

RoboBoat 2026 | Team Handbook

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Welcome to the frontlines of innovation at the 2026 RoboBoat Competition!

This Team Handbook contains information that teams need to compete at the 2026 RoboBoat Competition. It includes task descriptions, rules and requirements, and other guidance and specifications. Teams are encouraged to read this document for a thorough understanding of what is necessary to compete effectively.

What is RoboBoat?

RoboBoat is an international student program established to generate, cultivate, and enhance a community of innovators capable of making substantive contributions to the Autonomous Surface Vehicle (ASV) domain. The vision is achieved by providing a venue and mechanism, whereby practitioners of robotics and maritime autonomy come together at RoboBoat to share knowledge, innovate, and collaboratively advance the technology of ASV systems. Teams must also document their designs as described in this Team Handbook.

Why RoboBoat?

The objective of RoboBoat is to build an international community of innovators – ranging from high school to higher education, capable of making substantive contributions to the maritime field and pushing development of small-scale (X-Class) ASV. The competition has been held annually since 2008.

Why compete in RoboBoat?

Participants of RoboBoat may expect to:

- Increase technical proficiency;
- Establish valuable professional connections; and
- Enjoy the satisfaction of learning and collaborating while advancing the technology of ASV systems.

The nominal winners are those teams that have scored the most points. The real winners are all those participants who have learned something lasting about working together to create an autonomous system that accomplished a challenging mission in a complex environment.

Maritime autonomous technology is critical to monitoring and healing our oceans. Developing the human resource to expand this effort is even more essential.

ROBOBOAT ORGANIZERS



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Change Log

Date	Section	Details
2025-11-11	All Sections	Initial Release

What's New for 2026

1 Vehicle Requirements

- Teams may enter up to two (2) vehicles in the competition and have the opportunity to showcase inter-vehicle communication.
- Vehicles may be commercially available systems.

2 Capability Levels

Each mission task has capabilities divided by three levels:

- **Core Capabilities:** Fundamental competencies required for safe and effective baseline autonomous operation.
- **Advanced Capabilities:** Competencies that reflect growth in autonomy sophistication and real-world relevance.
- **Disruptive Capabilities:** Transformative competencies pushing the boundary of autonomous systems - enabling novel or mission-critical applications.

3 Qualification Criteria

To qualify for Semi-Finals, the ASV must complete:

- Core capabilities of two (2) individual tasks
- Advanced capabilities of two (2) individual tasks
- Two (2) tasks in sequence autonomously
- Send heartbeat message

4 Reporting and Communications

ASV will send short updates with location and task status to the course server.

5 Multiple Boat Operations

As teams advance to Semi-Finals and Finals, multiple vessels may be operating in the course while the team is completing the mission.

- *Example:* Teams' ASV detects and avoids a programmed or remote-control "Patrol Boat," that will be operating throughout the mission field.

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Reduced Presentation/Assessment Time

The presentation and assessment time blocks have been reduced to 15-minute time blocks.

Section 1: Competition Overview

1.1 Dates & Venue

The 2026 RoboBoat Competition (RoboBoat 2026) will be conducted February 19-24, 2026, at the [Nathan Benderson Park](#) ↗ in Sarasota, Florida, USA.

1.2 Competition Structure

RoboBoat includes the [Autonomy Challenge](#) that demonstrates autonomous performance and safety, and [Design Documentation](#) that presents each team's work and ASV design.

1.3 Competition Theme: Storm Response

Technology in Action for Recovery and Relief. *Storm Response* explores the power uncrewed systems play in recovery, resilience, and discovery in disaster relief efforts. Framed as an opportunity, not just to restore what was lost, but to rebuild smarter and reimagine the future; this season's challenges reflect the real-world role of robotics in helping communities respond to and recover from storms and other natural events. Through hands-on missions grounded in post-disaster scenarios, teams will apply technology with purpose – restoring harbor operations, assessing underwater infrastructure, supporting exploration, and unlocking new possibilities.

A powerful storm swept through, leaving behind unknown destruction and potential environmental hazards. Vehicles are deployed to demonstrate how coordinated action can turn disaster into resilience:

- **Assessment & Discovery:** Vehicles are deployed for rapid damage assessment to inspect the area and report environmental hazards, gathering the critical information needed to understand the scope of damage.
- **Recovery & Repair:** Vehicles work to search the debris field armed with supplies to restore safety and functionality. Yet recovery is not only about rebuilding what was lost; it's also about protecting the future.

- **Environmental & Public Safety:** Vehicles conduct surveying and data collection to coordinate with first responders, underscoring the responsibility to restore balance for both communities and ecosystems.

Find out more in [Section 3: Autonomy Challenge](#) for the 2026 tasks.

1.4 Eligibility

Student teams from anywhere in the world are eligible to participate. All teams must build an ASV to compete and may enter up to two vehicles in the competition.*

**First-year teams are eligible to participate in RoboBoat without an ASV. These teams are expected to participate in Design Documentation and send representatives on-site at the event as a learning experience. First-year teams are expected to indicate this option in their registration form.*

1.4.1 Eligibility Details & Team Composition

- Teams must be comprised of 75% or more full-time students. Student members are expected to make significant contributions to the engineering development cycle of their ASV.
 - The majority of team members must be college or high school students. Teams may also include middle school students. Interdisciplinary teams are encouraged.
 - Teams may be comprised of 25% or less alumni, industry, academic or government partners.
 - A minimum of three (3) team members are required for safe operations on-site at RoboBoat.
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1.5 Competition Schedule and Timeline

The event schedule is also available on the [RoboBoat website](#) ↗.

Date	Event	Location
Online		
01 October 2025 - 01 December 2025	Registration	Start Registration ↗ (Online)
14 January 2026	Event Submission Deadline: • Team Member Registration • Team Demographics • Merchandise Order • Vehicle Information • On-Site Requirements	Registration Portal ↗ (Online)
14 January 2026	Design Documentation Deadline: • Technical Design Report • Website • Team Introduction Video • Community & Outreach (optional)	Registration Portal ↗ (Online)
In-Person Event		
19 February 2026	Team Check-in / Orientation	Nathan Benderson Park
20-21 February 2026	Practice Course Open Qualifying Round Design Presentations System Assessments	Nathan Benderson Park
22-23 February 2026	Semi-Finals Round	Nathan Benderson Park
24 February 2026	Finals Round Awards	Nathan Benderson Park

1.5.1 Daily Team Meeting

Each competition day starts and ends with a mandatory team meeting for all teams, conducted by the Technical Director. Team leads (or their designated team representative) are required to attend all meetings. All participants are strongly encouraged to attend.

The Technical Director summarizes the day's events, describes any course changes for the following day, and teams are encouraged to ask questions and provide feedback.

1.6 Points of Contact

RoboBoat Questions:	Registration Questions:	On-Site Logistics/Safety:
roboboat.org/discord ↗ competitions@robonation.org ✉	support@robonation.org ✉	events@robonation.org ✉ 850.642.0536

1.7 RoboNation Code of Conduct

All team members must abide by the RoboNation Code of Conduct while participating in the Competition. Failure to abide by this Code of Conduct at any point during the competition season may result in the disqualification of the team and/or participants from the Competition, components of the competition, the full competition, and/or future competitions.

1. Give your best effort. Display honesty, integrity, and sportsmanship while engaging in friendly competition. Compete fairly. Team products are solely the creation of student participants' own efforts, ideas, and designs with supporting mentors providing only verbal advice.
 2. Respect others. All participants and guests will display courtesy and respect toward officials, volunteers, other teams, and guests of the Competition.
 3. Act with integrity. All participants and guests will behave in a responsible manner and follow the rules of the competition and host organization.
 4. Support each other. All participants will embody the spirit of RoboNation and endeavor to engage with, learn from, and support one another.
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Section 2: Design Documentation

This section includes detailed requirements and instructions for the design documentation portion of the competition.

Prior to the on-site competition, teams are required to develop and submit (1) technical design report, (2) team website, and (3) team introduction video. On-site at the competition, teams are required to conduct (1) an oral design strategy presentation and (2) system assessment by subject matter expert judges.

Delivered Online Before On-Site Competition

The following design documentation is delivered online before the on-site competition according to the deadlines found in [1.5 Competition Schedule](#). Teams are encouraged to refer to the past top-scored deliverables: roboboat.org/past-programs ↗.

- [2.1 Technical Design Report](#)
- [2.2 Team Website](#)
- [2.3 Team Introduction Video](#)

Delivered On-Site During Competition

The following design documentation is delivered on-site during the competition.

- [2.4 Design Strategy Presentation](#)
- [2.5 System Assessment](#)

2.1 Technical Design Report

Each team is required to submit a TDR that describes the team's design principles and competition priorities. The report should address the rationale for which autonomy challenge tasks have been chosen to attempt and how this competition strategy influenced the design decisions for the hull, propulsion system, control systems, and autonomy system. Teams must follow the TDR instructions provided below. To be eligible for full points, teams must submit their TDR by the deadline found in [Section 1.5](#).

A strong TDR provides a coherent narrative and addresses the elements of the rubric as much as possible, including citing references used. The competition strategy justifies the choices of autonomy challenge tasks and design decisions that trace back to those task choices. The report also identifies which software tools allow the team to accomplish the tasks chosen.

The technical design report is worth a total of **200 points**. The outline of each content section includes a scoring weight with guidance for scoring considerations that are provided to the judges during evaluations.

2.1.1 Deliverable Requirements

The content of the written paper shall include the following sections:

- [Abstract](#)
- [Acknowledgements](#)
- [References](#)
- Technical Content: [Competition Strategy](#), [Design Strategy](#), [Testing Strategy](#)
- [Optional Appendix: Test Plan & Results](#)

The format of the written paper shall adhere to the following guidelines:

- 6 page limit (excluding References and Appendices)
- 8.5 × 11 in. page size
- Margins ≥ 0.8 in.
- Font: Times New Roman 12pt
- Header on every page including team name and page number
- Submitted in .pdf format

Optional Formatting: Teams may choose to follow the two-column format, editorial style for IEEE Conference Proceedings: www.ieee.org/conferences/publishing/templates.html ↗.

 **RoboNation Tip:** It is recommended that papers be peer-reviewed prior to submission. For example, teams can utilize resources at their institution, fellow students, or professional editing services.

Formatting Scoring Metrics (5% of score)

Strong	Paper follows page limit, and all formatting guidelines are followed. The document is professionally organized. All required sections are included and easy to identify. All grammar, punctuation, and spelling are correct. The style follows that expected of a scientific paper submitted for publication.
Requirements Not Met	Formatting guidelines are not followed and the layout is unorganized.

2.1.2 Abstract

The abstract is a short summary of the main points in the paper. The abstract should summarize the linkage between overall competition strategy and system architecture, design, and engineering decisions.

Abstract Scoring Metrics (10% of score)

Outstanding	Abstract is engaging, lists the scope of the work, and provides a thorough summary of the paper.
Strong	Abstract provides a strong overview of the scope of work and a detailed summary of the paper.
Average	An adequate explanation of the scope of work is included with a brief summary of the paper.
Below Average	Abstract provides a basic summary of the paper.
Poor	Abstract section is included but does not serve the intent of an abstract. The abstract is treated as an introduction and provides no summary of the paper.
Requirements Not Met	No abstract is included.

2.1.3 Acknowledgements

Participating in the competition, as in all research projects, involves leveraging resources and support beyond the efforts of individual team members. This support can take many forms such as technical advice, labor, equipment, facilities, and monetary contributions. Acknowledging those who have supported efforts is important.

Acknowledgements Scoring Metrics (5% of score)

Strong	Acknowledgements detail supporting personnel and their contributions as well as resources. Sponsors and their contributions are acknowledged.
Average	Acknowledgements include a list of supporters and sponsors with little or no detail of the support provided.
Poor	Acknowledgements provide a general thank you but do not specify particular contributions.
Requirements Not Met	No acknowledgements are included.

2.1.4 References

As with any technical publication, original ideas and content not generated by the paper's authors should be properly cited. The references should follow the [IEEE Conference Proceedings citation style](#).

References Scoring Metrics (5% of score)

Strong	Sources include notable technical references including technical papers and articles. Use of the source materials are evident in the TDR. Sources are thoroughly documented. The IEEE citation style is correctly utilized.
Average	Sources are adequate and documented correctly with the IEEE citation style is utilized.
Poor	Limited sources are documented but there is no adherence to the IEEE citation style.
Requirements Not Met	No sources or citations are documented.

2.1.5 Competition Strategy

The paper must include details on the team's strategy for the competition, including the plans for approaching the course and how the vehicle design relates to this approach. The course consists of multiple tasks with associated points for accomplished behaviors. The only required task is navigating through the start gates. Teams may choose to attempt the other tasks and complete the tasks in any order. The more tasks a vehicle is designed and engineered to accomplish, the more complex the overall vehicle system will be.

Discuss the team's strategy on trade-offs between system complexity and reliability. For example, teams have a limited number of working hours to prepare for the competition; this time could be spent adding additional capabilities or testing and improving the reliability of an existing capability. As system complexity grows, changes in subsystems can propagate in unmanageable ways when time is limited. Based on history and the system engineering talents of the team, include a description the team's strategic vision.

Competition Strategy Scoring Metrics (25% of score)

Outstanding	Detailed description of the team's strategic vision and how the vehicle design compliments their goals. Detailed discussion on trade-off studies between system complexity and reliability during design development process.
Strong	The team's goals are clearly evident but not discussed in detail. Trade-off studies evident but lacking details.
Average	Brief mention of team's strategic goals and/or trade-off studies.
Below Average	Document hints at a goal for competition and/or trade-off studies.
Poor	Discussion of the team's vision is incoherent; rationale for competition goals is not discussed.
Requirements Not Met	No mention of competition goals.

2.1.6 Design Strategy

Given the strategy for success at the competition and the approach to managing complexity, the paper must include a description of the system design to meet the goals they established for the competition. Justification for design choices should be clear. Discuss how components and subsystems were selected and integrated on the vehicle. For teams that are working with a previously designed vehicle, discuss how the design meets the current competition strategy and any modifications needed at the component, subsystem, and/or integrated system levels. Describe the experience in making both architectural/design decisions and system engineering decisions.

This section should not include detailed component descriptions and/or specifications not of original design.

Design Strategy Scoring Metrics (25% of score)

Outstanding	Provides in-depth explanations on design strategy and clearly identifies creative aspects of system. Creative design methodology is justified with required calculation steps and visual aids. Content clearly exhibits a Systems Engineering approach.
Strong	Provides explanations on design strategy and identifies creative aspects of system. Creative design methodology is justified with calculation steps and visual aids. Content hints at a Systems Engineering approach.
Average	Provides some information on design strategy and creative aspects of system. Creative design methodology is supported with a few calculations. Content could be justified as a Systems Engineering approach.
Below Average	Provides little information on design and creative design methodology. Little evidence to support applications of a Systems Engineering approach.
Poor	Provides limited information on the creative aspects of system. Creative design methodology is hypothesized. No evidence to support application of Systems Engineering principles.
Requirements Not Met	Creative aspects of design are not described.

2.1.7 Testing Strategy

Testing and experimentation is a crucial step to preparing and innovating a system design that strongly correlates with a competitive performance in the arena. The paper must include the approach to a testing strategy, including various test plans, both physically and in simulation.

Discuss considerations of the time needed to thoroughly test to meet the determined goals and the demands of design and engineering with those of testing and experimentation.

Testing Strategy Scoring Metrics (25% of score)

Outstanding	Testing approach is presented in great detail, to include test strategy and plans. Component testing, sensor and control systems testing done in accordance with a test plan.
Strong	Detailed testing approach, test strategy, and plans. Documentation shows good overview of components, sensors and control system testing.
Average	Testing approach is presented with sufficient detail, including mention of test strategy and plans. Documentation shows components, sensors and control system testing.
Below Average	Testing approach is presented with little to no detail. No mention of components or sensors testing.
Poor	Testing is done to a certain degree. No components and sensors are tested independently. There are no test plans.
Requirements Not Met	No mention of testing or connection with the system design.

2.1.8 Test Plan & Results (Optional Appendix)

Based off the testing approach outlined in the paper, this appendix showcases the test plan that was developed and the detailed results that came out of testing. Teams should present their plans for testing, including algorithm testing in a virtual environment, component testing in a laboratory setting, subsystem testing in a relevant environment, and full system testing in a pseudo-competition environment. Test set up should be included and results presented. Any design modifications or changes in competition strategy as a result of testing should be discussed.

While this appendix is not required, excellence seen in this section can be eligible for a special judges' award.

The appendix may include detailed documentation covering the following areas:

- *Scope:* Objectives and test cases (this may also specify what was not included in tests)
- *Schedule:* Start/end dates and deadlines
- *Resource and Tools:* Resources and tools needed to conduct tests and assess results
- *Environment:* Description of the test environment, configurations, and availability
- *Risk Management:* Outline potential risks that could occur throughout testing

- *Results:* Detailed outcomes of test cases

2.2 Team Website

Teams are required to submit a website in English that documents their team, vehicle design, and competition approach.

2.2.1 Deliverable Requirements

1. Website Content: Layout and detailed contents of the website are left for the teams to develop; however, the team website must include:
 - Current team name and contact information
 - Vehicle photos and/or videos
 - Supporting media, which may include:
 - Instructional/Informative videos
 - Procedures (text, images)
 - Design decision documentation (text, images, videos)
 - Blogs for historical records of build progress
 - List of sponsors with logos
2. Website Quality: Websites are often the first impression of a project. Potential supporters such as supervisors, sponsors, or advisors must find the website visually appealing and easy to navigate. Development of the website should include careful consideration of user experience, including:
 - Written in English, or English translation provided
 - Clear prioritization of key content
 - Site search functionality
 - Basic design elements: contrast, repetition, alignment and grouping to organize/highlight content
 - User accessibility, as defined by the [W3C Web Accessibility Initiative: www.w3.org/WAI](http://www.w3.org/WAI)
[↗](#)
 - Cross browser compatibility for modern web browsers (Chrome, Firefox, Safari, MS Edge)
 - A mobile friendly display

2.2.2 Scoring Metrics

The website submission is worth a total of **180 points**. The scoring metrics include a scoring weight with guidance for scoring considerations that are provided to the judges during evaluations.

Team Information (20% of score)

Outstanding	Team website includes all required team information, including the team's name and contact information, and a list of team members and sponsors. All mentions of the vehicle are relevant to the current competition year.
Strong	Team website provides a brief introduction to the team, team members and sponsors. There is supporting media on the vehicle.
Average	Team website introduces the team and/or team members.
Below Average	Team website provides little to no information on the team. There is no mention of the vehicle.
Requirements Not Met	The required team information is not included on the website.

Vehicle Design Documentation (40% of score)

Outstanding	Vehicle development and testing process is thoroughly documented with instructional and informative supporting media and historical recording. This could include photographs, diagrams, videos, procedures (text + images), design documentation (text + images + video), or blogs for historical records.
Strong	Good documentation on vehicle development and testing process is provided. Supporting media is accessible.
Average	Vehicle development and testing process is adequately presented with some evidence of supporting media.[L11]
Below Average	Few pictures or videos of the vehicle, but no instructional or informative documentation included.
Requirements Not Met	No visuals or documentation of the vehicle is available on the website.

Website Quality (40% of score)

Outstanding	Website places a heavy emphasis on human factors. Layout is visually appealing, easily maneuverable, and does an excellent job of drawing user's attention to relevant content.
Strong	Website considers user experience. Layout does a good job of drawing user's attention. Users can navigate the site easily and quickly.
Average	Website quality was adequate. Users can navigate the site to find most information.
Below Average	Layout and/or design makes it difficult to find information. Website does not have a user-friendly display.
Requirements Not Met	Website is busy and difficult to read; no guidance on maneuvering site.

2.3 Team Introduction Video

Teams are required to create a video introducing their team members and highlighting their team personality. This video is meant to be a creative showcase of what makes each team unique, such as the mission of the team or the team culture. Teams should consider this video as an “elevator pitch” or project proposal for an opportunity to earn additional funding or support.

2.3.1 Deliverable Requirements

- Video must be conducted in English or include subtitles in English.
- Video must be no more than three (3) minutes in length.
- Video may include graphics, vehicle performance, and/or simulation.
- Videos must be hosted by team. Teams have the choice of hosting on YouTube, Vimeo, or on their Team Website. The video must follow YouTube [Rules & Policies ↗](#), including appropriate music copyright management.

2.3.2 Scoring Metrics

The team video submission is worth a total of **120 points**. The scoring metrics include a scoring weight with guidance for scoring considerations that are provided to the judges during evaluations.

Formatting (10% of score)

Strong	All formatting guidelines are followed. Video is conducted in English or includes English subtitles, video is no more than 3 minutes in length, and video is hosted on the YouTube, Vimeo, or on their Team Website.
Requirements Not Met	Video does not follow formatting requirements.

Video Quality (20% of score)

Outstanding	Visuals immediately draws attention. Overall, the video is solid in frame (not shaky), correctly lighted, in precision focus, appropriately segmented, and visually clear in all respects. Transitions between segments are clear and smooth. The video is less than 3 minutes total runtime.
Strong	Good visual impression. Majority of video is clear, adequately lit, and places people and objects in recognizable scale and perspective. Video segments are generally of the appropriate length, transition well, and are related to each other. Use of video effects is good. Runtime is less than 3 minutes.
Average	Video quality is satisfactory.
Below Average	Frames and segments are shaky, distracting or poorly lit. Some segments are out of focus. Some heavy shadows are obscuring viewpoint. Visual effects are distracting rather than informative. Video exceeds 3 minutes in length.
Requirements Not Met	No focus on visual quality. Video exceeds 3 minutes in length.

Information Organization (25% of score)

Outstanding	Video is a complete introduction of the team makeup including team members, sub-teams, activities, mentors, and major sponsors. Organization of video information is logical and compelling.
Strong	The viewer is left with good understanding of the information shared in video.
Average	Video information is somewhat scattered throughout video, leaving the viewer lacking complete understanding of project.
Below Average	Video provides incomplete information regarding the team members, activities, or progress. The information presented is extraneous, confusing, or low quality.
Requirements Not Met	No organizational strategy is apparent.

Clear and Effective Communication (25% of score)

Outstanding	Effective and compelling use of video medium to communicate the introduction of the team. Easy for non-technical viewer to understand and support. [You're left wanting to learn more.]
Strong	Exhibits moderately compelling use of video medium to communicate the introduction of the team. Strong potential, moderately compelling, mostly understandable to non-technical viewer. [You're left strongly considering to learn more.]
Average	Adequately uses the video medium to introduce the team. Not difficult to understand, but not compelling either.
Below Average	Exhibits some ability to use video to attempt to introduce team and project overview. Difficult for viewer to understand and/or was not compelling. [You're left unenthused.]
Requirements Not Met	Poorly used video medium to convey team introduction. Information was as not clearly understood and was not compelling. [You're left with little information.]

Creativity (20% of score)

Outstanding	Team creativity and enthusiasm is clearly evident in the video. Appropriate use of humor is understated and well done. Video captures user's attention without diminishing or obscuring the information delivered. Effects of careful post-production editing are clear.
Strong	Some creativity has been used throughout video. The visual style and tone are consistent throughout video.
Average	Exhibits a moderate attempt at creativity.
Below Average	Little attempt made to include creative or imaginative ideas in video. Poor visual effects and enthusiasm for the project.
Requirements Not Met	Little imagination or creativity is evident in production. Information is presented lacking enthusiasm.

2.4 Design Strategy Presentation

Teams are required to give a design strategy presentation to a panel of subject matter expert judges. The goal of the presentation is to share the team's system design approach to the challenges presented in the Autonomy Challenge, specifically the capabilities required for each task. The presentation should include:

- a concise description of the team's strategic vision, and
- how the vehicle design compliments the team's goals.

2.4.1 Deliverable Requirements

This presentation must be conducted in English and may include visual aids (i.e. digital slides, poster board). If digital slides are used, teams must provide their own computer and adapters for an HDMI connector to use the presentation display monitor. Teams receive an assigned 15-minute presentation time. The presentation schedule can be found on the RoboBoat webpage: roboboat.org/2026 ↗. This presentation includes:

- Team presentation – 10 minutes
- Judges' question and answer – 5 minutes



Reduced Presentation Time Block: With the reduced time for presentations, the team video will not be played prior to the presentation as it was in past years.

2.4.2 Scoring Metrics

The design strategy presentation is worth a total of 180 points. The scoring metrics include a scoring weight with guidance for scoring considerations that are provided to the judges during evaluations.

Competition Strategy (30% of score)

Outstanding	Presentation includes a concise description of the team's strategic vision and how the vehicle design compliments their goals. The team clearly explains how they developed their competition strategy.
Strong	Presentation describes their competition strategy and how their vehicle design aligns with meeting their competition goals.
Average	Presentation includes a brief overview of how the vehicle design aligns with the team's competition strategy and goals.
Below Average	Team mentions a competition strategy but no additional details on how it was developed or how it led to their strategic vision.
Requirements Not Met	Team does not mention their competition strategy, vision or how their vehicle design is aligned with vision.

Design Rationale (30% of score)

Outstanding	Team presents their design process and how their decisions relate to their overall competition strategy. Lessons learned from testing or previous competition experience are described, including application throughout the design process.
Strong	Presentation includes a description of the team's design process and includes narrative on how testing or previous experience influenced vehicle design.
Average	Team describes the rationale behind the vehicle design process.
Below Average	Presentation includes mention of the design process, lacking a clear rationale of design choices.
Requirements Not Met	No mention of the team's design process or the rationale behind the design process.

Effective Communication & Professionalism (20% of score)

Outstanding	Presentation materials and team members' knowledge are effective and support the team's message. Team members are engaging, respectful, and professional, while interacting positively with the judges and each other.
Strong	Presentation materials are presented in a professional manner and support the team's message. Presentation is well prepared and appears to be rehearsed in advance.
Average	Presentation materials are presented in a mostly professional manner and support the team's message.
Below Average	Presentation materials and styles are adequate but less than engaging.
Requirements Not Met	The message was not effective, and the presentation was not organized.

Judge Questions & Dialogue (20% of score)

Outstanding	The team effectively uses evidence, experience, and research from their project to inform responses to all questions and discussion posed by the judges.
Strong	The team responded professionally and knowledgeably to judges' questions.
Average	The team responded adequately to most or all of the judges' questions, mostly interacting with courtesy and professionalism.
Below Average	The team did not provide sufficient answers to the judges' questions and interacted with minimal courtesy and professionalism.
Requirements Not Met	Team members were not able to respond to many or all questions and did not take the initiative to engage in dialogue with the judges.

2.5 System Assessment

Judges inspect the team's vehicle and assess technical design, technical innovation, and craftsmanship of the design. Team members should be present to answer technical questions posed by the judges during this inspection and be prepared to explain their design strategy and how decisions made impacts on the technical design, functionality, and craftsmanship.

Teams receive an assigned 15-minute slot. The assessment schedule can be found on the RoboBoat webpage: roboboat.org/2026.

 **Reduced Assessment Time Block:** Assessments have been reduced to 15 minutes.

2.5.1 Deliverable Requirements

Team members should be present to answer technical questions posed by the judges during this inspection and be prepared to explain their design strategy and how decisions made impacts on the technical design, functionality, and craftsmanship.

2.5.2 Scoring Metrics

The system assessment is worth a total of **180 points**. The scoring metrics include a scoring weight with guidance for scoring considerations that are provided to the judges during evaluations.

Technical Design (45% of score)

Outstanding	Design and implementation of systems and subsystems are well aligned with team's strategy, design decisions, and engineering principles. Clear and thoughtful design choices are evident in the technical functions, key decisions, and testing regimen.
Strong	Good and knowledgeable rationale and execution of design selections made, aligning with team's strategy, design decisions, and engineering principles.
Average	Adequate explanation of technical design decisions, equipment selections, and testing regimen, mostly evident in the vehicle and subsystems.
Below Average	Rationale of technical design is briefly covered with minimal alignment with team's strategy, design decisions, and engineering principles.
Requirements Not Met	Design and implementation of systems and subsystems are not aligned with team's strategy, design decisions, and engineering principles.

Innovation (30% of score)

Outstanding	Full system demonstrates creative and innovative solutions by applying existing technology in novel ways within the system, using existing technology in a previously unintended way, or creating new technology or products incorporated into the system.
Strong	Clear evidence of innovative approaches across multiple sub-systems. Research and testing were conducted throughout the development process.
Average	There is moderate evidence that creative and innovative solutions were incorporated into system to improve performance.
Below Average	Little evidence of creativity or innovation in design choices throughout the system.
Requirements Not Met	No technical innovation noted.

Craftsmanship (25% of score)

Outstanding	System is assembled with exquisite care and thoughtful attention to detail and aesthetics. Construction and improvisations are neatly executed to maintain high levels of functionality, durability, and adherence to the team's design philosophy. Any vehicle adornment demonstrates creativity, originality, etc.
Strong	System is assembled with care and attention to detail and aesthetics. Construction and improvisations maintain acceptable levels of functionality, durability, and adherence to the team's design philosophy.
Average	System is assembled to execute acceptable levels of functionality, durability and adherence to team's design philosophy.
Below Average	Minimal evidence that system is assembled with care and attention to detail and aesthetics. Adherence to team's design philosophy is vague and unclear.
Requirements Not Met	Evident hazards or potential hazards throughout the system. The system was assembled with minimal care and attention to detail. Little to no attention to aesthetics.

Section 3: Autonomy Challenge

This section includes detailed requirements and instructions for the autonomy challenge portion of the competition.

These challenges showcase ASV performance through autonomous behaviors designed to represent research and real-world applications.

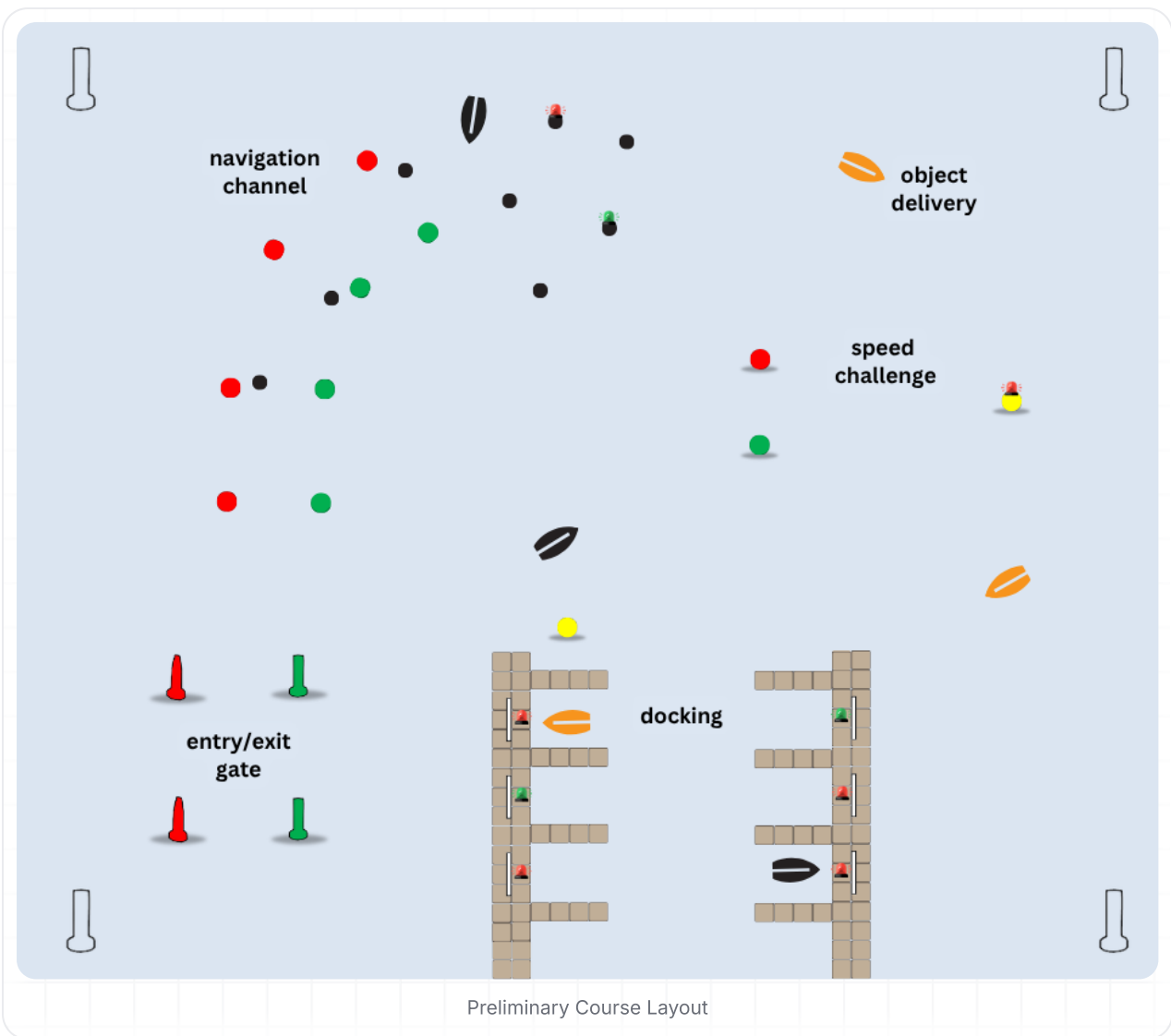
[3.1 Mandatory Activities](#)

[3.2 Task Descriptions](#)

3.3 Communications Protocol (will be released at a later date)

[3.4 Qualifying Round](#)

[3.5 Semi-Finals/Finals Round](#)



3.1 Mandatory Activities

3.1.1 Vehicle Transit

Teams must provide a cart to move the vehicle around the competition site and launch the vehicle into the water.

- Cart must be manually propelled on site, no motorized carts.
- Cart's handle must be solid, no rope or chain.
- Cart's width must be less than thirty-six (36) inches.
- Carts are recommended to have six (6) inch (or more) diameter rubberized wheels.
- Carts must be able to get wet with minimal impact to function.
- Carts must be negatively buoyant in the water.

Suggested carts: garden cart, available at [homedepot.com](https://www.homedepot.com); or dump cart, available at [homedepot.com](https://www.homedepot.com).



Example Vehicle Carts

3.1.2 Static Safety Inspection

Prior to deploying in the water, the ASV must meet all safety requirements. At a minimum, the following areas are checked:

- Emergency Stop System (location of switches, on-board and remote functionality)
- Demonstration of remote Emergency Stop failsafe functionality by removing the batteries or turning off the remote Emergency Stop transmitter.
- Safety issues related to a propeller or hazard
- All components are properly secured
- Towing points and tow harness is present and secure

More details on system requirements are available in [Section 5.3: Vehicle Requirements](#).

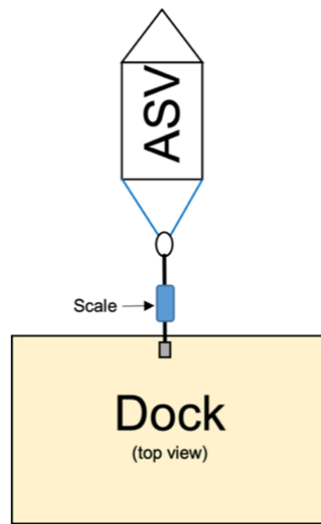
3.1.3 Weight and Thrust Measurements

Vehicles are weighed at the start of every day of the competition. Teams transport the vehicle on their cart to the scale (similar to a veterinary scale, available at scaleline.com) for weight measurement. The stable scale reading weight is recorded. Thrust is measured after the vehicle is deployed in the water either in manual or autonomous mode. The thrust value used is the highest scale reading that is stable for at least two seconds. Teams may opt to repeat their thrust measurement at each deployment.

During Finals runs, the vehicle must be re-weighed, and re-thrust tested every time it is launched into the water. If the vehicle stays in the water between finals runs, teams may forgo the weight and thrust test a second time. However, if a team is observed to be switching significant components or making modifications on their boat, the judges or TD staff may ask for a new measurement.

Weight and Thrust Scoresheet

Parameters	Points
ASV weight > 140 lbs.	Disqualified!!!
140 lbs > ASV weight > 110	$-250 - 5*(w - 110)$
110 lbs > ASV weight > 70	$2*(110 - w)$
ASV weight $\leq$ 70 lbs	$80 + (70 - w)$
Dimensions greater than: - three feet of width or - three feet of height - six feet of length	Disqualified!!!
Thrust (t) vs weight (w)	$100*(t / w)$



Thrust Measurement

Vehicle Weight Example Calculations

- ✓ Vehicle Weight: 60.5 kg

$$80 + (70 - 60.5) = \mathbf{89.5 \text{ points}}$$

- ✓ Vehicle Weight: 113 kg

$$-250 - 5 \cdot (113 - 110) = \mathbf{-265 \text{ points}}$$

- ✓ Two Vehicles: #1) 87 kg, #2) 50 kg

$$\text{\#1) } 2 \cdot (110 - 87) = \mathbf{46 \text{ points}}$$

$$\text{\#2) } 80 + (70 - 50) = \mathbf{100 \text{ points}}$$

$$\mathbf{\text{Total Score: } 46 + 100 = 146 \text{ points}}$$

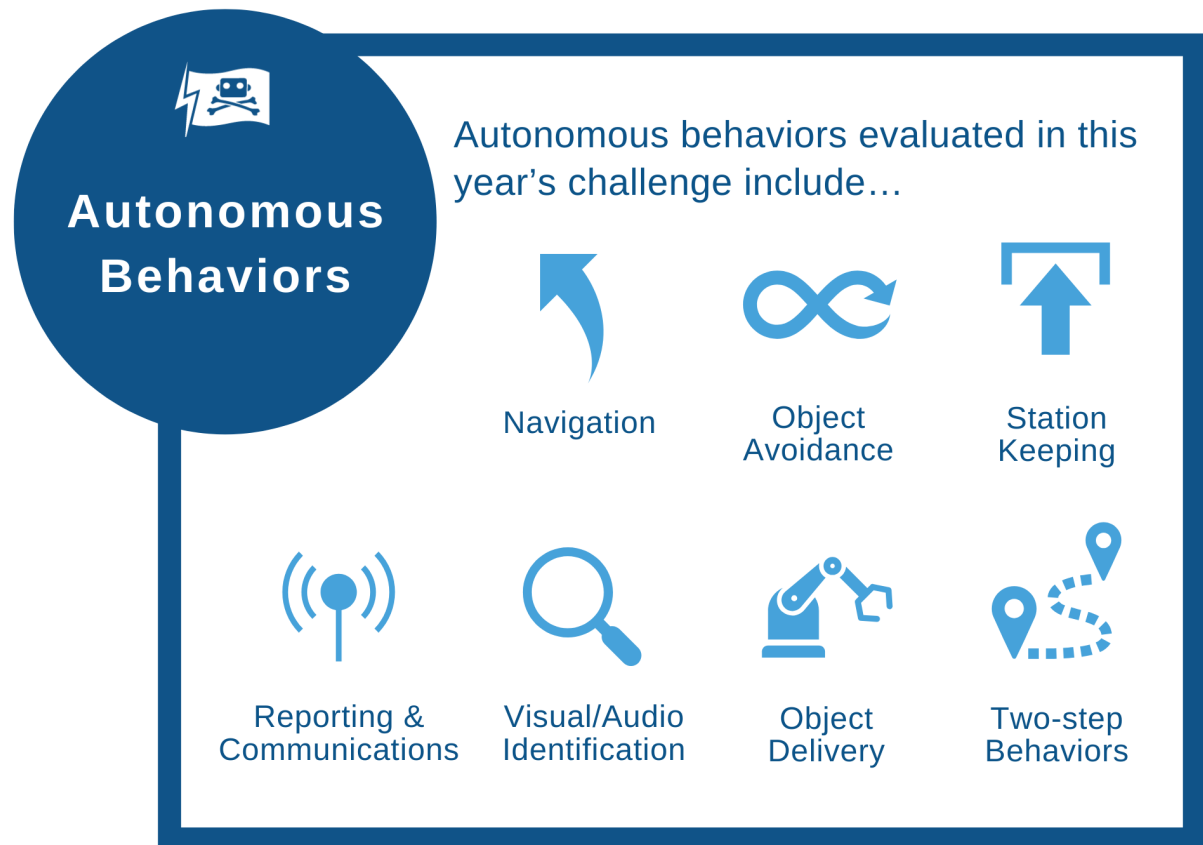
3.2 Task Descriptions

This section provides details of the tasks in the Autonomy Challenge. Teams are encouraged to develop a strategy approaching these tasks that best suits the capabilities of their ASV.

Storm Response: Technology in Action for Recovery and Relief

The 2026 Mission is based on the following scenario: operations in a harbor environment recovering from a major storm. ASVs are used to demonstrate surface navigation, debris avoidance, target identification, and collaborative behaviors as they contribute to restoring marine operations and responding to critical zones.

- **Assessment & Discovery:** Tasks involving obstacle navigation, pylon inspection, and wreckage/debris identification simulate the urgent need for rapid assessment of damage following a storm. These missions reflect how autonomous vessels might support situational awareness in dangerous or hard-to-reach environments.
- **Recovery & Delivery:** Tasks like Emergency Response Sprint and Harbor Alert mimic real-world missions where rapid action is necessary to prevent further harm and begin rebuilding efforts. These simulate coordination with relief teams and accurate, repeatable delivery of materials.
- **Environmental & Public Safety:** Debris Clearance and Navigate the Marina tasks simulate crucial post-disaster actions—like identifying water contamination and clearing navigation hazards—that help restore safe conditions for both rescue teams and the public.

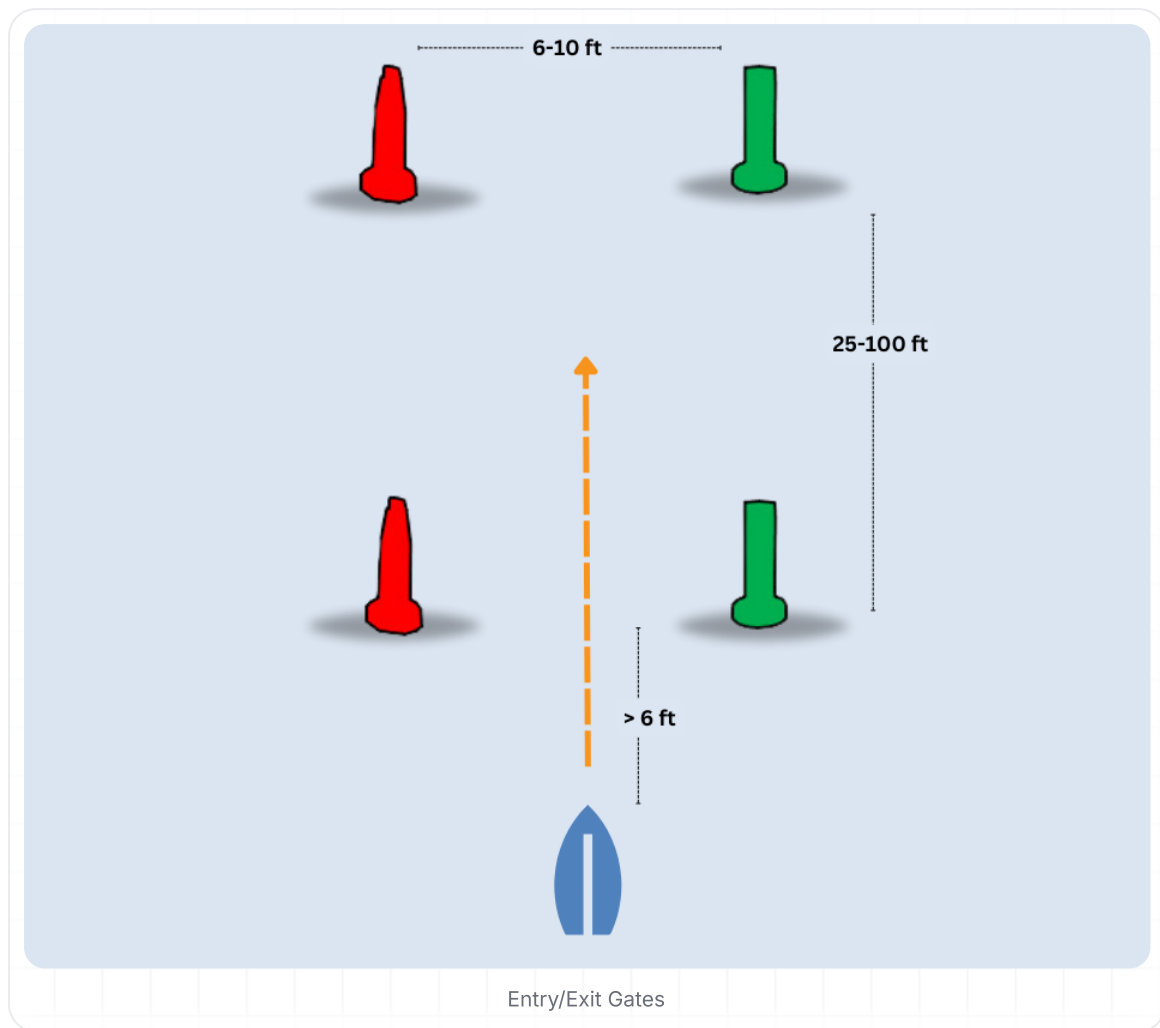


3.2.1 Task 1 - Evacuation Route & Return

Entry & Exit Gates

The Evacuation Route and Return task is a navigation demonstration showcasing the basic autonomous control and sensing capabilities. The ASV must autonomously navigate through two pairs of red and green buoys. The entire ASV must pass through both sets of the gates, without touching the buoys. The ASV must start its autonomous navigation a minimum of 6 ft. before the first set of gates.

During the [Semi-Finals/Finals Round](#): This task is mandatory for all teams to qualify for semi-finals and is required to be completed first during each scored run. Additional points may be earned for exiting through gates at the end of the run.



Capability Matrix

- **Core:** Navigate through two pairs of gates

No Advanced or Disruptive levels for this task.

Communications & Reporting

The ASV reports on the following for this task:

- Time and position of completion of entry gates (start of run)
- Time and position of completion of exit gates (end of run)

Defined reporting guidelines will be available in Section 3.3: Communications Protocol at a later date.

Task Elements

Buoys are supplied from Taylor Made, www.taylormadeproducts.com.

Task Element	Description	Model No.	Color	Height	Diameter
Port Marker Buoy	Taylor Made Sur-Mark Buoy	950410	Red	39in (above waterline)	18in
Starboard Marker Buoy	Taylor Made Sur-Mark Buoy	950400	Green	39in (above waterline)	18in

3.2.2 Task 2 - Debris Clearance

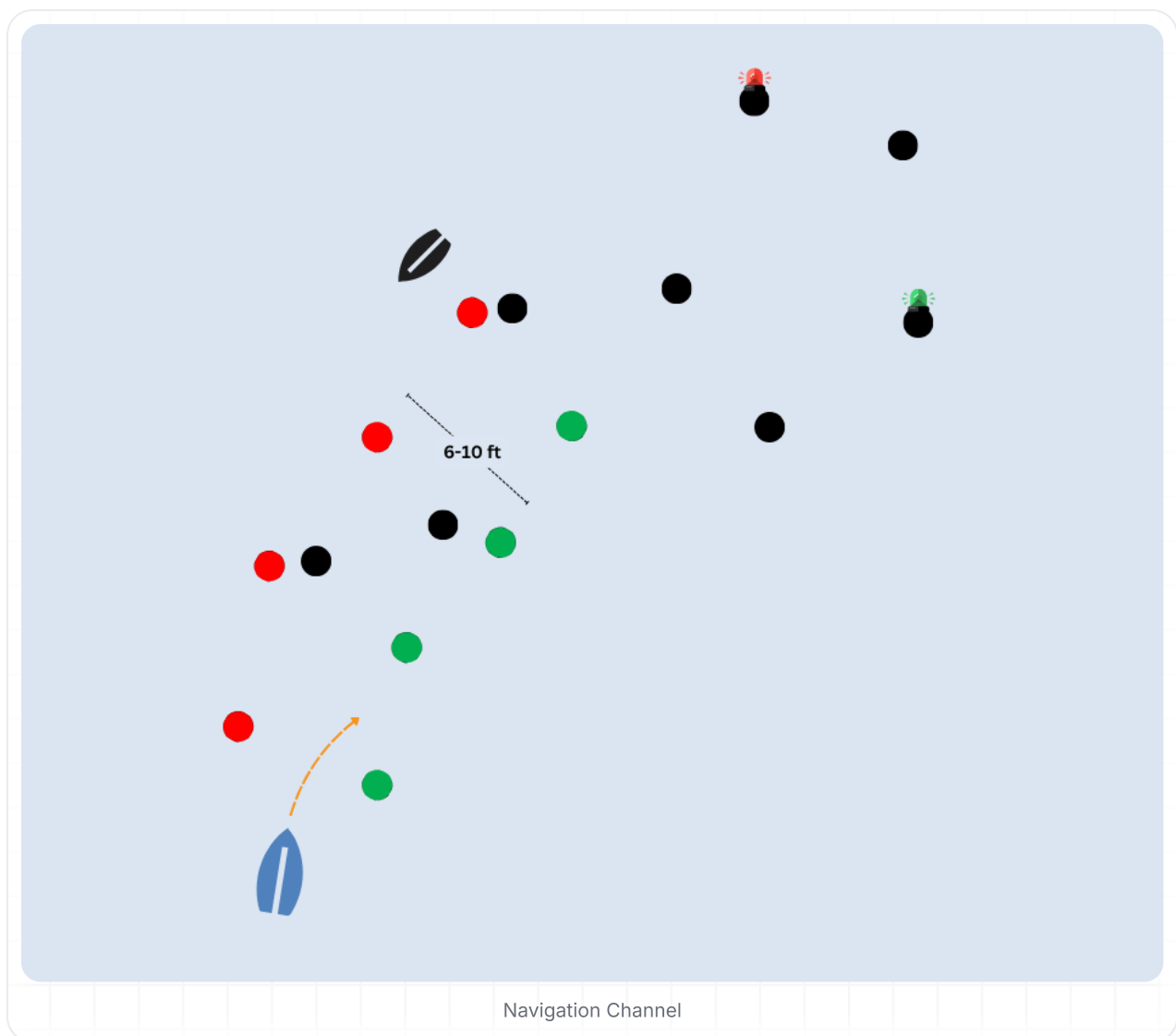
Navigation Channel

The Debris Clearance task simulates designated emergency boat lanes cleared after a storm, to enter a debris field. The ASV must sense and maneuver through the channel, staying within the defined pathway, and avoiding contact with obstacles along the way. The ASV enters the debris field and scans for floating debris hazards (black buoy represents debris; dynamic scattered light buoys):

- **Red** light beacon = hazard to avoid and report location
- **Green** light beacon = survivor to rescue, circle, and report

After scanning and reporting hazards in debris field, the ASV returns through the channel.

The task consists of multiple sets of gates designated by pairs of red and green buoys. The debris field is made up of black obstacle buoys and [light beacons](#).



Capability Matrix

- **Core:** Transit channel, enter debris field, avoid debris, and return through channel.
- **Advanced:** Detect and interact correctly with red or green debris.
- **Disruptive:** Reports location (lat/long) of all debris (lighted and non-lighted buoys).

Communications & Reporting

The ASV reports on the following for this task:

- Color and location of light beacons
- Location of all buoys in the debris field

Defined reporting guidelines will be available in Section 3.3: Communications Protocol at a later date.

Task Elements

Buoys are supplied from Polyform US, shop.polyform.com ↗.

Task Element	Description	Model No.	Color	Height	Diameter.
Gate Buoy	Polyform A-0	A-0	Classic Red	0.5 ft (above waterline)	20.3 cm
Gate Buoy	Polyform A-0	A-0	Green	0.5 ft (above waterline)	20.3 cm
Obstacle Buoy	Polyform A-0	A-0	Black	0.5 ft (above waterline)	20.3 cm
Light Beacon	Bright LED lights	Custom built	Red / Green		
Stationary Vessels	Coroplast floating vessels	Custom built	Yellow / Black	Full dimensions and plans can be found in Data Sharing ↗	

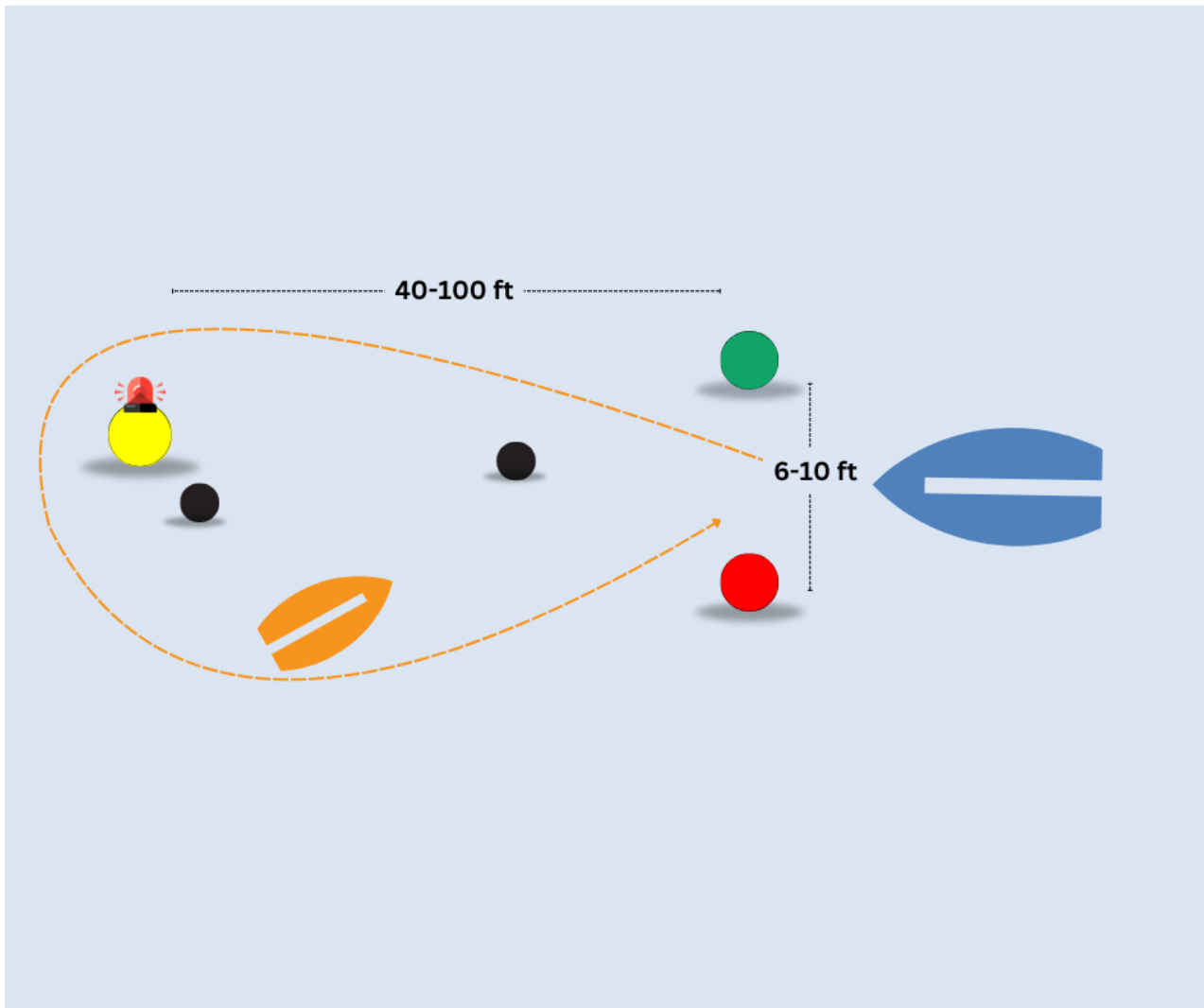
3.2.3 Task 3 - Emergency Response Sprint

Speed Challenge

The ASV must locate the entrance/exit gate marked by green and red buoys. ASV passes through the gate buoys, maneuvers around the red or green light beacon, and exits through the gate buoys, as quickly as possible.

- **Red** light beacon = circle the buoy from the right (counter-clockwise)
- **Green** light beacon = circle the buoy from the left (clockwise)

The ASV demonstrates the ability to rapidly sense the task elements with visual recognition and decision making. This task demonstrates hull form efficiency coupled with its propulsion system, and the resulting maneuverability.



Speed Challenge

Capability Matrix:

- **Core:** Pass through gate, circle light buoy, and exit through gate.
- **Advanced:** Circle light beacon in correct direction indicated by color.
- **Disruptive:** Report color of light beacon and time of response.

Communications

The ASV reports on the following for this task:

- Color of light beacon
- Time to complete task

Defined reporting guidelines will be available in Section 3.3: Communications Protocol at a later date.

Task Elements

Buoys are supplied from Polyform US, shop.polyform.com ↗.

Task Element	Description	Model No.	Color	Height	Diameter.
Gate Buoy	Polyform A-2	A-2	Classic Red	1 ft (above waterline)	36.8 cm
Gate Buoy	Polyform A-2	A-2	Green	1 ft (above waterline)	36.8 cm
Mark Buoy (light beacon mounted atop this buoy)	Polyform A-2	A-2	Yellow	1 ft (above waterline)	36.8 cm
Light Beacons	Bright LED lights	Custom built	Red / Green		
Obstacle Buoy	Polyform A-2	A-2	Black	1 ft (above waterline)	36.8 cm
Stationary Vessels	Coroplast floating vessels	Custom built	Yellow / Black	Full dimensions and plans can be found in Data Sharing ↗	

3.2.4 Task 4 - Supply Drop

Object Delivery

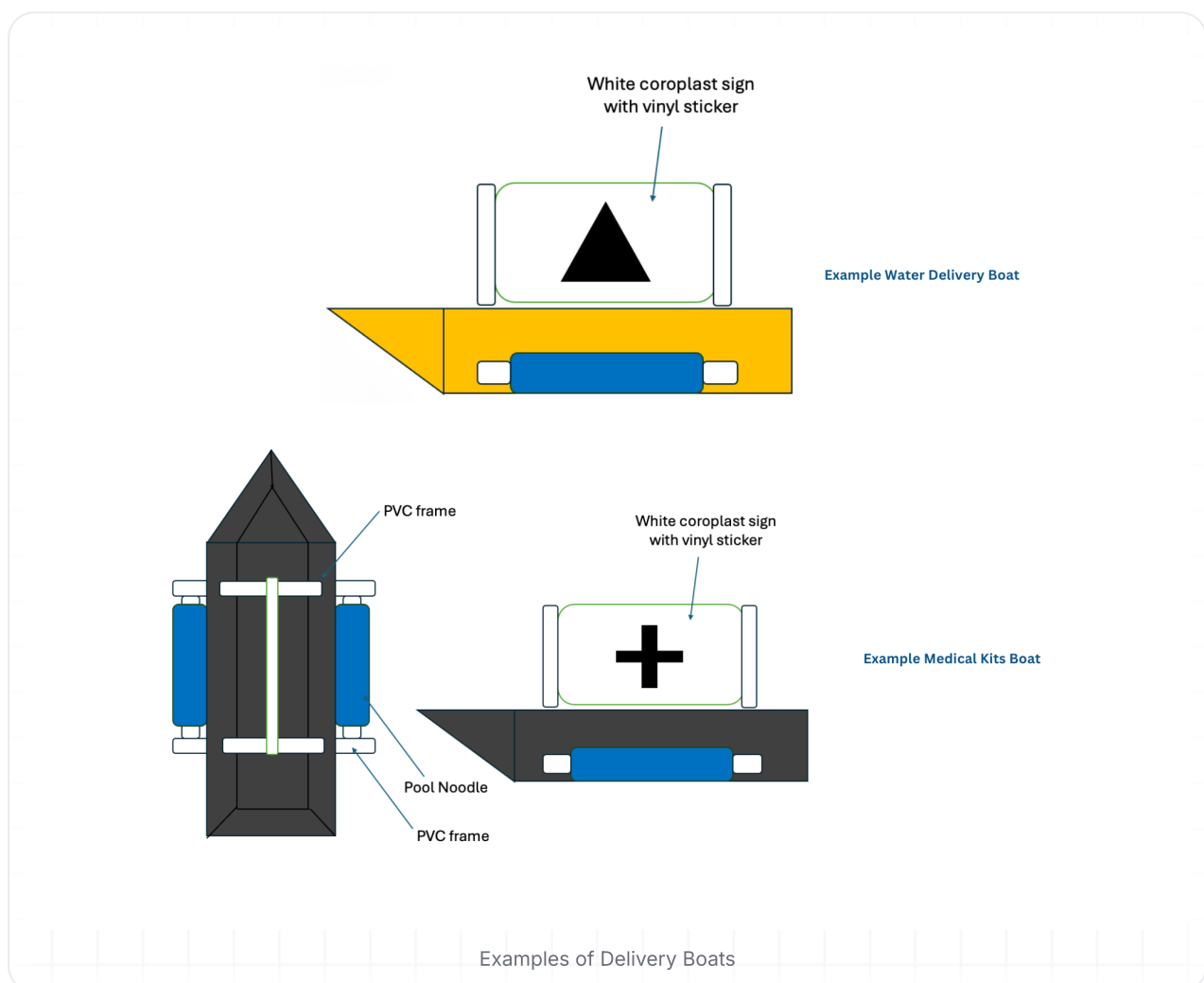
The ASV delivers supplies to other rescue vessels. The yellow vessel indicates clean water delivery. The black vessel indicates urgent medical kits (ball delivery).

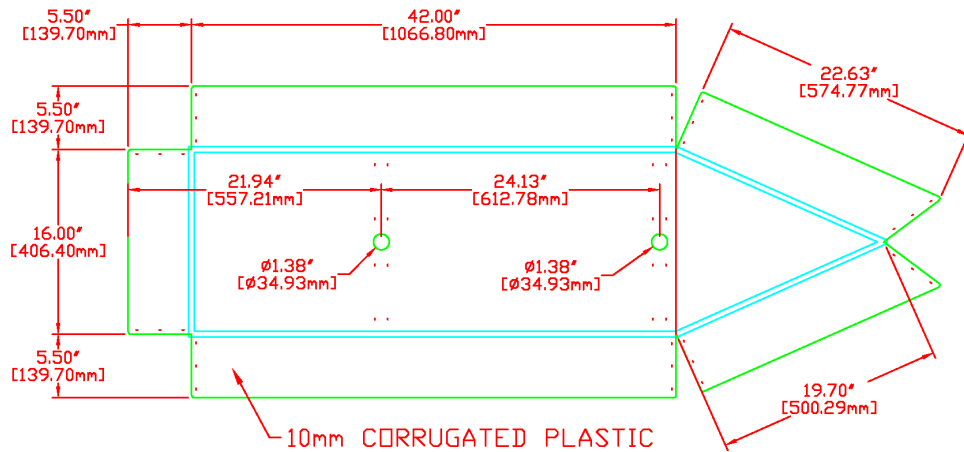
Yellow Vessels - Water Delivery

The ASV detects up to three (3) yellow boats that are anchored throughout the course with a black triangle shape fixed to both sides of the boat. The ASV locates the boats and delivers/shoots water at the black triangle shape. The ASV should strike (with a steady and visible stream of water) the black triangle shape for at least 3 seconds. Performance of the ASV's ability to correctly and intentionally aim water at the target will be evaluated and scored by the judges observing the scoring run.

Black Vessels - Object Delivery

The ASV detects up to three (3) black boats that are anchored throughout the course, with a black plus-shape fixed to both sides of the boat. The ASV locates the black vessels and delivers a racquetball to the vessel, either striking the plus sign or inside of the vessel hull; or simply dropping the ball into the hull of the vessel is acceptable. Teams will not be penalized if the ball does not stay in the stationary vessel after successfully hitting the plus sign or inside of the hull. The ASV can be pre-loaded with up to three racquetballs before each scored run.





Dimensions for Delivery Boats

Capability Matrix

- **Core:** Deliver water to orange vessel or ball to black vessel.
- **Advanced:** Deliver water to orange vessel and ball to black vessel.

Communications

The ASV reports on the following for this task:

- Location and color of yellow / black stationary vessel
- Type of delivery (water or ball)

Defined reporting guidelines will be available in Section 3.3: Communications Protocol at a later date.

Task Elements

Racquetballs are supplied from Amazon, www.amazon.com ↗.

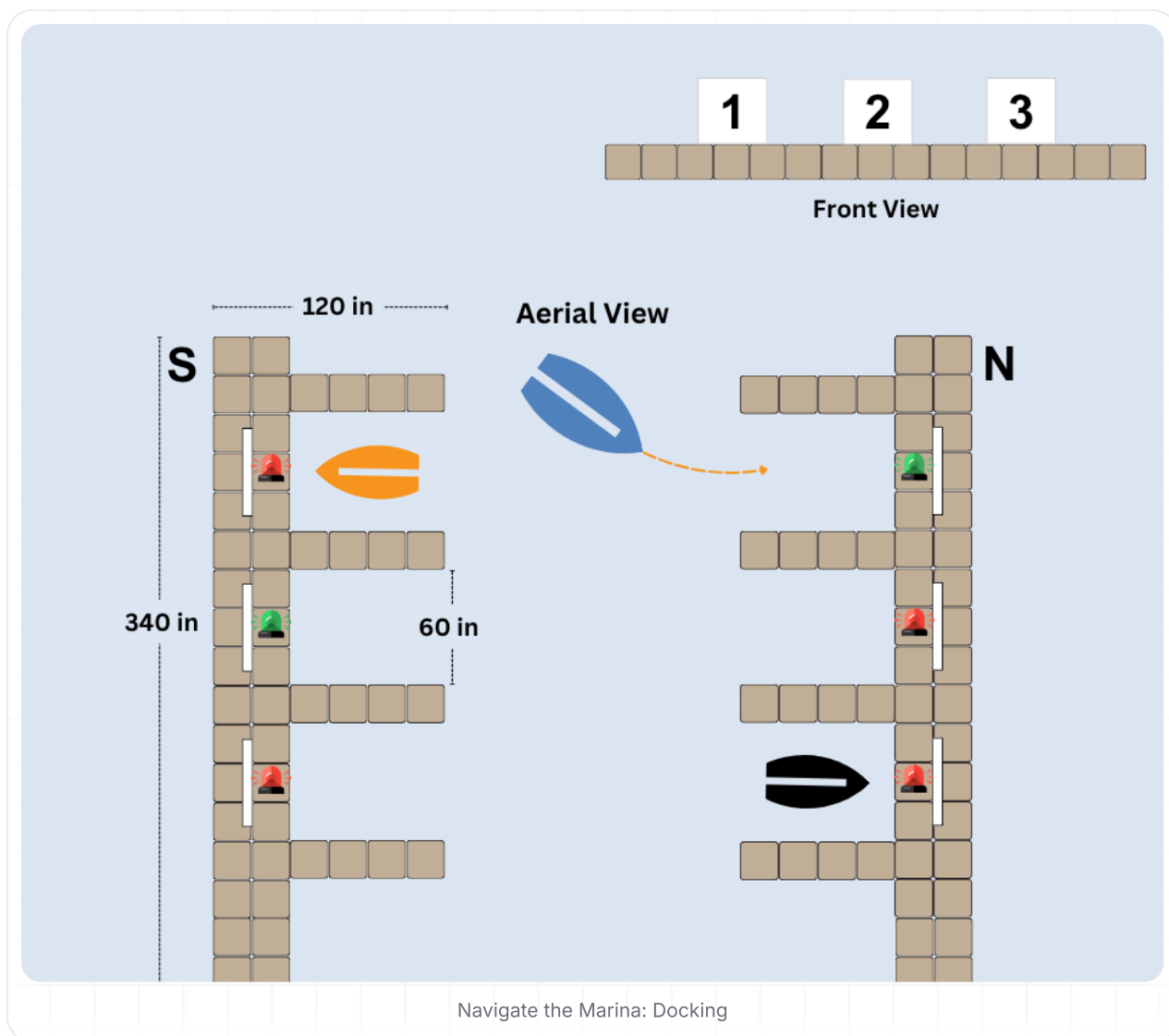
Task Element	Description	Dimensions	Color
Stationary Vessels	Coroplast floating vessels	Full dimensions and plans can be found in Data Sharing ↗	Yellow / Black
Racquetballs	FJBM Squash Ball	5.5 cm diameter	Red Blue Orange

3.2.5 Task 5 - Navigate the Marina

Docking

The ASV must enter the marina and dock in an available slip (indicated by green light beacon). Each dock slip has a number sign: 1-3. The ASV must dock in the most desirable open dock, indicated by the lowest number available. For example, if dock #2 and #3 are available, the ASV should dock in #2 as the lowest number available.

 **Note:** there will not be a situation where a slip has a stationary vessel and a green light. However, there will be situations where a slip has a red light but does not have a stationary vessel.



Navigate the Marina: Docking

Capability Matrix

- **Core:** Dock in any unoccupied bay.
- **Advanced:** Dock in slip with green light beacon, signaling an available bay.
- **Disruptive:** Dock in slip with green light beacon and the lowest number sign available.

Communications

The ASV reports on the following for this task:

- Dock identification (Dock N or S)
- Slip number (Slip 1, 2, or 3)

Defined reporting guidelines will be available in Section 3.3: Communications Protocol at a later date.

Task Elements

Task Element	Description	Color	Dimensions
Floating Dock	Large dock cube Item Code: C000000008	Beige	Dock: 40 in. W x 10 ft. L x 16 in. H Tines: 4-7 ft. L Individual Cube: 20 in. x 20 in. x 16 in. H Two dock piers with three (3) docking slips
Number Banners	Vinyl Banner	Black	24 inches x 24 inches
Light Beacons	Bright LED lights	Red / Green	
Stationary Vessels	Coroplast floating vessels	Yellow / Black	Full dimensions and plans can be found in Data Sharing ↗

3.2.6 Task 6 - Harbor Alert

Sound Signal

The Harbor Alert task simulates an emergency maritime command-and-control, testing the ability of autonomous systems to detect, interpret and act on real-time dynamic cues that override other mission objectives, mirroring emergency maritime operations.

The ASV detects an audible signal and immediately abandons current task and:

- **One-Blast Signal** = Navigate to emergency response zone (yellow buoy positioned at Task 3)
- **Two-Blast Signal** = Return to marina (yellow buoy positioned at Task 5)

The sound signal can alert at any point during the mission. Each course will have a signal with a different frequency designated and published at the beginning of the day, the possible frequencies include: 600Hz, 800Hz, 1000Hz (+ 5%). The signal volume at distance:

- 1m: 85-100 dB SPL
- 60m: ~60 dB SPL



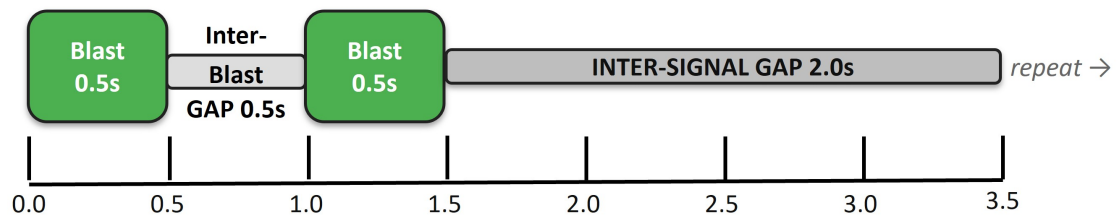
Available for Download: The .wav files are available in the [RoboBoat Data Sharing folder ↗](#).

Audible Alert System - Horn Timing

Pattern A (One blast)



Pattern B (Two blasts)



The full signal is a single course unique frequency.

Course frequencies example:

Course A: 600Hz

Course B: 800Hz

Course C: 1000Hz

Add 1200Hz if needed

Alert meaning:

One blast = navigate to emergency response zone

Two blasts = return to dock

Capability Matrix

- **Core:** Detect and classify audible signal (1 vs 2 blasts) and immediately abandon task, override behavior, and navigate safely to assigned zone/task.
- **Advanced:** Report confirmation of signal and execute optimized routing and collision avoidance to assigned zone/task.
- **Disruptive:** Coordinate response with another boat, report real-time status confirmation.

Communications

The ASV reports on the following for this task:

- Audible Alert Tone (1 or 2 blasts)
- Frequency
- Real-time status of response time

- Assigned zone

Defined reporting guidelines will be available in Section 3.3: Communications Protocol at a later date.

3.2.7 Light Beacon

Custom light beacons will be used across the course. These light beacons are bright LED lights inside clear or translucent tubes. This single colored light is visible 360° radially on a horizontal plane only. The light beacon will be mounted on a custom float, with roughly 12-16 in diameter. More information will be released as this is prototyped and tested.



Light Beacon Prototype

Light Beacon Elements

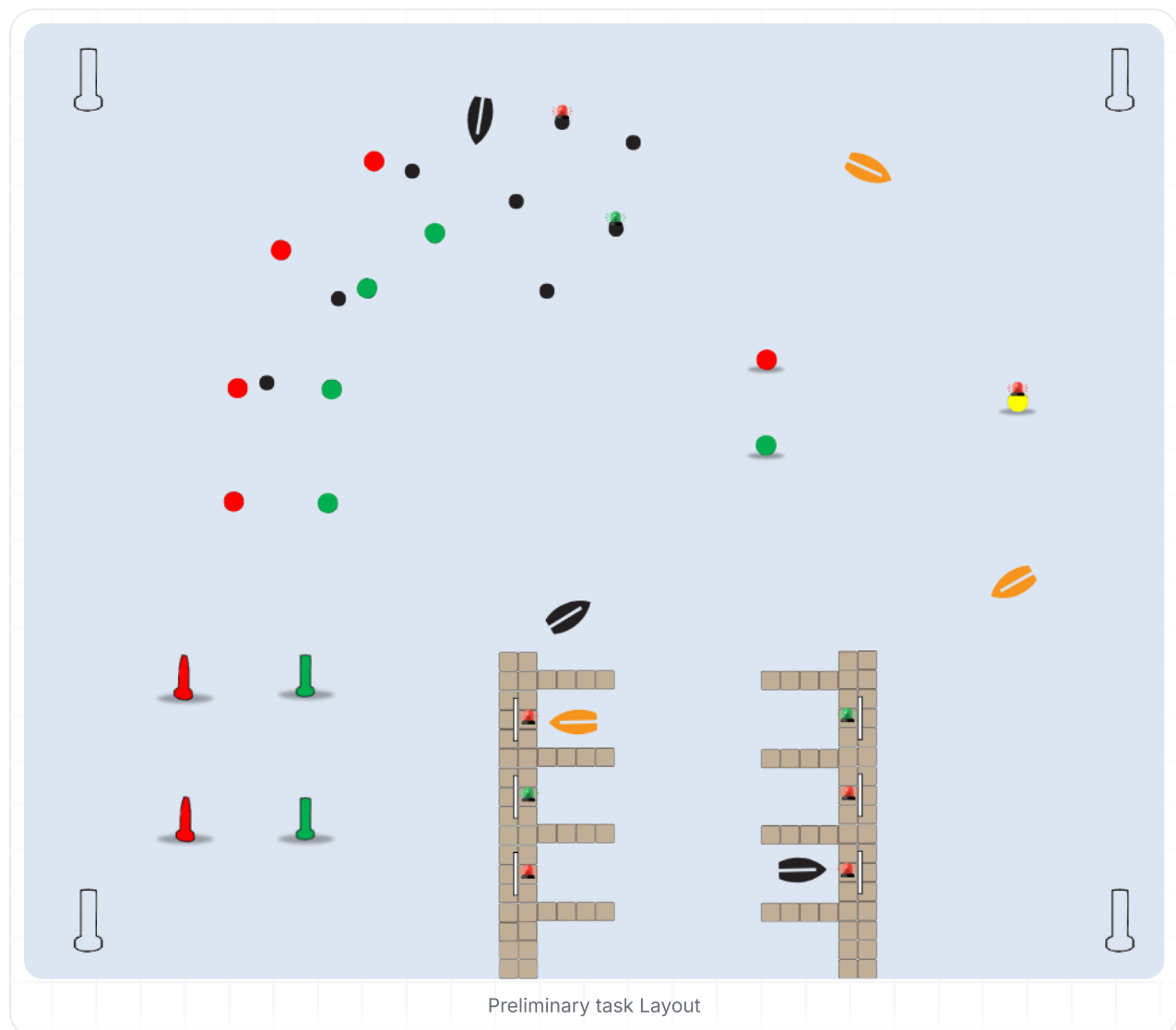
More details on the components in the light beacons will be released at a later date.

3.4 Qualifying Round

Three Qualifying and Practice Courses are available for teams to practice, demonstrate proficiency, and qualify for the Semi-Finals Round. These courses consist of all six (6) tasks. Multiple teams may be on a Qualifying and Practice Course at the same time. Teams may schedule times to practice or complete individual tasks on these courses with the Technical Director. Teams may attempt completion on individual tasks in any order.

Qualification Criteria | To qualify for Semi-Finals, the ASV must complete:

- core capabilities of two (2) individual tasks
- advanced capabilities of two (2) individual tasks
- two (2) tasks in sequence autonomously
- send heartbeat message



3.5 Semi-Finals/Finals Round

Teams that qualify will have access to a full Semi-Finals Course once one becomes available. These courses consist of six (6) tasks: the mandatory navigation channel and tasks 2-6. Only one team may be on a Semi-Finals/Finals Course at a time. Note that teams may not know what course they are assigned until right before the start of their time slot.

During a Semi-Finals/Finals run the ASV must:

- operate autonomously throughout the entire run; no remote-controlled survey runs allowed and teams must navigate directly back to the starting position with no deviations when resetting for another run.
- enter the course through the gates in Task 1: Evacuation Route (Entry and Exit Gates).
- transmit a heartbeat message to begin the run (as described in Section 3.3).
- attempt the remaining Tasks 2-6 of their choice, in any order.
- exit the course through the gates in Task 1: Evacuation Route (Entry and Exit Gates), at the end of the run.

The scoring criteria for Semi-Finals and Finals is detailed in [Section 4: Scoring](#).

Section 4: Scoring & Awards

This section includes a detailed overview of the competition scoring.

Scores are calculated by the judges' evaluation and observation. All decisions of the judges are final.

4.1 Design Documentation Scoring

Design documentation must be submitted in accordance with the requirements outlined in [Section 2: Design Documentation](#) and the deadlines listed in [Section 1.4: Competition Schedule and Timeline](#), to be eligible for full points. After the competition, the judges will issue overall standings in the design documentation portion of the competition.

Design Documentation	Potential Points
Technical Design Report	200
Website	180
Team Introduction Video	120
Design Presentation	180
System Assessment	180
Total Potential Points	860

4.2 Autonomy Challenge Scoring

The Autonomy Challenge occurs in three rounds: Qualifying Round, Semi-Finals, and Finals. For the Qualifying Round minimum performance criteria is specified and no points are awarded. Qualifying Round and task completion criteria will be shared in the next version of the Team Handbook.

For the Semi-Final and Final Rounds points are awarded, as outlined in this section. Upon completion of the Semi-Finals Round, the judges will announce the top-scoring teams who will progress to the Finals Round. The judges have the discretion to select the number of teams advancing to the Finals Round.

After the competition, RoboNation will issue Autonomy Challenge overall standings. Any team accepted into the Finals Round will be ranked ahead of all teams that did not participate in the Finals Round.



The scoring breakdown will be released in the next version of the Team Handbook.

4.2.1 Inter-Vehicle Communication (IVC)

When entering multiple vehicles into the competition, teams may earn points for inter-vehicle communication (IVC). Proof of the IVC is required for judges to evaluate accordingly. The level of the communication and the complexity of the behaviors derived by the communication are what determine the level of points awarded. Teams may earn additional points if indicator lights are used when vehicles are transmitting and receiving IVC messages.

There are three tiers to consider for these points: Core, Advanced, and Disruptive

Core (1-33% of points): One-way communication attempted by a single boat without acknowledgment or action from another boat.

- Example Scenario: The boat blinks green after the end of every task to alert any other boats on the course of the intent to switch tasks.

Advanced (34-66% of points): One way communication that results in acknowledgment or action observed on a second boat.

- Example Scenario: The boat blinks green after the end of every task to alert any other boats on the course of the intent to switch tasks. Another boat on the course acknowledges receipt of message by flashing green twice.

Disruptive (67-100% of points): Two way communication resulting in observed cooperative or coordinated fleet behavior.

- Example Scenario: Two boats coordinate the docking task so they each find one of the available open slots and station keep until the other boat has done the same, and then coordinate entering the dock slip at the same moment.

4.3 Awards

Awards are provided in three categories: Autonomy Challenge standings, Design Documentation standings, and Special Awards. Teams must be present to collect their awards, and award money will be issued within 4-6 weeks after the competition.

4.3.1 Autonomy Challenge Ranking

Teams are awarded prize money reflective of their autonomy challenge ranking after scores are calculated. The first-place teams receive a RoboNation champion banner.

4.3.2 Design Documentation Ranking

Teams are awarded prize money reflective of their design documentation ranking after scores are calculated.

4.3.3 Special Awards

Throughout the competition, teams, judges, and staff are asked to be on the lookout for exemplary behavior from teams to acknowledge with special awards. A digital nomination form is open during the event to nominate teams for special awards. During the event, nominations are collected at the following link, until the day before finals: roboboat.org/award-nomination ↗.

Section 5: Rules & Requirements

This section includes detailed rules and requirements for the system developed to enter into the competition.

[5.1 Rules](#)

[5.2 Safety](#)

[5.3 Vehicle Requirements](#)

[5.4 Obstacle Avoidance](#)

5.1 Rules

1. **Code of Conduct:** All team members must abide by the RoboNation Code of Conduct while participating in the Competition. Failure to abide by this Code of Conduct at any point during the competition season may result in the disqualification of the team and/or participants from the Competition, components of the competition, the full competition, and/or future competitions. ([Section 1.7: RoboNation Code of Conduct](#))
2. **Vehicle Entry:** Teams must build an ASV to compete and may enter up to two vehicles in the competition. ([Section 5.3: Vehicle Requirements](#))
 - a. **Rookie Teams:** First-year teams are eligible to participate in RoboBoat without an ASV. These teams are expected to participate in Design Documentation and send representation on-site at the event as a learning experience. First-year teams must indicate this option in their registration form.
3. **Vehicle Requirements:** Teams that arrive at the competition failing to meet the vehicle requirements will not be permitted on the course, until the vehicle is modified to meet all requirements. ([Section 5.3: Vehicle Requirements](#))
 - a. **OCU Connection:** During any Semi-Finals or Finals run the ASV and OCU computers must not connect or be open to connections from any source of communication from the internet or anywhere onsite other than equipment stationed in the course operating tents. This includes any LTE corrections used for communications or GPS corrections.
 - b. **No Combustion:** No combustion engines of any type may be used on the ASV.
4. **ASV Safety:** Prior to entering the Autonomy Challenge courses, teams must demonstrate the ability to operate their ASV safely. ([Section 5.2 Safety Requirements](#))
5. **Team Composition:** Teams must be comprised of 75% or more full-time students. ([Section 1.3: Eligibility](#))
 - a. **Team Lead:** One student member of the team must be designated as the "team lead". The team lead must be conversationally fluent in English. The team lead, and only the team lead, will speak for the team during competition runs.
6. **Attendance:** Teams must have at least one representative present onsite at the competition venue during the competition hours (8:00 am – 5:30 pm) to be eligible for prizes. If teams cannot be onsite, they must notify RoboNation staff in a timely manner.
 - a. **Orientation Attendance:** Teams must have at least one representative present for the team orientation. Teams who miss orientation will not be permitted to deploy their ASV.
 - b. **Daily Team Meetings:** Team leads are required to attend daily team meetings conducted by the Technical Director. ([Section 1.4.1: Daily Team Meeting](#))
7. **Potential Damage:** RoboNation is not responsible for any damage to a team's ASV as a consequence of participating in the competition.
8. **Competition Suspended:** The officials may suspend the competition at any time they deem that it is required (i.e. for safety or security reasons).
9. **Award Money:** Only the student component of each team is eligible for award money.

10. **Judge Decisions:** All decisions of the judges are final. ([Section 4: Scoring & Awards](#))
11. **Course Entry:** Unless otherwise specified, no team member is allowed to enter the course at any time (this includes wading, swimming and diving as well as floats, boats, etc.) Competition officials are responsible for recovering lost vehicles. Officials make all reasonable efforts to recover a lost vehicle but cannot guarantee that they will be able to do so. All teams recognize that by entering the competition, they risk damage to or the loss of their vehicle. The judges, officials, hosts, and sponsors can take no responsibility for such damage or loss.
12. **Course Boundaries:** An Autonomy Challenge run will be terminated if the ASV interferes with course elements or crosses a course boundary through to a different course. This includes entangling, dragging, pushing, or damaging course elements or landscape.

5.2 Safety Requirements

Safe operations are a priority for the RoboBoat staff. All considerations to maintain safety for operators and the surrounding environment must be made. These guidelines are the minimum requirements for all teams and their vehicles during the competition.

1. All Radio Frequency (RF) equipment must be operated within the rules and regulations of the host country. This includes, but is not limited to, frequency, transmitting power, antenna height, etc.
2. ASV power systems must follow the safety rules and regulations of the host country as well as the team's home country.
3. RoboBoat staff may suspend team operations at any time for safety considerations. The staff is not required to advise the team prior to the decision to terminate the run attempt. In all matters of safety, the decisions of the RoboBoat staff are final.

5.2.1 Safety Inspections

Before operating in the water, all systems **must pass a safety inspection**. This includes, but is not limited to:

1. A Safety Inspector completes a safety checklist, verifying successful operation of all safety features at each unmanned system launch.
2. Teams demonstrate compliance with all the requirements, to include identifying all actuators, and moving parts and their associated protection mechanisms (shrouds, etc.).
3. Verification of both kill switches' operation (remote and physical). This is repeated each time a team enters the water.

Safety Checklist

- Demonstrate On-board Kill Switch
- Demonstrate Remote Kill Switch
- Vehicle killed when transmitter loses link?
- Verify tele-operation link (remote control)
- Vehicle have forward and/or aft tow line?
- Any safety issues related to the propellers?
- Any potentially dangerous protrusions?
- Is everything properly secured to the system?
- Is system properly protected from rain? (recommended)

5.2.2 Battery Safety Requirements

Teams are required to understand and follow battery safety best practices on the battery chemistry selected by the team. Lithium-ion chemistry batteries may become damaged and create a hazard if misused/abused, representing the greatest risk to people, facilities, and the environment. The following safety rules and requirements must be followed:

1. Teams will be required to attend a mandatory battery safety briefing prior to the start of the competition.
2. Teams must submit battery specifications, Material Safety Data Sheets (MSDS), and proper disposal procedures, sourced from the battery manufacturer for all batteries.
3. Teams must keep a hard copy of the battery safety documentation for all batteries in Team Village (onsite) at all times, for reference.
4. Teams must bring a LiPo safe bag(s) adequate for the lithium batteries used. LiPo bag(s) must be available at the competition and the hotel.
5. Li-Po (Lithium Polymer) battery packs need cell level safety and balancing circuits.
6. Batteries must be shipped according to required shipping regulations based on battery weight/type. Note that most batteries are considered HAZMAT and must be shipped using HAZMAT regulations.
7. Each team must understand and follow their own country's regulations as well as those of the host nation.
8. All batteries must be stored, used, and maintained in accordance with manufacturer guidelines.
9. Teams are required to inspect their batteries daily for signs of swelling, heat, leaking, venting, burning or any other irregularities.
 - a. Lithium batteries that become too warm during use or have become swollen or malformed must be removed from use and reported to the Technical Director.
 - b. Lithium batteries that do not hold a charge must be removed from use and reported to the Technical Director.
10. A team member must be present at all times to monitor charging batteries.
11. At the competition site, if any of the above battery conditions are observed, students must immediately notify the Technical Director or RoboBoat staff and provide the battery specifications and safety information.
12. At the hotel, if a battery irregularity occurs at any time, students must notify RoboNation's Senior Events Manager, Cheri Koch immediately by phone at 850.642.0536 and provide the battery specifications and safety information.

13. Failed or failing Lithium-ion batteries must be handled in accordance with manufacturer's safety and disposal guidelines. In the absence of specific guidelines, batteries must be placed in a LiPo safe bag, which must then be placed in a bucket, covered with sand, and placed in a designated safety zone.
14. Teams cannot change or replace batteries when ASV is in the water or while standing on floating docks.

5.2.3 Kill Switch (Emergency Stop) Requirements

The ASV must comply with the kill switch requirements detailed below. The ASV must have two emergency stop systems, also known as 'kill switches' or 'E-Stops'.

- On-Board: A hard-wired, on-board, emergency stop system.
- Off-Board: A wireless remote emergency stop, located off-board and on its own frequency and link.

Both systems must operate in a failsafe fashion (if any part of the system fails, the battery dies or is removed, the system must enter emergency stop) and upon activation of either system (on-board or off-board), the switch must instantaneously disconnect power from the vehicle's thruster units. An example of how to implement this is shown in Figure 11. System should be designed such that power, to the thrusters, cannot be restored until the emergency switch is reset. Designs that do not remove power, but simply command the thrusters or thruster controllers to a stop state will not be approved.

The Technical team will conduct a detailed engineering and safety inspection including a team demonstration of the proper operation of all emergency systems. This includes the removal of the remote kill switch battery to prove it fails safe. Teams must be prepared to discuss the design and implementation of their fail-safe systems in detail.

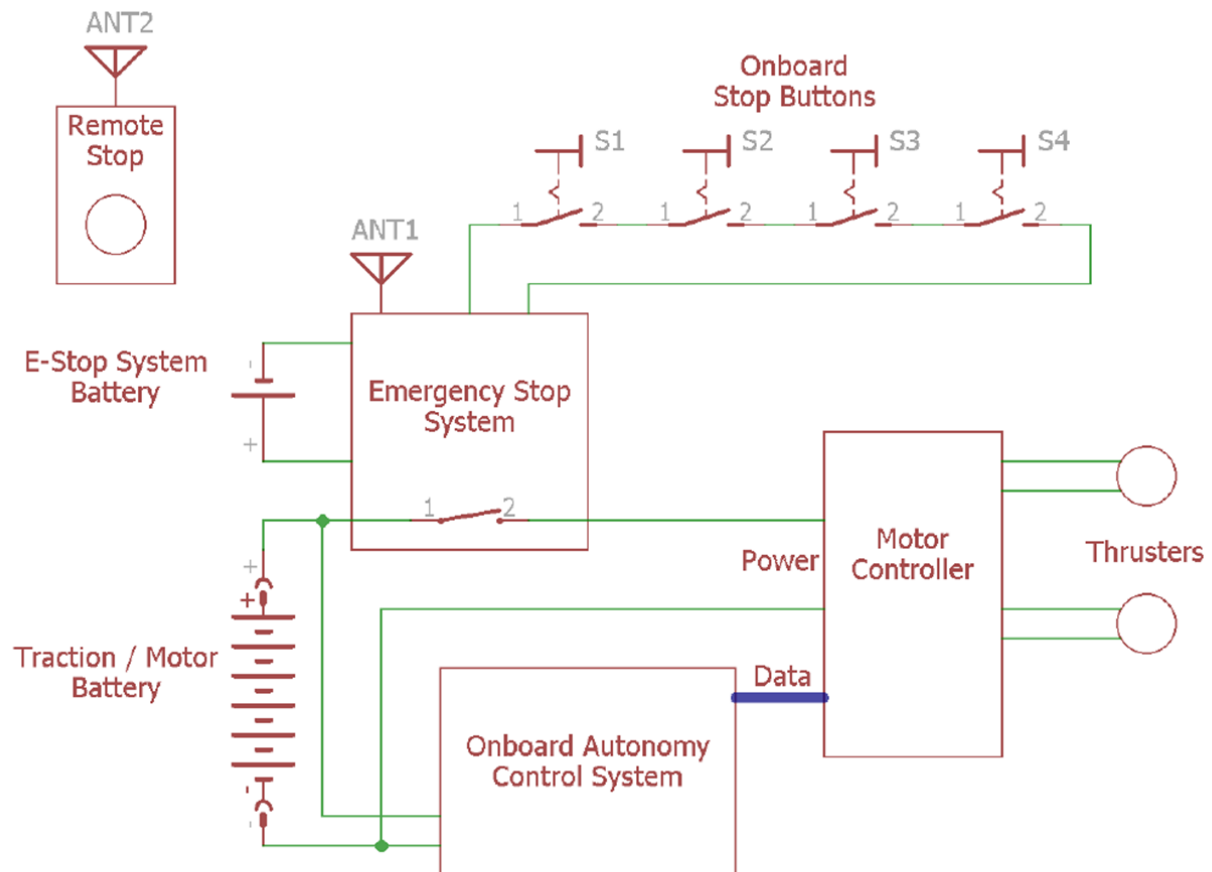


Figure : Example Emergency Stop Circuit

Onboard Emergency Stop System

All ASVs must have an onboard emergency stop capable of being actuated by personnel from a support craft. For personnel safety, the switch may be triggered from a distance by a wooden or plastic pole/paddle. Keeping this in mind, teams should select rugged and reliable components for their safety system.

Emergency Stop Button

A large, red button should be installed in such a way that safety personnel, from the support craft can easily actuate the button. The engage/disengage button should be red in color and have a 'press to activate and twist/pull to reset' feature. This button, momentary contact switch or not, should cut power to the thrusters immediately on actuation. The thrusters must remain in a powered-down state until the judge gives permission for the team to reinitialize the system. An example of a suitable button is shown in Figure 12 and can be found at www.mcmaster.com

➤.



Figure 12: Example Kill Switch

Wireless Emergency Stop

All ASVs must be equipped with a portable, handheld, Wireless Emergency Stop controller. This controller must immediately (less than 2 seconds) disconnect power to the vehicle's thruster units when activated or when power/battery is removed from the transmitter. This system must also meet the host country RF guidelines for frequency and transmit power. If the battery in the transmitter is removed, the system must also remove power from the thrusters automatically.

5.3 Vehicle Requirements

The following is a list of minimal requirements for a vehicle to be permitted access to a course.

Teams that arrive at the competition failing to meet the vehicle requirements will not be permitted on the course until the vehicle is modified to meet all requirements.

5.3.1 ASV Requirements

- **Autonomy:** Vehicle shall be fully autonomous and shall have all autonomy decisions made onboard the ASV.
- **Buoyancy:** The vehicle shall be positively buoyant.
- **Communication:** The vehicle cannot send or receive any control information while in autonomous mode (to and from Operators Control Station).
- **Towable:** The vehicle must have a multi-point tow harness installed at all times to allow staff to attach a rope and tow the vehicle through the water. Underslung harnesses will NOT be permitted.
- **Energy source:** The vehicle must be battery powered. All batteries must be sealed to reduce the hazard from acid or caustic electrolytes. The open circuit voltage of any battery (or battery system) may not exceed 60Vdc.
- **Kill Switch:** The vehicle must have at least one 1.5 inch diameter red button located on the vehicle that, when actuated, must instantaneously disconnect power from all motors and actuators. ([Section 5.2.3: Kill Switch Requirements](#))
- **Wireless Kill Switch:** In addition to the physical kill-switch, the vehicle must have at least one remote kill switch that, when actuated, must instantaneously disconnect power from all motors and actuators. If the remote kill switch system is powered off or battery removed, vehicle must default to a state in which power is disconnected from all motors and actuators. ([Section 5.2.3: Kill Switch Requirements](#))
- **Propulsion:** Any propulsion system may be used (thruster, paddle, etc.). However, all moving parts must have protection. For instance, a propeller must be shrouded.
- **Remote-controllable:** The vehicle must be remote-controllable (tele-operated) to be brought back to the dock. If the remote controller is turned off (or power is interrupted), vehicle must default to a state in which all motors and actuators are automatically commanded to 0% thrust or an off state. Driving the vehicle through a laptop is STRONGLY discouraged.
- **Safety:** All sharp, pointy, moving or sensitive parts must be covered and marked.
- **Size:** The vehicle must fit within a six feet, by three feet, by three feet "box". (Any extensions from the hull can exceed these dimensions during a run.)
- **Surface:** The vehicle must float or use ground effect of the water. Mostly submerged/flying vehicles are forbidden for use as primary autonomous platform.

- **Weight:** The entire maritime system shall weigh less than 140 lbs.

5.3.2 Multiple Vehicle Requirements

A team may enter up to two vehicles into the competition. Along with the [5.3.1 ASV Requirements](#), teams who enter multiple vehicles must follow these specifications as outlined in this section.

- **Weight and Size:** Each vehicle must adhere to the weight and size requirements. The thrust and weight of each vehicle is measured separately, and the scores are calculated per vehicle then combined for total score ([Section 3.1 Weight and Thrust Scoresheet](#)).
- **Gate:** At the start of a run, each vehicle must pass through the entry gate first before heading off for its desired task.
- **Run Time:** A team may elect to kill one vehicle and bring it back to the shore. If one (or more) vehicles are still out on the course, the competition time continues to count down (think of them as a swarm). Any vehicle that has been killed is returned to the start location and can be redeployed at any time.
- **Time Stop:** The competition timer is only stopped when the last vehicle out on the course is under remote control and returning to the shore. The timer starts again once this last vehicle has returned to the shore, or the first vehicle leaves the shore (starting its new run).
- **Inter-Vehicle Communication:** Teams wishing to have communication between each vehicle are asked to post their method and frequencies on the [RoboBoat Discord's rb-technical-forum](#) channel. Inter-vehicle communication and cueing of one vehicle by another is an advanced behavior that merits special points. If such behavior is executed, teams are required to present post-run supporting documentation (e.g., vehicle logs) to the judges.

5.4 Obstacle Avoidance

The ability to avoid obstacles is a core capability for unmanned systems. Each buoy on the course represents an object to be avoided or approached in some way. In addition, obstacle buoys may be placed throughout the operating areas in an effort to provide a more representative real-world challenge.

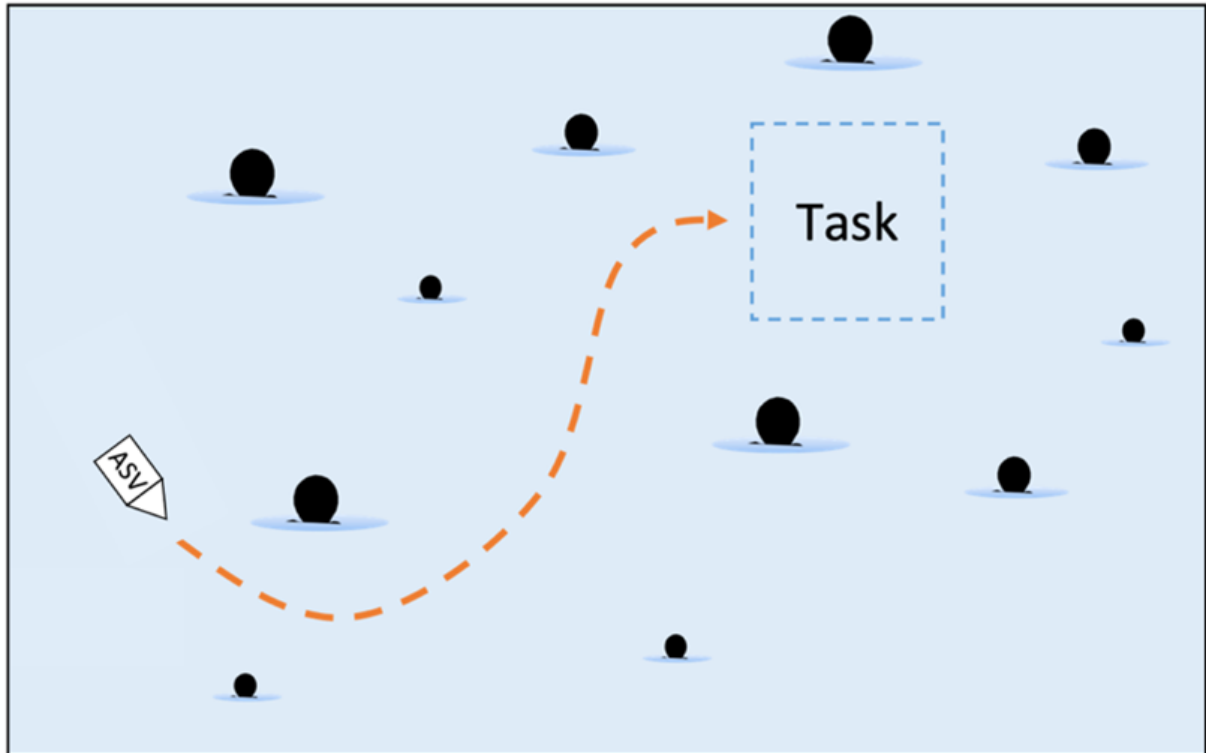


Figure : Obstacle Avoidance

Section 6: How to Compete

This section includes detailed instructions and requirements that are required to register and participate in the competition.

[6.1 Registration](#)

[6.2 Event Submissions](#)

[6.3 Design Documentation Submissions](#)

[6.4 Event Expectations](#)

[6.5 Team Communications](#)

[6.6 Data Sharing](#)

6.1 Registration

All teams are required to register to compete using the Registration form found on the RoboBoat website: RoboBoat.org/2026. This registration collects each team's point of contact information, demographics, and the Pre-Competition Requirements outlined in [Section 6.2: Event Submissions](#) and [Section 6.3: Design Documentation Submissions](#).

6.1.1 Registration Fees

To complete the RoboBoat 2026 registration, teams must pay the registration fee of **\$1,250 USD**.

6.1.2 Cancellation and Refund Policy

To cancel a registration, teams must complete the [Cancellation Form](#). Cancellation requests submitted via email will not be accepted. Click here to review the cancellation and refund policy: roboboat.org/cancellation-policy.

6.1.3 First-Year Teams

First-year teams are eligible to participate in RoboBoat without an ASV. These teams are expected to participate in Design Documentation and send representation on-site at the event as a learning experience. First-year teams are expected to indicate this option in their registration form.

6.2 Event Submissions

This information is collected prior to participation on-site at the competition, during the registration process.

6.2.1 Team Member Registration

This form is required for all team members, advisors, and chaperones planning to attend the competition on-site. Each individual will be able to enter and submit their own information using this process. This information includes name, contact information, dietary restrictions, academic information, optional resume, emergency contact information, signed forms, and a request for an invitation letter.

- Download the [waiver ↗](#) (required of all minor and adult participants)
- Download the [youth protection policy form ↗](#) (required of all adult participants, over the age of 18 years)



The registration owner will need to collect an email address for each team member to send the team member registration form. For team members that are minors, please enter the email of a parent or guardian to complete the form.

The registration owner is responsible for following up with each team member to complete this task before the deadline.

6.2.2 Team Demographics

Team demographics are collected to determine program impact on students and in educational settings. This information may also be shared with any eligible sponsors.

6.2.3 Merchandise Order

Using the RoboBoat Competition Shop, teams place an order for their team's shirts. A discount code is provided in the registration portal to receive the first five t-shirts for free. Additional shirts cost are available for purchase.

6.2.4 Vehicle Information

This submission documents a list of all components utilized in the system design. In cases where components were developed by the team versus purchased off the shelf, this information should be included. Additionally, if commercial off the shelf equipment were significantly modified this should be noted. Under the column marked "Specs" a web link to the manufacturer's specifications may be provided. This standardized table will help document and track trends in component (hardware and software) usage and team metrics.

	Vendor	Model/Type	Specs	Custom/Purchased	Cost	Year Purchased
ASV Hull Form/Platform						
Waterproof Connectors						
Propulsion						
Power System						
Motor Controls						
CPU						
Teleoperation						
Compass						
Inertial Measurement Unit (IMU)						
Doppler Velocity Logger (DVL)						
Camera(s)						
Hydrophones						
Algorithms						
Vision						
Localization and Mapping						
Autonomy						
Open-Source Software						

6.2.5 On-Site Requirements

Battery Safety Requirements

Teams are required to submit battery specifications, Material Safety Data Sheets (MSDS), and proper disposal procedures, sourced from the battery manufacturer for all batteries. More information can be found in [Section 5.2: Safety](#).

Shipping Plan

Teams are required to submit a shipping plan to facilitate shipment receipt/handling at the competition hotel. Shipping guidelines can be found in [Section 6.4.2: Shipping](#). This shipping plan must include:

1. Organization name
 2. Team name
 3. Shipping POC
 4. Shipping POC mobile number
 5. Shipping POC email address
 6. Number of crates
 7. Dimensions for each crate
 8. Estimated shipping date
 9. Shipping Company
 10. Type of shipment – Air, ground, ocean
 11. Has initial pick-up or drop off been scheduled – include date of pick-up or drop off
 12. Is this a dangerous good shipment? If so, has a dangerous goods shipment been arranged?
 13. Have you scheduled your outbound shipment pick-up or drop off? Provide pick-up details (date/time) for any pick-up from the hotel.
 14. Additional information for shipment, if needed.
-

6.3 Design Documentation Submissions

This information is collected prior to participation on-site at the competition, during the registration process. Submission requirements, guidelines, and scoring rubrics can be found in [Section 2: Design Documentation](#).

Design Documentation submissions collected before the competition include:

- [Technical Design Report](#)
- [Team Website](#)
- [Team Introduction Video](#)

6.3.1 Optional Community & Outreach

Teams are invited to outline their educational outreach efforts. This activity is not scored; however, it will be shared online for the community and can be eligible for special awards and recognition. Teams may submit one page description of their activities, that may include supporting photos.

6.4 Event Expectations

6.4.1 Travel + Lodging

Teams are responsible for coordinating their own lodging and travel plans.

Lodging—Event Hotel

RoboNation has contracted with a local hotel to provide a special rate for RoboBoat teams. Teams are responsible for booking their own lodging for the event. More information to be released at a later date.

Travel Considerations

VISA Process – It is recommended for international students to acquire a B-1 Visitor VISA to attend the competition. However, if the student has plans for any other activities besides the competition, they may choose to investigate other types of visas. Explore the different types of visas: travel.state.gov ↗.

Invitation Letter – Once a team is officially registered and the registration fee is paid, they are eligible to request invitation letters. During the [Team Member Registration](#), each team member is given the opportunity to request an invitation letter issued by RoboNation. Contact support@robonation.org ✉ with any questions.

6.4.2 Shipping

Teams are responsible for coordinating the necessary shipping to ensure arrival of vehicle and equipment. Any shipping questions can be directed to Cheri Koch at ckoch@robonation.org ✉ / 850.642.0536. More shipping instructions will be released at a later date.

6.4.3 Event Logistics

Team Village

Each team is provided with a 10' x 10' working area in a tent that includes two tables / seven chairs, one electrical outlet (120V 60 Hz 15A), and a wireless internet connection. The Team Village is a tent with sidewalls that resides on a flat grassy field surface. Although the covered workspace is weather resistant, teams are discouraged from leaving sensitive electronics/equipment exposed in the tent.

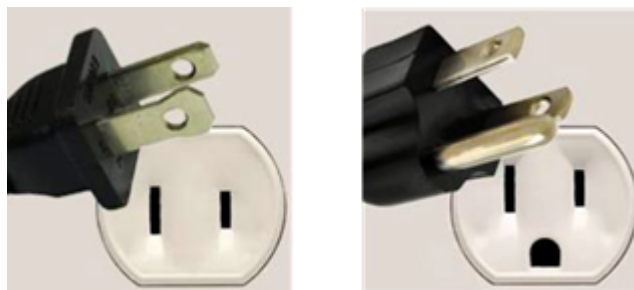
Teams should conduct development, maintenance, and repair of their systems in their designated area in Team Village. Batteries may be charged during the day at the Team Village but may not be left charging overnight.

Team Course Operating Areas (Shoreline)

Teams are provided with an area along the shoreline near the course areas where they are able to set up their shore equipment. Each course has a 10' x 10' tent-covered area with a single table per tent, 120V 60Hz 15A power, and a hard-wired Ethernet connection to the Technical Director network. The power provided is for Operator Control Station (OCS) use only and shall not be extended to any platforms on the beach. This space is shared between all teams utilizing the course.

Power

The United States uses a 120V 60Hz 15A electrical outlet plug. Usually three pins, two parallel blades (one wider than the other), and an offset semi-round pin. The wider blade is Neutral, the shorter blade is Hot/Line and the third pin is Ground. Teams will only get one 15A service and should not connect more load than that.



US electrical outlets

Vehicle Deployment and Recovery

Vehicles are deployed and recovered in the water on the required cart provided by each team, using a portable rollout mat. The temporary walkway is similar to the Mobi-mat, available at shop.mobi-mat.com. The cart will get wet as it's submerged during deployment and recovery. RoboBoat staff are responsible for recovering any lost vehicles. All reasonable efforts to recover a lost vehicle will be made, but the recovery of a lost vehicle cannot be guaranteed. All teams recognize by entering the competition, they risk damage to, or the loss of, their vehicle.

Open to the Public

This event is open to the public. Consider the possible attendance from future employers or sponsors.

6.5 Team Communications

6.5.1 Pre-Competition Communications

RoboBoat teams have a variety of opportunities to interact with each other and the RoboBoat staff leading up to the event.

TeamTime Meetings

Leading up to the on-site competition, teams are asked to send a representative to regularly scheduled virtual meetings. These TeamTime meetings are hosted by the RoboBoat organizers and technical team to provide teams with competition updates and the opportunity to ask questions. Teams can find the meeting dates and details on the [website ↗](#), [Discord ↗](#), and email.

RoboBoat Discord

All questions, comments, and suggestions should be posted on the [RoboBoat Discord ↗](#). Teams are encouraged to actively participate in the online community and monitor it for the latest news and updates regarding all things RoboBoat.

6.5.2 Event Communications

Team Lead

Each team must designate a student team member as their team lead. The team lead is the only person allowed to speak for the team. The team lead is the only person permitted to request vehicle deployment, run start, run end, or vehicle retrieval. The team lead must be conversationally fluent in English to communicate with RoboBoat staff. Teams who do not have members fluent in English should contact RoboBoat staff as soon as possible.

Technical Director Team

The RoboBoat Technical Director Team consists of a Technical Director, Safety Inspectors and Course Managers.

Other RoboBoat Staff

The RoboBoat Staff are identified with "Staff" shirts.

6.5.3 RoboBoat Website

The official competition website is *www.RoboBoat.org/2026*. This website includes all official documents and a detailed list of the registered RoboBoat teams. Helpful resources, past competition results, and other engagement opportunities can be found on this website. Information and documents are updated regularly, and it is the team's responsibility to check the website for updates.

6.6 Data Sharing

A Data Sharing project has been established for registered teams competing in RoboNation's autonomous competitions: [RoboBoat ↗](#), [SUAS ↗](#), [RoboSub ↗](#), and [RobotX ↗](#). This project aims to increase collaboration between teams and to provide access to shared resources and test data to validate and debug the reliability and robustness of teams' machine vision algorithms.

For the data sharing guide and more information on Data Sharing, visit [RoboNation.org/data-sharing](https://robonation.org/data-sharing). ↗

6.6.1 Data Sharing Access Requirements

During the registration process, teams must provide a generic email account and a team acronym that is used in the Data Sharing project. The generic email can be associated with any email provider. An example of the Generic Email is: roboboat-team@outlook.com. The team acronym must be within 2-6 characters, abbreviating the team's school or organization. Examples of the team acronym are: RNB or RNTEAM.

Only official registered teams maintain access to the Data Sharing project for the competition season. Access is provided to teams at the close of registration, using the generic team email address entered during registration. Contact competitions@robonation.org ✉ for any access questions.

Section 7: Glossary & Acronyms

7.1 Glossary

Phrase	Definition
Practice Courses	These courses are designed to provide opportunities to demonstrate proficiency in one task at a time. They contain an instance of each task.
Team Lead	Designated spokesperson for each team.
Technical Director Team	Technical team that runs the courses, safety inspections, set-up, and tear-down.
RoboBoat Event Staff	RoboBoat support personnel.
Judge	Subject Matter Experts that observe and score the Autonomy Challenge and Design Documentation.
Sponsor	Organizations that provide support to RoboBoat.

7.2 Acronyms

Acronym	Definition
ASV	Autonomous Surface Vehicle
COLREGs	International Regulations for Preventing Collisions at Sea, an international agreement published by the International Maritime Organization that sets out the "rules of the road" for all vessels on the high seas to prevent collisions.
N/A	Not available
OCS	Operator Control Station
RGB	Red, Green, Blue
RF	Radio Frequency
TD	Technical Director
TDR	Technical Design Report