

K4 Highlights

Wayne Burdick, N6KR

The Versatile KAT4 Automatic Antenna Tuner

The KAT4 is the most advanced built-in ATU we've ever offered. It also adds a powerful receive antenna switching matrix. Here's a brief overview its benefits for those considering adding one to their K4.

Matching and Memories

Like the KAT3, the KAT4 has a very wide matching range -- far wider than the "3:1 max" ATUs found in most desktop transceivers. On 80-10 meters it handles 10:1 SWR loads, and in many cases higher. On 160 and 6 meters, we conservatively specify it at 5:1.

The KAT4 also shares the KAT3's per-band L-C network memories. Settings are stored per-band, per-antenna, and per-band-segment (up to 32 segments per band). With most antennas, you'll only need to do an ATU TUNE in one to four places for each covered band. But having up to 32 segments is a real advantage with narrow-banded antennas, e.g. electrically short wire antennas used on the low bands.

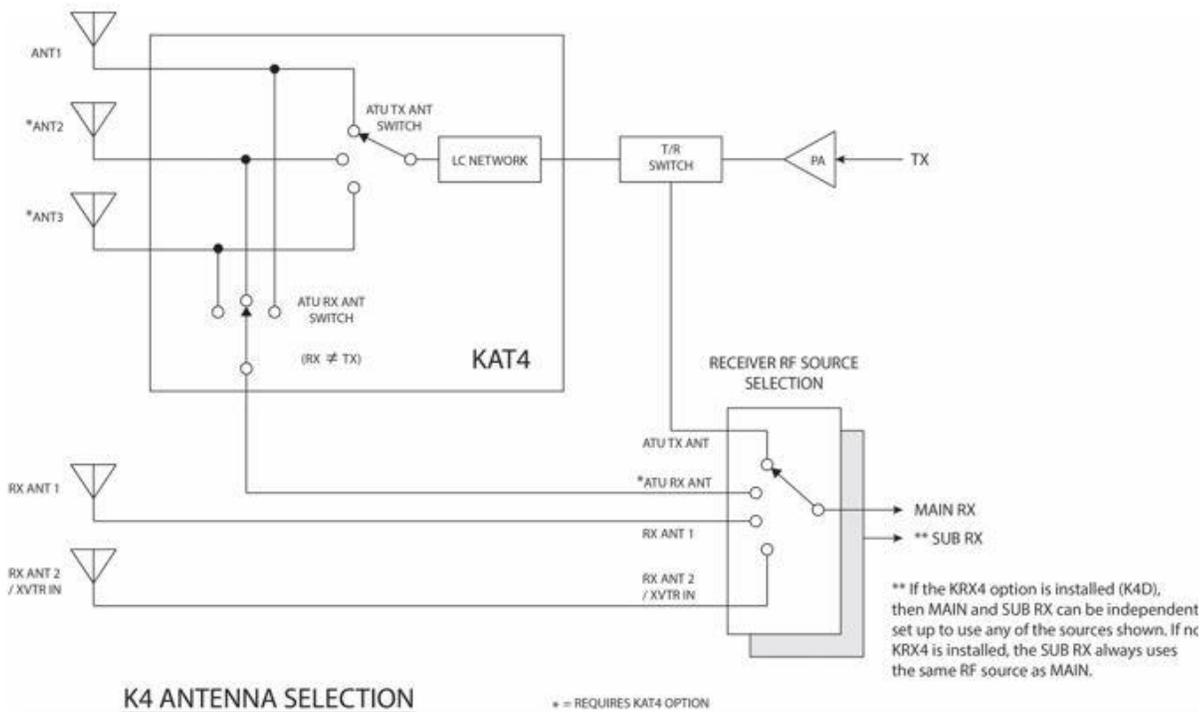
A unique feature of all Elecraft built-in ATUs is that you can tap the ATU TUNE switch a second time within five seconds to try a wider range of LC values. This is another useful tool when dealing with hard-to-match, high-Q antennas.

A side benefit of the KAT4's wide tuning range is that it can often match antennas on bands they weren't designed for. For example, a typical tri-band beam (20/15/10 m) can usually be loaded on one or more nearby WARC bands (30/17/12 meters). (Actual losses will vary with type of feed line used, whether there's a balun in the system, etc.; in some cases reduced power may be recommended.)

The KAT4's L network was optimized for low stray impedance, so it can even improve the match between the K4 and an external amplifier. This is especially true on the highest bands (10 and 6 meters). In many cases, this can allow the K4's 100 W PA to run more efficiently in the presence of a small mismatch.

Transmit and Receive Antennas

The KAT4 represents a clear advance in antenna management. There are three transmit/receive antennas (ANT 1/2/3), with your selections stored on a per-band basis. In addition, a second relay switching matrix is provided to allow either of the two non-transmit antennas to be used as a receive antenna for the main receiver, sub receiver, or both. This configuration is shown in the block diagram below.



Let's say you've selected ANT 1 as the KAT4's transmit antenna, as shown in the diagram. This leaves both ANT 2 and ANT 3 as possible receive antennas. In this case, ANT 2 has been selected. Additional antenna choices are shown at the bottom of the diagram: RX ANT 1



and RX ANT 2. As indicated by the overlapping rectangles, there's a separate antenna selection matrix for each receiver.

Front panel controls are provided for independent selection of main and sub receiver antennas. One of the settings, “=TX ANT”, simply locks that receiver’s antenna to the transmit antenna. As with the transmit antenna, receive antenna settings are stored on a per-band basis.

Receive Signal Enhancement

The “=TX ANT” setting has another benefit. When a receiver is sharing the TX antenna path, its signal is also routed through the KAT4. In many cases, especially with non-resonant antennas, this can improve receive sensitivity and aid out-of-band rejection.

Field Installation

The basic steps: (1) Unplug the KANT4 module; (2) Attach the ANT 2 & 3 SO239 assemblies to the rear panel; (3) plug the KAT4 RX ANT coax cable into the RF board; (4) plug in the KAT4; (5) attach the ANT1/2/3 pin-plugs, as well as the RX ANT coax.

K4 Highlights #4: DX LIST mini-app

No doubt many K4 ops have an encyclopedic knowledge of DX entities -- every prefix, whether countries or territories still exist, whether you can get there without military or divine intervention, etc.

For the rest of us, there's the K4's built-in DX list. This is an Elecraft-curated list, cross-checked against several other reputable sources.

The next time you hear a "new one" on the air, try popping up the K4's DX list rather than scouring the internet or rooting through piles to find that ARRL reference you ordered in 1972. Ours is right there at your fingertips.



Steps:

1. Tap Fn.
2. Tap DX LIST.
3. Scroll the list with VFO A or the up/down arrows, or...tap the magnifying glass icon to do a text search.

If more than one hit is found during a text search, the up/down arrows go into hit-navigation mode, as indicated by the magnifying glass reversing colors. This allows you to jump from one match to the next quickly, without scrolling.

This navigation technique is used in other cases as well. In fact, the DX LIST feature is just one example of a mini-app running on the internal Linux module. Others include the software updater and the built-in owner's manual. With virtually unlimited code space, we'll be adding other mini-apps in future releases.