

YAMAHA T-1020

*Natural Sound AM/FM Stereo Tuner
New Computer Servo Locked Tuning System
Super-precision Digital Fine Tuning (0.01MHz steps)
Auto Local/DX Tuning System
Zero Intermodulation Mixer Front End
20-Station Random Access Preset Tuning*



Thank you for purchasing the YAMAHA T-1020 AM/FM stereo tuner.

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OWNER'S MANUAL



IMPORTANT

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

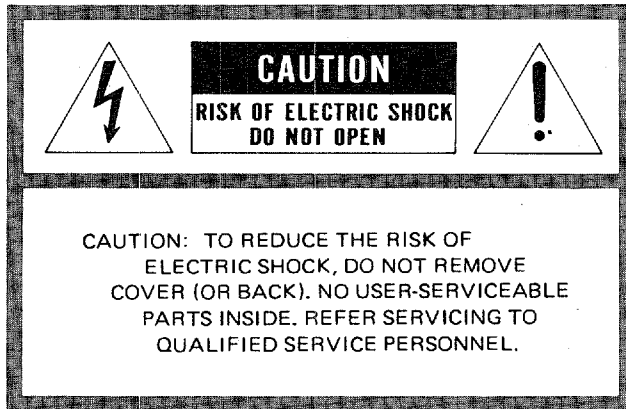
Model: **T-1020**

Serial No.:

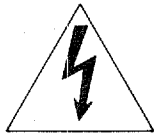
The serial number is located on the rear of the chassis.
Retain this Owner's Manual in a safe place for future reference.

WARNING

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



• 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.

SAFETY INSTRUCTIONS

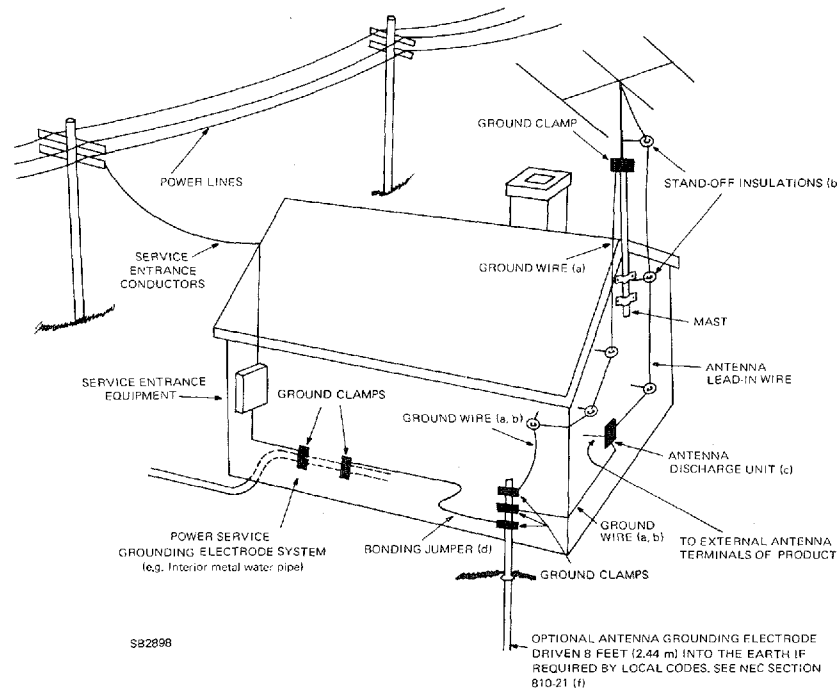
- 1** Read Instructions — All the safety and operating instructions should be read before the appliance is operated.
- 2** Retain Instructions — The safety and operating instructions should be retained for future reference.
- 3** Heed Warnings — All warnings on the appliance and in the operating instructions 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.
- 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 not spilled into the inside of the appliance.
- 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.

CAUTION: READ THIS BEFORE OPERATING YOUR T-1020

18 Outdoor Antenna Grounding — If an outside antenna is connected to the tuner, 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.

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



(a): Use No. 10 AWG (5.3mm²) copper, No. 8 AWG (8.4mm²) aluminium, No. 17 AWG (1.0mm²) 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 (13.3mm²) copper, or the equivalent when a separate antenna-grounding electrode is used. See NEC Section 810-21 (j).

1

The T-1020 is a sophisticated AM/FM stereo tuner. To ensure proper operation for the best possible performance, please read this manual carefully.

2

Choose the installation location of your T-1020 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 yank the cord.

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 the T-1020 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 your T-1020 is faulty.

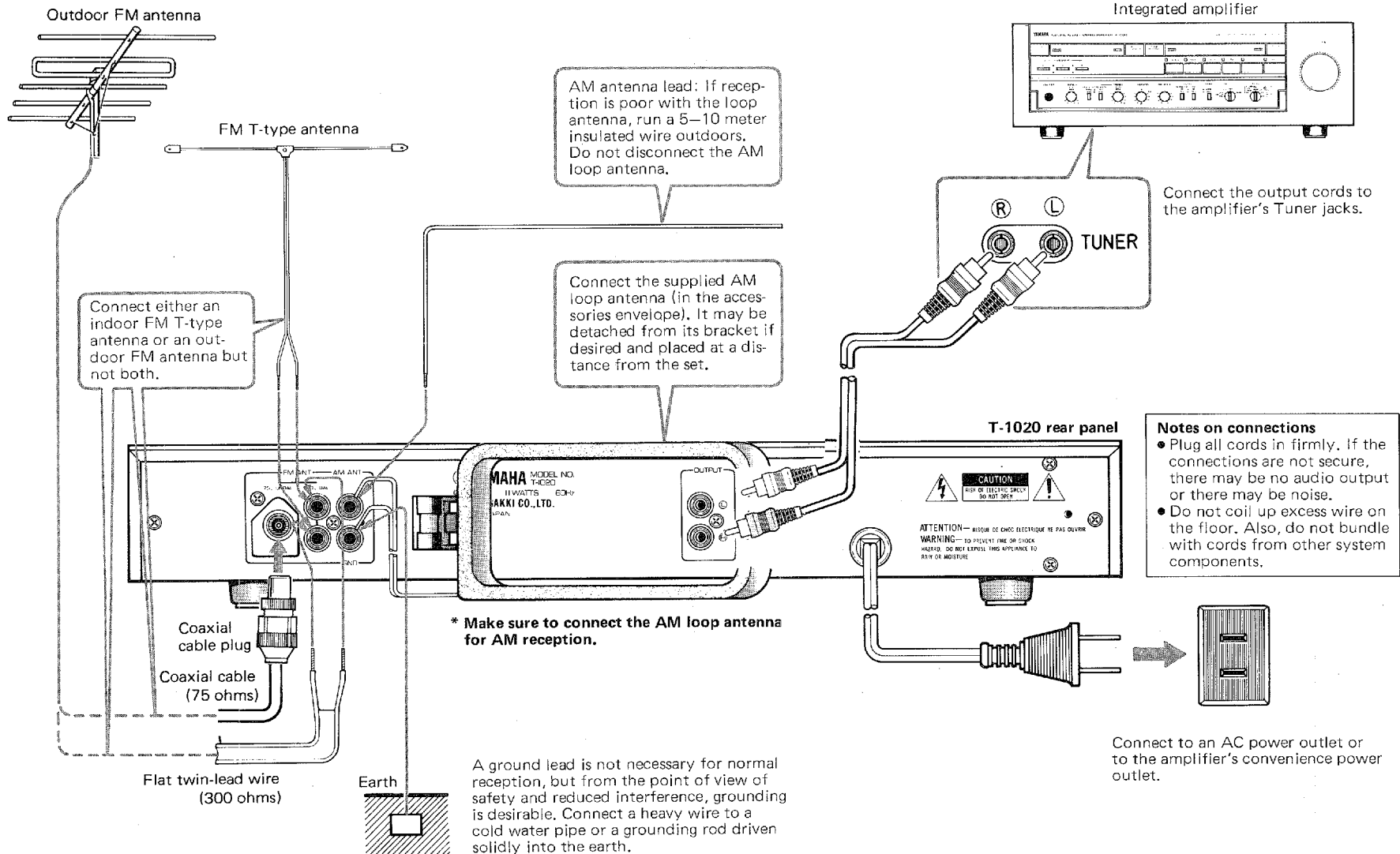
10

Keep this manual in a safe place for future reference.

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CONNECTION DIAGRAM

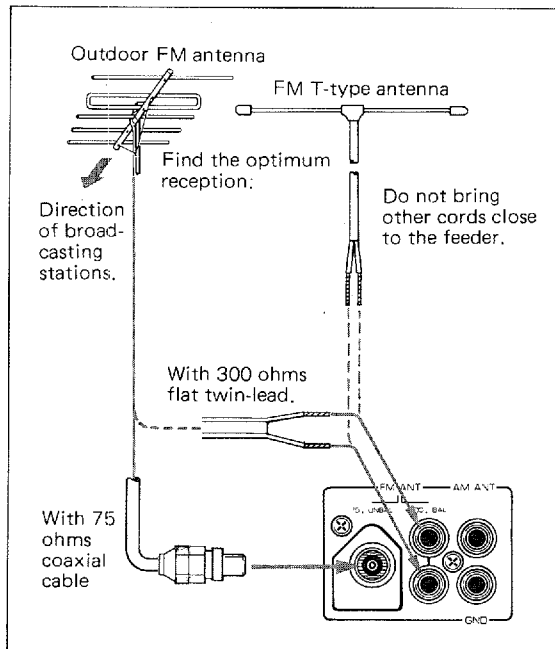
*Be sure to turn the power OFF before making connections, and connect the left (L) and right (R) channels consistently from component to component.



CONNECTIONS

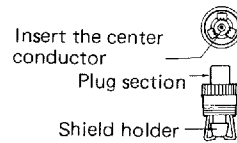
CONNECTING THE FM ANTENNA

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, a portable T-type antenna is usually adequate. Connect the feeder wire to the 300 ohm terminal, stretch the wire out tight, and turn the antenna to obtain optimum reception. Attach to a suitable support such as a wall.



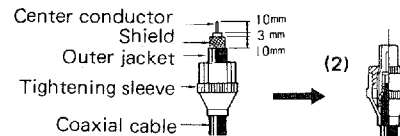
In all but the best reception conditions, an outdoor FM antenna is necessary for best results. Either a 300 ohms flat twin-lead wire or a 75 ohms coaxial cable may be used. In locations where electrical interference is a problem a coaxial cable is preferable. Refer to the figure for instructions on installing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

Attaching the plug to the coaxial cable



(1)

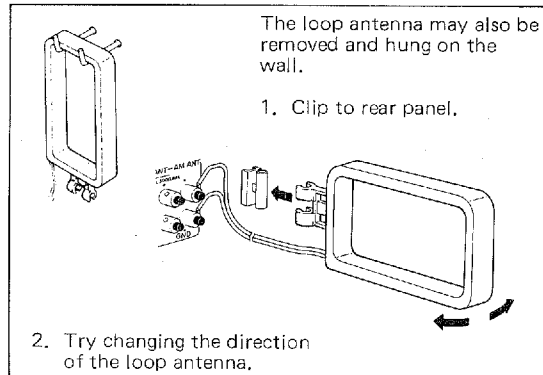
(1) Remove the outer covering of the coaxial cable up to about 23mm (1") from the end, and slide the tightening sleeve over the cable. Insert the center conductor of the coaxial cable into its hole in the plug section, place the shield into the shield holder and plug in.



(2) Screw on the tightening sleeve.

CONNECTING THE 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 long insulated wire to the AM Ant terminal and run it outdoors.



NOTE ON FM/AM ANTENNA INSTALLATION

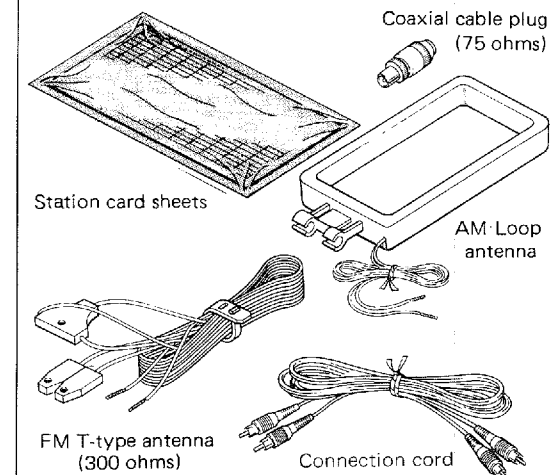
This tuner has both an Auto Search type tuning system with 100kHz tuning steps on FM and 10kHz steps on AM and a Manual tuning system. Normally, with stations stronger than $10\mu\text{V}$ ($300\mu\text{V/m}$ on AM when using the loop antenna), Auto Search tuning can be used to find and tune in stations automatically. Weaker stations may be tuned in with Manual step tuning. Extremely weak stations, however, will not be heard due to the action of the muting circuit. In this case, try rechecking the antenna connections and adjusting the location, direction and height of the antenna to increase the signal strength to a sufficient level for proper reception.

CONNECTING TO THE AMPLIFIER

Use the cable supplied to connect the OUTPUT jacks of the tuner to the input jacks of your amplifier, being sure to observe the left and right channel markings. Also make sure that the connections are secure and that the connecting cable is not bundled with the speaker leads or power cord from the amplifier.

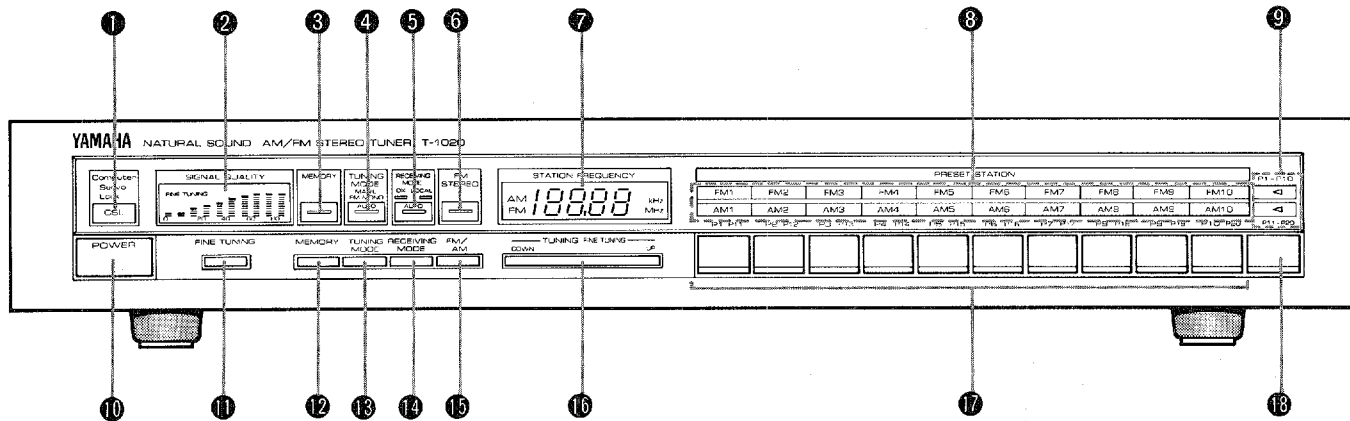
Accessories

Please confirm that the following accessories are included.



T-1020

FRONT PANEL PARTS AND FUNCTIONS



1 CSL (Computer Servo Lock) INDICATOR

This indicator lights up during tuning to show that the Computer Servo Lock synthesizer system has tuned in a station.

2 SIGNAL QUALITY INDICATOR

Indicates the quality of radio waves coming into the tuner when broadcasts are being received.

3 MEMORY INDICATOR

Flickers for about 5 seconds after the MEMORY key 12 is pressed. During this interval the PRESET STATION keys may be programmed.

4 TUNING MODE INDICATOR

The AUTO indicator lights when the TUNING MODE key 13 is set to AUTO, and remains off when the TUNING MODE key is set to MAN'L.

5 RECEIVING MODE INDICATOR

Pressing the RECEIVING MODE key will switch to the receiving mode, and this indicator will light up.

push (manual) DX → push (manual) LOCAL → AUTO → DX ----

When the power is turned on, the receiving mode will be identical to that set when the POWER key was last turned off.

6 FM STEREO INDICATOR

When an FM STEREO broadcast is being received this indicator lights. The FM STEREO indicator will not light if the TUNING MODE key 13 is set to MAN'L.

7 STATION FREQUENCY DISPLAY

Shows the frequency of the station tuned in with the TUNING key 16 or the PRESET STATION keys 8

The FM frequency range is 87.5 – 108.0MHz, while the AM frequency range is 510 – 1620 kHz.

8 PRESET STATION INDICATOR

These rear-illuminated indicators will indicate the preset station selected. Pressing one of the PRESET STATION keys will cause its corresponding indicator to light up.

(Although two stations will be indicated simultaneously by the upper and lower indicators respectively, the station indicated by the 9 indicator will be selected.)



9 P1 — P10/P11 — P20 SELECTION INDICATOR

Pressing the P1 — P10/P11 — P20 SELECTION key will cause the unlit ◀ indicator to flicker for 5.5 seconds, after which the flickering will change to a steady glow, indicating the range has been selected.

Pressing a PRESET STATION key while either indicator is flickering will cause the flickering to change to a steady glow, which means that the preset stations can be tuned in instantaneously.

10 POWER KEY

When the power is turned on, this unit will be set to the mode activated when the power was last turned off.

11 FINE TUNING KEY

When this key is pressed, the words "FINE TUNING" will illuminate on the SIGNAL QUALITY INDICATOR, and the FM frequency will be displayed to a precision of 0.01MHz (= 10 kHz). Thus, FM tuning to a precision of 0.01MHz is possible when the FINE TUNING key is pressed intermittently. For AM, 1-kHz step tuning will be possible. (The frequency can be continuously changed in steps of this width if the key is pressed continuously.) This switch can then be used for even more precise tuning.

12 MEMORY KEY

Pushing this key causes the indicator above to flicker for 5 seconds. Pressing one of the PRESET STATION keys 9 while the indicator is lit causes the frequency of the station currently tuned in to be memorized.

13 TUNING MODE KEY

Sets either Auto or Manual tuning operation.

- **AUTO Position (FM STEREO)**

The TUNING MODE indicator 4 lights, and the Auto Search tuning function of the TUNING MODE key 13 is activated.

In the AUTO position, any FM stereo broadcast will be received in stereo.

- **MAN'L/MONO Position (MONO)**

The TUNING MODE indicator is off, and the Manual tuning function of the TUNING MODE key 13 is activated.

In the MAN'L/MONO position, FM stereo broadcasts will be heard in mono.

14 RECEIVING MODE KEY

This key is effective for improved reception of distant stations or noisy stations during FM reception.

Each time the key is pressed, it changes in order from AUTO DX to compulsory DX to compulsory LOCAL, as indicated by the RECEIVING MODE indicator.

- **AUTO**

When interference is not strong, the wide-range LOCAL mode is used for reception, but when the signal is weak or there is interference, there is an automatic switchover to the highly selective DX mode so that reception noise can be lessened.

There is no automatic return to the LOCAL mode even if the reception conditions improve. Either the broadcast should be detuned, or this switch should be pressed to the LOCAL position.

- **Compulsory DX**

Set to this mode to receive a distant broadcast station or if the broadcast signal becomes weak.

- **Compulsory LOCAL**

Set to this position if broadcast signals are strong and there is little interference, or if you wish to receive only strong-signal broadcast stations.

* The suggested usual setting is the AUTO DX mode.

15 FM/AM KEY

This key selects either FM or AM broadcasts.

16 TUNING KEY

Use this key to tune in broadcast stations.

- **When the TUNING MODE key 13 has been set to AUTO.**

Pressing the DOWN side of the key scans the broadcast band downwards until a station is encountered, and scanning then stops with the station perfectly tuned in (Auto Search Tuning). Pushing the key again scans progressively lower frequencies until the next station is found. When the lower end of the band is reached, the frequency is set to the high end of the band and scanning continues downward. Pressing the UP side of the key scans the band upwards in the same way.

- **When the TUNING MODE key 13 has been set to MAN'L.**

Pressing the DOWN side of the key starts tuning down the band only as long as the key is held, and pressing the UP side starts tuning upwards as long as the key is held. In either case the tuning stops when the key is released. Pushing either side of the TUNING key briefly causes the frequency of change 0.1MHz on FM or 10kHz on AM.

- **When the FINE TUNING key 11 has been set to FINE TUNING.**

Pressing the DOWN side of the key starts tuning down the band only as long as the key is held, and pressing the UP side starts tuning upwards as long as the key is held. In either case the tuning stops when the key is released. Pushing the TUNING key briefly causes the frequency to change 0.01MHz on FM or 1kHz on AM.

17 PRESET STATION KEYS

Up to 20 preset stations (selectable between FM only: 20 stations; AM only: 20 stations; or FM and AM combined: 20 stations) can be programmed by using the PRESET STATION keys together with the P1 — P10/P11 — P20 SELECTION key.

When programming each preset, the station frequency, tuning mode, receiving mode (FM), and the fine tuning on/off mode can be entered simultaneously into the memory. Thereafter, each station can be tuned in simply by lightly touching the proper PRESET STATION key.

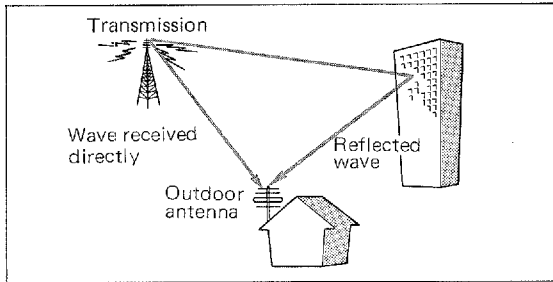
18 P1 — P10/P11 — P20 SELECTION KEY

Each time this key is pressed, the preset station range will be switched between the P1 — P10 range and the P11 — P20 range.

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MULTIPATH INTERFERENCE

Multipath is an effect similar to television ghosting; it distorts the received signal and also causes poor stereo separation and noise. As shown in the figure, radio waves which travel directly from the transmitter to the receiving antenna are mixed with waves which are reflected off nearby objects such as buildings. Because the path taken by the reflected waves is longer than the direct path, the time required for the waves to arrive at the antenna is also longer. The mixing of the directly received signal and the delayed signal noticeably degrades reception quality. Multipath interference can be greatly reduced by the use of a high-quality directional antenna oriented in the proper direction.



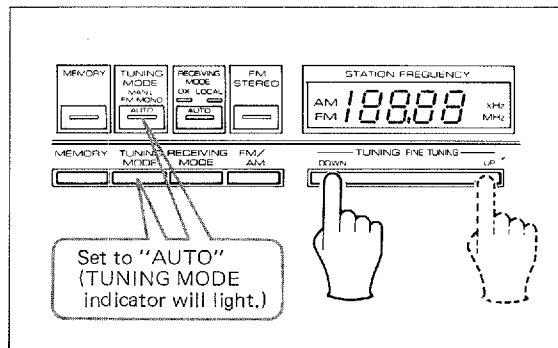
PREVIOUS-STATION MEMORY

- If power is turned off while a station is tuned in, the same station will be tuned in automatically when power is turned on again. Even if the power cord is pulled out rather than the power key being turned off, the effect is the same.
- When the FM/AM key is changed from FM to AM, the last AM station listened to will automatically be tuned in again. In the same way, when the key is changed from AM to FM, the last FM station will be tuned in again.
- * If the power is turned off or the Function key is pressed while auto-search tuning is in progress, next time the power is turned on or the Function key is pressed no station may be tuned in even though the frequency display is lit.

RECEIVING FM/AM BROADCASTS

■ AUTO SEARCH Tuning

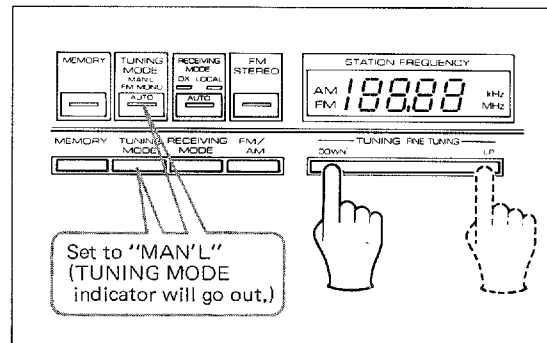
- 1) Press the FM/AM key to select FM or AM.
- 2) Set the TUNING MODE key so the TUNING MODE indicator lights up.
- 3) Set the RECEIVING MODE key to AUTO or DX.
- 4) Press the DOWN or the UP side of the TUNING key. The tuner will automatically scan the band and stop scanning when a station is found.



- 5) If the frequency of the desired station has not yet been reached, press the key repeatedly until your station has been tuned in.
- *If no antenna is connected or when an indoor antenna is being used, there may be no stations strong enough to stop the automatic scan. Set the TUNING MODE key to MAN'L to stop the scan in this case.

■ MANUAL Tuning

When the signal strength of the desired station is very weak, there are cases when the auto search tuning feature will not be able to find the station. In this case manual tuning should be used.



- 1) Press the FM/AM key to select FM or AM.
- 2) Set the TUNING MODE key so the TUNING MODE indicator goes out.
- 3) Set the RECEIVING MODE key to AUTO or DX.
- 4) Press the DOWN or the UP side of the TUNING key continuously.

Release the key before the frequency of the desired station is reached, and press the correct side of the key in quick steps to tune the station in exactly.

■ FINE Tuning

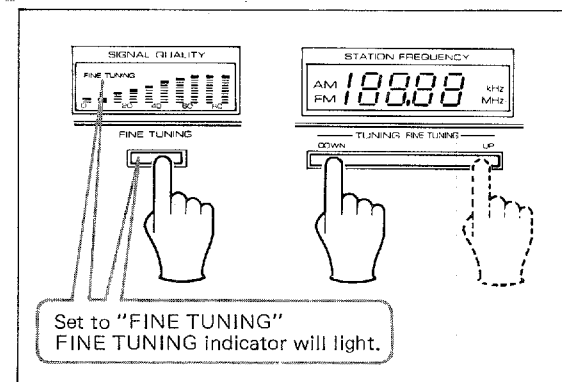
Rapid tuning is usually possible by the Auto Search or Manual tuning method, but Fine Tuning allows more stabilized reception.

In the following instances, Manual tuning and then Fine Tuning can be used to reduce noise and distortion. The best reception can be easily obtained by using the SIGNAL QUALITY indicator during fine tuning.

- (1) To receive a weak or very badly fading broadcast signal from among many signals.
 - (2) To receive a weak or medium-strength signal which is near a strong signal.
 - (3) If beat noise is received.
- * The optimum reception conditions obtained by fine tuning can be programmed into the memory of the preset keys, both for FM and AM.

Fine Tuning procedure is as follows.

1. Press the FM/AM key to set the band.
2. Press the TUNING MODE key to set the desired tuning mode.
3. Set the RECEIVING MODE key to AUTO or DX. Tune in the desired station.
4. Press the FINE TUNING key to activate the fine tuning mode, and the corresponding indicator will light up.
5. Press the DOWN or the UP side of the TUNING key while watching the SIGNAL QUALITY indicator till the very best reception is obtained.



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■ PRESET Tuning

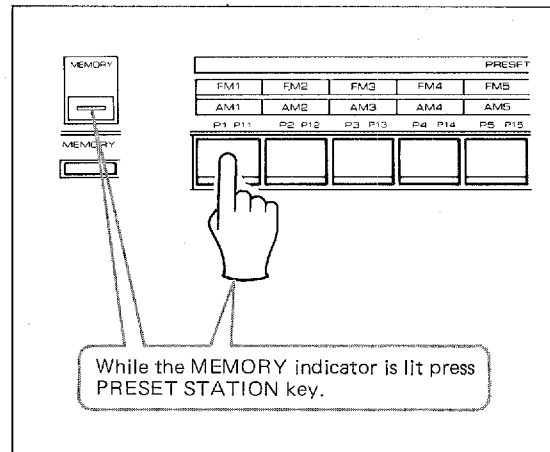
The PRESET STATION key can be used to select, at a single touch, any desired station which has been preset by Manual, Auto Search or Fine Tuning.

To program the PRESET MEMORY

The following example is for an FM station to be programmed to PRESET STATION key P1. (P11)

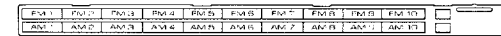
1. Press the FM/AM key to set the FM band.
2. Set the RECEIVING MODE, TUNING MODE and FINE TUNING keys according to the reception conditions.
3. Tune in the desired station.
4. Press the P1 – P10/P11 – P20 SELECTION key to set the P1 – P10 range.
5. Press the MEMORY key and then, while the indicator is flickering about 5 seconds, press the P1 (P11) preset key. The MEMORY indicator will go out and the P1 (P11) indicator will light.
6. That FM station is now preset, including the reception mode conditions, to preset key P1 (P11). To confirm the setting, press another PRESET STATION key and then press PRESET STATION key P1. (P11)
You can confirm the frequency and reception mode as they will be displayed.

- AM stations can be programmed in the same way after the AM band is set.
- In this way as many as 20 stations (both AM and FM total) can be programmed at random for preset tuning.
- To change the setting for any key, follow the same procedure. The new setting will be programmed in place of the former one.
- After the P1 – P10 presets have been programmed completely, pressing the P1 – P10/P11 – P20 SELECTION key will enable the P11 – P20 preset station range to be programmed.



■ Using the Station Cards

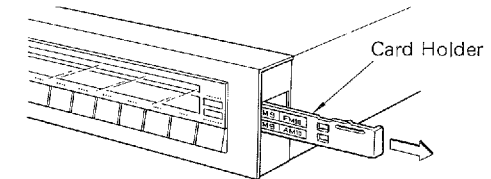
Station Cards as shown below come with the T-1020.



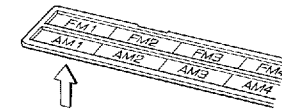
Blank station cards are provided for you to fill in according to the particular stations in your area you wish to program into the preset memory. They can be changed freely.

Inserting, replacing station cards:

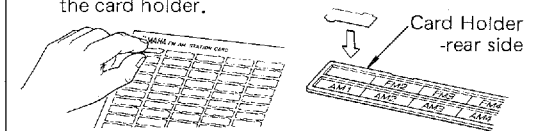
1. Remove the card holder.



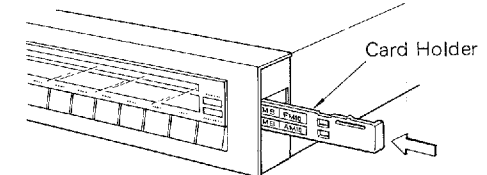
2. Remove the attached card.



3. After appropriately labelling a station card, remove it from the film sheet and attach it to the card holder.



4. Attach the card holder to the tuner.



TROUBLESHOOTING

Before assuming that your tuner is faulty, check the following troubleshooting list which details 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
FM	Cracking 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 should be used.
		Noise from thermostats or 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 multiple element FM antenna.
			Press the TUNING MODE key so that the TUNING MODE indicator goes out ("MAN'L, FM MONO" setting).
	The FM STEREO indicator flickers on and off and reception is noisy.	Insufficient antenna input.	Use an antenna appropriate for the reception conditions in your area.
		Station not tuned correctly.	Tune in correctly.
	There is distortion and clear reception cannot be obtained even with a good FM antenna.	Multipath interference.	Adjust antenna placement to eliminate multipath interference.
	No stereo effect even with a stereo broadcast.	The TUNING MODE indicator does not light (i.e. the "MAN'L, FM MONO" setting is set).	Press the TUNING MODE key so that the TUNING MODE indicator lights up ("AUTO" setting).
	A desired station cannot be tuned in with Auto Tuning.	The station is too weak.	Use a high-quality directional FM antenna.
Use Manual tuning mode.			
Previously preset stations can no longer be tuned in.	The tuner 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 the antenna for best reception.
	A desired station cannot be tuned in with Auto Tuning.		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 groundwire. This will help somewhat but it is difficult to eliminate all noise.
	There are buzzing and whining noises (especially in the evening).	Another station is interfering with the received station.	This is impossible to remedy.
A television set is being used nearby.		Move the television and tuner apart.	

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SPECIFICATIONS

■ FM SECTION

Tuning Range	87.5 ~ 108.0MHz
50dB Quieting Sensitivity (IHF)	
Mono (75Ω)	1.6μV (15.3dBf)
Stereo (75Ω)	20μV (37.2dBf)
Usable sensitivity	
(30dB Quieting Mono) 75Ω	0.9μV (10.3dBf)
Image Response Ratio	80dB
IF Response Ratio	110dB
Spurious Response Ratio	110dB
AM Suppression Ratio	65dB
Capture Ratio	
Local	1.2dB
Alternate Channel Selectivity	
DX	85dB
Adjacent Channel Selectivity	
DX	20dB
Signal to Noise Ratio (IHF)	
Mono	90dB
Stereo	84dB
Distortion	
Mono 1kHz	DX 0.15%, Local 0.04%
Stereo 1kHz	DX 0.5%, Local 0.05%
Stereo Separation (1kHz)	Local 55dB
Frequency Response	
30Hz to 13kHz	0 ±0.5dB

■ AM SECTION

Tuning Range	510 ~ 1620kHz
Usable Sensitivity	250μV/m
Selectivity	25dB
Signal to Noise Ratio	52dB
Image Response Ratio	40dB
Spurious Response Ratio	50dB
Distortion (400Hz)	0.3%

■ AUDIO SECTION

Output Level/Impedance	
FM (100% MOD 1kHz)	500mV/2.8kΩ
AM (30% MOD 400Hz)	150mV/2.8kΩ

■ GENERAL

Power Supply	120V 60Hz
Power Consumption	11W
Dimension (Wx HxD)	435 x 72 x 316 mm (17-1/8"x2-7/8"x12-1/2")
Weight	3.4 kg (7 lbs 8 oz)

Specifications subject to change without notice.

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