1 Introduction

The goal of this project is to create a multi-payload system for a drone based on the principals of a "water sampling and data collection device," shown in Figure 1. The primary payload will be suspended from a drone by a 3-inch snap clip fastener (carabiner clip) which will be hanging 2 ft from the attachment point of the drone. A secondary payload will be suspended by at least 1 ft from the primary payload and will serve as the means for water collection. Once the water is collected, the secondary payload must be lifted to the primary payload.

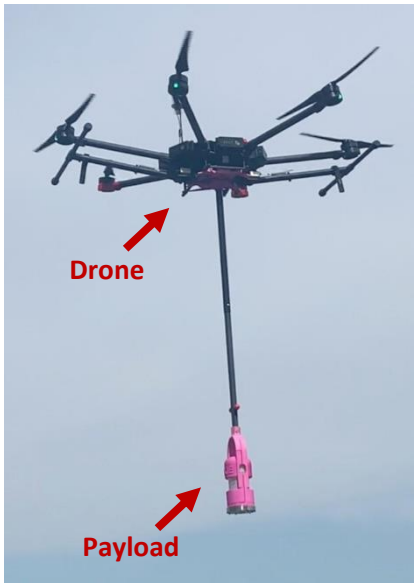

Figure 1. Drone outfitted with water collection payload[1]

In addition, the primary payload must indicate/display:

1. Orientation (right-side up/upside down) – light LEDs
2. Tilt angle (along axis of travel) – text display
3. Object detection in forward direction (+/- 10 in) – beep
4. Detection of water source – unique beep code
5. Elevated temperature – primary payload release from drone

The payload hardware must be sufficiently secure during flight. Therefore, all payload electronics must be soldered. The payload must also include a removable energy supply, with sufficient power and capacity.

2 Supplemental Task

In addition to the above tasks, each group will be required to perform a unique, additional task of their choosing during operation. The task can require items to be integrated in the operational field, however, they may not interfere with other items or components in the field. Each group is required to submit a proposal, via email, of their additional task and its integration.

3 Deliverables

Over the course of the project, intermediate tasks will be completed individually or by groups, as shown in Table 1. Specifics will be provided for each deliverable and outlined in separate documents.

Table 1. Final Project Deliverable Matrix

Deliverable	Completed By	Date
Finals Schedule, Groups	Individual	04/09
Problem Understanding	Individual	04/10
Additional Task Approval	Group	04/15
Completion of One Task	Group	04/22
Project Poster	Individual	04/28
Performance Review	Group	04/29,30 4-6PM

4 Performance Review

Evaluation of each team's project will begin with each group providing a two-minute oral presentation summarizing their project. Each group will be evaluated by the following metrics:

1. Presentation
2. Completion of Tasks
3. Reliability
4. Quality
5. Professionalism

[1] https://springwise.com/innovation/mobility-transport/nixie-drones-water-testing/