ABSTRACT

Radar (Radio Detection and Ranging), which means the radio wave detection which is used to detect, measure distances and map objects such as airplanes, military, and weather information. One type of radar is Air Defense Radar, these ones is an air defense radar capable of detecting targets in the air include the position and velocity. The radar maximum range exceeding 300 miles and reached 360^0 in azimuth . In Air Defense Radar's system needed a transmission medium that is antenna. For conventional radar system, radar antenna is rotated using rotator which allow the antenna scanning the area around them. Array antenna application allows electric scanning in the radar antenna, which is not change the mechanic position of antenna but the radiation pattern can be directed with controlling as needed. One method is control the supply current phase in antenna. Thus, the weakness of conventional radar antenna that requires a great power to rotate the rotator can be solve.

Phased Array Antena is an antenna composed of several pieces of antenna elements with the phase between the elements is a variable so that radiaton pattern of antenna can be changed by a phase change .

Antenna designed and simulated with software which have design microstrip antenna and realized using a substrate material Duroid Rogers 5880 with a value (ε_r = 2,2 dan h=1,57 mm). Antenna works at a X-Band (9,37 – 9,43 GHz) frequency that produces VSWR are 1.101, 1.104 , 1.106 , 1.109*, linear polarization, Gain 18.636 dBi and undirectional radiation pattern. Antenna has 256,6 × 37,88 x 1,535 mm dimension and electrically able to shift the phase until 20^0 and 30^0 with phase difference of 70^0 dan 90^0 using a variation of supply cable. With these specification , the phased array antenna is work well for the performance of air defense radar.*

Keyword : Phase Array Antenna,Phase shifter, X-band