

# ICOM AH-4 tuner



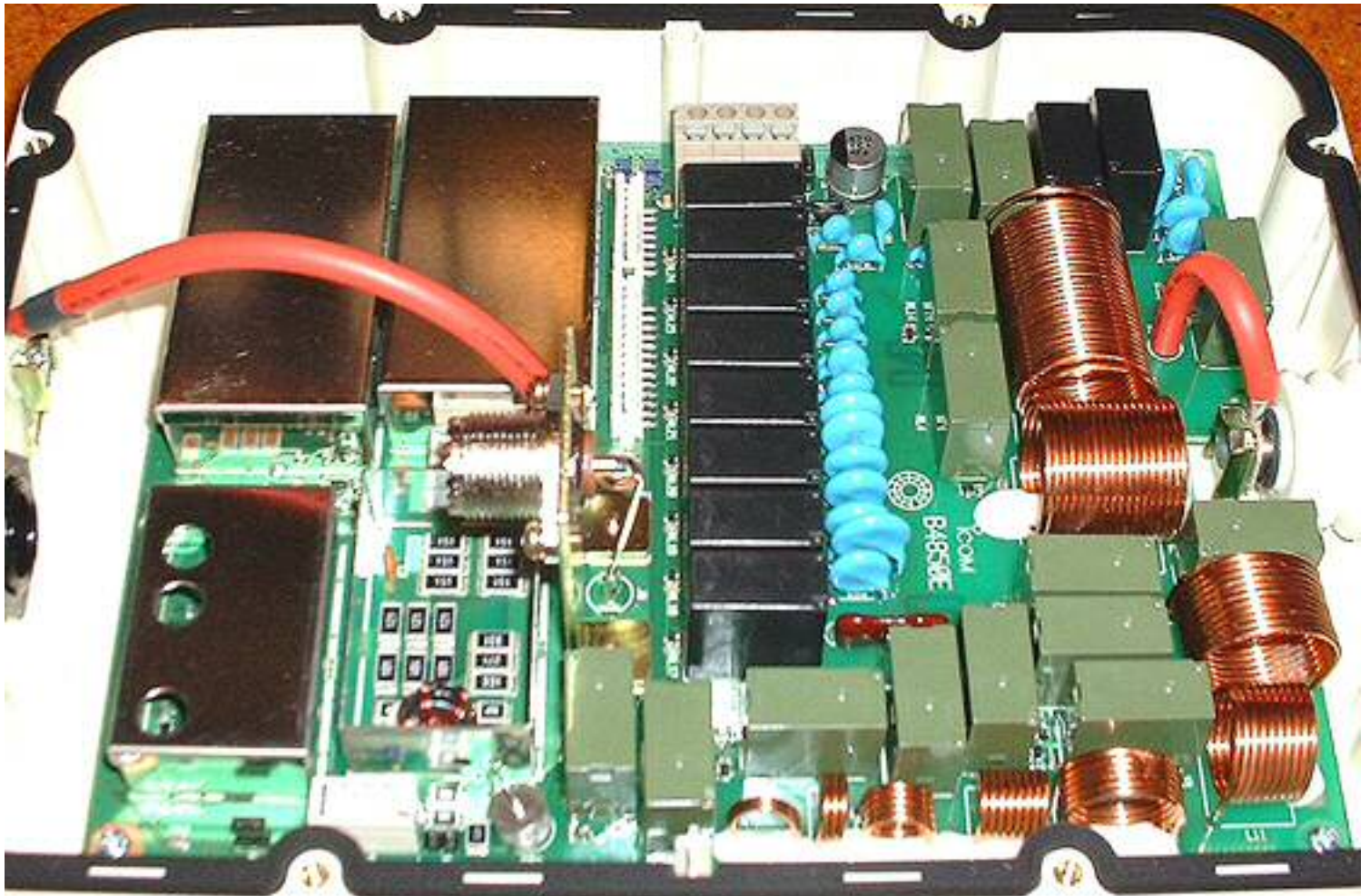
By Matt Erickson KK5DR

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These little auto whip/wire tuners have been on the market for a few years, but I have recently acquired a new one for use with my IC-746Pro in a field type operation.

Above is a picture of the tuning unit, shown with the plastic cover installed. The

entire body of the cover is plastic, with chrome plated metal mounting plates screwed to the back half on top and bottom. The unit is fully weather tight, with seals on every seam.



Above is a picture of the internal parts of the tuner unit. Notice the rubber gasket that seals the two halves of the cover. There are also seals on all the cable entry ports as well as the ground lug, and the output insulator. In the center of the photo, can be seen, the input coax cable connector. Next to the coax input port is the ground line attached to the external ground lug. On the right hand side of the picture is a short red wire which is the RF output line to the antenna insulator.

The AH-4 uses relay switched LC networks for matching of the output antenna. There are 1,040,000 possible LC combinations that are selected by the CPU in 2.5 seconds or less. The unit is designed to operate from 3.5 to 54MHz, with a wire/whip of 23ft. long or more. For operations on 7-54MHz only, and shorter radiating wire/whip can be used. If the unit is to be used in a mobile installation,

the ground should be a heavy strap bonded to the frame of the vehicle, and the tuning unit should be mounted as close to the whip as possible, preferably with a feed length of 12" or less to the whip. The CPU is shielded in the silver box in the upper left of the photo above. At the upper center is a gray terminal strip where the control cable is to be connected. While the unit is powered up, there are 45 memories that are automatically saved after a tune cycle on a given frequency, after that, the unit uses the memorized settings to retune each time the transmitter is keyed, in under 1 second. When the unit is powered down, the memories are lost.

The AH-4 is rated at 125 watts input maximum. It is recommended that either a heavy ground strap be used in a mobile installation, or on portable/field operation should use a set of at least three counterpoise wires of equal length to the radiator antenna. I plan a set of four wires about 30' long each for counterpoise, and a 30' wire for antenna. The control cable is only 16' long, I wish it was twice that long, to get the unit farther away from the radio, and the operator.

I made a special RF input cable with the addition of a toroid cores that will choke off any RF current returning to the radio on the outside of the coax or the control cables.

One small potential problem I could see, would be the formation of water condensation inside the tightly sealed unit when operating outdoors in all types of weather. A simple fix is to place a small packet of silica gel inside the unit before it is sealed up. This packet will absorb any trapped water vapor inside. Changing or recharging the silica gel pack about once every few years would be a good idea. I have found that silica gel can be "recharged" by placing it in a gas type kitchen oven with only the pilot light on. Leave the pack there for about 5-7 days, and the gel should be recharged by then.

## **Field test**

My first test of the AH-4 was using a single 12ga. insulated stranded wire for the antenna 30' long, pulled up into a tree just off my porch. The counterpoise system

uses the same wire, but there are four of them at 30' long each. The exciter must be placed in CW mode to tune the AH-4, it tunes at a reduced output automatically. I used my IC-746Pro as the exciter for the AH-4. The antenna port #1 must be used since when the unit is connected to the exciter, the internal ATU is automatically bypassed and "EXT" is displayed on the front panel display. It only works through ant port #1 for HF/50MHz.

I started on 17mtrs, but due to the poor conditions these days my calls went unanswered, same on 15mtrs. In this time of low sunspots and weak propagation on the higher frequency bands, some times the more effective bands are below 20mtrs. I went to 40mtrs where I found strong daytime activity, and my signal was reported to be good, very readable. No RF feed-back was detected, thanks in part to my toroid chokes and good ground plane created by the counterpoise system. Tuning was quick, under 1 second, and the memories worked fine. I was able to hop from band to band once the tune points were memorized on each band. The longest tune time I noted was about 2.5 seconds. It is too bad that the RAM is "volatile" meaning that when the unit is powered down all memorized tune points are lost. Perhaps someday an updated AH-4 design will have "non-volatile" RAM memory.

I consider the field test to be successful, even with the poor conditions. It proves that this system can be used very easily when backpacking, camping, or on Field Day. Its quick and easy, and fairly effective.

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### **Field Day 2006:**

We used the AH-4 on FD with an IC-7000. The radiating wire was 90 feet of 12ga insulated stranded copper. The ground radials were the same wire but cut to 30 feet, with four runs laid out in a fan pattern in the opposed direction from the radiator wire. The radiator was about 15-20 feet above ground running horizontal.

The system worked very well, tuned very quickly and seemed to radiate very

well. The bands used were 80-10mtrs.

There were no problems with the tuner or radio during the entire event.

## **Conclusion**

The AH-4 is a nice little package, excellent for mobile whip tuning, and backpacking, as well as QRP remote antenna operations. I don't really like the short control cable, it should be at least 25' long so when operating a ground mounted vertical, the radio can be located somewhat out of the main radiation field, but with the 16' cable, the operator is nearly on top of it.

I added 25 feet of four conductor unshielded cable to the control cable with the connector installed on the radio end of it. I added about 40 feet of coax to feed the tuner. Now the unit can be placed a good distance from the operating position, or high in a tree.

I plan to use my AH-4 when I'm out camping, and on Field Day, for quick and easy to install 80-6 meter antennas. The unit tunes quickly and nearly flat, typically 1.2 or less.

Tiny, quick, and easy to install and use.

To learn how tuners/couplers work click [here](#).

73 de Matt

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