

Land and Flying Robot

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How to cite this paper: Vaibhav Salonia | Piyush | Preeti Arora "Land and Flying Robot" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-3 | Issue-4, June 2019, pp.447-448, URL: <https://www.ijtsrd.com/papers/ijtsrd23754.pdf>



IJTSRD23754

ABSTRACT

We are introducing a robot which has the capabilities of being maneuvered on land, flying and videographer. The robot can be controlled on land like a simple robot car by simple connecting to any android application using Bluetooth. The flight mode works using radio transmission for commanding the robot where the robot has a radio receiver attached to its body while the radio transmitter in the form of a remote is held by the user. The camera will provide the live footage as well as recorded everything on the camera application. 2 separate controllers have been used, a KK2.1.5 Flight controller for the flying capability of the robot and Adriano nano for the car section.

Keywords: Yaw, Throttle, Pitch, Roll

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force. The robot car aspect helps to maneuver this robot on land very easily, just like any other electronic toy car. It helps provide the ease of performance on plain and flat surfaces while allowing for the flight capabilities of the robot.

This robot is capable of performing surveillance operations as a camera has been attached for monitoring, recording and surveillance purposes. The presence of a camera allows an opportunity for aerial videographer and photography as well.

II. CONTROLS

Roll – Done by pushing the right stick to the left or right. Literally rolls the maneuvers the quad copter left or right.

Pitch – Done by pushing the right stick forwards or backwards. Tilts the quad copter, which maneuvers the quad copter forwards or backwards.

Yaw – Done by pushing the left stick to the left or to the right. Rotates the quad copter left or right. Points the front of the copter different directions and helps with changing directions while flying.

Throttle – To increase, push the left stick forwards. To decrease, pull the left stick backwards. This adjusts the altitude, or height, of the quad copter.

I. INTRODUCTION

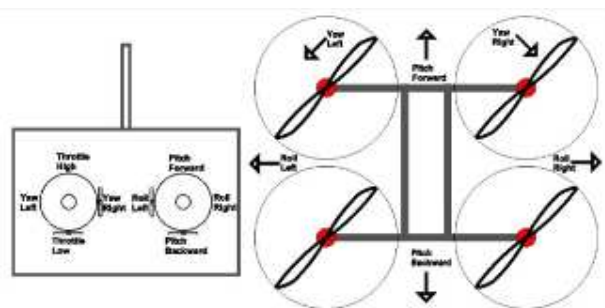
A flying and land robot can be said to be a hybrid formation of a land robot and a quadcopter that can be maneuvered on land and fly as well. A quad copter, also called a quad rotor helicopter or quad rotor is a multi rotor helicopter that is lifted and propelled by four brushless motors and propellers. Quad copters generally use two pairs of identical fixed pitched propellers; two clockwise (CW) and two counterclockwise (CCW). These use independent variation of the speed of each rotor to achieve control. By changing the speed of each rotor it is possible to specifically generate a desired total thrust; to locate for the center of thrust both laterally and longitudinally, and to create a desired total torque, or turning

Trim – Buttons on the remote control that help you adjust roll, pitch, yaw, and throttle if they are off balance.

The Rudder – You might hear this term thrown around, but it's the same as the left stick. However, it relates directly to controlling yaw (as opposed to the throttle).

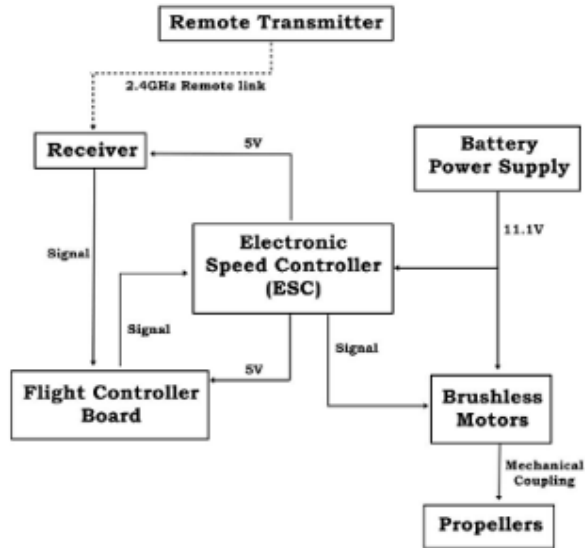
Aileron – Same as the right stick. However, it relates directly to controlling roll (left and right movement).

The Elevator – Same as the right stick. However, it relates directly to controlling pitch (forwards and backwards movement).

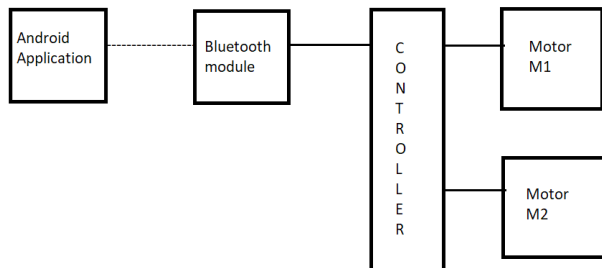


Controls of the robot

III. BLOCK DIAGRAMS

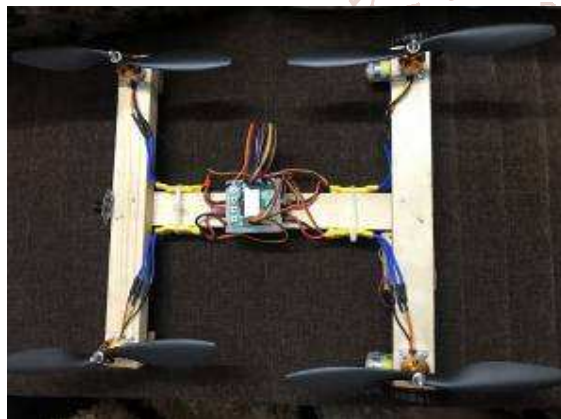


Block diagram of the quadcopter

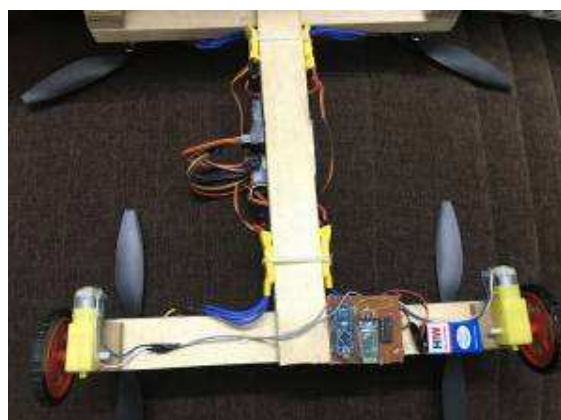


Block diagram of the car

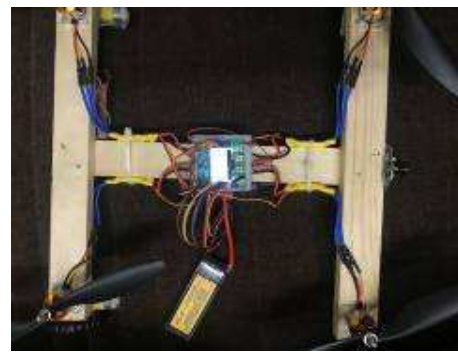
IV. HARDWARE



Top view



Bottom view



Top view with screen on

V. CONCLUSION

We introduced a robot which implements 3 techniques namely maneuvering on land, flight capability and a camera for surveillance, pictography or videographer. We have also implemented 2 ways of controlling this robot, one is through the use of Bluetooth and an android application while the other is with the help of a radio transmitter remote. The robot can be fully controlled using it. 2 separate microcontrollers have been used, a flight controller and arduino nano for implementing both car and the quadcopter. The quadcopter is able to take a flight using the brushless motors and the propellers while the dc motors have been used for the wheels of the car. This project completely reforms the robotic vehicle and gives it a new dimension.

VI. FUTURE SCOPE

This project provides a lot of scope for future developments just by making small changes or adding certain new features. Some of the examples can be seen.

- It can be implemented using a wifi which would make it more accessible.
- Instead of a camera a microphone can also be mounted for sound recording purposes
- This robot can form the basis of new and improved UAVs used by the defence forces.
- It can be used for spying purposes
- Can be used to monitor any area without specially employing people to do so.
- The future research can be carried out to implement and design SWARM technology so that a fleet of quadcopter drones can be sent that communicate with each other and perform various operations.

VII. REFERENCES

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