

## **ABSTRACT**

Advances in science and technology, especially in realm of aerial robotics has grown rapidly, one of them is a four-propeller aircraft (quadcopter) that could be controlled from a certain distance. Nowadays quadcopter mostly used for an observation and reconnaissance to certain areas, capturing picture or video, etc. Problems often occur in quadcopter are the quadcopter have not been able to detect obstacles and avoid obstacles in flight mission and give information about the flight trajectory. These problems will cause in crashing quadcopter through the obstacle and can't be controlled again.

Based on the above, in this final project will be made a system that could detect any obstacle and give information about the flight trajectory so that the quadcopter could avoid the obstacle that block in the way. This system use an ultrasonic sensor to detect obstacle and a micro servo to observe the condition in the flight trajectory that will be passed. Thereafter a compass sensor is used to indicate the direction of quadcopter when it meets an obstacle. Data transmission from the system use wireless module, so that this system can be used to obtain data in real time.

Ultrasonic sensor, micro servo, compass sensor and wireless module used has been integrated in a system using microcontroller. Ultrasonic sensor and compass sensor give a similar value to other measuring instrument that are used as a comparison system quality. The data obtained will be sent into the computer and could be seen on ground station side. The data will be a guidance to fly a quadcopter to the direction where there is no obstacle.

**Keywords** : quadcopter, ultrasonic sensor, compass sensor, wireless module, ground station.