ABSTRACT

Hexacula Binomial Unidirectional Antenna with 0,3 GHz – 3,0 GHz is designed on two purposes, which are :

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

The specifications of antenna that must be fulfilled are 0,3 GHz – 3,0 GHz working frequency in VSWR maximum 1,5 at 50 Ω unbalance, gain minimal 2,14 dBi, unidirectional pattern and linear polarization. This antenna was constructed with two strip rows, by using binomial transformator which 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 materials and size : N = 0,64 = 1 degree, ε_r =1,257 (stryrofoam, l = 40,54 mm), using brass strip with size 5,1 mm in width (w) and 30 mm in space (s). Monotriangular feed was built by 90° brass pieces, 30 mm in height, 50 Ω unbalance terminal.

By measurement of these specification in IT Telkom's garden, the results are : in maximum 1,5 VSWR, 0,9 GHz – 2,75 GHz working frequency at terminal Z_T 50 Ω unbalanced, the value of gain 3,491 dBi at 1,65 GHz, ellipse polarization and unidirectional.

To widen the frequency range, we can increase the space (s) of antenna and repair the feed used. To make sure that we can get linear polarization, it is suggested to measure in anechoic chamber with pencil beam antenna.

Key word : Hexacula Unidirectional, Binomial, Linear, Styrofoam, Monopol