QUAD-COPTER USING ATMEGA328 MICROCONTROLLER

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ABSTRACT

The project presents the design of Quad-Copter flying machine using Atmel microcontroller. The scope of this project involves both hardware design and software implementations. Potentiometer is used as an input device to produce analog signal. The analog signal is converted to digital form using Analog to Digital Converter (ADC) in Atmel microcontroller. The digital value is used by the microcontroller to generate Pulse Width Modulation (PWM) for the Electronic Speed Controller (ESC). ESC is a device that use with Brushless DC (BLDC) motor to control its speed. The project start with literature review where all the information for designing the control system of the quad rotor was gathered. All design requirements was obtained from the literature review. The requirements of the control system of four motor in quad rotor are microcontroller, Electronic Speed Controller (ESC), Brushless DC (BLDC) motors, propellers and the potentiometer as the throttle.

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CHAPTER 1

INTRODUCTION

1.0 BACKGROUND OF STUDY

Quad-Copter, also known as quad-rotor, is a helicopter with four rotors. The rotors are directed upwards and they are placed in a square formation with equal distance from the centre of mass of the quad-copter. The quad-copter is controlled by adjusting the angular velocities of the rotors which are spun by electric motors. Quad-copter is a typical design for small Unmanned Aerial Vehicles (UAV) because of the simple structure [1]. Quad-copters are used in surveillance, search and rescue, construction inspections and several other applications.

Conventional helicopter only has one propeller and some helicopter needs a yaw stabilizing rotor at the back of the helicopter. The main propeller not fix to its position since the helicopter need to move forward, backward and turn left or right [2]. It used some mechanism to force the propeller to have an angle of attack on the shaft and spin then the wings start to develop lift force to the helicopter. The mechanism required periodically maintenance in order to make sure the helicopter can perform it desired functions.