ABSTRACT

DESIGN AND REALIZATION OF EXPONENTIAL-UNIDIRECTIONAL-CATURCULA-ANTENNA 300 MHZ – 3000 MHZ VSWR MAKS 1,5:1 TERMINAL 50Ω ENGLAND FEED ST.EE0926-CEU-0709

Exponential Unidirectional Caturcula Antenna (300-3000) MHz 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 transformation between free space and transmission lines

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

Based on twin rows strips theory, construction is obtained (with the materials and size), they are: length of element antenna is 30 cm which scale by n=3, value of ε_r from calculation is variant from 1.0 to 2.16 along the lines so the dielectrics can be variant too such as swallow slipper, kardus paper, A4 80 and 70gr paper, newspaper, book paper, and styrofoam.

This antenna is also using brass strip with its size 1 & 0.5 cm (w) x 30 cm (l) x 3 cm (s). England triangular feed was built by brass pieces, 3 cm in height, terminal Zt 50 Ω unbalance.

By measurement of these specification in IT TELKOM's garden , the results are : in VSWR maximum 1,5 , the working frequency 900 MHz- 2685MHz at terminal Zt 50Ω unbalance, the value of gain 7.55 dBi at 2,4 GHz , ellipse polarization and unidirectional pattern.

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 because incomplete condition of measurement. It must measure in anechoic chamber with pencil beam antenna. So, the creation of anechoic chamber and pencil beam antenna must be considered and supported by IT Telkom for the development antenna its self.

Keyword: twin rows strips, exponential transformator