

ABSTRACT

Territorial waters of Indonesia are very large and it is rich marine product so making this target areas and vulnerable to a variety of crimes. Therefore, there needs a monitoring in Territorial waters of Indonesia using a equipment 'radar detectors'. The radar detector will be mounted on a ship and used to detect the radar beam around the ship. Any device that supports a radar detector is an antenna.

In the final project that entitled "Design of Ultra Wideband (UWB) Elliptical Antenna based on Microstrip for Monitoring Radar" discussed on how to design a small dimension antenna but can produce a wide bandwidth. Antennas that will be made is ultra wideband microstrip antenna (UWB) using microstrip line feed rationing techniques to form elliptical patch. Substrate material used is FR-4 epoxy with $\epsilon_r = 4.4$. In designing this antenna dimensions used mathematical analysis and simulated with CST Microwave Studio 2010 software to obtain the antenna according to desired specifications, and then performed the antenna fabrication. After the fabrication, antenna measurement and analysis comparison of the results of measurement and simulation.

The designed antenna is a receive only on the radar detector. In the simulation and measurement results of this antenna have shown the ultra wideband (UWB) with a working frequency range 2-18 GHz and is capable of receiving from the radar beam around the S band (2-4 GHz), C band (4-8 GHz), X-band (8-12 GHz) and Ku band (12-18 GHz), has a $VSWR \leq 2$ for all frequencies but for the frequency range of 2 GHz has a $VSWR > 2$, has a wide bandwidth up to 15 GHz, and a low gain is 2.381dBi because only the working principle of this antenna as a receiver that does not require high gain. Based on the results of measurements, the result of radiation pattern is omnidirectional and the polarization is ellips which approached linear polarization based on the calculation of the ratio of electric field strength.

Keywords: radar, microstrip antennas, ultra wideband (UWB), radar frequency band