Windom Antenna

Off-Center fed vs. Center-fed

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Ran some models of both a center-fed dipole and a Windom on NEC-2. I used 40 meters (67') at 7.15 MHz #14 copper wire for convenience. Results can be extrapolated to other lengths.

Pattern

Feeding the Windom up to 12.75' off center has no measurable effect on the pattern, either on free space models or at various heights above ground. The patterns are identical. Even end-fed, the pattern offset is a mere 0.03 dB.

A half-wave length long antenna has essentially the same pattern, wherever along it one places the feedline. The pattern changes more radically with height above ground. At a 35' height for a 40-meter antenna, the pattern of an oval, with maximum radiation at 60 degrees upward. At a height of 67' (about a half wavelength up), the pattern is like a peanut, with maximum radiation at about 29 degrees up.

Feed-point impedance

As one moves outward from the center point, the impedance rises from about 70 ohms to about 100 ohms at 12.75' outward from center. If initially resonant, it remains resonant (i.e., little or no reactance). However, at heights below 1 wavelength, the feed point impedance will change a good bit. Between 35' up and 67' up with a feed point 10' out from center, the feed point impedance changed 20 ohms resistive and 30 ohms reactive.

Why a Windom

The sole reason for a Windom is the ability to set up the feed point for a common feed system that requires no adjustment on the lowest band and on even harmonics. There may be for some a mechanical reason for a Windom, for example, to place the feed point where it makes a shorter straight run to the operating position.

There is no advantage to a Windom in performance as an antenna relative to an antenna of the same length fed at a different point--like the center.

Center feeding for multiband operation is likely to yield better results on odd harmonics and on WARC bands, relative to finding ATU settings for efficient power transfer and best matching. Even harmonics are also usually no problem for an ATU. Hence, if using an ATU is not a problem and center feeding is mechanically feasible for a yard layout, then center feeding is usually simplest.

For a single horizontal wire of a given length, the feed system does not change antenna pattern or basic performance (although, a badly chosen or maladjusted feed system can adversely affect performance by not transferring power effectively).

A half wave wire performs like a half wave wire, whether we call it a Windom, Zepp, or dipole. A 102' piece of wire performs like a 102' piece of wire, whether we call it a non-resonant multiband dipole or a G5RV.

Rules of thumb, whether you pay $100 for a kit or make your own:

1. Get the antenna as high as feasible.

2. Make the antenna as mechanically sound as possible.

3. Make all electrical connections secure and durable, and able to withstand the chemical soup called the atmosphere.

4. Clean and maintain the antenna periodically--at least once per year. Remember: wire and feedline age, but so slowly that we may not notice the decreasing performance until we do notice that the other operator is making all the contacts we used to make.

Most of the claimed outstanding performance in advertising testimonials for various configurations of single wire antennas comes from attention to the installation details the manufacturer provides. We tend to overlook home brew installations, not from any special difference in the antenna patterns, for equal length pieces of wire up the same number of feet.

Incidentally, the single-wire fed Windom is not a horizontal antenna, but essentially a vertical with an unbalanced flat-top, which produces some horizontally polarized radiation at lower antenna current levels than the vertical portion of the antenna--which has traditionally been called a single-wire feeder, but which radiates like any other vertical radiator.

Radiation in the shack from this arrangement is like radiation from any end-fed antenna - it likes a ground plane or counterpoise. Parallel fed Windoms--or even End-fed Zepps - show little imbalance between the parallel lines, either in practice or in models, despite some of the abstract arguments for imbalance. If an end-fed Zepp or parallel-fed Windom shows excessive feedline imbalance resulting in shack RF, the most likely cause is less-than-optimum feedline installation--which would yield the same effect even for a center-fed antenna.

Take your time with antenna installation, no matter how basic the design. The better-installed antenna performs better longer.