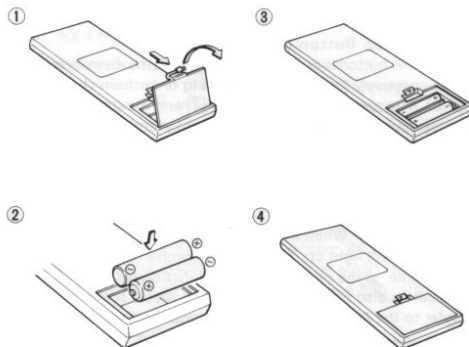
● Batteries

The remote control transmitter is powered by two batteries. Before using this unit for the first time, insert the two batteries (included) as shown in the diagram. The remote control transmitter has no on/off button. Average battery life is one year. This period may be shorter depending on the frequency of use and environment (temperature and humidity) in which the remote control transmitter is used. If the remote control transmitter does not operate even though front panel controls function normally, the batteries should be replaced. Use only batteries listed in the following chart.

Type	Voltage	Size
Manganese	1.5V	AA R6 UM-3

- Note**
1. Do not leave an expired battery in the case as it may leak or damage the battery case.
 2. When inserting the batteries, be sure the (+) and (-) ends are properly aligned.
 3. Do not use nickel-cadmium (rechargeable) batteries.
 4. Do not use one specified (manganese) battery and one alkaline battery at the same time.
 5. Replace both batteries at once; do not use one old and one new battery together.

Transmitter Battery Replacement



● Precautions

1. Remove the batteries if the remote control transmitter is not going to be used for a long time.
2. This unit uses infrared rays. Therefore, commands may not be received properly if the front panel of the T-9090II is exposed to bright light. To prevent this from occurring, place the T-9090II so that it is not directly exposed to bright light.
3. The batteries of the remote control transmitter must be replaced periodically. Remember, however, that commands will be received only when the main power switch of the T-9090II is on.
4. The transmitter operates up to a distance of about five meters (16 feet). The transmitting window must always be pointed at the reception window when a command is sent to the tuner.
5. If the T-9090II is placed inside an audio rack behind a glass door, the door should not have colored glass or have any decorations on it, since this could shorten the range or prevent commands from being received.
6. Use of other infrared remote control devices in the same room may cause interference.
7. If this remote control transmitter does not operate properly, confirm that the batteries are not dead. If the problem persists, contact your Onkyo Service Center.

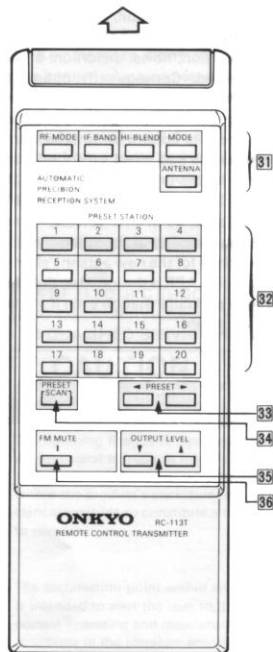
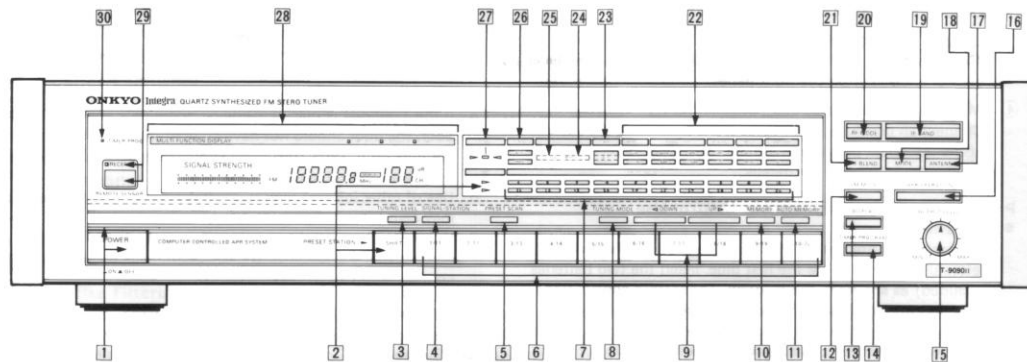
About the APR (Automatic Precision Reception) System

This unit is equipped with Onkyo's unique computer-controlled APR system that automatically sets the RF stage gain (Distance/-Local), IF bandwidth (wide/narrow/super narrow), stereo/mono reception modes, hi-blend function, and antenna selection function (Antenna A/B) to the proper settings for the quality (field strength, intermodulation distortion, noise, distortion, etc.) of the broadcast currently being received. Consequently, optimum reception is assured at all times. When desired, the APR settings can be manually overridden by using the corresponding front panel switches and the buttons of the remote control transmitter. Since speaker noise and vibration can have a bad effect on sound quality, these are reduced electrically in this unit by means of S.F.R. (Sonic Noise Filtering Reception). When S.F.R. is operating, an indicator lights. If you are using an antenna with a rotator, press the APR on button each time the direction of the antenna is changed, to obtain the correct APR settings for the new antenna alignment. To maintain stable reception quality, APR is designed so that the original settings are maintained for a particular station even if signal quality changes in some manner afterward.

Front panel facilities

NOTE:

The front panel design for the T-9090II differs slightly according to the areas for which each unit was manufactured.



- 1 **Power Switch (POWER) and Indicator**
Depress once to turn power on and once again to turn power off. The indicator above the switch lights when power is on.
- 2 **Shift Button (SHIFT) and Indicator**
The preset buttons [6] can be used to store a total of 20 radio stations. Use this button to switch the preset buttons between the memory channel 1-10 mode and the memory channel 11-20 mode. Each time the button is pressed, the memory mode alternates between 1-10 and 11-20, and the respective indicators light. When power is turned on, the setting is the same as when power was last turned off.

Be sure to confirm the present shift button mode before pressing a preset button to store a radio broadcast in the memory.

- 3 **Tuning Level Selector Button (TUNING LEVEL)**
Each time this selector is pressed, the tuning level is switched from 17dB to 27dB, 37dB and then back to 17dB again. Use the 37dB setting if there are a lot of strong FM broadcasts in your area and the 17dB setting if there are a lot of weak FM broadcasts in your area. The current setting is shown in the multi function display [28] for about two seconds each time this selector is pressed. To receive broadcasts below the 17dB level, set the muting button [12] to the off setting and tune in the broadcast manually. The displayed tuning level unit of 'dB' is an abbreviation for dBf.
- 4 **Signal Strength/Station Channel Button (SIGNAL/STATION)**
When this button is pressed, the signal strength of the signal currently being received is displayed at the right side of the multi function display [28]. Press once to display signal strength for about two seconds and hold down to maintain the signal strength display longer. Note that the 'dB' display in this mode stands for 'dBf'.
- 5 **Preset Scan Button (PRESET SCAN)**
When this button is pressed, each station in the memory is tuned in successively for about 5 seconds in order from channel 1 to 20. The preset station indicators [7] and the station indicator on the multi function display [28] flash on and off during preset scan to show which station is currently being heard. Refer to the preset scan section for details.
- 6, 7 **Preset Buttons (PRESET STATION) and Indicators**
Use these buttons to recall an FM station or to store a station in the memory. When a button is pressed, the corresponding indicator will light up. The memory number is displayed at the same time, at the right of the multi function display [28]. The indicators also flash on and off during preset scan operation. Refer to the Memory section for details.
- 8 **Tuning Mode Button (TUNING MODE)**
The tuning mode is switched between auto and manual each time this button is pressed. The current setting is shown by the tuning mode indicator [26].
- 9 **Tuning Selector Buttons (◀ DOWN UP ▶)**
DOWN: Press to lower the reception frequency.
UP: Press to raise the reception frequency.

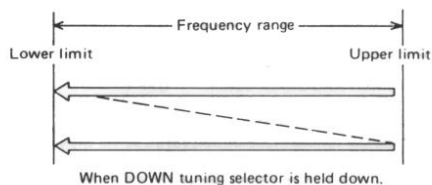
● **Using the Tuning Selector Buttons (Manual Mode)**

First, press the tuning mode button [8] to set the unit to the manual tuning mode (tuning mode indicator (MANU) lights). When the tuning selector is held down, the tuned frequency will increase or decrease continuously. To tune in a station, press either tuning selector until you are near the frequency of the desired station. Then, after releasing the tuning selector, press again to change the frequency in single steps until the desired station is precisely tuned. Pressing once changes the frequency by 25kHz.

● **Using the Tuning Selector Buttons (Auto Mode)**

First, press the tuning mode button [8] to set the unit to the auto tuning mode (tuning mode indicator (AUTO) lights). Then press either tuning selector once; there is no need to keep the selector depressed as in the manual tuning mode. The tuned frequency will continue to increase or decrease until a broadcast of sufficient strength is reached. To move on to the next broadcast, press the UP or DOWN tuning selector again.

When the upper or lower end of the frequency range is reached, the displayed frequency will switch to the opposite side of the range and continue moving in the same direction. For example, when the DOWN tuning selector is held down, the frequency will decrease until the lowest frequency is reached and then continue decreasing from the highest frequency.



Scanning will not stop for broadcasts weak enough to be suppressed by the muting circuit. To receive a weak FM broadcast, set the muting button [12] to the off setting and the tuning mode button [8] to the manual mode to tune in the broadcast manually.

The signal strength of stations below which scanning does not stop in the auto tuning mode is set using the tuning level selector button [3]. The tuning level is shown in the multi function display [28] and is changed progressively among the three settings (17dB/27dB/37dB) each time the tuning level selector button [3] is pressed. Be sure the tuning level is set to the proper point for your area before using the auto tuning mode. Otherwise, auto tuning may not stop for a broadcast you want to hear.

10 Memory Button (MEMORY)

Press this button to place a station in the memory using the preset buttons [6]. When this button is depressed, a red MEMORY indicator lights on the multi function display [28] for about 5 seconds. While the indicator is lit, depress one of the preset buttons. The indicator for the depressed preset button will light up and the memory indicator will go out to indicate that memory operation has been completed. The memory functions of this unit include the ability to store contents specified in the APR CONTROL function: RF MODE (DX/LOCAL), IF BAND, (WIDE/NAR/S-NAR), MODE (AUTO/MONO), HI-BLEND (OFF/ON) and ANTENNA (A/B).

11 Auto Memory Button (AUTO MEMORY)

Use this button to automatically store stations in the memory. When this button is pressed, the MEMORY indicator on the multi function display [28] lights for about five seconds. Then press one of the preset buttons [6] to store each station on the FM band from the currently tuned frequency upward in the memory. The stations will be stored in order beginning with the preset channel of the button pressed to begin auto memory scan operation. Refer to the auto memory function section for details.

12 Muting Button (FM MUTE)

When muting is on, only strong broadcasts can be received. Press this button to turn muting off to receive weak, noisy FM broadcasts. The current setting is shown by the muting indicator [24].

13 Next Timer Program Display Button (DISPLAY)

Press this button during timer-programmed reception to find out the next selection programmed with the timer. The selection is displayed in the multi function display [28].

14 Timer Program Button (TIMER PROGRAM)

If you have an audio timer, up to 5 consecutive selections can be programmed with the timer. First, memorize the selections to be programmed in order, using the preset buttons 1 to 5. Press the timer program button [14] to activate this function. The timer program indicator [30] lights. Each time the power is turned off/on the preset memory advances in order from 1 to 5. Leave the power switch [1] ON, and use the audio timer to turn power on and off.

15 Level Control Knob (OUTPUT LEVEL)

This knob is used to adjust the output level from the output jacks (VARIABLE) [3] on the rear panel.

16 APR On Button (APR OPERATION)

When you have used the APR control function and selected a setting different from the APR system setting, or after you have called out a broadcast selection from the memory, this button is used to recall the APR setting.

17 Antenna Selector Button (ANTENNA)

When the APR system is operating, the reception conditions of either A or B can be automatically assigned. For a setting other than the APR system, press the antenna selector button. To return to the APR setting, press the APR on button. When the power is turned on, the setting is the same as when power was last turned off. (Setting conditions can be stored in memory.)

18 Stereo/Mono Selector Button (MODE)

The APR system automatically selects the stereo or mono reception mode according to the quality of the signal being received. Press the stereo/mono selector to change the setting to the opposite setting selected by the APR system if desired. To return to the APR setting, press the APR on button. The current setting is shown by the APR mode indicators [22]. Stereo broadcasts will be heard in stereo only when the stereo indicator [25] is on. (Setting conditions can be stored in memory.)

19 IF Bandwidth Selector Button (IF BAND)

The APR system automatically switches the IF bandwidth to wide, narrow or super-narrow according to the quality of the signal being received. Press the IF bandwidth selector to change the bandwidth to a setting other than that set by the APR system if desired. The IF setting goes from wide to narrow, super-narrow and then back to wide each time this selector is pressed. To return to the APR setting, press the APR on button. (The setting conditions can be stored in memory.) The current setting is shown by the APR mode indicators [22].

20 RF Mode Selector Button (RF MODE)

The APR system automatically sets the gain of the RF section to DX or LOCAL according to the quality of the signal being received. Press the RF mode selector to change the setting to the opposite setting selected by the APR system if desired. To return to the APR setting, press the APR on button. (The setting conditions can be stored in memory.) The current setting is shown by the APR mode indicators [22].

21 Hi-Blend Selector Button (HI-BLEND)

The APR system automatically switches the hi-blend circuitry on and off according to the quality of the signal being received. Press the hi-blend selector to change the setting to the opposite setting selected by the APR system if desired. To return to the APR setting, press the APR on button. The current setting is shown by the APR mode indicators [22]. (The setting conditions can be stored in the memory.)

22 APR Mode Indicators
These indicators show the current FM reception mode settings.

23 APR Indicator
When the APR system is in use, this lights along with AUTO. During auto tuning, or if the button is released during manual tuning, and the APR on button **16** was pressed, the APR indicator lights.

24 Muting Indicator
This indicator shows the current setting of the muting button **12**.

25 Stereo Indicator
This lights when a stereo broadcast is being received. It does not light for weak stereo broadcasts that are heard in mono to improve sound quality.

26 Tuning Mode Indicator
This indicator shows the current setting of the tuning mode button **8**.

27 Tuned Indicator
If the center of the indicator is lighted, the tuning is exactly right. If either the right or left indicator is lighted, use the **9** tuning selector to tune manually until the center of the indicator lights.

28 Multi Function Display
On this display, the bar graph display or digital display of the signal strength currently being received is displayed, frequency, preset station number, or tuning level setting is displayed. The bar graph on the left displays the signal strength of the currently received station in units of 10dBf. To check this figure in greater detail, press the signal strength/station channel button **4**. The signal level indicator lights, and the information is displayed for about two seconds at the right of the display. The center number is the frequency being received, and this is normally displayed. If you press the tuning level selector **3**, the tuning level indicator lights, and the current level setting is displayed for two seconds at the right of the display. The rest of the time, if the currently received station was selected with a preset button, the station indicator is lighted, and the preset number is displayed. However, if tuning was done with the tuning selector, nothing is displayed.

If the preset scan button is pressed, the preset channel lights for about five seconds, and the currently received frequency is displayed in the center. If the memory button **10** or the auto memory button **11** is pressed, the memory indicator lights.

29 Remote Control Sensor (REMOTE SENSOR) and Indicator
This sensor catches the operation signals from the remote control unit. When the remote control unit is being operated, the indicator lights.

30 Timer Program Indicator
This indicator lights when the timer program button **14** is pressed to show that timer program operation is possible.

Remote Control Transmitter

31 APR System Buttons (RF MODE, IF BAND, HI-BLEND, MODE, ANTENNA)
By pressing these buttons, you can change from the mode already in the memory to any other mode. The buttons correspond to buttons **17** ~ **21** on the front panel. To re-store in the memory, use the front panel buttons.

32 Preset Station Buttons (PRESET STATION)
By pressing these buttons, a station already stored in the memory can be called out. To memorize a station, use the front panel buttons.

33 Preset Station Up/Down Button (◀ PRESET ▶)
This function can be used only with the remote control unit. By pressing this button, you can advance or backtrack through preset stations one by one. Each time you press the button, you advance or backtrack one station. If you press it continuously for more than half a second, you will advance or backtrack continuously through the stations.

34 Preset Scan Button (PRESET SCAN)
By pressing this button, you can automatically scan preset broadcasts. This corresponds to button **5** on the front panel.

35 Level Control Buttons (OUTPUT LEVEL)
This adjusts the output level. Pressing the righthand button increases the output. Pressing the lefthand button decreases the output. This corresponds to **15** on the front panel. If it is pressed continuously, the **15** knob rotates automatically.

36 Muting Button (FM MUTE)
This is used to turn the muting function on and off. It corresponds to button **12** on the front panel.

Operations

- Before turning power on, confirm that all connections have been made properly.
- All buttons on this unit except the power switch are soft-touch buttons. When power is turned on, all settings return to the same ones set when power was last turned off.
- If the timer program mode is activated (timer program indicator **30** is lit), the memory preset channel setting will be advanced each time power is turned off and on (between channels 1 and 5).

Standby Mode

15 OUTPUT LEVEL button	Min. (or amp vol. min.)
1 POWER switch	ON
12 FM MUTE button	ON
3 TUNING LEVEL button	17dB
14 TIMER PROGRAM button	OFF

FM Reception (Manual Mode)

1. Press the tuning mode button **8** to select the manual tuning mode.
2. To tune in an FM station not stored in the memory, press the UP or DOWN tuning selector buttons **9** until the frequency display approaches the frequency of the desired station. Then release the tuning selector button and press it again in single steps until the desired frequency is tuned precisely. The frequency is changed in 25 kHz steps when either tuning selector button is pressed in single steps.
3. To recall a station stored in the memory, simply press the preset button **6** corresponding to the desired station. Be sure the shift button **2** is set to the correct mode (1-10 or 11-20).
4. The stereo indicator **25** will light if the broadcast is being received in stereo. Stereo broadcasts having a signal strength below 25dBf will be heard in mono and the stereo indicator will not light.
5. When the tuning selector button was used for tuning adjustment, the APR system will automatically select the correct reception mode settings and the APR mode indicators **22** will display these settings.

FM Reception (Auto Mode)

1. Press the tuning mode button **8** to select the auto tuning mode.
2. Press the UP or DOWN tuning selector buttons **9**. The frequency will continue to increase or decrease until a sufficiently strong broadcast is reached. To move on to the next broadcast, press the UP or DOWN tuning selector button again depending on the direction in which you want to go.
3. To stop scanning during automatic tuning, press the tuning mode button **8**.

Preset Memory Scan

The preset memory scan function is used to automatically recall each station stored in the memory for about five seconds. When the preset scan button **5** is pressed, this sequence will begin with the next higher memory channel from the one currently being used. If no higher memory channel is being used, scanning will begin with channel 1. After memory channel 20, scanning will resume from channel 1. There is no need to press the shift button **2** to switch from channels 1-10 to 11-20 during memory scanning. When scanning advances to the next channel, the corresponding preset channel indicator and the preset number at the right side of the multi function display **28** flash on and off. The frequency

of the memory channel is shown in the multi function display [28]. To stop scanning and listen to the channel currently being heard, press the preset button [6] of that channel.

Memory Function

This unit can store a total of 20 FM stations and each mode of APR control in the memory for instant recall at any time without using the tuning selector buttons. Read the following directions carefully to avoid mistaken operations.

1. Set the memory shift button [2] to the 1-10 or 11-20 mode.
2. Tune in the broadcast to be placed in the memory using the tuning selector buttons [9]. At this time, if you want to use settings other than those already selected automatically by the APR system, press the buttons for each of the APR control modes (RF MODE, IF BAND, HI-BLEND, MODE, ANTENNA) and set the preferred settings.
3. Press the memory button [10] and, while the memory indicator remains lit (about 5 seconds), press one of the preset buttons [6].
4. When the preset button is pressed, the memory indicator will go out and the indicator for the pressed preset button will come on. The multi function display [28] will then show the memory channel number used and then the frequency of the station just placed in that channel.
5. If the memory indicator goes out before you have pressed one of the preset buttons, simply press the memory button [10] again to give yourself another 5 seconds.
6. Placing another broadcast of the same band in the same memory channel automatically cancels the station previously stored in that channel. For example, if a 100.1 MHz station is stored using the first preset station button and then a 105.1 MHz station is stored using the first preset station button again, the 100.1 MHz station will be replaced by the 105.1 MHz station. NOTE: In the memory of this unit, not only the station frequencies, but each mode set in RF MODE, IF BAND, HI-BLEND, MODE, and ANTENNA can be memorized.

- Refer to the shift button explanation in the front panel facilities section for details.

Notes Concerning Memory Operation

1. Preset frequencies can be transferred to other channels. For example, the FM station stored by preset button number 6 can be transferred to preset button number 1 in the following manner.
 - 1) Press preset button number 6.
 - 2) Press the memory button [10] (memory indicator lights).
 - 3) Press preset button number 1.
 - 4) The same station is now stored by both preset buttons 1 and 6.
2. When the power is turned off or when the power cord is unplugged from the wall socket, the frequencies stored in the memory will be preserved and the last tuned station will be returned immediately when the power is turned on again. For example, if 90.1 MHz was tuned in when the power was turned off, the frequency displayed when the power is turned on again will still be 90.1 MHz. NOTE: The same applies to all APR modes; that is, the condition when the power is turned on is the same as that when it was last turned off.

The Auto Memory Function

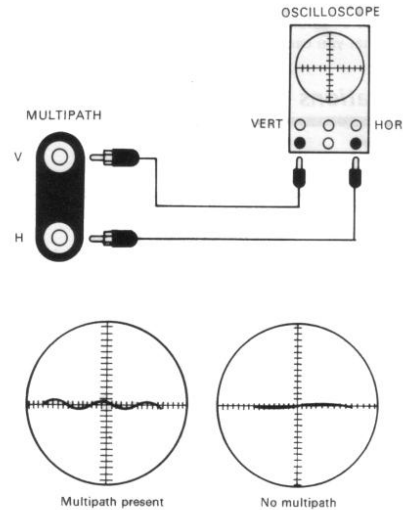
The auto memory function is used to automatically store stations in the memory. When the auto memory button [11] is pressed, the memory indicator [10] lights for about 5 seconds. While the indicator is lit, press one of the preset buttons [6] to begin auto memory scanning from that memory channel. The tuned frequency will then automatically advance, placing each station strong enough to satisfy the conditions for auto memorization in the memory, beginning with the memory channel of the preset button just pressed. The tuned frequency will stop advancing when the upper end of the frequency range is reached.

If no stations are placed in the memory by the time the upper limit is reached, the tuned frequency will return to the lower limit and auto memory scan will stop. In this case, the next memory channel used will be the next lower one from the preset button originally pressed unless channel 1 was selected, in which case the setting remains the same. For example, if auto memory scan was started by pressing preset button 3 and no stations have been placed in the memory when the upper limit is reached, the memory channel changes from 3 to 2 and auto memory scan is stopped.

Auto memory operation begins from the frequency (radio broadcast) currently being received. To cover the entire FM band, auto memory operation should be started from the lowest frequency.

Multipath Adjustments

This unit is equipped with rear panel terminals to allow checking for multipath reception problems. To use these terminals, connect an oscilloscope as shown below and then adjust the direction and/or location of the antenna until the multipath problem is minimized. If you require more detailed information, contact your Onkyo Service Center.



Troubleshooting guide

Trouble	Cause	Remedy
Crackling noise on FM.	<ul style="list-style-type: none"> Noise caused by turning fluorescent lamp on and off. Noise from automobile ignition. 	<ul style="list-style-type: none"> Move the antenna as far as possible from the fluorescent lamp. Install an outdoor FM antenna as far as possible from the road. Change the position or direction of the FM outdoor antenna.
Signal strength is sufficient but the sound is distorted and the separation is bad.	<ul style="list-style-type: none"> Station is too strong. Multiple reflection of the radio waves because of tall buildings or mountains. 	<ul style="list-style-type: none"> Change to T-shaped antenna. Use an antenna which has better directivity and select a point where the distortion is least.
Signal strength indication varies unsteadily. Hiss on FM.	<ul style="list-style-type: none"> The station is too weak. Stereo FM broadcasts cover only about half the distance of an ordinary broadcast. 	<ul style="list-style-type: none"> Install outdoor FM antenna. Change the position or direction of the outdoor antenna. Switch to mono reception. (Even stereo broadcasts will be heard in mono.)
No station is recalled when a preset button is pressed.	<ul style="list-style-type: none"> The power switch has not been turned on for a long time or the power cord has been unplugged for a long time. 	<ul style="list-style-type: none"> The memory contents are lost if the power is not turned on and off a few times each month. Store all stations in the memory again and remember to turn power on and off a few times each month.
Front panel controls function but remote controller does not.	<ul style="list-style-type: none"> No batteries in remote control transmitter. Batteries have worn out. 	<ul style="list-style-type: none"> Insert batteries. Replace batteries.

The tuning steps by which the tuned frequency changes on each band have been set at the factory to the proper value for the country where each unit is to be sold. If you use the unit in a country where a different tuning step is required or if the broadcast frequencies in your country change so that you can not tune in radio stations precisely, take this unit to an authorized Onkyo Service Center.

Specifications

Tuning Range:	87.5 – 108.0 MHz (AUTO MODE 50kHz steps, MANUAL MODE 25kHz steps)	General
Usable Sensitivity:	Mono: 0.8 μ V (S/N 26 dB, 40kHz Dev.) DIN Stereo: 20.0 μ V, (S/N 46 dB, 40kHz Dev.) DIN	Power Supply: USA & Canadian models: AC120V, 60 Hz Worldwide model: 120 and 220V switchable, 50/60 Hz
50dB Quieting Sensitivity:	Mono: 15.8dBf, 1.7 μ V Stereo: 37.2dBf, 20 μ V	Dimensions (W x H x D): 465 x 103 x 387 mm 18-5/16" x 4-1/16" x 15-1/4"
Capture Ratio:	1.0 dB	Weight: 8.5 kg, 18.7 lbs.
Image Rejection Ratio:	100dB	Specifications and features are subject to change without notice.
IF Rejection Ratio:	100dB	
Signal-to-Noise Ratio:	Mono: 95dB (IHF) Stereo: 85dB (IHF)	
Selectivity:	80dB (\pm 300 kHz, IF: super narrow)	
AM Suppression Ratio:	60dB	
Total Harmonic Distortion:	Mono: 0.009% (IF: wide) Stereo: 0.02% (IF: wide)	
Frequency Response:	30 – 15,000 Hz +0.5 dB, -1.0 dB	
Stereo Separation:	55 dB at 1 kHz (IF: wide) 33 dB at 70 – 10,000Hz (IF: wide)	
Output Voltage:	0 – 1.5V	

ONKYO CORPORATION

International Division: No. 24 Mori Bldg., 23-5, Nishi-Shimbashi 3-chome, Minato-ku,
TOKYO 105, JAPAN Tel: 03-432-6987 Fax: 03-436-6979 TLX: 242-3551 ONKYO J
ONKYO U.S.A CORPORATION
200 Williams Drive, Ramsey, N.J. 07446, U.S.A.
Tel: 201-825-7950 Fax: 201-825-8150