

## Adding Fuses F102 and F103 to the single fuse R390A (Revised 1/11/2012)

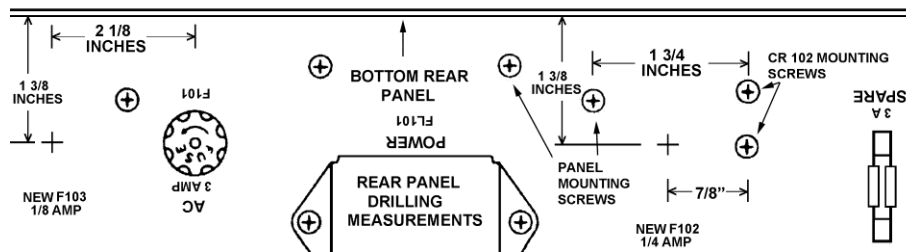
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F102 and F103 were added only to receivers having order number 14 – Phila - 56 serial numbers 2683 and above and order number 14385 – Phila – 58.

Adding the two extra fuses can save the receiver from having serious wiring and/or unobtanium part damage in case of a short. Repairing a burned wiring harness is something one wants to avoid at all costs.

The problem is however, since most are only one fuse and if one doesn't have a 3 fuse receiver, how can one do the upgrade? This was my situation until I recently acquired a three fuse unit. So I wrote this article to help others who may only have one fuse receivers.

Below is an excerpt of the rear diagram turned upside down of a single fuse receiver from the Y2KR3 manual with the measurements I was able to make from my 3 fuse unit. Although I tried to be as accurate as possible, the measurements are close but they are not critical. One does want to keep them all on the same plane to look reasonably professional. The real issue is protection, not beauty.



For drilling the holes I used a “Unibit” set that I bought at Harbor Freight on sale. They have made great holes for me as it has tapered increments which greatly improve ones chances of getting a truly round hole without significant burrs. If you have to obtain a “Unibit” from other sources they tend to be relatively expensive.

Before tapping into the wiring harness I'd strongly recommend that one has a D/L copy of the Y2KR3 and/or one of the better TM's such as TM 11-5280-358-35 for reference. Although there are many steps to the process it is straight forward. The key is to take your time to avoid damaging the wiring harness.

I did the F102 modification first as it is the easiest. It is also the most critical. Do this one even if you don't do the one for F103 as a shorted tube could fry an unobtanium coil or transformer.

First remove the power supply. Remove the screws of and move out of the way CR 102. (Now would be a good time to replace it with a modern bridge rectifier if it is the original selenium type.)

I drilled the hole for the new fuse holder using the measurements shown in the diagram. Your hole size may vary depending on the particular fuse holders you have. My size was 1/2 inch.

Put a tywrap about 1 inch from the cable harness clamp and cutaway the cable lacing up to P 111. Remove the shell clamp, and then remove the molded connector out of the shell.

Now what we want to find is Pin 5 on P 111. Fortunately the pin numbers are molded into the base. Pin 5 should be white with a red stripe tracer. After verifying the wire color visually, I ohmed out the P111 pin 5 continuity to P 619 pin 5. Re-assemble P 111.

Install the new fuse holder so that the inner connection is facing towards the left hand chassis divider. Then remount the power supply and insert P111 into the power supply.

Fortunately there is just enough slack in the wiring harness that it can be cut and soldered onto the new fuse holder without needing any extension wiring. Next carefully cut the pin 5 (W/R) wire coming from the chassis end of the wiring harness about 1/4 inch above the inner fuse holder connection. Strip off about 1/8 inch of insulation and solder to the inner fuse holder connection. Strip off 1/8 inch of insulation off of the other end and solder it to the end terminal of the fuse holder. Insert a 1/4 amp fuse. Remove P 111 and verify continuity to P 119 pin 5. Add a tywrap about an inch above and below the fuse holder. Re-install CR 102. I then ohmed out the circuit again to verify that there wasn't a short circuit. Wallah! Mission accomplished.

Verify the receiver is working properly before doing the F103 modification.

Adding the F103 modification.

This a bit more difficult part as it requires a bit of rewiring of P119 pin 2.

First remove the AF module. Drill the hole using the illustration dimensions and mount the fuse holder.

Put a tywrap where the cable to P119 comes away from the chassis. Cut and remove the cable lacing. Remove the clamp collar outer shell of P119 and the two end screws to expose the wires. There should be 4 wires on terminal 2. Two should be coded white/ red/ green and the other two should be coded white/red. They all should be a smaller diameter than most of the other wires in the plug.

Now it's decision time. Plan "A". One could cut the harness all the way back to the backside of the PTO, remove the 4 wires from terminal 2, install a new 30 inch wire to terminal 2, re-route all 5 wires below FL101 - after enlarging the hole in the bottom of the divider panel for the additional needed space. After trimming the wires to length, soldering them to the fuse and re-lacing the harness one would have an almost identical factory wiring job. Besides the time this would take this is not a good idea at all. I believe the chances of doing serious damage on a 50 or 60 year old cable harness are too great for the results obtained.

Plan "B" isn't nearly as elegant but can be implemented far more rapidly. And it doesn't require drilling any holes.

The simpler method.

To do it as I did you need two 36 inch pieces of #24 or #26 hookup wire twisted together for about 30 inches, 3 one terminal insulated mounting strips, about 10 tywrap strips, and the new fuse holder. You will have extra wire left over but the longer length makes for an easier installation.

Un-solder the four wires from pin 2 then trim off the bare wire. Slide the four wires backwards out of the shell to where the tywrap is located. Twist them together for the moment.

Slide one end of the non-twisted hookup wire through the black insulation and clam shell and solder it to pin 2. Insulate the terminal. Re-assemble P119.

Install a one insulated terminal terminal strip using the front panel screw for mounting on the left of the cable clamp by the phone jack or to the cable clamp on the inner side of the AF module depending on which version wiring harness was used on your receiver.

Twist the 4 wires from P119 with the other hookup wire end and solder them to the insulated terminal. Ohm out the wiring.

Install a one terminal terminal strip on the 8-32 screw at each bottom end of the spacer by the AF module. Now route the hookup wire along the large cable and using tywraps every 1 1/2 inches or so.

At the edge of the spacer move the wires down to the terminal strip and secure it with a tywrap so the wires make a straight drop.

Continue to run the wires along the bottom spacer. Slide the wires through the extra space in the whole for the wiring harness, remove the slack, then tie off the wires to the terminal strip with a tywrap. This results in a neat straight wire run.

Put a tywrap around the twisted pair and attach them to the wiring harness.

Now make about a half circle of the remaining wires and attach them to the fuse holder. I put the hot wire from P 119-2 on the side terminal. Install the 1/8 amp fuse.

Re-install the AF module then ohm out the wiring again. Now you are ready to operate your radio.

