

ABSTRACT

In the modern era, the field of telecommunications is growing rapidly, both in the civil and military fields. Aviation and even the development of the telecommunications sector are very advanced, ranging from RADAR communication tools to Automatic Dependent Surveillance - Broadcast (ADS-B). ADS-B is a RADAR non-flight monitoring system. An aircraft equipped with a transponder automatically sends flight data. Flight data such as position and speed are obtained from the Global Navigation Satellite System (GNSS) navigation satellite system. Flight data transmitted on this broadcast will be received and processed by the receiving station (ground station). In the ADS-B system for the ground station is a receiver system of data sent by the aircraft at a frequency of 1090 MHz using an antenna.

Antenna is a device that plays an important role for ADS-B communication, the signal reception is fulfilled with the development of the antenna which leads to large gain and bandwidth. Therefore, this Final Project designed an Antenna with specifications having a frequency of 1090 MHz, $VSWR \leq 2$, return loss ≤ -10 dB, bandwidth of 20 MHz and a minimum gain of 3 dB. The design of this antenna uses FR4 substrate material, and is simulated with CST Studio Suite 2019.

Based on simulations in the 2019 CST Studio Suite, at a frequency of 1090 MHz the return loss value is -29.2 dB, VSWR is 1,071, the bandwidth is 113 MHz and the gain is 3.3 dBi with omnidirectional radiation patterns and vertical linear polarization. Whereas the measurement obtained return loss value of -23.8 dB, VSWR of 1,134, bandwidth of 150 MHz and gain of 3.03 dBi with omnidirectional radiation patterns and elliptical polarization.

Keywords: CST Suite Studio 2019 Software, ADS-B, Microstrip Antenna, Aircraft