



SAEINDIA is India's leading resource for mobility technology. As an individual member-driven society of mobility practitioners the ownership of SAEINDIA wrests with its members who are Individuals from the mobility community, which includes Engineers Executives from Industry, Government Officials, Academics and Students. SAEINDIA is a strategic alliance partner of SAE International registered in India as an Indian nonprofit engineering and scientific society dedicated to the advancement of mobility industry in India.

SAEINDIA has over 50,000 student members in more than 480 collegiate clubs located all over India. Collegiate clubs provide practical exposure to a professional engineering society as well as focal point for campus engineering programs and projects. Applicants must be students pursuing studies leading to any bachelor, masters, or doctoral degree in Engineering Colleges approved by AICTE or UGC. SAEINDIA membership is not open to school students.

SAEINDIA Collegiate clubs offer student members organise programs and activities, fellowship, and leadership experience. SAEINDIA student members are also entitled to many of the services available to SAEINDIA's regular members.

### **VISION & MISSION OF SAEINDIA**

- SAE is the most preferred technical body for knowledge dissemination & skill development of mobility professionals, students, and faculty
- SAE is a trusted think-tank advising policymakers on Mobility-Related Matters
- SAE is a self-sustaining Society with more than 10% of Mobility Professionals as Members
- SAE is a nimble and Professional Organization Creating Value for Mobility Engineering Community

## **SAE INDIA ASIET**

SAE INDIA ASIET student chapter is started on 2014 June with a student members of strength 120. From 2014 SAEINDIA ASIET Chapter has conducted many programmes in every year. The programmes organized by ASIET chapter are Lecture meeting, Faculty training workshops, SAE Trek, Tier II etc. All the programmes enhances the profession growth of students and faculties of the collegiate club. It improves the students organizing capabilities and leadership qualities. The programmes like SAE Trek open the platform for students to interact with industrial persons and students from other states.

The SAE Colligative club of ASIET is actively involved in the various SAE national level competitions like SAE BAJA and Aero design Challenge. The 2015-2019 batch students successfully completed their SAE E- Baja virtual level in 2018 at Chitkara University, Punjab. The students of 2016-2020 batch students made a team of 7 members and clear the initial levels of SAE Aero design Challenge. Currently students of 2020-2024 batch is doing Aero design Challenge competition.

### **Student Membership**

Academic Year	No. of Student Members	No. of Faculty Advisors
2014 -2015	120	2
2015 -2016	90	2
2016- 2017	114	2
2017- 2018	88	2
2018- 2019	26	2
2019- 2020	33	2
2020- 2021	26	2
2021- 2022	0	1
2022- 2023	0	1
2023- 2024	7	1

## *SAE ASIET Collegiate Club Activity Report*

**Academic Year : 2019 – 2020**

### **Student Members**

#### **SAE STUDENT MEMBERS 2019 - 2020**

Sl. No	Honorific	First Name	Last Name	Amount Rs.*	Type of Membership
1	Mr.	ABHIJITH	P A	Rs.472/-	One Year
2	Mr.	AKASH	M MURALI	Rs.472/-	One Year
3	Mr.	G	AMSHUMAAN	Rs.472/-	One Year
4	Mr.	ADARSH	V KUMAR	Rs.472/-	One Year
5	Mr.	ASWIN	PRABHAKAR	Rs.472/-	One Year
6	Mr.	HARIKRISHNAN	S	Rs.472/-	One Year
7	Mr.	V J ADARSH	SHENOY	Rs.1770/-	Life Time
8	Mr.	SHAMBHU MAHADEV	R	Rs.1770/-	Life Time
9	Mr.	SHARATH	ANILKUMAR	Rs.1770/-	Life Time
10	Mr.	ABY	SCARIA	Rs.1770/-	Life Time
11	Mr.	RONAC	JOSEPH	Rs.1770/-	Life Time
12	Mr.	BUHARI	ASHRAF	Rs.1770/-	Life Time
13	Mr.	ANANTHAN	VENUGOPAL NAIR	Rs.1770/-	Life Time
14	Mr.	SEBIN	K DAVIS	Rs.1770/-	Life Time
15	Mr.	VISHNU	HARI	Rs.1770/-	Life Time
16	Mr.	AKHIL	SUVERNAN	Rs.1770/-	Life Time
17	Mr.	SANJU	PETER	Rs.1770/-	Life Time
18	Mr.	AMAL	UNNIKRISHNAN	Rs.1770/-	Life Time
19	Mr.	VISHNU	T M	Rs.1770/-	Life Time
20	Mr.	BLESTIN	JOHNSON	Rs.1770/-	Life Time
21	Mr.	MAHESH	V.S	Rs.1770/-	Life Time
22	Mr.	NADEEM	KN	Rs.1770/-	Life Time
23	Mr.	ABDUL	RAMEEZ	Rs.1770/-	Life Time
24	Mr.	SANDEEP	S MALLYA	Rs.1770/-	Life Time
25	Mr.	AZIL	MUHAMMED	Rs.1770/-	Life Time
26	Mr.	MILAN	JERALD	Rs.1770/-	Life Time

**Faculty Advisors:** 1. Mr. Eldhose K Joy, Asst. Prof., Mechanical

2. Vishnu S, Asst. Prof., Mechanical

**SAEINDIA ASIET Activities**

**SAE AERODESIGN CHALLENGE 2020**

**Southern Section**

**DESIGN REPORT**

**TEAM PRANA**

**Team**

Eldhose K Joy: Faculty Advisor

1. Abhijith B : Team Captain
2. Jithu Augustine
3. P S Devadarsan
4. Anand G Potty
5. Harikrishnan S
6. Aravind P R
7. Akif Husain

## SAE AERO DESIGN CHALLENGE 2020

### STATEMENT OF COMPLIANCE

#### Certificate of Qualification

Team Name: PRANA

Team No. ADC2020196

College: Adi Shankara Institute Of Engineering And Technology, Kalady

Faculty Advisor: Asst Prof. Eldhose K Joy

Faculty Advisor's Email: eldhosekj.me@adishankara.ac.in

#### Statement of Compliance

As a faculty advisor, I certify that the registered team members are enrolled in collegiate courses. This team has designed and constructed an electric motor powered radio controlled airplane, for their participation in SAE Aero Design Challenge 2020, without direct assistance from professional engineers or RC model experts and pilots.

Mr. Eldhose K Joy 

Assistant Professor

Department Mechanical Engineering,

Adi Shankara Institute of Engineering and Technology, Kalady

## **TEAM OBJECTIVES**

To define the objectives the team is based on the requirements established by the Society of Automotive Engineers (SAE). The following outlines the specific goals that were defined for the development of PRANA.

### **Objectives**

Maximum payload possible

Precise and reliable telemetry

A functional releasable-payload system

Good lift performance

Good design structural

Improve aircraft performance

## **EXECUTIVE SUMMARY**

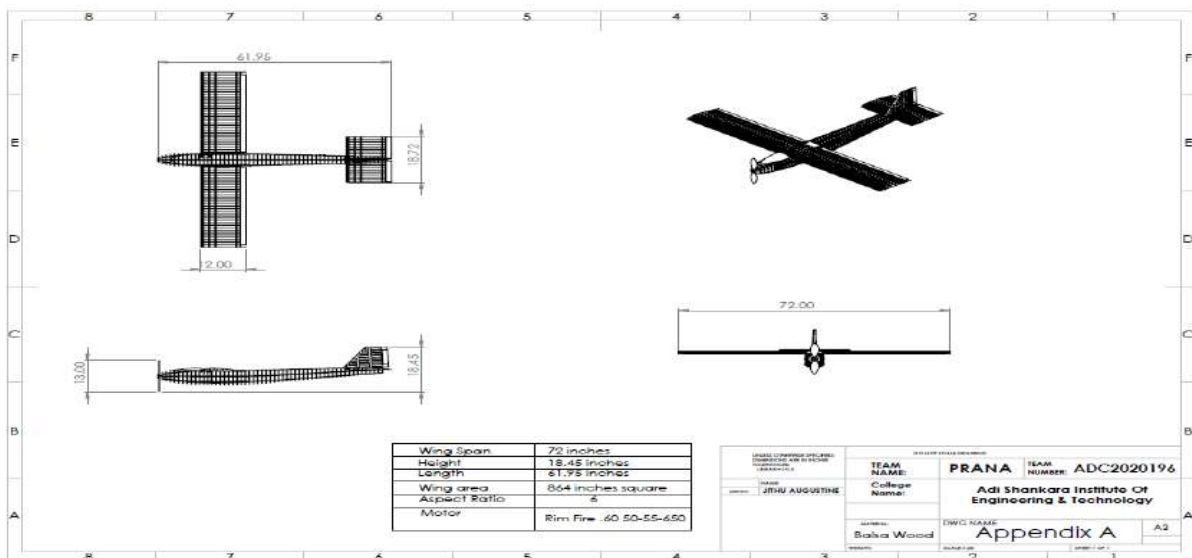
This document details the final design made by the Team PRANA from the Adi Shankar Institute Of Engineering And Technology , participating in the SAE Aero design 2020 , in which the methodology is explained, as well as overall design, analysis , performance, and the manufacturing process used to build this aircraft named “PRANA” (This name will be used to future references on the report).

The main objective is to design and build an unmanned aerial vehicle capable of transporting the highest payload as well as having a precise telemetry system for the launch of packages or dynamic loads and therefore being able to achieve excellent design performance. The model must fulfil its mission by following the SAE design requirements and be an aircraft safe enough to operate.



**Fig. Aero Design Workshop**

**Design Details**





## AERO DESIGN CHALLENGE 2020 CERTIFICATE

*This is to certify that*

Mr. / Ms. ABHIJITH.B

from ADI SHANKARA INSTITUTE OF ENGINEERING & TECHNOLOGY, ERNAKULAM has

Participated in the **5<sup>th</sup> SAEINDIA SOUTHERN SECTION AERO DESIGN CHALLENGE**

*held at Bannari Amman Institute of Technology, Sathyamangalam,*

*from 28<sup>th</sup> February to 1<sup>st</sup> March 2020.*

*V. Hairt*  
Champion - ADC 2020

*G. Rajasekhar*  
Secretary - SAEISS

*J. Jagan*  
Chairman - SAEISS

Activate  
Go to Settings

## SAE Electric Two Wheeler Design Competition

### SAE Electric Two Wheeler Design Competition

#### Introduction

The SAE Electric Two Wheeler Design Competition serves as a platform for engineering students to showcase their innovation and technical skills in designing electric two-wheelers. Organized by the Society of Automotive Engineers (SAE), this competition challenges participants to create efficient, sustainable, and market-ready electric vehicles (EVs) that meet performance, safety, and environmental standards.

#### Objective

The primary objective of the competition is to foster creativity and ingenuity among students in developing electric two-wheelers that address current and future mobility challenges. Participants are encouraged to integrate advanced technologies, optimize vehicle dynamics, and ensure compliance with regulatory requirements while emphasizing energy efficiency and environmental sustainability.

### **Benefits and Learning Outcomes**

Participation in the SAE Electric Two Wheeler Design Competition offers numerous benefits and learning outcomes for students:

- **Hands-on Experience:** Students gain practical experience in designing, prototyping, and testing electric vehicles, preparing them for careers in the automotive and sustainable transportation industries.
- **Interdisciplinary Collaboration:** Teams collaborate across disciplines, fostering teamwork, communication skills, and the ability to integrate diverse engineering principles.
- **Innovation and Problem-Solving:** Participants develop critical thinking skills by addressing real-world engineering challenges related to electric vehicle design, performance optimization, and environmental impact.
- **Industry Exposure:** The competition provides exposure to industry-standard practices, technologies, and emerging trends in electric vehicle development.
- **Networking Opportunities:** Participants have opportunities to network with industry professionals, potential employers, and fellow enthusiasts in the electric vehicle sector.

### **Conclusion**

The SAE Electric Two Wheeler Design Competition plays a crucial role in nurturing the next generation of engineers and innovators in the field of electric mobility. By encouraging creativity, technical excellence, and sustainability in vehicle design, the competition contributes to advancing the adoption of electric vehicles and promoting sustainable transportation solutions globally.

The students register for the competition but, they didn't go for the competition due to the corona related issues.





Team Name		TEJAS			
Team Captain Name		ASHBIN TOMY			
University/College Name		ADI SHANKARA INSTITUTE OF ENGINEERING & TECHNOLOGY			
University/College Address		VIDYA BHARATI NAGAR, MATTOOR, KALADY, PIN-683574			
S. No	Student Name	E-Mail ID	SAE Membership ID	Contact Number	Signature
1	P-AKSHAY BHAT	<a href="mailto:pakshaybhat233000@gmail.com">pakshaybhat233000@gmail.com</a>	7190428698	9207052688	
2	BRISTO JOSE	<a href="mailto:bristojose2033@gmail.com">bristojose2033@gmail.com</a>	7190428699	7902539902	
3	ASWINKUMAR K. A	<a href="mailto:aswinkumar9496@gmail.com">aswinkumar9496@gmail.com</a>	7170447485	9447925477	
4	ANEX TOM MARTIN	<a href="mailto:anextomofficial@gmail.com">anextomofficial@gmail.com</a>	7190428690	7907722073	
5	ADARSH K SURESH	<a href="mailto:adarshksuresh1999@gmail.com">adarshksuresh1999@gmail.com</a>	7190428702	8078531214	
6	AMAL OA	<a href="mailto:eamal635@gmail.com">eamal635@gmail.com</a>	7190428696	9946974281	
7	AKSHAI SHINE TOMY	<a href="mailto:akshaitomy@gmail.com">akshaitomy@gmail.com</a>	7190428701	9562052722	
8	ASHBIN TOMY	<a href="mailto:ashbinatompublishka@gmail.com">ashbinatompublishka@gmail.com</a>	7190428704	8593827398	
9	ASIF A GAFOOR	<a href="mailto:asifgafoor@gmail.com">asifgafoor@gmail.com</a>	7190428700	9562573799	
10	ANANDHU ASHOKAN	<a href="mailto:anandhuashokan320@gmail.com">anandhuashokan320@gmail.com</a>	7190428688	9496447183	

Details of Faculty Advisor					
Name	Designation	E-Mail ID	Mobile No.	SAEINDIA membership No	Signature
ELDHOSE K JOY	Asst. Professor	<a href="mailto:joyeldhose77@gmail.com">joyeldhose77@gmail.com</a>	9605440515	7160411699	

Date:  
Place: MATTOOR



Signature  
(Head of the Institute with seal)

PRINCIPAL  
ADI SHANKARA INSTITUTE OF  
ENGINEERING & TECHNOLOGY  
VIDYA BHARATHI NAGAR,  
KALADY, KERALA - 683574

## Academic: Year 2020 – 2021

### Student Members

Membership No	First Name	Last Name	User id	Password
7190423250	MILAN	JERALD	8156982935	8156982935
7190423249	AZIL	MUHAMMED	994670971	994670971
7190423248	SANDEEP	S MALLYA	8281160403	8281160403
7190423247	ABDUL	RAMEEZ	9495313178	9495313178
7190423246	NADEEM	KN	9526702130	9526702130
7190423245	BLESTIN	JOHNSON	9995199601	9995199601
7190423244	VISHNU	T M	8891379851	8891379851
7190423243	AKHIL	SUVARNAN	9946630780	9946630780
7190423242	VISHNU	HARI	9744423939	9744423939
7190423241	ANANTHAN	VENUGOPAL NAIR	8078277802	8078277802
7190423240	RONAC	JOSEPH	9074227202	9074227202
7190423239	ABY	SCARIA	9495980928	9495980928
7190423238	V J ADARSH	SHENOY	9633441677	9633441677
7190423237	HARIKRISHNAN	S	9895187539	9895187539
7190423236	ASWIN	PRABHAKAR	8606926299	8606926299
7190423235	ADARSH	V KUMAR	9645373632	9645373632
7190423234	G	AMSHUMAAN	8943308624	8943308624
7190423233	AKASH	M MURALI	8281154149	8281154149
7190423232	ABHIJITH	P A	8606026828	8606026828
7170447489	Buhari	Ashraf	8921888799	38800
7170447487	Amal	Unnikrishnan	8078031650	31434
7170447482	Sharath	Anilkumar	7902933867	85408
7170447476	Sebin	K Davis	9495603877	99769
7170447475	Sanju	Peter	7902470826	82894
7170447472	R Shambu	Mahadev	9747388117	98916
7170447471	Mahesh	V S	7902286389	36093

**Faculty Advisors:** 1. Mr. Eldhose K Joy, Asst. Prof., Mechanical

2. Vishnu S, Asst. Prof., Mechanical

## Online Lecture Meet

### LECTURE MEETING

ON

### **BS VI CHALLENGES AND TECHNOLOGIES**

ORGANISED BY

SAEISS COCHIN DIVISION IN ASSOCIATION WITH SAE COLLEGIATE CLUB OF ASIET,  
KALADY, KERALA



**03<sup>rd</sup> SEPTEMBER 2020**

### **Program Schedule**

**05.45 PM: INVOCATION**

#### **MODERATOR**

Mr. Francis A J  
MC Member, SAEISS

#### **WELCOME ADDRESS**

K T Subramanian  
HOD, Mechanical Engineering Department  
ASIET, Kalady

#### **ABOUT THE SPEAKER**

Mr. Eldhose K Joy  
Secretary, SAEISS, Cochin Division

**05.55 PM: KEYNOTE ADDRESS**

Mr. Midhun V S  
Asst. General Manager, Ashok Leyland Ltd.  
**Topic: BS VI Challenges And Technologies.**

**06.55 PM: VOTE OF THANKS**

Mr. Vishnu S  
Faculty Advisor - SAE Collegiate club, ASIET, Kalady.



SAEISS COCHIN DIVISION  
IN ASSOCIATION WITH  
SAE COLLEGIATE CLUB OF ASIET  
IS ORGANISING A

## LECTURE MEET

ON

**BS VI CHALLENGES AND TECHNOLOGIES**

**RESOURCE PERSON**



**Mr. Midhun V S**  
Assistant General Manager for Ashok Leyland

**No. of participant's: 120**

### **REPORT ON LECTURE MEET**

SAEISS Cochin Division in association with the SAE Collegiate Club ASIET, organized a lecture meet on “BS VI CHALLENGES AND TECHNOLOGIES” on September 3<sup>rd</sup> 2020. The meet was held through the online platform Google meet which was attended by over 120 people. The meeting started by 6pm with a silent invocation, followed by opening address by MR. Francis Augustine, MC SAEISS, and then welcome address by Prof. K T Subramanian, HOD Mechanical Engineering department ASIET. The speaker was Mr. Midhun V S, who is currently the Assistant General Manager, Ashok Leyland. Mr. Eldhose K Joy, secretary SAEISS Cochin division give a brief introduction about the speaker.

Mr. Midhun gave an elaborate idea regarding BS VI engine norms, mainly centered on emission reduction and Treatment System (EATS), by covering a lot of topics. He started off giving a brief idea regarding pollution in present situation and the technology adopted in the BS VI norms. He then gave detailed explanation of how pollution formation in diesel engines and the relevance of BSVI technology. He gave insight regarding the challenges phased by the BSVI technology, improving engine efficiency, EGR circuits and combustion technologies incorporated. He also discussed how vehicles are tested focusing on emission parameters, changes to be made in BSVI. Towards the end he discussed the prospect of challenges phased in BS VI norms in various fields like its maintenance, customer usage, different temperature conditions and load conditions. Overall, the session gave the participants the motive behind implementing BSVI as an effective way to reduce negative environmental impact by the current engines. Mr. Midhun clear all the doubts of the participants related with BS VI norms. The session end with vote of thanks by Mr. Vishnu S, Faculty advisor of ASIET.

## **Academic: Year 2023 – 2024**

### **Student Membership**

**SAE DRONE DEVELOPMENT CHALLENGE 2024**  
**SOUTHER SECTION**  
**DESIGN REPORT**  
**TEAM TACHYON AEROSPORT**  
**DDC2024003**  
Team Members

1. Nowar Lal
2. Naveen Natesan
3. Madhav Muraleedharan
4. Maheshwar M Nair
5. Safwan P M
6. Muhammed Sabir M R
7. Mohammed Hashim M N
8. Jeffin Jose
9. Sreeraj C R
10. Sreehari Suresh

Team Mentor  
Eldhose.K.Joy  
Assistant Professor

**SAE DRONE DEVELOPMENT CHALLENGE 2024**  
**STATEMENT OF COMPLIANCE**  
Certificate of qualification

Team Name : TACHYON AEROSPORT  
Team ID : DDC2024003  
College : Adi Shankara Institute of Engineering and Technology, Kalady  
Faculty Advisor: Asst Prof. Eldhose K Joy  
Faculty Advisor E-mail: joy.eldhose77@gmail.com

**Statement of Compliance**

As a faculty advisor:

- I certify that the registered team members are enrolled in collegiate courses.
- I certify that this team has designed, constructed and/or modified the radio-controlled airplane with the intention to use this aircraft in the **SAEISS Drone Development Challenge 2024** competition, without direct assistance from professional engineers, R/C model experts or pilots, or related professionals.
- I certify that this year's Design Report has original content written by members of this year's team.
- I certify that all reused contents have been properly referenced and is in compliance with the University's plagiarism and reuse policies.

Signature of Faculty Advisor  Date 17/02/2024  
Signature of Team Captain  Date 17/02/2024

**Team Captain Information**  
Team Captain Name: Nowar Lal  
Team Captain's Email: nowarlal76@gmail.com  
Team Captains Mobile: 7593930397

## **INTRODUCTION**

The SAEISS Drone Development Challenge (SAE DDC) is an initiative by the Society of Automotive Engineers India Southern Section (SAE ISS) to promote and develop Indian expertise and experience in unmanned systems technologies at the university and college levels.

The competition encourages a well-planned and executed design approach for small scale unmanned vehicles, with safety considerations being a crucial factor. The challenge allows a maximum of 10 student members and one faculty advisor per team, and multiple teams from the same institute are allowed. The competition includes categories such as Regular Class and Micro Class. The SAE DDC is a significant platform for students to showcase their skills and innovation in the field of drone technology.

To best achieve the task of micro-class competition, the aircraft designed by this team utilized a conventional aircraft configuration., which was modifies to excel at providing heavy lift capabilities. The conventional aircraft configuration was chosen over more advanced designs because of its performance predictability. The maximum weight of the aircraft in micro-class competition should not be more than 1.5 Kg.

In the following sections we outline the design process used to create our aircraft.

### **REQUIREMENT**

- The dead weight of the aircraft should not be more than 1.5 Kg.
- Micro class aircraft is restricted to electric motor propulsion only.
- The aircraft cannot be a lighter than air or rotary wing aircraft.
- The maximum flight battery pack allowed for Micro class is a 3 cell lithium polymer battery pack.
- The aircraft must be able to accommodate a payload bay of 5 inches by 1.5 inches by 1.5 inches.



- The aircraft shall be hand tossed by throwing the aircraft using one hand grasping the fuselage.
- The aircraft and its essential components should fit into a carrying cubic box measuring less than or equal 3 feet on all sides.
- The total weight comprising of the carrying box and the aircraft should be less than 4.5 Kg.

## **TEAM OBJECTIVES**

The team “Tachyon Aerosport” objective to design and construct an unmanned aerial vehicle (UAV) that optimally balances aerodynamic efficiency, structural integrity, and payload capacity for the SAE Drone Development Challenge 2024.

- Maximum payload possible
- Good lift performance
- Good design structural
- Improve aircraft performance
- Prioritize aerodynamic considerations to achieve an exceptional lift-to-drag ratio, enabling the UAV to operate efficiently.
- Optimize the payload capacity of the UAV to meet competition requirements.
- Embrace a culture of continuous improvement by regularly assessing and learning from design iterations, testing outcomes.

## **SYSTEM OVERVIEW**

The final aircraft design consists of a monoplane and has straight high-wing. The aircraft’s fuselage has a truss structure. The propulsion system is constituted by an electric motor of 2200 Kv and a single 2 blade propeller. The wing span of aircraft is 30 inches and the length of the aircraft is 22inches. The empty weight of the aircraft is around 1.2 Kg. We are expected lift a payload fraction of 0.6 as our





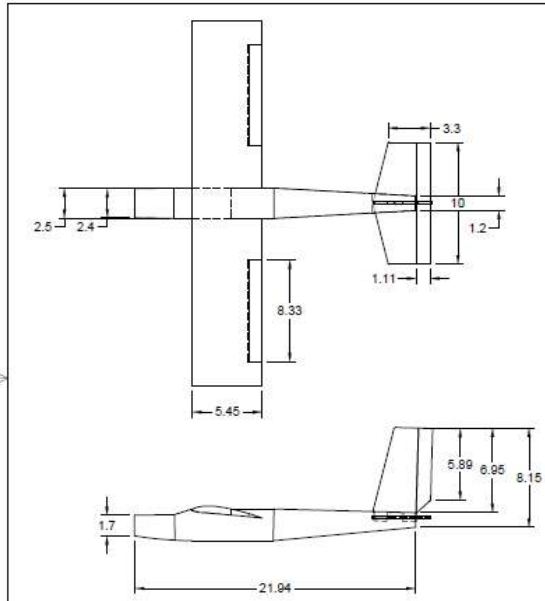
target. The payload to lift is around 720 grams. The total weight of the aircraft including the payload is around 1.92 Kg.

## **EXECUTIVE SUMMARY**

This document presents the conclusive blueprint devised by Team "TACHYON AEROSPORT" of the Adi Shankara Institute Of Engineering And Technology, Kalady for the SAE Drone Development Challenge 2024. It comprehensively delineates the approach taken, encompassing the overall aircraft design, analysis, performance evaluation, and the manufacturing procedures employed in crafting the aircraft named "TACHYON" (for future reference in this report).

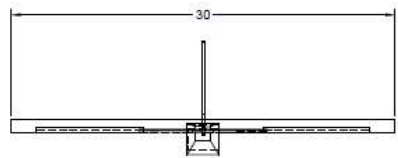
The primary aim revolves around fabricating an unmanned aerial vehicle with the capability to efficiently transport substantial payloads and feature a precise telemetry system for launching packages or dynamic loads. This objective is anchored in achieving optimal design performance. Complying rigorously with SAE design prerequisites, the model must serve its purpose while ensuring operational safety as a fundamental attribute of the aircraft.





SR.NO	PART NAME	QUANTITY
1	Fuselage	1
2	Wing	1
3	Vertical Stabilizer	1
4	Rudder	1
5	Horizontal Stabilizer	1
6	Elevator	1
7	Aileron	2
8	Motor	1
9	Servo	3
10	ESC	1
11	Battery	1

SR.NO	PART NAME	WEIGHT (Kg)	DISTANCE (inch)
1	Motor	0.065	-1.1
2	ESC	.033	0.23
3	Battery	0.187	0.5
4	Propellor	0.010	-1.52
5	Servo	0.009	6.59
6	Servo	0.009	16.17



WING SPAN	CHORD	TAIL SPAN	EMPTY WEIGHT(Kg)	MOTOR
30"	5.45"	10"	1.2	2200 Kv

**TEAM: TACHYON AEROSPORT**

COLLEGE NAME :  
**ADI SHANKARA INSTITUTE OF ENGINEERING AND TECHNOLOGY**

SIZE	TEAM NO.	REV
A3	DDC2024003	
SCALE 1:7	WEIGHT 1.2 Kg	SHEET 1/1

