Sri Siddhartha Academy of Higher Education

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Agalakote, Tumkur-572107

A Project Report

On

"DESIGN AND FABRICATION OF MINI ORNITHOPTER"

Submitted in partial fulfillment of requirements for the award of the Degree of

BACHELOR OF ENGINEERING

In

MECHANICAL ENGINEERING

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SYNOPSIS

Ornithopter is an aircraft that flies by flapping its wings. The main objective of this project is to design an ornithopter by imitating the flapping wing flight of large-wing-span birds. The mechanism comprises of a motor connected to a Slider crank mechanism which is coupled to the flapping wing mechanism. The flapping wings are designed using MYLAR/BOPET material (in view of its high strength to weight ratio) connected to a framework of carbon fibre rods whose exact geometry and shape was finalised by trial and error method for generation of maximum LIFT and THRUST force while in operation. The flapping wing mechanism gets the power source from a 10,000 rpm brushless micro DC-Motor driven by rechargeable Li-Polymer batteries. The Ornithopter incorporates an Elevator in the Tail portion for controlling the altitude of flight and Rudders to control the direction. This is similar to the ones used in an conventional aircraft with fixed wings. The flight of the ornithopter is controlled on the ground, by using a Remote Control Unit having 4-Channel RCA Transmitter.

The design and fabrication of the ornithopter was done in approximately three months time and the field trials were conducted to evaluate its functional aspects. The Project is highly successful as it has demonstrated its flight worthyness by reaching up to a maximum height of around 50 feet and flying in the air for a duration of upto 5 minutes(depends upon the wind conditions and the condition of the battery).

This project has been sponsored with financial support, by Karnataka State Council for Science and Technology(KSCST). The overall cost of the project is around Rs. 30,000/- .