

AUTONOMOUS QUADCOPTER

A quadcopter, also called a quadrotor helicopter or quadrotor, is a [multirotor helicopter](#) that is lifted and propelled by four [rotors](#).

Quadcopter find their application in variety of industries, with Amazon planning to use them to deliver packages there potential is limitless. In regards to Health, Safety & Environment we plan to make autonomous Quadcopter that can remotely survey otherwise inaccessible offshore steel structures, wind farms, or pipelines. The Quadcopter would be mounted with a camera, GPS receiver, Gas Detection Sensor and Telemetry module.

Team Members

- i) Shibam Saha - ECHE17061
- ii) Aashish Malik – EPE17001
- iii) Arunima Singh – EPE17011
- iv) Rahul Sureka – EPE17037
- v) Ankan Ekansh–ECHE17014
- vi) Shubham Kumar – ECHE17053
- vii) Yogesh Kumar – ECHE17059
- viii) Anant Srivastava – ECHE17013
- ix) Aayush Joshi – EPE17012

List of Items Required

- i) A Quadcopter Frame
- ii) LiPo batteries
- iii) 4 ESCs of 30Amp
- iv) 1000kV Brushless Motors
- v) Telemetry
- vi) Flight Controller
- vii) Anti vibration mound for the APM Ardupilot
- viii) Buzzers
- ix) GPS
- x) Camera
- xi) Glue gun
- xii) Double sided tape
- xiii) Zip Ties

REASON FOR MAKING

Quadcopter is very visionary project.

But the main question arises, Why?

Why does the quadcopter needs improving upon?

1. The Autonomous Quadcopter presently **lacks stability**.

The team is unable to fly and/or control it in a limited space, without posing a threat to the members.

We plan to stabilise the Quad by changing its configurations and damping its vibrations.

2. The Quadcopter is **unable to hold the Loiter mode**.

Upon changing it to loiter mode, the Quad starts attaining height.

The team speculates it may be due to the lack of damping of the vibrations due to motors.

Moreover, due to the rotating blades, the attached barometer may provide wrong readings of the pressure.

The team plans to attach foam and anti vibration mound to the frame.

3. **Due to amateurish flying of the Quad, it may get lost** or get stuck somewhere out of our sight.

To retain it, the team plans to attach buzzers to the Quad, so that its location becomes known, and retrieval is easy.

4. We plan to **connect the Quad with GPS**(Global Positioning System). It would help us in retrieving Quad in case it gets lost.

Moreover, we plan to use it for navigating purposes and to deliver packages.

Since the medical centre of the institute is far away, the medicines can be transported to the ill ones immediately with the help of Quad.

5. For the same above reason, we also **plan to attach movable hands** to the base of the Quad to help it hold packages.

We currently plan to use it for lighter packages, and if the venture deems successful, we would think of increasing the weight.

6. To speculate areas, the team **also plans to attach a camera** to the Quad.

FUTURE AIM

The team mainly plans to focus on the applicability of the Quadcopter in Petroleum Fields.

Following are some of the ideas we plan to turn into reality in due course-

1.Pipeline Monitoring

The application is to visually monitor the area to ensure that any threats will immediately inform the administrator and the safety committee of the oil and gas company.

This would be obtained with the help of the attached cameras of the Quad, which could be viewed live on a computer screen, on tablets, mobiles etc.

2.Repair of Pipeline

To repair pipelines against external threats that associate either natural or man-made cause. Robotic drones are automatically designed to detect and repair any damage along the hollow tube inside the pipeline before petroleum products can pass through.

3.Night Vision Drones

The application of night-vision drones is to visualize the main functional area of the company in dark place or during the night-time. The purpose is to provide security measures to the company as well as protecting the facilities.

It reduces the required manpower, and can be achieved quite easily by attaching night vision cameras with recording feature.

4.Aerial Exploration

We plan to make the Quad record images to allow petroleum engineers and geologists to determine the right area to start building temporary passageway for logistics and manufacturing facilities.

5. Logistics

Drone applications in oil and gas companies help the logistics department to transport purified products before it will be transported to target markets. Logistic drones are designed to carry products after the purification process have finished.