

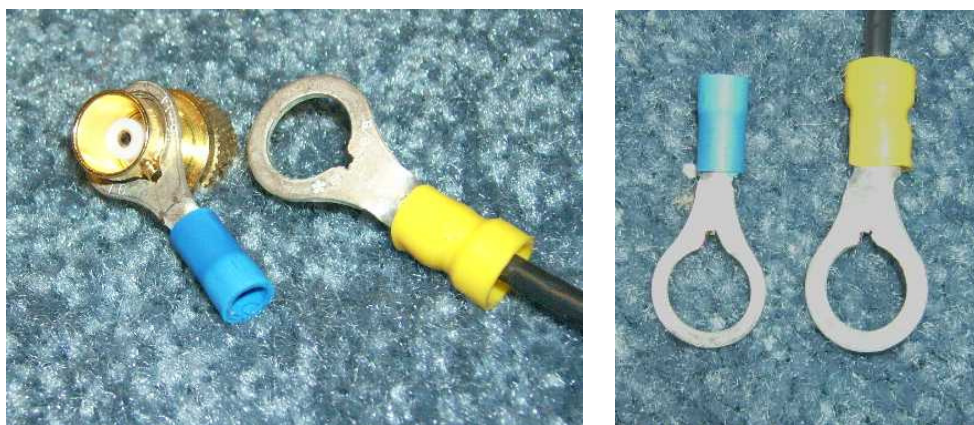
Easy HT Improvements

by N6JSX

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We all know OEM (original equipment manufacture) HT rubber-duffy antennas are a dismal compromise, at best, facetiously called "*helical-dummy-loads*." There are a few ways to improve your HT'ing distance and experience. First and foremost consider buying an after-market antenna, like the Diamond SRH77CA-SMA or RC77CA-BNC, or make a more economical full $\frac{1}{4}\lambda$ BNC Brass Whip and add a Tail. I found my 2m Brass Whip to work well on 70cm too.

Second, is to improve the antenna's counterpoise; an HT body is a very poor counterpoise! A product I saw decades ago, called the 'Tiger-Tail', seemed to have been the answer to this problem but it was just too easy for HAMs to reproduce, killing its sales. The Tail is a $\frac{1}{4}\lambda + 5\%$ counterpoise wire hung from the HT antenna connector creating a mock $\frac{1}{2}\lambda$ dipole. The trick in making an affective Tail is to insure a good tight fit to the HT connector. I duplicated the Tail by using ring terminals but a problem with ring terminals are those darn BNC posts. I over came this by filing a small notch inside the ring to fit over one post, twist it around the BNC barrel and slip it over the other post.



But with the advent of HT's going to a SMA connector the BNC post issue disappears making this Tail a much simpler and far easier to attach.

The Tiger-Tail is a $\frac{1}{4}\lambda + 5\%$ length of wire hung from the HT connector.

Thomas & Betts ring-crimp-terminals:

SMA = $\frac{1}{4}$ " eye for 14-16AWG wire (blue) T&B #14RB-14X

BNC = $\frac{3}{8}$ " eye for 10-12 AWG wire (yellow) T&B #10RC-38X

Black 14-16AWG stranded wire is soldered to the ring. (I do not crimp my tails but solder the tail wire to the ring terminal.) See Table "A" for wire lengths per band.



The hardest part of using this Tail is getting the wire to hang straight.

Easy 1/4 BNC Brass Whip

Here is an easy 'how-to' make a 1/4 wave BNC whip antenna ◊ that I created in the 80's.

Parts need:

BNC RG-58 type coax crimp connector, 3 piece.

Brass welding/brazing rod 3/32" diameter.

Heat shrink tube 3/32", 1/8", & 3/16" ~1.5" long each.

Method of build:

1. Cut the brass rod to table "A" plus 1 inch.
2. On one end grind/file off enough brass to securely fit that tip into the center pin of the BNC.
3. Solder the pin to this brass rod shaped end.
4. Slide 1.5" of 3/32" heat shrink over the brass rod and just covering the top edge of the attached center pin and shrink.
5. Slide 1" of 1/8" heat shrink over the 3/32" shrunk tubing just down to the brass rod and shrink into place. This will act as an insulating spacer to the BNC barrel.
6. Slide all into the BNC barrel – insure the BNC pin protrudes well into the connector then slide 1.5" of 3/16" heat shrink tube over both the BNC barrel and rod, then shrink tight. This piece of heat shrink holds the whole BNC antenna together.
7. Measure **Table "A"** dimension and cut to length or tune for best VSWR.
8. Round off the top end of the brass rod.

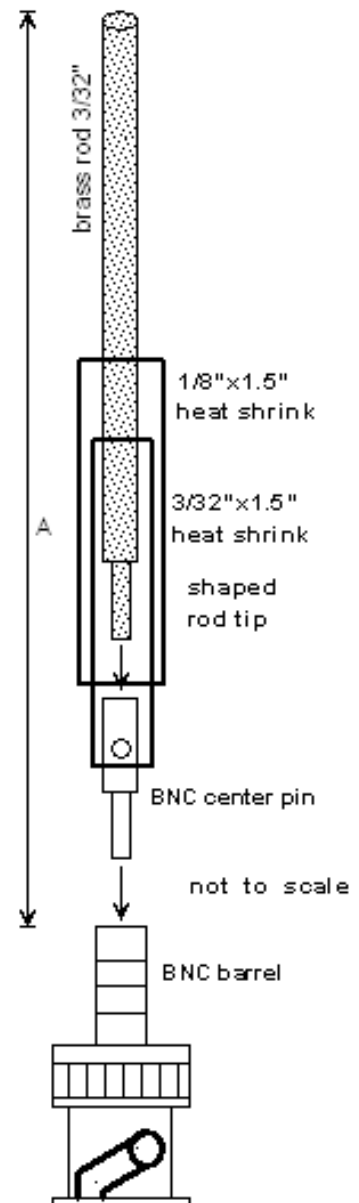
146 MHz	19.3"
222 MHz	12.7"
445 MHz	6.35"
902 MHz	3.1"
1250 MHz	2.25"

Table "A"

NOTE: insure the BNC center pin & rod do NOT make any physical contact with the BNC outer housing.

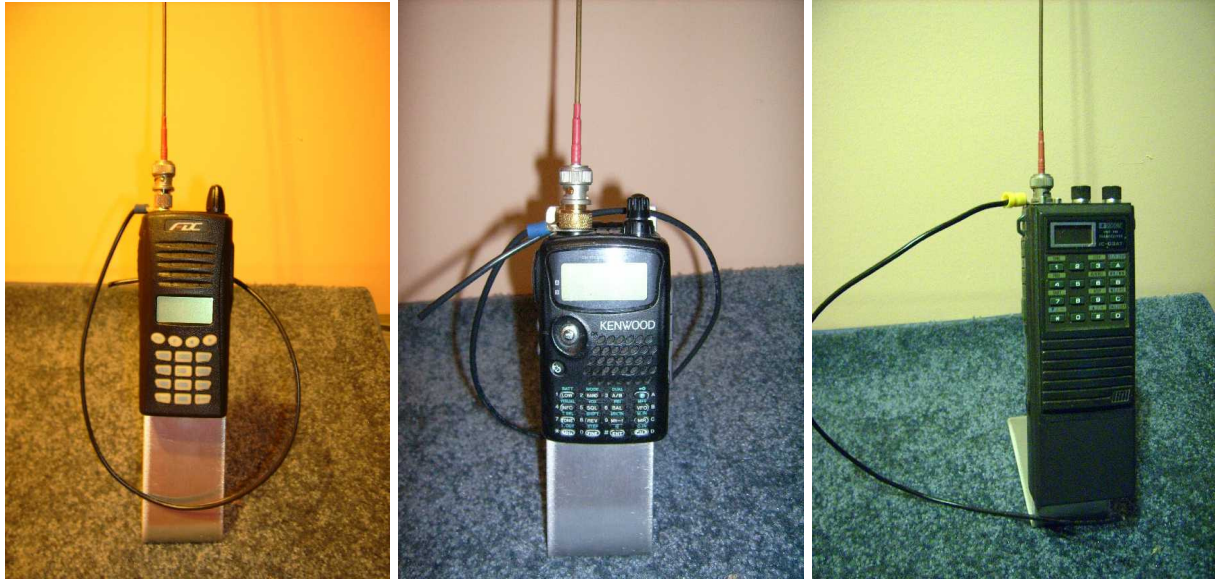


Making this rod whip antenna with a "SMA" connector was found to be very difficult and then I was leery of its durability!

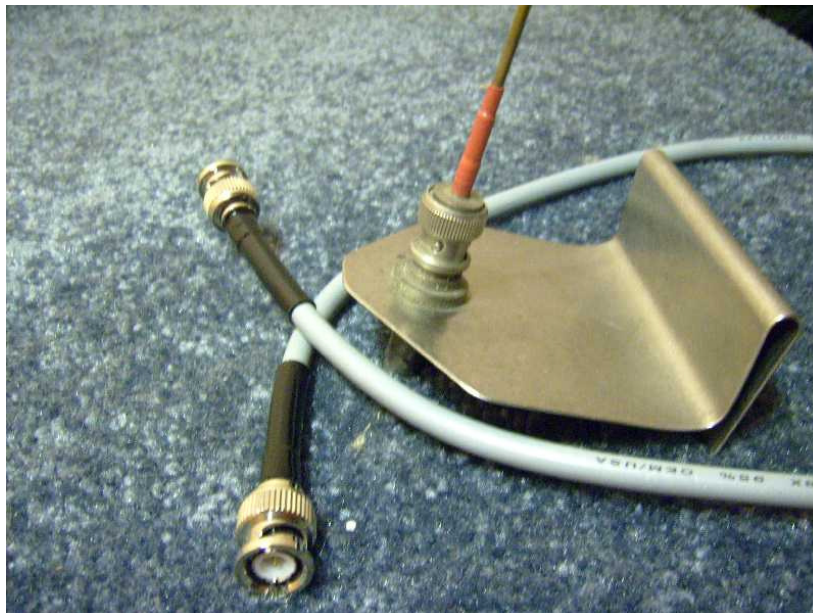


Some of the HT's sold today have different type male/female SMA connectors all SMA-to-BNC adapters pictured were bought from eBay. HT's are most difficult to quantifiably measure antenna performance from - you will just have to do it the old fashion way of over the air reports flipping between using a ducky vs. Whip+Tail under the same conditions, to judge.

Here are a few of my HT's with my Whip & Tail:



If you want to use your HT mobile seek or make an over-the-edge Stainless-Steel window bracket (I designed & sold this in the '80's under *Kuby-Kommunications™* but an AES copier and then MFJ coping killed my sales too). It was simple but affective!



Never use coax length >5' RG-174 (*1/8"dia*) -1.65db/10' ; I only use RG-8x (*1.4"dia*) -0.4db/10'.

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