

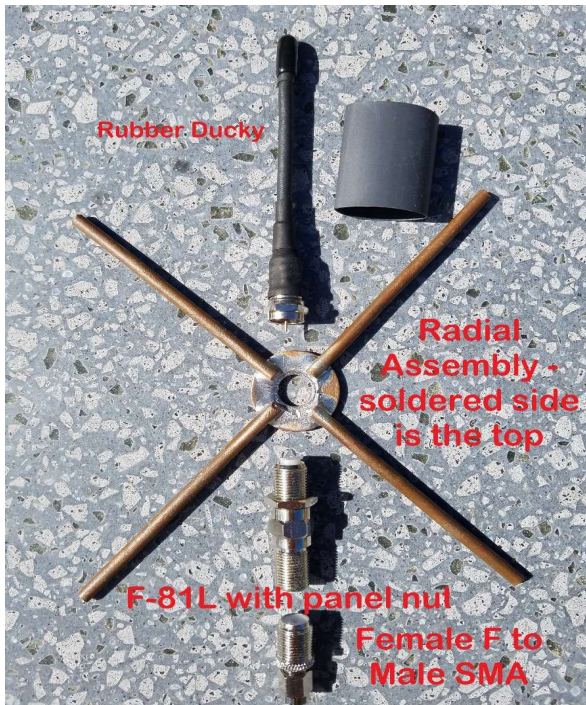
Lothar of The Hill People' s Boris The Spider ADS-B Antenna Kit



Introduction: Boris was designed as a low cost entry level antenna for 1090 MHz ADS-B reception. It is a quarter wave ground plane design with a nominal 2.5 dBi gain. It was designed to out perform the cheap printed circuit board antennas while being a similar cost. It was also designed to be less expensive than other home made "spiders" using panel mount N or UHF connectors and to be water proof. The most important feature is that Boris uses inexpensive satellite rated F connectors and cabling. The 50 / 75 Ohm mismatch loss is only 0.14 dB. Use of RG-6 and F connectors means that antenna cost and installation costs are significantly lower than other home brew antenna designs. **What's in the kit?:** Boris comes with a 1090 MHz "rubber ducky", a satellite rated F-81L connector with a panel nut, a radial assembly, a short piece of heat shrink tube and an F Female to Male SMA connector. Note that the soldered side of the radial assembly is the TOP of the antenna. To save on shipping and labor, the radial assembly is shipped flat but fully soldered. After radials are bent and the the rubber ducky is mated, the panel nut is raised to force the radials against the underside of the rubber ducky connector. The rubber ducky shown here and the radials have additional shrink tubing on them and red thread protectors on them because this was a prototype and red teats is what I had on hand. The rubber ducky has a black teat on the final version.



[See the larger pictures](#)


[attached to this document.](#)



What else do I need?: You supply satellite rated RG-6 with F connectors on both ends and a bit of shrink tube to seal the down lead cable to the antenna. The maximum recommended length at the 3 dB loss point is 38' for high grade satellite rated RG-6. **Shorter is better - 20' is recommended.** You need some simple hand tools as well - needle nose pliar, a C Clamp, small wrenches and a painters 5 in one or similar stiff but thin pry bar. The radials are bare 8 AWG copper. If you need Higher Wife Approval Factor, or a more stealthy look to avoid Condo or HOA busybodies scrutiny you can cover the radials with additional shrink tube and put thread protectors on the radial ends as shown in the first picture above. **THE ADDITIONAL SHRINK TUBING AND THREAD PROTECTORS FOR THE RADIALS ARE NOT INCLUDED IN THE KIT.** The photo at left shows the contents of the kit.

ASSEMBLY INSTRUCTIONS

<p>Step 1</p> 	<p>Bending</p> <p>Check both sides of the radial assembly washer for corrosion. Give both mating surfaces a little sandpaper abrasive cleaning if need be. <u>Clamp the radial assembly soldered side down on a flat surface with a C clamp, or screw it down to some scrap lumber with a washer between the screw and the bottom of the radial assembly if you do not have a C clamp.</u> The soldered side faces the sky when you are done and the clean side of the washer faces the earth. The point is to NOT stress the solder joints during bending AND to keep the radials straight at the same time. The picture at left shows my method with a C clamp and a painter's 5 in one tool, which is very stiff, yet has a thin edge that allows bending the radials very close to the washer, and does not change the straightness of the radials. <u>Do NOT bend by hand.</u> Set the angle to 45 degrees as a start point. The picture show a carpenters speed square used as a reference for 45 degrees. <u>Bend slowly!</u></p>
<p>Step 2</p> 	<p>True the center pin</p> <p>The rubber ducky is made with Belden 1505, which has a solid copper center conductor and not copper clad steel as many CATV and satellite cables do. Therefore it is somewhat subject to bending. Check the center pin of the rubber ducky for straightness before mating the connector. If necessary, straighten it with a small needle nose pliar.</p>
<p>Step 3</p>	<p>Drop the pre-bent radial assembly from Step 1 onto the F-81L on the panel nut end of the F-81L connector with the panel nut fully retracted down.</p>
<p>Step 4</p>	<p>Snug the rubber ducky down to the F-81L by hand and tighten it to the F-81L to 15 In./Oz. torque while grasping the F-81L barrel nut with another tool.</p>
<p>Step 5</p>	<p>Grasp the barrel nut on the F-81L and tighten the panel nut up to hand tight against the bottom of the radial assembly. Tighten the panel nut to 15 In. / Oz. torque.</p>

<p>Step 6</p> 	<p>Square the supplied shrink tube with a sharp scissors and drop it over the top of the rubber ducky, force it down to the top of the radial assembly and shrink it in place.</p>
<p>Step 7</p>	<p>If your are so inclined, you can fine tune the down angle of the radials to 42 degrees, but its probably not necessary. If you do, grasp the solder joints with needle nose pliers and bend as close to the base washer as possible with another tool.</p>
<p>Step 8</p>	<p>Mate your F connector feed line after putting a length of shrink tube over the connector and cable. Make sure it is long enough to cover the F connector to F-81L completely up to the F-81L barrel nut. Hand tighten and then torque to a maximum of 7 In. / Oz. while holding the F-81L barrel nut with another tool. Shrink the tubing, and Happy Feeding! If you have followed these instructions, then pour a Beer!</p>
<p>READ ME</p>	<p>Lothar's Disclaimer: This is a hobby grade antenna intended to be inexpensive but durable. The use case is for fill in feeders and as give away antennas to get friends and family to allow feeder appliances on their property. Tuning is approximate and performance is not Guaranteed.</p>

Rubber Ducky



Radial
Assembly -
soldered side
is the top

F-81L with panel nut



Female F to
Male SMA



