

# Updated Project Plan: Self-Leveling Stow-Away Pool Table



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# Background

- Been around for hundreds of years
- Not just a table with rails; precise craftsmanship is required
- Popular all around the world
- Competitive sport or game of leisure



# Problem Statement

## Pool Tables:

- must be extremely level
- require leveling if moved
- take up an entire room
- are heavy and difficult to move



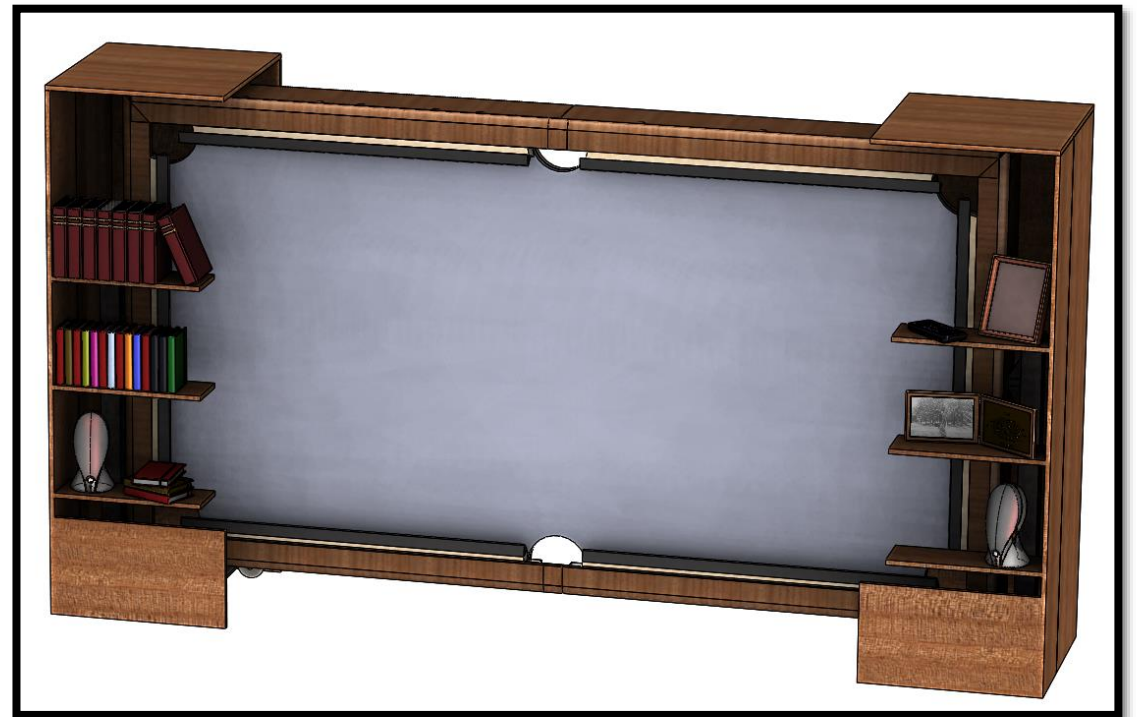
**Dedicated gaming room**

# Project Goals

- Reduce footprint by 75%
- Level table in 5 minutes
- Stow table away easily by one person
- Control height of table with buttons
- Tournament regulation dimensions

# Project Concept

- Reinforced steel frame/rail assembly
- Motor controlled extending legs
- Mechatronics system
- Dolly system for moving table
- Multi-use stow-away housing





# Why a self-leveling system?

- Moving a pool table requires professional help
- Price to move and re-level: \$300
- Self-leveling system is safe, quick and easy.



**Pool table being leveled by a professional**

# Self-Leveling System Design

- 333lb load capacity Linear actuators
- Power actuators according to inclinometer
- Control height and level by simple buttons

# Self-Leveling System Component Testing

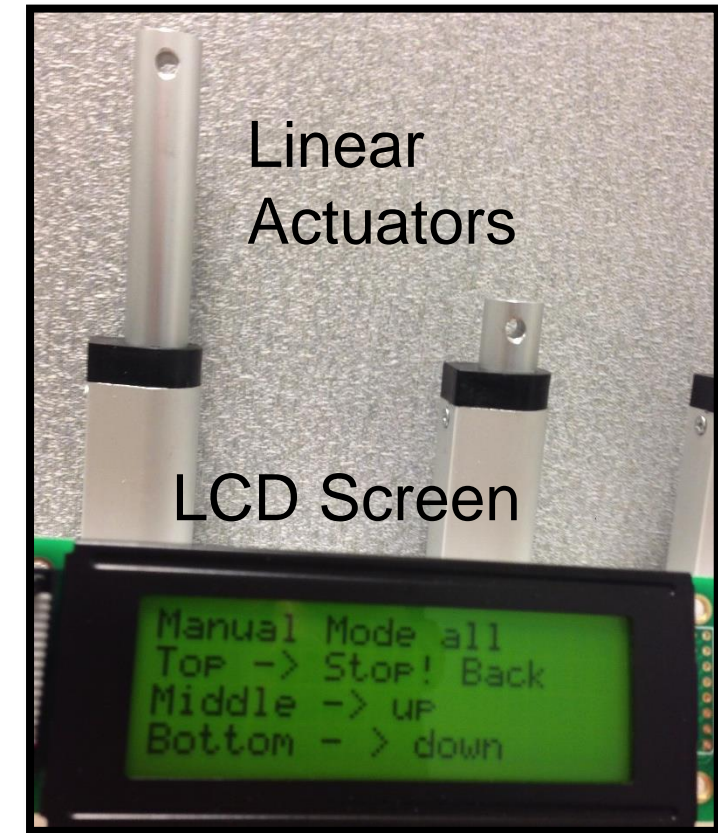
- ✓ Orangutan X2 micro-controller
- ✓ Atmel VNH2SP30-E motor drivers
- ✓ Linear actuators
- ✓ Inclinator
- ✓ Wires
- ✓ Power adapter
- ✓ Atmel Studio 6.2





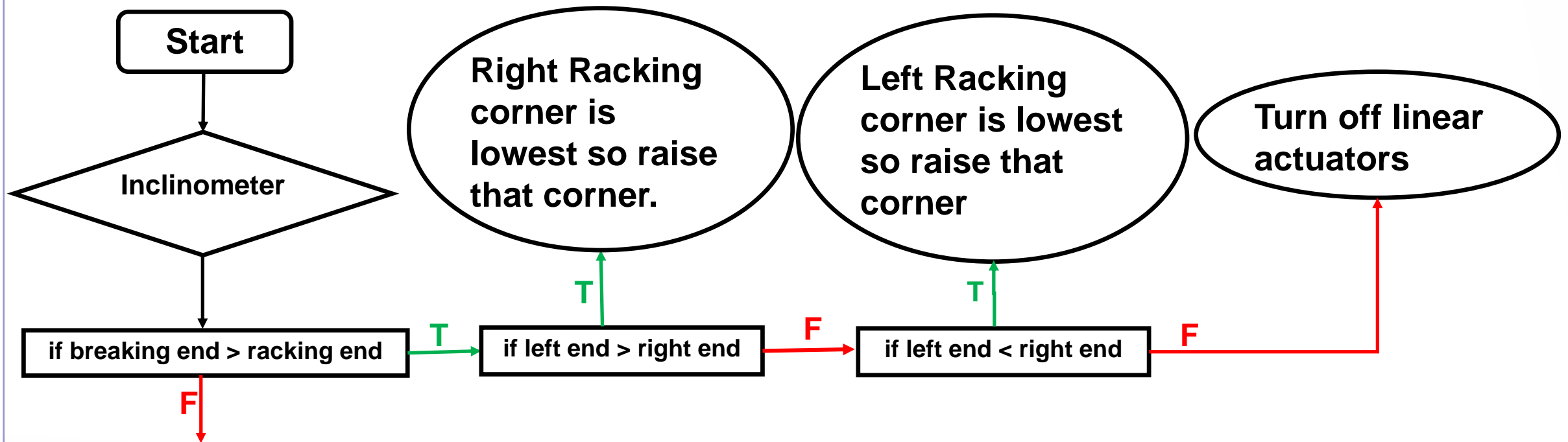
# Initial Testing Phases

- ✓ Basic controller tests
- ✓ Controller-motor interaction
- ✓ Control motors with buttons
- ✓ LCD output
- ✓ Reading sensor output
- ✓ Second motor driver



# Leveling Algorithm Development

- Most time consuming process
- Requires repeated testing and reprogramming

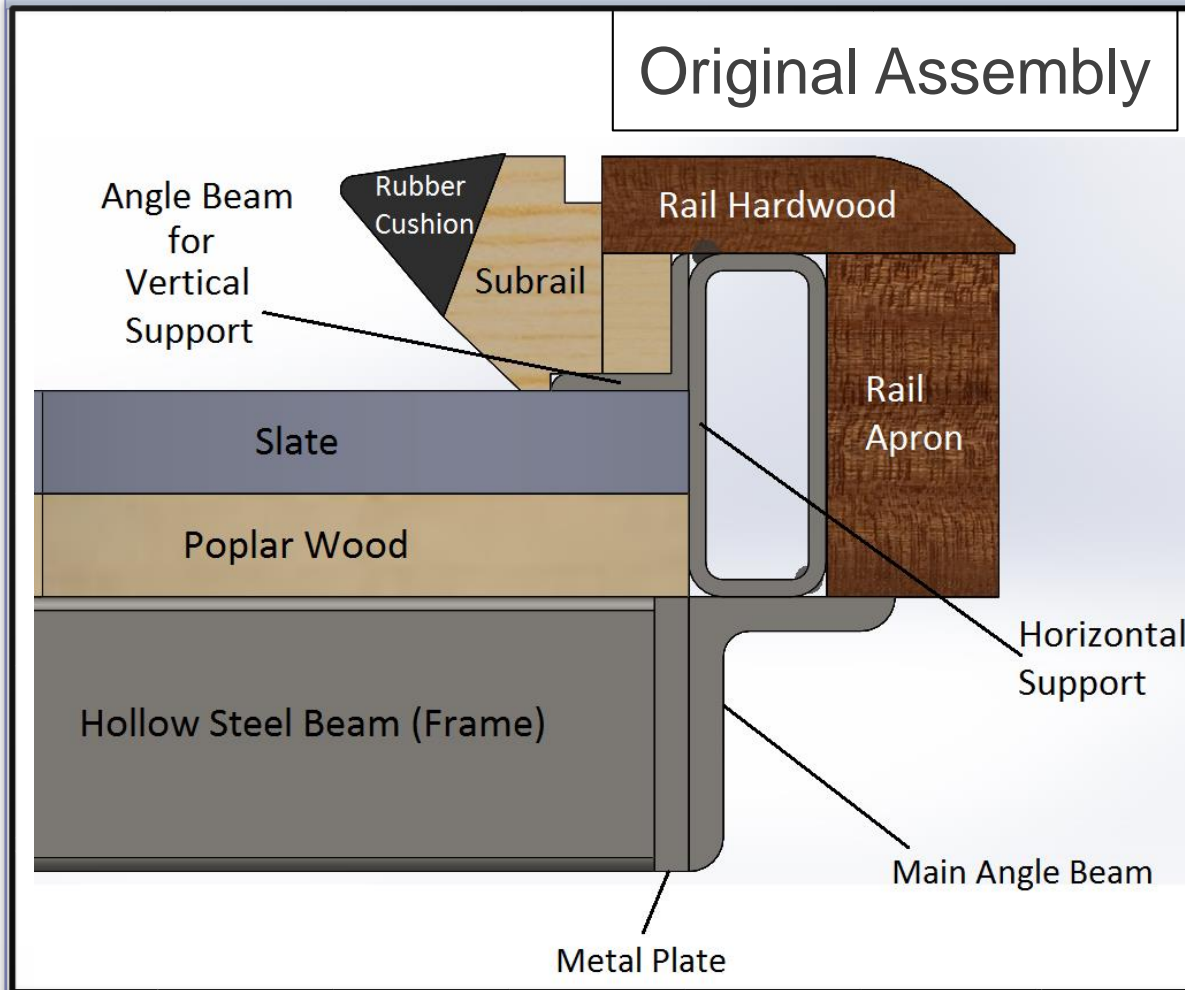


# Building Progress

- ✓ Finalize frame & rail assembly designs
- ✓ Frame components ordered
- ✓ Wood picked up from lumber company
- ✓ Fabricate wooden slate backing
- ✓ Frame materials transported to machine shop for fabrication

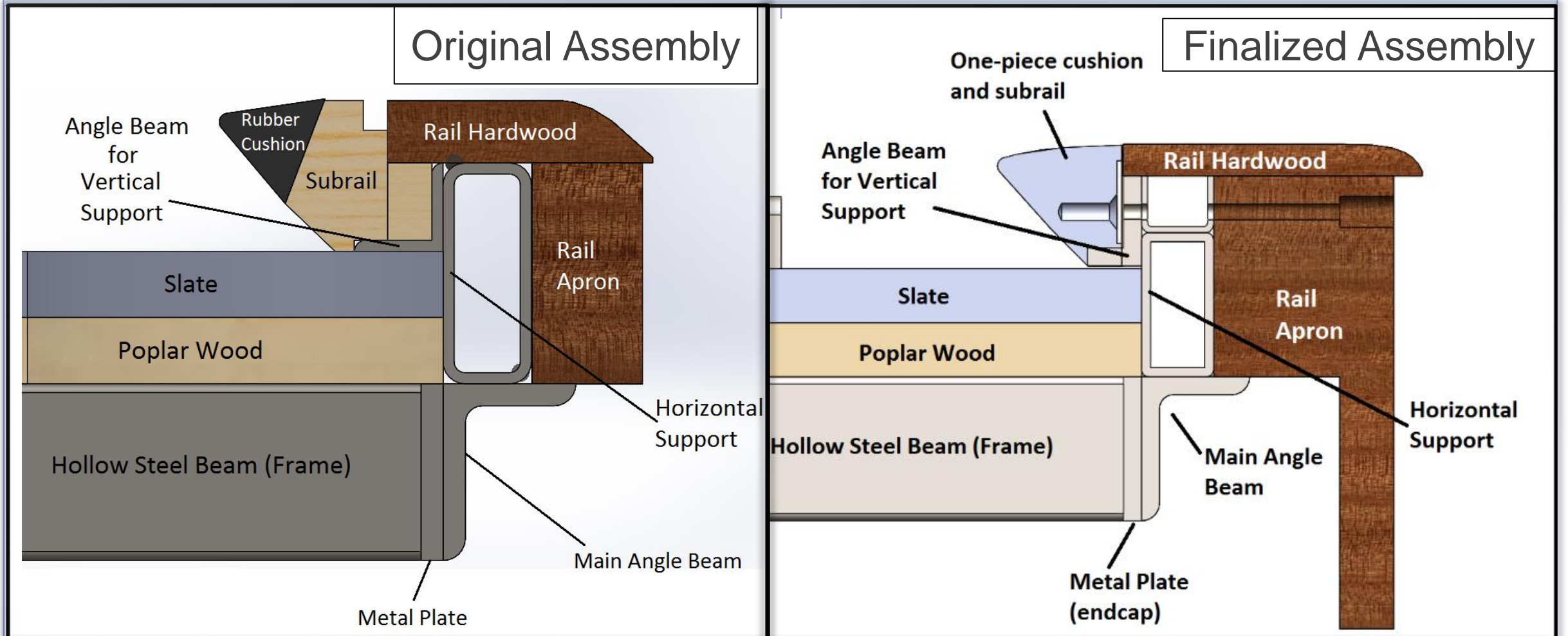


# Rail Subassembly Finalized





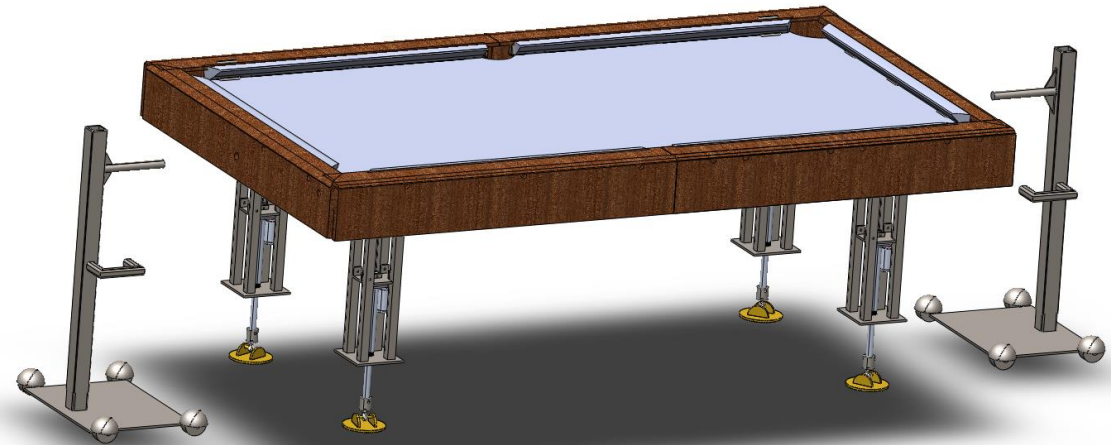
# Rail Subassembly Finalized





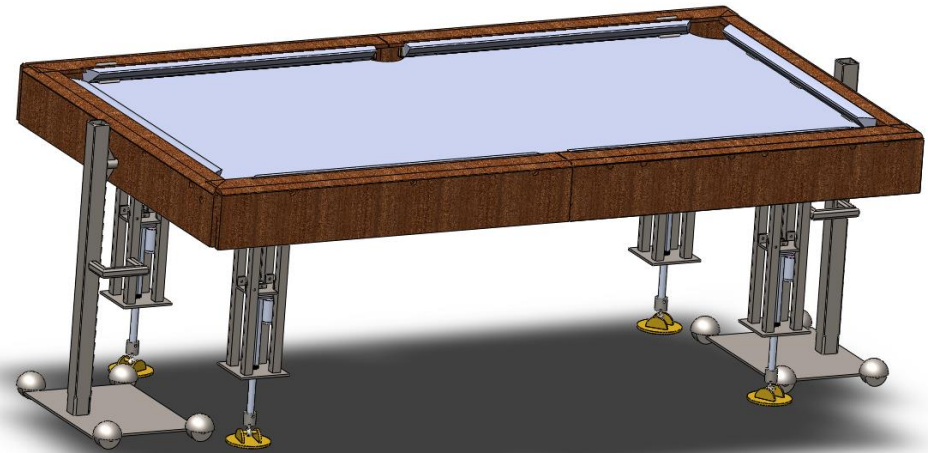
# Stow-Away Method

- Dollies brought to ends of pool table
- Table raised by linear actuators
- Dollies pushed into position
- Table legs lowered for table to be fully supported by pins
- Table rotation into vertical position
- Table legs are folded up
- Table pushed into housing unit for storage



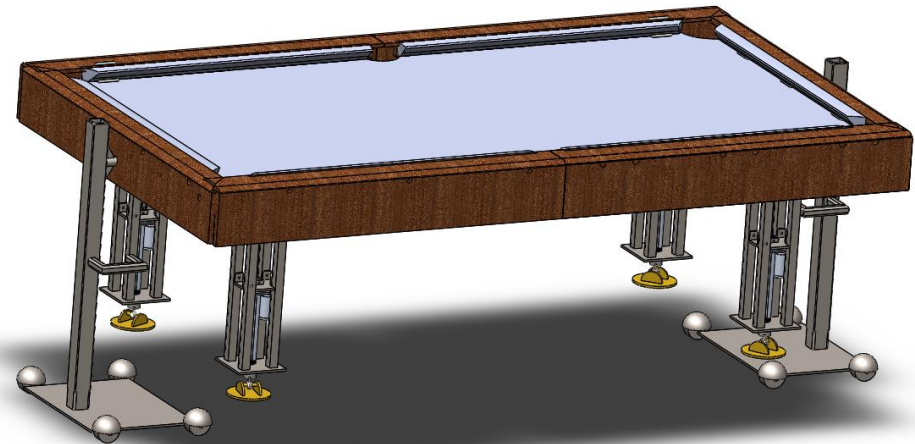
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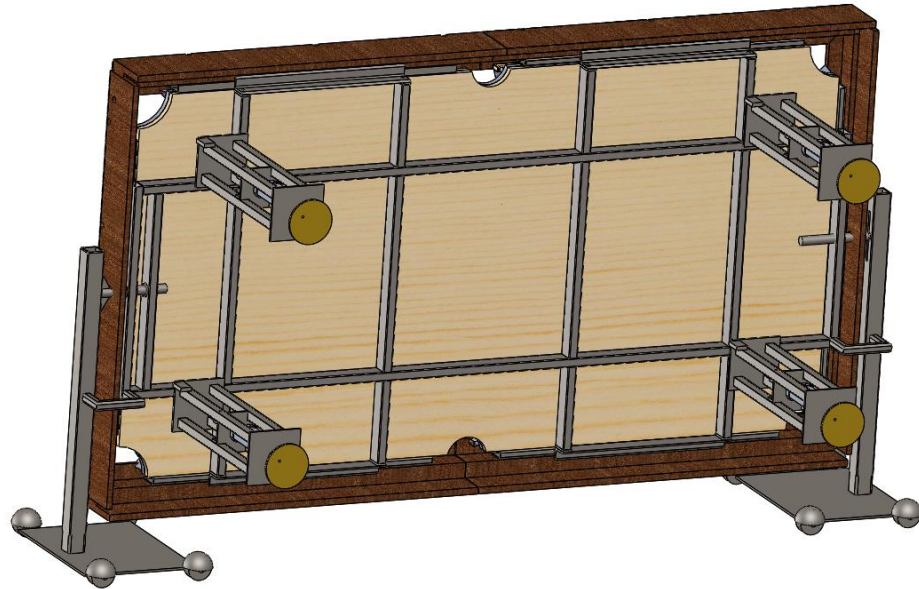
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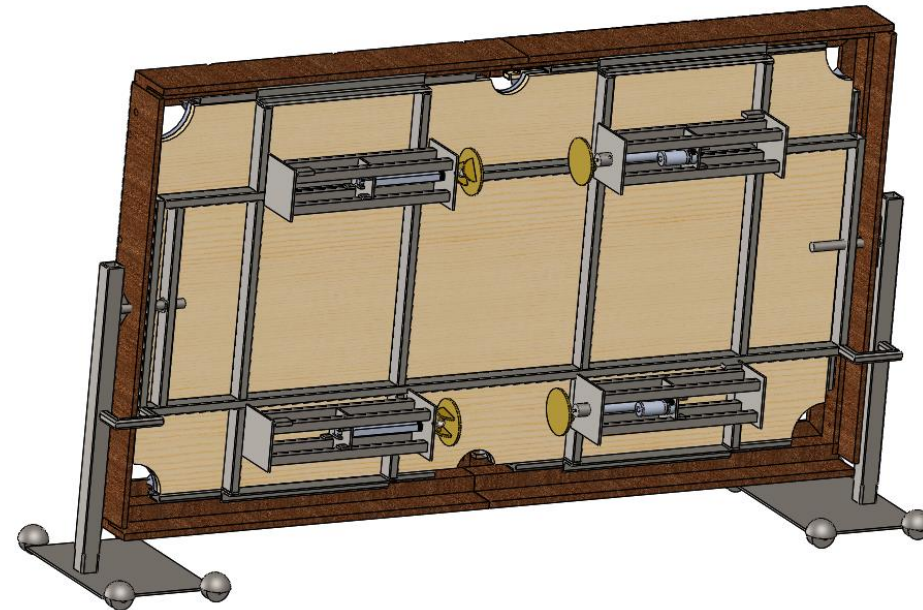
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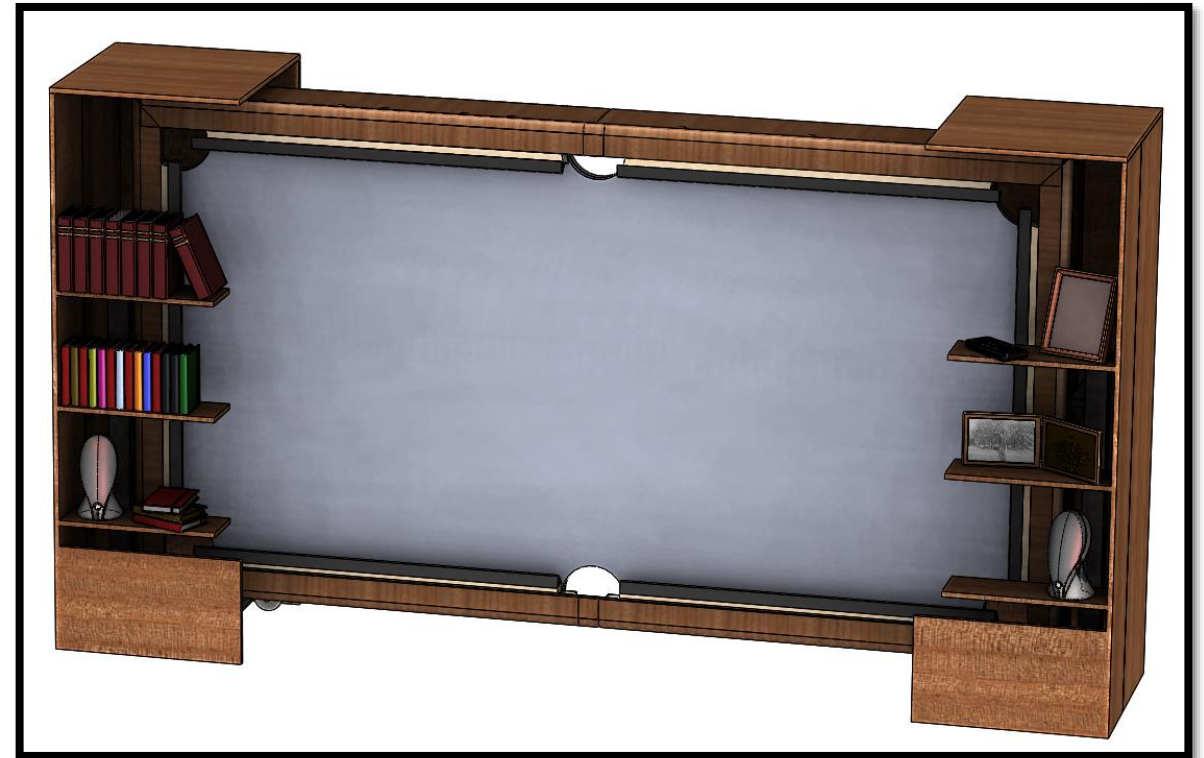
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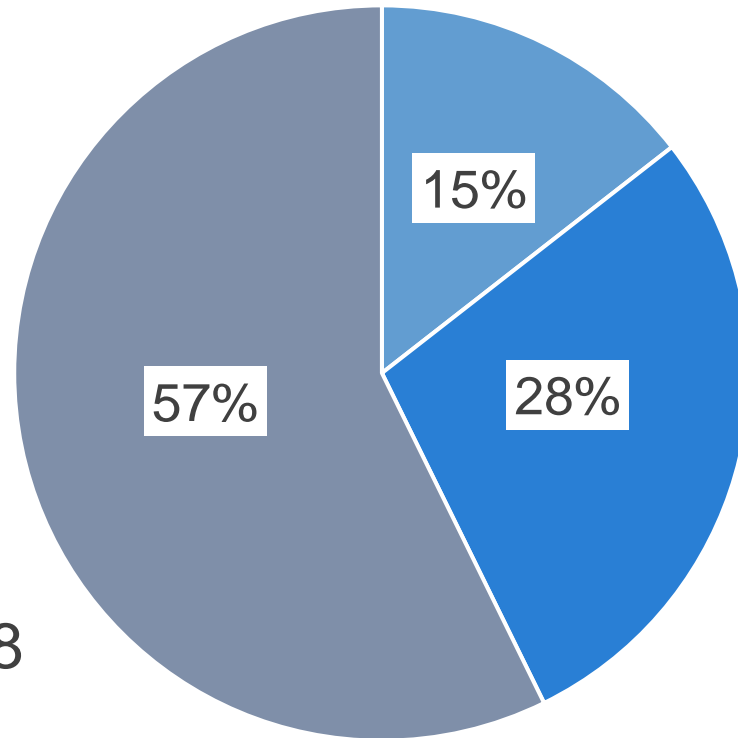
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# Budget Assessment

- Budget: \$5,000
- Spent: \$2,136.42
- Remaining: \$2,863.58



- Self-Leveling Components Cost
- Structural Construction Cost
- Remaining Budget

# Extended Goals

- IR range finder incorporation
- Modern graphic user interface
- Automated folding of the legs
- Dual purpose cabinets/housing
- Custom College of Engineering cloth

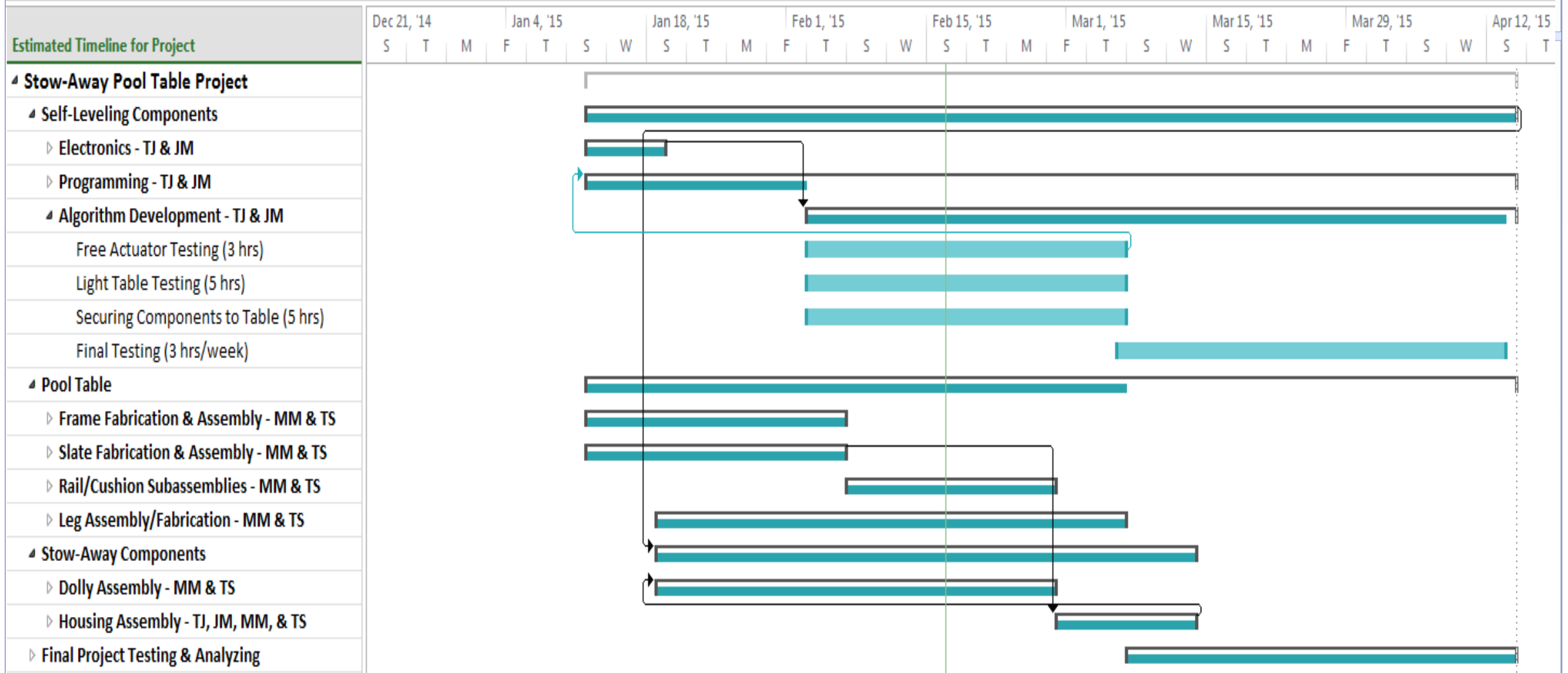


Infrared Range Finder

# Upcoming Work

- Further testing and debugging
- Fabrication
  - Legs
  - Frame
  - Dollies
- Assembly of Table

# Gantt Chart





# Questions?



# Leveling Demonstration

