ABSTRACT

Monotriangle 0,3 GHz – 3,0 GHz Chebyshev - Unidirectional Hexacula Antenna is designed on two purposes, they are:

1. To supply a wideband unidirectional antenna prototype so it can be used by some operators at once therefore economize the load of tower.
2. To prove the hypothetic of first advisor which told antenna is a device which used as a transformator between free space and transmission lines

The Specifications of antenna that must be fulfilled are the working frequency 0,3GHz-3,0GHz in VSWR max. 1,5 at 50Ω unbalance, gain min. 2,14 dBi, unidirectional pattern and linear polarization. This antenna was constructed with two strip rows, by using chebyshev transformator which is used in air or vacuum. This device is also using monotriangular as balun to deliver a wideband antenna without any coil.

Based on twin rows strips theory, construction is obtained (with the materials and size), like this: N = 5,098 ≡ 6 degree, ε_{r1}= 3,78 (glass, l_1 = 23,3 mm),), $\varepsilon_{r\,2}$= 2,96 (asturo paper, l_2 = 26,4 mm), ε_{r3} = 2,25 (puzzle, l_3 = 30,3 mm), ε_{r4} = 1,96 (STT date paper, l_4 = 32,4 mm), ε_{r5} = 1,49 (present paper, l_5 = 37,2 mm), ε_{r6} = 1,16 (Styrofoam, l_6 = 42,1 mm). This antenna is also using brass strip with its size 0,344 mm (w) x 191,7 mm (l) x 20 mm (s). Monotriangular feed was built by 90^0brass pieces, 20mm in height, terminal 50 Ω unbalance.

By measurement of these specification in IT TELKOM's garden , the results are : in VSWR maximum 1,5 , the working frequency 975,20 MHz – 2814,01 MHz at terminal Zt 50Ω unbalance, the value of gain 9,34 dBi at 1.650 MHz , ellipse polarization. The hypothesis has been proved, it can be seen that all the results are proper to the specification, only the lower frequency and the polarization out of plan. To widen the range frequency 975,20 MHz – 2814,01 MHz by decrease the lower one should be done by attach the monotriangular feed more closer to the material and keep the conductor strip away from the monotriangular feed. For the ellipse polarization, it can be a linear one if it is measured in anechoic chamber with pencil beam antenna.

Keyword : *unbalance, chebyshev, monotriangular,* dan *prototype.*