

# PBL REPORT 2

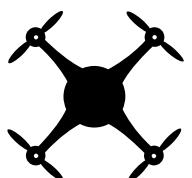


## *Delivery* QUADCOPTER



### SYMBIOSIS

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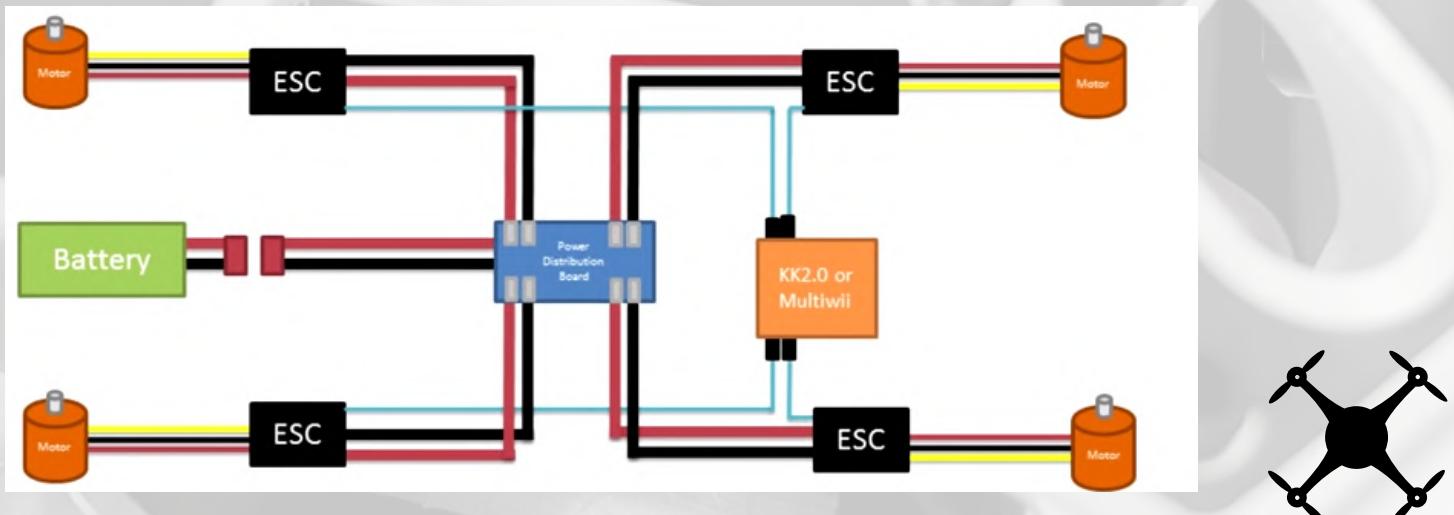
# INTRODUCTION

An Unmanned Aerial Vehicle (UAV) is an aircraft without a human pilot aboard. Its flight is controlled either autonomously by onboard computers or by the remote control of a pilot on the ground or in another vehicle. The Quadcopter an emerging UAV is lifted and propelled by four rotors. It has good maneuverability with limitless applications. Departing from a century-old design, modern QCs are evolving into small and agile vehicles. After already proving their usefulness as aerial imaging tools, new research is allowing QC to communicate perceptively with other autonomous vehicles, explore unknown environments, and maneuver in dense surroundings with speed and precision. However, if all of these developing technologies are combined, quadrotors will be capable of advanced autonomous missions that are currently not possible with any other vehicle. This report shows details and usages of a QC as for pick and delivering parcel/packages.



# METHODOLOGY

The four BLDC motors are mounted on the ends of the quad frame each connected to the flight control board via ESC. The 4 motors are connected in parallel to the supply battery. The ESCs are connected to their respective 4 pins M1, M2, M3, and M4 on the KK board. The receiver is then attached to the KK board. Four channels are used in the receiver for the four different movements and are connected to their respective pins namely the throttle, elevator, aileron, and rudder pins. Only one of the pin pairs is made in connection to the Vcc and Gnd pins and the remaining three are connected via signal pins. The KK board is an inbuilt microprocessor that gives out the desired output to the motors by receiving the signals for the different movements via the receiver.



# **REVIEW OF REFERENCE PAPER**

The First reference paper which we referred was a research part by Md R Haque of the Department of Aeronautical Engineering, Military Institute of Science and Technology, Dhaka, Bangladesh. In this research paper, they have created an Autonomous Quadcopter for Product Home Delivery which is few steps advanced than what we have been creating. The basic working mechanism of both the Quadcopter is similar.

The Third reference paper which we referred was a research part by Savan Vyas of the Embedded Systems Department, VIT University, Chennai, India. This research paper focuses on an Autonomous delivery drone using an Arduino MEGA microcontroller and GPS module compensating few drawbacks that a normal delivery drone faces. They have also used a keypad for secure delivery to the customers. Our Quadcopter mainly focuses on delivering the packages to rural areas within the range of TX/RX without any GPS module and the cost-effectiveness of the project.



# RESULTS

We tested the quadcopter. The motors and ESCs were successfully calibrated; the requirement of best-minimized size was met, and communication from the ground control station to the quadcopter was achieved.



# FUTURE PLANS

We as a group have achieved all of our weekly goals which we had set up in order to complete this task up till now. We are in the final stage of our project where we will make our quadcopter ready to deliver products. We are figuring out what kind of mechanism we can use for delivering any kind of product. We will be giving a different channel on the transmitter and receiver for the mechanism which we will be going to use.



# **CONCLUSION**

Drones are set to become the future of logistics with their reduced cost, higher convenience, and delivery times of less than 30 minutes. Both online retailers and brick-and-mortar stores will adopt it to smoothen their last-mile delivery process. Our group learned a substantial amount about the parts that were used in making of the quadcopter, fabrication, and control. We had to use various references in order to calibrate our components through the flight controller. We learned important soldering and electric system fabrication skills. Our group has become proficient in understanding and handling electronic components. In these four weeks, we succeeded in stabilizing the quadcopter. We are proud of our accomplishments. We would also implement the delivery mechanism which would help us in delivering important items in remote areas say medicines through our quadcopter .



# **REFERENCES**

1. Gordana Ostoja, "Design, control, and application of quadcopter", International Journal of Industrial Engineering and Management, IJIEM, Vol. 6 No 1, 2015
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3. Jeevan G Murthy, "Autonomous Drone Delivery System: A Survey", International Research Journal of Engineering and Technology (IRJET), Volume: 07, Issue: 03, Mar 2020

