

Review of the MFJ-950K3

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Introduction

The MFJ-950K3 is a drop-in replacement for the KAT3A autotuner manufactured by Elecraft for the K3 and K3S. Documentation for the MFJ-950K3 claims the module is able to tune impedance mismatches of 10:1 at 100W, which is comparable to the claims made by Elecraft for the KAT3A. Figure 1 shows the front and back sides of the MFJ-950K3. For the purposes of this review, the front side will be defined as the side with the toroids (Figure 1a), and the obverse as the side with the relays (Figure 1b).

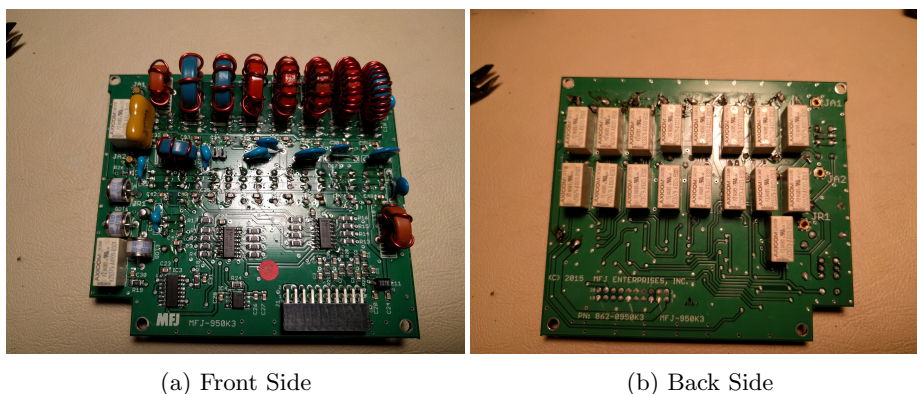


Figure 1: MFJ-950K3

Installation

The MFJ-950K3 installs almost identically to the KAT3A. The instructions for disassembling the K3 provided in the online manual are accurate. One thing to note is that the MFJ-950K3 does not have a keyed socket like the KAT3A and the KANT3. As there are very few markings to orient the MFJ-950K3, care must be taken to insert the board in the correct orientation. As shown in Figure 2, the MFJ-950K3 is mounted with the back side facing the sidewall of the K3. The three sockets (JA1, JA2, and JR1) should be near the SO-239 connectors on the back of the K3. Aside from a few solder bridges, the biggest issue to watch for is that Elecraft seems to have changed the sizes of the pins used on their SO-239 connectors. The new pins are too large to fit into the sockets

*For the sake of full disclosure, it must be stated that Dr. Marsh did work at MFJ for approximately six months upon completion of his doctoral degree. This review, however, is an accurate assessment of his experience with this product and does not reflect any influence from MFJ, its affiliated companies, or personnel for or against this product.

on the MFJ-950K3. If this is an issue, simply replace the Elecraft-supplied pin with one that has an outer diameter between 0.06 and 0.07 inches.

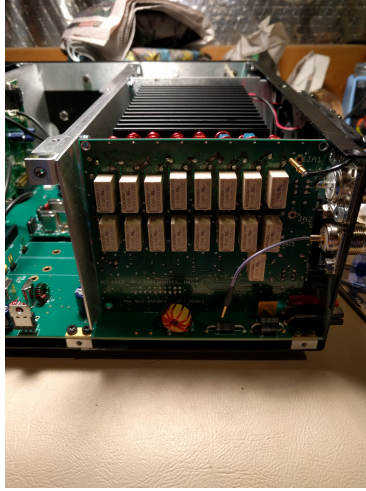


Figure 2: Side view of the MFJ-950K3 mounted in the K3S

Testing

The 950K3 operates exactly like the KAT3A. Once the tuner is installed, open the **CONFIG** menu and change the **KAT3** setting from **Not Inst** to **Auto** or **Byp**. **Auto** enables the tuner on the selected band, while **Byp** bypasses the tuner on the selected band. Installing the MFJ-950K3 also activates the second HF output on the K3 and K3S.

This particular tuner was tested against a non-ideal loop antenna on every band except 60 m. The antenna is located along the top of a picket fence, approximately six feet above the ground. The antenna is fed via coaxial cable through a 9:1 balun, providing a minimum of matching assistance to the tuner. The standing wave ratios (SWR) were measured at the center frequency of each band using an MFJ-225 analyzer. The K3 and K3S display the SWR of the autotuner as it attempts to match the antenna. These readings were used to verify whether or not the tuner was functioning. Table 1 shows the results of the SWR measurements.

From the measurements, it appears that the tuner performs best from 80 m to 12 m. 10 m and 6 m do produce acceptable results, however. The only band that seems to have a problem is 160 m. In the bands where it was the most functional, the tuner does seem able to tune a wide range of SWR values. Special note is given to the results from the 80 m band where the tuner was able to match an SWR greater than 10:1. A similar SWR was encountered on 6 m, and while the tuner was not able to completely match the antenna, it was

Frequency (MHz)	Actual SWR	Tuned SWR
1.800	8.01	3.1
3.750	>10	1.0
7.150	2.66	1.0
10.125	2.91	1.0
14.175	4.48	1.0
18.118	1.76	1.0
21.225	4.47	1.1
24.940	1.25	1.0
28.350	4.90	1.6
52.000	>10	1.4

Table 1: Actual and Tuned Standing Wave Ratios

able to get reasonably close. More rigorous testing would have been nice, but such testing is beyond the capabilities of the author's available equipment.

Field Operation

Of course, all of the bench testing in the world is pointless if the unit will not perform in the field. This particular unit was used in the primary radio for a Field Day station in 2017. The tuner handled all of the operating modes in use at the Field Day site (CW, SSB, and digital) without issue. Signal reports were consistently good, and reception (such as it was) was clear. Given the bench measurements and the real-world station results, it is the opinion of this author that the MFJ-950K3 is an acceptable alternative to the Elecraft KAT3A.