

Improve Your HT Antenna

Understanding antenna
options for VHF/UHF
handheld radios

Bob Witte, KØNR
bob@k0nr.com



Tri-Lakes Monument
Radio Association
www.w0t1m.com

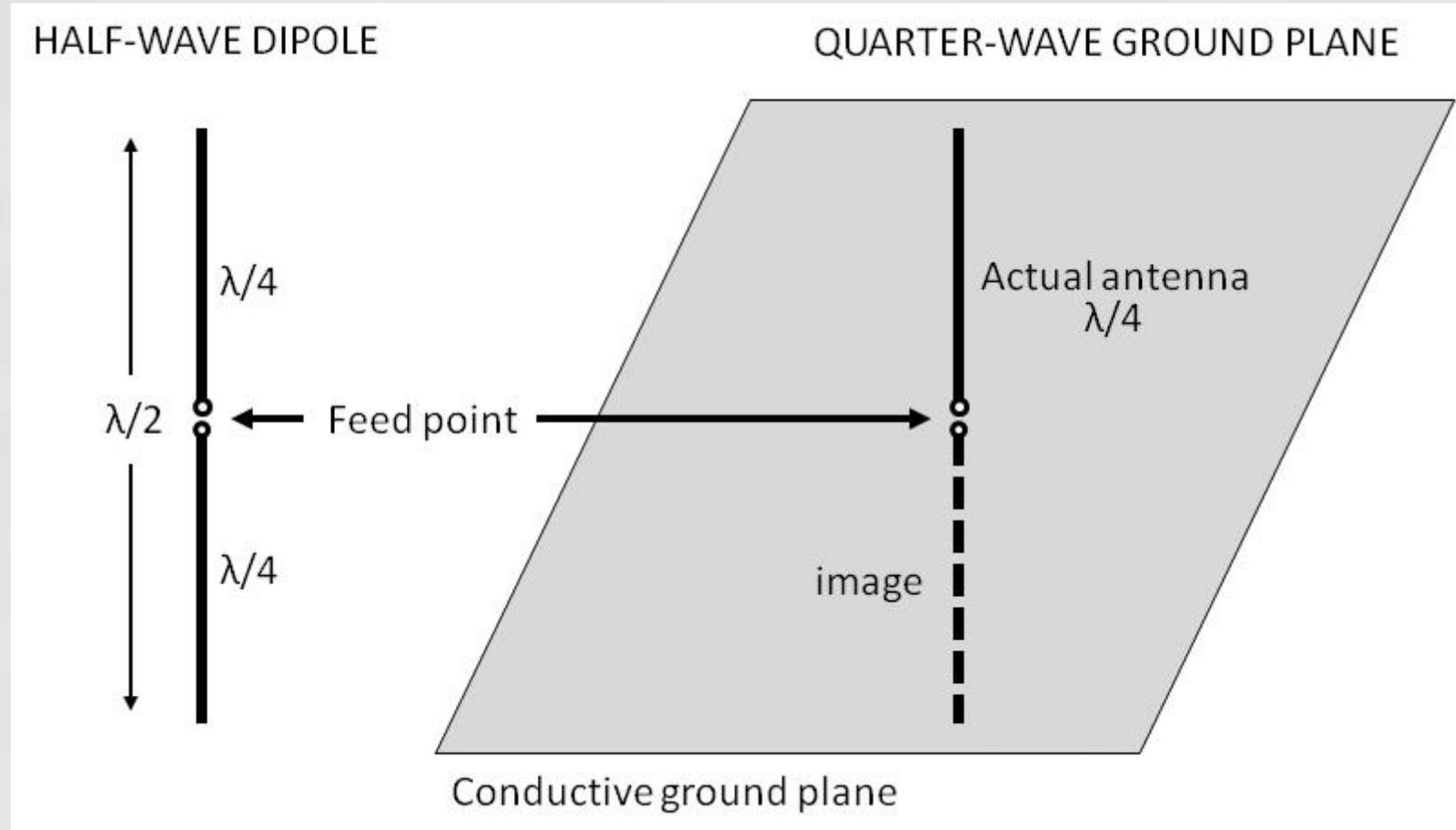
Ham Shack In Your Hand

- HT: Handheld Transceiver (Handie-Talkie)
- Affordable and compact transceiver with antenna, battery
- Typically covers 2 meters and 70 centimeters
- Low power (~5 watts)
- The three best ways to improve your HT:
Antenna, antenna, antenna



Antenna Basics

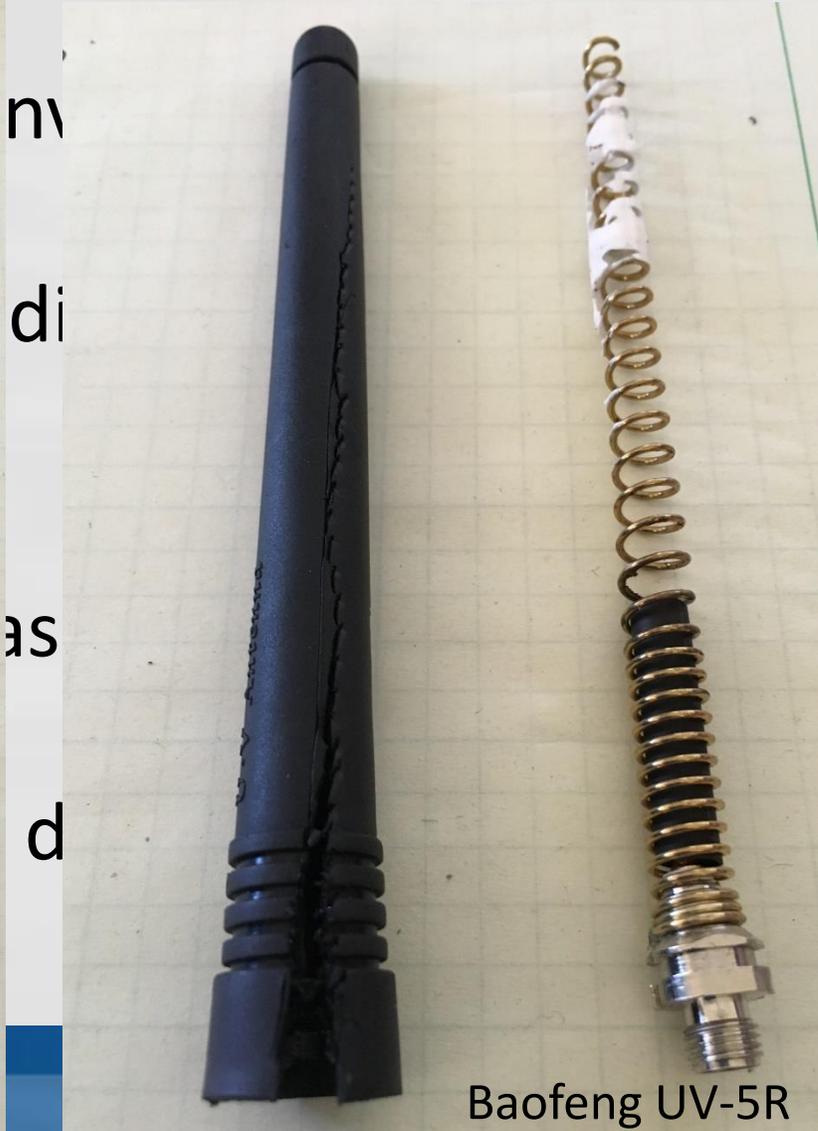
- The quarter-wave vertical antenna requires a ground plane to work properly
- The ground plane produces an image that makes the antenna work like a half-wave dipole



The Rubber Duck Antenna



Yaesu FT-1DR



Baofeng UV-5R



Longer Duck – 19-inches

- A full-length rubber duck for 2m
- Usually works on 70cm
- Does not fix the “no ground plane” problem

Source: Amazon.com Nagoya NA-771



Add a Counterpoise

Sometimes called a “Tiger Tail” or “Rat Tail”

Add a $\frac{1}{4}$ -wave wire to the HT ground
(19 inches for 2 meters)

Creates a dipole antenna with the
rubber duck

Or a quarter-wave vertical with a
counterpoise



The ½-wave Vertical

New Improved!
Dualband 2m/70cm halfwave antenna

**Search Amazon for
TWAYRDIO RH770**

**SMA (male or female)
BNC**

\$17 delivered



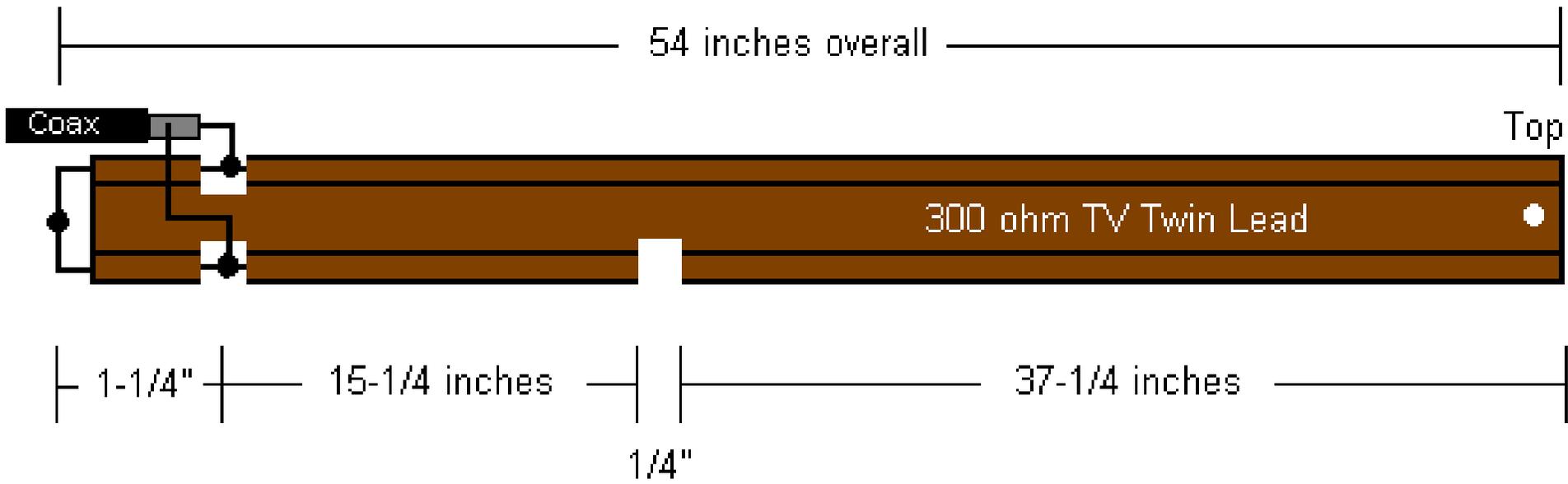


Figure 1. J-pole
(Not to scale)

WB3GDK '98



2m/70cm

Source: multiple vendors on Ebay
Or build it yourself.

Magnetic Mount Antenna

- HT in a car is a transceiver inside a Faraday shield
- External antenna gets the antenna outside of the vehicle
- Mag-mount on the metal roof works well (requires a ground plane)
- About 19 inches high, 2m / 70cm

Source: Amazon.com

TRAM 1185

Make sure you get the proper connector or buy an adapter



Antenna Mounting

Attic antenna

Magnetic mount on
steel sheet metal

Or on a
filing cabinet,
refrigerator,
any hunk of metal



Photo: Steve/KC2SP

Arrow II Hand Held Portable

If Simple is Good, then this is Truly
Simply the Best

The Boom & Elements
have plastic end caps
for Safety.

The boom is
square, but has
rounded corners.
The handle has
a thick black
foam grip for
easy holding.

Assembly Instructions

Attach the elements to the boom, by screwing the elements together through the boom. Attach feed line to the BNC connector. That's it. The Antenna is pre-tuned and ready to go.

SPECIFICATIONS

No. Elements 3
Element spacing is .2 wavelength.
SWE 1.2:1
Maximum Power (because the antenna is
hand held power should be kept to ~ 20 Watts)
Boom 3/4" Sq. (T6061 Aluminum)
Elements, Easton Aluminum Arrow Shafts
Gamma Match, Is attached to half of the
driven element (comes pre-tuned).
Connector, BNC Only

Model
146-3

15 oz.

arrowantennas.com



Arrow 3-element Yagi

Directional
antenna

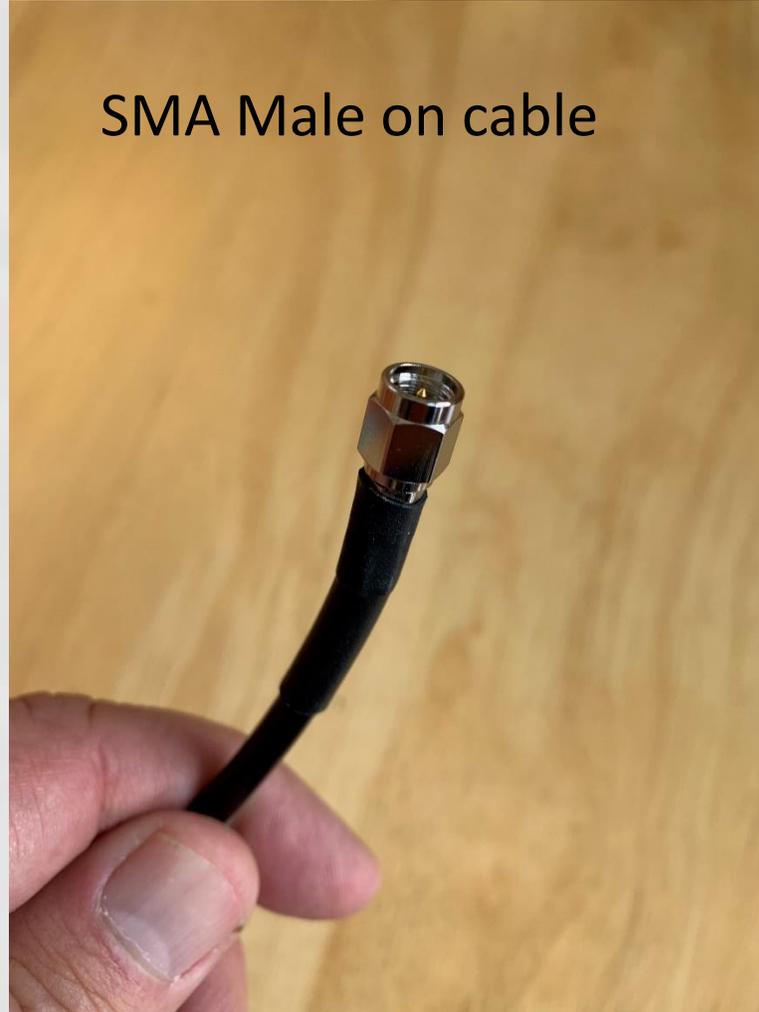
BNC connector

~ 6 dB better
than a dipole

Antenna Connectors



BNC
Male - Female



SMA Male on cable



Not
PL-259

Coaxial Cables

50 ohms

RG-316 Even smaller!
0.1 inch diameter



.58

.8X

.8U

RG-58 0.194 inches diameter
Standard for mobile installations

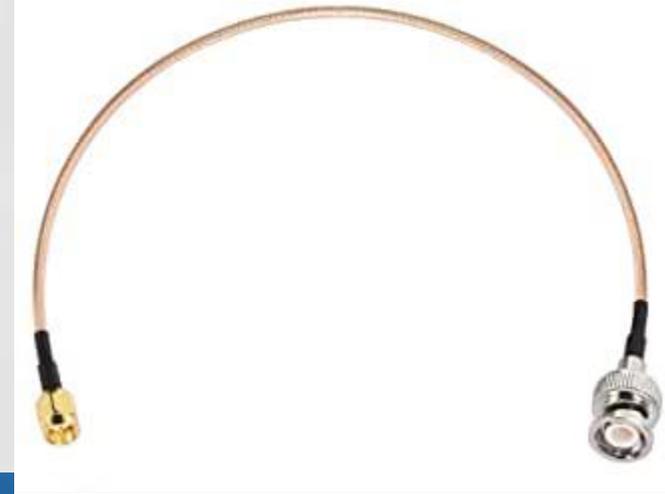
RG-8X 0.242 inches diameter
Slightly larger and lower loss than RG-58, still convenient size

RG-8U 0.405 inches diameter
Not normally used with an HT, except for long coax runs. Lowest loss.

For HT use, buy premade cables with the right connectors --- 50 ohms!

Source: HRO hamradio.com, Amazon

RF Adapters



Source: Amazon,
DXEngineering, HRO

Summary

- Rubber duck antenna: convenient & crappy
- Antennas are a great way to improve your signal
- Pay attention to cables and connectors
- Try some things and experiment

Contact info:
Bob Witte KØNR
bob@k0nr.com

