

"Project Build" for the EARS Club. (Rev C)

Dual Band Slim Jim J-Pole - More gain than a standard J-pole!

Proposed is a dual band (2 meter & 70cm) Slim Jim, J-Pole flexible antenna, having great Slim Jim gain.

Features:

Length - 6 Feet tip to connector.

1.5:1 Bandwidth > 4mhz

Power Handling - 100 watts

Gain - Approx 6dbi 2m 5dbi 70cm

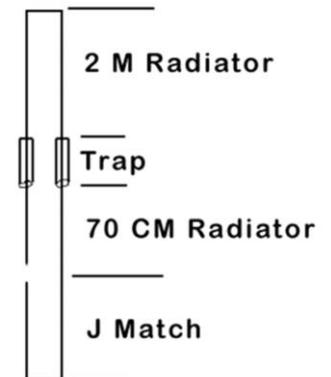
Weight - 6oz

Connector - so-239 / N-Female*

Construction - 450 ohm ladder line with short coax-stub.



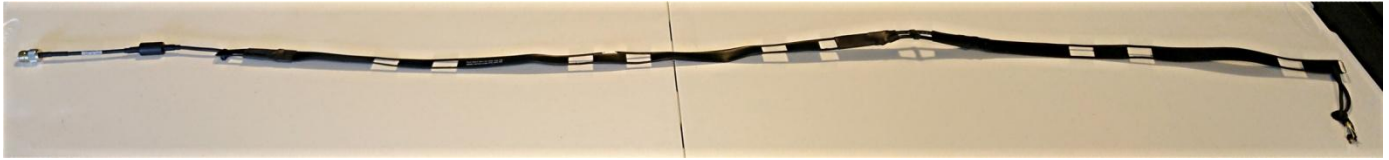
The illustration shows that the half wave radiator folds back on itself. This essentially creates an end fed dipole yet still retains the j match system. The traps isolate the bottom of the antenna at high frequencies to allow dual band use. The lower half of the antenna becomes a 70cm j-pole. At 2 meter frequencies the wave doesn't see the traps and acts as a regular Slim Jim antenna.



This antenna can be supported by many things including trees, ceilings, curtain rods and pretty much anything else you can dream up that will support 6oz of weight and keep the antenna a couple inches away from solid objects. These antennas are great for E-COM activities, field expeditions, hotel rooms and base station use too. Many people use one as a base antenna claiming it performs better than a 1/2 wave vertical.

The antenna is not designed to connect directly to a radio. **A minimum of a 3** foot coax extension is recommended.

Roll up antenna VHF / UHF EARS Club Project 2-6-2016 Rev C



Completed antenna with cord at top end for hanging. Note! This antenna is not designed to be connected directly to a radio. Rather a 3 ft minimum coax cable needs to be added between the antenna and radio.

Kit pieces

- 1 Piece long ladder line about 37 inches
- 1 Piece ladder line about 21 inches
- 1 Piece ladder line about 5 inches - scrap for strip practice
- 1 coax cable with male / female SO 239 connectors
- 2 "Traps" 6 inch prepared coax pieces
- 1 Snap on ferrite coil
- Heat shrink tubing pieces
- 1 cable tie
- Coil of solder



Step one; Prepare short ladder line section (top end).

A. Top end, or the end which will hang;

Don't shorten piece!!

Make 1/2 inch leads on both sides. >>>>



The "Windows" on ladder line vary, may not match picture.

Stripping ladder line isn't easy, practice on scrap piece.

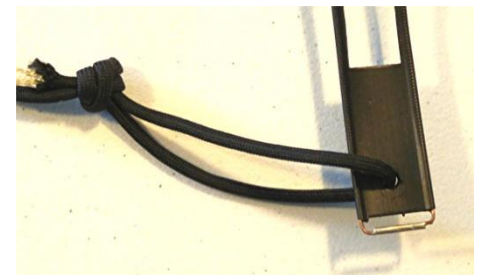
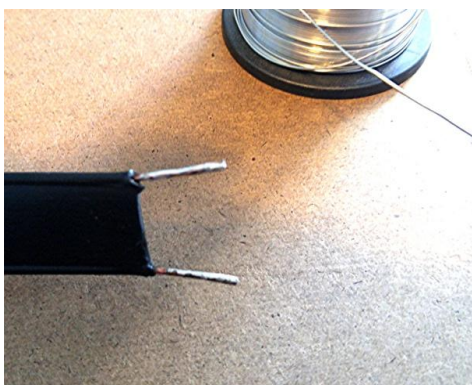
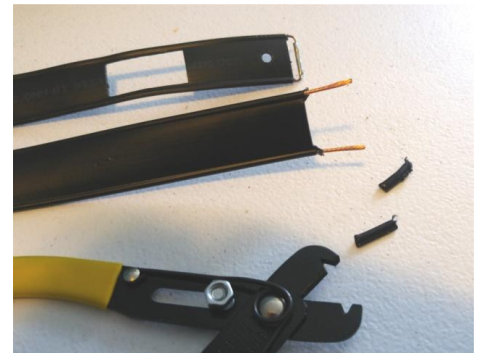
You may need to cut plastic to make the 1/2 inch leads.

Twist strands so they are tight. Next, "Tin" or solder each lead.

Bend each lead 90 degrees and solder them together.

You can drill hole near the end to attach a cord for hanging.

You can also just push a soldering iron tip through, remember to clean the melted plastic off the soldering iron tip.



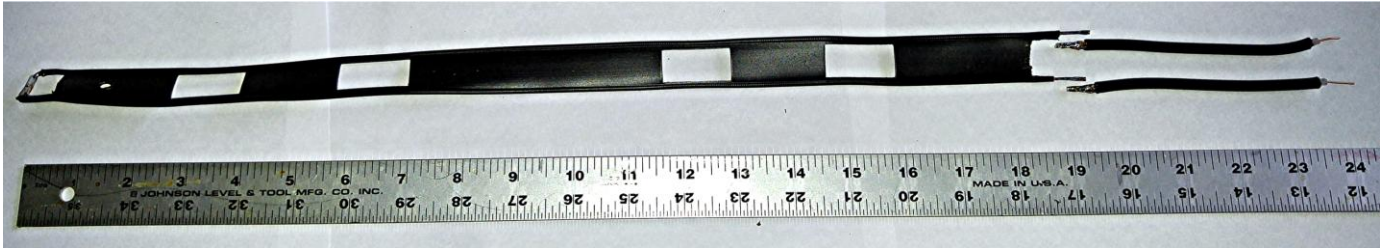
B. Prepare opposite end of short ladder line (This is still the top section).

Critical measurement! From the soldered folded leads at the finished end, measure 19.25 inches and cut.

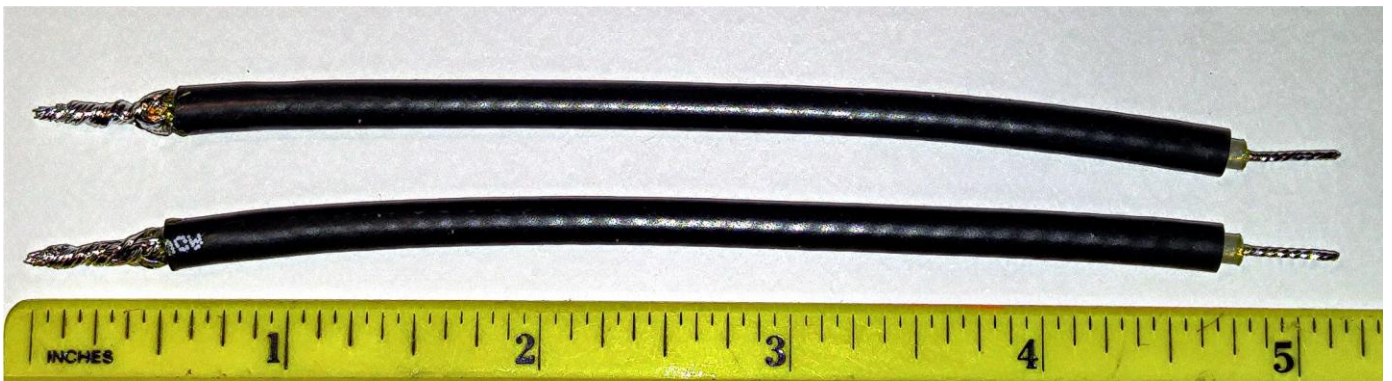
Now create 1/2 inch leads like you did on the other end. Be very careful not to make a mistake.

This length (19.25 inches) is critical.

Twist the strands of these two leads so they are tightly wound. Tin the twisted leads so they so they won't unravel.



"Traps"



The coax trap pieces are 5.25 inches long and are identical. One end has the center conductor and shield soldered together (shorted). The opposite ends have the center conductor insulated from the shielding. When adding the traps to the ladder line, the shorted ends connect to the upper portion of the antenna which is the opposite end having the 239 coax connector.

Solder the two coax trap pieces having the shorted center conductors & shields, one to each side of the ladder lines you previously tinned.



<<< Top section is finished, set aside.

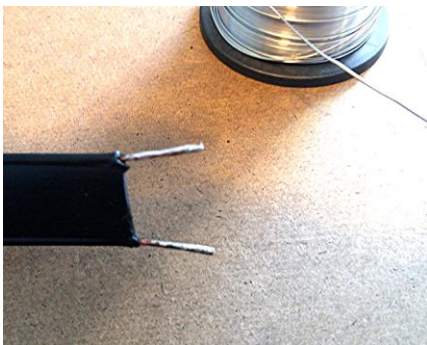


C. Create bottom section ladder line (long piece of ladder line).

At one end, create the two leads as you did before. Twist strands, "Tin", fold and solder.

<< This is now the **bottom end** of the antenna.

Now measure **34.5 inches** from the bottom and make a mark on the ladder line. Cut off the ladder line here. This length is critical.



Trim the ladder line leads on both sides exposing 1/2 inch of copper wire.

Again, twist & tin these leads. These ends will connect to the **center conductors** of the traps.

D. From the bottom section soldered wires, measure 3.25 inches & make a pencil mark. >>>>>

Strip or cut away 1/4 inch plastic at the mark on both sides to expose the conductors.

Be careful, Do not cut the wires!

Use a razor? Melting with the soldering iron also will work. Remember, the holes (windows) in the plastic of the ladder line may not match picture.



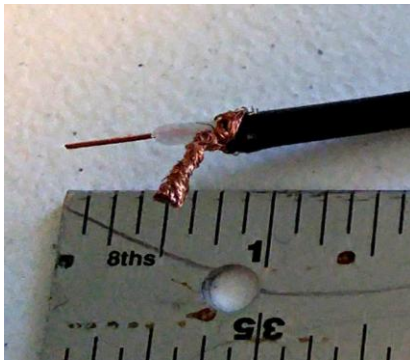
<<< Set the lower section aside for the time being.

E. Prepare coax connector

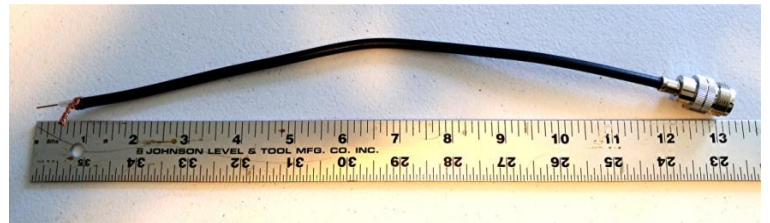
Decide which connector you want to use for your antenna. The female connector was chosen in our example. From the end of the connector cut the coax at 13.5 inches. Save the opposite end for another project.



Carefully strip to expose about 1 inch of shielding, separate shielding and twist and solder to make a lead. Strip the center conductor, exposing about 1/4 inch of wire, leaving a little insulation near the copper shielding.

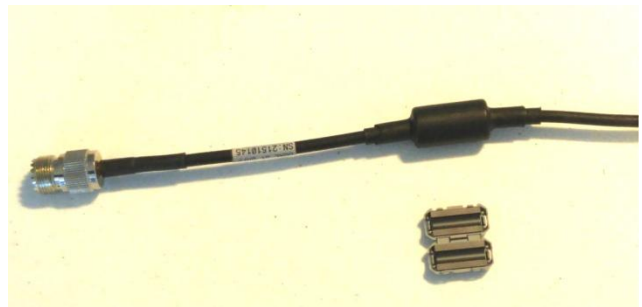


< Close up of connector preparation



F. Ferrite coil placement.

Clamp ferrite coil around coax 6.5 inches from connector end. Use black electrical tape or heat shrink tubing to secure tightly.



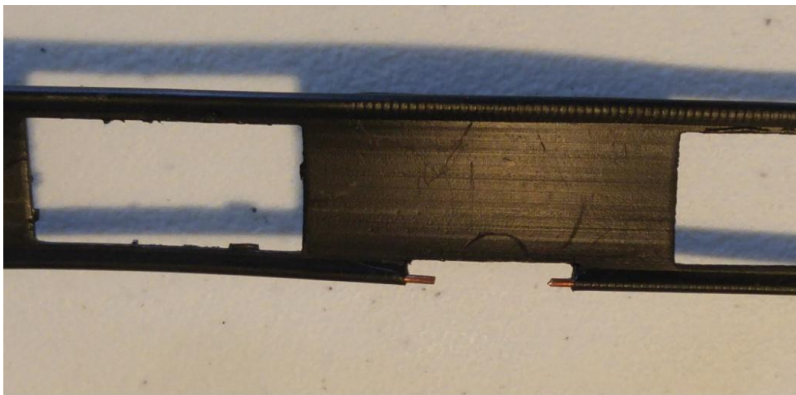
G. Attach coax connector section to bottom ladder line where you exposed the wires.

Connect and solder the center lead to either side, and the shield to the opposite side and solder both.

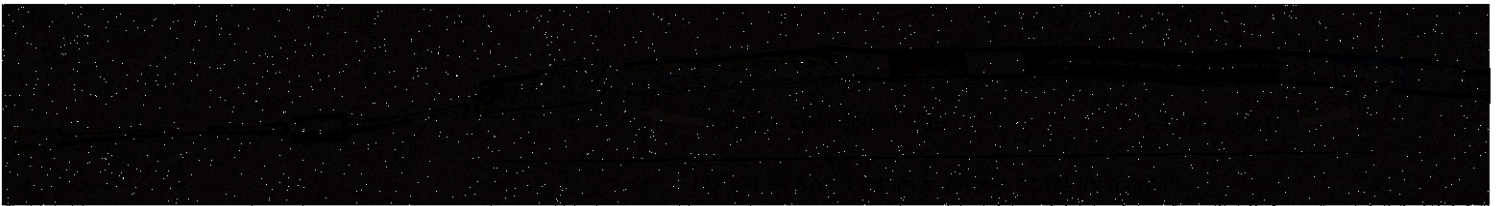


H. Create 1/4 inch "Notch" in lower ladder line.

Notch is located on the **same side of the ladder line that the outer shield** was soldered to. the notch is 1/4 inch wide, 20 inches from the bottom of the longer ladder line.



< Close up of 1/4 inch gap



I. Connecting lower ladder to the remaining leads of the traps.

Tin the two ladder line leads and the remaining center conductor leads coming from the traps.

Solder the leads you **just tinned** on the **lower** end of the ladder line to the **center conductors coming from the trap** coax pieces.

Make certain the LADDER LINE leads you solder don't touch the coax shield on the trap pieces. Your LADDER LINE leads should be a 1/8 inch away from the shield so as not to short out.

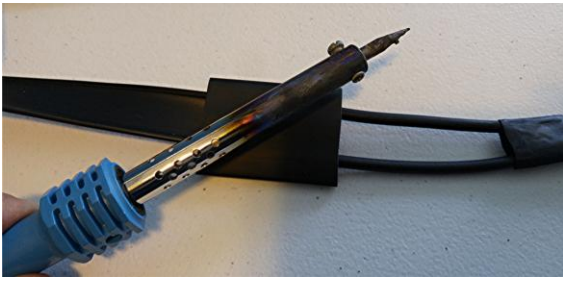


J. Place heat shrink tubing on connections and shrink.

Best if you have a heat gun, a hair dryer will work also the barrel part of a soldering iron (not the tip).

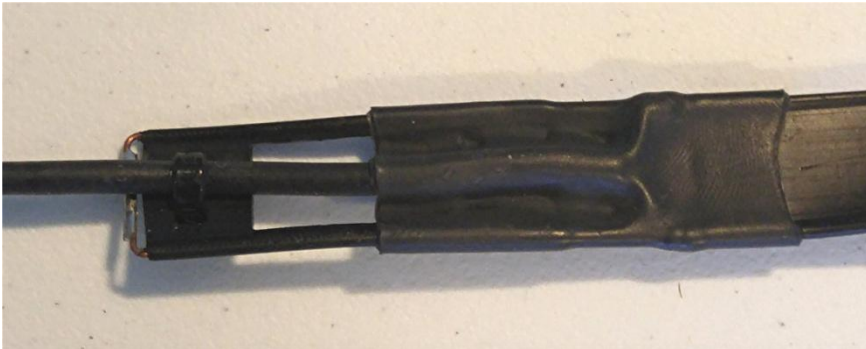
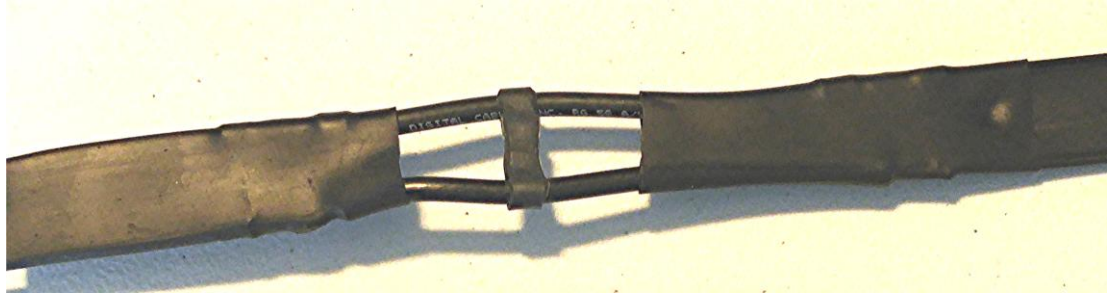
One short piece tubing on each trap connection. One short piece over gap cut out.

One long piece over coax connector connection near the bottom of the ladder line.



<< If using a soldering iron, keep moving the barrel (not the tip) over the heat shrink tubing, (top bottom and sides).

"Trap" section" >>



<<<< Bottom ladder where connector is attached.



If you still have some heat shrink tubing left over, add a piece to cover the gap section. This will help strengthen this area of the antenna.

Finished! Use an antenna analyzer to test the antenna.