

Adjusting a Conventional T-Network Tuner

Best common T-network tuning practices:

1. Use the most capacitance (most meshed capacitor) that allows a match on lower bands. Never start capacitance mid-way or more open unless on highest bands.
2. The most capacitance results in the lowest inductance T-network inductance for a given band. It also results in the greatest bandwidth before retuning.
3. T-network tuners work best and handle the most power into moderately high impedance loads.
4. Tuners do not work as well into low impedance loads.

Incidental Points

- Power does not “bounce back” from the load and flow back into tuners or radios. A mismatched antenna or load causes **standing** waves that make the radio or tuner see an impedance different than the feedline impedance.
- Conventional T-Network Tuners are under the least electrical stress with moderately high load impedances that are not extremely reactive.
- The best loads for a tuner are not 1:1 SWR loads or close to 1:1. The T-tuner works better with port loads much higher than 50 j0 ohm or 1:1 SWR
- T-network tuners dislike low impedance loads, especially low impedances that are capacitive. A low impedance, especially capacitive, causes more reactive current and voltage and loss inside the tuner.

Critical Points

- Using the most capacitance (capacitor plates most meshed) that allows a load match is the simplest T-network adjustment practice ensuring maximum power handling and widest operating bandwidth

- The LEAST bandwidth and least power handling (and usually the most loss) occur when using the minimal capacitance, or plates more unmeshed, that will load match
- The common practice of setting capacitors midrange and adjusting the inductor for maximum receive transfer is a poor practice on lower bands. The tuning goal is to use the maximum capacitance that allows a perfect smooth-adjusting SWR match.
- The best starting point for capacitors on the lowest bands will be with plates fully meshed or near fully mesh. Higher bands can start more open, but use the maximum plate mesh or capacitance that allows good smooth tuning.
- Using lowest or fewer active inductor turns coincides with using the maximum capacitance
- Know your tuner! Do not assume you know the device maximum capacitance position based on a guess. While almost all devices in the world have maximum capacitance and/or maximum inductance (lowest frequency and lowest impedance) fully counter clockwise, some manufacturers and builders just do the opposite of what we intuitively expect. Some devices are exact opposite of standard expectations.
- Numbers on knobs and shafts are reference logging scales. They provide a number reference. They may not track world-common numbering where clockwise is a higher number, but they are repeatable references in proper equipment.