

Newcomers and Elmers Net: VHF/UHF Antennas 7-6-14
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HT Rubber Duck is a severely compromised antenna

- designers know this and put in very sensitive receivers
- also assume you will be using a repeater which is also sensitive, higher powered, and high in elevation
- everything works fine until you are at the edges of reception/Tx
- very limited inside the house or car
- any external antenna will work better
- rubber duck can also be replaced with a telescopic antenna for better portable operation; still limited
- size of antenna is the key; anything less than an eighth wavelength (9") is almost useless
- ¼ (19") is better, ½ (39") best

Mobile antenna is a great option, even indoors

- get it near a window if possible, or on the second floor
- even better if there is some place to mount it outside
- needs a ground plane; something metal to make up the ground part of the signal; a metal baking sheet works great, or if indoors, a file cabinet, etc
- and of course a mobile antenna on the car will let a 5 watt radio sound great

Classic Antennas for Best Results

--J-pole

--Ground Plane

--Log periodic

--Yagi

--each design has strengths and weaknesses; every antenna is a compromise of some sort

J-pole is simple to build, and a good performer for general work

--does not have a lot of gain/directivity, but has other strengths

--can be made from basic ladder line or better

--numerous options/plans on the Internet

--can be extremely portable if you build a roll-up version

¼ Wave Ground Plane is a vertical antenna like the J-pole

--has a vertical wire or tube ¼ wavelength in height

--uses ¼ wavelength radials to complete the other half of the antenna

--easy to build, again many plans available online

--also no real gain, but good omni-directional antenna

--possibly the cheapest antenna to build

--portable like the J-pole and can be hung by a rope from a tree/support

Log Periodic is more complex, but a substantially better directional antenna
--looks a lot like a TV antenna
--has gain in the form of directivity
--lots of design options; will help you learn about antenna theory
--directivity means it will hear/transmit well in one direction, less in others
--heavier and therefore requires more support strength

Yagi typically has highest gain and performance, most directive
--Yagis use multiple elements (1 reflector and one or more directive elements in addition to the driven element) to narrow the RF signal
--often called beam antennas
--many, many options and easy to build
--the longer the boom (that's the part that holds the elements) the more gain (at least up to a point)
--really good for portable work when trying to work in a particular direction
--also good for satellites, fox hunting, etc.

VHF/UHF antennas are a good place to begin experimenting
--useful for regular repeater work
--useful for satellites, fox hunts, portable work
--base stations either at home or at another location where you will be stationary

Antennas are small and manageable
--material costs are less
--easier to build by yourself in terms of size and handling
--takes up minimal space and can be taken down easily if needed
--you can use better materials in construction and not break the bank

Many Commercial and Homebrew Options
--search the Internet, magazines, and books for construction plans
--try several different types of antennas
--if possible, set up more than one kind for variety and options

Feedlines

The quality of the coax is extremely important for VHF/UHF antennas
--low quality coax cause a lot of your signal to be converted to heat, especially at 440 MHz
--keep coax runs as short as possible (under 50' is good, 25' even better)
--use RG213 or LMR 400 if possible, even on short runs
--the thicker coax provides a greater surface area for the signal, and less resistance
--make sure you know how the coax is to be handled near the antenna

e.g.:

--J-poles they usually need 5-6' of coax going horizontally from the feedpoint before coming down

--ground plane antennas usually have the coax hanging straight down from the feedpoint

Height

Since VHF/UHF signals are basically line of sight, the higher you can get your antenna the better your coverage will be

--base antennas should be mounted 25 feet or more if possible

--if using a Yagi or Log Periodic antenna, consider adding an inexpensive TV antenna Rotor/controller to change directions when needed

Polarization

Keep in mind the polarization issue

--For most FM simplex and repeater work, antennas are vertically polarized, meaning the signals radiate out over the earth's surface

--For most SSB work antennas are horizontal