Radio Controlled Airplane for Safety Surveillance and Transportation.

This research is carried out by the fund of University Research Grant Pabna University of Science and Technology, Pabna

Fiscal year: 2022-2023

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Roll: 200610	**Roll:** 200615	**Roll:** 200622
Reg. no: 1065375	**Reg. no:** 1065380	**Reg. no:** 1065387
Session: 2019-2020	**Session:** 2019-2020	**Session:** 2019-2020

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Abstract

Abstracting a radio-controlled airplane for safety surveillance and transportation involves adapting the concept of an RC plane to fulfil specific requirements related to safety monitoring and transportation tasks. The RC airplane is designed to have an increased payload capacity for transportation of goods or the installation of sensors, high-resolution cameras and communication systems suitable for safety surveillance tasks. These systems enable real-time monitoring and recording of the surrounding environment for various applications such as aerial inspections or search and rescue operations. The project may have specific performance goals, such as achieving a certain flight speed so that minimizes the time. This could involve meeting their expectations in terms of ease of use, reliability, durability, and overall satisfaction with the RC plane's performance. It makes significant contributions to the medical sector by facilitating the transportation of blood and other medical tools. Furthermore, it enables swift and efficient response in emergency situations, such as aiding individuals in distress in rivers and oceans. Additionally, the project assists in identifying forest fires and preventing unwanted activities in the forest.The RC airplane incorporates advanced communication systems, including video transmission capabilities, to ensure seamless connectivity between the aircraft and the operator or ground station. These features enhance the safety surveillance and transportation capabilities by enabling the aircraft to operate in a more autonomous and reliable manner.

*Keywords:*Radio control, surveillance, transportation, communication system,video transmission.

1. INTRODUCTION

A radio-controlled plane called RC plane is a small flying electronic device that is controlled by a remote through an operator on the ground using a radio transmitter. The transmitter communicates with a receiver within the plane that sends signals to servomechanisms (servos) which move the control surfaces based on the position of joysticks on the transmitter. The control surfaces in turn affect the orientation of the plane. The design of RC plane involves aerodynamics, woodworking, composite materials, electronics, mechanics, small motors drafting, artistry, and club activities practically all at the same time. The model is a real aircraft which flies and operates by the same principles as its full-scale counterpart. The only difference is size and weight.

1.1 Aims and objectives of the Project:

Aims:

- To transport a small weight from one place to another at a short distance. As an example, it can transport a blood, vaccine, medicine.
- To detect and then help the victim of the any type of water vehicles.
- To identify fire in the forest and unwanted activities in the forest
- To Throw the fire ball in the fire

Objectives:

- To design a RC plane
- To construct of the RC plane
- To test the performance of RC plane.
- Video surveillance

2. METHODOLOGY

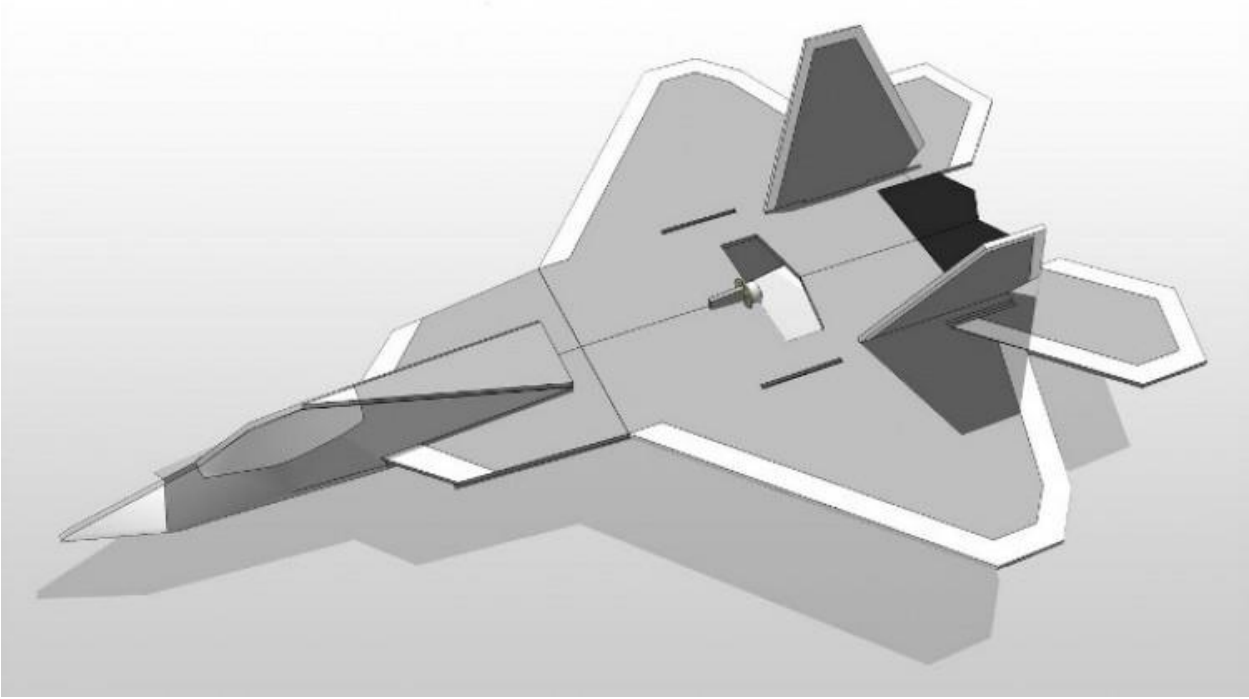
This research methodology will be completely built by using Flysky fsi6 Transmitter, ia6b receiver, 1400KV BLDC MOTOR, 30A ESC, 1500MAH 3S LIPO BATTERY, MOTOR MOUNT, BATTERY BELT, 9G Servo, Controll Horn, Push Rod, 8inch propeller and 720mm wingspan Foam Body. A transmitter transmit the signal from operator that will receive the reciver and controll the plane in the sky. There BLDC motor and servos control the speed and direction. Where the ESC controll the BLDC motor.

3. DESIGN SPECIFICATION

Table -01: Overall design specifications:

Maximum take of weight	1 kg
Transmitter Bandwidth	500 KHz
Empty weight	0.58 kg
Length	880 mm
Wing span	630 mm
Type of engine	Brushless Electric Motor
Range	1 km
Cruise velocity	210 km/hr
Construction Material	Depron Foam

4. CAD MODEL



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5. SYSTEM IMPLEMENTATION

5.1 Cutting and Shaping:

Use cutting tools to shape the various components of the plane according to the design.Cut the foam or balsa wood sheets to create the main wing, fuselage, tail surfaces, and other required parts.Ensure precise measurements and smooth edges for accurate assembly.

Figure-01: Foam cutting

5.2 Electronics Installation:

Carefully install the electronic components, including the receiver, servos, and battery.Ensure proper wiring connections and secure placement to prevent interference or damage.

Figure – 02: Electronics installation

5.3 Assembly:

Begin by joining the wing halves and attaching the spar for strength and stability. Connect the fuselage sections, ensuring proper alignment and stability. Install the tail surfaces, such as the horizontal stabilizer and elevator, as well as the vertical stabilizer and rudder.

Mount the motor, propeller, and landing gear, if applicable, following the manufacturer's instructions.Install the control surfaces (ailerons, flaps, and/or elevators) and connect them to the servos.

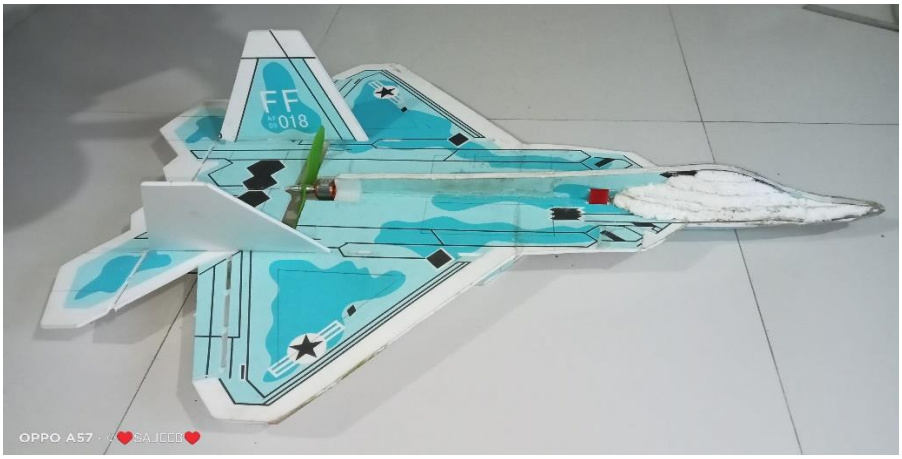

Figure-03: Plane Assembling

6. RESULT AND DISCUSSION

The aim of this project was to adapt the concept of a radio-controlled (RC) airplane for safety surveillance and transportation purposes, addressing specific requirements related to these tasks. The RC airplane was designed with modifications to enhance its payload capacity, enabling the transportation of goods or the installation of various safety monitoring equipment, such as sensors, high-resolution cameras, and communication systems.

Flight test was conducted successfully.

Table -02: Test results of the constructed aircraft model

Static Eqivelent Thrust	1776 gm.
Revolutions	10489 rpm
Speed (level)	95 km/hr
Speed (vertical)	48 km/hr
Weight	885 gm
Thrust Weight Ratio	2.06:1
Motor Efficiency	80.1%
Maximum Inflight Cruise velocity	160 km/hr

Figure-04: Fly testing

7. CONCLUSSION

In conclusion, this project aimed to adapt the concept of a radio-controlled (RC) airplane for safety surveillance and transportation tasks. The modifications made to

the RC airplane successfully increased its payload capacity, allowing for the transportation of goods and installation of safety monitoring equipment. The advanced communication systems incorporated in the aircraft enabled real-time monitoring and recording, enhancing its capabilities for various applications, including aerial inspections and search and rescue operations.

The project's results demonstrated that the adapted RC airplane met the established requirements and performance goals. It proved to be reliable, durable, and easy to use, providing overall satisfaction with its performance. The successful implementation of this technology in sectors such as the medical field and emergency response showcased its potential to facilitate swift and efficient transportation and aid in critical situations.