Antenna Facts #5

MULTIPLE ANTENNAS ON THE SAME MAST: I'm often asked how much spacing is required when placing dissimilar antennas onto the same mast with one of our LPs. The following should help to explain my standard, "A minimum of 1/10 of a wavelength at the lowest operating frequency" reply, which is generally followed by my, "More is better." With this, you can calculate your own requirements, the object is to keep adjacent antennas, of the same polarity, and their **Effective Apertures,** away from and out of the Effective Apertures of other antennas. You must consider the Effective Apertures of all antennas under study, the spacing requirement is cumulative.

The **EFFECTIVE APERTURE** (Area) of an antenna is calculated by: $A = \frac{\text{Wavelength}^2 \ G}{4 \text{ pi}}$ (All calculations are in feet)

A = Effective Aperture, or Area
G = Power multiplier (**NOT dB**) (Example: A +5.0 dBd antenna = Inverse Log of 5.0/10 = 3.16 = G)

Therefore, on 20M: $A = \frac{69.25^2 \times 3.16}{12.566} = 1206 = A$

The **radius** of this Effective Aperture is then determined by: $\frac{A}{4.189} = r3 = 1206/4.189 = 287.9 = r3$

Therefore, the **Radius** (r) **of Effective Aperture** in this illustration is: r = 6.6 feet

EXAMPLE: We want to stack one of those loaded 40M beams 10 feet above our 5.0 dB 20M antenna. Advertising aside, the reality gain of the 40M, loaded beam is in the area of 2 dB, which gives us a Power Gain of 1.58.

Therefore, on 40M: $A = \frac{137.3^2 \times 1.58}{12.566} = 2370$

The **radius** is then: 2370/4.189 = 565.8 = r3 = r of 8.3 feet

The total stacking space thus required is 6.6 + 8.3 ft = 14.9 feet

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