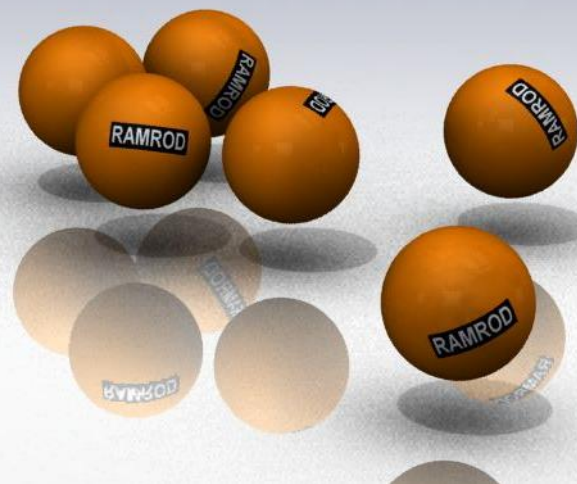
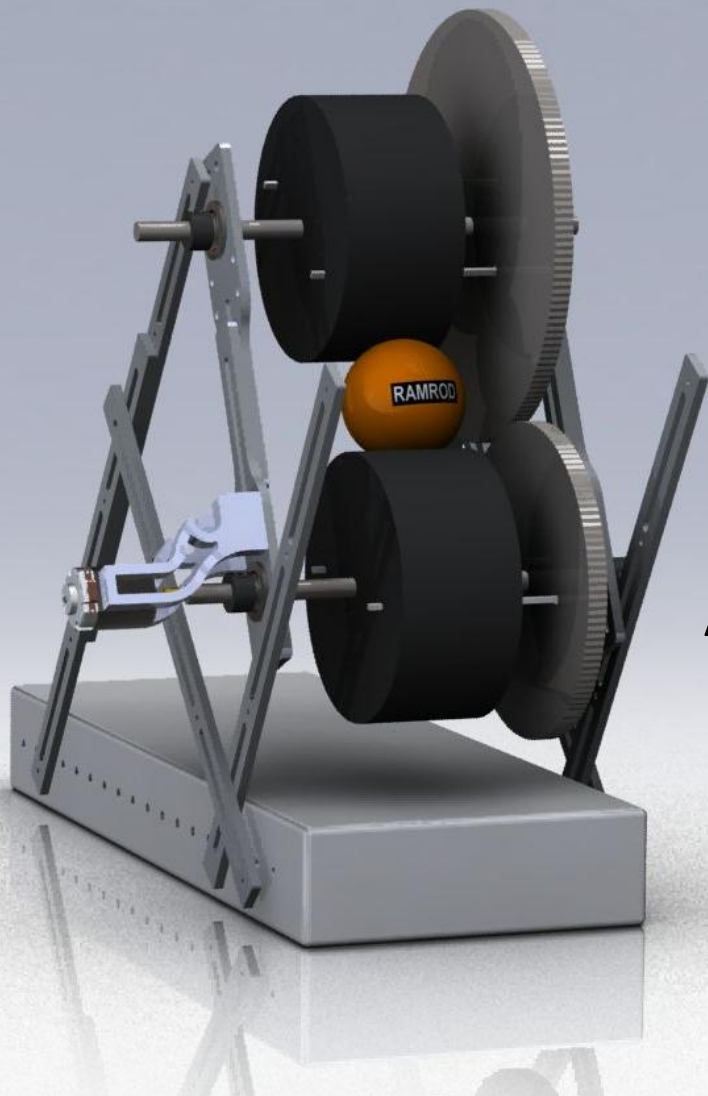




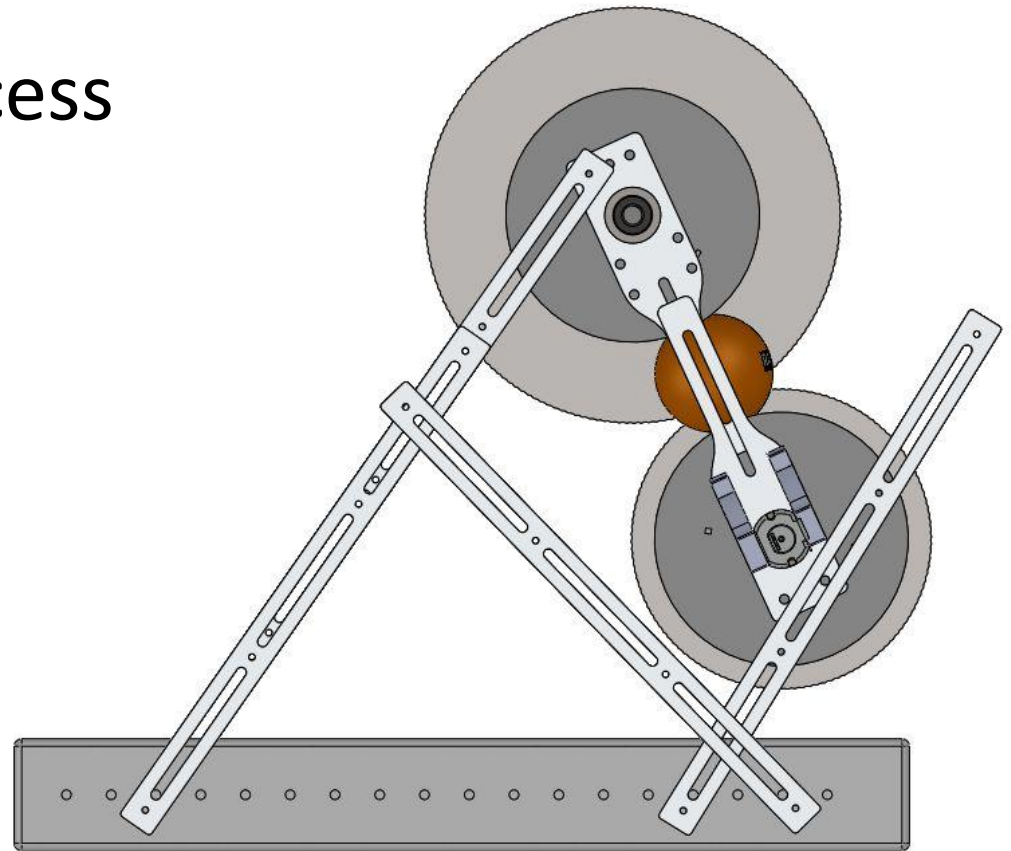
Team Ramrod

Charles Atlar
Tim Ballas
Adam Brigantic
Greg Kelley
JP Robocker



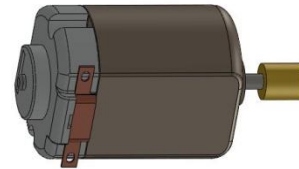
Overview

- Design Process
- Manufacturing Process
- Building Process
- Rebuild Process
- Cost Breakdown
- Results



Design Criteria

- Motor/Battery constraint



- Realistic Ping Pong Ball server
 - Random Serve position
 - High speed with backspin
- Simplistic design
- Within \$50 budget



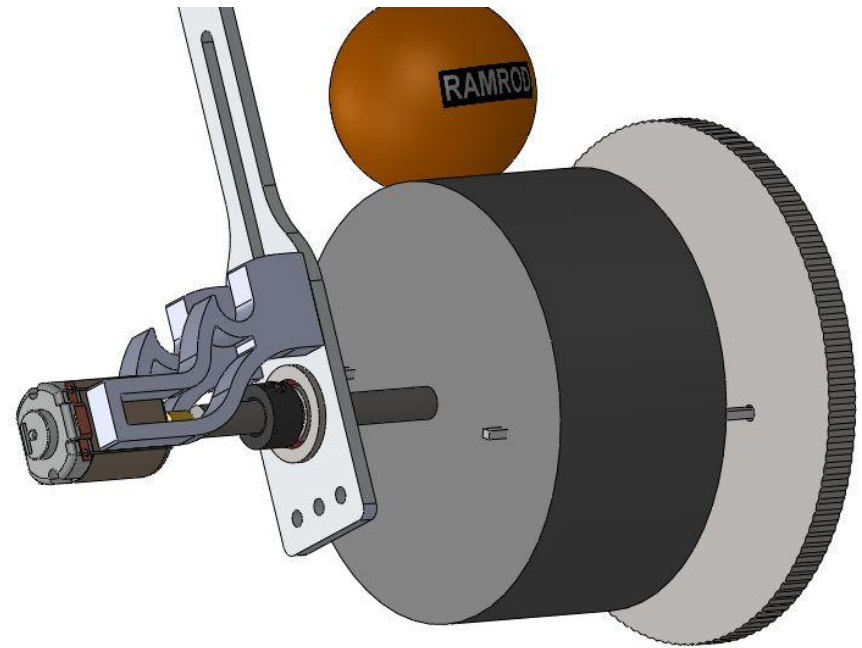
Design Process

Selected design: Pitching machine

- Heavy gears
- Simple design
- Induce ball spin
- Spare parts on available
- Ease of use

Method

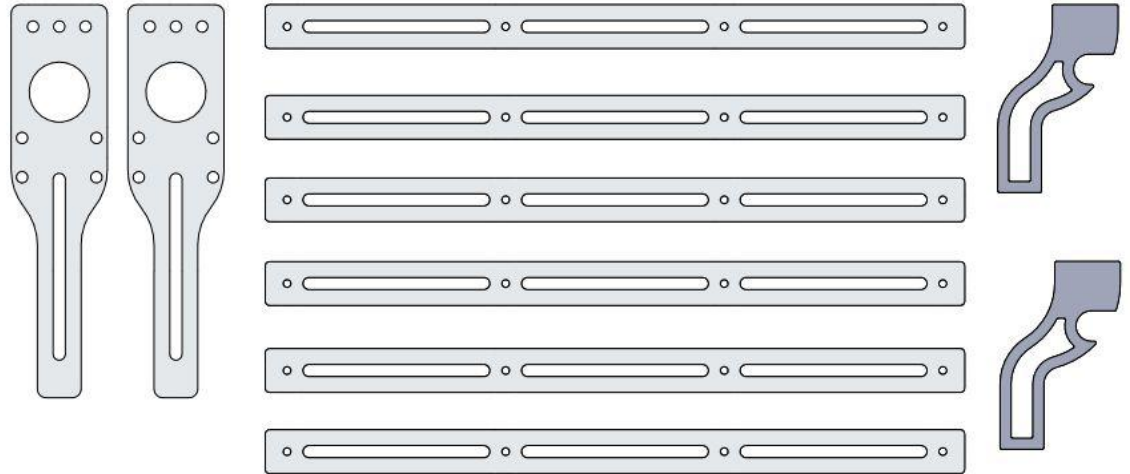
- Design with Solid modeling
- Machine parts
- Assemble



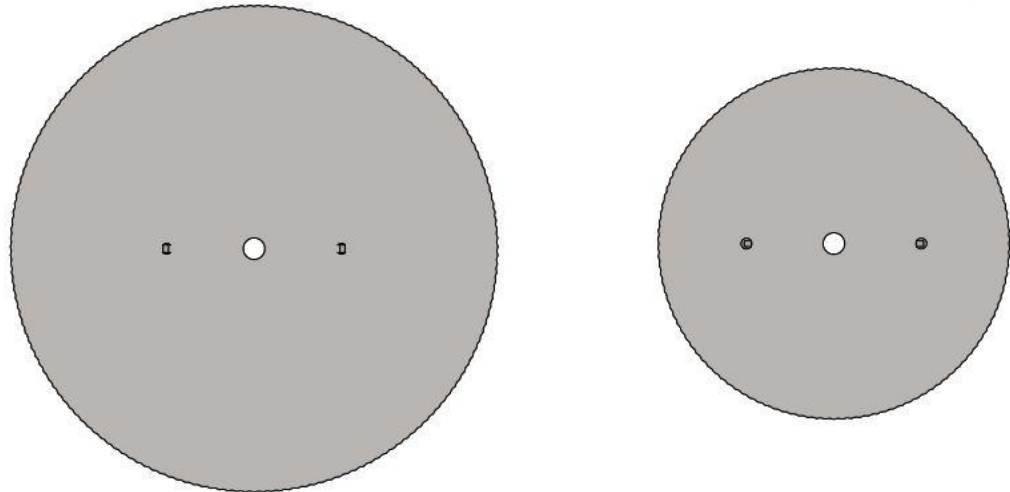
Manufacturing process

Water jetted parts

- Cheap
- Accurate



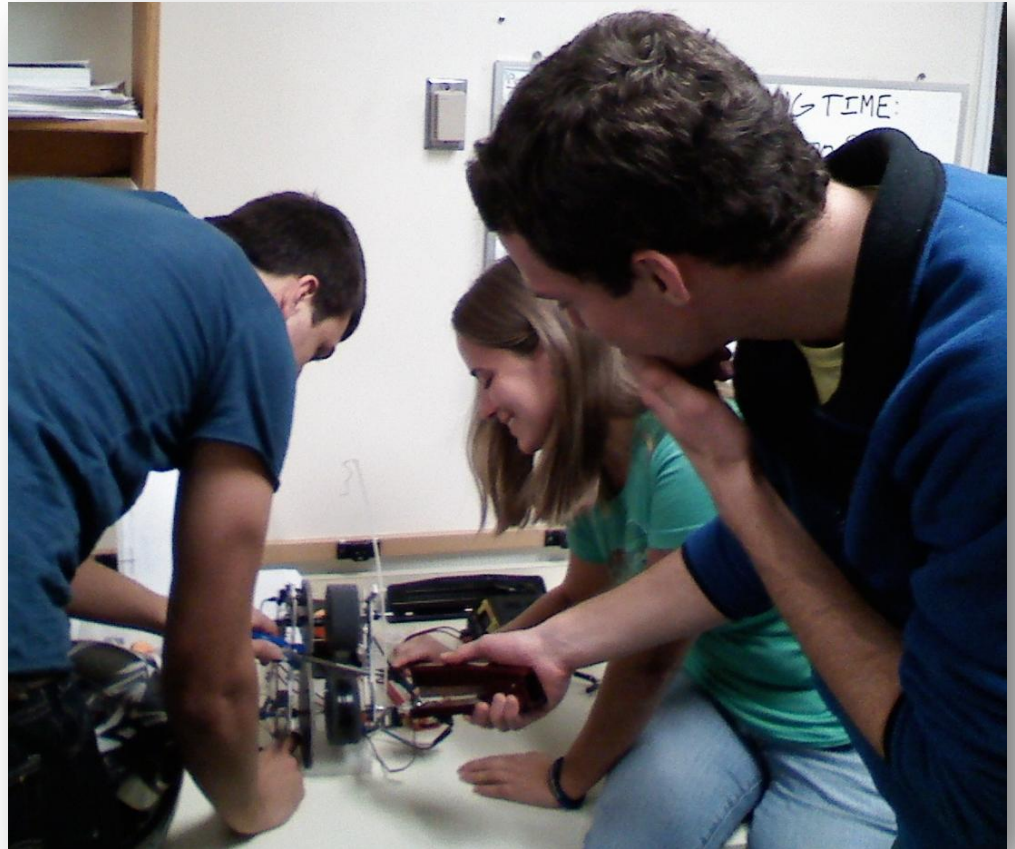
- Manufacturing delay due to N1H1 Pandemic



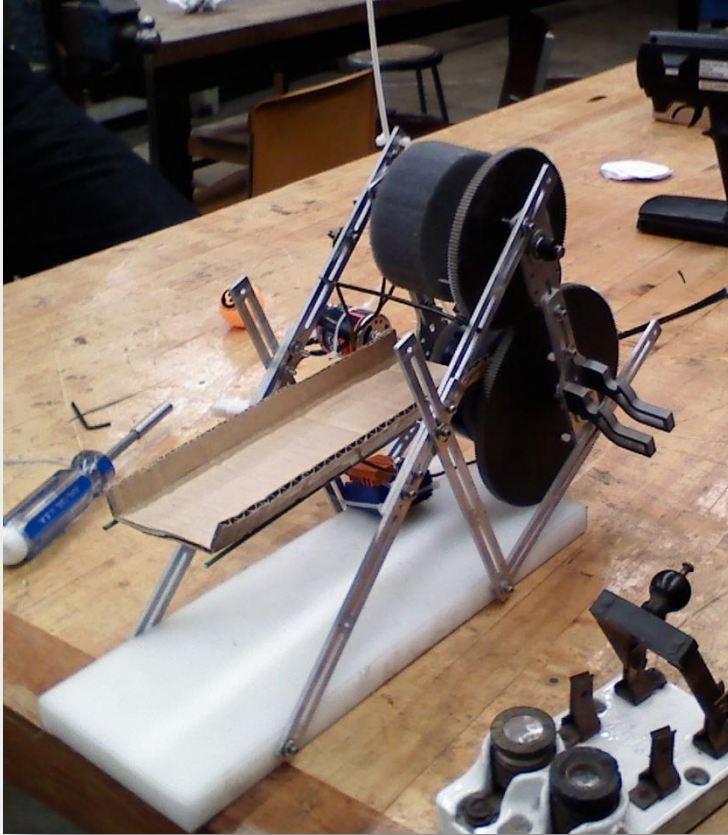
The Build

Assembled as planned

- Drilled & tapped screw holes
- Attach motor mounts
- Press in Bearings
- Cut Axles

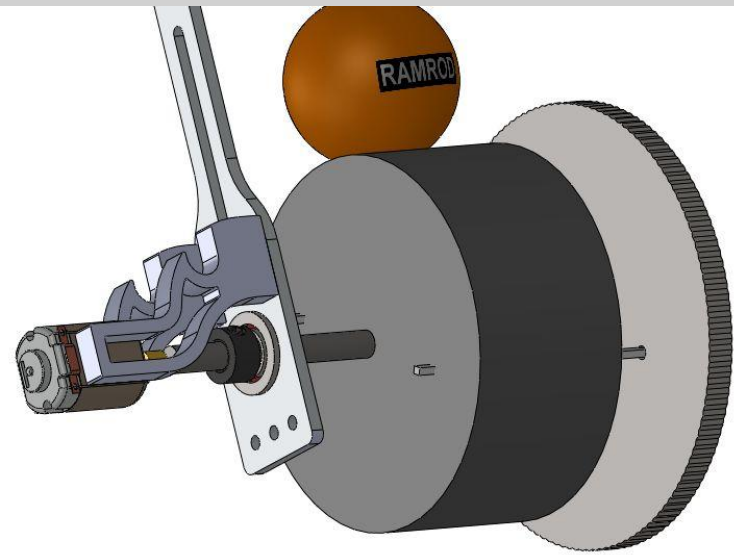


The Build

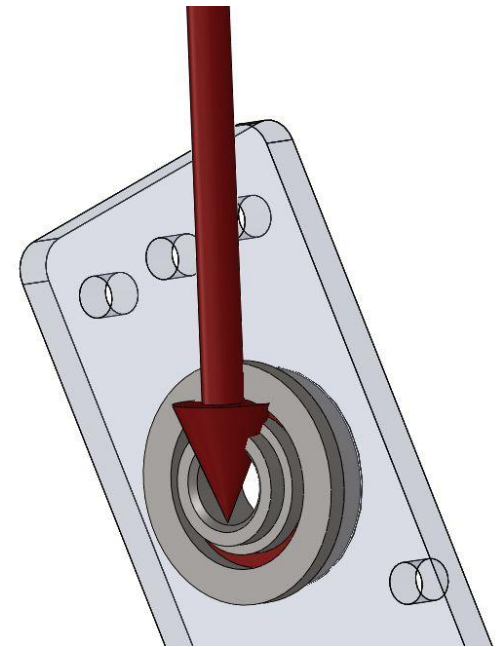
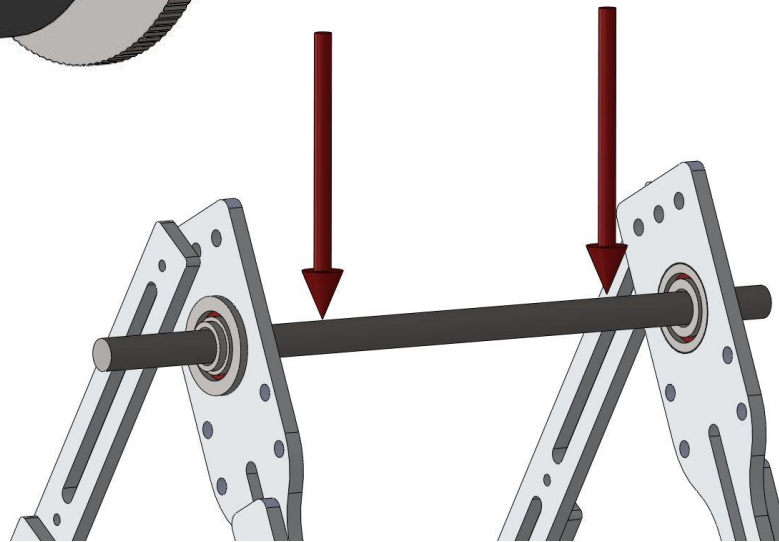


- Slow feeding mechanism desired using gravity and vibration
- An ideal hopper could not be developed in time for demonstration

The Build

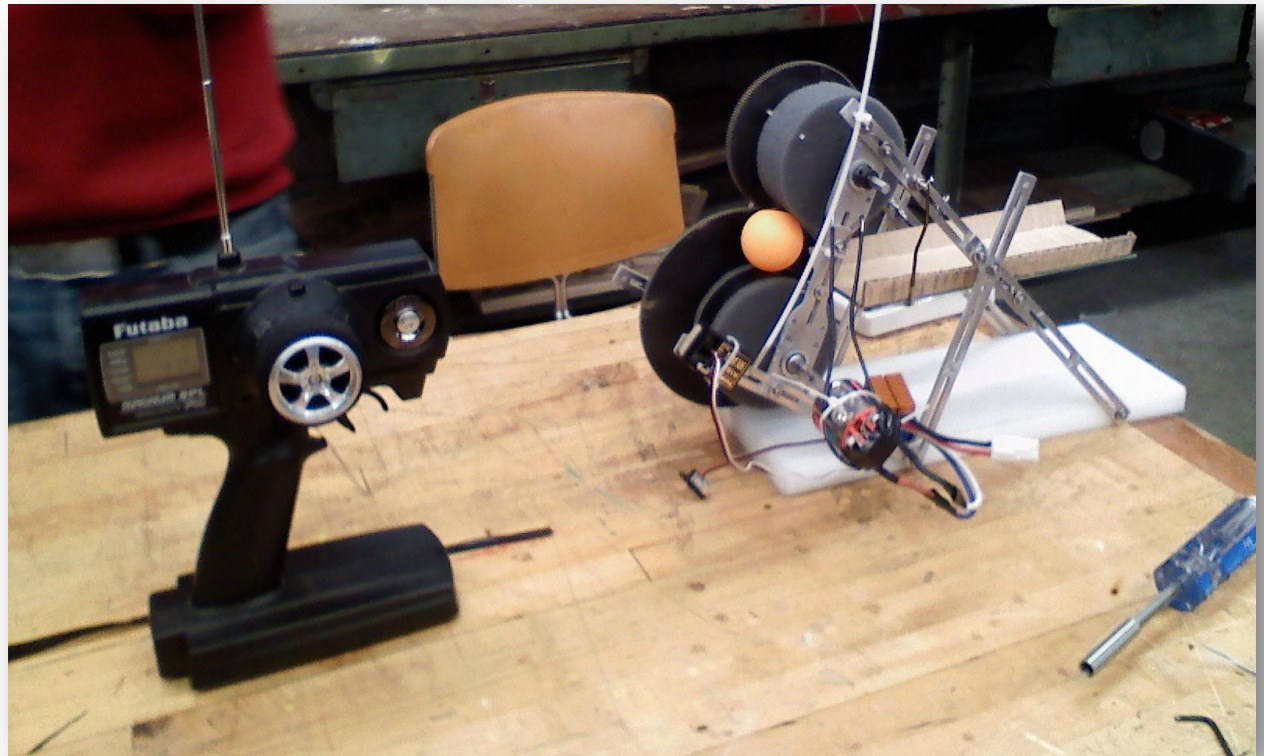


Motor too weak



The Rebuild

- Bigger motor
- Bigger battery



Cost and Time

• Shop costs	\$40
• Motor	\$3
• Batteries	\$4
• Group Hours	20
• Total	\$47
	20 Hours



Overview



- Very realistic ping pong ball serve
- Simple design
- Within budget
 - Did not work with original motor and battery

Questions?

