SECOND YEAR INDUSTRIAL TRAINING SEMINAR REPORT

AEROMODELLING

Submitted in partial fulfilment of the Degree of Bachelor of Technology Rajasthan Technical University

Submitted to-
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RAJASTHAN TECHNICAL UNIVERSITY

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CERTIFICATE

This is to Certify that Second Year Industrial Training Seminar Repor t en titled " KAISER MODEL"has been submitted by "NAVYA SHARMA " (PCE22CR035) for partial fulfilment of the "Degree of Bachelor of Technology of Rajasthan Technical University.It is found satisfactory and approved for submission.

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25/09/2023

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Certificate No:-AP/WS/2023-195

Date : 25th Aug 2023

CERTIFICATE

OF COMPLETION

This is certified that

Navya Sharma

has successfully completed the 15 days (7 Aug 2023 to 25 Aug 2023) **aeromodelling** internship held at **S-13, VT Road, opp. CITY PARK, Mansarovar Jaipur, Rajasthan** organized by **AEROPHANTOM.**

Rahul Sharma
CEO & Founder

Aerophantom

Mayank Yadav
CTO & Co-Founder

DECLARATION

I hereby declare that the Industrial Training Seminar report entitled "KAISER MODEL" was carried out and written by me under the guidance of shilpi kalra (industrial training coordinator)Department of computer science ,Poornima college of Engineering,Jaipur.This work has not been previously formed the basis for the award of any degree or diploma or certificate nor has been submitted elsewhere for the award of any degree or diploma.

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Submitted by:

NAVYA
SHARMA

ABSTRACT

The aeromodelling internship at Aerophantom offered an immersive experience in the world of aviation and technology. This report documents the significance of the training, explores Aerophantom's company profile, delves into the technologies learned, provides project descriptions and snapshots, discusses limitations and learning outcomes, explores future technology prospects, and concludes with references and appendices. The journey through this internship was marked by hands-on learning, skill development, and a glimpse into the exciting future of aeromodelling, with a specific focus on our work on the Kaiser Model - a training model that allowed us to apply theoretical knowledge to practical experience, offering invaluable insights into the complexities of designing, manufacturing, and flying of model aircraft.

The primary objective of this project was to construct a remote-controlled (RC) aircraft model known as the Kaiser. This project aimed to employ various materials and techniques to create a functional and controllable flying RC model. The Kaiser Model in aeromodelling focuses on simplicity, reliability, and accessibility in the manufacturing of RC aircraft. Kaiser Model are known for their durability and stability that's why they are excellent choice for beginners as well as for experienced enthusiasts.

Keywords:
Aeromodelling, Aviation, Hands-on Learning, Kaiser Model,
Designing, Manufacturing, Flying

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Chapter 1

Introduction to Aeromodelling

1.1 Introduction

Aeromodelling is the art and science of designing, manufacturing and flying of miniature aircraft models like drones, RC planes, gliders and many more.
It is a very exciting and interesting way to learn, apply and understand science and engineering principles.

Fig.1.1

Aeromodelling looks like a lot of Aerospace/ Aeronautical engineering topics, it involves a lot of interdisciplinary concepts from various streams of engineering - primarily Aerospace/ Aeronautical, Mechanical, Electronics, Electrical and Computer Science. Aeromodelling gives a good understanding of the roles each of these engineering skills play in the real aircraft industry and provides enormous opportunities to develop innovative thinking and implementation. The aeromodelling journey starts with the selection of appropriate materials such as balsa wood, foam, super compressed sheet, depron sheet and lightweight composites. These materials serve as the canvas on which complex designs are brought to life. Skills in cutting, shaping, taping and assembling are honed to make each part of model plane. The careful integration of electronic systems, from motors and servos to transmitters and receivers, adds another layer of complexity to the process. These components are not just instruments; they are the lifelines that connect the model to its pilot, enabling precise control and maneuverability.

1.2 Significance of training

Aeromodelling, the art of designing, building, and flying model aircraft, stands as an extraordinary portal to the world of aerospace engineering and technology. It serves as a dynamic bridge that connects the theoretical principles of aviation and aerodynamics to the tangible reality of aviation enthusiasts, aspiring engineers, and aviation professionals. The significance of embarking on an aeromodelling journey goes beyond the realms of a hobby; it represents an educational pathway that cultivates a profound understanding of the intricate science behind flight, the nuances of aircraft design, and the practical applications of aerospace engineering.

Fig.1.2.1

Fig.1.2.2

1.3 Scope of Aeromodelling at the Beginner Level:

1.3.1 Skill Development

Aeromodelling, at its core, is an incredible starting point for beginners. It's a journey that goes beyond mere recreation. As beginners, there is opportunity to cultivate essential skills such as precision craftsmanship, problem-solving, and meticulous attention to detail. Crafting and flying model aircraft will sharpen fine motor skills and enhance dexterity.

1.3.2 Understanding Aviation Basics

Aeromodelling is your passport to the world of aviation and aerospace engineering. Here, the fundamental principles of aviation come alive. You'll gain a fundamental understanding of aerodynamics, flight control, and the intricate science behind flight. These early lessons can form the foundation for future educational endeavors in aviation-related fields.

1.3.3 Creativity and Innovation

Aeromodelling offers a canvas for your imagination. As a beginner, you'll have the freedom to experiment with diverse designs, materials, and configurations. Witness firsthand how each tweak impacts flight performance. It's an arena where creativity knows no bounds, and innovation is encouraged.

1.3.4 Teamwork

Aeromodelling is not limited to solitary endeavors. You can join clubs or collaborate with fellow enthusiasts on exciting projects. This collaborative spirit fosters teamwork and enhances your communication skills, as you collectively pursue the thrill of flight.

1.3.5 Enjoyment and Relaxation

Above all, aeromodelling is about enjoyment and relaxation. It offers respite from daily routines and serves as a source of leisure and personal gratification. It's a hobby that lets you unwind while nurturing your passion for aviation.

1.4 Scope as a Career

1.4.1 Aerospace Engineering

For those who wish to elevate their passion for aeromodelling to a professional level, the aerospace engineering field beckons. The understanding of aeromodelling principles can be the cornerstone for a career in aerospace engineering, where you may find yourself designing and constructing real aircraft, drones, or cutting-edge aerospace technologies.

1.4.2 UAV (Unmanned Aerial Vehicle) Industry

In the era of UAVs for applications such as agriculture, surveillance, and logistics, professionals with expertise in aeromodelling and remote-controlled aircraft are in high demand. Opportunities abound in roles related to UAV design, testing, and operations.

1.4.3 Research and Development

Research institutions and organizations focused on aviation technologies rely on aerodynamicists and aerospace engineers to drive research and development initiatives. The expertise could contribute to groundbreaking advancements in aviation.

1.4.4 Flight Simulation

The aviation industry heavily relies on flight simulators for pilot training. Professionals well-versed in aeromodelling principles play a crucial role in developing and enhancing these simulators, ensuring they offer realistic training experiences.

1.4.5 Aeromodelling Instructor

Experienced aeromodellers can become instructors or mentors, passing on their knowledge and passion to new enthusiasts, further enriching the aeromodelling community.

1.4.6 Model Aircraft Manufacturing

Companies engaged in model aircraft production seek skilled individuals for various roles, including design, testing, and manufacturing. Your expertise could contribute to the creation of high-quality model aircraft.

1.4.7 Entrepreneurship

For the entrepreneurial spirit, aeromodelling offers the possibility of starting your own business in the field. We can explore avenues such as designing and selling kits or custom-built model aircraft, turning your passion into a thriving enterprise.

1.5 Company Profile

1.5.1 Introduction to AEROPHANTOM

Aerophantom is a prominent company in the education sector, specializing in providing practical knowledge to schools and institutions about the fundamentals of aeromodelling. It is a platform where you learn to design, manufacturing and flying of miniature aircrafts, rc planes, drones and UAV's.

The mission of organisation is to make aeromodelling accessible and enjoyable for all by offering comprehensive training on the design and operation of drones and model planes. Through this innovative approach, they transform what was once a difficult and costly activity into an easy, fun, and cost-friendly experience.

1.5.2 INCEPTION OF AEROPHANTOM

Aerophantom began its journey in September 2022 with a vision to revolutionize aeromodelling education. Founded by Rahul Sharma, CEO, and Mayank Yadav, CTO, set out to inspire and empower individuals to pursue their passion for building and flying aircraft. Since the inception, they have been dedicated to providing practical training, fostering creativity, and nurturing a love for aviation among students and enthusiasts.

1.5.3 MISSION AND VISION

Their mission is to provide practical knowledge and training in aeromodelling to schools and institutions, enabling individuals to learn the nuances of building and operating drones and model planes. Their aim to make aeromodelling an accessible and affordable activity that fosters creativity, problem-solving, and a deeper understanding of aerodynamics. Through their programs, they strive to ignite the imagination of learners, empowering them to innovate and explore the limitless possibilities of flight. Their vision is to be a leading provider of aeromodelling education, recognized for their commitment to practical learning, innovative teaching methods, and the development of future aviation enthusiasts and professionals. They envision a world where aeromodelling is embraced as a valuable educational tool, nurturing skills such as critical thinking, teamwork, and technical expertise.

Fig. 1.3

Chapter 2

Technology Specification

2.1 Different types of model planes

2.1.1 Free Flight

Free-flight model planes are designed to fly without control inputs, using only the power of the motor and the aerodynamics of the plane to navigate the air currents.

2.1.2 Control Line

Control line planes are flown in a circular pattern around the pilot, using two wires to control the plane's movement in the air.

2.1.3 Radio controlled

Radio-controlled planes, are flown with a handheld controller, allowing the pilot to control the plane's movement in the air with precision.

2.1.4 Indoor Aeromodelling

Indoor aeromodelling involves flying small models in closed spaces like gymnasiums or halls, where wind conditions are minimal and the planes' size is an advantage.

2.2 About Aircraft and its Type

2.2.1 Fixed-Wing Aircraft

It contains a fixed set of wings which generate lift, which allows the aircraft to take off, stay in the air, and land. They can be used for a wide range of purposes, from passenger transport and military applications to cargo shipping and firefighting.

2.2.2 Rotary-Wing Aircraft

Rotary-wing aircraft, also known as helicopters, have rotors instead of wings which generate lift. They are used in a variety of applications, from commercial airline transportation to military operations and medical emergency services.

2.3 Types of RC Planes

2.3.1 Trainer/Pusher Model

Trainer models are beginner-friendly, designed for ease of control and stability. Pusher models have the propeller at the rear, reducing the risk of damage during landings.


Fig 2.1.1 Fig 2.1.2

2.3.2 Gliders

Gliders are non-powered aircraft that rely on thermals and air currents for flight. They teach the principles of unpowered flight and soaring.


Fig 2.2.1 Fig 2.2.2

2.3.3 Sports Plane

Sports planes are versatile and suitable for various flying styles. They offer a balance of stability and agility.

Fig 2.3.1

Fig 2.3.2

2.3.4 Aerobatic Plane

Aerobatic planes are built for performing stunts and maneuvers in the air. They require precision control and are favored by experienced pilots.

Fig 2.4.1

Fig 2.4.2

2.3.5 Float Planes

Float planes have floats instead of wheels, allowing them to take off and land on water. They are used for water-based flying adventures.

Fig 2.5.1

Fig 2.5.2

2.3.6 Jets

Jet models emulate the appearance and speed of jet aircraft. They are known for their high-performance capabilities and are popular among experienced pilots.

Fig 2.6.1

Fig 2.6.2

2.3.7 Warbirds

Warbirds are scale models of historical military aircraft. They are chosen by enthusiasts interested in replicating iconic planes from history.

Fig 2.7.1

Fig 2.7.2

2.4 Parts of an RC Plane

2.4.1 Fuselage

The fuselage is the main body of the aircraft, housing the engine, electronics, and payload.

2.4.2 Wing

Wings provide lift and control the aircraft's altitude. They come in various shapes and sizes, influencing flight performance.

2.4.3 Vertical Stabilizer

The vertical stabilizer, or fin, keeps the aircraft flying straight by preventing unwanted yaw motion.

2.4.4 Horizontal Stabilizer

The horizontal stabilizer maintains the aircraft's pitch stability, helping it maintain level flight.

2.4.5 Elevator

Elevators are movable control surfaces on the horizontal stabilizer that control the aircraft's pitch.

2.4.6 Rudder

The rudder is a movable control surface on the vertical stabilizer that controls the aircraft's yaw.

2.4.7 Ailerons

Ailerons are movable surfaces on the wings that control the aircraft's roll and bank during turns.

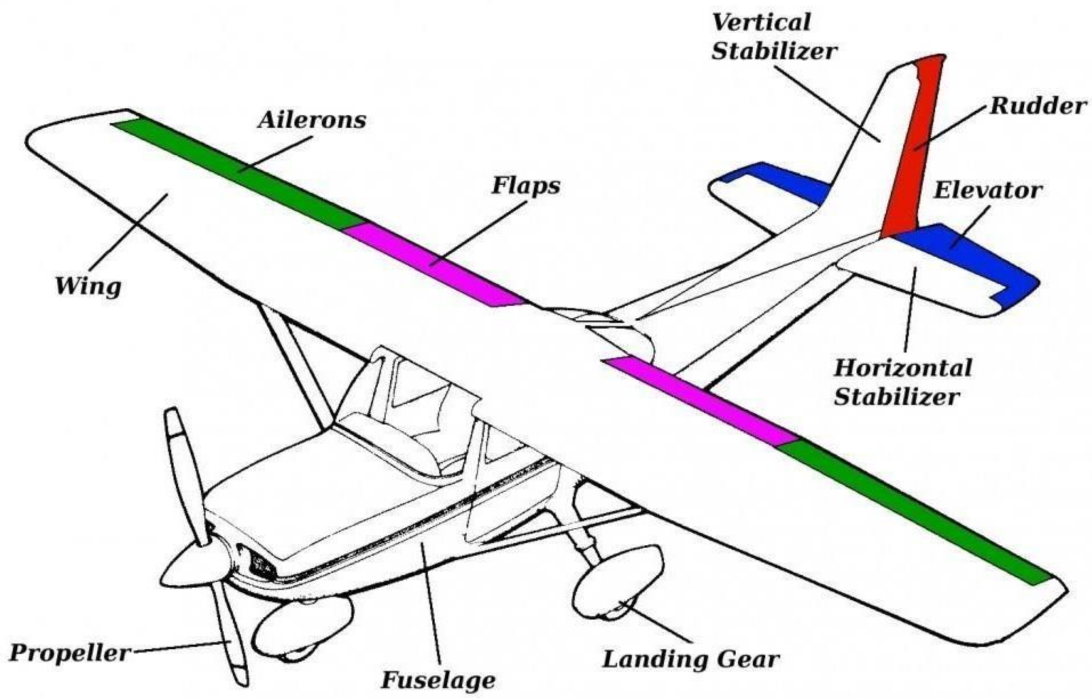

Fig 2.8

2.5 Processes in Aeromodelling

2.5.1 Tracing and Designing

Aeromodelling begins with tracing and designing. This stage involves sketching out the aircraft's blueprint, specifying its dimensions, shape, and aerodynamic features. Accurate tracing and designing are crucial for achieving the desired flight characteristics.

2.5.2 Fabrication and Cutting

Once the design is finalized, the next step is fabricating and cutting . This involves using precision tools to cut the chosen materials (commonly balsa wood or foam) into the required shapes and sizes.

2.5.3 Filing and Smoothening

Filing is essential to smoothen edges and ensure proper fitment. Smoothening is a meticulous process that involves sanding and polishing the cut components. It helps reduce drag, enhance aerodynamic performance, and improve the overall appearance of the aircraft.

2.5.4 Taping and Strengthening

Adhesive tapes are often used, offering strength and stability to the aircraft structure. Strengthening is critical for the durability and structural integrity of the model. Techniques such as adding carbon fiber reinforcements or using stronger materials in high-stress areas are common practices.

2.5.5 Assembling and Manufacturing

Fabrication is where the components come together. Skilled craftsmanship is required to assemble and attach the parts. Assembling brings all the components together. The various parts are joined to create the complete aircraft. The manufacturing phase may involve producing specialized components, such as propellers and landing gear.

Chapter 3

Project Description

3.1 Objectives of the Kaiser Model Project

3.1.1 Introduction

The Kaiser Model stands as the centerpiece of our aeromodelling journey. This chapter is dedicated to understanding the essence of the Kaiser Model project, its objectives, and the vision behind its creation.

3.1.2 Primary Goals

The primary objectives of the Kaiser Model project were meticulously crafted to align with our learning and skill development goals. We aimed to achieve the following key milestones:

- Application of Aeromodelling Processes: The Kaiser Model project served as an opportunity to put into practice the aeromodelling processes learned during our internship, including designing, cutting, fabrication, and assembling.

- Integration of Electronic Components: We sought to integrate a suite of electronic components, including the motor, ESC, transmitter and receiver, servo, and battery, to control and stabilize the Kaiser Model's flight.

- Real-World Flight Testing: The project aimed to provide us with hands-on experience in real-world flight testing and performance optimization, bridging the gap between theoretical knowledge and practical application.

3.2 Design and Construction of the Kaiser Model

3.2.1 Structural Design

The structural design of the Kaiser Model was conceived with a focus on simplicity, reliability, and accessibility. Drawing inspiration from established park jet designs, our goal was to create an aircraft that embodied stability and aerodynamic efficiency.

3.2.2 Material Selection

Material selection played a pivotal role in shaping the Kaiser Model's characteristics. We carefully chose materials that struck a balance between weight and durability, with balsa wood and foam emerging as the primary building blocks.

3.2.3 Construction Process

The construction process of the Kaiser Model unfolded in a methodical manner. We commenced with the cutting of materials, shaping them according to the design, and skillfully assembling the components to form the aircraft's structure.

3.2.4 Integration of Electronic Components

The heart of the Kaiser Model lay in the seamless integration of electronic components. This phase involved the installation of the motor, ESC, transmitter and receiver, servo, and battery, transforming the inert structure into a functional RC aircraft.

3.3 Significance of the Kaiser Model Project

3.3.1 A Learning Platform

The Kaiser Model project served as a valuable learning platform, allowing us to apply theoretical knowledge to practical experience. It was a hands-on opportunity to understand the complexities of designing, manufacturing, and flying model aircraft.

3.3.2 Skill Development

The project contributed significantly to our skill development, enhancing our capabilities in areas such as craftsmanship, electronic integration, and flight control.

3.3.3 A Glimpse into the Future

The Kaiser Model was not just a project; it was a glimpse into the exciting future of aeromodelling. It showcased the potential for innovation and exploration in the field of aerospace engineering.

Fig.3.1.1

Fig.3.1.2

3.4 Development Process

This section will delve into the development process of the Kaiser model. It will outline the research, design, and engineering efforts involved in recreating a scaled down, radio-controlled version of the original Kaiser model. The challenges faced and the methodologies employed during the prototype's development will be discussed. The Kaiser model RC Plane Prototype was developed for deep understanding of the parts of plane, installation of electronic components and to completely understand the fundamentals of aeromodelling. The objectives included creating an accurate scale model, replicating key features, and ensuring a realistic flying experience.

3.5 Design Features

Here, we will explore the design features of the Kaiser model RC Plane Prototype. We will discuss the aerodynamic considerations, structural elements, and the incorporation of essential components such as the control surfaces, landing gear, and propulsion system. The importance of maintaining visual accuracy and scale fidelity to the original Kaiser model will also be emphasized. The RC prototype was meticulously designed to capture the essence of the original Kaiser Model. It involved the use of lightweight materials, such as foam and carbon fibre, to achieve a balance between durability and manoeuvrability. Attention was given to details like the aerodynamic profile, wing configuration, and accurate markings.

3.6 Technical Specifications

This section will provide a comprehensive overview of the technical specifications of the Kaiser model RC Plane Prototype. It will include details on dimensions, weight, construction materials, control mechanisms, power system, and other relevant technical aspects. Performance data, such as flight speed, endurance, and manoeuvrability, will also be included.

3.7 Performance Evaluation

The performance of the Kaiser model RC Plane Prototype will be evaluated in this section. It will discuss flight characteristics, stability, control response, and overall manoeuvring capabilities. The prototype's adherence to the original Kaiser model's performance parameters and its suitability for recreational flying and aerial displays will be assessed. Comprehensive flight testing was conducted to evaluate the prototype's performance and manoeuvrability. The flight characteristics were analysed, including take off, landing, stability, aerobatic capabilities, and responsiveness to control inputs. The results demonstrated the successful replication of the Kaiser model's flight experience.

3.8 Parts: The Basic Build

RC planes come in all shapes and sizes. Yet most planes consist of the same structural parts: the nose, the fuselage, the wing, the tail, and the propeller. Understanding (and being able to identify) the different parts of an RC aircraft will help you tackle more advanced topics with confidence.

3.8.1 Nose

The nose is a term used loosely to refer to the front of an RC plane. Typically, the power source – electric motor or internal combustion engine - is mounted on the nose. Occasionally, you may also find a cowling and a spinner. The cowling is a smooth surfaced mold covering the engine while the spinner is a pointed module fitted over the propeller; both components are designed to reduce aerodynamic drag.

3.8.2 Fuselage

The fuselage can be thought of as the body of the plane. In a commercial aircraft, this is where you would find passengers or cargo. In an RC model, the fuselage houses your batteries, radio equipment, and servos - most fuselages are tubed shaped and hollow for this reason.

3.8.3 Wing

The wing is the single most important part of any fixed-wing aircraft. While all wings are designed to provide lift, wing placement - where the wing is mounted in relation to the fuselage - can impact the flying experience. High-wing is best for trainers as they provide greater stability; mid-wing and low-wing are geared more towards aerobatic planes.

3.8.4 Tail

The tail - technically known as the empennage - is positioned at the rear of an RC aircraft. While there are many types of tails such as the T-tail, dual-tail, and boom-tail, they all serve the same purpose: to provide horizontal (pitch) and lateral (yaw) stability. If the tail of your RC plane were to be destroyed, this would shift the center of gravity forward, forcing your plane into a rampant nosedive.

3.8.5 Propeller

The propeller is generally mounted on the nose of an RC airplane; however, they can also be found on the wings or tail. Regardless of the position, the propeller converts engine (or motor) power into thrust that pushes your plane through the air. Generally, the more blades a propeller has, the faster it will fly. This is not a direct correlation, but an accumulation of different factors.

3.9 Control Surfaces

While many parts of an RC aircraft are fixed components (holding your plane together and making the flight possible), control surfaces are adjustable pieces – connected to the servos – that enable you to control and maneuver your plane. A typical RC plane will have 3 control surfaces: the aileron, the rudder, and the elevator; these are collectively known as the primary controls.

3.9.1 Ailerons

Ailerons are the flaps found on the outer rear of each wing panel and work in opposite directions. When the right aileron is up, the left aileron is down. This generates more lift on the left wing pressing the aircraft to roll to the right. Used in conjunction with the rudder, this allows your aircraft to turn in the air.

3.9.2 Rudder

The rudder is mounted on the vertical tail panel and it is used to steer the nose of the aircraft left or right – the yaw of the plane. When the rudder is angled to the right, the nose of the plane reciprocally turns to the right and vice versa. This is caused by a disruption of airflow: when the rudder is deflected to a side, a force is exerted which pushes the tail of your aircraft in the opposite side yawing the nose in the desired direction.

3.9.3 Elevators

Located on the horizontal tail panel, elevators – as the name implies – control the elevation or pitch of your plane. When the elevators are tilted down, the tail receives more lift and the nose of the plane is pitched downwards. Conversely, when the elevators are tilted up, more force is exerted on the tail, pushing the tail down while pitching the nose of the plane upwards.

3.9.4 Visual representation of controls in aircraft

1) Ailerons = Ailerons are basically used to provide rolling motion in an aircraft

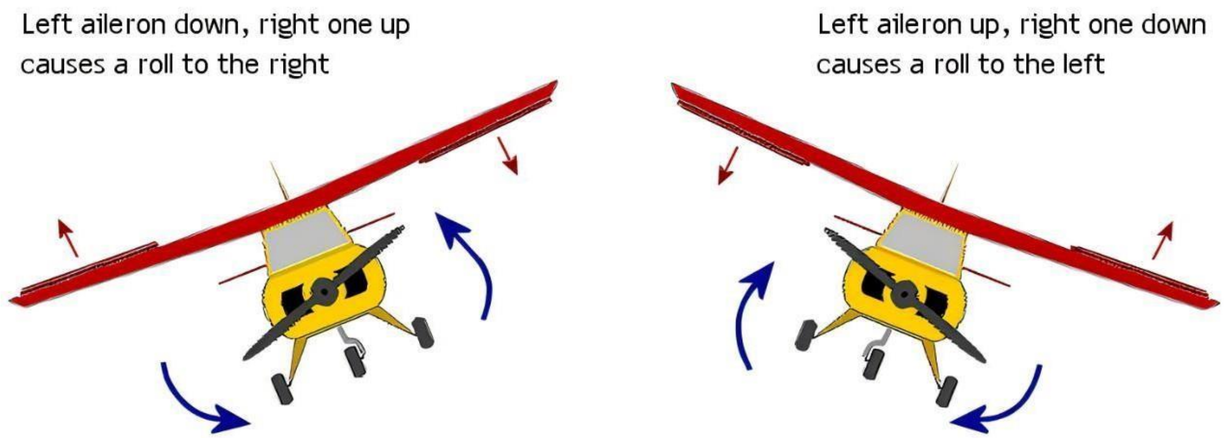

Fig. 3.2

2) Elevator: - Elevator provide upward and downward motion to an aircraft

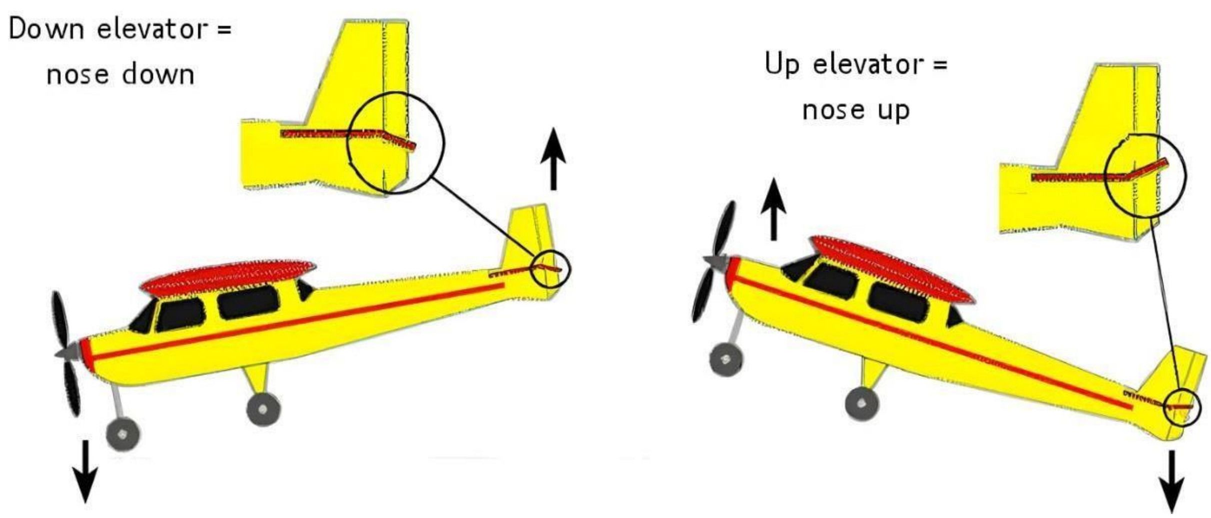

Fig. 3.3

3) Rudder :- Rudder provides yaw motion to an aircraft.

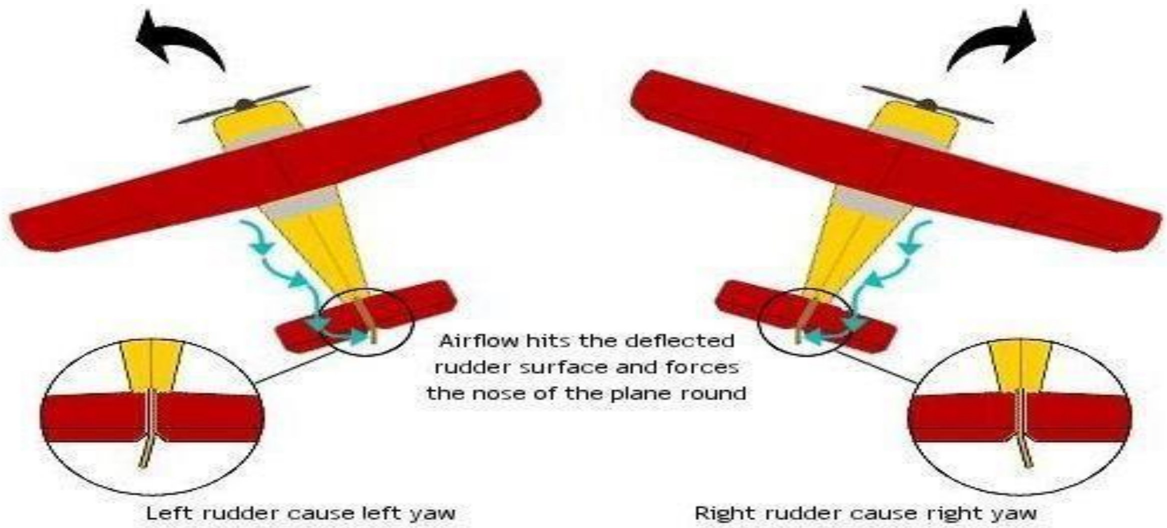
Airflow hits the deflected
rudder surface and forces
the nose of the plane round
Left rudder cause left yaw
Right rudder cause right yaw

Fig. 3.4

Chapter 4

Hardware components

4.1 Receiver

The receiver is a crucial component in an RC plane that receives radio signals transmitted by the remote control. It decodes these signals and sends corresponding commands to other electronic components. The receiver typically operates on a specific frequency band, such as 2.4 GHz, and it must be compatible with the transmitter used.

4.2 Transmitter

The transmitter is the handheld device used by the pilot to control the RC plane. It consists of a control interface, which includes joysticks, switches, and dials. When the pilot manipulates these controls, the transmitter converts the input into radio signals and transmits them to the receiver installed on the plane. The transmitter and receiver must operate on the same frequency to establish a reliable connection.

Fig. 4.1

4.3 Servos motor

Servos are small electric motors equipped with position feedback mechanisms. They are responsible for controlling the movements of various control surfaces on the RC plane, such as the ailerons, elevators, and rudder. The servos receive commands from the receiver and translate them into mechanical movements, adjusting the orientation and stability of the aircraft during flight.

Fig. 4.2

4.4 Electronic Speed Controller (ESC)

An ESC is a vital component in electric-powered RC planes. It controls the speed and direction of the electric motor that drives the propeller. The ESC connects between the receiver and the motor and receives signals from the receiver to regulate the power supplied to the motor. It also provides features such as braking, battery monitoring, and thermal protection to ensure safe and efficient motor operation.

Fig. 4.3

4.5 Battery

The battery supplies power to all the electronic components of the RC plane. Lithium polymer (LiPo) batteries are commonly used due to their high energy density and light weight. The battery's capacity, measured in milliampere-hours (mAh), determines the flight duration. It is crucial to select a battery that can provide sufficient power for the motor and other components while considering the weight and size constraints of the aircraft.

Fig. 4.4

Batteries power everything in radio control (RC), even nitro-powered models. Although the engine burns gasoline, you can't move without a battery to run the receiver and servos. As with so many other facets of our incredible hobby/sport, you may become quite knowledgeable about battery technology if you are truly interested in doing so, but this is rarely necessary to make an informed battery decision and comprehend the several types of batteries we use in radio control. What you truly need to know is provided here.

4.5.1 LiPo and NiMH

The two primary battery types used to power electric models are lithium polymer (LiPo) and nickel-metal hydride (NiMH). Each of the chemistry-class names refers to a component of the battery that reacts to store and discharge energy as electricity, and each has advantages and disadvantages.

4.5.1.1 NiMH

It's likely a NiMH battery if you purchased a ready-to-run (RTR) model with one. Nickel-metal packs are hardy, affordable, and don't need much particular maintenance. While their voltage declines consistently when the pack is depleted, they are heavier than a LiPo battery of comparable voltage and capacity (we'll get to those words later). As soon as you start driving, your automobile moves more slowly every minute. initially barely perceptibly, but slowly.

NiMH packs are constructed with cylindrical cells (usually 6-8 of them) like those we've been dropping into flashlights and TV remotes for years.

Fig. 4.5

4.5.1.2 LiPo

LiPo batteries are frequently marketed as extras, certain RTR models come with them. LiPo batteries are lighter than NiMH batteries of the same voltage and capacity, making your model appear more potent. The LiPo's capacity to hold its voltage for a longer period of time when the pack is drained also contributes to the "feeling of power" (often referred to as "punch") that users experience. A LiPo will maintain a constant voltage for the majority of your run before abruptly dropping off at the conclusion of the charge, as opposed to providing less and less voltage over the course of your run. The drawbacks include cost (LiPos are more expensive than NiMH, but the difference is closing), and care, as LiPos need a certain maintenance routine for the longest lifespan and safest use.

Fig. 4.6

4.6 Extension and Y cords

Fig.4.7.1 Fig.4.7.2

Chapter 5

Future Scope and Potential Improvements

5.1 Advances in Materials and Construction

This section will explore potential advancements in materials and construction techniques that can enhance the performance and durability of Kaiser model RC planes. It will discuss the incorporation of lightweight composites, advanced coatings, and manufacturing methods that can optimize strength-to-weight ratios and improve overall structural integrity. The Kaiser Model RC Plane Prototype can be further developed for remote sensing and surveillance purposes. With the integration of advanced imaging systems, it could contribute to aerial mapping, environmental monitoring, and disaster response operations.

5.2 Enhanced Control Systems

Advances in control systems, such as fly-by-wire technology and advanced autopilot features, can significantly improve the maneuverability and responsiveness of RC planes. This section will explore the integration of advanced control systems to enhance pilot experience and ensure precise control during flights. Continued technological advancements, such as miniaturization of components, improved battery efficiency, and enhanced materials, will enhance the performance and capabilities of future RC models. Integration with emerging technologies, such as artificial intelligence and virtual reality, can also provide new possibilities for training and simulation. Developments in autonomous flight systems and artificial intelligence can enable Kaiser Model RC planes to operate with increased autonomy and advanced decision-making capabilities. This could lead to applications in autonomous reconnaissance missions and collaborative swarm operations.

5.3 Integration of Advanced Technologies

The integration of advanced technologies, such as GPS navigation, telemetry systems, and onboard cameras, can enhance the capabilities and functionality of RC planes. This section will discuss the potential applications of these technologies, including real-time flight data monitoring, autonomous flight modes, and aerial photography/videography.

5.4 Potential Applications

Beyond recreational flying, RC planes have potential applications in various fields. This section will explore potential uses in education and training, aerial cinematography, aerial surveillance, and scientific research. The benefits, challenges, and opportunities associated with these applications will be discussed. The RC Plane Prototype has the potential for diverse applications in both military and civilian sectors. In military contexts, it can serve as a training tool for pilots and ground crews, aid in research and development, and be utilized for mission rehearsals. In the civilian realm, it can be embraced by hobbyists, aviation enthusiasts, and even educational institutions.

5.5 Limitations

It is difficult to control and requires a higher level of skill and experience to fly properly.
The constructional and operational cost is high as sheets, motor and other items used to make of RC planes are quite expensive. It is even more costly to purchase. Additionally, regular maintenance and repairs can be costly due to complexity of the aircraft. Crashing is also a risk during flying of RC planes, as it is difficult to pilot them, especially for beginners accurately.

5.6 Learning Outcomes

The 15-day Aeromodelling internship has resulted in a comprehensive set of learning outcomes. I gained a fundamental understanding of aerospace and aeronautical engineering principles, delving into the intricate science behind flight and the crucial role of engineering in aviation. Through hands-on experience, I honed the craftsmanship skills, mastering the art of cutting, shaping, taping, and assembling materials to construct model aircraft. The integration of electronic components, such as motors, servos, and transmitters, deepened my knowledge of electrical systems and control mechanisms. Additionally, the training provided insights into aerodynamics, flight control, and the core principles of aviation, serving as a solid foundation for potential future careers in the aerospace industry. Moreover, the internship encouraged creative thinking and innovation, granting participants the freedom to experiment with various designs, materials, and configurations. Collaboration with peers and experts fostered teamwork and improved communication skills while collectively working on model aircraft projects. Aeromodelling was also showcased as a source of enjoyment and relaxation, offering respite from daily routines and nurturing a passion for aviation. Lastly, the internship explored diverse career opportunities in aerospace engineering, UAV industries, research and development, flight simulation, aeromodelling instruction, model aircraft manufacturing, and even entrepreneurship within the field. These learning outcomes collectively empower participants with a well-rounded understanding of aeromodelling, bridging the gap between theory and practical application and opening doors to various exciting prospects in the world of aviation.

5.7 Conclusion

In conclusion, my 15-day internship in Aeromodelling has been an enlightening and transformative experience. This journey into the world of miniature aircraft design, construction, and flight has not only deepened my understanding of aerospace engineering but has also instilled in me a profound appreciation for the intricate science behind flight.

Throughout this internship, I had the opportunity to delve into various facets of aeromodelling, from the selection of materials to the integration of electronic components, and from the meticulous craftsmanship of model planes to the exhilarating moments of witnessing them take flight. I learned the importance of precision, attention to detail, and problem-solving skills in the construction of these model aircraft.

Moreover, this internship has allowed me to grasp fundamental concepts in aviation and aerodynamics, providing a solid foundation for potential future pursuits in aviation-related fields. The hands-on experience with control surfaces, flight dynamics, and flight testing has been invaluable in bridging the gap between theoretical knowledge and practical application.

Aeromodelling has also highlighted the significance of teamwork and collaboration. Working alongside fellow enthusiasts and experts in the field, I witnessed how collective efforts can lead to the successful completion of complex projects. It has enhanced my communication skills and underscored the importance of coordination in achieving common goals.

As I look to the future, I recognize the vast potential for aeromodelling as both a hobby and a career. The skills I've acquired during this internship have opened doors to various opportunities, from pursuing a career in aerospace engineering to engaging in entrepreneurship within the aeromodelling industry.

In closing, I would like to express my gratitude to the mentors, instructors, and the team that made this internship possible. Their guidance, expertise, and passion for aeromodelling have been instrumental in my learning journey. I leave this internship with a deep sense of accomplishment and excitement for the possibilities that lie ahead in the fascinating world of aeromodelling.

FUTURE SCOPE

this is one of the most growing fields the field of areomodeling holds much scope in future studies for the students the students who get the course of this will be able to study various courses in an amazing way after the students complete the study of areo-modeling he/she will be able to get the job along with the better salary.

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