QUADCOPTER AIRCRAFT USING ARDUINO MEGA

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ACKNOWLEDGEMENT

First of all, I would like to thank to Allah the Almighty for giving me the strength and ability to complete this final year project and thesis.

The most important person that I like to thank is my supervisor Prof. Madya Kartini Salam to help, support and guidance since the project proposal until the final year project.

Last but not least, I would also want to thank to my family for their support and in terms of financial to complete the project. And not to forget to my friends that also help in many ways from the starting until finish the project.

Thank you.

ABSTRACT

The title of this project is Quadcopter Aircraft Using Arduino Mega. There are many previous researches about quadcopter aircraft however the difference this research from others is the microcontroller that used to control the movement of the quadcopter. Microcontroller is the brain of the device which contains a processor core, memory and programmable input/output peripherals. There are many type of microcontroller in the market nowadays for example is arduino mega. The arduino mega is a board based on the ATmega1280 which is programmed using Arduino programming language and the Arduino development environment. It used c++ language to programming the arduino mega.

This project is developed from scratch by doing a lot of research on the project through many sources especially from internet in order to achieve the objective. Selecting the components is based on the cheapest and the important only because the objective of this project is to design the simple, easy and cheap quadcopter aircraft. Programming will be done after assembly all the components needed and troubleshoot the device if there is any problem occurs.

Unlike helicopter, quadcopter have four propellers rotate by four brushless motors control by the microcontroller. The movement and speed of the quadcopter can be controlled by the keyboard or transmitter depends on the users. Each of the motor is supported by Electronic Speed Controller (ESC) due to the power hunger. The idea of this project is to build a quadcopter and test how the arduino mega programming functional as a microcontroller to the quadcopter aircraft.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Research and development of unmanned aerial vehicle (UAV) are getting high encouragement nowadays since it is an aircraft control by remote control without having a human pilot on board. However due to the construction and controlling by remote control, quadcopter aircraft are often used as model aircraft project only. An electronic control system and electronic sensors is used in these vehicles to stabilize the aircraft. Quadcopter have an advantage as it can be flown indoors and as well as outdoors. Quadcopter is different with a helicopter as a quadcopter do not require mechanical linkage to vary the rotor blade pitch angle as they spin which give advantage to a quadcopter. Besides that, the four rotors that used in quadcopter allow each individual rotor to have a smaller diameter than the equivalent helicopter rotor. Thus, allowing them to possess less kinetic energy during flight which will reduce the damaged caused should the rotors hit anything. The application of quadcopter can be applied in variety area such as for military, film making, agriculture, rescue mission and often preferred for missions that are too dangerous for manned aircraft [1].

Quadcopter Aircraft is one of the multicopter that is lifted and propelled by four rotors at the end of the cross frame. It is controlled by electronic control system with different movement such as yaw, pitch and roll. The research focuses on how to design a model quadcopter from a scratch. During the process, the stabilization of