

Autonomous Quadrocopter  
Interim Report

by

Taylor Coulthard V00708475  
Jarrod Ferguson V00708860  
Evgeny Schastlivenko V00714012

Group: 9  
Supervisor: Fayez Gebali, Haytham Elmiligi

Due: Oct. 16, 2012

©Dept. Electrical and Computer Engineering  
University of Victoria

All rights reserved. This report may not be reproduced in whole or in part, by photocopy or other means, without the permission of the author.

## Autonomous Quadrocopter

### **Abstract**

A quadrocopter is essentially a 4 propeller helicopter. The 4 propellers are located on the 4 compass directions of the aircraft and the frame forms a cross with each propeller on one of the outer ends. This report will be to outline the progress of creating a quadrocopter that is autonomous, or controlled without a remote.

### **Contents**

1. Abstract
2. Introduction
  - Motivation
  - Goals
3. Proposed Project
4. Milestones
5. Supervisor Marking and Comments

## **Introduction**

### Motivation

Our group's decision to take on this project was purely out of interest. After meeting with our supervisors, Dr. Gebali and Haytham Elmiligi, their excitement in showing off this project got our group very enthused further consider it. After watching a few videos on the project and further discussions with Haytham about what could be done with this, we made an easy decision. Building a robotic helicopter was something that all of us could learn from, but apart from that we were able to show real interest in the project and determination to complete the task at hand successfully.

### Goals

By the end of this semester we will have a quadcopter that will be able to perform certain pre programmed tasks that will include flying up, down, forward, back and rotate. The copter will also stabilize any forces, such as wind, that would tend to throw it off balance.

If time permits we would like to show that we can use the copter to collect data about the altitude and potentially other data while in the air.

## **Proposed Project**

Our proposed project is to build a quadrocopter that will navigate on its own without the use of a remote control.

To do this we were given a working quadrocopter with a programmable microcontroller. Our goal in ELEC 399 is to customize the quadrocopter so that it can take-off, land, and fly safely. Although we have ideas for more advanced uses, these may require more time than we have in the current semester. If time permits we will address adding 1 or more of the following ideas: an instrument that would measure altitude, camera(s) for surveillance and obstacle recognition, ability to stabilize itself from any external forces. If we are not able to look in to further abilities than simple motion during 399, our belief is that the future of this project in 499 is limitless.

While completing this project we will gain skills pertaining to programming with an emphasis on mechanical functions, as well as gaining knowledge on how to construct mechanical systems.

**Milestones:**

October 12 <sup>th</sup> (Completed)	Have basic plan for project laid out.  Collect helicopter materials.
October 15 <sup>th</sup> – October 29 <sup>th</sup>	Learn how to program the microcontroller (potential for installing an altimeter if we figure out gyros fast)
October 29 <sup>th</sup> – November 9 <sup>th</sup>	Small timed flights, take off and landing
November 9 <sup>th</sup> – November 19 <sup>th</sup>	Side to side movement and stabilization
November 19 <sup>th</sup> – December 1st	Rotation and forward movement, longer flights and predetermined flight paths

