TEAM DROP

Deliverable Realistic Optical Payload

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Problem Statement

Current droppable rounds are not integrated with existing MILES harness/halo systems and require manual adjudication, reducing training realism and scalability—this project will close that gap by producing a weight- and safety-compliant emitter that interoperates with field MILES equipment.

Motivation

80% of casualties in Russia-Ukraine are caused by drones and drone dropped munitions.

U.S. soldiers require a realistic way to train against these emerging threats.

Project Vision

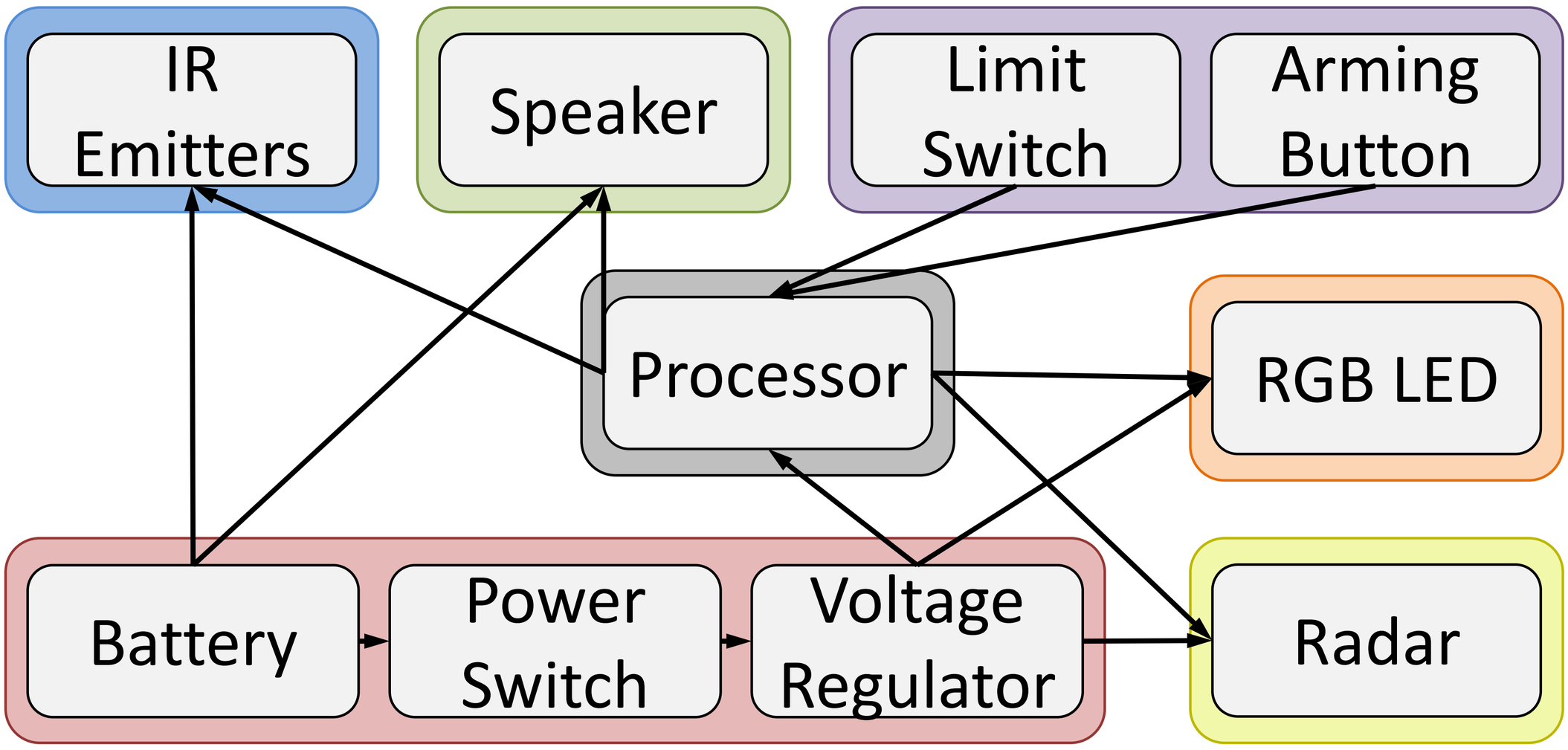
A durable, safe, turn-key UAS-droppable munition that emits an authentic 360° MILES signature replicating a 60 mm mortar round so training units can realistically and autonomously simulate indirect-fire effects.

Training Gap

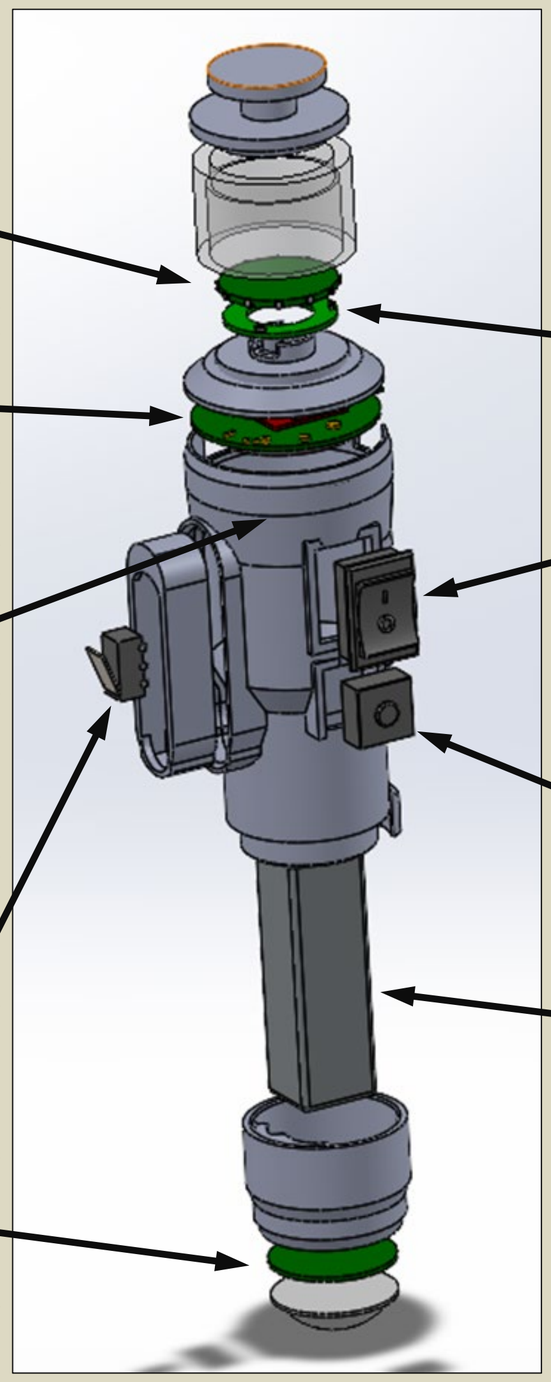
At JRTC and NTC, indirect fire effects are often simulated through an Observer Controller (OC), resulting in:

- Limited real-time feedback
- Reliance on subjective assessment
- Reduced training realism

Block Diagram



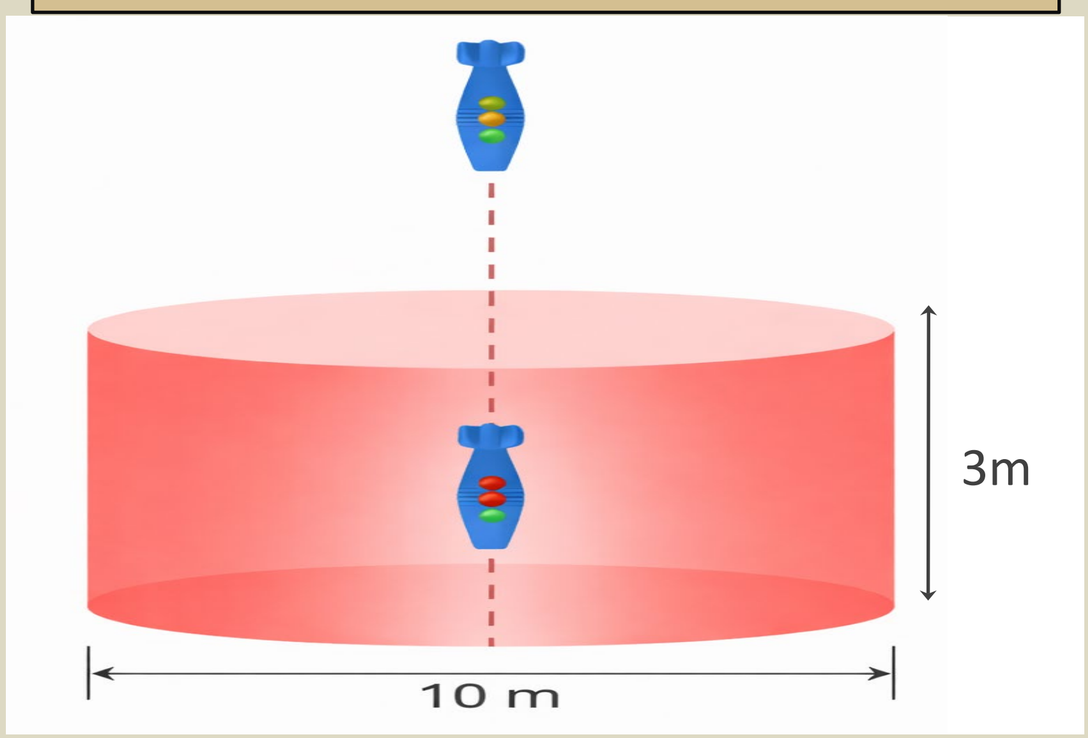
Payload Design



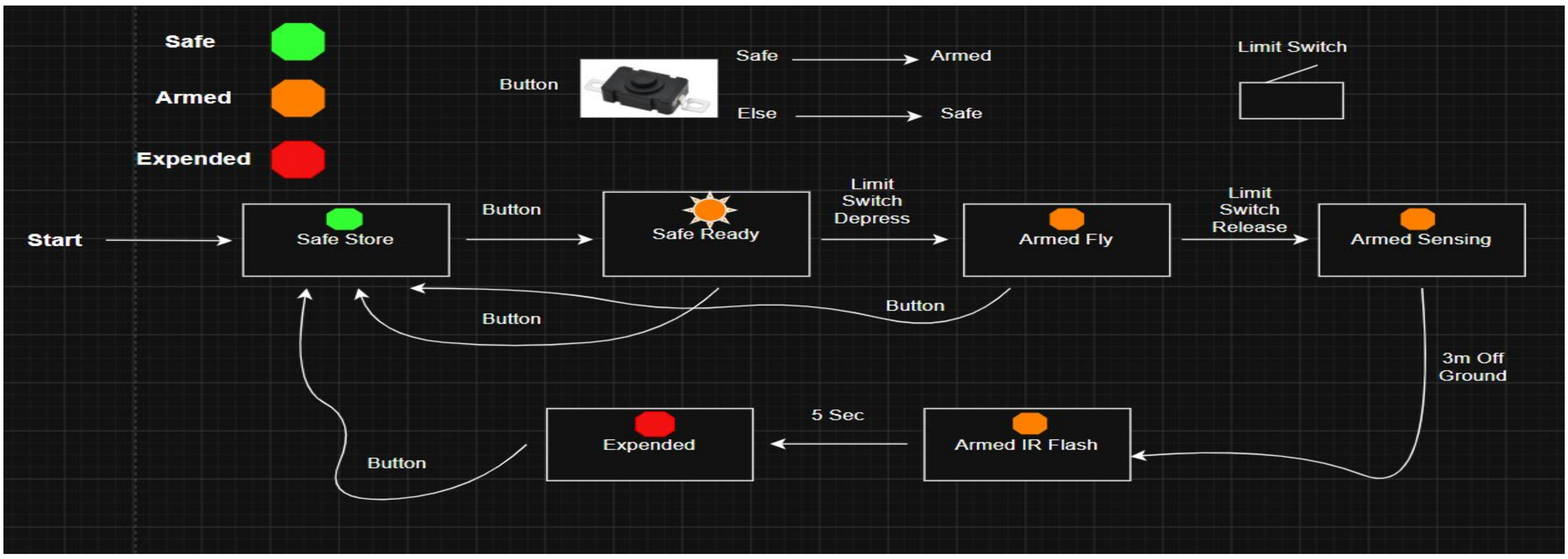
Requirements

- 1+ Hour Battery Life
- Emulates 60mm Mortar Signal
- 10m Signal/Blast Radius
- 3m Simulated Airburst
- Repeated Use With ~100m Drop
- Visual and Audible Feedback
- Low Training Burden
- Manual Power Switch

Emission Pattern

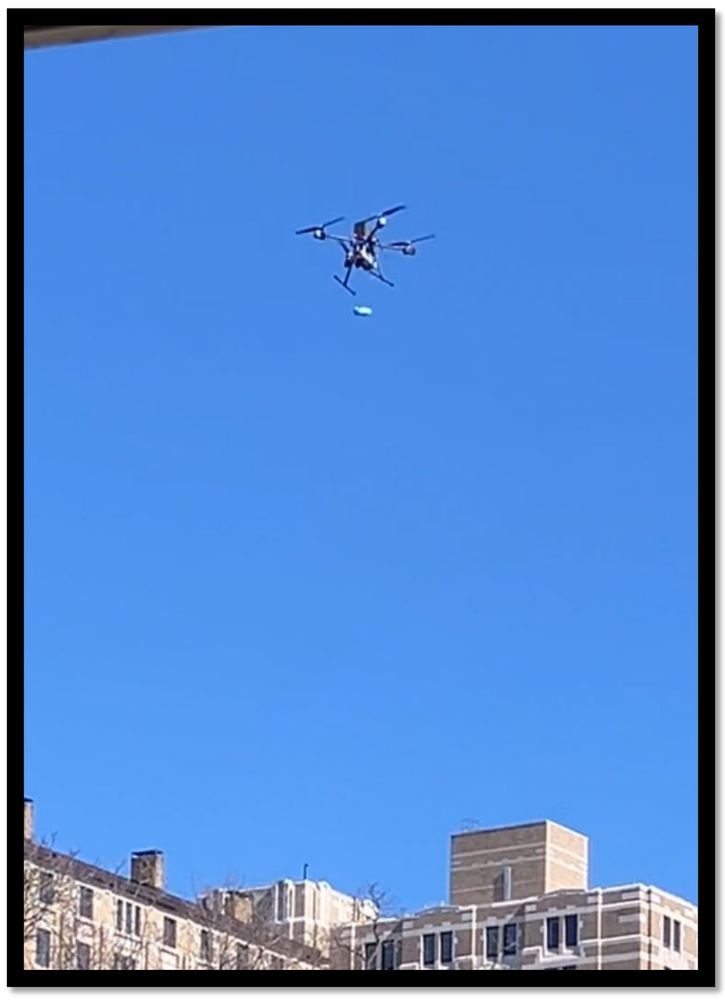


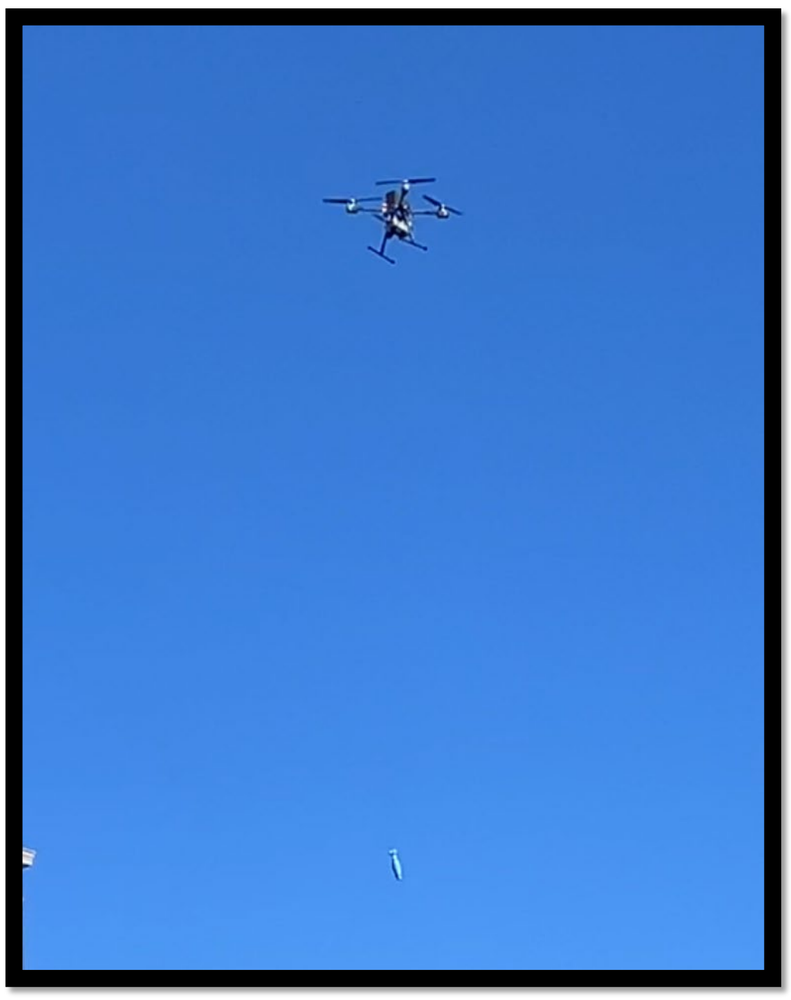
State Diagram



Requirements vs. Results

10m MILES Blast Radius	→	Achieved 12m trigger radius
3m Simulated Airburst	→	Radar reliably triggered at 2.8m – 3.2m
Survives ~100m Drop	→	Survived 5 drops at 30m





← Dropping Mechanism

Bill of Materials

Item	Quantity	Price
Microcontoller	1	$ 16.95
Radar Board	1	$ 22.20
Radar Lens	1	$ 37.50
Voltage Regulators	2	$ 2.86
MOSFETS	7	$ 2.48
IR LEDs	12	$ 26.62
RGB LEDs	3	$ 2.21
Resistors	9	$ 3.06
Switches	3	$ 4.62
Foam	68 oz	$ 11.08
Circuit Boards	4	$ 24.26
3D Prints	4	$ 2.54
Polycarbonate Tube	1 ft	$ 6.98
3s Battery	1	$ 13.27
Total		**$ 176.63**

Future Work

Drop Testing

- Conduct repeated drop tests up to 100m
- Evaluate impact reliability and activation consistency
- Ensure Nose-first impact orientation

Continued Field Testing

- Test in realistic training environments
- Assess effectiveness with MILES integration at various angles
- Gather user feedback