



K1 App Note: Minor T-R Switch Mod

Date: December 1, 2000

Impact: All K1's through S/N 400

Background:

During testing of the KAT1 antenna tuner, we intentionally created worst-case conditions, such as dead shorts, opens, and large transients. As a result of these experiments, we've decided to add a resistor to the K1's T-R switch circuitry. (Technical details can be found below.) This has no effect on receive or transmit performance, but helps protect the transmitter from extreme mismatch conditions.

Applicability:

We recommend that this minor modification be made to all K1s, even though it's very unlikely that you'd ever encounter a problem during normal use.

If you have not yet received your K1, keep a copy of this builder alert, then check the manual revision when the kit arrives. If your manual is rev. D, your kit includes the resistor and the modification instructions. If the manual is rev. C, make the modification as described below. In this case you'll need to supply your own resistor, which can be in the range of 1.8 to 2.2 K (5% or 10%, 1/8-watt, 1/4-watt or higher rating).

Modification instructions:

1. Remove the Filter board and locate RP4, in the back-left corner near the key jack.
2. On the bottom of the RF board, solder one end of a 1.8K, 2.0K, or 2.2K resistor to pin 1 of RP4 (the round pad).
3. Solder the other lead of this resistor to the nearby ground pad for crystal X6. This pad can be easily identified on the top side of the board; it has the "X6" label directly above it.

Technical Details:

Under extreme load or transient conditions, high RF voltages or currents can appear on the power supply and ground leads, as well as the T-R switch control lines (6R and 6T). Q14 (part of the TX Buffer circuit) is connected to 6R, and is supposed to remain off during transmit. Adding a 1.8K (approx.) resistor from the base of Q14 to ground significantly improves the noise immunity of this circuit, without compromising the normal function of Q14 when 6R is turned on.