

ABSTRACT

Radar Detection and Ranging are electromagnetic systems that detect targets from the reflection of the emitter. The target can be from airplanes, ships, humans and all natural conditions that occur. One type of radar is the air surveillance radar, which is able to monitor the movement of aircraft and other objects that pass through the area around the radar even at a distance away. Antenna is a very crucial component that can determine the work of the entire radar system. For optimization of radar performance, an antenna is needed which can increase high gain. The surveillance radar operated in the S-Band frequency range (2-4 GHz), minimal weather disruption and does not require more space for the antenna.

To improve the radar antenna performance in this final project a helical antenna was designed and realized which was arranged as much as 1×8 using a rectangular plane. Antennas designed using antenna design software. For the realization of the antenna using aluminum as a rectangular plane and L-Shape and copper (copper) as conductor material (wire) by using an N connector on the rectangular plane.

The helical array antenna 1×8 as a result of this final project works at a 3 GHz frequency (S-Band) with elliptical polarization, with a *return loss* value of -14,078, the value of VSWR 1,49, Gain 12,04 dBi and *bandwidth* 577 MHz. The realization of the helical antenna has dimensions of 420 mm \times 56 mm \times 49 mm

Kata Kunci : Radar, *Air Surveillance Radar*, S-Band, *Heliks*, *Array*