

Drone Disabling Device

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Background

- Commercial and household drones pose a large security threat to secure areas
- Need to create a device to detect, neutralize and retrieve these drones in a specified airspace

Objectives

- Protect 30 ft dome airspace from drones
- Portability of a standard-issue rifle
- 5 minute assembly and disassembly time
- Target acquisition speed of 20 seconds

Device Overview

3D Image Detection

- Object recognition software
- 360° FOV, utilizing 3 cameras
- Noise alert from Raspberry Pi auxiliary speaker

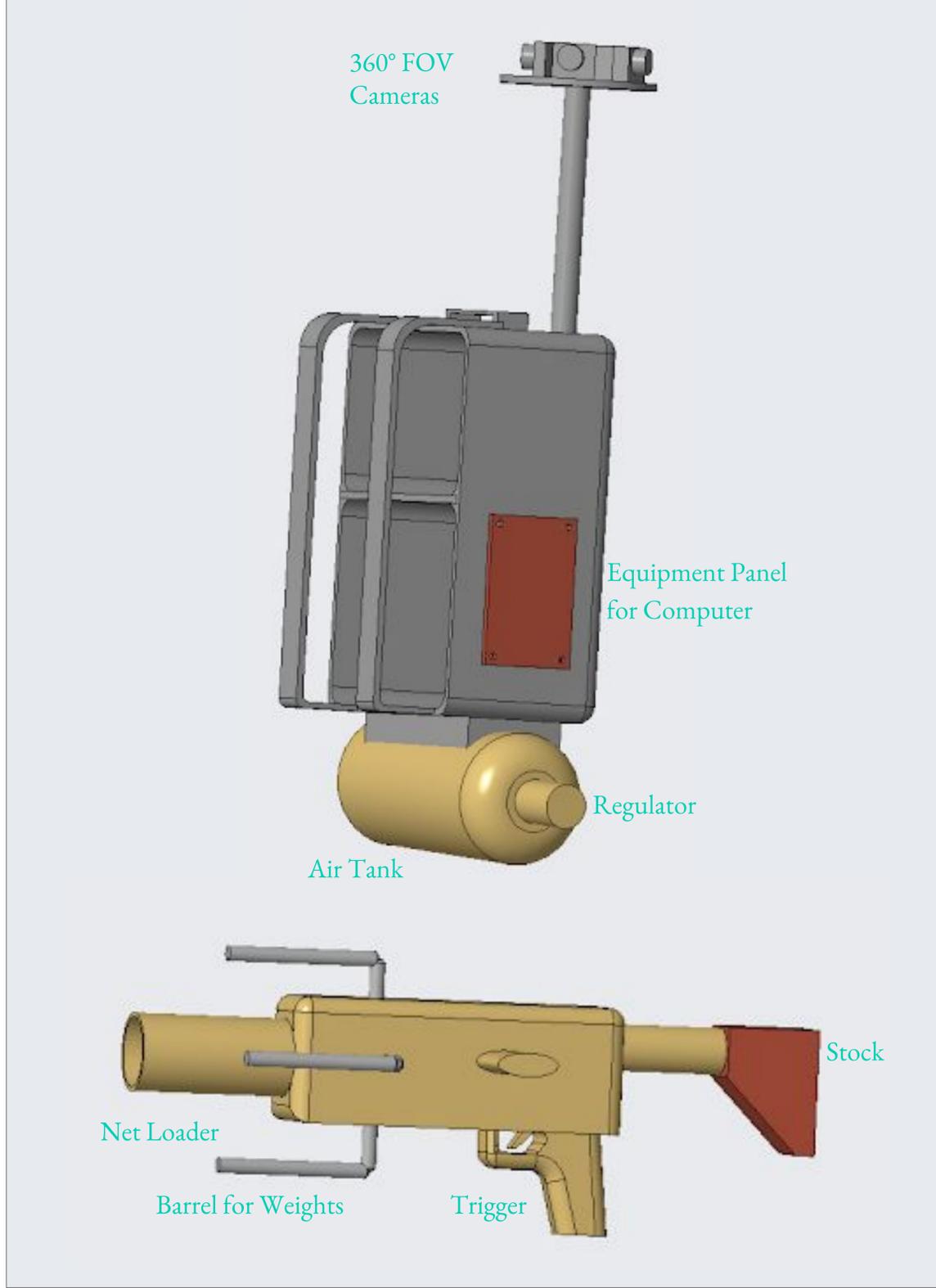
Radio Frequency Interference

- Disrupt signal from controller to drone
- Most drone controllers communicate with 2.4 GHz
- Transmitted signals overlap to disrupt all channels
- Causes drone shut off or "hover mode"

Weighted Net

- Serves as backup to RF interference
- Neutralizes drones that remain airborne after jamming
- Compressed air launches weights attached to net
- Net Launcher manually aimed at target drone
- Trigger is modeled after a pneumatic blow gun trigger to release high pressure

Device CAD Prototype



Design Challenges

3D Image Detection

- Speed of target acquisition
- Distinguishing between drone and bird
- Different shapes and sizes of drones
- Detection accuracy vs. speed of flying drone

Radio Frequency Interference

- Drones driven by other frequencies
 - 5 GHz
 - 900 MHz
- Drone driven by other means of communication
 - Bluetooth
- Legality involved with testing WiFi-frequency RF jamming

Launching of Net

- Weight of compressed air tank on backpack
- Optimizing net reloading ease and speed
- Maximizing net launching range

Future Work

- Testing viability of increasing net launcher pressure
- Prototyping of initial concept design
- Development and optimization of image recognition
- Optimizing comfort and ease of device usage

Acknowledgements

Team 518 would like to give thanks to Tameika Hollis, Stan Zoubek, and Northrop Grumman for their sponsorship; to Dr. McConomy and Dr. Hooker for their support; and to Dr. Clark for his motivation and assistance.