2026 International Rocket Engineering Competition - Team Application

Please visit https://www.esrarocket.org/documents-and-forms for specific information.

TEAMS ARE GIVEN THE OPTION UPON SUBMISSION OF THE FORM TO SAVE YOUR RESPONSES.
YOU WILL NEED TO CREATE A MICROSOFT ACCOUNT TO SAVE THIS FORM FOR FUTURE EDITS.
Please also save a copy of your responses for your own records.

You will have the ability to edit your responses through **October 24, 2025 at 5:00 pm CST** using the Microsoft account you created or used upon submission.

Introduction

1. **Title of your project**
   Give your submission a catchy title that describes the idea and gets people interested. *

From Ashes to Zenith : The Rebirth of Power

2. **Short description of your project.**
   Provide a brief description of your idea. Be clear and concise. *

Our rocket project focuses on optimizing aerodynamic performance, structural integrity, and recovery precision. Through detailed CFD analysis, weight optimization, and improved stability, the design aims to achieve reliable flight performance and a safe, consistent recovery sequence.

Please enter at most 500 characters

3. **Link to PNG image of your team's logo.**
   (Ex. on Google Drive or Dropbox) *

https://www.dropbox.com/scl/fi/aaakubg0jbauwdv0y3s8j/ZENITH_LOGO.png?rlkey=nbacrvpmwmxk8yg38o7339hoj&st=piqz8o9e&dl=0

Please enter a URL

4. **How did you hear about the 2026 IREC?** *

We first learned about this competition last year while researching international rocketry events that matched our project goals, and our experience motivated us to participate this year again.

General University and Team Information

BEFORE you submit this team application, you must complete the following training - https://esra-training.thinkific.com/courses/prep-app
Ensure your team's name also includes yourschool's name.
This Team Application Form IS NOT THE SAME AS the TEAM REGISTRATION. Do not confusethe two.

5. **Formal University Name**
ONLY enter your FULL FORMAL SCHOOL'S NAME.
For example:"California State University, Long Beach" (not CSULB)"Washington State University" (not WSU or WAZZU) *

Atilim University

6. **University City/Province**
Ex: Cincinnati, Ohio *

Golbasi, Ankara, Turkey

7. **Country**
Ex: USA *

Turkey

8. **Team Name**
Enter your Rocketry team's name. ACRONYM and Full Name.
For Example: LRA (Longhorn Rocket Association)AeroMavs (University of Texas, Arlington) *

ZRT- ZENITH Rocket Team

9. **Organization Type**
Select one. *

- ◯ Club/group
- ◯ Engineering Class
- ◯ Senior Project
- ◯ Grad Project
- ◯ Other

10. **Rocket/Project Name**
Name for this year's rocket project
*

ANKA

11. **Social Media Presence**
Web page URL, Facebook, Twitter, Instagram ...
ESRA needs to have a clear understanding of the skills, experience and expertise of your rocketry team. *

- https://www.instagram.com/zenithrocket/
- https://zenithrocketry.weebly.com

Please enter at most 500 characters

12. **Primary Student Contact - Name**
Typically, this is the student lead or project manager.
Ex. Pat Smith
*

ROHIN NESSARY

13. **Primary Student Contact - Phone Number**
Ex. 11234567890
*

5522267673

The value must be a number

14. **Primary Student Contact - Email**
Ex. psmith@youruniversity.edu *

Nessary.rohin@student.atilim.edu.tr

15. **Alternate Student Contact - Name**
Ex. Pat Smith *

Serhat Ozturk

16. **Alternate Student Contact - Phone number**
Ex. 11234567890 *

5377296190

The value must be a number

17. **Alternate Student Contact - Email**
Ex. psmith@youruniversity.edu *

ozturk.serhat@student.atilim.edu.tr

Please enter an email

18. **Student Media Contact - Name**
Typically, this will be the student maintaining the social media sites.
ESRA may contact this student and request material for promotional or documentary use.
Ex. Pat Smith
*

Yusuf Ozan Cakir

19. **Student Media Contact - Phone number**
Ex. 11234567890 *

+90 (538) 221 7114

The value must be a number

20. **Student Media Contact - Email**
Ex. psmith@youruniversity.edu
*

cakir.yusufozan@student.atilim.edu.tr

Please enter an email

21. **Faculty Advisor - Name**
Ex. Pat Smith *

Mehmet Oguz Tasci

22. **Faculty Advisor - Phone number**
Ex. 11234567890 *

+90 (537) 498 02 40

The value must be a number

23. **Faculty Advisor - Email**
Ex. psmith@youruniversity.edu
*

oguz.tasci@atilim.edu.tr

Please enter an email

24. **Alternate Faculty Advisor - Name**
Ex. Pat Smith

Ahmet Hakan Argeso

25. **Alternate Faculty Advisor - Phone number**
Ex. 11234567890

+90 (530) 820 87 02

The value must be a number

26. **Alternate Faculty Advisor - Email**
Ex. psmith@youruniversity.edu

hakan.argeso@atilim.edu.tr

Please enter an email

27. **Team Mentor(s) - Name**
Ex. John Smith *

Can Gokovali

28. **Team Mentor(s) - Organization** *

- ○ **Tripoli**
- ○ NAR
- ○ CAR
- ○ UKAR

29. **Team Mentor(s) - Certification Level** *

- ○ **Level 2**
- ○ Level 3

30. **Team Mentor(s) - Email**
Ex. Jsmith@youruniversity.edu
*

gokovali@gmail.com

Please enter an email

31. **Team Mentor(s) - Phone**
Ex. 11234567890
*

+90 505 269 66 35

The value must be a number

32. **REQUIRED Team Flyer of Record - Name**
REQUIRED - Do not submit this form without having your CONFIRMED Flyer of Record listed.
Blank or anything besides a name will disqualify your application.
Please indicate who will be the Flyer of Record for the Team. (This can be the same as your mentor.)
Ex. Jane Smith
*

Rick Vanvoorhis

33. **REQUIRED Team Flyer of Record - Organization** *

- ◯ **Tripoli**
- ◯ NAR
- ◯ CAR
- ◯ UKAR

34. **REQUIRED Team Flyer of Record - Certification Level** *

- ◯ Level 2
- ◯ **Level 3**

35. **REQUIRED Team Flyer of Record - Email**
Ex. Jsmith@youruniversity.edu
*

rocketthon3@gmail.com

Please enter an email

36. **REQUIRED Team Flyer of Record - Phone**
Ex. 11234567890
*

+1 512 567 0453

The value must be a number

37. **Application Notes for ESRA**
(optional) Enter any notes specific to this application, if needed and ESRA will contact you.

Please enter at most 500 characters

38. **Category**
Select your participation category. The acronyms refer to the propulsion system.
Note: New teams should start with the 10K - COTS category unless they have previous experience with more advanced rockets.

Acronym Definitions:
COTS - Commercial Off The Shelf
SRAD - Student Researched And Developed *

- ◯ 10K COTS - All propulsion Types
- ◯ 30K COTS - All propulsion Types
- ◯ 10K SRAD - Solid Motors
- ◯ 30K SRAD - Solid Motors
- ◯ 30K - Multi-stage
- ◯ 45K - Multi-stage
- ◯ 10K - SRAD Hybrid/Liquid
- ◯ 30K - SRAD Hybrid/Liquid
- ◯ Non-Competitive Demonstration Flight

39. **Provide link to CSV file with all competing team members not listed above.**
INCLUDE ALL TEAM MEMBERS WORKING ON THE ROCKET, NOT JUST THE MEMBERS ATTENDING THE COMPETITION.
Please download and use the following template: https://www.esrarocket.org/s/Question-39-Team-Roster-CSV-Template.csv.
Provide a link to the edited CSV file below. *

https://www.dropbox.com/scl/fi/madh2ine2xik3twhecsz7/Zenith_Team_Roster_son_son.csv?rlkey=omhsc8rhr9m7njwn114yofckf&st=wb36cz7a&dl=0

Please enter a URL

40. **Provide a link to a downloadable PNG version of the render of your rocket.**
Ensure your image is at least 650 pixels wide by 366 pixels tall for clarity.
(ex. Google Drive, Dropbox) *

Please enter a URL

41. **Why did you choose the specific category?** *

We ssellecctedd the 10K COTS category bbaseed on ddetaiiledd enggineerneeringg anallysissis. OuOur plannned rocket desigign, propulopulsion system system, and avioavionicscs archrchitectucture are opptimizmizedd ffor ththis altituude,, ennsurinng rrelliablable pperfrformance andnd fuulll ssubbsystemm vvalididattioon.. TThiss rangee aalllowws us tto reffinee our mechaanicall dedesiggn, recovery system, and simullations wwithhin realiisttic teesting andnd manufufacturturingg limimitss.

Please enter at most 500 characters

42. **Has your team completed in other competitions?**
Ex: Argonia Cup, USLI, LASC, EUROC, etc *

TEKNOFEST 2024,,IREC 2025

Team Demographic Data

This is all members working with your project including those not attending the event. This will help ESRA promote the event and get more sponsorships and grants to help the team and improve the event.

***NOTE: High School Students may NOT participate*.**

43. **Number of Undergraduate Team Members** *

10

The value must be a number

44. **Number of Masters Team Members** *

1

The value must be a number

45. **Number of PhD Team Members** *

0

The value must be a number

46. **Number of Team Members who Identify as Men** *

5

The value must be a number

47. **Number of Team Members who Identify as Women** *

6

The value must be a number

48. **Number of Team Members Who Identify as non-binary** *

0

The value must be a number

49. **Number of Active Duty and/or Veteran Military Members**
Include those that have previously served. *

0

The value must be a number

50. **Number of Tripoli Members** *

4

The value must be a number

51. **Number of NAR Members** *

0

The value must be a number

52. **Number of CAR Members** *

0

The value must be a number

53. **Number of UKRA Members** *

0

The value must be a number

54. **2025-2026 Team Rocketry Experience**
Please describe your current team's high-power rocketry experience. This includes things like local launches, regional rocketry competitions, and similar events. Also list experience with the type of propulsion system you intend to compete with. If you have individuals who have experience (but not with the team), be sure to list that as well.
*

Our team participated in the IREC competition last year. However, during the flight, the motor failed due to a defect caused by the manufacturer. A crack in the grain led to an unexpected burnout and motor case rupture. Despite this issue, our overall design and recovery systems performed as expected, and we gained valuable experience in both testing and troubleshooting under real competition conditions. In addition to IREC, we also participated in TEKNOFEST in our country.

Please enter at most 500 characters

55. **VISA Status for International Teams**
Numerous international teams each year cannot attend the event in the US due to VISA request delays.
Is your team concerned about securing VISAs to travel to the US?
Explain your concerns.

Three of our team members have US visa

Please enter at most 500 characters

STEM Outreach

Describe any activities that your team leads or participates in that helps your local community with Science, Technology, Engineering or Math enrichment.

56. **STEM Outreach Events**
If you perform any STEM related outreach events, please provide a detailed description of the top three (3) activities that your current team (2025-2026 competitors) have done in the last 12-months.
STEM stands for Science, Technology, Engineering, and Mathematics. *

Our team advanced STEM engagement by presenting our TEKNOFEST 2023-2024 Rocket Project at Atılım University's MUBAK Congress, inspiring students in aerospace. We held workshops on composite manufacturing, CFD analysis, and avionics integration. By participating in the IREC 2025 competition in Texas, we further promoted practical STEM learning and strengthened local interest in engineering and aerospace.

Please enter at most 500 characters

Rocket Information

Overall rocket parameters.
Please be as thorough as possible.
FOR ALL NUMERIC FIELDS DO NOT INCLUDE UNITS in the field, use the units identified in the help.
All numerical values use a maximum of 2 decimal places.

57. **Which rocket components are planned to be commercially purchased?**
Please list planned commercial components and materials.
Ex. Nose Cone - fiberglass with an aluminum tip *

- **Recovery System:** Black Powder, Electric Igniters, Shock Chords, Carabiner, Swivel, Commercial Flight Computer.
- **Propulsion system:** AeroTech M2500T-PS RMS-98/10240
- **Miscellaneous:** Fireproof Fabric, Eyebolt, Fasteners. Composite Fabrics (Fiberglass, Carbon-fiber)
- **Avionics:** Easy-Mini Dual Deployment Altimeter, RRC3 Sport Altimeter, Featherweight GPS Tracker. Jumper Cables, Switches.

58. **Which rocket components are planned to be student fabricated?**
Please list planned student fabricated components and materials.
Ex. Airframe - Carbon Fiber layup on an aluminum mandrel
Ex. Electronics Sled - 3D printed with XXX filament *

- **Nose Cone -** Carbon Fiber layup on an epoxy mold (using resin and epoxy, followed by vacuum bagging and oven curing). including the nose cone tip made of Aluminum 7075-T6 in CNC Cutting.
- **Fins -** Carbon Fiber layup over a cleaned glass surface (using resin and epoxy, followed by vacuum bagging and oven curing).
- **Upper and lower body -** Fiberglass wrapping technique over an aluminum tube mold (using resin and epoxy, followed by vacuum bagging and oven curing).
- **Electronics Sled –** 3D Filaments.
- **Aluminum Turning Operation -** Bulkheads, motor blocks, centering rings, upper and lower covers of avionics, hot gas generator tubes. Angle Brackets
- **Nose Cone Tip** - CNC machining using G code from Aluminum.
- **Avionic –** Logger Avionic Card.
- **Recovery Systems** - Parachutes

59. **Number of Stages** *

- ○ 1
- ○ 2

60. **Total Vehicle Length (meters) - DO NOT INCLUDE UNITS**
Vehicle length from nose tip to aft end when ready for launch.
Numbers ONLY - All numerical values use a maximum of 2 decimal places. *

2.90

The value must be a number

61. **Single-Stage/First-Stage Airframe Diameter (mm) - DO NOT INCLUDE UNITS**
Numbers ONLY - All numerical values use a maximum of 2 decimal places. *

154

The value must be a number

62. **Second-Stage Airframe Diameter (mm) - DO NOT INCLUDE UNITS**
Numbers ONLY - All numerical values use a maximum of 2 decimal places.

The value must be a number

63. **Single-Stage/First-Stage Fin-span (mm) - <u>DO NOT INCLUDE UNITS</u>**
The measurement from fin root cord to tip cord.
Numbers ONLY - All numerical values use a maximum of 2 decimal places. *

80

The value must be a number

64. **Second-Stage Fin-span (mm) - <u>DO NOT INCLUDE UNITS</u>**
The measurement from fin root cord to tip cord.
Numbers ONLY - All numerical values use a maximum of 2 decimal places.

The value must be a number

65. **Total (on the pad) Vehicle Weight (kgs) - <u>DO NOT INCLUDE UNITS</u>**
Numbers ONLY - All numerical values use a maximum of 2 decimal places. *

27.51

The value must be a number

66. **Payload weight (kgs) - <u>DO NOT INCLUDE UNITS</u>**
Must be at least 2 kgs per IREC Rules.
Numbers ONLY - All numerical values use a maximum of 2 decimal places. *

3

The value must be a number

67. **Rocket Information - Additional Comments**
Add additional comments (500 characters or less) here regarding rocket construction and rationale for material selection. (optional)

The choice of carbon fiber for the wings and nose cone (excluding the tip) is to ensure high altitude and stability thanks to its exceptional strength-to-weight ratio. The upper and lower fuselage sections are made of S-Glass Fiberglass for high tensile strength and impact resistance. The trapezoidal wing set optimizes stability while minimizing drag. The von Kármán nose cone profile was selected for its superior drag performance, particularly in the transonic and low supersonic ranges. All these choices are aimed at maximum performance and safety in IREC competition.

Please enter at most 500 characters

Propulsion System

68. **Propulsion Type** *

- ◯ **Solid**
- ◯ Hybrid
- ◯ Liquid

69. **Propulsion Systems - Manufacture**
Ex: Aerotech, C77, Loki, or SRAD *

AeroTech

70. **Propulsion Systems - Motor**
Ex: M1939 *

M2500T-PS RMS-98/10240

71. **Propulsion Systems - Motor Letter Class**
Ex: M *

M

72. **Propulsion Systems - Total Impulse**
IREC entries shall not exceed 40,960 Newton-seconds (Ns) until further notice.
Please use a new line for each motor/engine.
*

9573

The value must be a number

73. **Propulsion System Discussion**
Use this field to discuss the rationale behind your motor/engine selection.
*

After detailed simulations and analyses, the AeroTech M2500T-PS was selected as the optimal engine for our rocket. It provides higher continuous thrust (2,461 N), total impulse (9,573 Ns), and ideal burn duration (3.88 s), perfectly matching our design parameters. Its 98 mm diameter and 751 mm length ensure structural compatibility and maximize flight stability and performance.

Please enter at most 500 characters

Predicted/Simulated Flight Data and Analysis

The following stats should be calculated using rocket trajectory software (OpenRocket, Rocksim, RasAero...) or by hand.
Pro Tip: Reference the Barrowman Equations, know what they are, and how to use them.

74. **Launch Rail**
Provide additional details in the next question if "other." *

- ○ ESRA Provided Rail (5.2 meters for single-stage or 6.4 meters for two-stage)
- ○ Team-provided

75. **Team provided rail length in meters.**

5.7

The value must be a number

76. **Rocket transport to pad.**

- ○ ESRA Provided Transport to Pad
- ○ Team-provided

77. **Launch Rail (Effective) Departure Velocity (meters/second)**
Effective velocity = Velocity at the altitude where only one rail button is connected to the rail.
25 mps is the absolute minimum. *

33.2

The value must be a number

78. **Minimum Static Margin During Boost**
Stability ratio between rail departure and burnout. Measured in Calibers.
1.5 calibers minimum, 2.0 calibers minimum for supersonic, simulated with no wind. *

1.57

79. **Maximum Acceleration (G)**
Measured in G forces *

10.05

The value must be a number

80. **Maximum Velocity (meters/second)**
Measured in mps
*

309

The value must be a number

81. **Predicted Apogee (feet AGL)**
Feet above ground level.
Note: Teams will receive a zero-flight performance score if their actual apogee differs from the competition target (10/30/45k feet) by over 30%.
*

10311

The value must be a number

82. **Simulation/Analysis Comments**
Use this field to provide more detail and methodology used to help justify your analysis.
*

The design was sized and optimized with OpenRocket. The von Kármán nose cone and trapezoidal wings were selected to minimize drag and ensure stability. The M2500T-PS engine was selected because it provided the highest thrust and thrust to reach the 10,000 ft target. Fin flutter speed was calculated as 506.14~m/s with a NACA TN 4197 (1.5 times the maximum speed, 63.8% safety margin). The minimum static margin is 1.57 calibers, ensuring stable flight. Structural and CFD analyses will be performed in Ansys, and 6-DOF solutions will be performed in MATLAB Simulink.

Please enter at most 500 characters

Payload Information

NOTE: To compete in the SDL Payload Challenge, you MUST follow the instructions on the Documents and Forms Page. The information provided here is for ESRA purposes only. https://www.esrarocket.org/documents-and-forms

83. **Payload Description**

    Please help us to help you, by filling this box out as completely as possible. Identify whether the payload is functional or inert. Include a description of its purpose (if applicable) and its recovery scheme (if applicable). The more information we have the better we can help you.
    *

The design was sized and optimized with OpenRocket. The von Kármán nose cone and trapezoidal fins were selected to minimize drag and ensure stability. The M2500T-PS engine was selected because it provided the highest thrust and thrust to reach the 10,000 ft target. Fin flutter speed was calculated at 506.14 m/s with a NACA TN 4197, 1.5 times the maximum speed, a 63.8% safety margin. The minimum static margin is 1.57 calibers, ensuring stable flight. Structural and CFD analyses will be performed in Ansys, while 6-DOF solutions will be performed in MATLAB Simulink.

Electronics

84. **Electronics Description**
Describe all the electronics in your rocket. Include COTS and SRAD components and indicate the role of each component.
Teams are reminded of the requirement that at least one altimeter and one gps in each rocket section must be a COTS.
For altimeters include manufacturer and model.
For GPS or telemetry, include manufacturer and model.

All teams WILL BE ASSIGNED a gps frequency. US teams will likely be assigned a 70 cm channel and WILL require a HAM Radio Licence. *

Rocket includes three flight computers and one GPS system. Two of these flight computers are COTS, while the third is an SRAD system. The primary system selected from our COTS devices is the RRC3 Sport Altimeter produced by Missile Works, which was successfully tested in our previous year's launch campaign. This altimeter features a 16MHz 16-bit MSP430 series MCU, 8Mbit SST flash memory, and an MSI NS5697 pressure sensor. The main reasons for choosing this altimeter are its capability to provide high-resolution pressure data (due to its 24-bit analog-to-digital converter), its proven reliability from last year's flight. The RRC3 Sport Altimeter operates with dual deployment, allowing it to open both the drogue and main parachutes in our recovery system.

The secondary system utilized is the EasyMini Altimeter produced by Altus Metrum, which is also a COTS device. The EasyMini Altimeter contains an ARM Cortex M0 MCU, an NXPLPC11U24 chip, an MS5607 pressure sensor, and 1MB of SPI flash memory. This system operates in dual deployment mode and serves as a backup to the RRC3, providing an additional layer of safety for the deployment of the drogue and main parachutes.

As the third system, a custom-designed SRAD flight computer is used, which represents a significant upgrade from our previous year's logger-only system. Unlike last year's SRAD logger which was used solely for recording flight data, this year's SRAD flight computer actively participates in the recovery process while also providing comprehensive data logging capabilities. This SRAD flight computer is built around a 4-layer PCB integrating an STM32F429ZIT6 microcontroller (ARM Cortex-M4F @ 180MHz with hardware FPU), power regulation circuitry, sensor interfaces, and dual-channel pyrotechnic control. The system includes an MS5611 GY-63 barometric altimeter for high-precision altitude measurement (±10 cm resolution, 100 Hz sampling), which serves as the altitude source for apogee detection and main parachute deployment triggering. For inertial measurement, the SRAD computer incorporates an MPU-9250 9-DOF IMU for high-G acceleration measurement (±16g range, 1 kHz sampling) during boost phase and trajectory reconstruction, alongside a GY-BNO080/BNO085 IMU with onboard sensor fusion for attitude determination and redundancy (400 Hz quaternion output). The SRAD flight computer features dual IRFU120 MOSFET-based pyrotechnic drivers that can independently actuate e-match igniters for drogue (at apogee) and main parachute (at 500m AGL) deployment, providing an additional layer of redundancy to both the RRC3 and EasyMini systems. All flight data including altitude, velocity, acceleration, and deployment events are logged at 100 Hz to a W25Q40CLSNIG flash memory chip (512 KB non-volatile storage) for post-flight analysis. The SRAD system operates with dual deployment mode, serving as a third independent backup for recovery system deployment.

For GPS tracking and telemetry transmission, a separate system integrates a Ublox NEO-7M GPS module as the primary GPS for position tracking and landing position determination (2.5m CEP accuracy, 5 Hz update rate), with a Quectel L86-M33 GNSS module serving as backup GPS with multi-constellation support (GPS/GLONASS/QZSS). A 1575.42MHz 5dBi SMA antenna provides improved GPS signal reception. The system includes a LoRa E32-433T30D radio module operating on the 433MHz ISM band for long-range GPS coordinate transmission during flight and recovery, eliminating the need for an HAM license. An HC05 Bluetooth module is included as a development tool for pre-flight programming and diagnostics (ground use only, not for in-flight telemetry).

The PCB design for the SRAD flight computer will be created using Altium Designer and manufactured by JLCPCB. Our team will handle the assembly of all components. Power regulation on the SRAD flight computer is achieved through AMS1117-5 voltage regulators (5V rail for communication modules) and AMS1117-3.3 voltage regulators (3.3V rail for STM32 and sensors), with extensive filtering provided by 100nF, 1μF, 10μF SMD capacitors and 10μF, 22μF tantalum capacitors. A 16 MHz crystal oscillator with 12pF capacitors provides the system clock source for the STM32 microcontroller.

Each system has independent power sources. The two COTS flight computers (RRC3 and EasyMini) and the SRAD flight computer operate using pairs of serially connected Li-Ion batteries, while the GPS/telemetry system is powered by a 3S LiPo battery (11.1V nominal, 2200 mAh capacity, providing >2 hours operational endurance). All Li-Ion batteries are packaged in metallic cylindrical enclosures and will be held in commercial battery holders. Battery holders will be placed in a way that prevents acceleration forces from compressing the springs of battery holders. 22 AWG cables will be used to connect the necessary components. Paired cables will be in the form of twisted pairs and zip ties will be used where necessary. There is a Schurter rotary switch between each flight computer, GPS system, and their power sources. All three flight computers (RRC3, EasyMini, and SRAD) activate the recovery system independently, ensuring triple redundancy in the deployment process.

Recovery

85. **Recovery Description**

Describe your recovery system; dual-deploy, size, style, and color of chute, number of chutes, chute protection method, length of shock cord(s), and any other components of your recovery system.

Teams are advised to review recovery rules in the 2025 DTEG.

Please fill this box out as completely as possible. Identify every independently recovered part of the launch vehicle and its recovery scheme. As appropriate, identify its associated recovery events, means of event triggering (e.g. barometric, magnetometer, other...), the redundancy of those event triggers, and the altitude those events should occur at.
*

Our rocket, ANKA, features a dual-deployment recovery system designed to ensure the safe, stable, and fully controlled landing of both the rocket and its payload after flight. The system consists of two parachutes made from 40D Ripstop Nylon, chosen for its high durability and tear resistance. The main parachute is red and black for high visibility, while the drogue chute is green and black. Each parachute includes a central vent hole equal to one-tenth of its diameter to maintain landing stability and reduce oscillations. At apogee, the drogue chute deploys to stabilize the rocket and reduce descent speed. During the second separation stage, the main chute deploys, further slowing the rocket to ensure a safe landing in compliance with IREC safety standards. All deployment events are controlled by two independent altimeters EasyMini and RRC3 Sport each responsible for redundant charge triggering. For the separation mechanism, specially designed aluminum hot gas generators are used, each with primary and backup igniters. Each separation stage includes two generators for redundancy if the primary fails, the backup automatically fires. Black powder charges are carefully calculated to ensure precise and reliable separations. Inside the rocket, four independent gas generators are sealed with aluminum foil to maintain pressure integrity and consistent burning, guaranteeing redundancy even in case of a single-point failure. The avionics bay includes a pressure equalization vent to provide accurate barometric measurements at high altitudes. Two 15,000 N-rated, 19 mm-wide Perlon flat shock cords connect the rocket sections: a 4.5 m cord between the nose and upper body, and a 5.5 m cord between the upper and lower body totaling 10 m, roughly three times the rocket's length. These cords absorb shock loads during parachute deployment, preventing damage.
The payload is secured inside the lower body via a coupling tube and mounted ring. All structural connections are reinforced with M8 carabiners, M6 swivels, and steel eye bolts. Swivels prevent line twisting during descent, while locking carabiners increase safety by preventing accidental release. To protect the recovery system from high temperatures and possible ignition effects during black powder deployment, all parachutes and shock cords are wrapped in fire-resistant protective fabric, which provides excellent heat insulation while maintaining flexibility. Our recovery system prioritizes safety and reusability, ensuring that every component the main body, avionics bay, and payload lands safely and can be reused for future launches after optimization through simulations and ground tests.

Testing

86. **Planned Testing**
Please keep brief, use these headers in your response:
Date - Type - Description - Status - Comments

Teams are advised to review SRAD motor testing requirements in the 2025 DTEG. *

(January 2026)-Recovery Test-
Parachute deployment, shock cord durability, landing stability-
Planned-
Check all attachment points and shock cord strength.

(March 2026)-Wind Tunnel Test
CFD verification of fins and body; optional wind tunnel tests
Planned
Ensure all simulations match expected flight conditions

(February2026)-Electronic Test
Telemetry, GPS, altimeter
Planned
Verify sensor readings and data logging

Other Pertinent Information and previous competitions

87. **Any other pertinent information you feel our staff should know?**
Treat this as your team resume cover letter.
On initial application, this box may be the deciding factor on your acceptance--focus on what's important. *

Our team will compete in the 2026 IREC as a dedicated and technically driven student rocketry group with over three years of continuous experience in rocket design, manufacturing, and testing. Last year, our rocket achieved excellent aerodynamic stability and subsystem integration, but a motor malfunction prevented mission success. Building on that experience, we are optimizing aerodynamic design, improving composite manufacturing, and enhancing avionics reliability to ensure a successful flight. Beyond the technical side, we emphasize teamwork and mentor new members to strengthen collaboration and engineering skills. In 2026, we aim to compete for the Barrowman Award and SDL Payload Challenge, while also volunteering in IREC operations to gain hands-on experience and contribute to the rocketry community.

Please enter at most 1000 characters

88. **Has your team applied for past competitions?** *

◯ Yes

◯ No

89. **Previous Results/Outcomes**
Please provide a brief review for EACH year your team filled out an application.
Be sure to include YEAR; STATUS - Participated, Accepted did not participate, Not selected;
CATEGORY; FLIGHT RESULTS or reason for not participating;
RECOVERY RESULTS; HIGH LEVEL FAILURE ANALYSIS if applicable; AWARDS.
Yes/No
New teams fill the field with NA.
*

YEAR: 2024
STATUS: Participated
CATEGORY: 10K – COTS – All Propulsion Types
FLIGHT RESULTS: The rocket was successfully integrated and placed on the launch pad. However, due to a malfunction in the motor forward closure crack, the launch could not be completed successfully.
RECOVERY RESULTS: The upper body, nose, nose tip and avionics equipment were recovered completely intact. Unfortunately, the lower body split in two due to motor failure. Nevertheless, the fins remained intact.
HIGH LEVEL FAILURE ANALYSIS: The failure was traced back to the crack on the forward closure and it damaged the lower body highly.
AWARDS: None
Despite the unsuccessful launch, our team received positive evaluations for our design and documentation, gaining valuable technical and organizational experience that significantly contributed to our progress in the current project.

Competition Location and Travel Information

The information below will help us work with the local community. We understand that these numbers and dates may change, but please answer to the best of your knowledge. Thank you.

90. **Approximately how many team members do you expect to travel to Midland, Texas, to attend the competition in person?** Please use a whole number, ex. 15. *

11

The value must be a number

91. **Approximately when do you expect to make lodging reservations for the competition?** Ex. January 2026 *

April 2026

92. **Approximately when do you expect to make travel reservations for the competition?** Ex. January 2026 *

March 2026

93. **Where in the general area of Midland and the Launch Facility do you plan to stay for the competition?** *

- [ ] Midland
- [ ] Odessa
- [ ] Pecos
- [ ] Balmorhea
- [ ] Fort Stockton
- [ ] Unsure
- [ ] Other