

# Motor-Assisted Sled for Sled Hockey

Team 12

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## Need

Many young sled hockey players or players with certain disabilities do not have the upper body strength to push themselves on the ice.

“There are currently more kids who can’t participate in sled hockey than who can. With 3000 current sled hockey players in the U.S., this device can more than double that figure.” – Norm Page, former USA Sled Hockey National Representative

## Design Input

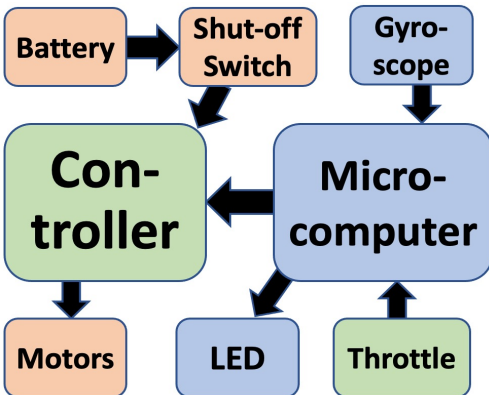
**Environment** - Perform in a cold (40F) and wet environment (IP55)

**Propulsion** – Max velocity: 2.9-3.25 m/s, acceleration: 0.77+/-0.2 m/s<sup>2</sup>

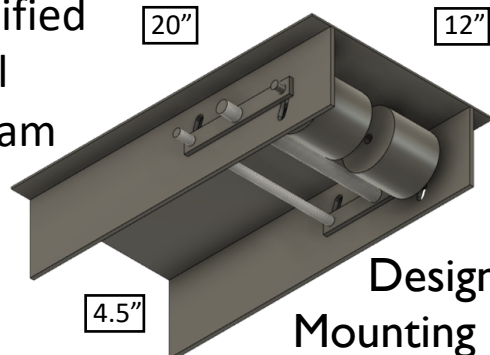
**Balance** - Player can maneuver with ease and without interference from motorized modifications

**Failsafe** - No extra exposure to injury during play & power shut off in the event of tipping

## Solution Design



Simplified  
Signal  
Diagram

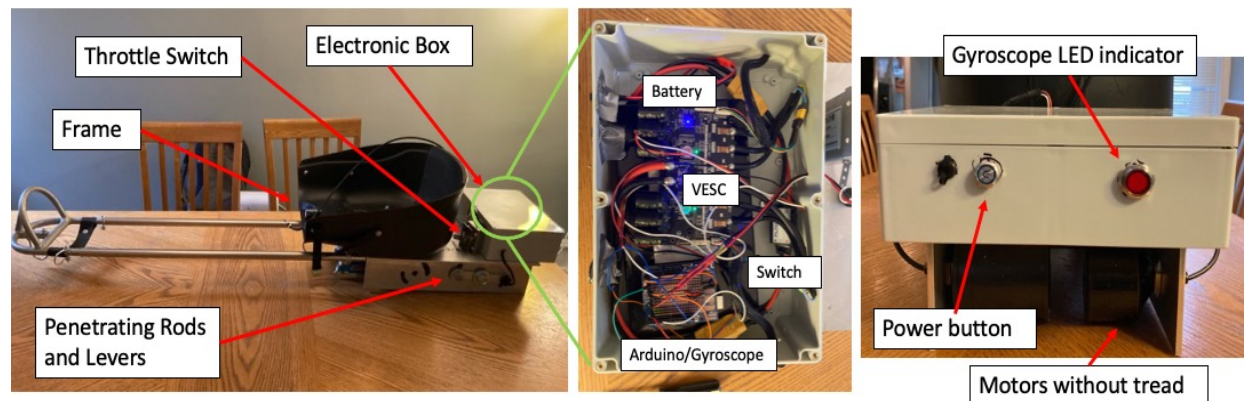


CAD  
Design of Motor  
Mounting Frame (in)

## Solution Build

A first of its kind electrically-powered device that takes advantage of advancements in small-scale electronic propulsion technology.

Easier access to specialized components allowed for a **lightweight, customizable, durable, electric-powered solution** to enable a more diverse population to engage in the sport.



## Testing Results

Propulsion Test	Battery Life Test	Tip-Over Safety Test
Distance: 65ft	Battery Run Time: 15 Minutes	Ideal Shut Off Angle: 30 Degrees
Max Velocity: 4.41 m/s ✓	Battery Voltage Used: 0.7V (3%) ✓	Mean Difference (Ideal vs. Actual) Shut off Angle: 11.4 Degrees ✗
Avg. Acceleration: .55 m/s <sup>2</sup> ✗		

## Summary

This sled can provide **independence and involvement** to youth players. Possible improvements include a lighter, more ergonomic frame and more consistent micro-processor.