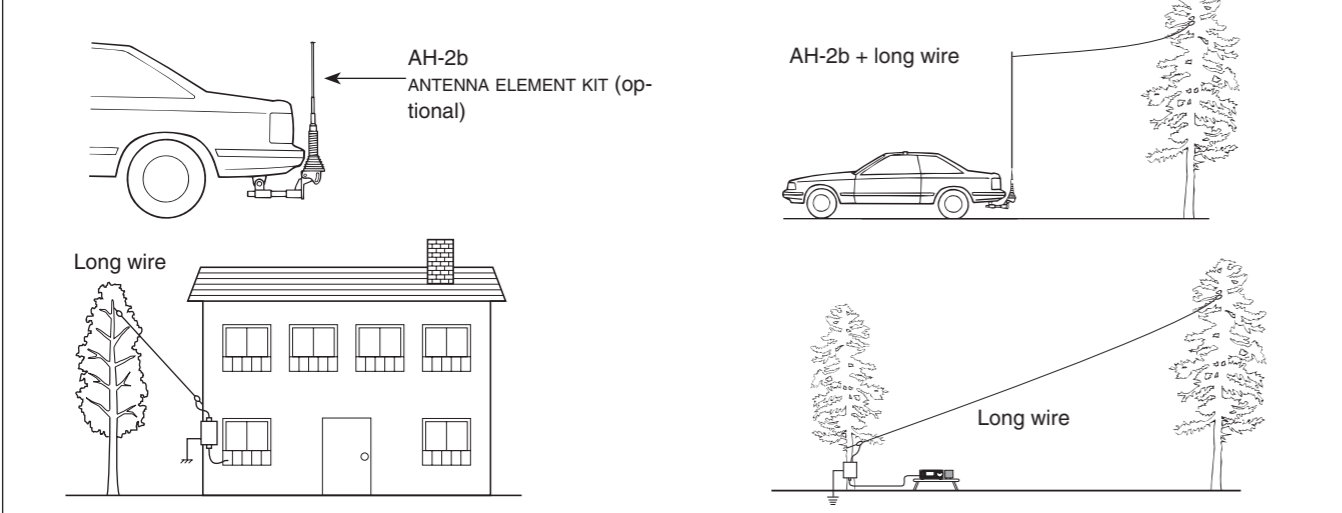


Fig.6 MOUNTING EXAMPLES

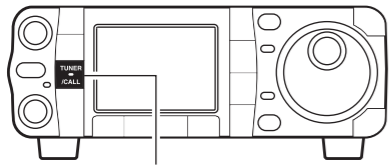


OPERATION

Tuning is required for each frequency. **Be sure** to retune the antenna before transmitting when you change the frequency— even slightly.

(eg. IC-7000)

- ① Set the desired frequency in an amateur band.
 - The AH-4 will not operate on frequencies outside of ham bands.
- ② Hold down [TUNER/CALL] for 1 seconds.
 - “**TUNE**” indicator appears while tuning.



Hold down [TUNER/CALL] for 1 second.

- ③ “**TUNE**” indicator stays ON when tuning is complete.
 - When the antenna cannot be tuned, “**TUNE**” indicator blinks, and the AH-4 is bypassed and the antenna is directly connected to the antenna connector on the transceiver.
- ④ To manually bypass the AH-4, push [TUNER/CALL].

CALCULATION OF UNDESIRABLE ANTENNA LENGTHS

$$\text{Length of half wave } (\frac{1}{2} \lambda) = \frac{300}{\text{Operating frequency (MHz)}} \times \frac{1}{2}$$

[EXAMPLE] Antenna lengths to avoid when operating at 29.00 MHz
 Multiple of $\frac{1}{2} \lambda = \frac{300}{29} \times \frac{1}{2} \times (1, 2, 3, \dots) = 5.2, 10.3, 15.5 \text{ m}$

SPECIFICATIONS AND OPTIONS

Specifications

- Frequency range : 3.5–54 MHz (with an antenna longer than 7 m; 23 ft)
7–54 MHz (with the AH-2b)
- Maximum input power : 120 W
- Input impedance : 50 Ω
- Tuning power required : 5 to 15 watts
- Rated voltage : 13.8 V DC ±15% (current less than 1 A)
- Usable temperature range : -10°C to +60°C (+14°F to +140°F)
- VSWR : 2.0 : 1 or less (except antennas a one half wave or multiple of a one half wave in length)
- Weight (approximately) : 1.2 kg (2.65 lb)
- Dimensions : 172(W) × 69.5(H) × 230(D) mm (projections not included) ; 6.8(W) × 2.7(H) × 9.1(D) inches

Options

- **OPC-420** SHIELDED CONTROL CABLE
Shielded control cable helps protect the transceiver from RF feedback and extends separation between tuner and transceiver up to 10 m. (cable length 10 m; 32.8 ft)
- **AH-2b** ANTENNA ELEMENT
A 2.5 m long antenna element for mobile operation with AH-4. Frequency coverage: 7–54 MHz with the AH-4.

All specifications are subject to change without notice or obligation.

ICOM

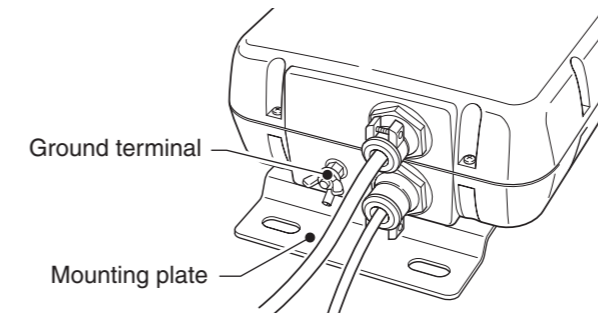
INSTRUCTIONS

HF + 50 MHz AUTOMATIC ANTENNA TUNER
AH-4

Thank you for purchasing the **AH-4 HF + 50 MHz AUTOMATIC ANTENNA TUNER**. The AH-4 matches your transceiver to an antenna more than 7 m/23 ft long (3.5–54 MHz), or the optional AH-2b (7–54 MHz).

Please read these instructions thoroughly before installing and operating the AH-4.

DANGER!



⚠ **NEVER** operate this tuner without a solid ground. Always connect the ground wire to the ground terminal. **DO NOT** use the mounting plate as a ground terminal.

NEVER transmit or tune without an antenna connected. Failure to use an antenna will damage the tuner.

⚠ **HIGH VOLTAGE! NEVER** touch the antenna while transmitting or tuning. Place the antenna in a position where you are sure it will not be touched.

FEATURES

○ **WIDE TUNING RANGE**

The AH-4 provides reliable matching from 3.5 MHz to 54 MHz when using at least a 7 m (23 ft) antenna; or 7 MHz to 54 MHz when using the AH-2b ANTENNA ELEMENT.

○ **AUTOMATIC DIGITAL CONTROL TUNING**

The built-in 8-bit microprocessor chooses the lowest SWR using more than 1,040,000 different LC (coil/capacitor) combinations.

○ **45 FREQUENCY MEMORIES FOR FAST TUNING**

The LC combinations of 45 previously-used frequencies are automatically memorized. Once a frequency is memorized, the AH-4 tunes on that frequency in less than 1 second. Note that the AH-4 does not memorize a frequency which is normally tuned within 2.5 seconds. Memories are retained only when the power is on.

○ **WEATHERPROOF DESIGN**

The AH-4's tightly sealed plastic case allows convenient mounting virtually anywhere. The AH-4 can be mounted outdoors under your antenna.

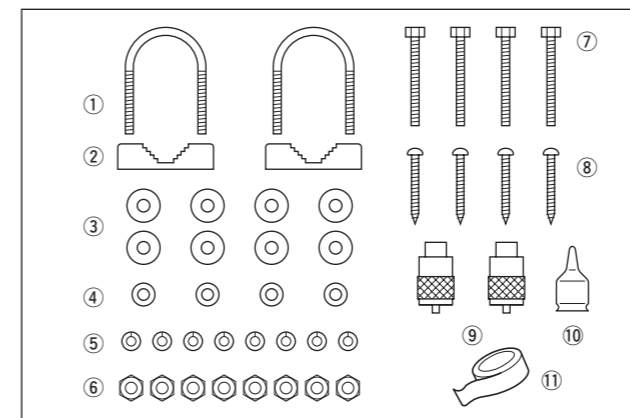
○ **0.3 W RADIATED POWER**

Radiated power during tuning is less than 0.3 W, minimizing interference to other stations.

⚠ **NOTE:**

The AH-4 can be used with most of Icom HF transceiver, which covers HF through 50 MHz bands. However, the IC-706 and IC-736 can only be tuned in the 3.5–30 MHz range.

SUPPLIED ACCESSORIES



- ① U-bolts2
- ② U-bolt brackets2
- ③ Flat washers (M6 large)8
- ④ Flat washers (M6 small)4
- ⑤ Spring washers (M6)8
- ⑥ Nuts (M6)8
- ⑦ Hex head bolts (M6 × 50)4
- ⑧ Self-tapping screws (A0 6 × 30)4
- ⑨ PL-259 connectors2
- ⑩ Weatherproof cap1
- ⑪ Rubber vulcanizing tape1
- Control cable* (5 m; 16.4 ft)1
- Coaxial cable* (5D-2V: 5 m; 16.4 ft)1

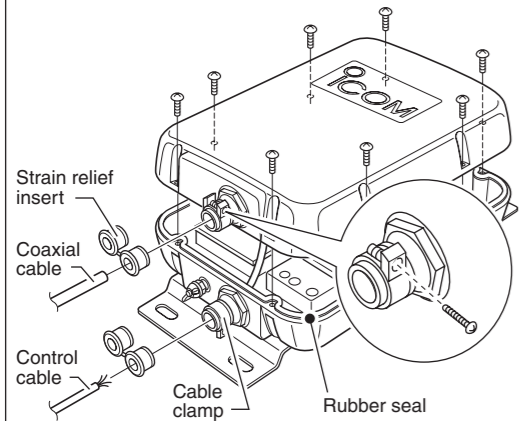
*Not shown in the illustration to the left.

INSTALLATION

NOTE: After inserting the coaxial cable through the waterproof cap and into the AH-4 top cover, solder the PL-259 connector to the coaxial cable.

- ① Remove the top cover (Fig. 1).
- ② Install the control cable and coaxial cable (Fig. 1).
- ③ Connect and solder the PL-259 connector to the coaxial cable (Fig. 3).
- ④ Connect the control cable to the AH-4 (Fig. 2-1).
- ⑤ Connect the GND cable to the AH-4 (Fig. 4).
- ⑥ Replace the top cover.
- ⑦ Mount the AH-4 in the desired location; on an antenna pole, in your vehicle's trunk, and so on. (Fig. 5).
- ⑧ Connect an antenna to the AH-4 (Fig. 6).
- ⑨ Connect the control cable and the coaxial cable to the transceiver.

Fig. 1 COVER REMOVAL AND CABLE INSTALLATION



- ① Remove the 8 screws from the top cover and remove the cover.
- ② Loosen the screws on both cable clamps. If desired, install a strain relief insert (supplied) corresponding to the diameter of the cable.
- ③ Install the coaxial cable through the top cover cable clamp.
- ④ Insert the control cable through the bottom cover cable clamp.
- ⑤ After connecting the coaxial cable and control cables, tighten the cable clamp screws.

NOTE:

- Make sure the cable clamps are well tightened with the screws, otherwise the waterproof protection may not be guaranteed.
- We recommend that you also wrap rubber vulcanizing tape or electrical tape over the cable clamps for better waterproofing.

NOTE:

- When attaching the tuner cover, make sure dust or other material does not adhere to the rubber seal. If dust or other material is on the seal when attaching, waterproof protection may not be guaranteed. Make sure the rubber seal is properly seated into the groove.

About the rubber seal

Correct position

Incorrect position

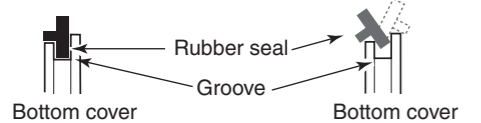
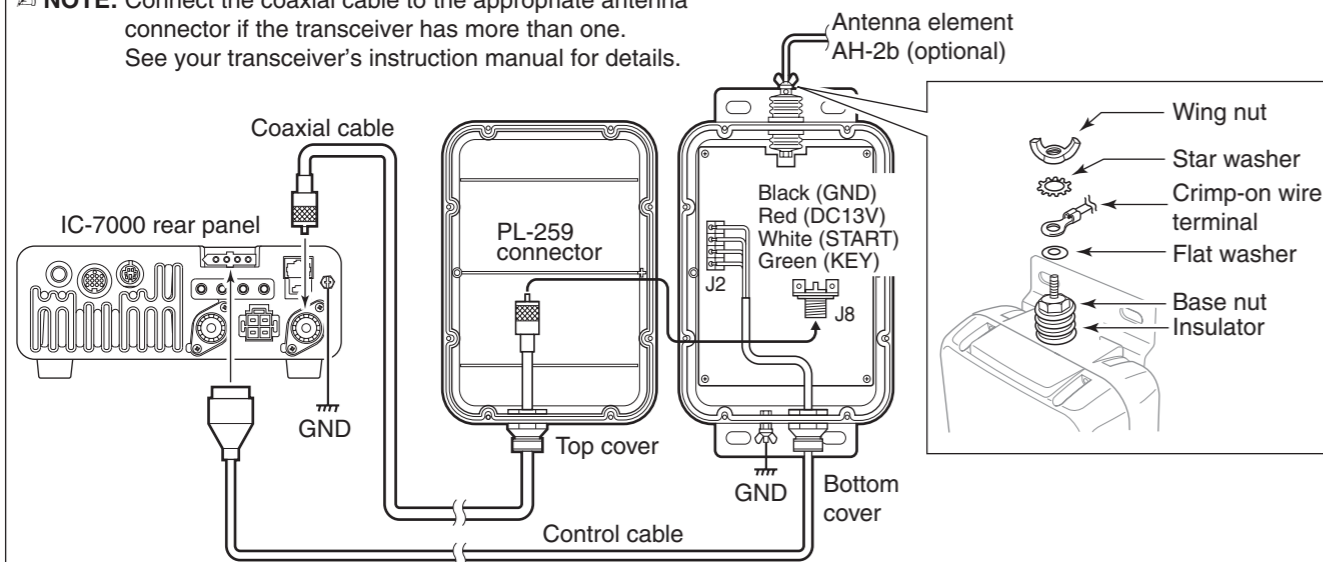


Fig. 2-1 CABLE CONNECTIONS (eg. IC-7000)

NOTE: Connect the coaxial cable to the appropriate antenna connector if the transceiver has more than one. See your transceiver's instruction manual for details.



See the Fig. 2-2 as shown to the right above.

- ① Put the flat washer, crimp-on wire terminal, star washer and then wing nut on the base bolt. Then, tighten the wing nut.
 - Before you tighten the wing nut, make sure the base nut is firmly tightened.
 - After you tighten the wing nut, carefully bend the wire terminal up so the wire lines up with the insulator.
- ② Place the weatherproof cap over as much of the insulator as possible.
- ③ Wrap the insulator with the rubber vulcanizing tape, starting at its bottom, then the cap, and finally the antenna wire.
 - This will help prevent water seepage.
 - Also, you may wrap electrical tape over the wrapped rubber vulcanizing tape for better waterproofing.

Fig. 2-2 Waterproofing the antenna connection

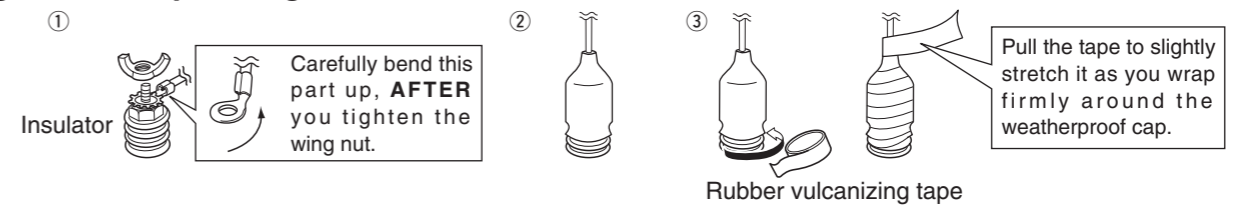
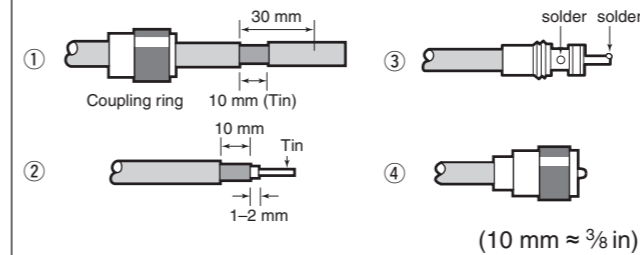


Fig. 3 PL-259 CONNECTOR SOLDERING



- ① Slide the coupling ring over the coaxial cable. Carefully cut only the cable jacket, and pull it out to reveal 10 mm (0.4 in) of braid.
 - Tin the exposed braid and then pull the jacket out.
- ② Strip the cable, as shown to the left. Tin the entire length of the exposed center conductor.
- ③ Slide the connector body over the cable and solder, as shown to the left.
- ④ Screw the coupling ring onto the connector body.

Fig. 4 GROUND CONNECTIONS

The transceiver and antenna tuner must have an adequate ground connection. Otherwise, the overall efficiency of the transceiver and antenna tuner installation will be reduced. Interference, RF feedback and electrical shocks from other equipment could also occur.

For best results, use the heaviest gauge wire or strap available, and make the connection as short as possible. (see the illustration to the right)

- A long wire connected to the GND terminal as a counterpoise is also acceptable.

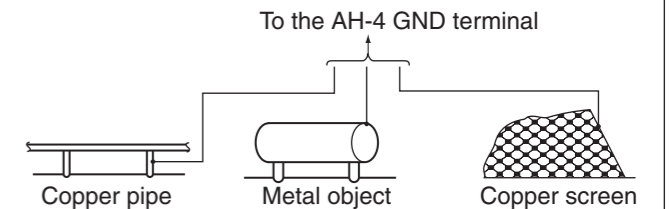
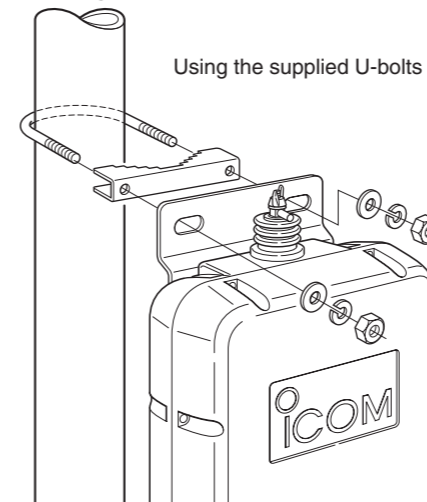


Fig. 5 MOUNTING THE AH-4

• Mounting on an antenna pole



• Mounting on a flat location

Using self-tapping screws

Using nuts and bolts

