2024-2025 Raytheon Autonomous Vehicle Competition: Operation Full Send

**GW Team Charter**

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# **Definitions**

* **We** is defined as the members of the senior Capstone design team working on **our** project: 2024-2025 Raytheon Autonomous Vehicle Competiton - Operation Full Send sponsored by Raytheon.
* **Stakeholders** are the individuals and groups that will be most impacted by our project. Our sponsor **Raytheon** is one of our key stakeholders. The Autonomous Vehicle Competition varies year-by-year with colleges participating from across the country. Raytheon provided a list of requirements outlined under the Rules of Engagement. We are also expected to submit deliverables such as a Qual/Eval test and meet with our Raytheon mentor. RTX has funded us with $15000 for project-related expenses. Our other key stakeholders are:
  + our university, George Washington University (GWU),
  + the School of Engineering and Applied Sciences (SEAS),
  + and our individual departments and advisors who all depend on us representing them well.
  + More generally, the application of unmanned vehicles has a wide impact on society with emerging use cases such as air-delivery fulfilled by Amazon Prime Air subscription, Walmart, and food delivery services via ground and air. As such, our work directly impacts the public, who are also considered as our stakeholders.

# Purpose

## Objectives and Goals

1. Our primary focus is to add value to the field of Unmanned Vehicles and to our stakeholders with the completion of this project.
2. Stay within the total budget of $15000.
3. Deliver two unmanned vehicles by April 19, 2025 which marks the completion of the project with the formal competition hosted by RTX and GW’s Senior Research and Design Showcase.
4. Complete and present all deliverables required from us from each of our departments and from RTX.
5. Place first among the Eastern Region of the Competiton.

# Roles and Responsibilities

* Foster psychological safety and have excellent, professional behavior.
* Communicate early if someone is behind in work or it’s difficult. We can move things around.
* Be proactive and try not to leave things for the last minute.
* Practice our presentations as a team.
* All members are responsible for maintaining the Bill of Materials (BOM), making corrections and confirming accuracy.
* Sometimes meetings require testing and testing should be done as a team. This requires more travelling for the flying drone because of DC flight restrictions. A remote pilot is required for flight tests done outdoors, and other team members are to act as visual observers and be part of the crew.

## Peer Reviews

Individual work will be evaluated by peers. After an individual or a group of individuals complete a task, the work will be checked for quality by the team.

On GitHub, code will be maintained using a main code base and subsequent branches. A pull request and edits to code will be reviewed by 2-3 individuals, or all members involved with the code piece before it can be included into the main branch. Normal GitHub procedures and operations will be followed, such as pulling from main after new edits. This is to avoid merge conflicts and the possibility of having code over-written.

## Organizational Roles

The entire team will break down into different subteams that represent subsystems: Chassis, Visual Processing, Communication, Navigation, and Package Delivery. Each subsystem and subteam is responsible for different aspects of the overall system:

* Chassis: Chassis, Motors, Propellors, ESCs, Batteries, Power Distribution, and Physical Layout.
* Visual Processing: Cameras and the processing of data from the cameras into a “map” of the area.
* Communication: All communication between processors and peripherals, such as Drone Controllers, Drone Computers, Motors, and ESCs.
* Navigation: Taking data input from the Visual Processing team and using it to navigate both Drones.
* Package delivery: All mechanisms, including the package release and retractable landing gear.

**Project Managers:**

* MAE: Henry
* ECE: Ben
* CS: Mark

**Chassis/Flight Electronics:**

* Nedah, Lead
* Henry
* Valeria
* Dorlene
* Yafet
* Ben
* Onur
* Joshua

**Visual Processing:**

* Michael, Lead
* Henry
* Nedah
* Ivan
* Jordan
* Aarifah
* Joshua

**Communication:**

* Ben, Lead
* Dorlene
* Jordan
* Joshua
* Aarifah
* Michael

**Navigation:**

* Mark, Lead
* Yafet
* Nedah
* Ivan
* Aarifah
* Henry

**Package Delivery:**

* Valeria, Lead
* Henry
* Nedah
* Ben
* Mark
* Onur
* Yafet
* Michael

**Remote Pilots:**

* Aarifah
* Ben
* Mark\*

## Decision Making

* All major decisions will be made at a Saturday meeting between the subteam leaders/project managers. Subteam leaders are responsible for contacting their team ahead of time to come to a conclusion.
  + If a subteam leader cannot attend a Saturday meeting, they are responsible for appointing a team member to represent the team for that week.
  + If a decision cannot wait for a Saturday to be made, a decision can be made at one of the other meetings with notice ahead of time, or a full team poll can be made in Teams.
* Minor decisions can be made within subteams, while making sure to note which other subteams any decision will affect. All minor decisions will be noted at Saturday meetings to ensure compliance with rules and rest of system.
* All decisions will be made with 50% (7 people or 3 subteams) concurrence, with any team member having the right to veto. A veto override can be made with two-thirds concurrence (9 people).
* Project impacting decisions will all be posted in the Patch Notes channel to ensure the entire team is kept up to date.

## Communication

### Norms and Expectations

Team members are expected to communicate with their team. If an individual is having trouble with their tasks, this should be communicated early so we can find a solution.

* All team members should check Teams at least twice a day (once in the morning and once in the afternoon/evening).
* If there is an event/meeting, all members should check teams 1 hour before the event/meeting for any changes.
* It is preferable for all members to have all Teams notifications enabled on their phone/laptop so that they can be updated on any changes.
* All posts in Teams shall tag any relevant team members in the body of the post.

### Methods and Platforms

* Microsoft Teams will be used for all text-based communication needs
* Zoom will be used for all video meeting needs
* Microsoft Teams will be used for General file storage (exceptions below)
* GitHub will be used for all code storage/version control
* Monday will be used for Project Management (tasks list, etc.)
* OnShape will be used for any Mechanical CAD designs
* Email will also be used as necessary, especially for formal communication with our stakeholders

## Meeting Expectations

All attendees are expected to prepare for the meeting and be on time. If an attendee is unable to attend, or expects to be late, this should be communicated early with all other attendees.

A meeting agenda document will be maintained and distributed among the team. It is recommended that the meeting attendees review the agenda beforehand. After the end of a meeting, a new meeting agenda will set the goals for the next meeting.

An agenda helps set the purpose of the meeting and orients our focus on accomplishing the tasks at hand. It also establishes how long the meeting is, who will attend, and summarizes key points for later reference.

Entire team meetings will be recorded and subteam meetings will be upon discretion. Meetings with the Raytheon mentor will not be recorded.

### Meetings

The entire team is expected to attend these meetings:

* Entire Team Meeting: Saturdays from 1 PM over Zoom
* Meetings with Raytheon mentor, Jarick: Monday 2:30 – 3:00 PM and Wednesday 2:15 – 3:00 PM

Additionally, each department has their specific meetings:

* MAE Team Meeting: Mondays from 2:20 PM – 3:35 PM
* ECE: Thursdays from 12 PM – 12:30 PM

These meetings are viewed as study halls where members are encouraged to attend:

* CS Capstone Lab: Wednesdays from 6:10 Pm – 8:40 PM in SEH 1300/1400/1450
* ECE Capstone Lab: Thursday 3:30 – 6:00 in Tompkins 402

# Procedures

## Conflict Resolution

Conflicts may arise, though of course no one is hoping for that. However, a set of procedures can be outlined in case that they do. If the team is unsure about a logistical aspect of the project, designs, or how to go about fulfilling deliverables, then a voting process can take place. A form can conduct the vote for key decisions.

## Revising the Team Charter

The team charter may be revised at any point in time when a member of the team feels there are missing aspects or that it does not encompass current situations. The team charter will most likely be revised at the end of Fall to reflect new meeting times. If the charter needs to be adjusted, this should be brought up with a team for discussion. The team charter should be viewed as a living document.

Members will be asked to re-sign the document once policies are changed.

## Breaches of Contract

If an individual of the team breaches the contract, it will be evaluated by severity. Being late or unprepared for meetings will be considered minor infractions until it is viewed as a recurring trend. Communicating in a way that is not expected by the team is also viewed as minor until it is habitually done. Going against the behavioral expectations outlined in Roles and Responsibilities of maintaining positive and professional behavior will be considered more severe than those mentioned above. Severe infractions deemed by the team will be evaluated as the situation arises, including any remedial actions.

# Team Members

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| Henry Fu  Inserting image... 9/28/2024 |
| Mark Parrish  9/28/2024 |
| Onur Coban    9/28/24 |
| Aarifah Ullah    9/28/2024 |
| Ben Sirota    9/28/2024 |
| Nedah Ahmad  10/2/24 |
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