

Antenna Tuner Antenna Coupler Match Box

Q. What is it?

- A. A device connected between the rig and the antenna which does the following:
1. Presents a 50 ohm load to the rig.
 2. Causes the antenna to resonate at the operating frequency.
 3. Transfers power output from the rig to the antenna with minimal loss.
 4. Performs the same functions in reverse when receiving.

Modern solid state rigs require a near perfect 50 ohm load to function correctly.

If the load is not correct, standing waves will cause excess voltages to exist in the output circuit. Solid state devices are very sensitive to excess voltage and will be damaged if the voltage goes too high.

If the load is not correct, the rig's protective circuitry will automatically reduce the power level to protect the output devices and keep the voltage within safe limits.

This means that the actual power delivered to the antenna will be reduced when the SWR is too high.

Most antennas are not a perfect 50 ohm load across a band of frequencies.

Older rigs with tube output amplifiers were more tolerant of non-perfect loads. They had front panel adjustments available to match a variety of load situations.

Tubes are more tolerant of excess voltage and short term overload than solid state devices. They don't require automatic protection circuits.

Modern solid state rigs have no front panel adjustment available for the output amplifier. You must provide a 50 ohm load for the modern solid state rig.

Types of antenna tuners:

Manual

Automatic

Built-in the rig

Where to install the antenna tuner:

In the shack at the operating position
(better than nothing)

At the feed point of the antenna
(best setup)

Demonstration:

Use a light bulb as a load simulating a non-perfect antenna. The brightness of the bulb indicates the relative power delivered to the load. When the antenna tuner is connected, the bulb is full bright and the SWR is low. Without the antenna tuner the bulb is not full bright and the SWR is too high. The rig automatically reduces power.

Conclusion:

Antenna tuners are definitely worth while if you want maximum performance.

Thank You!

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