

ABSTRACT

Automatic Dependent Surveillance Broadcast (ADS-B) is a data transmission technology that is transmitted by aircraft. It consists of the aircraft's identity and position. The problem faced at Indonesian airports is the limited surveillance equipment available at each airport, especially ADS-B equipment.

The solution offered for flight navigation security technology is to design an ADS-B Receiver. ADS-B receiver antenna with microstrip patch rectangular type at 1090 MHz frequency, the amplifier used is LNA with PGA-120+ component type, Wi-Fi transmitter system consisting of Wi-Fi antenna with microstrip patch rectangular type at 2.4 GHz frequency and Wi-Fi module with RTL8188ETV type, and ADS-B receiver consisting of radio module with RTL2832U/R828D type and Raspberry-Pi 4 used as research method in designing ADS-B 1090 MHz signal receiver monitoring system. The ADS-B transmitting signal is received by the ADS-B receiving station on the ground for further processing and display through the monitor screen.

The ADS-B receiver antenna, LNA, Wi-Fi transmitter system, and ADS-B receiver form a complex ADS-B receiver system. The ADS-B receiver antenna and LNA as an amplifier, successfully capture and increase the sensitivity of receiving signals from the aircraft. The data received by the ADS-B receiver can be processed by the Raspberry-Pi and can be accessed or sent via Wi-Fi connection. The test results without using LNA can detect aircraft as far as 12.73 km to 33 km, where the detection distance range of some of these aircraft is still far from the desired target detection distance of the aircraft, which is a maximum of 80 km. while testing using LNA can detect aircraft as far as 47 km to 54.98 km, where the detection distance range of some of these aircraft is close to the desired target detection distance of the aircraft, which is a maximum of 80 km.

There are several factors that affect the distance range of aircraft such as the test area factor carried out in a closed room, there is noise in the room that affects the ADS-B receiver antenna, causing the antenna performance to not be maximized.

Keywords: ADS-B, Aircraft, Antenna, LNA, Wi-Fi, RTL, Raspberry-Pi