

AUTOMATIC ANTENNA TUNER

AT-300

INSTRUCTION MANUAL

KENWOOD CORPORATION

KENWOOD

2. SPECIFICATIONS AND ACCESSORIES

2-1. SPECIFICATION

Frequency range	1.8 MHz to 29.7 MHz
Power Supply requirement	13.8 VDC \pm 15% Negative Ground max. 2 A (supplied from radiotelephone)
Power Capability	150W PEP (100W continuous)
Operating temperature	-20 °C to +60 °C (-4 °F to +140 °F)
Input Impedance	50 Ω
VSWR	Less than 1.5
Tuning Power	8~15 W
Antenna Required	12 to 23 m(39 to 75 feet); 1.8 to 29.7 MHz 2.7m(9 feet)whip; 3.5 to 29.7 MHz
Tuneup Time	Within 2 to 15 sec (Within 0.5 sec on pre-tuned frequencies)
Dimensions	W258×H425×D90 [mm] (10-5/32"×16-23/32"×3-17/32")
Weight	3.0 kg (6.6 lbs)

Note

Circuit and ratings are subject to change without notice due to advancements in technology.

2-2. ACCESSORIES

Unpack your AT-300 carefully and confirm that it is supplied with the following accessories.

Control cable ^{15 meters long}	E30-3037-08	1 ea.
Cover	F09-0427-08	1 ea.
Neon tube	W01-0416-08	1 ea.
Packing (diameter 7.5 mm)	G53-0597-08	1 ea.
Packing (diameter 10 mm)	G53-0592-08	1 ea.
Mounting bracket	J21-4300-08	2 ea.
U. bolt	N09-2095-08	2 ea.
Hex. bolt	N09-2096-08	4 ea.
Screw set	N99-0344-08	1 ea.
Tapping screw		4 ea.
Nut		8 ea.
Spring washer		8 ea.
Flat washer		12 ea.
Instruction manual	B62-0072-XX	1 copy
Warranty card (U.S.A.version only)		1 ea.

After unpacking

Shipping container:

Save the boxes and packing in the event your unit needs to be transported for remote operation, maintenance, or service.

Thank you for purchasing this new Automatic Antenna Tuner.

IMPORTANT

Please read this instruction manual carefully before placing the tuner in service.

SAVE THIS INSTRUCTION MANUAL.

The following explicit definitions apply in this manual:

WARNING: Personal injury may occur — do not disregard.

CAUTION: Equipment damage may occur, but not personal injury.

NOTE: If disregarded, inconvenience only, no risk of equipment damage or personal injury.

WARNING

RF Burn:

A 100W Transceiver develops more than 70V RF at the antenna. Do not touch or go near to the antenna while the transmitter is energized.

SAFETY FIRST!

Antenna location:

Do not install antennas in close proximity to power lines. Touching the antenna to the power line during installation will be FATAL.

1. BEFORE OPERATION

1. Fixed Station Installation

Ensure that the antenna and AT-300 are at least 2.5 meters from where people may come in contact with them.

2. Mobile Installation

Vehicle ABS (braking). Use of two-way radio equipment may adversely affect proper operation of on-board electronic controlled braking systems. Consult the vehicles manufacturer or authorized dealer for any possible cautions.

Vehicle Computer controlled ignition systems. Use of two-way radio equipment may adversely affect proper operation of ignition and/or emission control systems. Consult the vehicles manufacturer or authorized dealer for any possible cautions.

3. Suggested Microphones

Use of a dynamic microphone is recommended when using the AT-300.

3. INSTALLATION AND CONNECTION

3-1. ANTENNA

The type of antenna that is used will greatly affect the performance of the HF equipment. The antenna should be erected as high as possible for best performance.

Keep the antenna as far away from objects that might affect its performance. These items include metallic masts, guy wires, etc.

Insulators should be able to withstand leakage even when wet.

Caution
The base of the antenna has HIGH VOLTAGE present.
It should be connect thru a lead-in insulator.
Do not touch the base of the antenna during transmit as dangerous voltages are present.

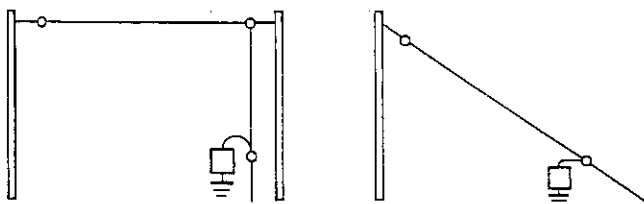
Certain antenna lengths might be difficult for the antenna tuner to match. Element lengths to avoid may be calculated with the following formula:

Lengths to avoid = $300 / \text{operating frequency (in MHz)} \times .5 \times (\text{any whole number, i.e. 1; 2; 3; etc.})$

In general you should avoid antenna lengths that are multiples of $1/2$ wavelength.

Cautions

1. High voltages are present on the antenna wire. Route the wire so that it cannot be easily touched by anyone.
2. Avoid antenna lengths that are multiples of $1/2$ wavelength.
3. If TVI or RFI occurs you should relocate the antenna as far away from the television or radio as possible.
4. Maximum input power is 150W PEP (100W continuous). Do not use with a Linear Amplifier.



3-2. GROUND

The AT-300 must be connected to a good earth ground for proper operation. Without a good earth ground you will realize maximum performance from your HF transceiver.

Cautions

1. Never use a gas pipe or electrical conduit for your ground connection.
2. Do not use the same electrical ground that you use for other major appliances such as air conditioners, or stoves etc. This could cause malfunctions of these devices due to radiated RF.
3. The mounting bracket for the AT-300 is not connected to ground. Use a separate ground connection.

3-3. INSTALLATION

Warning
Placement:
Select a location which will not interfere with safe operation of the vehicle, and, in the event of a sudden stop or collision, will not present dangerous protrusions to the vehicles occupants.
Mechanical installation:
Follow the detailed installation instruction contained in the Operations Manual. Be certain that the radio is securely installed so as not to break free of its installation and become a projectile to injure the vehicle driver or occupants.

Caution
Electrical:
Follow the detailed installation instructions contained in the Operations Manual. Do not remove fuses. Route and dress all cables carefully as shown.

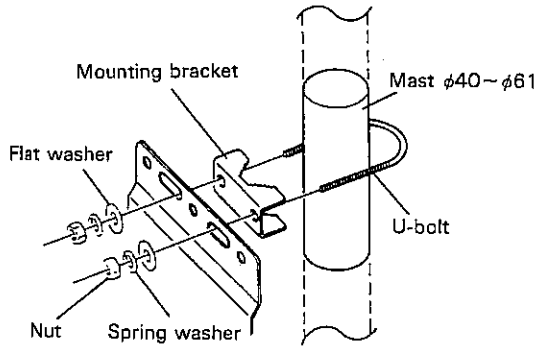
The AT-300 is protected by weather proof construction which permits the flexibility of interior or exterior installation.

Before installation note the following precautions.

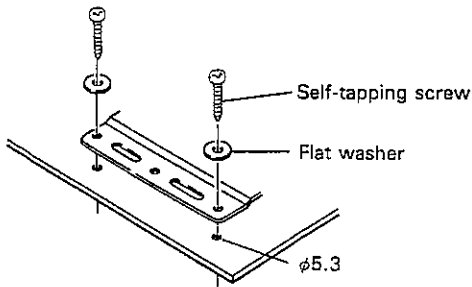
1. Attach the unit to a good RF ground.
2. Avoid water spray if possible.
3. High Voltages are present on the base of the antenna, use CAUTION.
4. Use caution when tightening the wing nut on the GND and antenna terminal. Over tightening may cause twisting of the terminal inside the coupler.

Three types of installation are available.

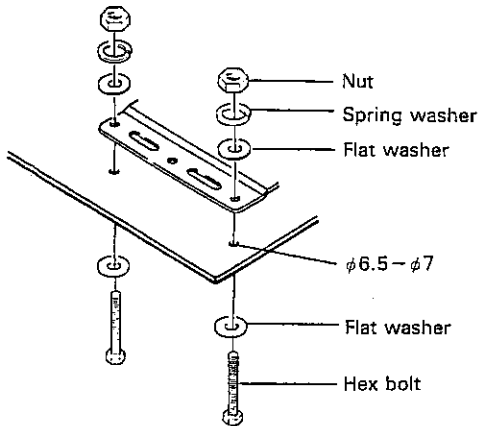
1. U-bolt mounting for mast installations.



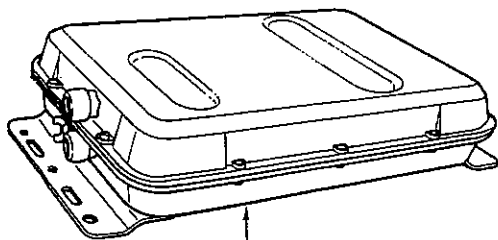
2. Self-tapping screws for semi-permanent mounting on a flat surface.



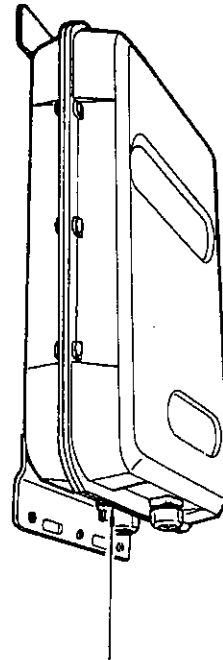
3. Hexagonal bolts for permanent mounting on a flat surface.



Two drain holes have been provided to help remove any moisture that may gather inside the tuner. One is provided for vertical mounting, and one for horizontal mounting.



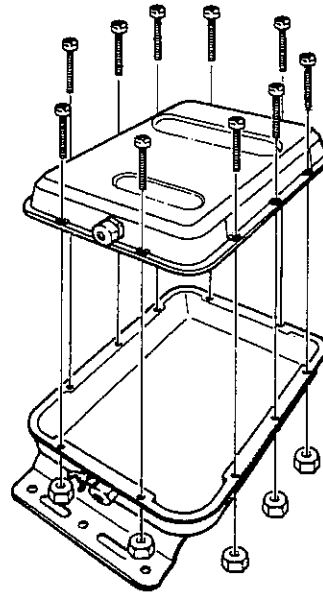
Remove screw A



Remove screw B

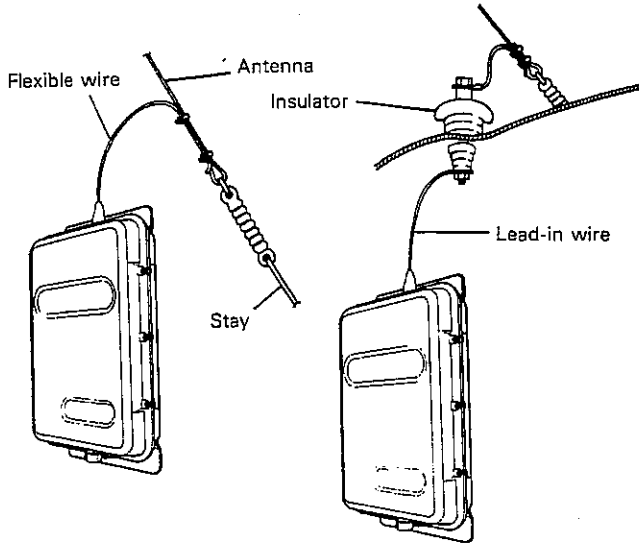
3-4. CONNECTION

3-4-1. Cover Removal



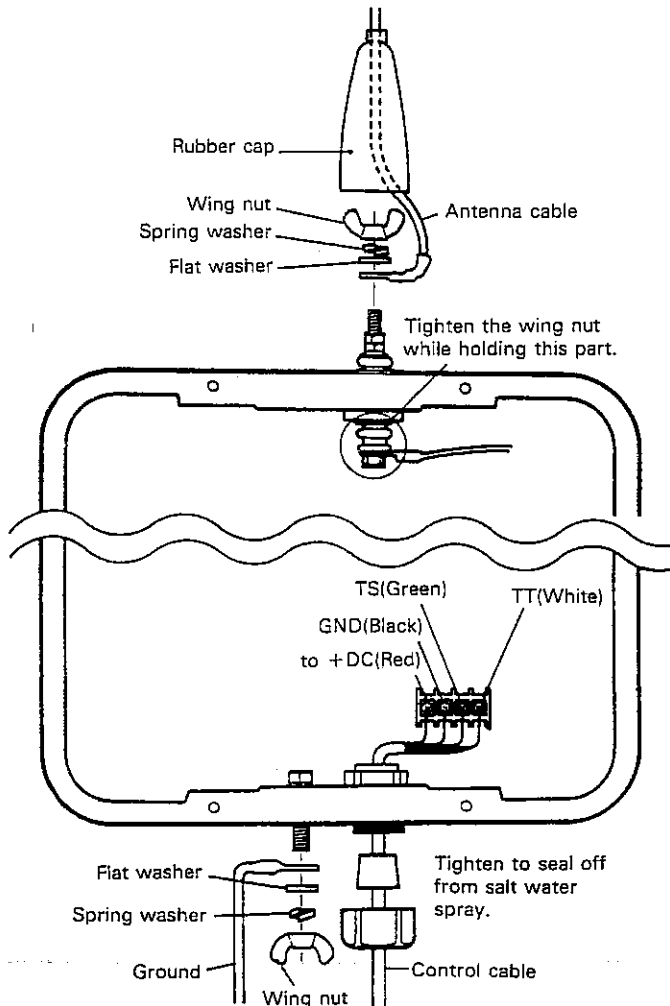
3-4-2. Wire antennas

The insulator must be relieved from mechanical stress by using a short flexible wire between the insulator and the supporting structure.



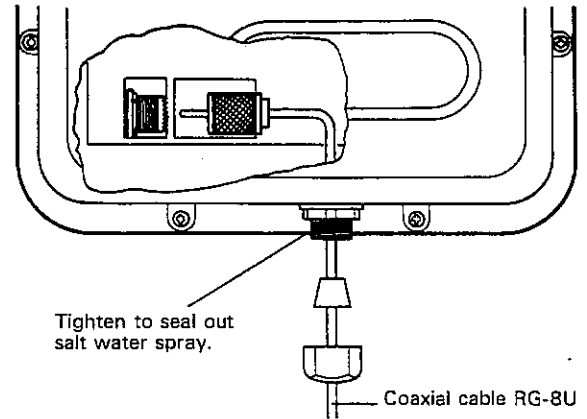
3-4-3. Control cables

Connect the AT-300 to the transceiver with the control cables that were provided with your tuner. Connect the to the terminals as shown in the accompanying diagram. Do not touch other terminals. Connect the two black wires to the GND terminal.

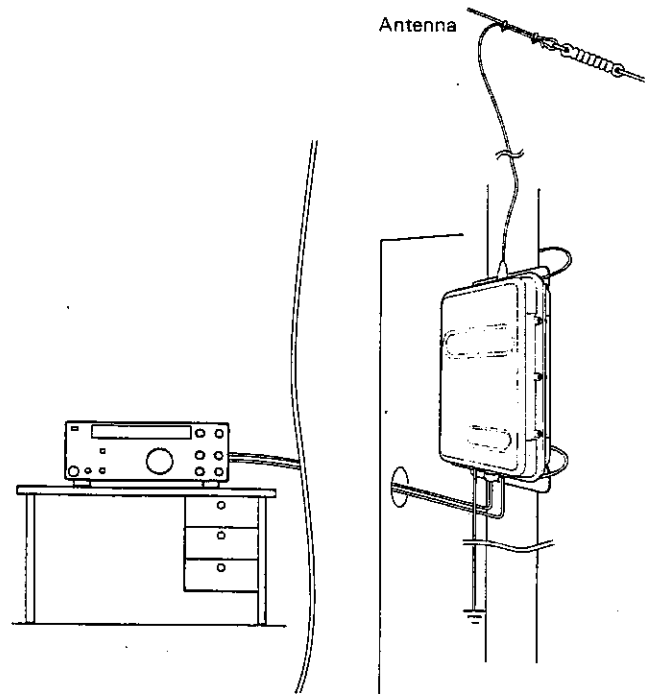


3-4-4. Coaxial cable

Connect the AT-300 to the transceiver with RG-213/U (RG-8A/U), or RG-58 coaxial cable. Pass the coaxial cable into the AT-300 as shown in the figure, and attach an M type connector at each end.



The grommet depends on the diameter of the coaxial cable that is used. Use the 10 mm diameter grommet for RG-213/U or RG-8A/U cable, and the 7.5 mm diameter grommet for RG-6 cable, and the grommet already in place for RG-58 cable.



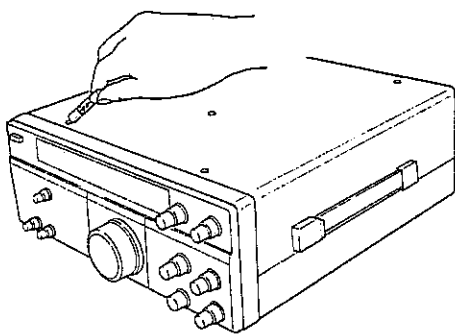
4. BEFORE TRANSMITTING

■ Generated voltage check

A high frequency voltage is produced by the transceiver that corresponds to the length of the antenna. This voltage is capable of causing a serious electric shock. To prevent this check the generated voltage with the supplied neon tube.

Test Procedure

1. Tune to the frequency to be used the select either FM or CW mode.
2. Turn the power control on the transceiver fully counterclockwise (minimum power).
3. Hold the neon tube as shown in the figure and touch a metal part of the case such as a case screw or microphone jack with the tester.



4. Slowly turn the power control on the transceiver up. The transceiver should not be used if the neon tube lights, until you supply a better ground, adjust the antenna length, or provide a counterpoise, to prevent the light from turning on.

■ Standing-wave ratio (SWR)

If the operating frequency is changed, tune to the frequency to be used again. Repeat the tuning if the standing wave ratio become greater than 2.0.

5. TUNING PROCEDURE

1. Place the AT TUNE switch ON.
The transceiver will switch to the CW Mode, the AT TUNE indicator will light, and the tuner will begin to tune

Notes

1. This switch will not function when the CAR control is turned fully counterclockwise.
 2. The THRU/AUTO switch is not active.
2. When tuning has been completed an the AT TUNE indicator goes out, the frequency display will return to its previous state.
 3. A warning beep will sound it tuning is not completed within 20 seconds. If this occurs turn the AT TUNE switch OFF.