

# Drone Use for Emergency Local Delivery in Time of Pandemic (Covid-19)

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## Abstract: -

The aim of this research paper is to design a light-weight & cost-effective hexacopter. The hexacopter will be controlled by a RC (Remote Controller) from a specific distance wirelessly. This compact sized system will acquire data such as video/images from the camera installed on the hexacopter and send it to the drone driver. The drone location and exact position can be checked through the GPS module installed in it. A drone or Unnamed Aerial Vehicle is very useful for delivery of essential items during emergencies such as medicine and food (low weight near about 1kg) when it is not easy to buy the same from the items by physically going to the store. This project will have a great impact to carry out medicine to an ambulance in case of emergencies struck in a heavy traffic jam.

**Key Words:** Unnamed Aerial Vehicle(UAV), hexacopter, Remote Controller, medicine, remote delivery, emergencies, essentials-items, pandemic situation

## 1. Introduction:-

The delivery of essential items during pandemic is a tedious task when it comes to cover a large area, then delivery by foot is near to impossible. That is the main reason we've drafted this project. This project consists of 2 main parts first is the physical hardware and secondly is the different software's required for this project which range from initialization software like Mission-Planner to the camera's proprietary software and the drone controller who will analyses the location of the person in need and with the help of a 4k HD camera he will be driving the drone to that location by tracking the drone's location in the mission planer. To facilitate this from the hardware side we've have tried using parts which are readily available online or in the nearest electronics retail store. If we look in the software realm of our project we have used open source software's which are readily available on the internet. To explain the working our drone would capture the incoming signals in its camera and stream the video feed to the paired smartphone device or FPV receiver with good receiving strength of about 1-2km radius. The item which has to be delivered is kept in a box with door having a servo for opening the door mechanism also controlled by the drone driver.

## 2. METHODOLOGY:-

Our methodology is divided among hybrid hardware and software based solution to the problem. We build a hexacopter with 6 powerful 980kv brushless motor and giving it a carbon fiber propeller of 10x4.5, giving the hexacopter a sufficient thrust to hover it the air with >1kg payload. In the hexacopter we had given a room for the delivery item between the legs with a mechanical box which is open by a servo motor as the guidance of the drone controller. I had used pixhawk flight controller, the most reliable and good one in the market of UAV which can give the drone some extra autonomous power by adding raspberry pi for identifying the person who is taking the delivery in OpenCv, real time tracking with GPS module and giving a channel for 4 auxiliary output. My drone can also come to its launching position as soon as it triggers something wrong in the UAV.

We use the google map location of the person whom we want to deliver the item then by following it in the map we can drive the drone to its location through its desired location by the position feedback send to the drone controller back in mission planner. The controller watching the live feedback coming from the 4k camera in the gimbal with a FPV system of high range strength and when then person arriver for taking the delivery , the delivery box gets open by the servo being triggered by the controller.

The controller then can press the RTL(return to launch) switch and the drone can automatically come back to its home or launching location maintaining an altitude of about 30m above ground(which can be changed in the software).

### 2.1 COMPONENTS USED:-

- 1) S550 hexacopter frame
- 2) 980kv brushless motors

- 3) 30A BLDC ESC
- 4) Pixhawk flight controller
- 5) Power module for pixhawk
- 6) Gps module
- 7) 5200mah 4S 40c LIPO battery(giving a flight time of about 35mins)
- 8) Fs-i6 receiver and transmitter
- 9) Carbon fiber propeller 10x4.5
- 10) Shock absorbing wire
- 11) 3-Axis gimbal
- 12) 4k camera (SJ 7 star)
- 13) FPV transmitter , antenna
- 14) Minim OSD module(for the flight information to be displayed on FPV receiver screen)
- 15) Servo
- 16) Cardboard box
- 17) Retractable legs
- 18) Telemetry (for tracking flight information in mission planner)
- 19) FPV display or android/ios phone with the given app support
- 20) Fpv receiver
- 21) Far view pagoda pro 5.8GHz antenna

After building the basic drone we make the software side of the thing in mission planner according to our need at all set to fly

## **2.2 COMPARISON WITH OTHER METHODOLOGIES:-**

Some of the other delivery drones such as the amazon drone delivery which is the one and only company building drone for delivery purpose, it is fully automated drone and it is a quadcopter drone. The drone has to get a certain area for landing which is not possible in the congested area, in road and in flood times. Since it is fully automated many natural accidents may cause such as colliding with birds, checking the person who is taking the delivery item. These all can be controlled in manual control delivery. Since our drone is hexacopter it can still fly if one arm of the drone become disable their having only 4 arms cannot and if such case occurs their drone will end up in a crash.

## **3. CONCLUSION:-**

Thus I've implemented a manually controlled drone which would help to delivery some of the essential items during a pandemic or natural disaster to the people in need and also to the ambulance with some medication if struck in heavy traffic because a single life is very important

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## BIOGRAPHIES



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