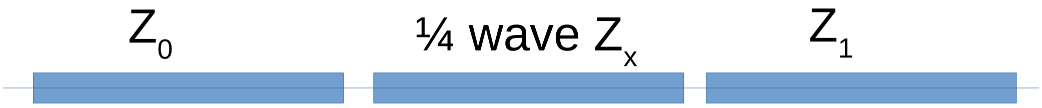
The magic of ¼ wave matching sections

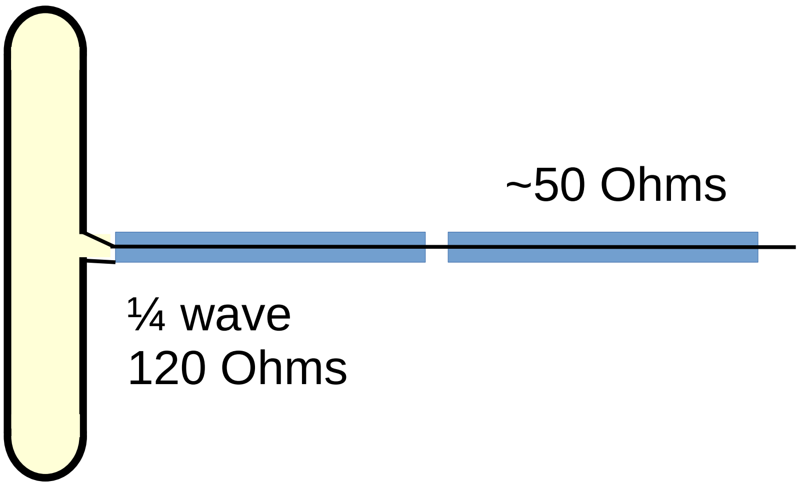


Suppose we want to match an antenna that has
A feed point impedance of 300 Ohms to 50 Ohm Coax
The ¼ wave matching section impedance can be calculated
As follows, mutiply the input and output impedances together and
take the square root, that's the impedance of the matching quarter
wave section.

$$Zx = \sqrt{Z_0 x Z_1}$$

For a folded dipole with equal element diameters the feed point impedance is 4x the non folded impedance, so if we take 70 to 75 Ohms as the dipole impedance then the folded dipole Will be 280-300 Ohms at the feedpoint.

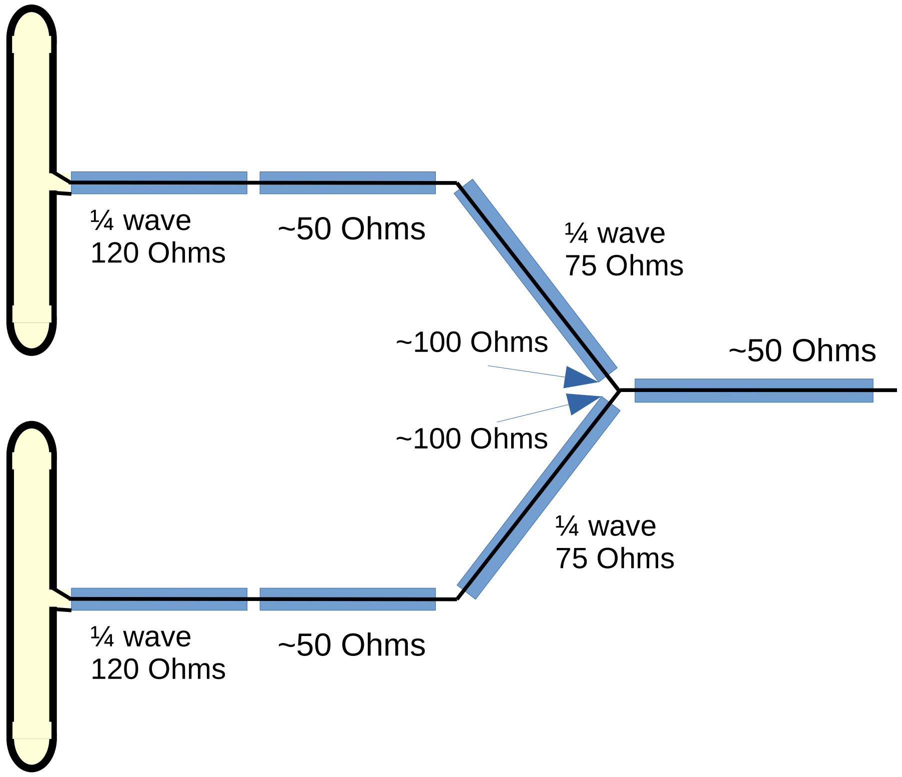
$\sqrt{280*50}$ = 118 Ohms $\sqrt{300*50}$ = 122 Ohms



It's common practice to run the ¼ wave matching section inside the hollow antenna element, in effect creating a sleeve balun

Feeding multiple folded dipoles, we want to transform the 50 ohms to 100 ohms so the two dipoles can be paralled to get Back to 50 ohms. Using the formula from the previous page

$Z_o = 50$, $Z_1 = 100$ $Zx = \sqrt{50*100} = 70.7$ Ohms



The ¼ wave sections must be corrected for the coax velocity Factor and is best measured with a VNA,

Ray VK3YNV