

## VFO-230: Solution for Power-Up Problem

by  
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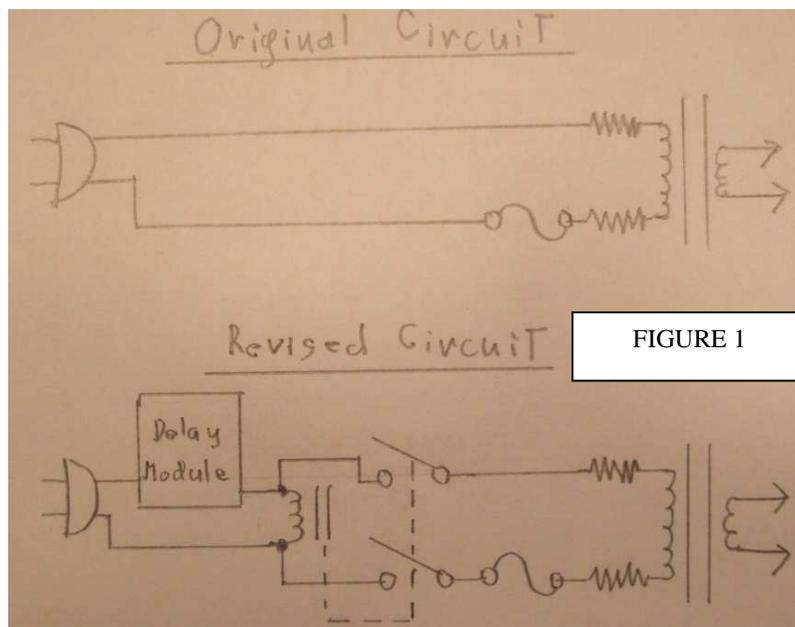
As most Kenwood enthusiasts know, the TS-830S and associated accessories are great pieces of ham radio equipment with legendary good audio on transmit as well as receive. In my station, I use a Tripp-Lite line conditioner to simultaneously turn all of my equipment on/off; I'd rather not leave it on all the time and expose it to surges, spikes, transients, sags, etc. Plus it makes it easier to turn everything on/off and saves wear and tear on the power switches, after all, they are over 30 years old. While I like my TS-830S transceiver, the synthesized VFO-230 suffers from an annoying problem as mentioned on page 6 of the instruction manual:

"NOTE: If the VFO-230 frequency display is abnormal, disconnect the AC power cable and after around 1 minute, reconnect it. The display shows 0.0 and the VFO starts correct operation."

Due to my operating style, it got annoying 75% of the time when I turned things on and then had to stand up, unplug the VFO, wait, and then plug it back in. Not a big deal unless you have Arthritis and mobility issues, if you catch my drift; yes, uncle Arthur (itis) has been visiting for some time now. So I decided enough was enough and I had to find a solution.

By experimentation, I found out that if you turn on the TS-830S, wait a few seconds, and then plug in the VFO-230 you never experience the power-on problem. So the solution was merely to use a time delay circuit for the VFO-230. It could be an external device or parts mounted internally; I decided on the latter to keep things neater, reduce the amount of cables, and actually spend less time with the fabrication process.

There are many options in terms designing the delay circuit. After considering several, I decided upon the design shown in figure #1.



The reason I selected it was that it was a good compromise considering component sizes, costs, and ease of mounting inside the VFO cabinet. The components I bought are shown in Figure 2 and were purchased from vendors on the Ebay auction site. There are quite a few styles available there and, had I decided to use an external adjustable relay, I might have selected one of the styles that plug into an octal socket. The delay module is made by ICM Controls and is an ICM102 p/n HMP500C2X600.

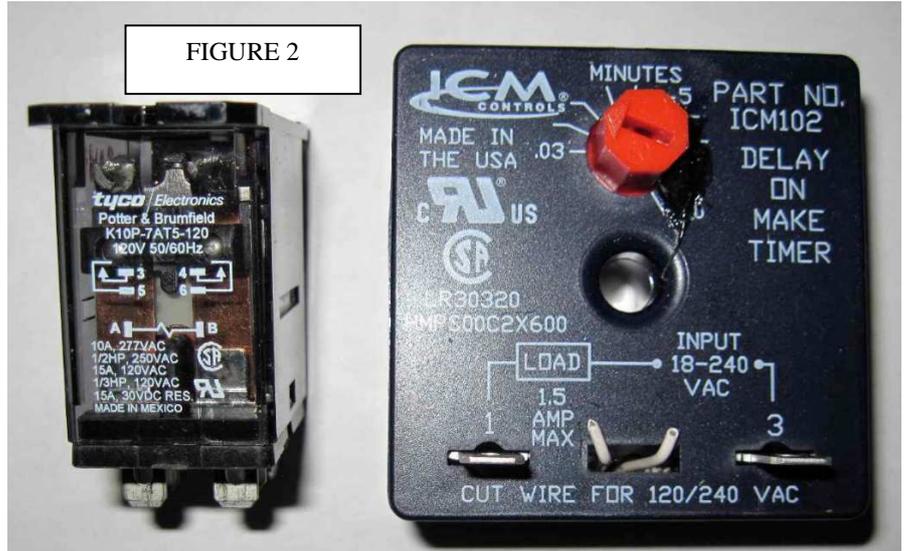


FIGURE 2

Before assembly and mounting, I did some prototype experimentation and found that when I adjusted the module delay for 15 seconds it reliably prevented the power up problem. Yes, I could have set it for a shorter delay but 15 seconds didn't seem that long especially considering the previous hassles of unplugging and replugging the VFO repeatedly over the years. I put a dot of RTV silicon rubber on the adjustment knob and module to prevent it from being accidentally moved. I glued the relay module together as shown in figure #3.

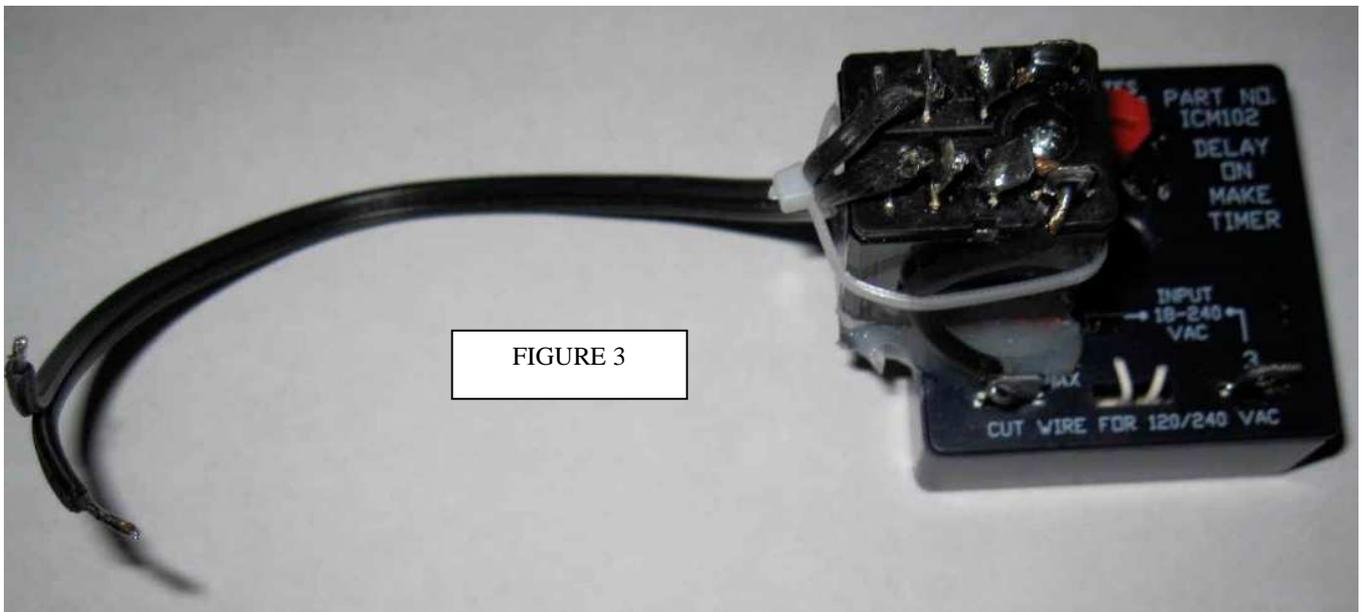


FIGURE 3

To start the installation, the original line cord must be unsoldered from the original connections. One wire goes to the fuse holder and the other wire goes to a terminal strip. No need to keep track of which wire goes where since the respective plug is unpolarized. Figure #4 shows the loose wires after unsoldering. I found that desoldering wick can be used to remove the solder thus enabling the wires to be "unwound". Painter's tape can be used to position the wires out of the way temporarily to enable easier mounting of the delay circuitry.

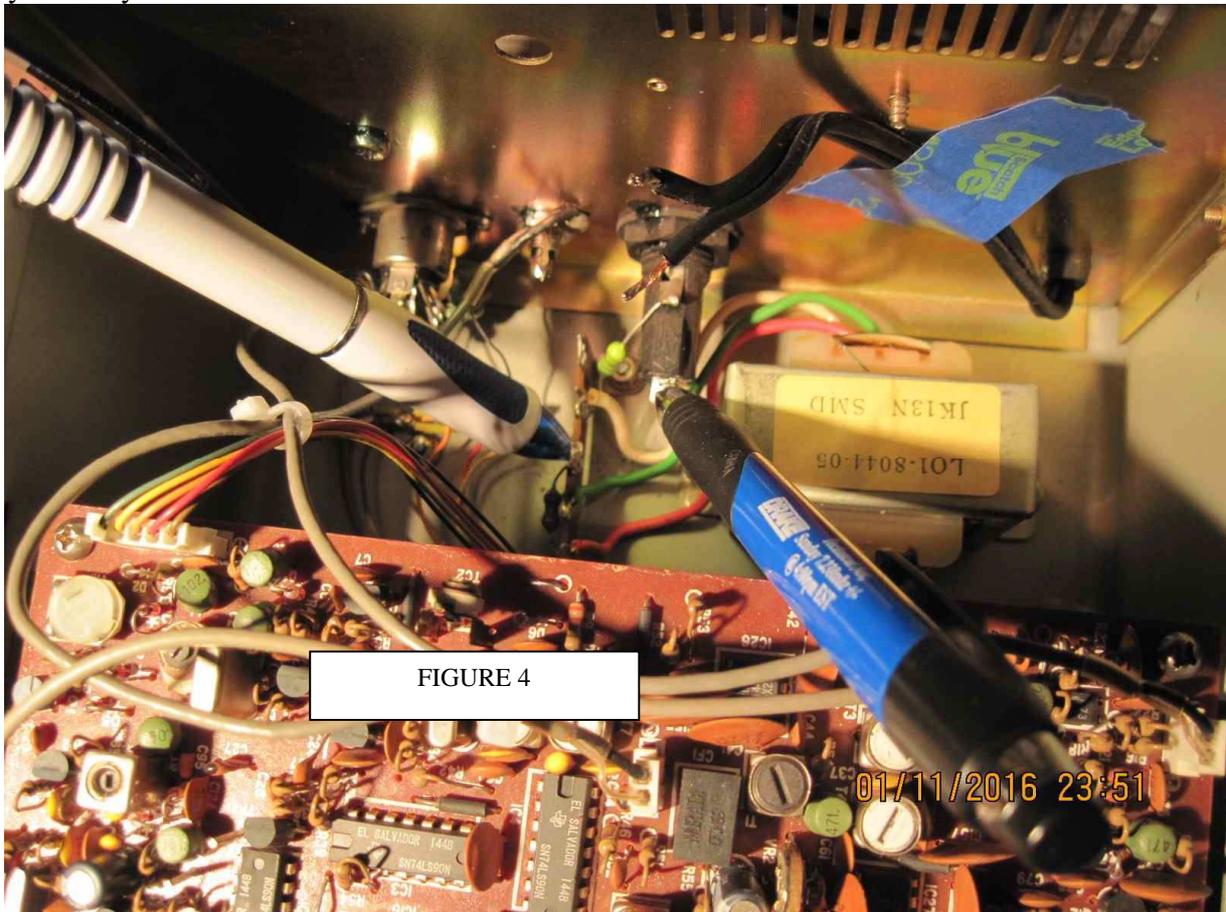


FIGURE 4

To ease assembly, I used double sided tape on the bottom side of the delay module. This would enable the assembly to be held to the rear panel, freeing both hands to then proceed with the nut and bolt mounting.

Application of the double sided tape is shown in figure #5 and figure #6. I used a one and a half inch, 4-40 stainless steel bolt with associated nylon insert locknut and washers, to hold the assembly to the cabinet back as shown in Figure #7. In order to allow clearance for the 4-40 mounting screw, I removed one of the sheet metal screws holding the nameplate on the back panel and drilled out the hole slightly. Please note that on the back (inner) side of the panel, before drilling, use a dampened cotton ball held in place with tape so that it will collect the metal filings from the drilling process. Electronics are terribly unforgiving of metal particles floating around when the power is applied.

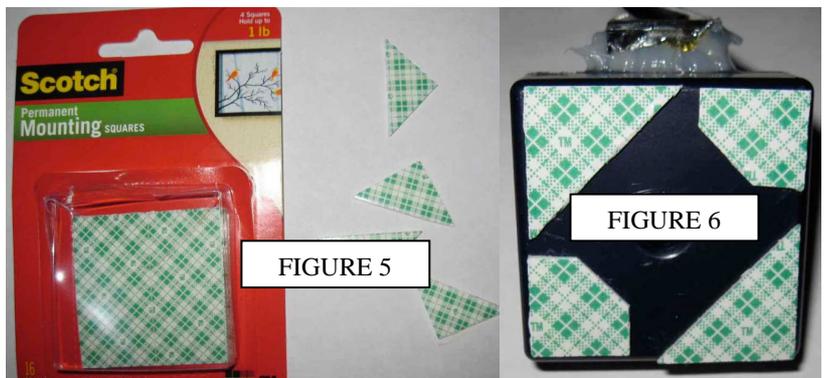


FIGURE 5

FIGURE 6



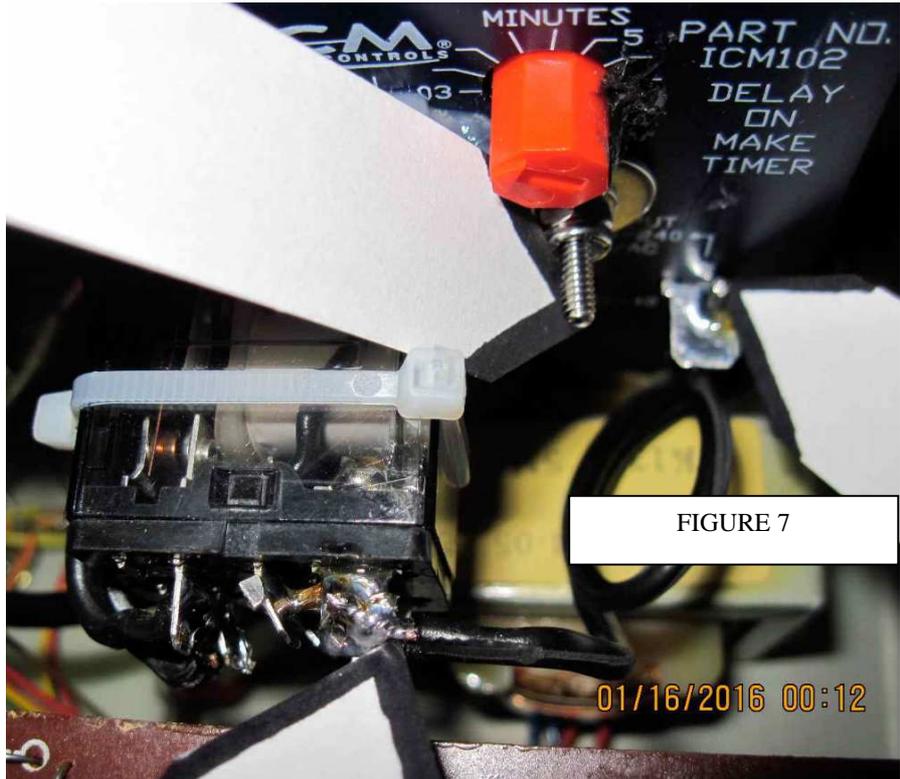


FIGURE 7

After the mechanical mounting, final rewiring is done. The line cord is first soldered to the delay assembly. Then, the output wires from the delay assembly are soldered to the original line cord locations, one to the terminal strip and one to the fuse holder as shown in Figure #8.

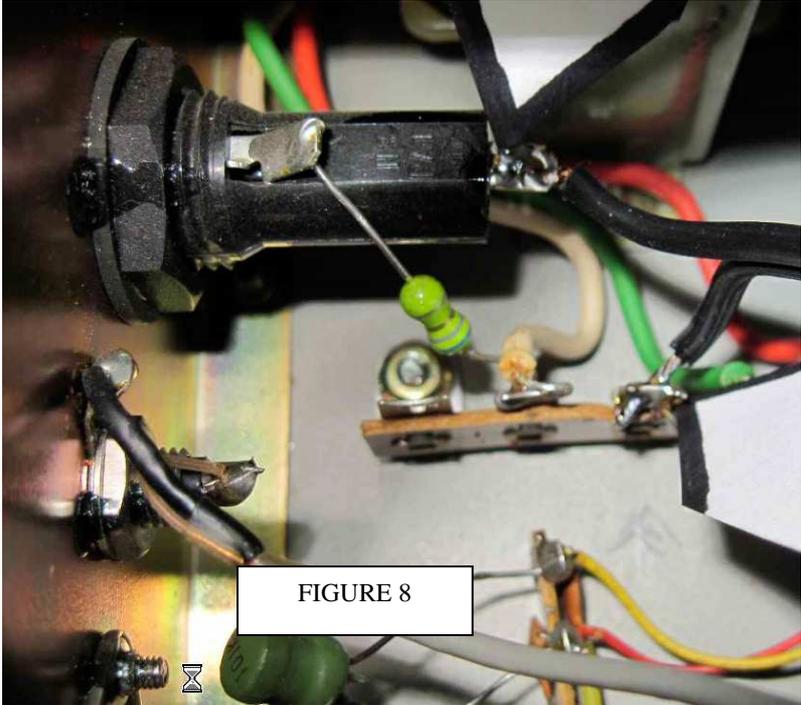


FIGURE 8

While I'm contented with the design, I'm sure you can come up with other designs that improve upon what is shown here. For example, for those that don't use a power strip or line conditioner to turn on all the equipment at once, a circuit could be designed that powers up the VFO-230 (after a short delay) when the TS-830S is first turned on.

I'd be interested in hearing from those of you that have addressed the power-up problem with the VFO-230. I'd like to learn from the solutions you have designed.

73's,  
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