Vertical Flight Society

2025-2026 Design-Build-Vertical Flight Competition

Request for Proposal

Version 3

Website: www.vtol.org/FLY

Questions: FLY@hq. vtol.org

Welcome Letter

Dear Students,

It is with great enthusiasm that the committee and I welcome you to the 2025-2026 Vertical Flight Society Design Build Vertical Flight Competition. Whether you are a new team, a returning team, or building a drone for the first time, we are excited to welcome you to another great upcoming year!

It was wonderful to see the teamwork and grit that so many of you brought to the field during last year's competition season. While it was tough, many of you rose to the challenge and did exceedingly well. And for all of us, many lessons were learned across the board. The theme of this upcoming season will follow a similar pattern but with a new twist.

As you take on this challenge, remember that while it is important to share what your actions were, it is equally important if not more so to explain the why behind your decision making. The depth and validity of your reasoning is often far more compelling than the actions alone. And simply building an aircraft is not the same as building one that is optimal for the mission at hand. Keep these thoughts in mind as you navigate this year’s competition, especially for your final report and presentations.

This year’s challenge will test not only your engineering skills but also your ability to connect your design to a clear mission need. From the first brainstorming session to the flight field, your work should reflect a balance of technical depth, rigorous testing, and thoughtful reasoning. This competition is more than building an aircraft. It is about creating a design that is sound, operationally effective, and designed for the missions at hand.

Throughout the season, you will face both successes and setbacks. Celebrate the small wins and learn from the oversights. They will strengthen your resilience and problem-solving skillsets. These experiences will serve you well beyond the competition and into your future careers. Stay determined, and do not give up!

We extend our sincerest gratitude to the faculty, staff, and mentors whose support makes this experience possible for the teams they work with. To the students, we encourage you to think boldly and collaborate fiercely. Good luck, and we look forward to watching your innovations take flight!

Warm regards,

Adithya Ramaswami

Chair, VFS DBVF Student Competition

Table of Contents

Overview

Introduction

The Vertical Flight Society (VFS) is excited to announce the Design-Build-Vertical Flight (DBVF) 2025-2026 Student Competition. This competition challenges student teams to design, build, and fly a singular remote-controlled electric vertical takeoff and landing (eVTOL) aircraft, specifically tailored to address the demands of wildfire response. The fly-off event will be hosted at the Survice Engineering Applied Technology Operation (ATO) facility located at Harford Airport (3538 Aldino Rd., Hangar 6) in Churchville, MD.

Scenario: The Role of Drones in Wildfires

Wildfires pose an increasingly serious threat to ecosystems, communities, and infrastructure worldwide. eVTOL aircraft hold significant potential to transform how these disasters are addressed. With their speed, versatility, and rapid deployment, eVTOLs could provide real time surveillance, map fire boundaries, and deliver critical payloads to hard to reach areas, offering aerial perspectives and precise operations that could enhance wildfire response while reducing risks to personnel on the ground. In this year's competition, students are challenged to design an eVTOL aircraft tailored for wildfire missions, with a focus on speed, maneuverability, autonomous operation, and precision in payload delivery and retrieval. These capabilities highlight the exciting possibilities eVTOL technology could bring to the future of wildfire management.

Timeline for Deliverables & Awards

- **Letter of Intent to Compete (accepted on rolling basis)**: Oct. 30, 2025 at 11:59 pm ET
- **Safety & Risk Plan:** January 7, 2026 at 11:59 pm ET
- **Wiring Plan:** January 7, 2026 at 11:59 pm ET
- **Team Fly-off Participant List**: January 19, 2026 at 11:59 pm ET
    - Must include pilot's proof of FAA Part 107 Drone Certification or equivalent certifying authority for non-US based teams.
- **Final Technical Report (FTR):** March 2nd, 2026 at 11:59 pm ET
- **Team Fly-Off Participant Confirmation or Withdrawal Deadline:** March 9th, 2026 at 11:59 pm ET
- **Final Presentations (Virtual):** Week of March 16th, 2026
    - Will be scheduled 2-3 weeks in advance.
- **Video Submission Deadline:** March 23rd, 2026 at 11:59 pm ET
- **Competition Fly-off Dates:** April 7-10th, 2026
    - Exact days, times, and schedule will be provided in advance. The event will last 4 days, starting April 7th morning and concluding by April 10th afternoon. Teams attending the fly-off are expected to stay for the full event.

The competition will provide awards for competitors. Please see the Awards section for more information.

The VFS DBVF Committee reserves the right to modify dates and timelines as necessary. Any changes will be communicated to all participating teams in advance.

Team & Pilot Requirements

Team eligibility rules are as follows:

- All team participants:
    - Must be full-time university students: Students may be at the undergraduate or graduate level, but they must be currently enrolled during the competition semester(s).
    - At least one (1) Team Captain must be identified: this team member will be the POC for all VFS correspondence related to the competition.
    - One (1) faculty advisor must be named.
    - The student team captain(s), including faculty advisor(s), must be a current member of VFS (student membership is US$25/year) at the time of submitting the Letter of Intent. Find VFS membership information at vtol.org/membership.
- Teams can have any number of student participants on their team working on design, development etc.
- For the fly-off portion of the competition:
    - Teams are restricted to **no more than five (5) participants**, including students and faculty members.
    - The team members attending the competition fly-off should attend the entire duration of the fly-off.
    - These strict rules are set by available space at the competition host site to ensure safe support of the competition and teams. Note: VFS DBVF Committee and the competition host reserves the right to reduce or increase the maximum number of teams or team members allowed at the fly-off.
- Teams can also adjust their team rosters as appropriate throughout the year: please notify VFS of any changes to the main team roster.
- Before the fly-off portion, teams will submit a list of students and faculty advisors to VFS following these guidelines:
    - A number of team members equal to or less than the maximum allowable participants stated above, including faculty.
    - Attendance of at least one (1) Faculty Advisor at the fly-off is recommended but not mandatory.
    - Teams will fill out a team roster of individuals attending the fly-off portion of the competition and submit it to the VFS DBVF committee. Please see the Overview section above for exact dates and timeline. Foreign national (non-US Citizen) team members are permitted to attend the fly-off, but additional information may be required from the competition host.
- Only teams that have completed their Team Fly-off Participant List, Safety, Risk, and Wiring Plans, Final Technical Report, Final Presentation, and Flight Video will be allowed to compete in the fly-off.
- Each team's pilot must also hold an FAA Part 107 Drone Certification or equivalent certifying authority for non-US based teams, e.g. European A2 Drone Flying License. The name of the pilot(s) must be identified in the attendee list.

- If there is more than one team per school, VFS reserves the right to limit the number of teams based on review of the letters of intent. If two or more separate teams from the same university apply and must be down selected, the teams will be given the option to combine into a single team entry that meets all RFP requirements.
- Team Withdrawal: if a team needs to withdraw from the competition, VFS must be notified in writing as soon as possible. Please see the Overview section for exact deadlines. Withdrawing from the competition after this date or not attending the fly-off may result in penalties, including your university being barred from competing the following year.

Note that the aircraft is restricted to FAA's Part 107 requirements, notably a maximum takeoff weight (MTOW) less than 55 lb (24.94 kg) at takeoff. The vehicle along with any power supply and payload must be less than 55 lb (24.94 kg). However, the requirements of this RFP may be more restrictive than the requirements of Part 107. Please refer to the Aircraft Requirements portion of the "The Fly-Off Competition" section for more information.

Pilot Requirements

Team pilots must hold an FAA Part 107 Drone Certification or an equivalent UAS pilot certification for non-US teams in order to fly at the competition. Requirements include:

- Pilot(s) must be identified by the deadline listed in the Overview section, when the fly-off team list is due to the competition host**.**
- Pilots of non-US-based teams may hold an FAA Part 107 certification or hold an equivalent UAS pilot certification from another certifying organization.
- Teams can name more than one (1) pilot if all pilots hold FAA Part 107 Drone Certification or an equivalent UAS pilot certification for non-US based teams.
- The pilot(s) will be required to complete the relevant pre mission and ground mission checks at the competition before being permitted to compete in the rest of the fly-off.
- The pilot must be an attendee of the team during the Fly-Off and may be either a student or faculty advisor.

Letter of Intent (LOI) to Submit

The VFS Design-Build-Vertical Flight Competition proposal submission window will be open until the deadline listed in the Overview section; LOIs should be emailed to FLY@HQ.vtol.org, and will be accepted on a rolling basis until the stated deadline. Teams are encouraged to continue their progress while awaiting final approval of their LOI after submission.

The LOI submission is limited to 4-pages (including the cover page but excluding the Letter of Support) and must be written by the students. The LOI should include the following sections:

- Cover page including university and team name
- Team Introduction
- Organization
    - Team roster to include name, email address and class standing.
    - Teams can have any number of student participants working on the different phases of the competition.
    - At least one (1) team lead/captain, and no more than two (2) co-leads/co-captains, must be identified. The team captain(s) will be the main contact for all communications related to the competition.
    - Tentative project schedule.
- Overview of Technical Approach
    - Briefly summarize any initial conceptual designs the team is considering.
- Letters of Support: Please include one (1) letter of support from a Faculty Advisor - letters of support do not count against the 4-page limit.
    - Include any secured or planned team funding, either through the university or outside sponsors.

Letters of intent are reviewed for completeness only.

In the future, VFS DBVF may create opportunities for competing students to submit their resumes and contact information to be shared with companies and sponsors networked with DBVF. This is aimed to help get students connected with additional opportunities (internships, jobs etc.) beyond the competition. This is simply a way for students and companies to network with each other, and there is no guarantee of external opportunities outside of DBVF. If any opportunities to share resumes/contact information are finalized, it will be communicated with teams accepted into DBVF for their consideration. In the meantime, please consider having resumes of team members on-hand.

Safety & Risk Plan

As part of the Vertical Flight Society (VFS) Design-Build-Vertical Flight (DBVF) Student Competition, each team must prioritize safety during the design, building, and testing phases of their aircraft. VFS assumes no liability for safety; it is the responsibility of each student team and their respective faculty advisors to establish and follow safety protocols during all design, build, and test activities conducted outside of the Fly-Off event.

Each team is required to submit a Safety & Risk Plan, developed in consultation with their faculty advisor. Please review the following bullet points:

- This document ensures that teams have proactively thought through safety protocols and risk management prior to testing and the competition.
- While this plan ensures a safer testing environment for teams outside of the event, it also allows teams to better prepare for the requirements provided by the host while occupying their airspace.
- During the Fly-Off event, all teams must adhere to the safety policies and requirements provided by the competition host while operating in their airspace.
- Recommended Length: No shorter than 2 pages. The Safety & Risk Plan must be submitted by the deadline listed in the Overview section.
- Non-Graded Requirement: The submission of the Safety & Risk Plan is required for participation but will not be graded, scored, or evaluated.

The Safety & Risk Plan should include:

- Safety Procedures: guidelines for maintaining a safe environment during aircraft construction and testing.
- Risk Mitigation: strategies for identifying and addressing potential risks associated with design, build, and flight activities.
    - For example, how does your aircraft safely prevent crucial components, like batteries, from being punctured or damaged on impact? How will you safely disarm the aircraft on hard landing or crash? And how do those types of factors impact your design decisions and flight planning?
        - Reminder: propulsion batteries and their respective external plug are required to be unshrouded and visible from outside of the aircraft. Consider how this impacts your design.
- Communication: methods for ongoing communication with the faculty advisor regarding safety practices and concerns, and active communication between team members during flight.

- Emergency Protocols: procedures for handling accidents or emergencies, including first aid measures and defined pre-flight, mid-flight, and post-flight emergency protocols.
- Signatures Required: the Safety & Risk Plan must be signed by the team captain(s), all certified Part 107 (or equivalent) holders, and the faculty advisor. This signature indicates that the safety measures and protocols have been reviewed and agreed upon internally to the team.

By submitting your Safety & Risk Plan, your team affirms its commitment to maintaining a safe environment during your participation in VFS's DBVF competition.

Wiring Plan

The purpose of the Wiring Plan is for each team to think about their electrical layout and system integration approach and ensure they meet competition requirements before the fly-off.

Each team is required to submit a Wiring Plan by the deadline listed in the Overview section. The Wiring Plan is a team's planned wiring schematic. This should be as detailed as possible, even if all final system components have not yet been finalized.

- Please note that during the pre-mission check at the fly-off, you must provide a final wiring diagram matching your exact final aircraft configuration. Please reference the pre-mission section for more details regarding this bullet point.

Recommended Length: No shorter than 2 pages dedicated to wiring diagrams and explanation.

The submission of the Wiring Plan is required for competition participation and will be reviewed by DBVF and the Host. DBVF and the Host may reach out to teams individually to ensure competition requirements are met. If teams are not willing to comply with competition requirements, this may lead the team to be disqualified from the competition.

The Wiring Plan should include:

- At the flyoff, teams will be expected to display failsafes, kill functionality, unplug their battery without touching the airframe, respect any set geofences, and drop and pickup payloads safely. The Wiring Plan is required to have a discussion section covering these topics, rather than being included as part of the diagram directly.
- Wiring Diagrams: initial wiring diagrams for both system components and the full system architecture.
    - These diagrams are not being checked for technical accuracy but will be reviewed by DBVF and the Host to ensure that competition requirements are met.
    - This section should include a block diagram showing each major aircraft component (flight controller, GPS, compass, motors, sensors, telemetry, RC receiver, remote ID, control actuators, ESC's, batteries, voltage regulators, etc. as applicable to your configuration).
    - The diagram must show:
        - Separation of high and low voltage components.

        - Location of communication shunt plug or switch in the circuit.
        - Location of the external plug for the propulsion battery or batteries.
    - The specific component does not need to be defined, only the type of component (i.e. ESC vs T-Motor Air40A)
    - An example diagram is shown in Figure 0 below.

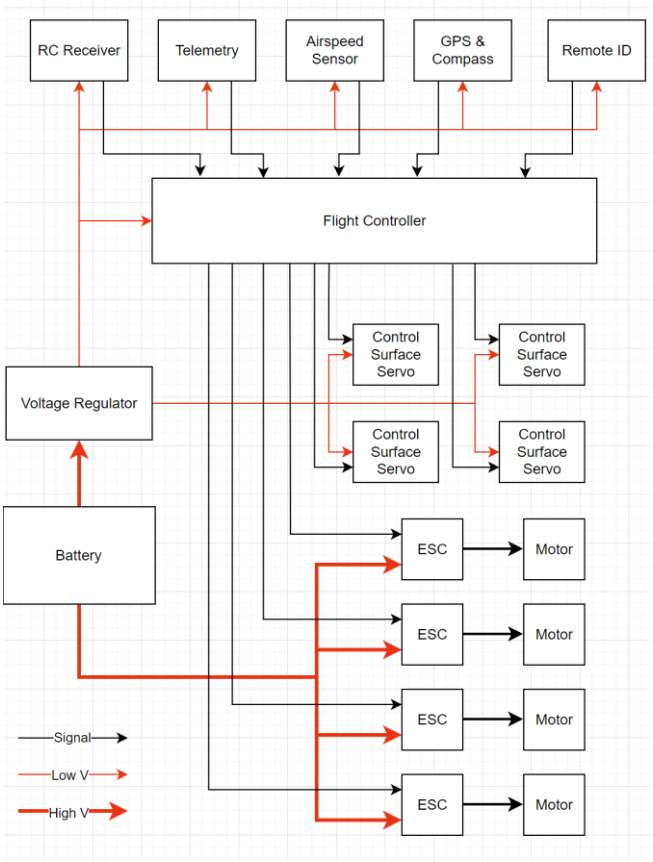

Figure 0. Example Wiring Diagram (Generalized Aircraft, and Missing Comms Switch/Plug and Propulsion Battery Plug, and Not Including Separate Propulsion and Flight Controller Batteries)

By submitting your Wiring Plan, your team affirms its expectations for the workings of the aircraft and will ensure that specific competition requirements are acknowledged and met early on in the design process.

Video Submission

The intention of this video is to display flight-readiness for competing aircraft prior to the fly-off event. This video will be due by the deadline listed in the Overview section. Instructions on how to share this video with VFS will be provided to teams prior to this deadline.

Prior to the fly-off, teams must submit a video of their aircraft in-operation to certify their flight-readiness. This helps to ensure safe flight during the fly-off event. All videos must show the competing aircraft completing the “manual safety flight” requirements of Ground Mission 1. We also ask that teams perform the main technical components of the Flight Missions listed in the “The Fly-Off Competition” section of this RFP. The video does not have to show the full flight mission, just the specific action described. However, the full Ground Mission 1 must be shown.

FTR

The Final Technical Report (FTR) is limited to 14 pages, including the cover page. References are not included in the page limit. The report must be emailed to FLY@HQ.vtol.org by the deadline listed in the Overview section.

The FTR is intended to capture the team's reasoning, methods, and decision-making process, rather than serve as a checklist of completed tasks. Each required section below has a page limit. Teams should focus on providing clear, concise answers to the guiding questions.

Teams must use the section headers as listed below starting with the Executive Summary. For each question, the header must clearly state the question (for example: "Q1: What is your aircraft, and why did you design your aircraft this way?").

The scoring criteria for the FTR is detailed in the Scoring Section of this RFP. Teams are encouraged to review the rubric carefully, as it describes how judges will evaluate responses to each section. Below are the required sections in order:

Section	Page Limit
Cover Page	1
Executive Summary	1
Team & Schedule Overview	1
Q1: What is your aircraft, and why did you design your aircraft this way?	3
Drawing Package	1
Q2: How did you build, test, and validate your aircraft?	3
Q3: What is innovative about your aircraft, and why does this matter for the competition's focus on wildfire response?	3
Reflection & Next Steps	1
References	Not Counted

Appendices are not permitted. All required content must be contained within the page limits specified. Questions 1, 2, and 3 must be written independently of each other, as the scoring of those sections will be dependent on the material contained within that section only. However, each of the 3 questions may make references to Team & Schedule Overview and/or Drawing Package sections only.

Presentation

Each team will deliver a final presentation summarizing its design and testing processes. The presentation should provide an overview of the key content from the Final Technical Report in a format suitable for a virtual judging panel. Please refer to the Scoring section for the detailed requirements and grading rubric. **The virtual Final Presentation will happen according to the schedule listed in the Overview section.**

- Time Limit: Presentations are limited to 10 minutes, followed by a 5-minute Q&A session.
- Language: All presentations must be delivered in English.
- Format: Visual aids (slides) are required, and the use of videos, plots, and images is strongly encouraged.

Presentations will be graded according to the rubric in the Scoring section.

The Fly-Off Competition

Expectations & Etiquette

A few notes for the Fly-off event are included below:

- Radios will be provided for team communications across long distances. Teams are also welcome to use cell phones for communications.
- A power station will be available in the team working locations for laptops, ground stations, and other powered equipment. The charging of LiPo batteries will happen at a separate location specified during the event.
- Components, other than batteries, cannot be changed out on the aircraft between missions, but may be switched 1-for-1 to replace a failed component between flight attempts.
    - Any aircraft configuration changes will require the team to redo an abbreviated ground mission for approval, and will void all points from prior mission attempts. This does not reset total mission attempts permitted at the fly-off.
    - Swapping battery packs will be allowed between mission attempts, but only a 1-for-1 swap that matches the nominal voltage, chemistry, weight, and capacity of the swapped battery. State of charge (the remaining charge percentage of a battery) does not need to be 1-for-1.
- Flight crew must consist of at least 2 operators: a pilot and a GCS operator.
    - The pilot will be responsible for operating the RC controller.
    - The GCS operator will be operating the ground control station.
- The Host reserves the right to ground any aircraft due to safety concerns. If there are safety tests required by VFS and the host, they will be on a pass/fail basis.
- The Host and judges may also instruct the aircraft pilot to safely land, or even kill-switch, their aircraft mid-flight due to safety concerns for the nearby area or fellow participants.
    - Failure to comply with these instructions will result in full disqualification from the fly-off event, and the voiding of all points across all mission attempts.
- **Of note: The fly-off is a safety-first event.** Due to weather constraints, it is possible that not all intended missions will be completed by teams. In the event of inclement weather, all teams may universally be asked by staff to complete a limited number of missions and attempts during the fly-off, with additional missions/attempts occurring if time permits.

Below are a few brief notes on fly-off etiquette:

- At the fly-off kickoff, teams will be assigned a randomized order. This order will be followed during the competition.
- Teams will be called by their order to go “on-deck”, at which point they should arrive at the flight line (which will be located at a short distance from the Home location). While on-deck:
    - Teams should turn on all components of their aircraft that do not rely on wireless communication (for example, radios, telemetry, or video links).
        - Keep the comms shunt plug unplugged or switched off.
    - Teams should be prepared to take off at the conclusion of the prior team’s mission attempt, with the exception of communication channels.
    - Failure to arrive promptly to an on-deck will result in the team being passed in the order.
- When called to the flight area:
    - Teams may turn on their communication equipment.
    - Teams are expected to take off within 3 minutes. Failure to take off within this period may result in the team being passed in the order.
- After completing a mission attempt:
    - Teams must then power down their aircraft and quickly make way for the next team to set up.
    - If payloads are dropped, team members are expected to help clear up all payloads dropped promptly after a judge gives the all clear to enter the field.
    - Additional communication systems must be shut off once the aircraft is turned off.
- This order will be followed for all flight mission attempts and will repeat back from the beginning after reaching the end.
    - A crucial reminder: weather is never guaranteed. While DBVF will work to maximize the opportunities for teams to fly, inclement weather may present challenges during the competition.
        - Please beware that each team is only guaranteed a set spot within the randomized order to be called on-deck, and they should be ready to fly on a moment’s notice should other teams pass on their opportunity to fly.
        - A kind note to teams: if inclement weather severely limits flight window availability, the importance of being ready to fly in the first cycle of flights cannot be overstated.
- This protocol may be subject to change by DBVF during the fly-off.

Aircraft Requirements & Constraints

Each team will only be permitted to compete with one singular aircraft during the fly-off event. Below is a list of constraints and requirements that any aircraft competing in the fly-off must meet. If it does not meet these requirements, the aircraft will not be permitted to fly during the fly-off event.

- RemoteID:
    - To maintain compliance with FAA Part 107, all competing aircraft must be equipped with remoteID functionality. VFS and the Host are not responsible for any non-compliant UAS operations.
- Maximum Aircraft Size:
    - A team's fully assembled aircraft, excluding any mechanisms for holding or mounting payloads, may not exceed the dimensions of 8ft x 8ft x 8ft.
    - **PLEASE NOTE: A bigger drone does not always mean a better drone. Your sizing and weight decisions may depend on a variety of factors beyond payload capacity.**
- External payload support:
    - All aircraft must be capable of carrying a payload provided by the Host **(NOT SANDBAG PAYLOADS)** meeting the specifications below, in addition to any payloads otherwise referred to in this RFP. This payload will help monitor aircraft position and altitude during flight missions. Constraints are outlined below:
        - Dimensions: 4 in x 4 in x 4 in (maximum) (L x W x H)
        - Weight: 0.5 lb (maximum)
        - Attachment Mechanism: 4 x 3.2mm diameter mounting holes, spaced 10 mm apart. (see Figure 1 below, please leave enough space to tighten locknuts into these holes)
        - Hole pattern can be on the bottom face of the aircraft (parallel to the ground), or any of the side faces (perpendicular to the ground). The mounted device must have a clear unobstructed view to the ground.

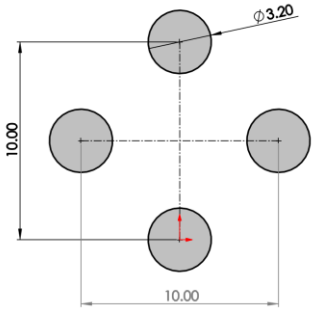

Figure 1. Mounting Pattern

        - Power Supply: FEMALE XT30 (see example in Figure 2 below) next to rail supplying 5 volts (regulated 4.9V - 5.3V, peak/burst current 3.5A, continuous current 2.5A)

Figure 2. XT30 Female Plug

        - Expected Comms Bandwidth: 902-915 MHz (bottom half of the full band)
            - Please note: certain modules used by your aircraft may interfere with this band. Your team is encouraged to consider alternative bands or configurable radios to deconflict if interference is of concern.
    - This payload will ensure consistency in attitude and altitude measurements across different aircraft types, allowing for standardization during the competition.
- Battery Power System:
    - The aircraft must be electric (electric power source and electric motors).
    - For the purpose of competition safety, unaltered commercially available LiPo batteries of six cells or less (6S or less) may be used. The team needs to select the proper capacity for their vehicle.
        - Batteries with chemistry that allow charging up to 4.35V per cell may be used but will not be permitted to be charged above 4.2V per cell at any point during the fly-off event.
        - Up to 2 batteries following the requirements in this section can be combined in series (not parallel) for the propulsion system.
            - For batteries tied together in series, each battery must be identical.
            - Note that a separate battery system is required to power the flight control system. It can be a different capacity from the main flight batteries but must still follow the battery guidelines specified throughout the RFP.
    - When connecting multiple batteries, ensure that the batteries are a) of the same chemistry, voltage and capacity; b) at the same charge level; and c) of the same age, charge cycle history, and health.

        - Crashes, damage, and poor multi-battery wiring may not immediately lead to a thermal event. However, if you try and charge damaged batteries, it can immediately lead to a thermal event. As such, batteries should be fully inspected before any flight to assess their readiness for continued use.
    - The propulsion and flight control systems must have separate battery systems.
        - A propulsion system battery monitor running through the flight control system is acceptable so long as the connection between the propulsion system battery and the flight control system is not a high-power carrying line.
            - i.e. Any connection should transmit a signal only, and no substantial amount of power.
            - Battery monitors are not a system requirement and are optional. Please exercise caution for monitoring flight time if your team has chosen not to use this component.
        - This separation of propulsion and flight control system power allows for a rapid disarming and re-arming process that safely turns off the propulsion system without power cycling other electronics. This is commonly done to improve safety when working near electric aircraft.
    - All LiPo batteries at the competition must be charged and stored inside a LiPo charging bag. They are only allowed outside the bag while being actively used with the aircraft.
    - The host will provide power and a location to charge batteries, but teams should bring their own charging equipment to the event.
    - Propulsion batteries should be unshrouded and visible from outside of the aircraft.
- Onboard Kill Switch (external propulsion battery plug):
    - The purpose of this plug is to provide an easy and quick way to manually disarm the aircraft.
    - A separatable plug connecting the propulsion batteries to the propulsion system must be reachable by hand from the exterior of the aircraft, without touching the aircraft. This must be connected to the propulsion system, but not the flight control system (see battery requirements for more information).
    - The plug must be located in a spot accessible from outside the aircraft.
    - A physical switch mounted on the drone would <u>not</u> be permitted and is <u>not</u> considered a valid plug.
- Remote Kill Switch:

    - During all flights, the aircraft must have the ability to remotely shut-off all propulsion components using a command from the pilot on the ground.
    - The command must not allow for a re-arming of the propulsion system after being issued.
        - For example, this command could fully power-off the entire propulsion system by disconnecting the propulsion battery. The command could also fully disarm the drone without disconnecting batteries.
- Remote Disconnection Functionality:
    - During all flights, if all ground-based control systems are disconnected from the aircraft for longer than 5 seconds, the aircraft must immediately begin landing vertically.
    - Comms Device Kill Switch: To ensure a lack of electromagnetic interference between aircraft during the fly-off event, teams must have the ability to power their system without powering RF devices. This includes any communication modules used for telemetry, direct command & control, or video.
    - This could be accomplished in multiple ways, including a switch or plug removing power from all communication modules. However, this could not be accomplished via command issued over remote transmission.
    - **For safety, any switching or plugging/unplugging of the comms device kill switch cannot and should not happen while the propulsion system is powered and has the potential to turn on. Please have your propulsion battery plug removed so your aircraft cannot be accidentally armed and propulsion system turned on.**
- A Ground Control Station (GCS) is required and must adhere to the following guidelines:
    - Must be displayed on a tablet, laptop, or separate monitor.
        - If FPV goggles are being used to aid teams, a separate operator must be present for that equipment.
    - Must be connected and displayed throughout the entire mission.
    - GCS must be able to:
        - View and change flight controller parameters.
        - Create and upload missions and geofences
        - Set failsafe actions
        - Receive live status messages on the state of the aircraft at least 1Hz
        - Send commands in real time to the aircraft
        - Show a map with the aircraft's live updating position on it
    - QGroundControl and Mission Planner are valid open-source GCS platforms

- Vertical Flight:
    - The aircraft must be capable of sustaining vertical flight during all takeoff and landing phases. This means that no significant sideways motion can occur during these phases.
- Camera Systems:
    - Live camera and video transmission systems are permitted, alongside ground-based displays. There are no constraints on the direction of the camera.
        - Actuators and gimbals that actively orient camera sensors during flight are permitted.
    - During the competition, the aircraft pilot must maintain line of sight with the aircraft at all times and may not view any live transmission from this camera system. A separate operator is required to relay information.
- Line of Sight (LOS):
    - All flights must be performed within the line-of-sight of the RPIC (Remote Pilot In Command).
- Maximum Weight:
    - Including any payloads attached during this competition, the aircraft and all on-board attachments must weigh **below 25 lbs** at all times.
        - The Host reserves the right to land the aircraft and lighten the payload if the aircraft is noticeably over-stressed and/or unstable upon takeoff.
- Transmission Frequencies:
    - Must follow US Federal Communications Commission (FCC) Part 15 rules for transmission frequencies and International Telecommunication Union (ITU) Region 2 frequency allocations. This means that telemetry, video, and control transmitters must operate on ~915 MHz, ~2.4 GHz or ~5.8 GHz.

- FAA Waivers:

    - No FAA waiver will be required at the competition. The UAS will be operated within the host's COA airspace. As such, the host will set any rules and restrictions for flight operation within their private airspace such that all teams operate in a safe fashion and in accordance with the rules given to the host by the FAA for their airspace. <u>Teams and team pilots must adhere to the rules set forth during the safety and pre-flight briefs at the host’s facility by the range officials. Non-compliance may result in immediate disqualification from the competition.</u>

Pre-Flight Check

During the fly-off event, the pre-mission check will involve each team giving the judge an explanation of how the aircraft works, safety considerations, and operating procedures prior to a thorough inspection. This will provide an opportunity for judges to ensure the safety of the aircraft, make any required modifications before moving on, or disqualify an aircraft deemed unsafe or non-compliant.

If an aircraft does not meet all the safety and competition requirements, the team can apply modifications and ask for an additional pre-mission check. If a team does not meet the safety requirements after 3 pre-mission checks, the team will not be permitted to fly during the fly-off event. DBVF and the competition Host reserve the right to run the pilots through additional checks or tasks during the pre-mission check.

The judges will check for items such as:

- Sizing and weight constraints for the aircraft, payloads, and mechanisms.
- Any material constraints for payloads (ie/ sand bag payloads must contain sand)
- Battery specifications and general health.
- Aircraft kill switches and failsafes.
- The final wiring diagram for the aircraft should be displayed and presented during the check as well. This will be used as a reference point during system checks.

The Host may also check for safety and competition requirements in the form of aircraft parameters. If a team is using either Ardupilot or PX4 please refer to the list of parameters below for guidance on a starting point. These parameters may be required during the fly-off event for any aircraft utilizing this firmware.

Table 1. Suggested Starting Points for Common Parameters

Firmware	Parameter Name	Value
PX4 (v1.15)	NAV_DLL_ACT	3 - Land
	COM_DL_LOSS_T	5 seconds
	COM_RC_LOSS_T	5 seconds
	NAV_RCL_ACT	3 - Land
Ardupilot (4.5.7, Copter)	FS_OPTIONS	0 - Disabled
	FS_GCS_ENABLE	5 - Land
	FS_GCS_TIMEOUT	5 seconds
	RC_FS_TIMEOUT	5 seconds
	FS_THR_ENABLE	3 - Land

Missions

The fly-off will consist of 2 types of missions, including one ground mission (GM-1) and the competition (composed of three flight missions: FM-1, FM-2, and FM-3).

For all flight missions, a standardized course will be used, as shown in Figure 3. This course includes a “Home” location for take-offs and landings, designated “H”. Multiple waypoints (labeled L for “Land”, WA for “Water, Autonomous”, WM for “Water, Manual”, F1 for “Fire 1” and F2 for “Fire 2”) are also present, alongside two potential ground zones (labeled 1 and 2). Dimensions are also provided, but drawings are not shown to scale.

Figure 3. Course Layout, with Waypoint and Ground Zone Locations. Course Scale and Location(s) Not Drawn or Displayed.

The locations and total number of courses running at a given time may also vary during the fly-off. Additionally, the location of waypoint L and the ground zones are subject to change prior to the fly-off. However, specific GPS coordinates and further information will be available and provided to teams during the event. Teams will also be provided designated times for GPS calibration and measurement.

The next subsections contain more information on each mission that will occur during the fly-off. All teams are required to complete the Pre Mission and Ground Mission 1 before performing any Flight Missions.

For all missions, the aircraft will be required to fly in a specific flight pattern. Below are a few clarifications on this process:

- Horizontal Transit:

    - All horizontal transit must be done at an altitude greater than or equal to 30ft AGL.
- Vertical Takeoff/Landing:
    - If the aircraft has significant sideways motion during the landing/takeoff process, the judges and flaggers reserve the right to verbally say “Restart”, at which point the aircraft will either return to the required altitude to vertical land again, or land to vertical takeoff again. In either case, any ongoing timers will continue during this process.
    - Successful vertical take-offs and landings are up to the discretion of the judge located at the Home waypoint.
    - Aircraft motion due to significant wind/gusts will not disqualify a vertical landing or vertical takeoff.
    - For descent:
        - The aircraft may begin any descent after coming to a stop above the waypoint that it will descend upon.
        - When descending, the aircraft may re-center itself on the location, within reason. If there is any significantly large horizontal movement during the descent, the aircraft will be required to ascend back up to 30ft and reattempt the descent, unless another altitude is stated.
        - If there is significant wind, reasonable horizontal motion is acceptable to stay centered.

Ground Mission 1 (GM-1): Essential Flight and Verbal Communication

Consistent, reliable, and safe flight is key in many sUAS operations. The goal of this mission is to display that the competing aircraft can perform consistently and safely.

The pilot must meet the following safety requirements under the maximum expected load for the team across all flight mission attempts:

- Manual Safety Flight Requirements:
    - Perform a controlled vertical take off
    - Steadily hover in place for at least 5 seconds
    - Steadily yaw (turn) the aircraft left and right
    - Steadily translate the aircraft forward, backward, left, and right
    - Perform a controlled vertical landing
    - If the aircraft is a VTOL Plane, the aircraft must display forward flight and then transition into and out of forward flight.

- If the team is planning to perform in any autonomous flight operations, they must show the ability to manually override an autonomous mission and land. Requirements below:
    - Teams will be asked to plan a mission with an autonomous takeoff and land at one location only.
    - Then interrupt the takeoff with manual control, hover steadily in place for 15 seconds, and then land.

Of note: during all armed portions of aircraft operation, all participating team members must remain behind a Host-defined boundary. **Approaching the aircraft while armed will result in immediate disqualification of the attempt.** The pilot of the aircraft must also loudly verbally signal major flight events prior to performing them, including any:

- Takeoffs and landings
- Intentional motions/movements in the air (ie/ yaw left, yaw right, forward, backward, left, and right)
- Arming and disarming events
- Flight mode changes

The Competition

Your scenario:

Smoke rises on the horizon, carried by strong winds toward the edge of a rural town. The call goes out, and a firefighting aircraft is launched. As it nears the growing blaze, the crew must battle turbulent air and shifting wind currents to get close enough to inspect the fire's location and intensity. Below, the flames spread quickly through dry grass, moving dangerously toward homes and roadways. Every moment matters as the aircraft prepares for its first critical mission.

With the fire's path identified, the aircraft begins releasing its payload directly onto the flames below. Fire retardant is dropped to contain and slow the advance, shielding areas at risk of being consumed. Each release must be carefully placed, as wasted payload means lost time and greater danger to the town. When the initial load is gone, the aircraft diverts to the nearest re-supply point, racing against the clock to pick up more retardant before the blaze grows beyond control. The cycle continues (approach, drop, and re-supply) until the fire is contained, demanding precision, speed, and endurance from the aircraft and its design. Can your team save the town?

The fire suppressant payloads will be represented by 0.5 lbs sand bags (minimum 0.5 lbs, including the sand and bag but not any external payload attachments), marked with

either red, yellow, or blue high-visibility spray paint or other same-colored marking tools. These items will be referred to as “payloads” throughout the competition, and an aircraft may never carry more than 5 of these payloads simultaneously. An example payload is shown in Figure 4. Teams are expected to show that their bags are filled with sand prior to flying, and not another type of material (ie/ teams should expect to bring a bag that is safe to open at the fly off event for inspection). Teams are also encouraged to consider how weather conditions may impact their selected bags and sand.

Figure 4: 0.5 lb Sand Bag (Bag is Not Shown Properly Filled)

A sandbag is any openable (for the purposes of showing that the bags are filled with sand at the event) and closeable container that is flexible. A rigid container, such as a hard plastic bottle, would not be considered a sand bag. Sand must specifically be silicon dioxide with fine granularity.

Each team will have a maximum time of 10 minutes per attempt. Prior to the mission:

- Waypoints L and H will be marked as a 15 x 15 foot square by visible stakes and blue or black tarp (with stakes being no more than 12 inches tall above the ground, and see-through material wrapping around those stakes to provide walls). Waypoints F1 and F2 will be marked in the same way as a 7x7 foot square and 3x3 foot square respectively. Waypoints WA and WM will be marked by a 20 x 20 foot square.
- Prior to takeoff, the team may place an unlimited number of **blue payloads** inside the square at waypoint WM. They may also place up to **5 yellow payloads** in waypoint WA.
    - Up to 5 payloads may be attached to each other at a time in a “payload bundle”.
    - Any materials attached to the payloads used for mounting onto the aircraft must never reach more than 1 foot above the ground in height.
        - Additional materials (not attached to the payloads) may be placed inside the waypoints WM and WA, so long as they never reach more than 1 foot above the ground in height.

    - When dropped, payloads and their respective attachments must never shatter.
        - If any individual payloads or their respective mounting mechanisms break apart into more than one piece, this will count as a shatter.
        - For example, if a sand bag bursts or ruptures during a drop, or if an attachment mechanism breaks into more than one piece on impact with the ground, this is considered a shatter.
        - If a payload bundle breaks into multiple individual payloads and mechanism(s), but all payloads and mechanism(s) individually remain in one piece, this will not be considered a shatter.
- A flagger will be stationed near waypoint L. Optionally, up to two team members (not the pilot or any other operator of the aircraft or its components) may also be stationed at the ground zones. These team members may not leave their respective zones during the mission, but they may communicate with the pilot verbally, visually, or over radio/cellular device.
- The aircraft will be safely assembled and turned on in the Home zone by the team and must start fully loaded with the maximum amount of expected payloads (up to the maximum amount allowed, **only red payloads**).
    - Teams may optionally start with no payloads onboard, but this will affect their ability to complete all flight missions.
- All remaining team members, including the pilot, will remain at the flight line. **If at any point a team member leaves their designated zone while the aircraft is armed, the attempt will be disqualified.**
- The pilot must be located out of line of sight of telemetry and visual data displays and must maintain line of sight with the aircraft at all times. The Host will designate a specific location for the pilot to stay during the flight, near the operators of the displays. The pilot will have line of sight to the home location and may not look at the displays.
- The aircraft must be set in either a manually piloted or autonomous flight mode prior to takeoff.

All altitudes will be measured above ground level, not relative to takeoff unless otherwise specified. The competition is composed of three consecutive flight missions, which must happen in series in one single “attempt” without the team touching the aircraft or swapping components on the aircraft. Each attempt must begin with FM-1. Before the next flight mission is started, the prior must be completed. Rules for each mission are as follows:

- Flight Mission 1 (FM-1):
    - Main Technical Component:

        - Manual or Autonomous Takeoff and Landing
    - A timer will begin on first take-off. The aircraft must take-off vertically to 30 feet, and then horizontally transit over waypoint L, and then land vertically at waypoint L.
        - The aircraft is not required to disarm once landed, but significant sideways motion during landing will result in a failed landing.
        - A landing also means no ‘bouncing’, or violently rapid touch-downs. Whether or not the aircraft ‘bounces’ will be determined by the judges present.
    - The flagger will raise their flag to signal a successful landing at this waypoint. This means that the aircraft is contained fully inside waypoint L.
    - The team may proceed to Flight Mission 2 after the flagger has approved if they are carrying payloads, and if the judge at waypoint H has approved their vertical landing.
        - Teams may not proceed to Flight Mission 2 unless they have completed the process above with at least one payload onboard.
        - If the aircraft fails to receive a flag, or if it does not receive approval from the judge at waypoint H, it must return to at least 10 feet and try to land vertically again.
    - If the team fails to land within the bounds of the box at L on the first touch down there will be a point deduction, as outlined below. Teams must successfully land within L before proceeding to FM-2.
- Flight Mission 2 (FM-2):
    - Main Technical Component
        - Dropping Payload (Manual or Autonomous)
    - The aircraft may then vertically take-off to 30ft AGL.
    - From here, the aircraft may horizontally transit to either waypoint F1 or F2 (the drop-zones) to drop the carried payload(s).
        - No drop for FM-2 may occur at an aircraft altitude less than 15 ft AGL. If any drops occur below 30 ft AGL, there will be point deductions.
            - Vertical descent below 30ft AGL is permitted over the drop zones.
        - Altitudes will be measured with LiDAR onboard the Host’s payload attachment.
        - Please note, the payloads dropped in FM-2 will be red.
    - Teams will not be able to manually reload the aircraft during FM-2.

    - Teams may proceed to FM-3 after their payload(s) has been dropped. These drops do not need to be successful in order to proceed.
- Flight Mission 3 (FM-3):
    - Main Technical Component:
        - Picking up payload (Manual or Autonomous)
    - FM-3 will begin once the aircraft begins to move toward waypoints WM or WA. The aircraft may horizontally transit to either waypoint WA or WM to pick up more payload(s), and must horizontally transit when traveling away from WA or WM.
        - The aircraft may not pick up more than the maximum allowed payloads (as defined in the ground mission).
        - The aircraft may vertically descend or land at the waypoint during this time to pick up payloads, and then vertically ascend back to 30 ft AGL.
    - Please note that, depending on the waypoint selected, either a set of yellow-only or blue-only payloads must be picked up. Payloads may then be dropped in either drop zone.
        - No drop for FM-3 may occur at an aircraft altitude less than 15 ft AGL. If any drops occur below 30 ft AGL, there will be point deductions.
            - Vertical descent below 30ft AGL is permitted over the drop zones.
        - Altitudes will be measured with LiDAR onboard the Host's payload attachment.
    - Teams may then do unlimited pickups/drops in FM-3, using only horizontal and vertical transit as described in the FM-3 drop above, so long as they are blue payloads picked up from waypoint WM.
        - If a yellow payload is picked up from waypoint WA at this time, there will be point deductions as outlined below.

- The aircraft must conclude the attempt for any combination of flight missions by landing at Home vertically before the allotted time runs out or receive point deductions as outlined below.

Points and point deductions include:

- Points added during attempt:
    - +20 points:
        - Successfully landing at waypoint L during FM-1.
    - +30 points:

        - Completing the initial take-off from H and landing at waypoint L completely autonomously for FM-1 (these points are added on top of the general landing). **Please refer to the statement on autonomy in the "Final Notes" section of this RFP for autonomous requirements.**
    - +2.5 points:
        - For each payload completely inside the box at waypoint F1 at the end of the attempt.
        - If a shatter occurs at this waypoint, or outside of this waypoint, all payload-drop points will be set to zero across all flight missions. This includes any point multipliers for autonomous drops, but not any point additions due to autonomy.
    - +5 points:
        - For each payload completely inside the box at waypoint F2 at the end of the attempt.
        - If a shatter occurs at this waypoint, or outside of this waypoint, all payload-drop points will be set to zero across all flight missions. This includes any point multipliers for autonomous drops, but not any point additions due to autonomy.
    - Additional points for autonomy include:
        - FM-2 only:
            - x2 point multiplier for each payload dropped successfully in FM-2:
                - If the aircraft flies from the moment it leaves the ground until the moment it completes the payload drop(s) in an autonomous flight mode.
                - Transitioning out of autonomy while the aircraft is touched-down at waypoint L is permitted, including a manual re-arm of the aircraft, however, the aircraft must be in an autonomous mode when the aircraft's landing gear leaves the ground.
                - Manually triggering a payload drop is allowed to achieve this multiplier.
            - +20 points:
                - If the entirety of the requirements for the x2 multiplier are met, and no manual triggering is done for the payload drops (meaning no ground commands or radio switches).
                - Payload drops do not need to be successful to obtain these points.

        - FM-3 only:
            - For the first set of payloads dropped only. (To clarify, if an autonomous pickup is attempted, and a payload is accidentally dropped from above 15ft, the autonomous attempt may continue to the drop location. The aircraft may not return to the pickup location until all carried payloads have been dropped, otherwise the autonomy points below are forfeited.)
                - x3 point multiplier for each payload dropped successfully during this drop:
                    - If the aircraft flies from the moment it starts FM-3 until the moment it completes this payload drop in an autonomous flight mode.
                    - Transitioning into autonomy after flying FM-2 manually is permitted.
                    - The payloads used MUST be retrieved from waypoint WA. If they are retrieved from waypoint WM, autonomy points and multipliers for FM-3 will not be applied.
                - +50 points:
                    - If the entirety of the requirements for the x3 multiplier above are met, and no manual intervention is done for the payload drops or pickups (meaning no ground commands or radio switches).
                    - Payload drops do not need to be successful to obtain these points.
- Adjustments to remaining points at end of attempt:
    - -20 points:
        - Every time the aircraft makes contact with the ground at any location other than waypoint L, WA, WM, or Home.
        - Every time the aircraft lands due to a failsafe, including but not limited to communications disconnection and geofence breaching.
        - If the aircraft does not conclude the attempt by landing vertically at Home (10 feet) before the timer is out.
    - The attempt automatically concludes:
        - Every time the aircraft lands due to a failsafe, including but not limited to communications disconnection and geofence breaching.

            - Please note, teams may attempt to exit failsafes during the landing process, but the attempt will conclude if the aircraft touches down during the failsafe.
            - Teams will keep the points acquired during the attempt up to the failsafe landing, but will still receive the 20 point deduction outlined above.
    - Full attempt disqualification (total of 0 points):
        - Aircraft experiences rapid unscheduled disassembly on the field.
        - The aircraft and any of its attachments make contact with the squares at waypoints F1 or F2, or make contact with the ground inside the drop zone waypoints (in the context of the scenario, your aircraft flew into the fire).
        - GCS is removed from the GCS operators' view at any time during the flight.
    - All payload-related points cut in half:
        - If one payload is dropped while the aircraft is at an altitude below 30 feet AGL, all payload points for that flight attempt will be halved. These include any drops associated with autonomy multipliers, but not any autonomy-related point additions.
    - All payload drop-related points lost (including any points associated with autonomy multipliers):
        - If at least one shatter occurs anywhere on the field, including any drops associated with autonomy multipliers.
        - If any payload is released at an altitude of less than 15ft anywhere on the course. This includes any unintentional payload drops that happen after a payload leaves the ground.
            - In this specific event, all autonomy static point additions will also be lost.
    - All autonomy-related points for FM-3 lost, including both multipliers and point additions:
        - If a yellow payload is picked up after the first drop in FM-3.

Scoring

FTR & Presentation

The scoring system is designed to reward teams that not only meet the baseline requirements but also demonstrate clear reasoning, strong evidence, and thoughtful communication. Both the Final Technical Report (FTR) and the Final Presentation are opportunities to showcase your aircraft, your process, and your team's work throughout the competition season.

The FTR serves as the detailed record of your work. It is where teams demonstrate the depth of their technical reasoning, documentation, and evidence. The Presentation complements the FTR by distilling the most important elements into a concise, impactful story for a live audience. Together, they form a complete picture of your project.

The requirements establish the minimum expectations for content, while the rankings below share insights into the guiding tone for judging and how judges will differentiate between weaker and stronger responses. Below is the ranking that will be the guiding tone for judging:

- Minimal (0-25% of available points): Meets few requirements, lacks clarity or evidence.
- Adequate (26-50% of available points): Covers the basics but with limited reasoning, evidence, or depth.
- Strong (51-75% of available points): Addresses most requirements with solid reasoning and evidence.
- Exceptional (76-100% of available points): Fully meets and exceeds requirements, with compelling reasoning, strong evidence, and clear communication.

Teams may go beyond the stated requirements to include additional reasoning, evidence, or insights that strengthen their responses.

FTR Scoring

Table 1: FTR Scoring Criteria		
Section	**Points**	**Requirements**
Cover Page	**1**	Include team name, school(s), picture (optional), logo (optional), and report title
Executive Summary	**14**	Summarize the aircraft, major design choices, and intended wildfire response mission in a clear, concise overview

Team & Schedule Overview	**10**	Provide a summary of team organization, faculty advisor, roles, and schedule progress up to submission
Q1: What is your aircraft, and why did you design your aircraft this way?	**50**	Explain the aircraft configuration and major design decisions, supported by reasoning and evidence
Drawing Package	**10**	Provide clear drawings that define the aircraft layout, dimensions, and key features
Q2: How did you build, test, and validate your aircraft?	**50**	Describe fabrication methods, ground testing, flight testing, and validation of design choices
Q3: What is innovative about your aircraft, and why does this matter for the competition's focus on wildfire response?	**50**	Explain innovations, how they differ from conventional approaches, and why they add value in wildfire missions
Reflection & Next Steps	**5**	Summarize what has been learned, challenges encountered, and what remains to be done before the flyoff
Presentation & Organization	**10**	Quality of writing, clarity of structure, professional formatting, and adherence to page limits
Total	**200**	

Final Presentation Scoring

Table 2: Final Presentation Scoring Criteria		
Section	**Points**	**Requirements**
Team Organization, Roles, & Schedule	**5**	Introduce your team, explain member roles, and provide a brief overview of your project schedule
Q1: What is your aircraft, and why did you design your aircraft this way?	**10**	Present your aircraft design, explain the mission needs and trade-offs, and justify why this configuration best meets the competition requirements
Q2: How did you build, test, and validate your aircraft?	**10**	Share how you built your aircraft, describe your testing process, and use data, images, or videos to demonstrate how performance was validated

Q3: What is innovative about your aircraft, and why does this matter for wildfire response?	**10**	Explain what is innovative about your aircraft, and why this matters for the competition's focus on wildfire response, including how your innovation could provide value in real-world use
Reflection & Next Steps	**5**	Summarize the key lessons learned, reflect on progress made, and outline what remains to be completed before the fly-off
Clarity & Delivery	**8**	Deliver a clear, well-structured presentation within the time limit and use visuals effectively.
Public Relations	**2**	Successfully fielded audience and/or judges' questions
Total	**50**	

Mission Scoring

Points will be allocated by each mission accordingly:

GM-1

In this Ground Mission, up to 20 points can be earned. All points will be awarded for successfully completing the mission. If the mission is not successfully completed, no points will be awarded.

Flight Missions 1-3

Points will be awarded for the flight missions as described in the "The Fly-Off Competition" section. If a team receives significant point deductions, such that their score is negative, they will instead be awarded zero points. The maximum score available will be 300 points.

Final Overall Scoring

Final scores for the fly-off will be calculated by adding together all points from each mission. Scores from the presentation and FTR will be calculated from the points earned in each individually. The rankings, including 1st, 2nd, and 3rd place awards, will be calculated by adding the points across the fly-off, the FTR, and the presentation. Final scores from all teams for each section of scoring, including the final scores for the FTR, Presentation, Ground Missions, and Flight Missions respectively, may be made public at the conclusion of the competition.

Awards

Competition awards will include the following.

- Overall competition winners will be awarded a trophy (1st place), plaque (2nd place) and certificates (3rd place, and other award categories) and the following monetary amounts:
  - **1st Place Overall: $2200**
  - **2nd Place Overall: $1300**
  - **3rd Place Overall: $700**
  - **Top Score Final Technical Report: $400**
  - **Top Score Fly-off: $400**

Final Notes

Expenses and Support

VFS will not provide any travel or accommodation support for competing teams or pay or reimburse any other expenses. Teams are encouraged to search for university or company sponsors for travel, accommodation, equipment, etc., and are free to display any sponsors logos on their team shirts and on their aircraft.

Statement on Autonomy

Assistive autonomy is permitted in missions requiring manual flight modes. An example of assistive autonomy would be a system that keeps altitude at 20 ft during cruise or a system that holds the aircraft in place when the pilot releases control input.

In all autonomous flight modes, the pilot must not have their hands on the controls, but must be capable of rapidly taking control and transitioning to a manual mode in case of emergency or as requested by judges or the competition host. ***Unless otherwise stated, if the pilot places their hands on their controls during a portion of a mission requiring autonomy, points associated with autonomy for that portion of the mission will be removed.***

If an autonomous flight mode requires a manual input to takeoff at any point during the competition, this will not impact any points awarded for autonomy. While the aircraft is in the air, however, it must remain in an autonomous flight mode in order to receive points associated with autonomy.

Questions

Questions should be sent to fly@HQ.vtol.org. The Frequently Asked Questions (FAQ) document will be posted to the competition site on monthly basis.

- Updated FAQ document will be periodically posted to the DBVF website https://vtol.org/FLY

Disclaimers

Safety is paramount in this competition. The rules are designed to minimize risk to all participants and to comply with U.S. government restrictions at the test site. VFS and the Committee assume no responsibility and accept no liability for any actions, injuries, or damages caused by participants of the DBVF Competition.

These rules are subject to change. Any updates will be published at the end of a revised document and it will be posted to www.vtol.org/FLY. All registered competitors will be notified of any clarifications on the rules or necessary adjustments.

Participation in the competition explicitly gives permission to VFS to use text, graphics, photographs, and video documentation of the competition and all competitors for educational and promotional purposes only. The competition event, participating schools, and team names may be the subject of VFS *Vertiflite* magazine articles, web page postings, social media, or other forms of publicity.

Final Word

The VFS DBVF Committee wishes you all the success possible in undertaking this year's VFS Design-Build-Vertical Flight Competition, and we look forward to meeting you at the fly-off competition. Good luck, and safe flying!

Revision History

Document Version	Update Notes	Release Date
1	First Release	09/03/2025
2	Please see changes in yellow, including: • Typo correction on team member positions (page 27) • Clarification on tarp color (page 26) • Clarification on the definition of “sand” and “bag” (page 26) • FM-2 and FM-3 scoring clarifications (pages 30-32)	10/21/2025
3	Please see changes in blue, including: • Update on materials being left inside waypoints WA and WM (page 26) • Sandbag weight clarification (page 25) • Additional clarifications on the host-provided payload (pages 17 and 18)	11/24/2025