

## ABSTRACT

Indonesia region is surrounded an ocean and often occur crime in the territorial waters of Indonesia. there needs to be a security system that can anticipate such actions by implementing RADAR (Radio Detection and Ranging) system to detect ships passing through Indonesian waters. To support the function of this technology required a device that is antenna. To get the antenna with the appropriate result is by modifying the antenna dimension designed using the antenna array technique by using microstrip line tracing technique with rectangular patch antenna.

This final project is about the design, manufacture, and realization of rectangular array 4 patch microstrip antennas for radar applications that work on frequencies 1.3 Ghz (L-Band) and a value  $VSWR \leq 2$ , bandwidth  $\geq 60$  Mhz, unidirectional radiation pattern, and linier polaritation. Microstrip antennas working at low frequencies in order to obtain wide beamwidth and design proposed the fairness guarantees with the complexity of waking time. To simplify the design process used simulation software. This final project begins by calculating the dimensions of the antenna. The dimension of the calculation result used in the simulation process. Modified antenna dimensions are used as a way to obtain optimum results in the simulation.

Results of antenna measurement parameters indicate that at frequency of 1.3 GHz, has a -12.261 dB return loss and VSWR 1.644, impedance is  $31.170 \Omega$ , gain 5.34 dB, and bandwidth 30 MHz at the intersection of  $VSWR = 2$ .

**Key words:** *Antenna, Rectangular, Microstrip, L-Band*