ABSTRACT

Automatic Dependent Surveillance Broadcast is an air surveillance system that is used to determine aircraft position, aircraft code, altitude, and other data. ADS-B periodically transmits information and other data to other aircraft, to satellites, and to ground stations. The ADS-B system is located on aircraft operating using satellites [6]. ADS-B has 2 types, namely ADS-B in and ADS-B out.

This ADS-B system also allows data communication between aircraft. In the ADS-B system for the groundstation section, it is a receiving system for data sent by aircraft at a frequency of 1090 MHz using an antenna as a medium for receiving signals sent from the aircraft.

Antenna is one of the devices that plays an important role for ADS-B communication, signal reception is fulfilled, with the development of the antenna leading to large gain and bandwidth. This antenna works at a frequency of 1090 *MHz* using an *FR-4* (*Epoxy*) substrate. The microstrip series feed 2 patch antenna is simulated using simulation software whose results will be realized in physical form, the antenna shape is designed using the MIMO 1×2 method, with a distance that can be far apart, thus expanding the capture distance of ADS-B. The antenna is integrated with a 2 way power combiner to increase the gain value. The specifications specified for this antenna are that it can work at a frequency of 1090 MHz with a VSWR value of 2, a minimum gain of 4 dBi, a bandwidth of 20 MHz, an omnidirectional radiation pattern, linear polarization, and an impedance of 50 . The results of the antenna realization obtained VSWR parameters of 1.32, Gain 4.40 dBi, Bandwidth 16 MHz, Omnidirectional Radiation Pattern, Elliptical Polarization, and Impedance of 42.04. Judging from the overall parameters, the realized antenna still does not meet the desired specifications for the ADS-B receiving antenna at the Ground Station because there are still parameters that are not on target.

Key words: ADS-B, Microstrip Antenna, Series Feed 2 patch, MIMO, Power Combiner.