

Active Dipole Experiences

Dallas Lankford, ca. 2000, rev. 10/6/2009

A few days after I built the CP651 active whip in August 2K I decided to built an active dipole using two of the active whips and a balun (about 20 feet above ground). I wanted to know if a push-pull active circuit would have higher 2nd order intercepts (it did), and if an active dipole would have figure 8 reception pattern similar to a loop antenna (it did). I also wanted to know if it would be a good antenna to use with a whip for LW null steering with my modified Misker phaser (it was).

Curiously the active dipole produced lower ground wave (daytime) signal levels in the upper MW band than the active whip; I do not know if this is because an active dipole is less sensitive to vertical polarization, or because of some other reason. Skywave (nighttime) MW signal levels were not as attenuated for the active dipole in the upper MW band. When the dipole was mounted vertically, ground wave (daytime) signal levels throughout the MW band were about the same as the whip.

Later I found a short article, "Horizontal Antennas Above Real Ground," by Ralph Holland, *Amateur Radio*, Vol. 64, No. 10, Oct. 1996 from which I quote as follows.

"Horizontal antennas are subjected to the influence of a broadside image in the ground. The antenna and its image are in anti-phase, so radiation tends to be canceled at low angles and the radiation resistance is lowered because the mutual impedance of the image is subtracted from the self-impedance of the driven element."

This could also account for the lower ground wave (daytime) signal levels in the upper half of the MW band produced by active dipole antennas compared to active whip antennas. Because of the reduced signals below 3 MHz into the upper MW band, I recommend against dipole antennas, active or otherwise for a lower frequency antenna. Based on recent measurements by Terry and me, a ground rod does not improve the signal to man made (or atmospheric) noise ratio of the active dipole antenna.

However, a horizontal flag array for 160 meters and 80 meters developed by N4IS has shown a much better signal to noise ratio than other antennas. But this could be due, in part, to the better RDF of his flag array or, in part, to the different frequencies.

