



1/4 Wave Ground Plane Antenna Calculator

Speed of Light = 299,792,458 m/s = 300 = s

Frequency = Operating Frequency in MHz = fo

Velocity Factor (see text*) = constant for 50 ohms cable = 0.95

Results is in meter.....

Meter -> Inch = 1 meter = 39.3701 inches

Formula:

$$\lambda = s / fo$$

$$\text{Vertical Monopole Radiating Element} = (\lambda * 0.25) * vf$$

$$\text{Radials} = (\lambda * 0.28) * vf$$

Actual wavelength approximate rounding off to = 81.3990 or 81.4 inches

Substitute from the formula for 145.000 MHz

$$\lambda = s / fo \text{ (meters)}$$

$$\lambda = \frac{299,792,458}{145,000,000} = 2.0675 \text{ meters}$$

Converting to inches by multiplying wavelength results to 39.3701

$$\lambda = 2.0675 \times 39.3701 = 81.3990 \text{ inches}$$

Hence:

$$\lambda = 81.4 \text{ inches}$$

$$vf = 0.95$$

Solving for quarter wavelength:

$$\text{Radiating Element} = (\lambda * 0.25) * vf$$

$$= (81.4 \times 0.25) \times 0.95 = 19.3325 = 19.4$$

$$\text{Radials or whisker} = (\lambda * 0.28) * vf$$

$$= (81.4 \times 0.28) \times 0.95 = 21.6524 = 21.7$$