ABSTRACT

Air Navigation Engineering is closely related to supporting aviation telecommunications facilities. These facilities are divided into four parts, including: Communication, Navigation, Surveillance (observation) and Automatic (automation). Nowadays, with increasingly developing technology, aviation telecommunications service facilities also go hand in hand with the transfer of technology connected to satellites. Automatic Dependent Surveillance Broadcast, or ADS-B, is a flight surveillance system that aims to transmit flight data received from satellites, such as the position and speed of aircraft. ADS-B uses Global Navigation Satellite System (GNSS) technology to locate transponders and ground stations. ADS-B is a receiver that works on the 1090 MHz frequency.

The antenna plays an important role in receiving electromagnetic waves which are then processed at the ground station. ADS-B antennas are generally omnidirectional antennas with vertical polarization. Microstrip antennas have been used in various fields, especially in health, military, cellular and satellite communications. Its uses are varied due to its small size and light weight. Fast and cost-effective fabrication is important when it comes to antenna prototyping. The microstrip antenna has three parts which are divided into 3 layers, namely groundplane, substrate and patch. This antenna operates at 1090 MHz using an FR4 substrate. The feed 2 series microstrip patch antenna was simulated with CST Suite Studio software, the results of which were realized in physical form. The antenna shape is expected to be designed using the MIMO method so that the distance can be far apart, which will increase the ADS-B interception distance. The antenna is connected to a 4-way power combiner.

It is hoped that the measurement results on this microstrip antenna will show that the antenna has a wide bandwidth and can work at a frequency of 1090 MHz with a VSWR value ≤ 2, S11 ≤ - 10 dB, and a minimum gain of 2 dB.

Keywords: *CST Suite Studio Software, ADS-B, Microstrip Antenna, Plane*