

SOTabeams

Hi Tee Antenna Tuning Unit



Operating Instructions

Introduction

The SOTAbears Hi Tee Tuner has been designed with flexibility in mind. It will match a wide range of different antennas allowing you to get on the air in most situations. Getting to know how to use your tuner will help you to get the best out of it.

The Hi Tee Tuner uses a T network for matching. This is perhaps the most commonly used configuration in antenna tuners. The reason for its popularity is that it will match such a wide variety of impedances to 50 Ohms (as required by most radios). It does however have a disadvantage; that is that it will give a good match with numerous different settings of the controls—and some combinations are better than others.

One of the nice features of the Hi Tee Tuner is that it uses an air-cored coil in a plastic box. This helps to keep the losses low as in many QRP tuners the main source of loss is the toroidal inductors.

Your tuner has been designed to work from 5 MHz to 30 MHz. In some cases you may find that it will work on 3.5 MHz too. If you use the same antenna all the time, you may wish to write the settings down on the front of the tuner. We provide a pen for doing this.

Note that the power rating of your tuner is 20 Watts. ANY MORE THAN 20 WATTS IS VERY LIKELY TO CAUSE PERMANENT DAMAGE TO THE TUNER AND MAY ALSO DAMAGE YOUR RADIO.

Connecting your tuner

To use your tuner you will need an SWR meter in line between the radio and the tuner. Many radios have an SWR meter built in these days which makes life easier.

Connect the output of your radio to the input of the tuner (BNC

Troubleshooting

There is little to go wrong with your tuner. However like all tuners it won't always be able to achieve a perfect match. This is normal and is a result of the physics of the situation. Changing the length of your antenna may well allow the tuner to be used successfully.

Your tuner is splash proof but not waterproof. If it does get soaked, take the lid off to dry it out as soon as possible.

Need help?

Email me: Richard@sotabeams.co.uk

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Need an antenna?

The SOTAbears Bandspringer antenna range is a good choice to use with our tuners.

Set the output capacitors to maximum capacitance (1). Set the inductor to minimum inductance (position A). Set the input capacitor halfway (3). Without transmitting turn the inductance knob while listening to the radio, see if one position sounds better than the others (stronger signals). If it does, then transmit while adjusting the input capacitor for the lowest SWR. If you can see a dip in SWR try also adjusting the output capacitor. Some fiddling may be required to get the best results.

If no position for the inductor seems to give a stronger signal on receive, return it to the lowest inductance setting and transmit while rotating the input capacitor looking for a dip in SWR. If there isn't one or it occurs at maximum or minimum capacitance, increase the inductance and try again.

The best performance (lowest loss) usually occurs with the highest output capacitance and lowest inductance that give a good SWR.

Once tuned, note the settings on the front panel for next time and enjoy some radio contacts.

If you move frequency within a band, you may need to slightly readjust the tuner to get the best SWR. This effect is more obvious when larger changes in frequency are done on lower bands (e.g. moving from 7.020 to 7.190MHz).

Use with kites

Your tuner is fitted with a static bleed resistor across the antenna terminals. This will serve to reduce the build-up of static that can be present when using kite antennas. It will only help if the black terminal of the tuner is connected to earth. IT WILL NOT PROTECT YOU OR YOUR EQUIPMENT AGAINST LIGHTNING STRIKES.

The static bleed resistor will not affect the operation of the tuner in any other way and can be left in place.

socket) using a patch lead.

The antenna is connected using 4mm plugs. Connect the antenna to the red socket. To work correctly long wire antennas will need to have a counterpoise connected to the black terminal. A counterpoise is simply a piece of wire that can be trailed along the ground. It should be as straight as possible and personally I try to trail it under the antenna wire. Aim for a length that is about 1/4 wavelength on the band that you intend using. It's not very critical. As an alternative you can connect the black terminal to an RF ground.

A tour around the controls

The central knob controls the amount of inductance (coil) that is in the circuit. It has six positions A through F. Position A has the lowest amount of inductance while position F has the highest. To the left of the inductance knob is the input capacitor (closest to the BNC socket) and to the right and closest to the antenna connectors (red and black sockets) is the output capacitor.

Choice of antenna

The Hi Tee tuner will work with most end fed antennas. For best results the antenna wire should be at least a quarter wavelength long on the lowest band that you intend operating on. A popular antenna type is the W3EDP which consists of 84ft of wire fed against a 17ft radial.

Using your tuner

Turn the power output of your radio down to 5 Watts or less to begin tuning. Select a clear frequency close to where you want to operate. Select a mode on your transmitter that will send a carrier (AM, FM or CW with the key down). Do not transmit yet