

## ABSTRACT

Electronic Support Measure (ESM) is an electronic defense system that functions to analyze the electromagnetic wave signal emitted to obtain the location and strength of the signal. In this final project, the authors design a rectangular microstrip antenna at the S-Band frequency, which functions as a receiver antenna in the ESM system. The specifications of the antenna are a return loss of  $\leq -10$  dB and VSWR  $\leq 2$  with a wide bandwidth of 2 GHz, a gain of 1 - 8 dB with radiation pattern of unidirectional and linear polarization.

Rectangular microstrip antenna which is designed as a receiver antenna in ESM systems uses FR - 4 Epoxy material. Conventional microstrip antennas tend to have narrow bandwidth. Based on these conditions the antenna will be designed using parasitic patches with proximity coupled. The design process in this final project is that the rectangular microstrip antenna will be simulated using simulator, and then optimized using proximity coupled with parasitic patches. After simulation and optimization, the antenna will be realized by means of fabrication. Then the antenna will be measured to find out whether the antenna meets specifications.

The design results of the rectangular proximity coupled microstrip antenna with parasitic patch are obtained from measurements at the center frequency of 3 GHz. These results are a VSWR of 1.6659, a return loss of -11,981 dB, with bandwidth of 2 GHz. Gain of 5.3 dB. As well as the unidirectional polarization and the polarization of 31,6227766 dB which makes this antenna elips polarized, for the resulting gain of 5.3 dB at the center frequency. With these specifications the microstrip antenna can be used in the Electronic Support Measure system at the S-Band frequency.

**Keywords** : Electronic Support Measure, rectangular microstrip patch, S-Band, parasitic patch, proximity coupled, FR – 4 Epoxy