

## ABSTRACT

Indonesian Institute of Sciences (LIPI), particularly in the field of telecommunications technology to develop UWB (Ultra Wideband) on Radar Detectors. One of the warship equipment is ESM (Electronic Support Measurement) which serves as a radar detector in the vicinity. ESM is a passive equipment with the aim of detecting and making measurements of the electromagnetic waves emitted from the radar system in its environment. The measurements were conducted on the frequency, pulse width, pulse amplitude, pulse repetition interval and intra - pulse modulation. In fact, the frequency of the radar used on UHF frequencies, C - BAND, S - BAND and X - BAND, To cover the operating frequency of the radar is needed applications with working frequency UWB (Ultra wideband ). One antenna that can cover the frequency is having a spiral antenna polarization right-hand or left-hand and the input impedance of about 180  $\Omega$ . Spiral antenna has a HPBW (Half Power Beamwidth) around  $70^\circ - 90^\circ$ <sup>[11]</sup>. So at the end of the task requires elevation and azimuth beamwidth of  $60^\circ$  as it will be made six sectors.

Based on the above conditions , in this study made the Archimedean spiral -shaped microstrip antenna. This antenna works at a frequency of 0.5-18 GHz with VSWR  $\leq 2$  limits the ability to meet transmits good data, designed antenna has a gain of  $\geq 3$  dBi. While the radiation pattern of the antenna is bidirectional spiral and circular polarization RHCP .

In this final project has been designed and realized an Archimedean spiral microstrip antenna two arms (two arms) to form a low profile. Using the antenna simulation using CST simulator 2010 and the realization of the microstrip Duroid made of Rogers RT 5880 with  $\epsilon_r = 2.2$  and  $h = 1.575$  mm. the results obtained from the design value of VSWR  $\leq 2$ , the frequency of 1112-18 GHz, whereas  $\geq 3$  dBi gain at frequencies 2-18 GHz. RHCP circular polarization and radiation pattern is bidirectional. Dimension size obtained was 6.96 cm in diameter.

**Keywords : ESM , Spiral Antennas , HPBW , microstrip , circular RHCP**