ABSTRACT

Antenna are already developed for various applications. But usually the result of measurement and testing of the antenna is not accurate and maximum. This is caused the transmitter antenna (reference) in the antenna measurement and testing is not pencil beam. Therefore, antenna pencil beam is very urged to be realized for measuring and testing antennas. Helical antenna was chosen as an elementary antenna because the antenna required must have wide frequency band. This antenna will be made linear polarized, it is according to a widely used antenna in telecommunications. This antenna will be made from goods that are around us to optimize in terms of price and quality.

Given that the total gain (G) of the order of N rows $\times$ M columns that is feeded uniform (current, voltage, and phase) is G = M $\times$ N. In this case was chosen for the size of matrix that can produce $\theta 1 = 2^o$ and $\theta 2 = 2^o$. $\theta 1$ and $\theta 2$ is the width of beam radiation patterns at two orthogonal fields. From the calculations is obtained matrix that required is 9×9. Because of constraints of time and the costs, that will be realized is one sector that consist of array 2×2.

From the result of measurements obtained bandwidth with VSWR ≤ 1.5 is 642.45 MHz (28.55%). Impedance of antenna 52.04 + j10 Ω, 72 Ω , radiation pattern is unidirectional , polarization is ellipse almost linear, and gain is 18.23 dBi that achieved at a frequency of 2250 MHz. With HPBW azimuth 18° and HPBW elevation 9°. From the results of measurement, to obtain HPBW of antenna pencil beam, the antenna must be consist of array of sector as much 15×15.

Keywords : Antenna Pencil Beam, Helix Array, Linear, 1500 - 3000 MHz.