

Making a Great Antenna Better – Super Antenna YP3 Yagi

The premier antenna from Super Antennas is the YP3, a 6 Band (Mono-band in operation) antenna. It is a 3 element portable HF Yagi that breaks down and fits in a carry bag. Vern Wright – W6MMA the creator of this antenna came up with a great design that allows this antenna to be deployed in about 30 minutes and then to be broken down and stored away in about the same time. This is probably the largest of the truly portable directional HF antennas available on the market. It weighs about 10 pounds with a max boom length of 11.6 feet.

We have been using this antenna to test the capabilities of the 12PR1A single axis Ultra-Portable Rotor System since the first prototype units were assembled. In using this antenna as both a test element and an operational antenna for weekend Ham fun, I have found 2 things that can be improved on.

First: The antenna as it is assembled from the factory is off balance along the boom. Normally when mounting to a fixed mast this should not be a concern but the 12PR1A requires a balanced antenna installation with such a big antenna to protect bearing life. To balance the antenna, the mast to boom mounting plate on this antenna needed to be moved about 4 inches, closer to the black plastic driven element mount.

The process is straight forward requiring the use of a single Philips screwdriver.

Assemble the antenna upside down on the ground (element mounting blocks facing down). I use grass as it does not cause scuffing and abrasions like cement will.

While standing or kneeling over the assembled antenna lift it a few inches off of the ground from the center of the mast mounting plate. If the antenna tips along the boom then it is off balance. To adjust the balance point on the boom there are 2 Philips head screws on the bottom of the mounting plate boom attachment where the boom slides through the loops. These screws can be loosened allowing the mounting plate to be slid along the boom. Experiment with the best place for the best balance. Tighten the screws, making sure the mounting plate is perpendicular to the elements, this way the elements are nice and horizontal when deployed. The rotor performance will improve without the extra stress and mechanical load caused by the off center mass.

Second: My only real gripe about this antenna is that it uses banana plug style connections between the feed line and the driven element. The antenna comes with a BNC to Banana Jack adapter that is used for the connection. This means that to use a standard PL-259 connector, a BNC to SO-239 adapter must also be used to make the connection.



In more than one instance I have had the adapter come unplugged from the driven element, only noticing it is loose after I have pushed up the mast/antenna to its operating height.

My solution was to retrofit the driven element plastic mounting block to accept a standard PL-259 Coax connector allowing me to use more common coax ends.

The process took me 3-4 hours to come up with a design and then to fabricate the changes, but it was time well spent. Materials needed were 2 banana plugs, a short piece of wire, small section of thin brass, 2 4/40 screws, a new SO-239 Chassis mount jack and epoxy glue.

After deciding on a course of action and removing the center section mounting block from the antenna boom I used a Dremel tool with a cut off wheel to cut a groove along the top to hold the center section wire and then cut out an opening to fit a little over 50% of the back side of the connector into. I then rounded off the top of the Chassis mount connector, removing 2 of the mounting holes (not necessary, just looks better with less to get snagged on). I then made sure the fit was where I wanted it and drilled 2 small hole into the side of the plastic block to set the 2 4/40 screws into, holding the connector to the plastic block.



I next removed the majority of the brass that the wire would normally attaches to on one of the banana plug. Next I attached a short section of 18 gauge wire to the banana plug and then to the SO-239 center section.

The last challenge was getting a strong electrical connection from the outer part of the SO-239 connector to the other banana plug location. I was unable to solder to the part I was using so I came up with the brass strap method. Using a thin piece of brass, I cut it using scissors and bent it to fit along the top of the plastic block between the Banana plug location and the 2 screw positions in use to hold the connector to the plastic. Then I drilled holes in the brass for the mounting screws and a single hole for the banana plug to fit through.



For real strong epoxy bounds, my favorite epoxy is JB-Weld. Not knowing how JB-Weld reacts to strong RF currents I decided to not let the center conductor of the feed line touch the JB-Weld epoxy. I first encapsulated the center section solder joint at the base of the SO-239 plug with 5 minute epoxy, guaranteeing a solid barrier between the center conductor and the surrounding structures and JB-Weld.

With everything test fit, the fun began: I coated JB-Weld on the bottom of the brass frame and slid it into place, next installing the SO-239 connector, banana plug and wire section. Screwing the structure together at the same time. Care must be taken to keep the epoxy from not getting between the SO-239 and the brass as that is the electrical connection. I then let the JB-Weld cure overnight and made the final solder connection from the brass to the other shortened banana plug. This took a larger than

normal soldering iron to get enough heat to make the connection. I final wash of denatured alcohol, and I coated the top, front and back with JB-Weld to seal and strengthen the assembly, encapsulating the connecting wire in its groove. A final bit of 5 minute epoxy over the center conductor banana plug and I set it aside to fully cure for 24 hours.



The final step was to sand the rough places and paint the gray epoxy modification black so it matches the original color.



This modification gives this excellent antenna a strong and weather resistant electrical connection that uses a common connector type. By mounting it on one side it moves the cable away from the Nuts and 'U' bracket. It is so much cleaner and easier to deal with now. Time well spent.

Materials used cost under \$10.00 if you do not need to purchase the epoxy glues. If you do not have the Epoxy's, then under \$20.00.

Materials Needed:

SO-239, 4 hole chassis mount style
2 – 4/40 x 3/8 screws – Junk Box parts
Brass sheet – 2x3 inches x .020 thick or similar.
2 – Banana Plugs
2 Inch piece of 18 Gauge wire
Some Solder
5 Minute Epoxy – Small amount
JB-Weld Epoxy – Small amount

Tools used:

Dremel Tool with cut off wheel
Small File
Drill and various drill bits
Wire stripper
Soldering Irons
Scissors
Small Screwdriver
Small Vise to hold parts