2026
GAME MANUAL

PRESENTED BY: LIGNUM PROPULSION

LIGNUM NATIONAL ROCKETRY COMPETITION

Caribbean Apex Challenge

Morant Point, Jamaica • August 16, 2026

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About Lignum Propulsion

Lignum Propulsion was founded to inspire young people's interest in aerospace, rocketry, and STEM. As Jamaica's first high-powered rocketry organisation, we are dedicated to laying the technical, educational, and operational foundation for a sustainable aerospace sector in Jamaica.

Lignum Propulsion combines the rigour of STEM learning with the excitement of hands-on rocketry, teamwork, and community engagement. Our programs have a proven impact on students' learning, curiosity, and skill-building both inside and outside the classroom.

The name Lignum is a reference to Jamaica's national tree, the Lignum Vitae, one of the hardest and most resilient woods on earth, chosen to reflect our commitment to building something enduring right here in Jamaica.

Purpose: To ensure that the future of flight is built on a commitment to sustainability, safety, and scientific integrity, empowering the next generation of engineers to innovate responsibly.

Vision: To lead a transformation in aerospace culture where technical progress and environmental responsibility are achieved in alignment.

Mission: To provide life-changing rocketry programs that give young people the skills, confidence, and resilience to build a better future.

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1.0 Introduction

1.1 The LIGNUM National Rocketry Competition

The LIGNUM National Rocketry Competition (LNRC) is a student-centred program that provides a unique and stimulating aerospace engineering experience. Each year, participants are introduced to a new launch challenge. Small teams, supported by mentors, design and construct rockets and then compete to achieve defined mission objectives, including reaching a target altitude, deploying payloads safely, collecting atmospheric data, and recovering all flight hardware intact.

Teams put their skills to the test in competitive launches, combining the excitement of rocketry with the opportunity to learn from peers, mentors, and aerospace professionals. Alumni of LNRC gain access to educational resources, mentorship, and a lifelong network of Jamaican STEM and aerospace enthusiasts.

> *Note: For more information about the LIGNUM National Rocketry Competition, visit www.lignumpropulsion.com.*

1.2 Spirit of Volunteering

Lignum can only achieve its mission with the help of dedicated volunteers. Each year, volunteers have the extraordinary opportunity to help create the best-ever experience for participants. Two phrases drive the individuals who volunteer their time for Lignum: Giving Back and Pay It Forward.

To all team members and mentors: remember that the volunteers you interact with are dedicating their most precious asset, their time, to ensure that all teams have a fulfilling, fun, and memorable competition. Volunteers are the lifeblood of Lignum, and without them, Lignum would not be where it is today.

1.3 About This Manual

The 2026 Competition Manual is the authoritative resource for all LNRC teams competing in the Caribbean Apex Challenge. Teams should read it in full. Its contents include:

- A general overview of the Caribbean Apex Challenge game format
- A description of the launch field and operational zones at Morant Point
- A detailed description of mission objectives and how to complete them
- Rules covering safety, conduct, gameplay, inspection, and event procedures
- Rocket construction and payload development specifications
- Scoring, awards, and eligibility criteria

The intent of this manual is that the text means exactly and only what it says. Please avoid interpreting the text based on assumptions about intent, implementation from previous competitions, or how a situation might work in real life. There are no hidden requirements or restrictions. If you have read the entire manual, you already know everything needed to participate.

1.4 Question and Answer System

The Question and Answer (Q&A) system is a resource for teams to ask questions about gameplay, competition rules, judging and scoring, rocket construction, payload requirements, and safety expectations. The Q&A will open on May 30, 2026 and will be accessible via the LIGNUM website at www.lignumpropulsion.com.

Moderators answer team questions each Monday and close the weekly cycle on Thursday at 12:00 p.m. Jamaica Time. Responses in the Q&A do not supersede the text in this manual, although every effort will be made to eliminate ambiguity and maintain consistency across all rules and requirements.

Good questions reference one or more specific rule numbers and ask generically about design features, gameplay scenarios, or rules. The following types of questions may not be addressed:

- Rulings on vague or hypothetical situations with no rule reference
- Challenges to decisions made at past events
- Design reviews of a rocket system for legality
- Questions that are overly broad, duplicate, or already addressed in this manual

2.0 Competition Eligibility and Inspection

2.1 Team Eligibility

To be eligible to compete, all teams must satisfy the following requirements before the competition date:

- Complete the annual LNRC registration process via the LIGNUM website
- There is no registration fee for LNRC 2026
- Register all team members via the LIGNUM website
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- Check in at the event on time on competition day, as instructed by the Event Director

Team Size: Each team must consist of a minimum of 2 members. There is no maximum team size. Members do not have to be students, and there is no faculty advisor requirement.

2.2 Team Registration Timeline

Milestone	Date
Q&A System Opens	May 30th, 2026
Team Registration Opens	May 16th, 2026
Kit Distribution to Registered Teams	July, 2026
Competition Day	August 16th, 2026

2.3 Rocket Inspection

All rockets must pass a full technical inspection conducted by the Lead Rocket Inspector (LRI) before being permitted to launch. The LRI has final authority on the legality of any component, mechanism, or rocket. Inspectors may re-inspect rockets at any time to ensure ongoing compliance.

Teams are strongly encouraged to complete a self-inspection using the provided Inspection Checklist prior to arriving at the event. The following applies to all inspection procedures:

- The rocket must be presented with all mechanisms, configurations, and decorations that will be used on competition day
- At least one student team member must accompany the rocket throughout the inspection process
- The rocket must be powered on during inspection if any electronic system requires it to demonstrate functionality
- Any rocket that fails inspection will be sent back to the pit area for corrections and will forfeit its current launch window
- The rocket and all its major mechanisms must have been designed and built by the registered team

2.4 Permitted Modifications Between Inspection and Launch

Unless the change is listed below, any modification to a rocket after it has passed inspection requires a new inspection. Permitted changes that do not require re-inspection include:

A. Addition, relocation, or removal of fasteners (e.g., cable ties, tape)
B. Addition, relocation, or removal of labelling or markings
C. Revision of flight software or data logging code
D. Replacement of an identical component or mechanism of the same size, weight, and material
E. Any change that does not alter the rocket's size, structural integrity, or safety profile

3.0 Caribbean Apex Challenge Requirements

3.1 Mission Overview

The Caribbean Apex Challenge is designed to simulate the rigorous requirements of a professional aerospace mission. Teams must demonstrate proficiency across four integrated engineering disciplines: vehicle design, propulsion integration, electronic systems, and atmospheric data analysis.

The core of the challenge is precision, not raw power. Teams are encouraged to view their rocket as a precision instrument. Every aspect of the flight is monitored and analysed to determine the final standing of each team.

A mission is only considered fully successful when all four of the following conditions are met:

- The rocket reaches an apogee between 290 and 310 metres (Perfect Tier)
- All flight hardware, including the main rocket body and the PicoSat payload, is recovered intact
- An uncorrupted dataset is retrieved from the PicoSat covering the full descent
- The egg payload is recovered with no visible cracks or leaks

Scoring uses a penalty-and-bonus system where the lowest final score wins. Penalties are added for deviations from the mission plan, and bonuses are subtracted for successful milestone completion. This reflects the aerospace industry reality that precision and reliability matter more than brute performance.

3.2 Airframe Classes

Teams must choose one of two competition classes before registration. The choice determines which airframe diameter the team will build to. Both classes use the same standardised motor and compete on the same day, but are judged separately.

Parameter	2-Inch Class	3-Inch Class
Body Tube Inner Diameter	2.0 in (50.8 mm)	3.0 in (76.2 mm)
Minimum Rocket Height	90 cm (approx. 3 ft)	90 cm (approx. 3 ft)
Maximum Rocket Height	168 cm (approx. 5.5 ft)	168 cm (approx. 5.5 ft)
Motor Mount Inner Diameter	34 mm	34 mm
Fin Geometry	Any	Any
Nose Cone Geometry	Any	Any
Recovery System	Dual (required)	Dual (required)
Launch Interface	Rail button or launch lug	Rail button or launch lug

Engineering Trade-off: The 2-inch class offers reduced drag and the potential for higher velocity, making it easier to approach the 300 metre altitude target, but significantly constrains internal volume. The 3-inch class allows greater internal space for payload integration and recovery system packing, but introduces more drag and mass, requiring additional optimisation to achieve comparable flight performance.

3.3 Altitude Targeting and Apogee Precision

The primary flight objective is to reach an apogee of exactly 300 metres. Apogee is the highest point of a rocket's flight, where upward velocity momentarily reaches zero. Achieving this altitude requires careful modelling of rocket mass, propellant burn curve, and aerodynamic drag.

Teams must use an approved flight simulation tool to predict their altitude before competition day. Altitude will be officially recorded by a calibrated digital altimeter mounted inside the rocket airframe. The peak altitude recorded by this device is used for official scoring.

Altitude Scoring Tiers:

Tier	Altitude Range	Score Effect
Perfect Tier	290 m to 310 m	1,000 points subtracted (maximum bonus)
High Tier	250–289 m or 311–350 m	500 points subtracted
Mid Tier	200–249 m or 351–400 m	300 points subtracted
	100 m to 199 m or 401+ m	
Disqualified	Below 100 m or total vehicle loss	0 points (no bonus)

3.4 PicoSat Payload Specifications

Every team is required to design and fly a PicoSat, a small modular satellite payload that functions as an independent atmospheric laboratory.

The PicoSat must be ejected from the main rocket at apogee, triggered electronically via Electro-pyrotechnic Initiator. Once ejected, it must descend independently under its own recovery device. It must be completely autonomous from the moment of ejection.

3.4.1 Physical Requirements

- Shell must be constructed from the materials provided in the competition kit
- Must include its own independent recovery system (parachute or streamer)
- Must withstand the vibration and acceleration forces experienced during launch and ejection
- Must be designed so that it does not interfere with the main rocket's recovery system

3.4.2 Electronics and Sensor Requirements

- Must use the Arduino Nano microcontroller provided in the kit as the primary flight computer
- Must include a calibrated barometric pressure sensor for altitude measurement
- Must include a temperature sensor for ambient air temperature logging
- Must include a humidity sensor for relative humidity logging throughout descent

3.4.3 Data Logging Requirements

The PicoSat must record continuous sensor readings from the moment of ejection through landing. The following data streams are mandatory:

F. Altitude (derived from barometric pressure)
G. Ambient air temperature
H. Relative humidity

All data must be stored in a non-volatile format (SD card or EEPROM) that survives the flight and recovery. Teams must submit the raw dataset and a set of clearly labelled graphs to the judges at the post-flight data submission window. Points are awarded based on the completeness of the dataset and the quality of the graphical presentation.

3.5 Structural Integrity Challenge

This challenge tests the team's ability to protect delicate cargo throughout the high-stress flight profile, from ignition through landing. It reflects the real-world aerospace requirement to protect sensitive payloads such as instruments, electronics, or biological specimens.

3.5.1 Egg Payload Requirements

- Each rocket must carry one Grade A large chicken egg
- The egg must be inspected and physically marked by a Technical Advisor before loading to prevent pre-launch substitution
- The egg must remain in its natural state: it cannot be hard-boiled, chemically treated, or coated in any material that alters its structural properties
- Teams must design a dedicated, easily accessible compartment within the airframe to house the egg
- The egg compartment must comply with all airframe material and volume constraints defined in Section 8

3.5.2 Success Criteria

The Structural Integrity Challenge is considered successful if the egg is recovered with no cracks or leaks visible to the naked eye upon inspection by a flight official. The condition of the egg is assessed immediately upon recovery before the egg is handled by the team.

> *Note: A cracked egg that shows no leakage will be assessed at the discretion of the Lead Rocket Inspector. The LRI's decision is final.*

3.6 Landing Accuracy

The accuracy component tests the team's ability to predict the complex physics of a drifting payload in a coastal wind environment. While the rocket itself is a high-speed ballistic vehicle, the PicoSat becomes a slow-drifting object once ejected. Success in this category requires a thorough understanding of parachute aerodynamics, descent rates, and the specific meteorological conditions at Morant Point.

3.6.1 Predicted Landing Coordinate

Before a rocket is cleared for the launch pad, each team must submit a Predicted Landing Coordinate (PLC) in writing to the flight officials during the pre-launch briefing. The PLC is the exact map coordinate where the team believes their PicoSat will come to rest after its flight.

- The PLC must be based on the team's chosen parachute size and the measured weight of the PicoSat
- Teams must account for the current wind speed and wind direction measured at the time of their flight
- Once submitted, the PLC is final and cannot be revised unless weather conditions change while the team is in the launch queue
- Teams are encouraged to use flight simulation software such as openrocket or manual drift calculations to arrive at their PLC

3.6.2 Accuracy Scoring Formula

The accuracy penalty is calculated using the following formula:

Accuracy Penalty = D × 10

Where D is the distance in metres between the PLC and the actual landing location of the PicoSat. The coefficient of 10 ensures that even small errors in wind prediction have a meaningful impact on the final standings.

Distance from PLC (D)	Accuracy Penalty
1 metre	10 penalty points
5 metres	50 penalty points
10 metres	100 penalty points
25 metres	250 penalty points
50 metres	500 penalty points

After the PicoSat touches down, the recovery team and team captain move to the landing site. A flight official marks the exact landing coordinates. The distance is then measured from the centre of the PicoSat shell to the centre of the PLC marker. If the PicoSat is dragged by wind after initial impact, the location of the initial impact is used. Both the flight official and the team captain must sign a distance verification form before the PicoSat is removed from the field.

3.6.3 Environmental Factors at Morant Point

Morant Point is the easternmost point of Jamaica and is characterised by steady coastal trade winds. Teams must be aware of the following conditions:

- Air density at sea level is higher than at inland sites, slightly affecting descent rates
- Wind speed typically increases with altitude, meaning the PicoSat may experience different wind layers during descent
- A PicoSat falling from 300 metres will spend a significant amount of time drifting before landing
- A larger parachute slows descent and improves payload survivability but increases drift distance
- A smaller parachute reduces drift but risks a hard landing that could damage sensors
- Teams should model several parachute sizes in simulation before selecting their final design

3.7 Standardised Propulsion System

The Caribbean Apex Challenge uses a standardised, custom-built propulsion system to ensure that the competition remains a test of engineering design skill rather than component procurement. Every registered team is issued the same motor. This levels the playing field and means that the winner is determined by airframe design, mass management, and recovery strategy.

3.7.1 Motor Specifications

Designation	LP-KNSB-34-165
Propellant Type	KNSB (Potassium Nitrate / Sorbitol composite propellant)
Casing Material	Linen Phenolic
Casing Outer Diameter	34 mm
Casing Length	165 mm (16.5 cm)

Propellant Mass	Approximately 77 g
Average Thrust	Approximately 79 N
Burn Duration	Approximately 0.84 seconds
Total Impulse	Approximately 69 Ns
Motor Classification	F-class (per NAR/TRA classification)

Note: The KNSB propellant formulation was selected because it can be prepared from materials available in Jamaica, making the propulsion programme sustainable and locally viable. Teams do not need to prepare the propellant; motors are assembled and validated by Lignum Propulsion staff. Each team receives 3 motors in their kit in July 2026. Teams may use any or all of their motors for test flights and practice at their own discretion.

3.7.2 Motor Handling Rules

- All motors must be stored in the official, climate-controlled magazine until the team is called to the launch pad
- The motor mount tube in the rocket must be clean and free of debris before motor insertion
- The motor must be secured using a mechanical retention system that prevents ejection during flight
- Any dropped or visibly damaged motor must be reported to officials immediately for inspection
- Teams may not modify, disassemble, or substitute the issued motor in any way
- Improper motor handling is a safety violation and will result in immediate disqualification

4.0 Recovery Systems and Flight Safety

4.1 The Dual Recovery Mandate

A successful aerospace mission requires that every part of the vehicle returns to the ground safely. In the Caribbean Apex Challenge, the rocket body and the PicoSat are treated as two separate vehicles, each requiring its own independent recovery system.

The competition mandates two separate recovery events during a single flight:

- Event 1 (Main Parachute): Deployment of the main rocket body parachute, triggered by the team's onboard electronic deployment system at or near apogee
- Event 2 (PicoSat Ejection): Ejection and independent deployment of the PicoSat, triggered by the onboard avionics flight computer

If any part of the rocket strikes the ground without an open parachute, it is a safety violation and the flight is disqualified. The recovery phase is often the most critical part of the mission, as it depends on the perfect timing of electronic and mechanical systems.

4.2 Engineering the Descent Profile

Teams must carefully select their parachute sizes to balance three competing priorities: safe landing speed, minimal horizontal drift, and adequate sensor data collection time for the PicoSat.

- The main rocket body parachute must be large enough to prevent structural damage on impact
- The PicoSat parachute or streamer must produce a descent rate that keeps sensors operational until landing
- Teams may use spill holes or specialised parachute geometries to improve descent stability in high crosswinds
- The recovery harness connecting the parachute to the rocket must be made from high-strength materials such as Kevlar or nylon

4.3 Pre-Launch Safety Inspection

Before any rocket is permitted to proceed to the launch pad, it must pass a comprehensive safety inspection by the Lead Rocket Inspector (LRI). The inspection covers:

- Structural integrity: all fins are securely bonded, airframe shows no cracks or delamination
- Stability: the centre of gravity (CG) is confirmed to be forward of the centre of pressure (CP)
- Electronics: the flight computer and data logger are armed and operating on a fresh battery
- Recovery: the parachute is correctly packed and the recovery harness is properly secured
- Motor: the motor retention system is correctly installed and secure
- Payload: the egg is loaded, marked, and accessible; the PicoSat is armed and ready for ejection

Any rocket that fails the safety inspection will be returned to the pit area for corrections and will forfeit its assigned launch window. A second window may be assigned at the discretion of the Event Director, subject to schedule availability.

4.4 Definition of Flight Success and Failure

A flight is considered fully successful only if all of the following conditions are met:

- The main parachute opens fully and the rocket body lands without structural damage
- The PicoSat ejects at apogee and deploys its own recovery device

- All flight hardware is recovered and returned to officials
- The egg is recovered intact with no visible cracks
- A complete, uncorrupted dataset is submitted from the PicoSat

Partial failure scenarios and their scoring consequences:

Failure Scenario	Scoring Consequence
PicoSat fails to eject but rocket recovered safely	Altitude bonus awarded; accuracy and payload scores: zero
Egg recovered cracked	Structural Integrity bonus not awarded
PicoSat data corrupted or incomplete	Data Excellence bonus reduced or not awarded
Rocket not recovered (ballistic impact)	All scores: zero; safety review required
Main parachute fails to deploy	Flight disqualified; safety review required

The final determination of flight success and recovery safety is made by the Range Safety Officer (RSO). The RSO's decision is final and cannot be appealed.

5.0 Scoring System

5.1 Overview

The Caribbean Apex Challenge uses an inverted scoring system: a lower final score indicates a higher ranking. This reflects the professional aerospace principle that errors and deviations from mission parameters are costly. Teams accumulate penalties for deviations and subtract bonuses for successful milestone completion.

Final Score = (Altitude Penalty + Accuracy Penalty) − (Bonuses Earned)

The team with the lowest final score wins within their airframe class.

5.2 Altitude Component

Altitude is evaluated using the tier system defined in Section 3.3. The closer the apogee to 300 metres, the larger the bonus subtracted from the team's score.

5.3 Accuracy Component

The accuracy penalty is calculated using the formula Accuracy Penalty = D x 10, where D is the distance in metres between the PLC and the PicoSat landing location. See Section 3.6 for full details.

5.4 Payload Bonuses

Bonus	Condition	Points Subtracted
Structural Integrity Bonus	Egg recovered with no cracks or leaks	500 points
PicoSat Data Excellence Bonus	Complete, clean dataset covering full descent	500 points
PicoSat Graph Quality Bonus	Well-labelled, clearly presented graphs submitted	Up to 200 points

5.5 Example Score Calculation

Apogee achieved	302 metres (Perfect Tier)
Altitude bonus subtracted	− 1,000 points
PLC distance	8 metres
Accuracy penalty added	+ 80 points (8 x 10)
Egg intact	Yes
Egg bonus subtracted	− 500 points
PicoSat dataset complete	Yes
Data bonus subtracted	− 500 points
Graph quality bonus	− 150 points

Final Score	− 2070 points (very competitive)

6.0 Rocket Construction Rules

6.1 Design Integrity and Material Constraints

All rockets must be designed and built by the registered team. Teams may receive assistance from mentors or other teams in fabricating individual components, but the overall rocket design, integration, and flight code must be the product of the team's own engineering work.

Permitted airframe materials:

- Cardboard body tube (phenolic or spiral-wound)
- Fibreglass body tube
- PVC body tube
- Plywood (for fins, bulkheads, and mounting rings)
- Balsa wood (for fins and nose cone formers)
- Corrugated plastic sheet (for fins or fairings)

All materials must be free of cracks, delamination, or structural defects at the time of inspection. The use of any pyrotechnic material other than the issued motor is strictly prohibited.

6.2 Airframe Dimensions

Rocket height must be between 90 cm (approximately 3 feet) and 168 cm (approximately 5.5 feet), measured from the base of the motor mount to the tip of the nose cone.

The body tube diameter must match the team's registered class (2-inch or 3-inch outer diameter). Mixed-diameter airframes incorporating a single transition are permitted provided the primary payload and motor sections conform to the class diameter.

6.3 Nose Cone

Each competition kit includes an ogive nose cone sized to match the registered body tube class. Teams wishing to use a different nose cone geometry must submit a request via the Q&A system for approval before fabricating or using a replacement. Any approved alternative nose cone must be securely attached to the airframe and must not separate during flight unless it is specifically part of the recovery deployment mechanism.

Ballast may be added inside the nose cone to adjust the centre of gravity forward, provided it is rigidly mounted and will not shift during flight.

6.4 Fin Design and Stability

Fins must be fitted at the base of the motor mount section. Fins must be:

- Symmetrically spaced around the circumference of the body tube
- Securely bonded to the airframe using epoxy or equivalent structural adhesive
- Reinforced with fillets at the fin-to-body joint to resist shear forces during launch
- Free of cracks, warping, or loose edges at the time of inspection

The static stability margin of the rocket must be a minimum of 1.0 calibre (one body tube diameter) at launch, measured as the distance between the centre of pressure and the centre of gravity divided by the body tube diameter. Teams must demonstrate this through their pre-submission simulation output.

6.5 Motor Mount and Retention

The motor mount tube must have an inner diameter of 34 mm to accept the standard KNSB competition motor. The motor mount must be:

- Constructed from phenolic, cardboard, or aluminium tube
- Bonded to the aft centring rings using epoxy
- Fitted with a mechanical motor retention clip or thrust ring to prevent the motor from ejecting during flight
- Clean and free of debris before motor installation on competition day

6.6 Avionics Bay

The avionics bay houses the flight electronics, data logger, and battery. It must be:

- Electrically isolated from the motor section to prevent false triggering
- Accessible for arming and battery replacement without requiring disassembly of major structural sections
- Vented with a minimum of two pressure equalization holes (minimum 1/8 inch diameter) to allow the barometric altimeter to reference ambient pressure correctly
- Capable of being sealed to protect electronics during deployment events Note: Main parachute deployment and PicoSat ejection are both controlled by the onboard avionics flight computer. The motor does not include a delay ejection charge.

6.7 Recovery Harness and Parachute Attachment

The recovery harness connecting the parachute to the rocket must be made from Kevlar, nylon, or equivalent high-temperature rated webbing. The harness must have a minimum breaking strength of 300 N. Shock cord must be of adequate length to prevent snatch forces from damaging the airframe or parachute canopy.

7.0 Event Rules

7.1 General Conduct

The Event Director has final authority for all safety-related matters within the venue. All participants, including team members, mentors, and observers, are expected to follow the rules in this manual and any supplementary local requirements communicated in advance.

The following applies universally:

- Safety is always paramount. Any item or behaviour deemed unsafe by LIGNUM personnel or the Event Director must be addressed immediately
- Violations of event rules result in a verbal warning from the Head Referee or Event Director
- Repeated or egregious violations may result in disqualification from launches and awards
- Criminal behaviour will result in immediate removal and referral to the appropriate authorities
- LIGNUM will make reasonable accommodations for participants with disabilities. Teams requiring accommodation should contact LIGNUM in advance of the event

7.2 Launch Zone Procedures

The Launch Zone (Hot Zone) is active during all launch windows. The following rules apply whenever teams are in or near the Hot Zone:

- Only authorised personnel are permitted in the Hot Zone during launch operations
- All electronics must be confirmed disarmed before a rocket is transported to the launch rail
- Once a rocket is placed on the launch rail, only the Launch Director may authorise arming
- All personnel must clear the Hot Zone to the designated safe distance before the countdown begins
- Spectators must remain in the designated Spectator Area at all times

7.3 Pit Area

The Pit Area is the designated workspace for teams to assemble, inspect, and prepare their rockets. Teams are responsible for maintaining a clean and organised pit space throughout the event. Any construction activities that involve open flame, power tools, or chemical adhesives must be approved in advance by the Event Director.

7.4 Load-In and Setup

Teams should arrive during the designated load-in period specified on the public event schedule. All equipment must pass a basic safety check upon entry. Teams must check in with the registration desk before accessing the Pit Area.

7.5 Ceremonies

An opening briefing will be held at the start of the competition day for all teams. Attendance is mandatory. An awards ceremony will be held at the end of the competition day. All teams are expected to be present for both ceremonies.

8.0 Awards

8.1 Mission Performance Awards

The following awards are presented at the closing ceremony to recognise outstanding performance across the scored mission components.

Award	Criteria
The Morant Point Cup (Overall Champion)	Lowest final score across all scored components, within each airframe class
Apex Altitude Award	Closest apogee to 300 metres in the competition, regardless of class
Navigational Accuracy Award	Smallest PLC deviation (lowest accuracy penalty)
PicoSat Data Excellence Award	Most complete dataset and highest-quality graphical analysis submitted
Structural Integrity Award	Egg recovered intact; awarded to all qualifying teams
Individual Engineering Achievement	Awarded by judges to a student who demonstrates exceptional technical contribution

8.2 Award Eligibility

To be eligible for any award, a team must:

- Have completed a full, official launch attempt on competition day
- Have passed the pre-launch safety inspection
- Have at least one student team member present at the awards ceremony
- Have submitted all required post-flight documentation, including the PicoSat dataset and distance verification form

9.0 Launch Site: Morant Point

9.1 Site Overview

Morant Point is the easternmost tip of Jamaica and the site of the Caribbean Apex Challenge. It is a flat, open coastal location with prevailing easterly trade winds, making it an ideal rocketry launch site with long clear downrange fields and minimal obstructions.

Teams should be aware that the proximity to the ocean means high ambient humidity, dense sea-level air, and wind speeds that can increase significantly with altitude. These conditions must be accounted for in all flight and drift simulations.

9.2 Operational Zones

Launch Zone (Hot Zone)	Active launch area. Restricted to authorised personnel during launch operations. Contains launch rail, blast deflector, and ignition system.
Pit Area and Inspection Station	Team workspace and technical inspection station. Teams assemble, test, and present rockets for inspection here.
Recovery Zone	Downrange area where PicoSat and main rocket body are expected to land. Recovery teams are deployed here after launch.
Spectator Area	Designated viewing area for observers and team members not on the range. Must be maintained throughout all launch operations.
Setup and Staging Area	Equipment staging, briefing area, and registration desk.

9.3 Field Staff

The following key roles will be present at the launch site on competition day:

- Head Referee: Final authority on competition rules and violations
- Lead Rocket Inspector (LRI): Final authority on rocket legality and safety
- LIGNUM Technical Advisor (FTA): Responsible for all technical launch operations and range safety
- Range Safety Officer (RSO): Final authority on flight safety and recovery determinations
- Field Supervisor: Coordinates team movements between pit area, inspection station, and launch pad

10.0 Registration and Team Logistics

10.1 Registration Process

Team registration for LNRC 2026 opens May 16, 2026. To register, complete the official team registration form at www.lignumpropulsion.com. Registration closes when capacity is reached. Teams that register early will have more time to prepare and begin airframe fabrication.

Registration requires:

- Names of all team members (minimum 2)
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- Selected airframe class (2-inch or 3-inch)
- Confirmation that there is no registration fee - participation is free

Note: There is no registration fee for LNRC 2026. Participation is free for all eligible teams. Contact lignumpropulsion@gmail.com with any questions.

10.2 Kit Distribution

Competition kits will be distributed to registered teams in July 2026. Kits are shipped in official packaging with handling and storage instructions. Each kit contains the components needed to build your rocket and PicoSat, including 3 KNSB motors. Motors must be stored in a cool, dry location away from open flame. Teams must not attempt to disassemble or modify the issued motors.

Using Items Outside the Kit: Teams are permitted to use components not included in the competition kit, except where this manual explicitly prohibits it. Any non-kit component that is not already addressed in this manual must be submitted for approval through the Q&A system before use. Teams may also request that 3D-printed parts be produced by Lignum Propulsion on their behalf by submitting a request through the Q&A system. Approved non-kit components and 3D-printed parts are permitted at no additional cost.

10.3 Travel and Accommodation

Morant Point is approximately 100 km east of Kingston. The Caribbean Apex Challenge is a single-day event. Details regarding transportation arrangements will be communicated to registered teams closer to the competition date via the LIGNUM website and email.

10.4 Post-Event Cleanup

All teams are responsible for removing all equipment, waste, and materials from their designated pit area before departing the venue. The launch site is a protected coastal environment. Teams that fail to restore their area to its original condition may be penalised in future seasons.

11.0 Finality of Results and Participant Conduct

11.1 Technical Verification and Final Scoring

All scores are considered provisional until officially confirmed by the Head Referee and the LIGNUM Technical Advisor at the end of the competition day. Final scores are announced at the closing ceremony. Score disputes must be raised with the Head Referee in writing within 30 minutes of the provisional score announcement. The Head Referee's decision is final.

11.2 Standards of Professional Conduct

All participants in LNRC 2026 are expected to conduct themselves in a manner consistent with the professional standards of the aerospace engineering community. This includes:

- Treating all participants, volunteers, and officials with courtesy and respect
- Accepting decisions by officials in good faith and raising disputes through the correct channels
- Representing your school and team with integrity throughout the competition
- Acknowledging the contributions of teammates, mentors, and volunteers

11.3 The Spirit of Teamwork

LNRC is as much about community as it is about competition. Teams are encouraged to share knowledge, support each other, and approach the day in a spirit of collaborative learning. The Caribbean Apex Challenge is designed to be hard. Teams that fall short of their goals on launch day are encouraged to reflect, iterate, and return stronger next season.

11.4 Closing the Range

After all launches are complete, teams assist with range clearance under the direction of field staff. All recovered hardware must be returned to the Recovery Zone coordinator. The range is officially declared closed by the RSO once all personnel are safely accounted for and all hardware is recovered or accounted for.

THANK YOU

We look forward to seeing your skills in action at Morant Point.

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