

ABSTRACT

Every flying vehicle requires altitude parameter for landing process purpose, giving information for the existence of rising terrains and high-fixed building while it operates on air which is above the surface of the earth. Therefore, it takes a radio altimeter device to measure the height of the aircraft against the ground level (earth surface). Radio altimeter itself works on the frequency of 4.3 GHz which uses antenna that has a beam size of $50^\circ \times 60^\circ$ with gain ≥ 10 dB.

In this final project, a 2x2 microstrip array antenna has been conducted that is qualified in the matter of the beam size to be used for this application. Despite being small and thin as its advantage, microstrip antenna has a deficiency of low gain. Thus, the array method is chosen as one of various methods to increase the gain value. To obtain a $50^\circ \times 60^\circ$ beam size, the distance between irradiating elements is adjusted in order to reach the desired beam.

The beam size of $50.2^\circ \times 60^\circ$ has been obtained in the simulation using CST Studio Suite 2017 simulator by giving a 0.27λ distance for the top - bottom spacing and 0.224λ for the left - right spacing. The 2x2 array microstrip antenna that has been fabricated and measured has a bandwidth of 147 MHz with VSWR value of 1.2444 and a return loss of -19.26 dB. Using the array method on the antenna has increased the gain value, reaching a value of 6,695 dBi.

Keywords : Radio Altimeter, microstrip, array, beamwidth