

ABSTRACT

Radar (Radio Detection and Ranging) is a monitoring tool used to replace the human eye because the ability of the human eye to monitor and observe objects is quite limited, one type of radar is a 3-dimensional radar, this radar is a radar with technology that has the ability to determine distance, azimuth and target height in one scan. At this time, the Radar has been used by the Air Force as one of the elements of the national air defense system.

In the radar system, the transmitter and receiver are needed, namely the antenna. one method to increase the gain on the antenna using an array antenna. Radar works by scanning an area with a certain radius using a rotator 360° so that the object can be detected in all directions, by using a phased array antenna application, mechanically scanning the area can be replaced by a dielectric, on a phased array antenna , phase variations can be adjusted by giving different supply cable lengths for each element of the phased array antenna so that it can replace the rotator function in scanning the area as a whole.

This final project is to design and realize microstrip vival antenna in 1x16 phased array operating at a frequency of 2.9 - 3.1 GHz. The antenna that has been designed has a dimension of 110mm x 1000mm and uses FR-4 epoxy as its substrate material. The realized antenna produces a VSWR value of 1.106 a gain of 13.826 dB and a unidirectional radiation pattern and in this antenna the phase variation is regulated by giving a different supply cable length for each phased array antenna element and a phase shift in the 25° azimuth radiation pattern that produces shifting the beam by 9.70° against main lobe at 177°.

Keywords : Radar, S-band, Antena Phased Array.