

10m Slim Jim antenna

Steve G0KYA

I can't take much credit for the following. The original 2m Slim Jim was designed by Fred Judd G2BCX, who lived in Norfolk before he became SK some years ago.

This 10m one, made from 450 Ohm slotted ribbon cable from Moonraker and secured on an 8m fishing pole, was inspired by Jim Bacon G3YLA (also a fellow Norfolk ham) who brought one along to our annual "Radio by the Seaside" event. It worked so well (beating a Rybakov vertical by about 6 S points) that I thought it needed more attention.

Jim's had a lowest SWR of about 1:1.7, which I thought I could better. It turns out that there are variables in this antenna that all interact with each other, which actually makes it hard to build one "out of the box".

These are:

1. The overall length and cable velocity factor
2. The position and length of the cutout gap, and
3. The position of the feedpoint

The basic maths of the antenna aren't too hard. It is a half wave over a quarter wave with J impedance matching. That is where the "Jim" bit comes from - "J" impedance match or J.I.M.

The other problem is that the velocity factor (VF) of the 450 Ohm cable will affect the length - it will end up shorter. How much shorter will depend upon the VF, which you don't know, but can derive with some head scratching and/or experimentation!

So here's the maths:

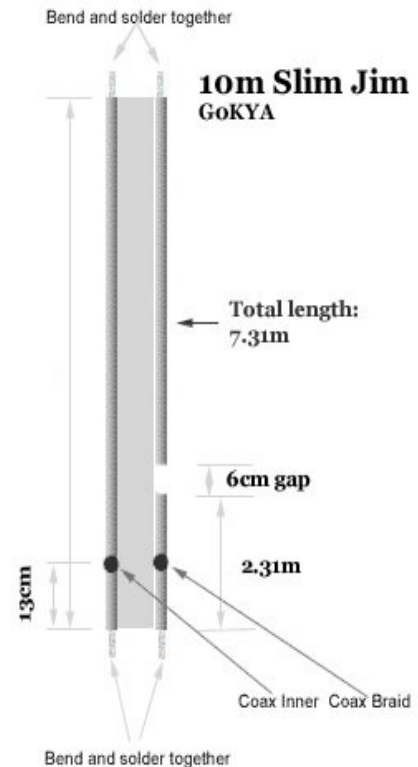
Design wavelength: $300/28.5\text{MHz} = 10.526\text{m}$

So $\frac{3}{4}$ wavelength = 7.895m. Taking the velocity factor of about 92-93% into account gives an overall length of 7.31m. Cut your antenna 4cm longer to allow for bending and soldering the ends.

Now, I found the optimum feed point was at 13cm from the bottom end - take off some of the insulation and solder the inner and outer of your coax at this point.

Now all you need to do is take out a "notch". This should be at the $.5/.25$ wavelength point - or one third up the cable. I actually found my best point in terms of the lowest SWR and the nearest resonance to 28.5MHz to be a 6cm notch 2.31m up from the bottom.

My prototype ended up looking like a patchwork quilt with bits added on and taken off. You could experiment with a smaller notch (cutout), a different notch position (at the $\frac{1}{3}$ 2.44m position?) and a different feed point, but my dimensions will get you going and give an SWR of about 1:1.4 at about 28.5MHz, useable between 28.0- 28.8MHz.



Steve G0KYA, August 2011