ABSTRACT

The X-Band radar can be used to detect targets by emitting an echo signal which is then reflected back by the object. For transmit, echo signals required radiation patterns that match the dimensions of the object. Therefore, it requires beam forming or radiation pattern formation. Getting the radiation pattern can be done by changing the current distribution of the amplitude or phase.

Changing the radiation pattern in this Final Project uses the Dolph-Tchebyscheff current distribution. This current distribution is applied to microstrip antennas with rectangular array patch 1 x 4 to 1 x 10. This observation uses a comparison with an isotropic array antenna as a reference. Besides that, the final result of a rectangular patch microstrip antenna using Dolph-Tchebyscheff's current distribution will be compared with Uniform and Binomial current distribution to see the effect of current amplitude input on each n-element on the radiation pattern.

This Final Project has analyzed a 1 x 10 microstrip array antenna with Dolph-Tchebyscheff current distribution at Side Lobe Level (SLL) 33 dB as an antenna that can work optimally at X-Band frequency or at 9,50 GHz. At this antenna, the second-largest total field is obtained after the Binomial current distribution. The total field value of the antenna is 223,99 volt/metre and the return loss is -12,00 dB. Also, a beamwidth value of 19,80° is obtained. The radiation pattern of this antenna also shows a directional direction.

Keywords: *radiation pattern, beamwidth, return loss, Dolph-Tchebyscheff*