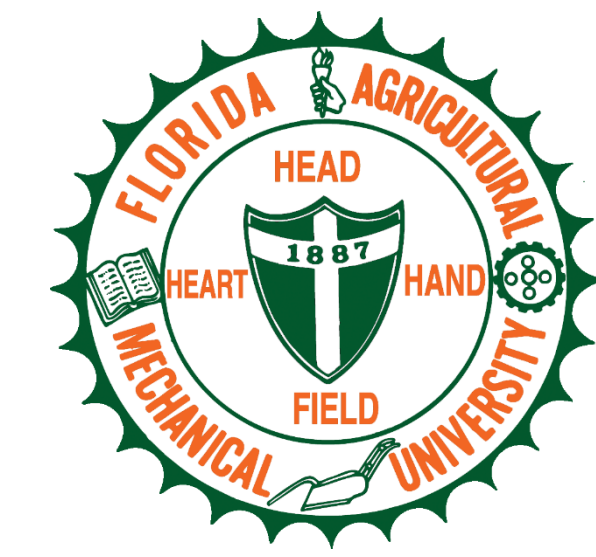


Team 13 Drone Disabling Device



Team Members: Gregory Boldt, Latarence Butts, Brandon Eiler, Jordan Lane-Palmer, Deshon Purvis, Natalie Villar, Justin Wawrzyniak

Sponsors: Tameika Hollis & Stan Zoubek

Advisor: Dr. Camilo Ordonez

Professors: Dr. Shayne McConomy & Dr. Chiang Shih

Problem Statement

Drones with cameras and possible explosives (IEDs) pose a security threat to the public and military safety.



Objective

Develop a device to secure specified air space from unmanned flight vehicles.

Customer Requirements

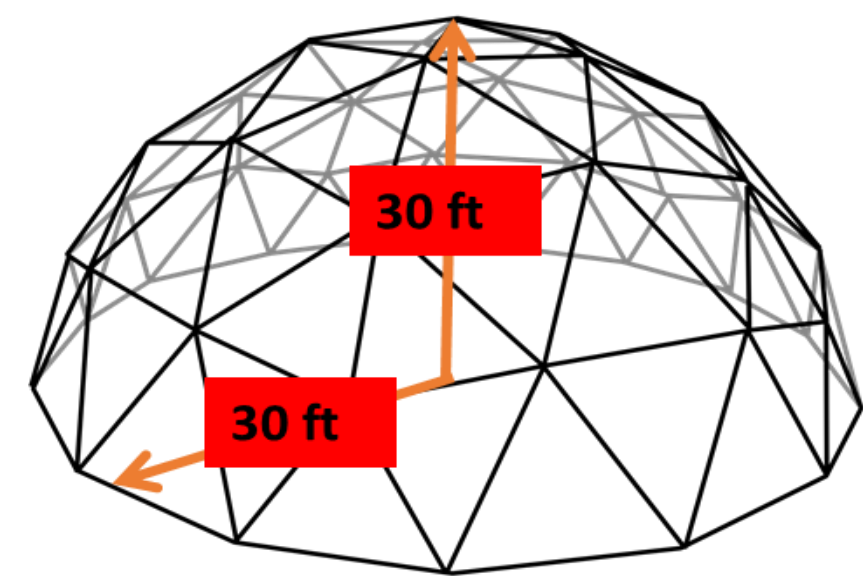
Drone Specs

Typical household drones



Range

30 ft radius dome



Power

120V (AC) outlet

Effectiveness

Minimum: Disable
Bonus: Recover

Operation

Trained human operator

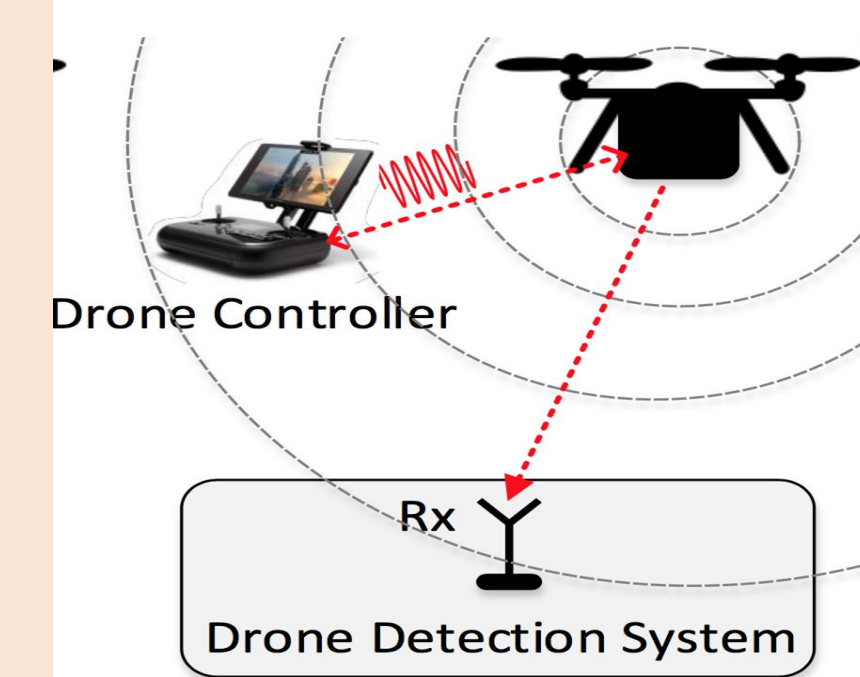
Portability

4 hour assembly time

Purpose

Preparation for industry

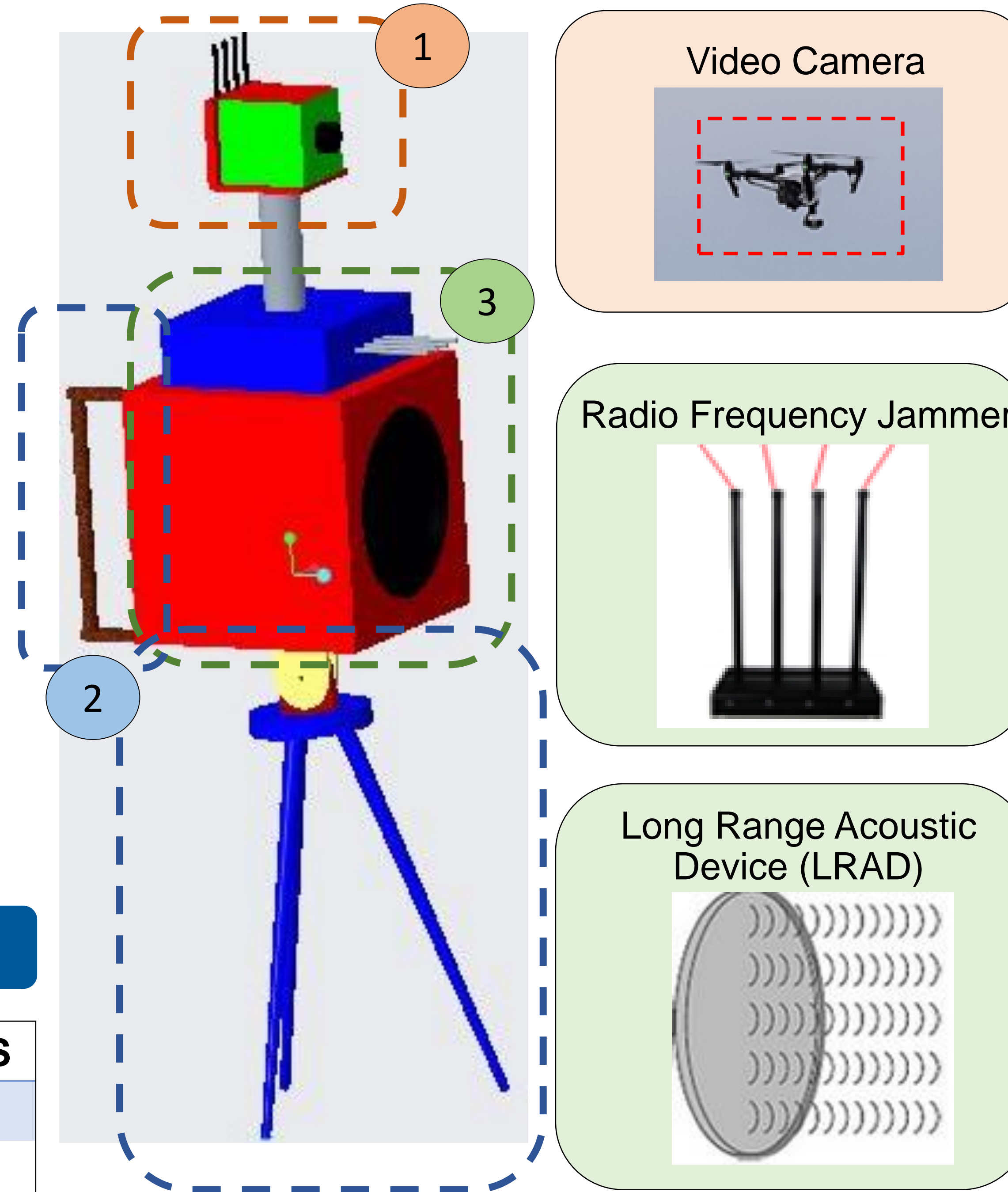
Radio Frequency Receiver



User Controlled Method



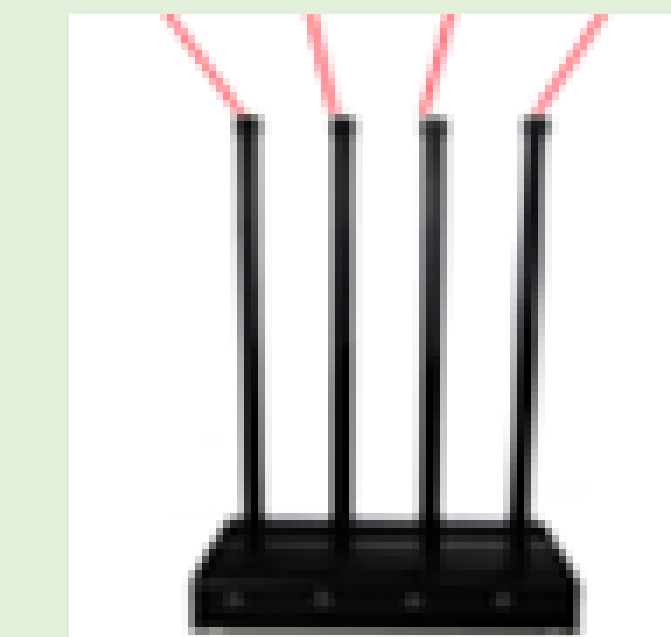
Selected Design Model



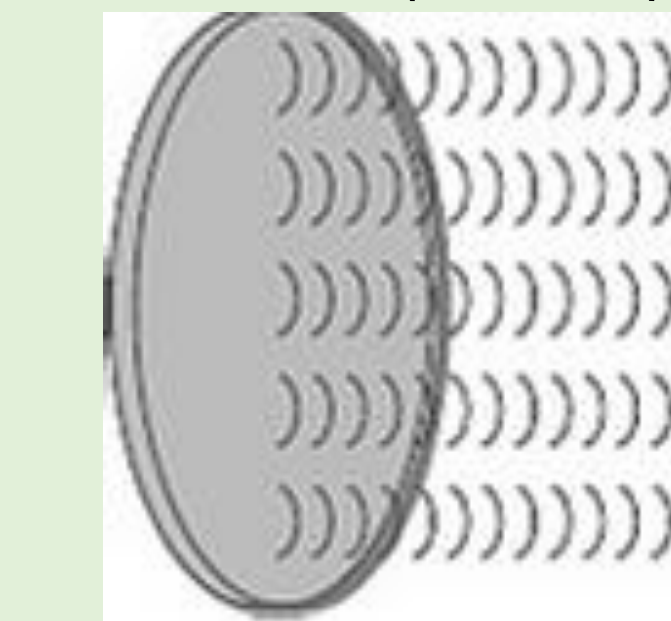
Video Camera



Radio Frequency Jammer



Long Range Acoustic Device (LRAD)



Target Catalog

METRIC	TARGET	UNITS
Assembly/Disassembly Time	4	h
Device operation voltage	120	V
Range of device (dome radius)	30	ft
Time to find/lock on to target	30	s
Time to neutralize drone	5	s
Effectiveness	90	%
Project budget	5000	USD

Future/Timeline

Test bench construction

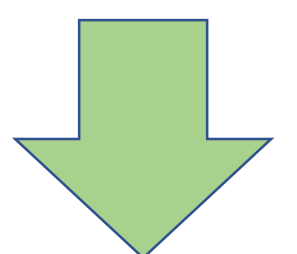
Small-scale testing

Prototyping

System Details

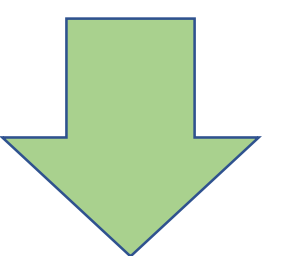
1 Detection

- Radio frequency (RF) receiver identifies the location of the drone controller and the drone as they communicate.
- Video camera detects movement in the airspace and runs algorithms to properly classify the target as a drone.



2 Control

- User is responsible for aiming the device at target.



3 Neutralization

- Jam 2.4GHz radio frequency band to disrupt controller to drone communication.
- LRAD speaker confuses the gyroscope causing false orientation readings being sent to flight controller.