

# The Radio Hotel Antennas—"Where the Rubber Meets the Road"

by Rick Hiller – W5RH

At the BVARC breakfast the other day, I asked one of our resident commercial broadcast engineers, Paul Easter, WW5PA, if he knew of an antenna that was designed specifically for a modulation technique. His answer was a quick and adamant – NO! Just checking. I have often made the statement that once modulation is placed on a carrier and put to the final amplifiers destined for the antenna that the RF produced is RF, plain and simple, and it does not matter whether it is CW, AM, SSB, QPSK, FT-8, DMR, Fusion or one of the hundreds of modulation techniques. RF is RF and the antenna sees only RF. The antenna is designed only for pattern, bandwidth, power level and matching transmission line feed impedance.... but not necessarily in that order. Applying these thoughts to Ham Radio, a neophyte Technician level ham setting up one of the latest popular modes, DMR or FT-8, to communicate locally or around the world, will be using the same antenna designs that have been around for many years....some designs maybe a century old. Nothing special for the contemporary DMR radios. Use just a plain old Hertz or Marconi antenna...modified for more gain or directionality, etc.

The antenna is where the RF meets space...similar to the old Firestone marketing catch phrase "where the rubber meets the road". On the road it does not matter whether you are a car or truck or many other vehicles; you use tires where the rubber meets the road. Just like all transmitters and receivers use antennas where RF meets space. Vehicles have different tires depending on the use of the vehicle, just as we hams have a different antennas only depending on the frequency and desired physical range we wish to attain.

As stated 2 months ago in my "Impedance of Space" diatribe, you can't do anything about the impedance of space, so it is best to concentrate on antenna attributes, which we do have control over and can design to an on-air advantage. And that is the point of this particular Radio Hotel diddy. You need to apply certain antenna designs to certain usages of RF with specific requirements like local, directional, omni-directional, NVIS, DX , etc. but not the mode of modulation.

In summary, antennas are the one part of the total RF chain that has not changed drastically. Look between your microphone and the final PA, there has been a lot of development and implementation of strange and wonderful things, like digital filtering or SDR -- software defined radios. Just because you are using the latest FT-8 software to make contacts around the world with less power than your spare refrigerator in your garage, does not mean you have to go nuts on some esoteric antenna. When you can control the gain and direction of your antenna please do so, but where you can't and you can just barely get up a  $\frac{1}{2}$  wavelength dipole, then just barely get up that half-wave dipole (horizontal or vertical) and have some fun traveling thru space on an antenna you built and put up. Fully enjoying that interface "where the rubber meets the road".

Enjoy your hobby – Rick --- W5RH

Next time.... Gain – The Final Frontier

The purpose of **The Radio Hotel** is to give you a practical kick start into exploring the workings of antenna systems. Google the buzz words and find out what they mean. Read up on antenna system theory to see how it all works together. You will be glad you did.