

# K3 AUTOMATIC FRONT-END PROTECTION

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**(PRELIMINARY)**

## Introduction

A simple modification, in conjunction with firmware rev. 3.24 or later, can help protect the K3's main receiver circuitry from very large signals. (The sub receiver is protected by a carrier-operated relay.) Such signals may not be audible at the K3's AF output. Instead, the level at the post-mixer amplifier output is sensed, which means the signal can be anywhere in the RF band-pass filter range. For example, you might be listening at 7.020 MHz, but have a potentially damaging signal appear at 7.250 MHz, usually originating from a nearby ham transmitter or shortwave broadcast station.

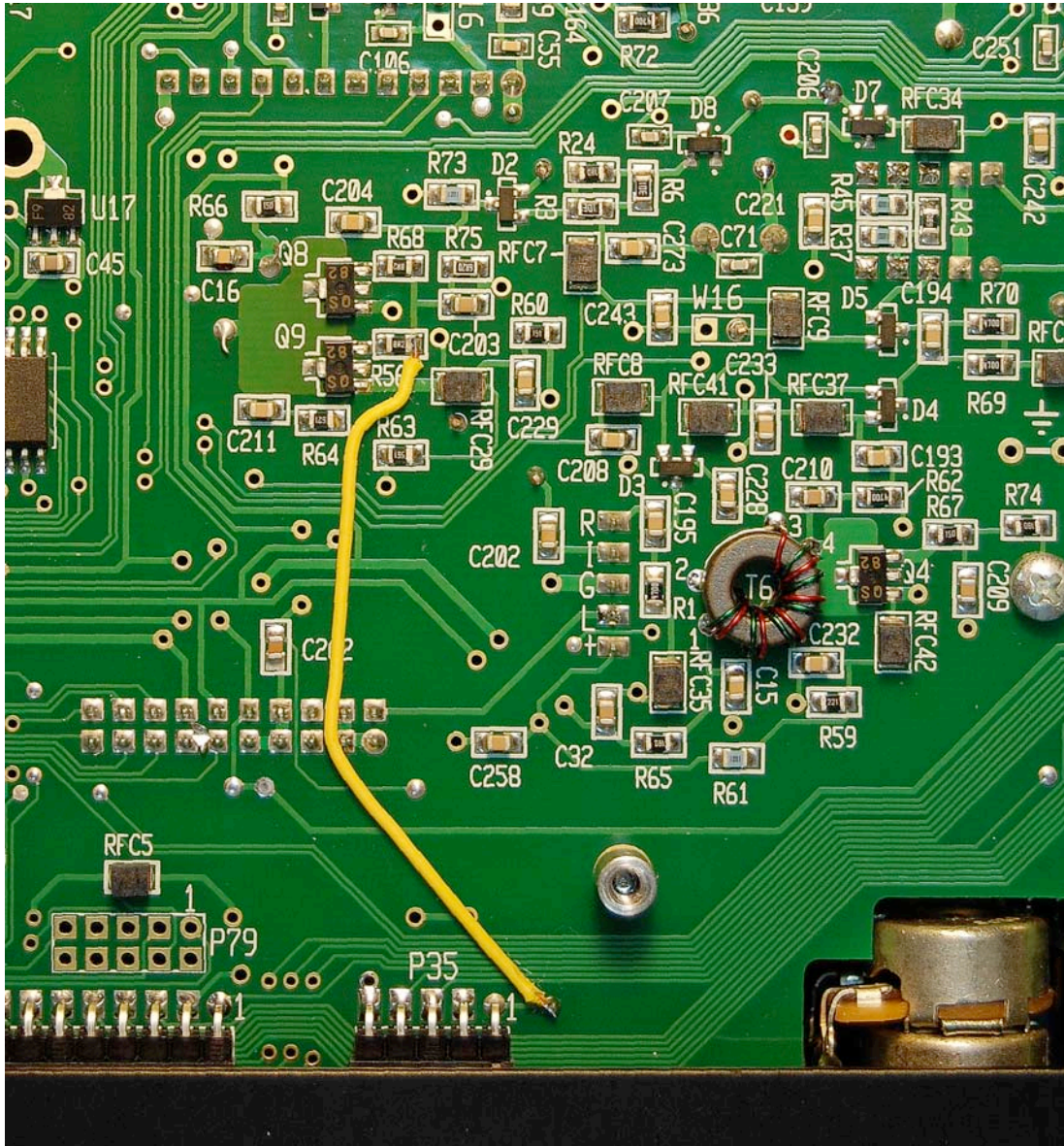
Post-mixer amplifier current drain is sensed by the K3's microcontroller via an added jumper wire on the RF board. If this current rises above a certain threshold, a **HI SIG** warning is flashed briefly on the VFO B display, and the K3's preamp is automatically turned off (along with the **PRE** icon). If post-amp current drain is still too high, the attenuator will be turned on (and the **ATTN** icon). These steps protect the post-amp and other receive circuitry while optimizing front-end gain in various operating situations.

The preamp is turned off when the signal at the ANT1 or ANT2 jack measures about +3 to +10 dBm, depending on the interfering signal frequency, filter losses, etc. The attenuator is turned on at about +13 to +20 dBm. Short-duration events such as noise or a single CW "dit" will not trigger protective action.

K3 firmware looks for the jumper on power-up. If it is not present, the protection feature is disabled.

## Modification Instructions

- Download and install firmware revision 3.24 or later. Refer to the K3 software page for instructions. Make sure the firmware is operating correctly before proceeding.
- Turn the K3 off. Place it upside-down on a soft cloth to protect the finish.
- Remove the front half of the bottom cover (the part the tilt stand is attached to).
- Locate the area of the RF board shown in the illustration on page 2. As shown, a jumper wire will be installed between the solder pad to the right of P35, and the right end of resistor R56.
- Make a jumper of the appropriate length using *insulated, solid-conductor* hookup wire. "Kynar" (#26) wirewrap wire can be used, or #22 or smaller hookup wire. (Smaller-gauge wire will be easier to form and easier to solder to R56.)
- Solder the jumper to the pad near P35.
- Lay the jumper wire on the PC board as shown, routing it between the indicated pads on the 20-pin connector and between resistors, then directly between resistors R63 and R64.
- Solder the free end of the jumper to the right end of R56 (NOT the nearby vias, which are not connected to R56). DO NOT OVERHEAT R56 – this may cause it to fall off its pads. (If this occurs, it must be reinstalled; hold it place with tweezers while soldering one end, then solder the other end.)
- Compare your installation to the photo. The wire should be routed in the same way.
- Reinstall the bottom cover, set the K3 back upright, and turn on power.
- You can optionally test the protection. Switch to 80 meters and inject a 0 dBm (1 mW) carrier from a signal generator into the antenna jack. Turn the preamp on, attenuator off. As you increase the signal to about +3 dBm, the preamp should turn off, and you should see a brief **HI SIG** warning.



**Jumper location on K3 RF Board**