ABSTRACT

The application of aerospace technology that has been developed in recent years is the unmanned aircraft systems , or commonly known as Unmanned Aircraft System (UAS). The UAS development formerly known as Unmanned Aerial Vehicle . However, with the rapid development of technology , the UAS is not only used for military purposes , but also for civilian purposes . UAS can help humans in order to perform the mapping and monitoring of the air easily.

UAS developed in this research is a rotary wing using four motors , commonly known by Quadrotor . This vehicle will be realized with the returns to the home system. This control system is an autopilot system on the Quadrotor in order to return to the home (origin coordinat) passes through the shortest path (straight line). This function is activated by one of the pilot channel from the remote . The system uses a GPS receiver Ublox Neo - 6M as a determinant of the coordinates , the MPU 6050 IMU sensors as stability control , MS5611 altimeter as altitude control, and magnetometer sensor HMC5883L as a heading on the Quadrotor control . All of these systems are controlled by a microcontroller AT - Mega 2560 with Proportional Integral Derivative control system (PID). By using telemetry communication system , it can be seen Quadrotor status on ground control station (GCS) in realtime.

The results of this study is a Quadrotor are capable of doing autopilot control system to return to home when the mode is switched from one channel on the remote. Winds caused the bearing error reaches 140° and crosstrack reach 7 meters. Quadrotor is able to send telemetry data to the GCS via radio frequency 433 MHz.

Keywords: *Quadrotor, GPS, return to home*, *telemetry*.