

ABSTRACT

UAV or known as an Unmanned Aerial Vehicle is developing quite rapidly at this time, in addition to the usefulness of this tool which can cover areas that are difficult to reach and has many other functions, this tool also works autonomously without requiring the assistance of human control. The UAV itself has the most important component where the entire control system on the UAV is arranged in one component, namely the flight controller, it can be said that this component is the center for processing various data belonging to the UAV, because all control is centered on the flight controller. Until now, most UAV users and UAV makers use ready-made goods, for ready-made UAVs such as the DJI Spark, and if they make their own UAVs, users usually use ready-made flight controllers that are sold commercially by foreign companies.

Pada In this research, the flight controller itself is made with a function that can use Altitude Hold mode, this mode can make the UAV can maintain its predetermined altitude even though it is exposed to wind or other factors that change the UAV's altitude. This flight controller uses an STM32 microcontroller which is assisted by an IMU sensor as a determinant of the attitude and direction of the vehicle and also a barometer sensor as a component of collecting data on the height of the vehicle. The flight controller made will use the PID control system to help control the UAV.

The result of this research is the Flight Controller which is made to have two flight modes, namely the stabilize mode which is controlled via Remote Control and the AltHold mode which makes the UAV maintain its altitude autonomously. The flight controller has been successfully created and has a PID value for AltHold with parameters $K_p = 9.71$, $K_i = 5.75$, and $K_d = 0.851$ with an overshoot value of 14% and a settling time of 1.8 seconds.

Keywords: *Flight Controller, UAV, Altitude Hold, Barometer, IMU, PID Control System, AltHold.*