

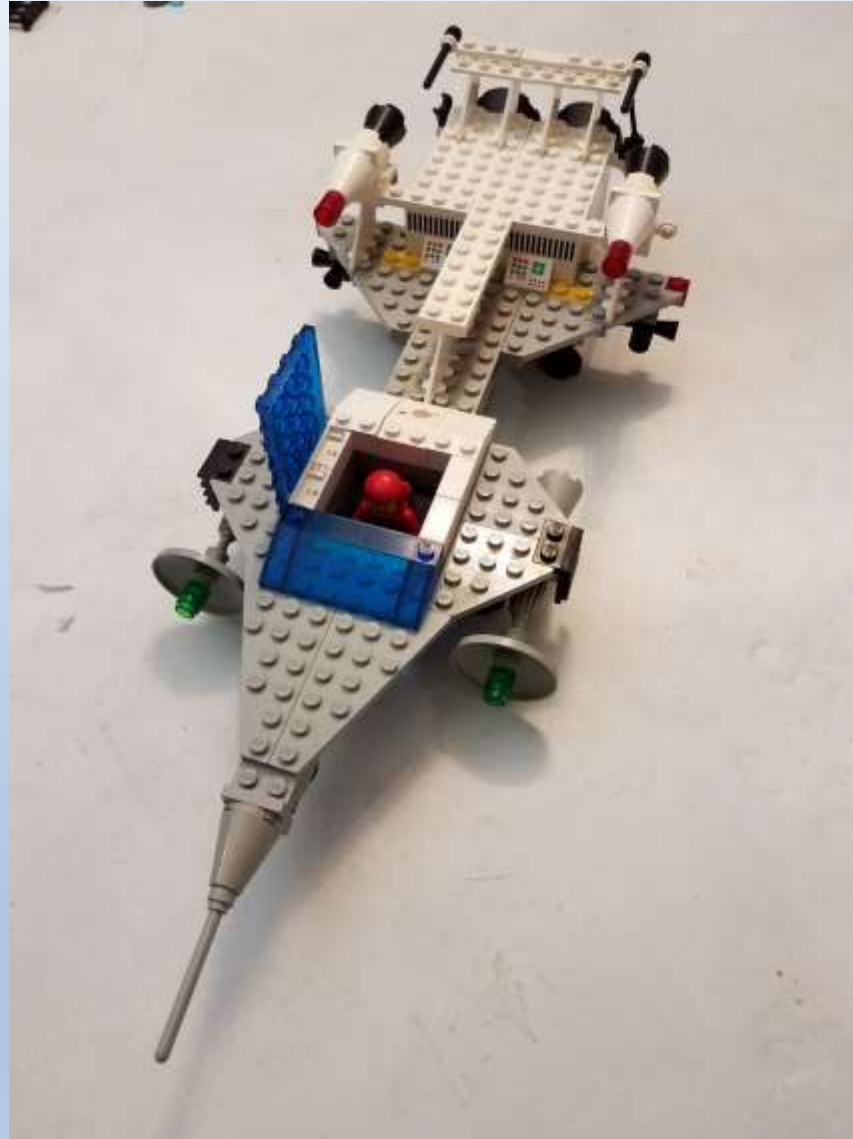
Building a Planetary Space Base



Agenda

- Who I am
- How I got here
- System Design
- Modular Platform Design
- Interconnect Design
- Platform Design
- Questions
- The Beginning

Lego Rediscovered



Lego at Work

- Testing glass resistance to a stylus
- Finding a Software Glitch caused by button press
- Mindstorms to the rescue
- HS Lego Robotics Club President as an Intern
- Liberal use of the Kragle

First Design

- Simple Design
- Used to show electronics
- Had Two Motors
- Simple LED Display



First Improvements

- First use of the platform
- Notice how black parts seem to disappear



First Multi-Platform Ideas



System Design

- Find a color scheme
- Parts are available in this color scheme
- Lighting, mostly an exercise in hiding wires
- LDraw when parts/colors aren't on hand



System Design

Color Scheme

- Structure colors
 - Tan (sand) as Main
 - Transparent Light Blue Glass as Secondary
- Main Accent Colors (muted)
 - Sand Green
 - Main accent
 - Used mostly to top off structures
 - Sand Blue
 - Secondary accent
 - Used mostly in power generation structures
- Secondary Accent Colors
 - Black
 - Depict infinite space
 - Part availability
 - Blue & Lime
 - Used in power generation

System Design

Using Black

- Black base disappears into the black cover
 - Gives the impression of floating
- Detail will disappear
 - Shadows disappear
 - Use where no detail is wanted
- Should only be used as an accent

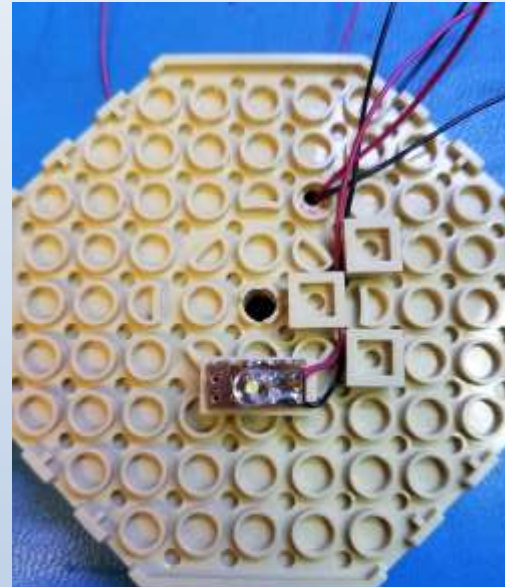
System Design

Lighting

- LEDs make it very easy, but can be difficult to use
 - Very small ones available, but difficult to use
 - Limiting resistor needed
 - What voltage to use
- Hiding wires
 - Very small wires that can go under bricks
 - To drill or not to drill
 - Building in channels to run wires

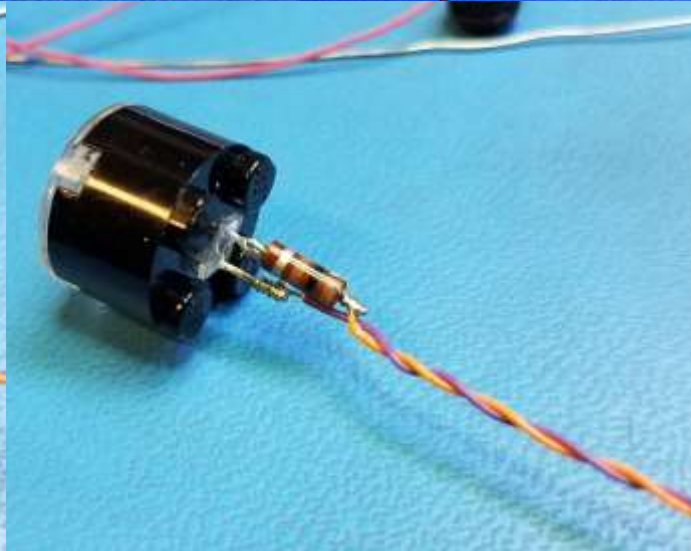
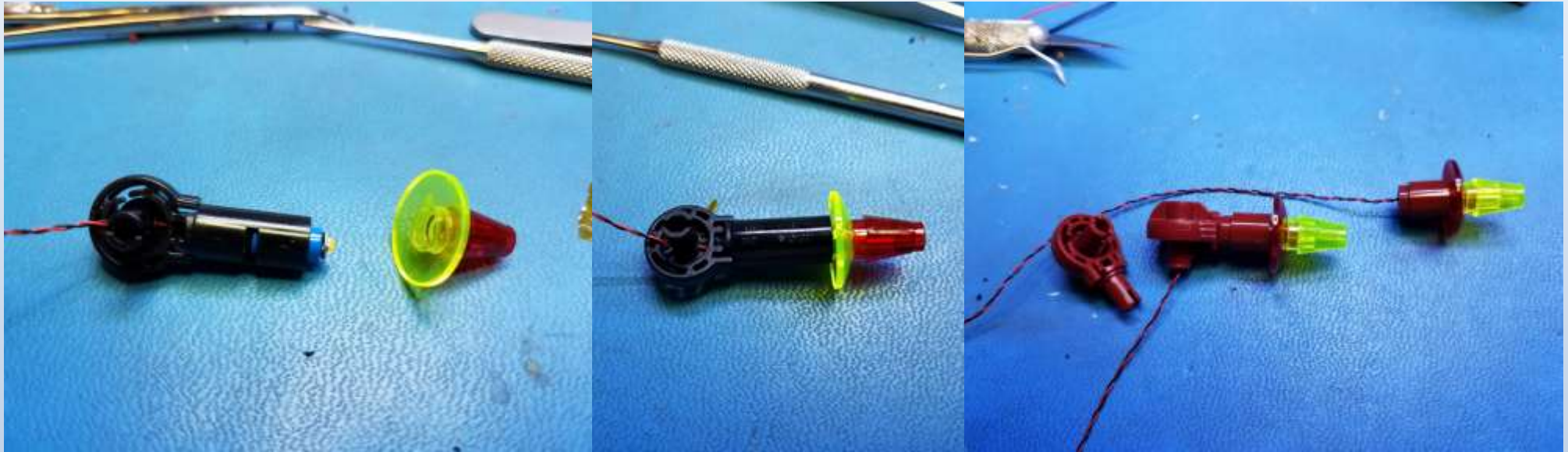
System Design

Lighting



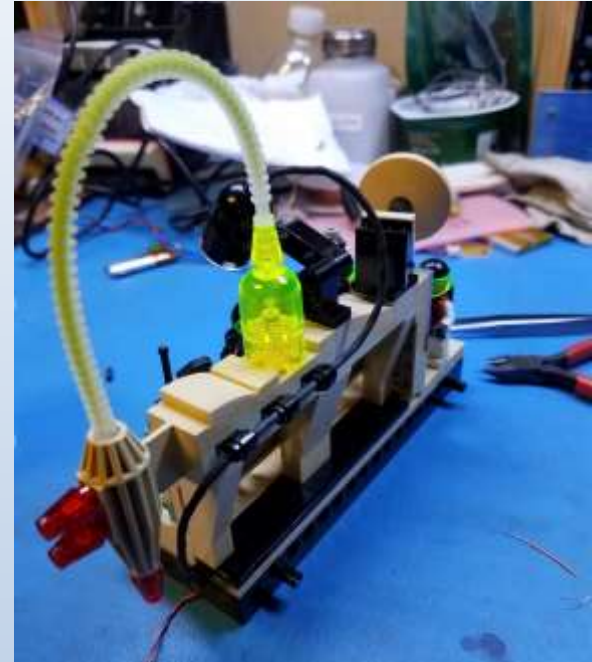
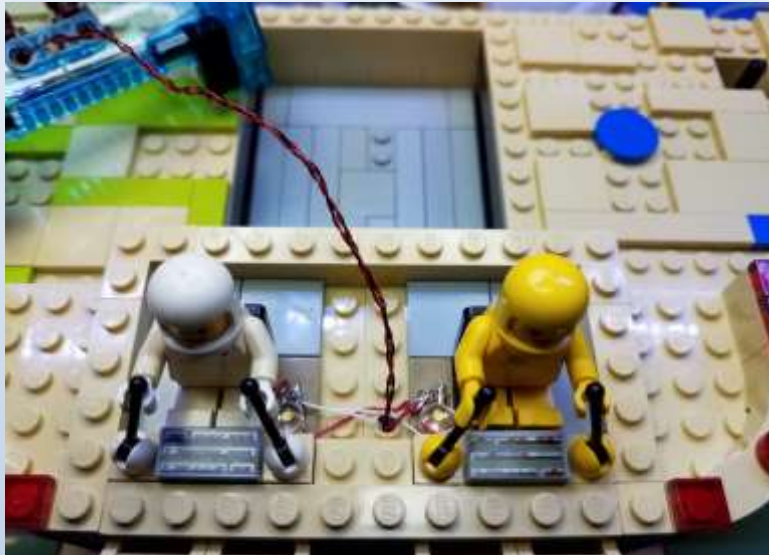
System Design

Lighting



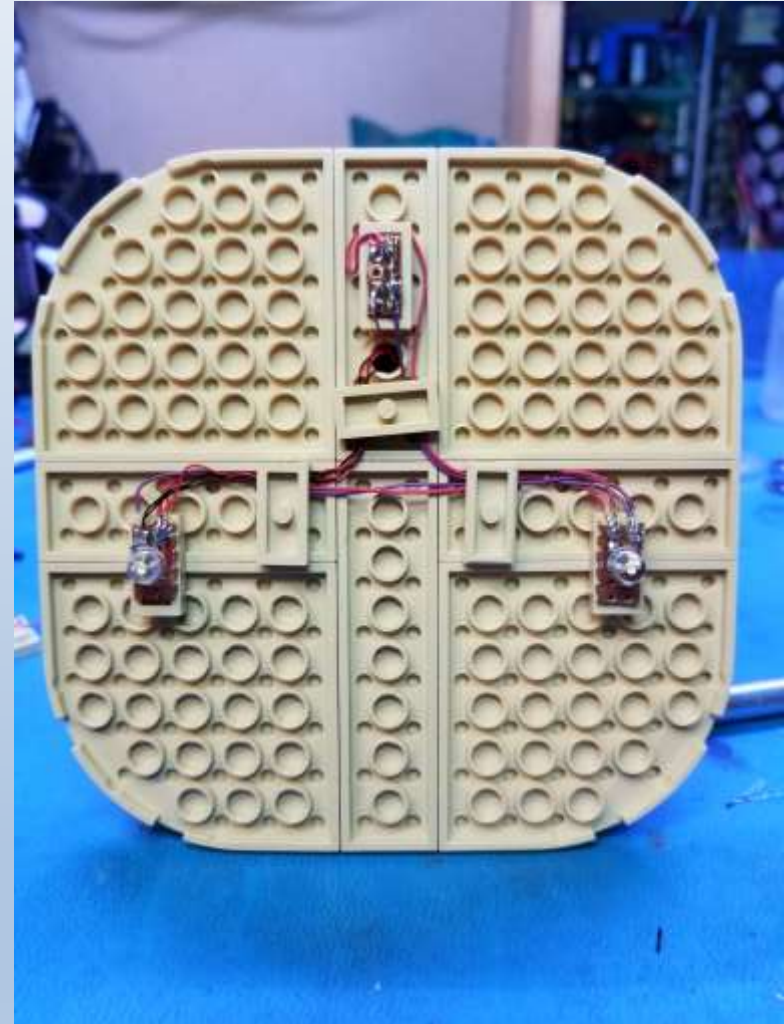
System Design

Lighting



System Design

Lighting



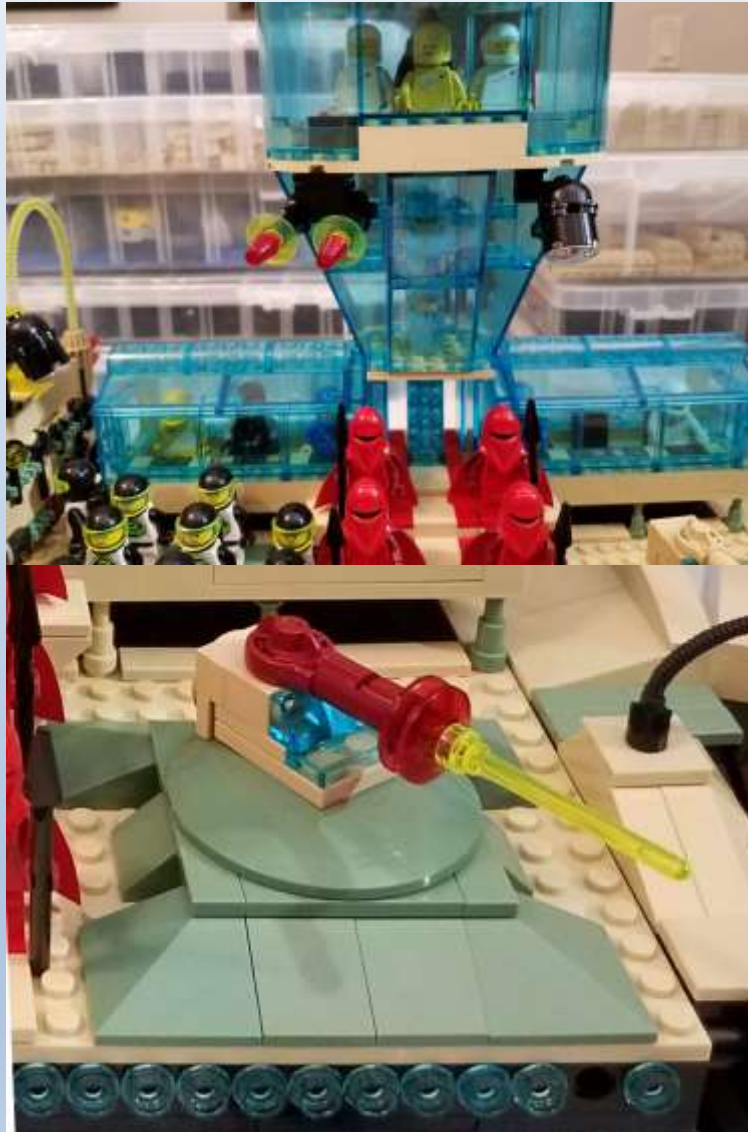
System Design

Detailing

- Create small but numerous scenes
- Shift observer focus
 - Begins at the macro level
 - Force shift to these small scenes
- Possible Approaches
 - Minifig Utensils and Tools
 - Hoses
 - Texture items

System Design

Detailing with Items



System Design

Detailing with Small Scene



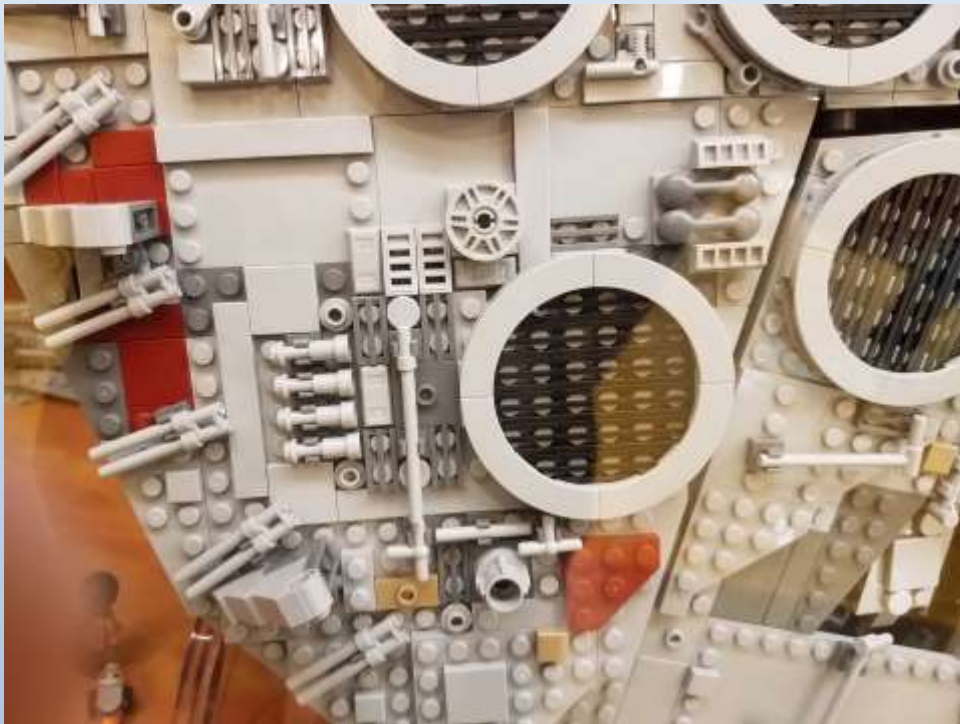
System Design

Detailing with Small Scenes



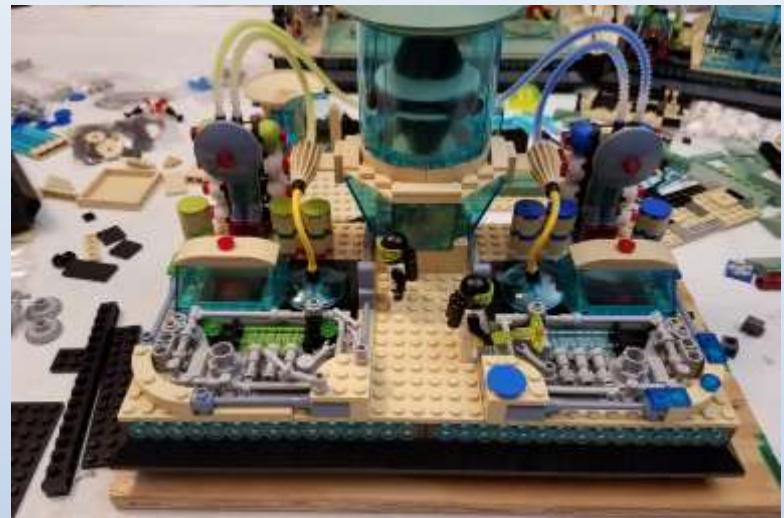
System Design

Detailing with Texture Inspiration

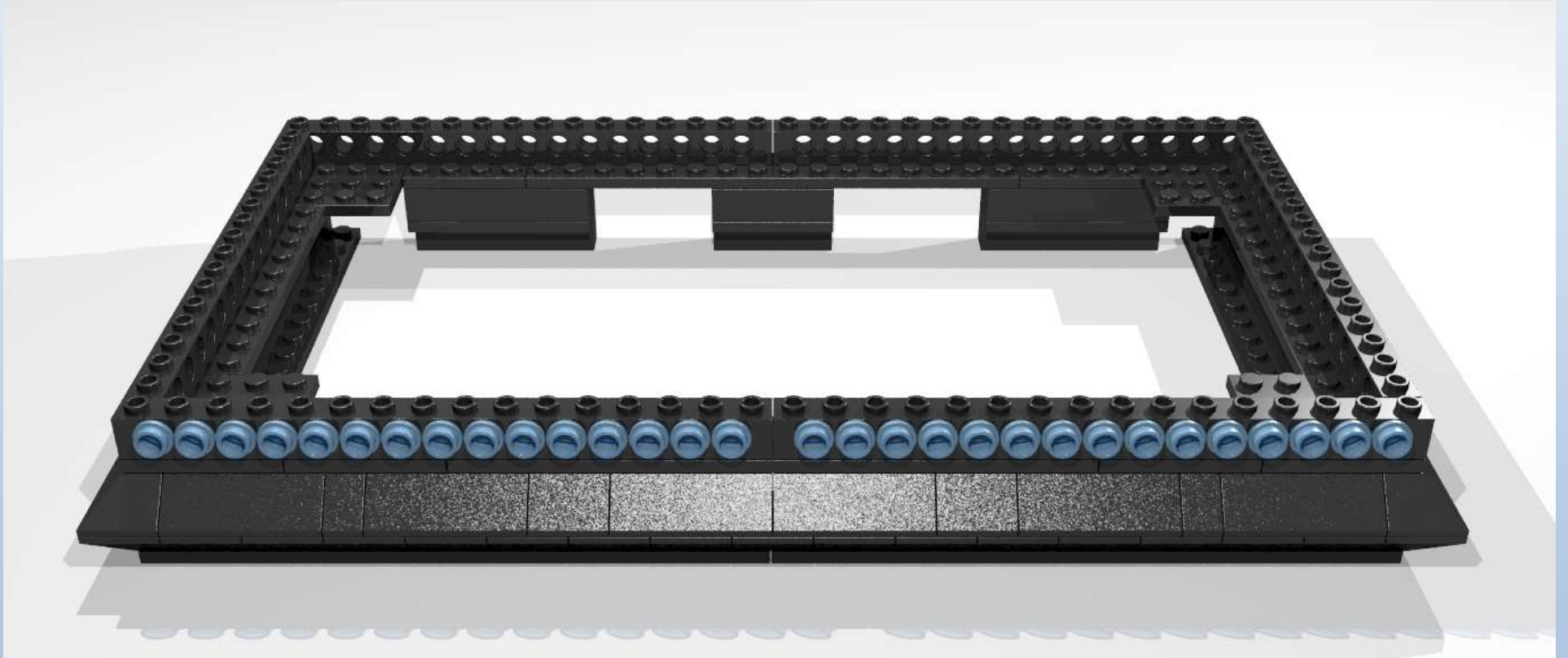


System Design

Detailing with Texture



Modular Platform Design



Modular Platform Design

Requirements

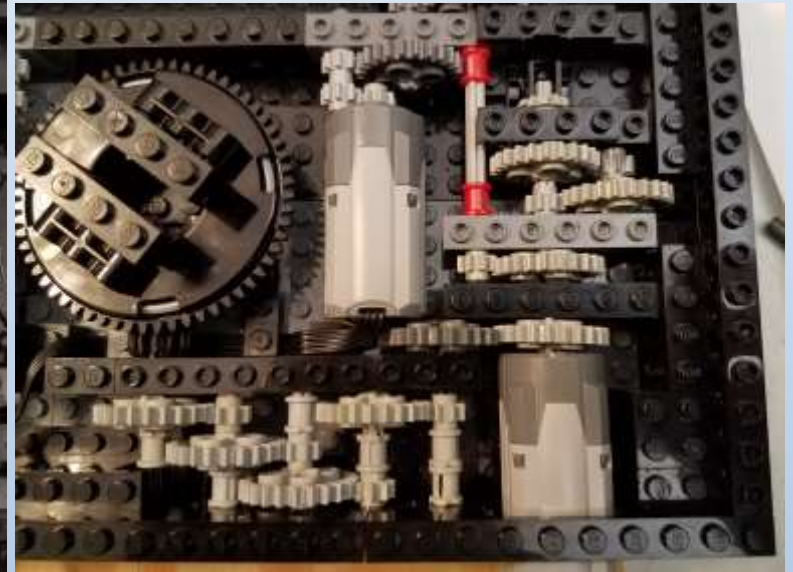
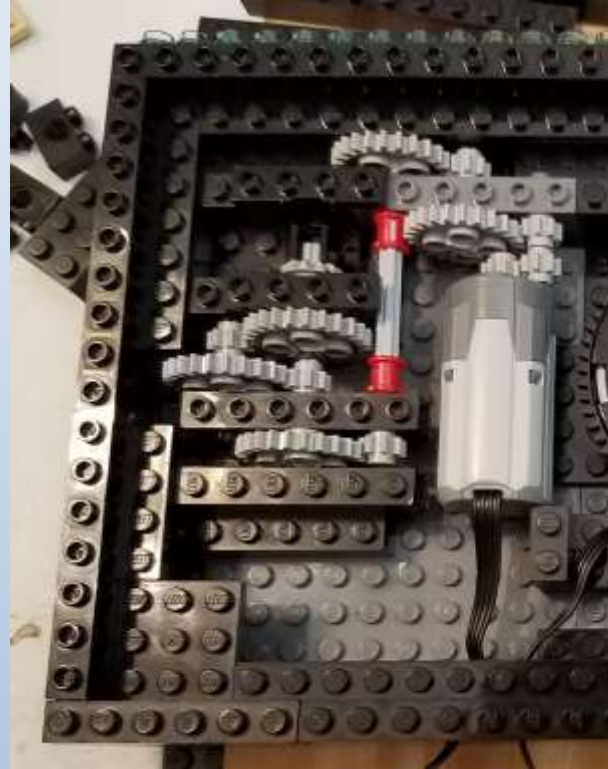
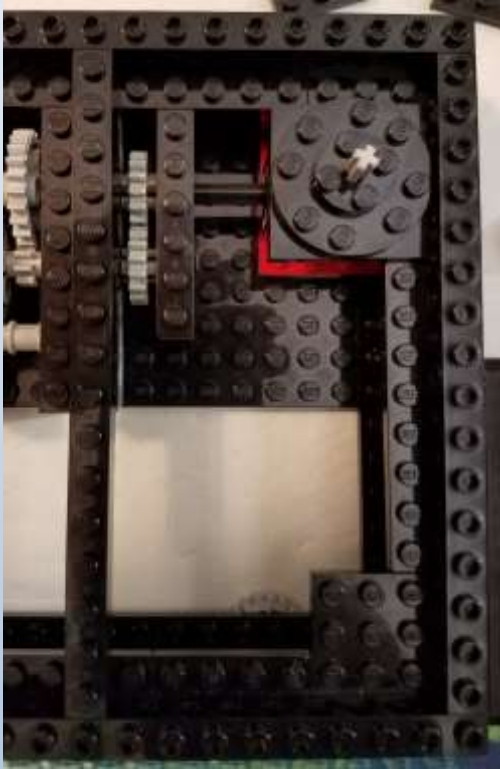
- Rigidity
- Interconnection
- Space for motors/gears
- Flexibility to minor changes
 - Can adjust the frame to fit internals
- What can't change
 - Technic Bricks on side for interconnect
 - Technic Bricks on front for consistency of design

Modular Platform Design

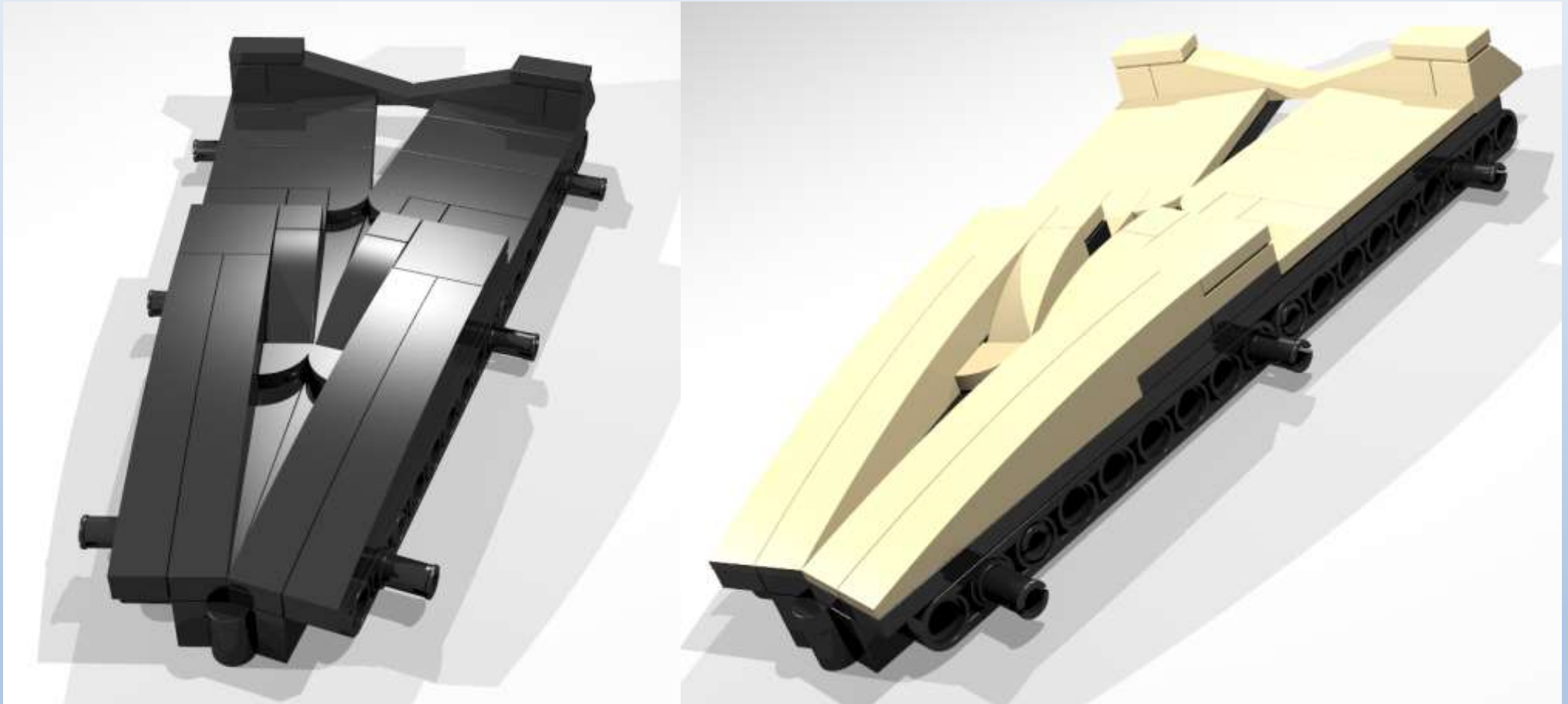
Requirements

- Dimensions
 - 32 x 18 (extra 2 is valuable)
- Stackup – bottom up
 - Plate 2 x n
 - Slope 2 x 2, inverted
 - Slope 2 x n (maximum overlap with inverted)
 - Plate 2 x n
 - Technic Brick 1 x 16 (front and sides)
 - Brick 1 x 16 (back when mounting not needed)

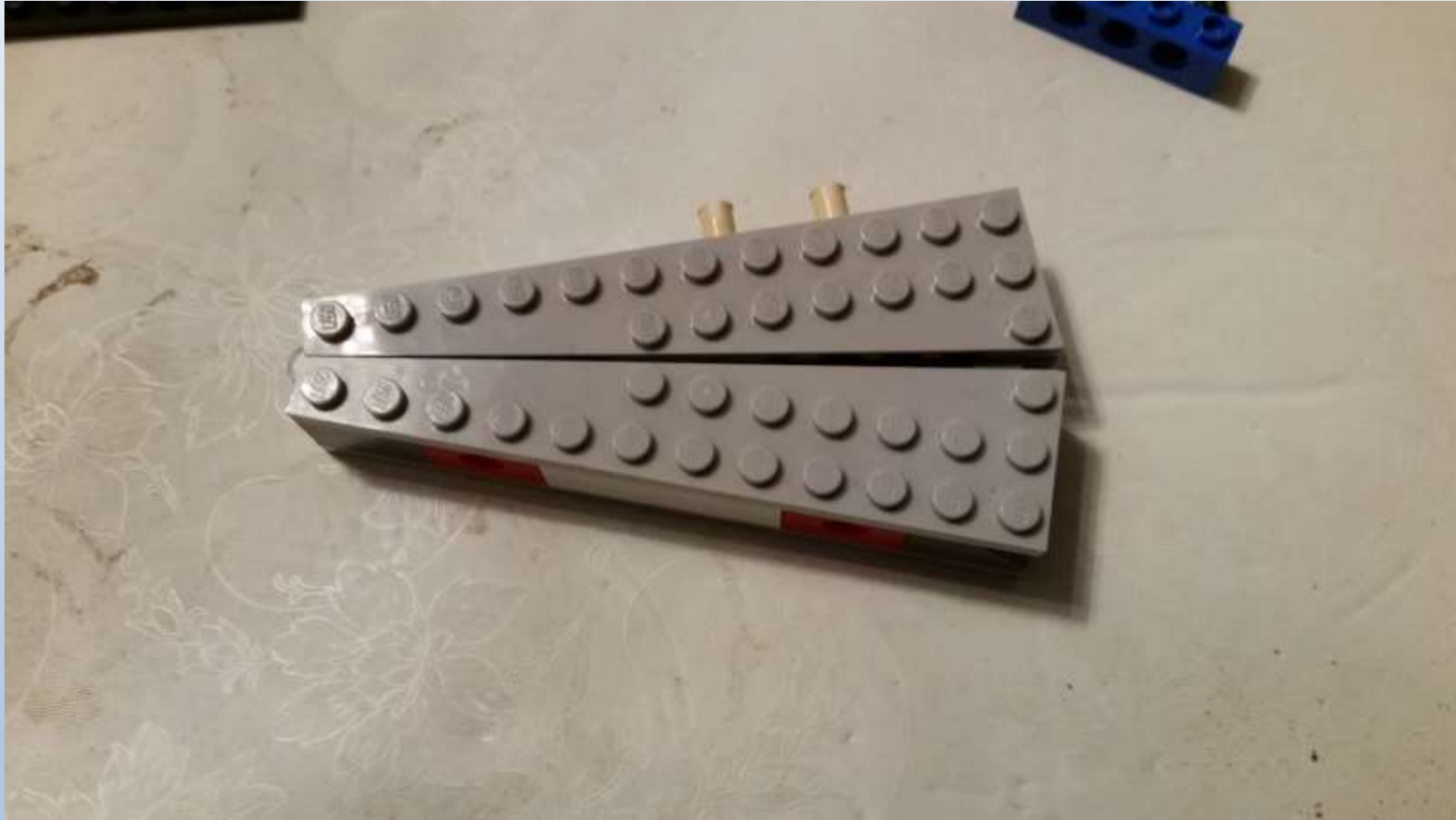
Modular Platform Design Modifications



Interconnect Design



Interconnect Design Inspiration

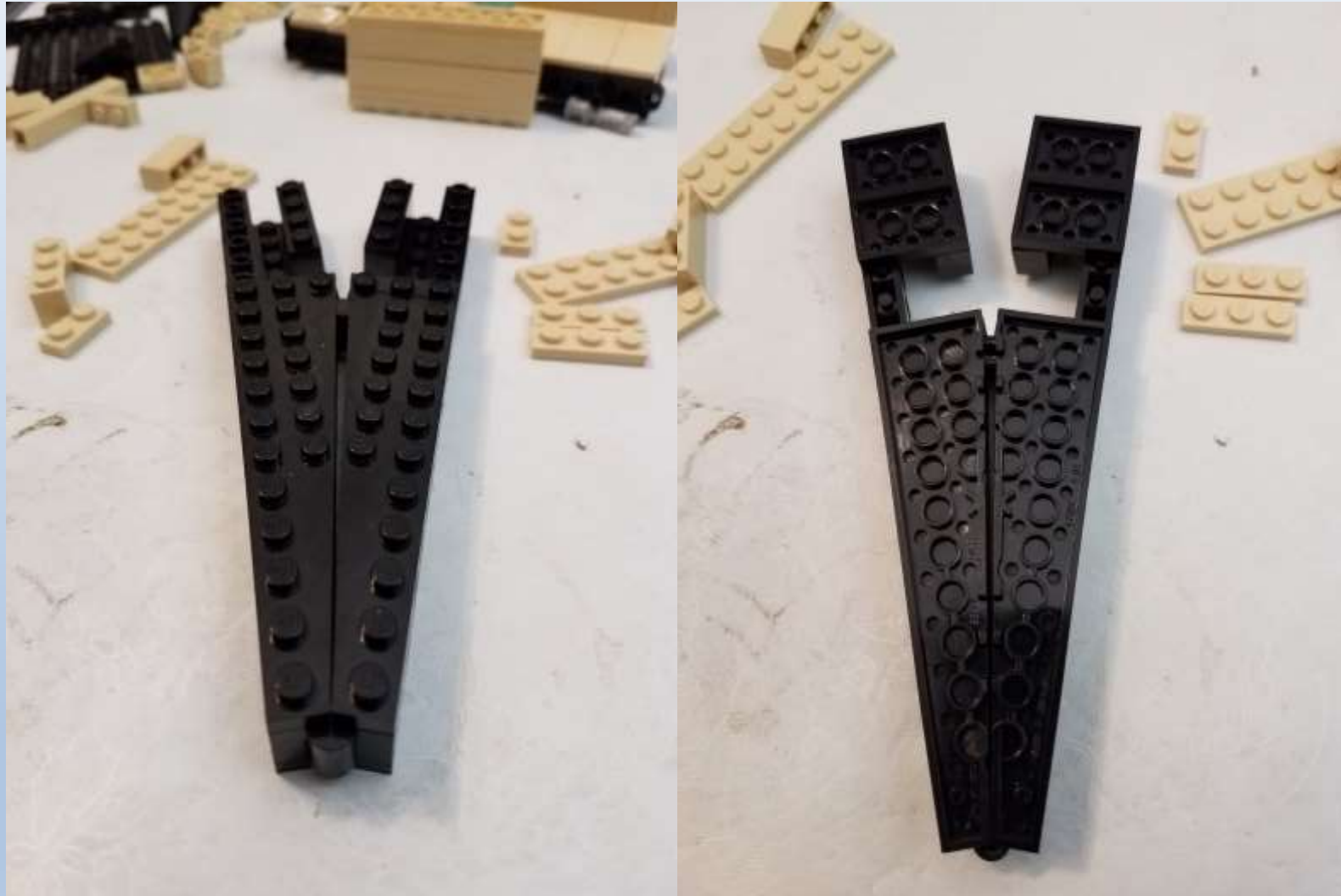


Interconnect Design Requirements

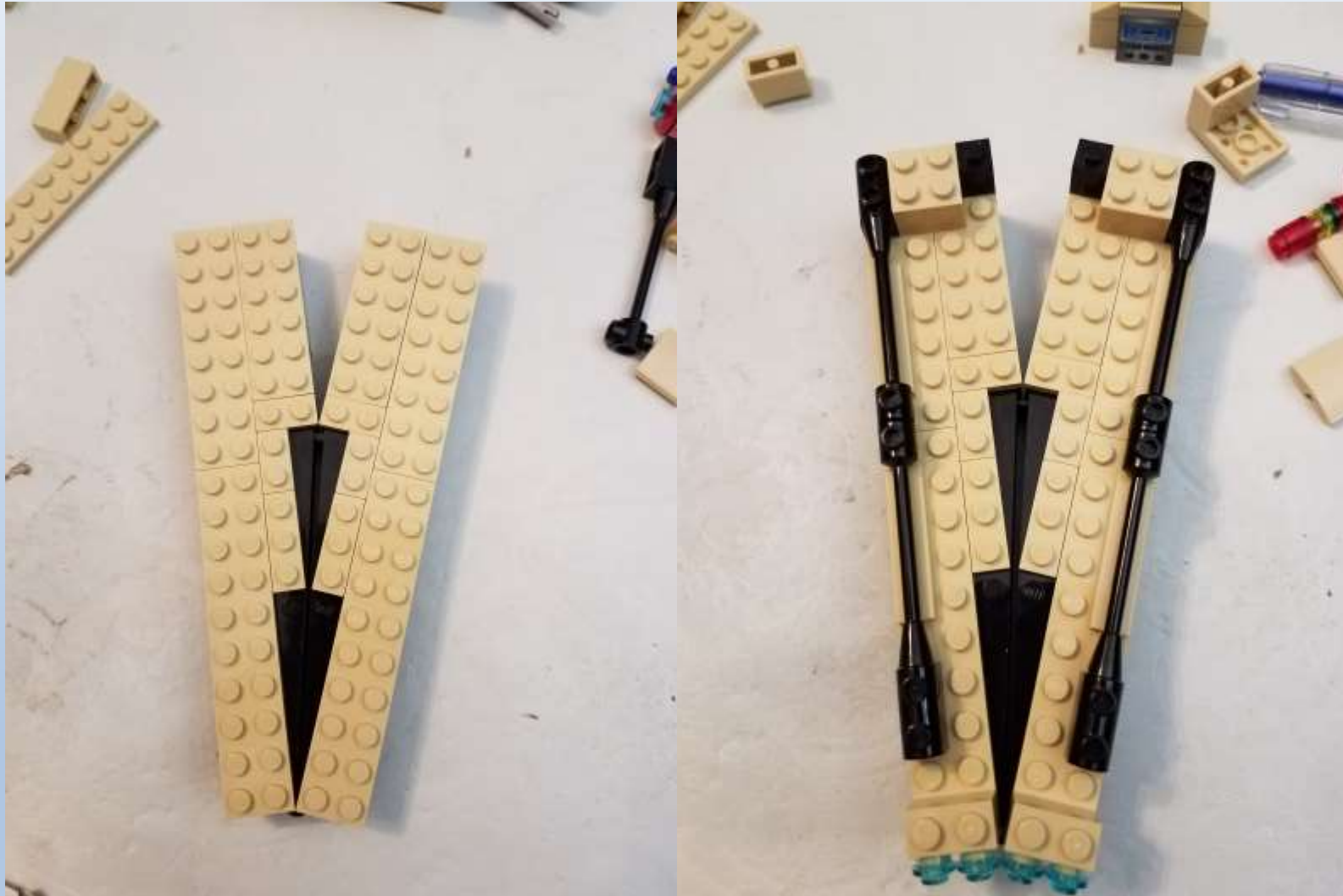
- Technic Brick, 1x16, on each side
 - Used for connecting to platform
- Technic Lift Arm, 1x15, on each side
 - Used for spacing
- Angled Plates
 - 20 degree turn
 - 40 Degree turn
- Hinges
 - At the Front to provide movement and stability
 - At the Back to set the angle

Interconnect Design

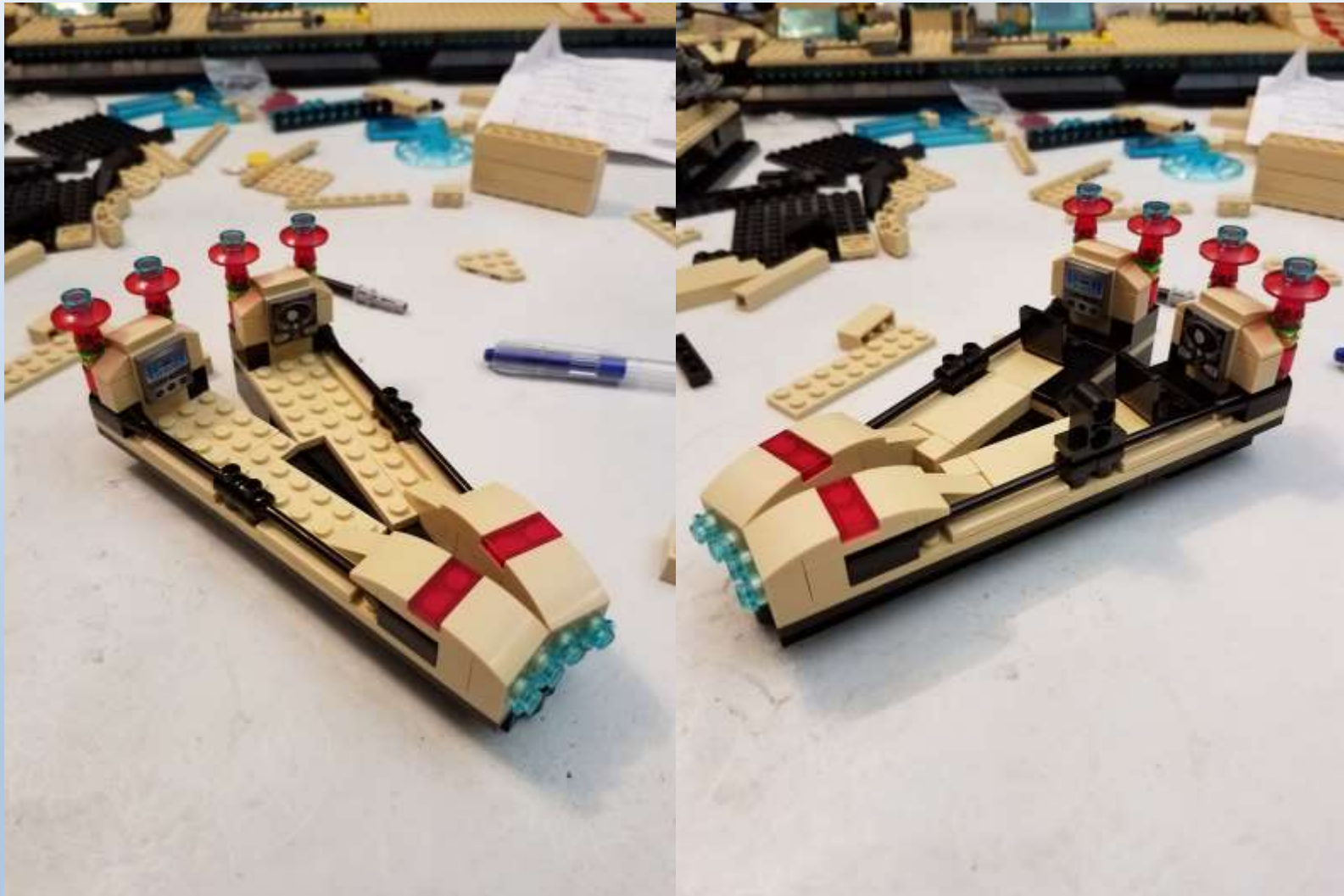
20 Degree Turn



Interconnect Design



Interconnect Design



Interconnect Design



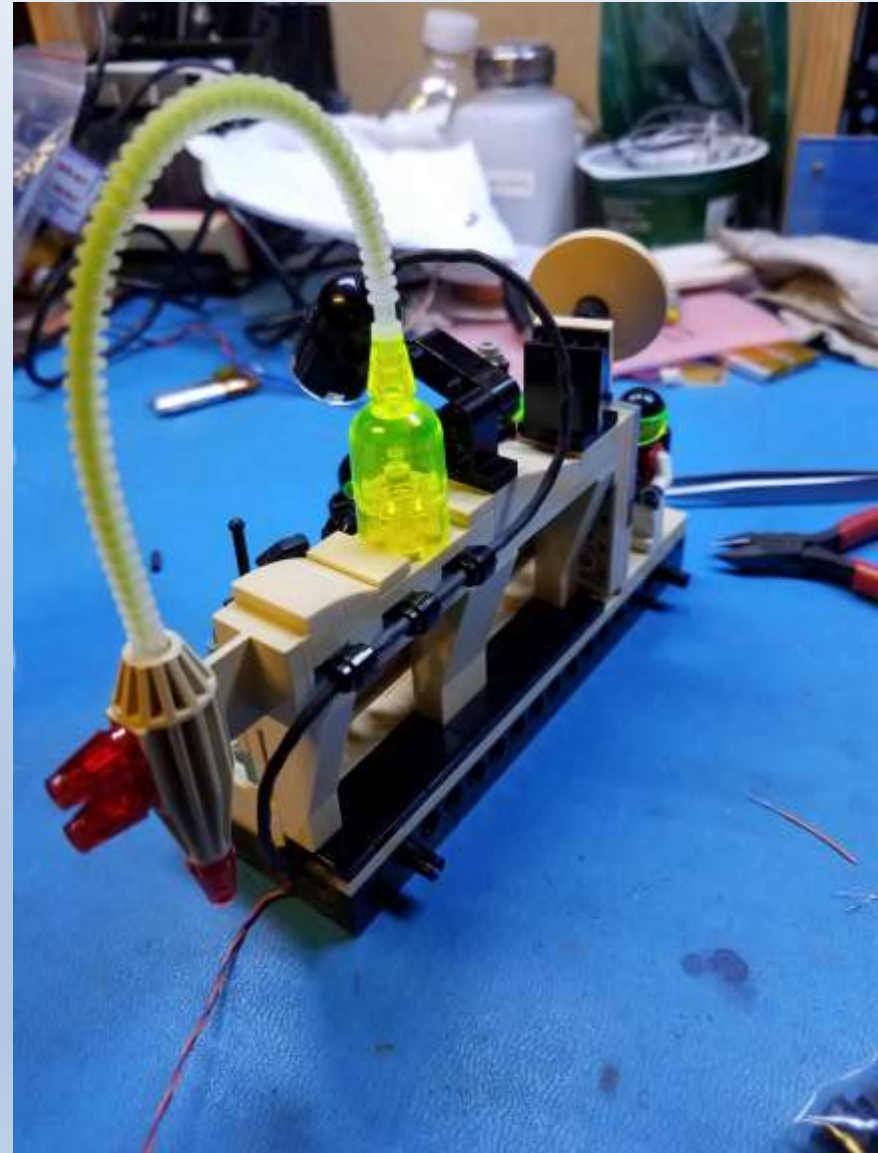
Interconnect Design

40 Degree Turn



Interconnect Design

Straight



Platform Design

- Six Platforms
 - Original/Control Center
 - Horizontal Generator
 - Command Center
 - Vertical Generator
 - Large Laser Cannon
 - Jetpack Base

Control Center Platform Design

Features

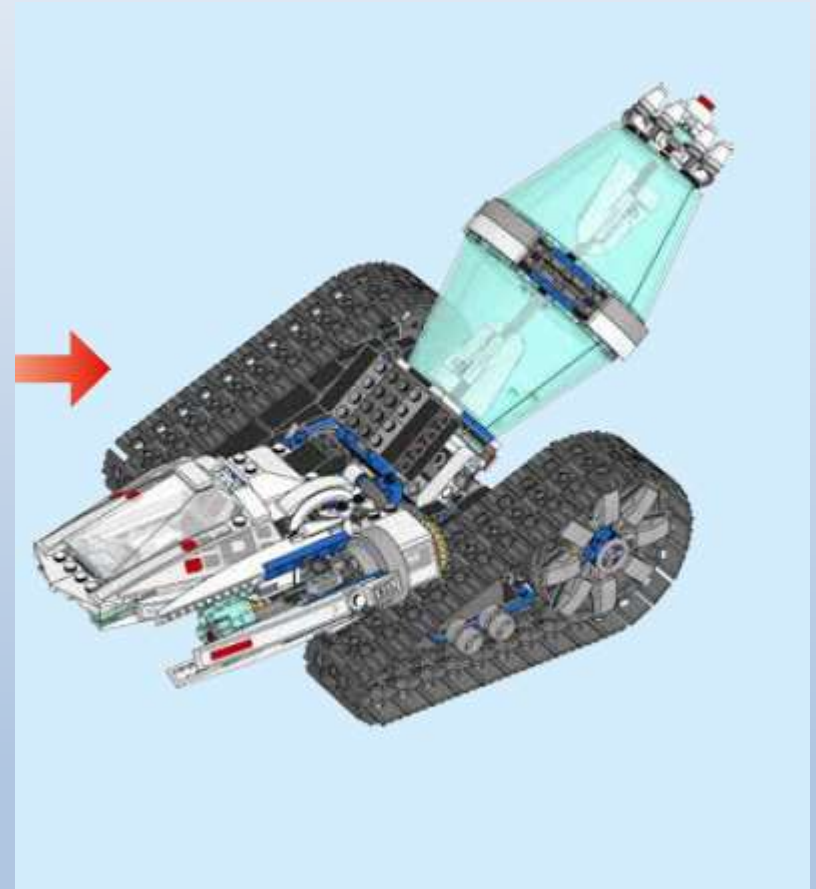
- Two Motors/Four Separate LED channels
- Two Spinning radar towers
- 3 Small Laser Cannons with LEDs
- Two small generators with pulsing LEDs
- Exposed Gear Train
- Lighted Motor Compartment

Horizontal Generator Platform Design

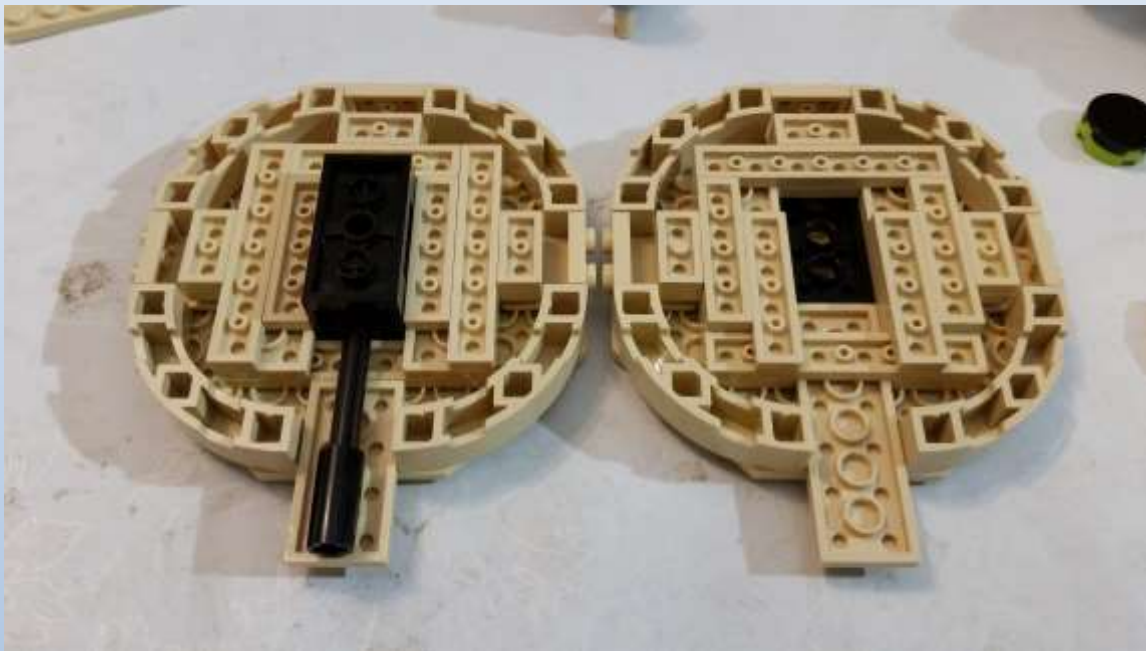
Features

- Two Motors/Four Separate LED channels
- One Large spinning Horizontal Generator
- Two Small spinning Vertical Generators
- 2 Laser Cannons with LEDs on motor platform
- Exposed Gear Train
- Detailed Control Compartment
- Detailed Power Connections

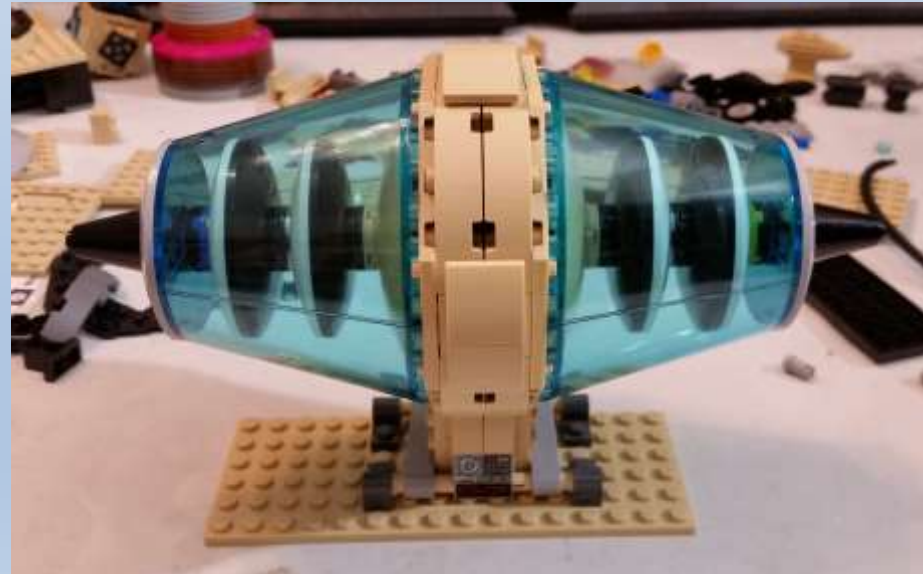
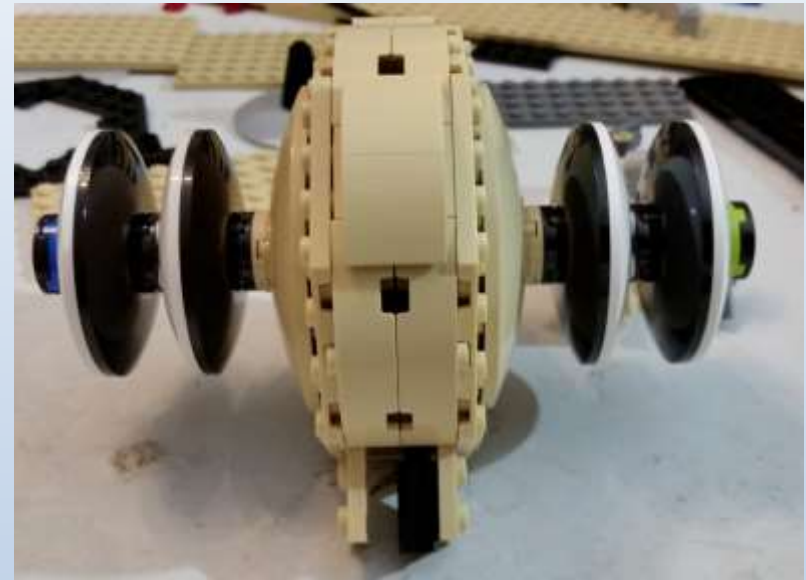
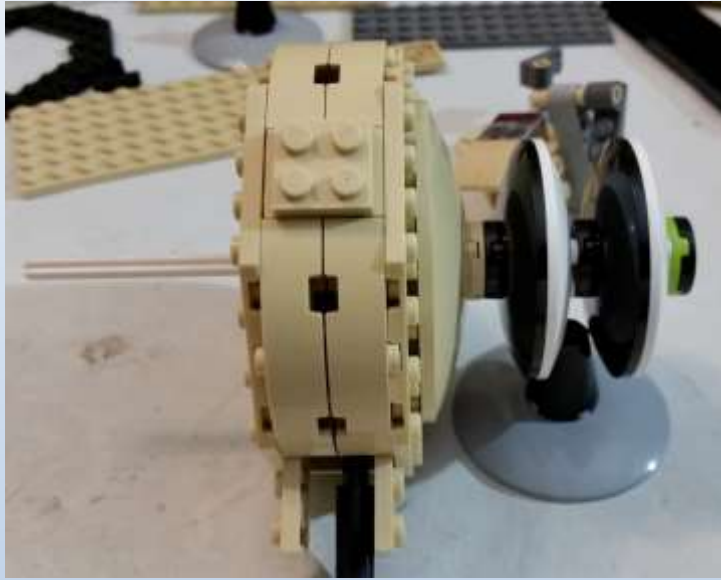
Horizontal Generator Platform Design Inspiration



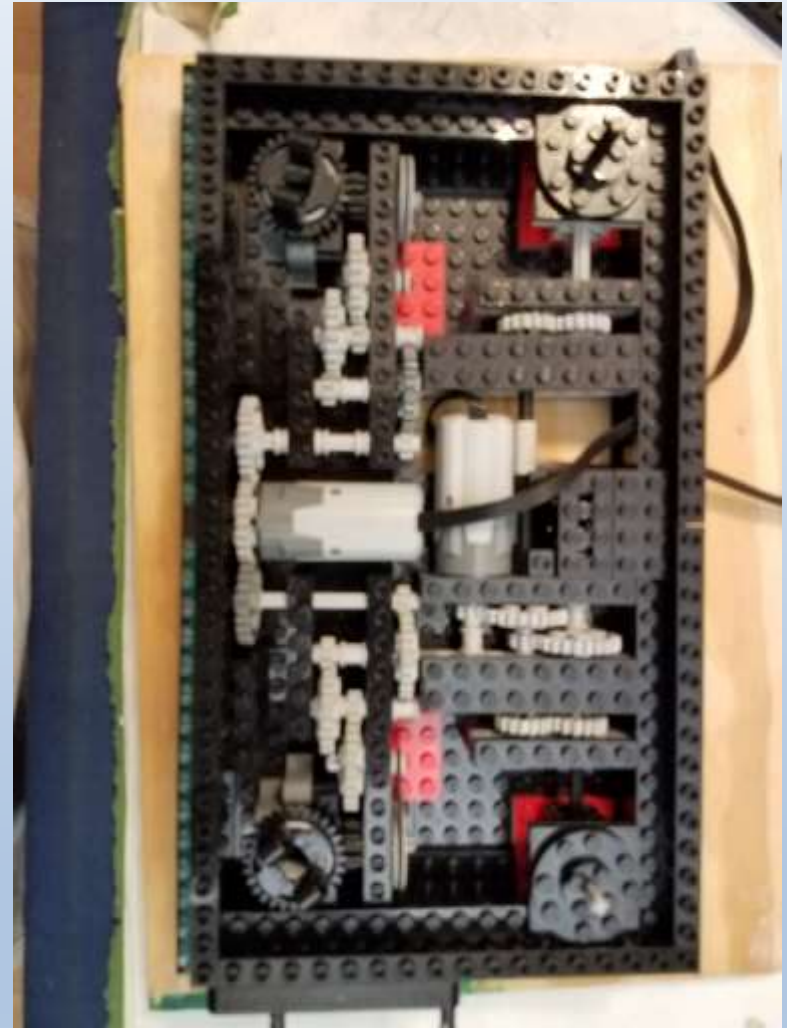
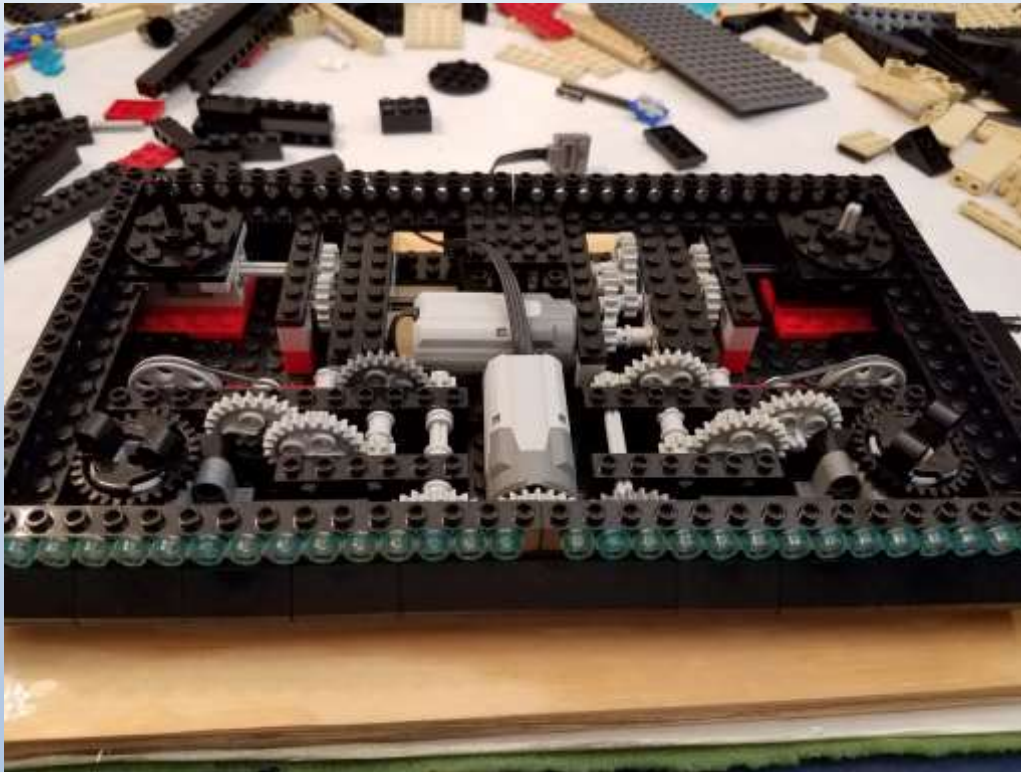
Horizontal Generator Platform Design



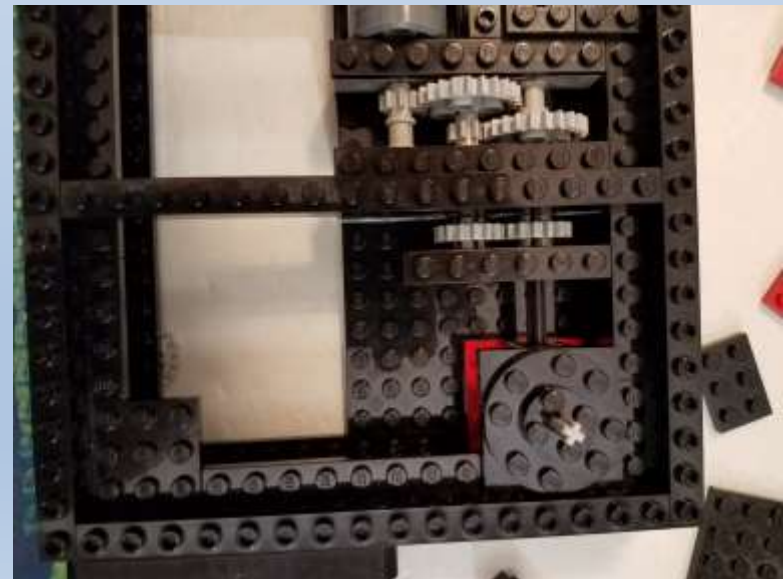
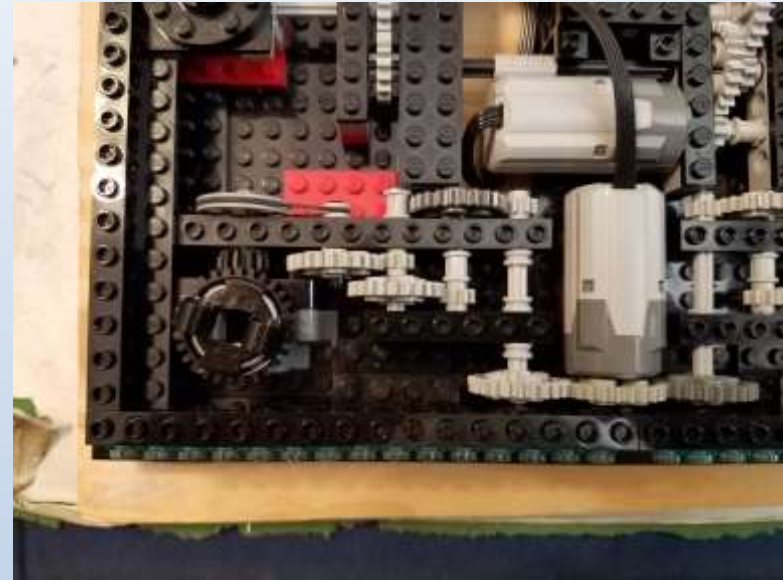
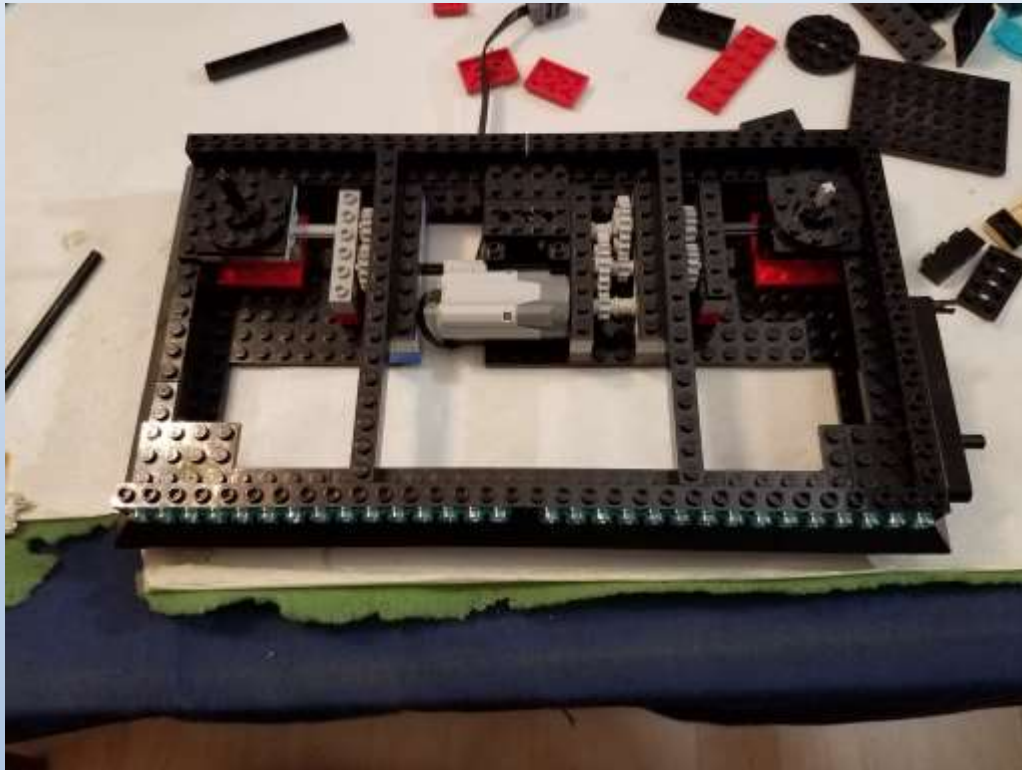
Horizontal Generator Platform Design



Horizontal Generator Platform Design



Horizontal Generator Platform Design



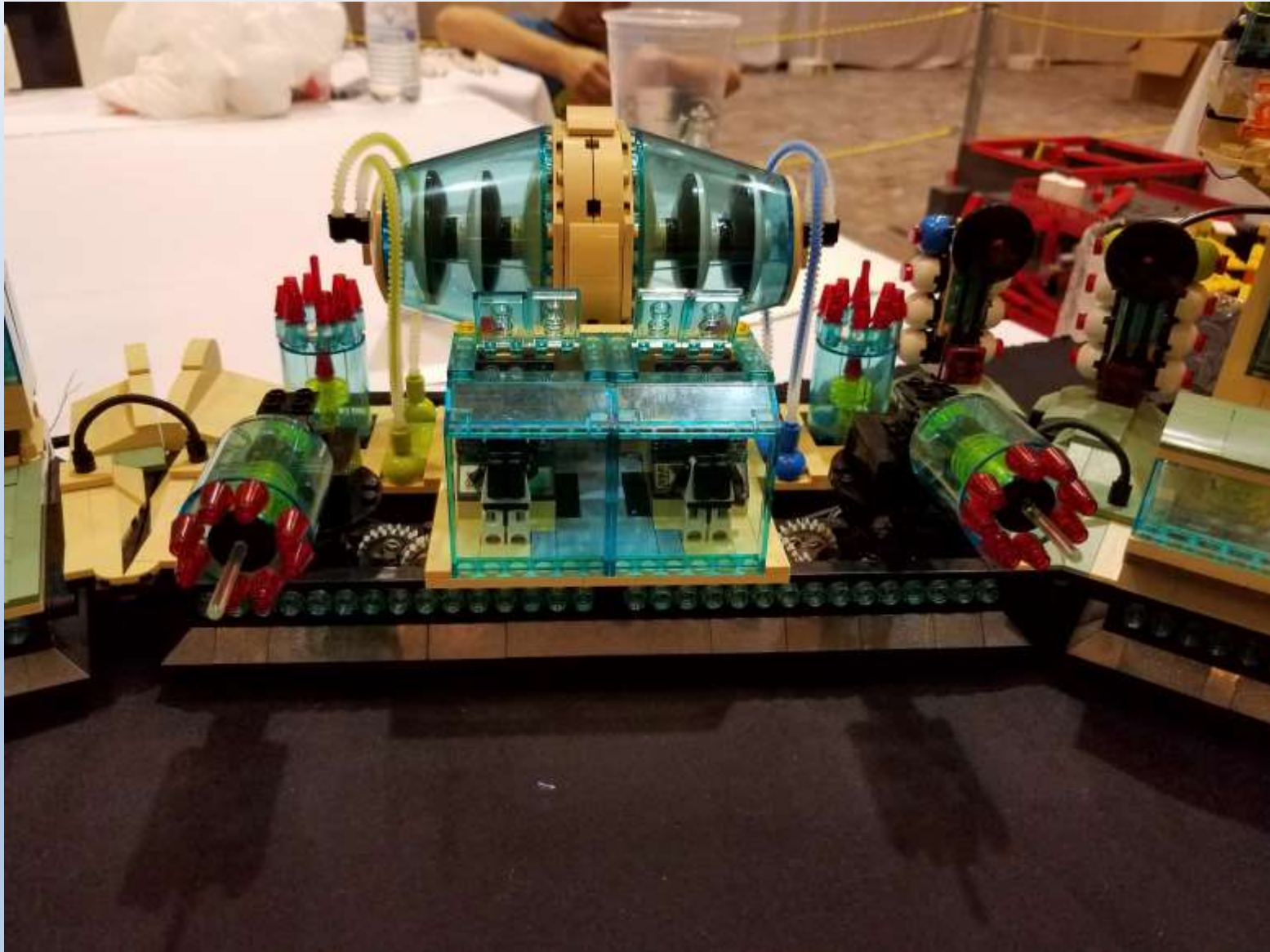
Horizontal Generator Platform Design



Horizontal Generator Platform Design



Horizontal Generator Platform Design



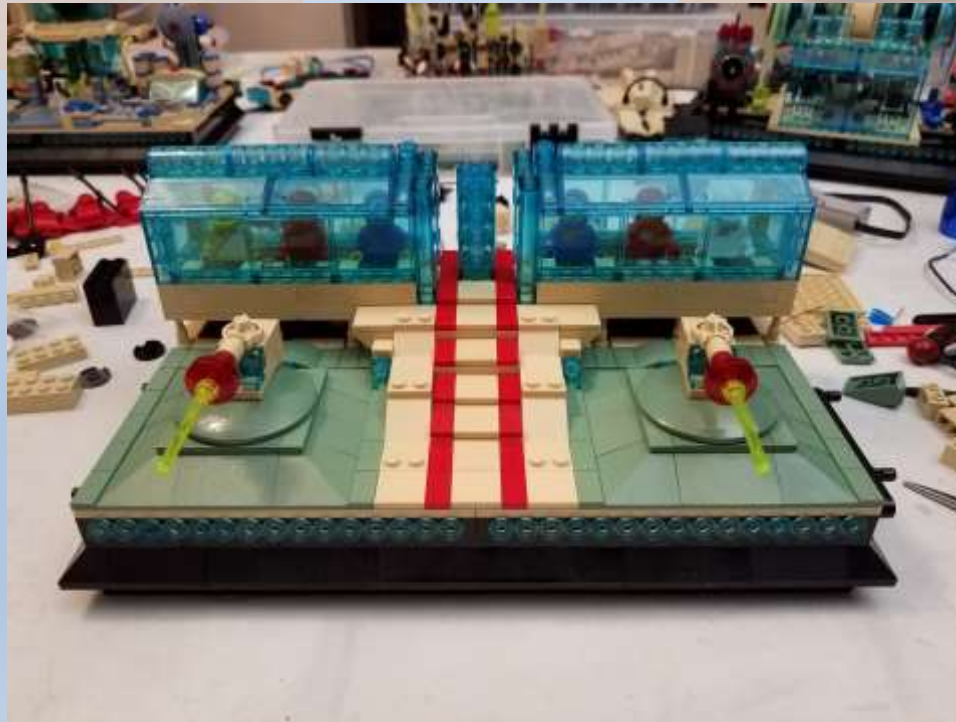
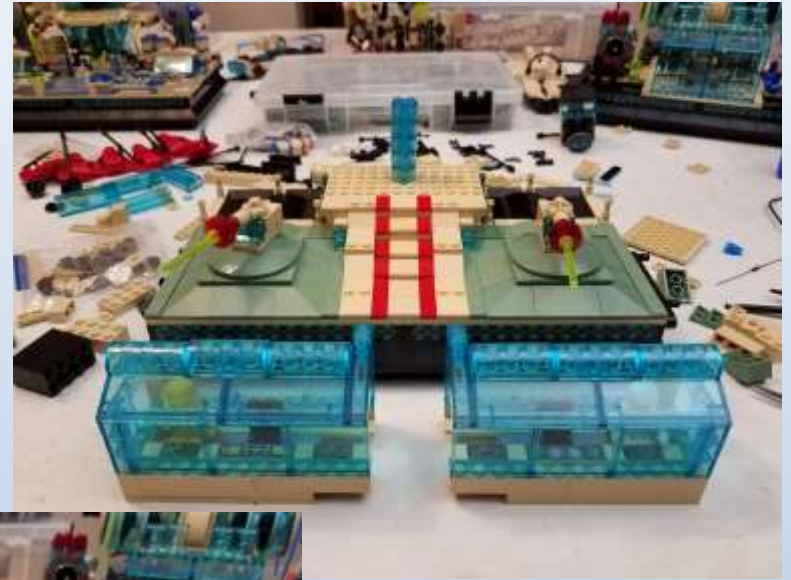
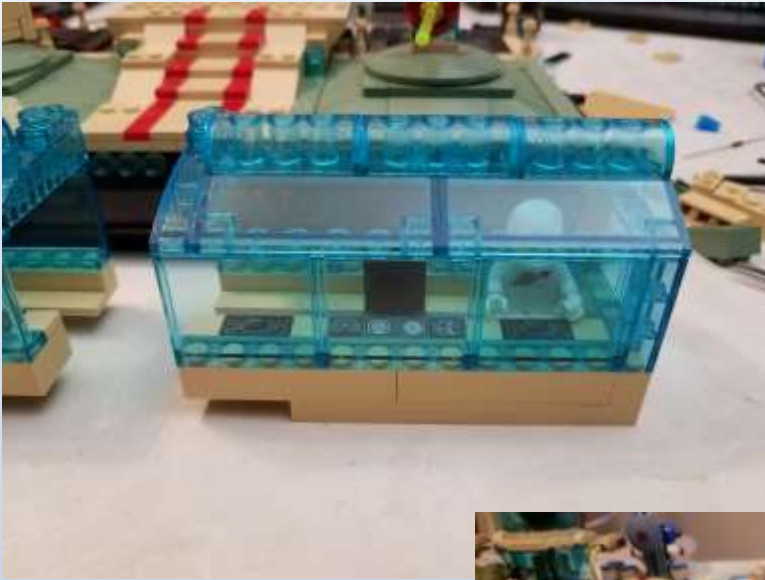
Command Center Design

Features

- Multiple Separate LED channels
- Tall glass control tower
- 2 small Laser Cannons with LEDs
- Detailed Command Area
- Imperial Decor

Command Center Design

Features



Command Center Design

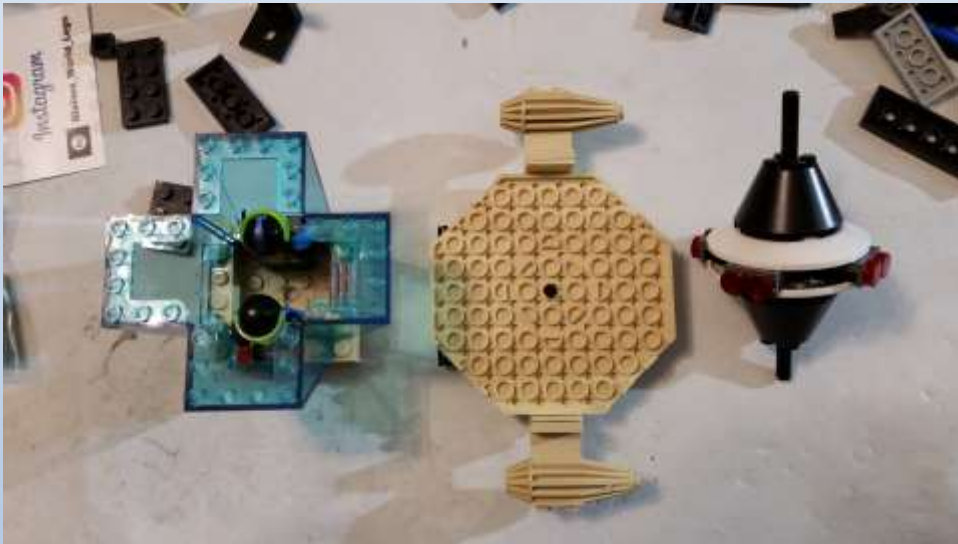


Vertical Generator Design

Features

- One Motor/Two Separate LED channels
- Tall Spinning Vertical Generator
- Lower Compartment for charging
- Compartment has pulsing LEDs
- Detailed Control Center
- Detailed Decking & Power Connections

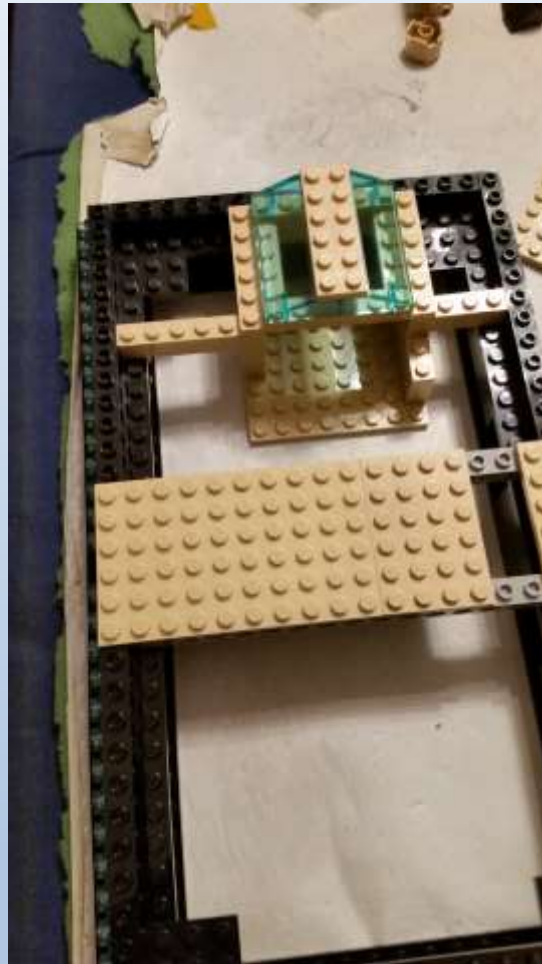
Vertical Generator Design



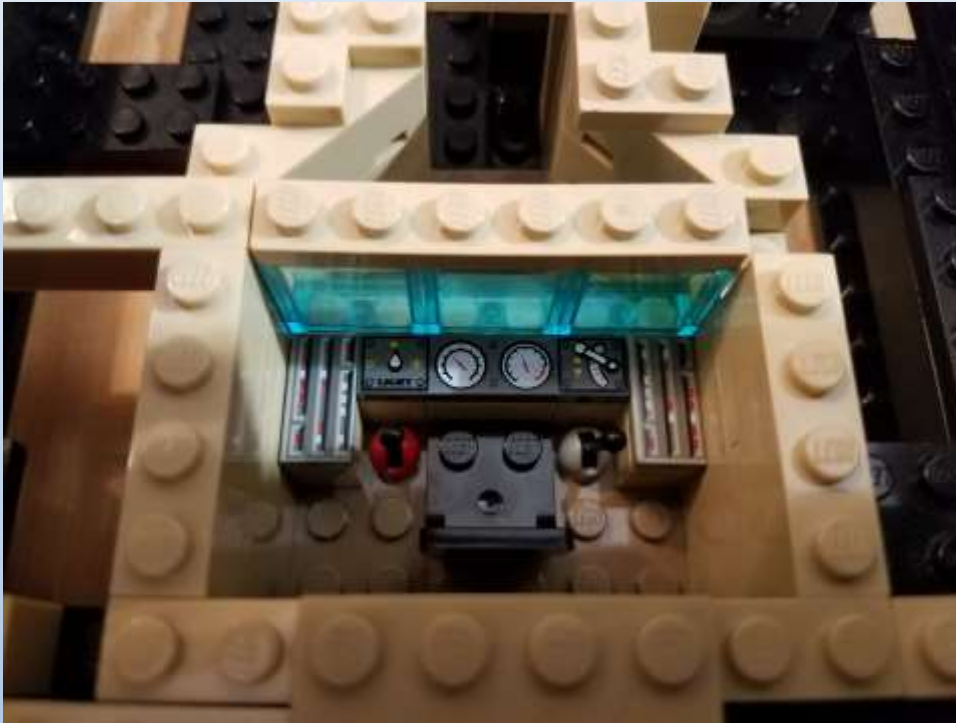
Vertical Generator Design



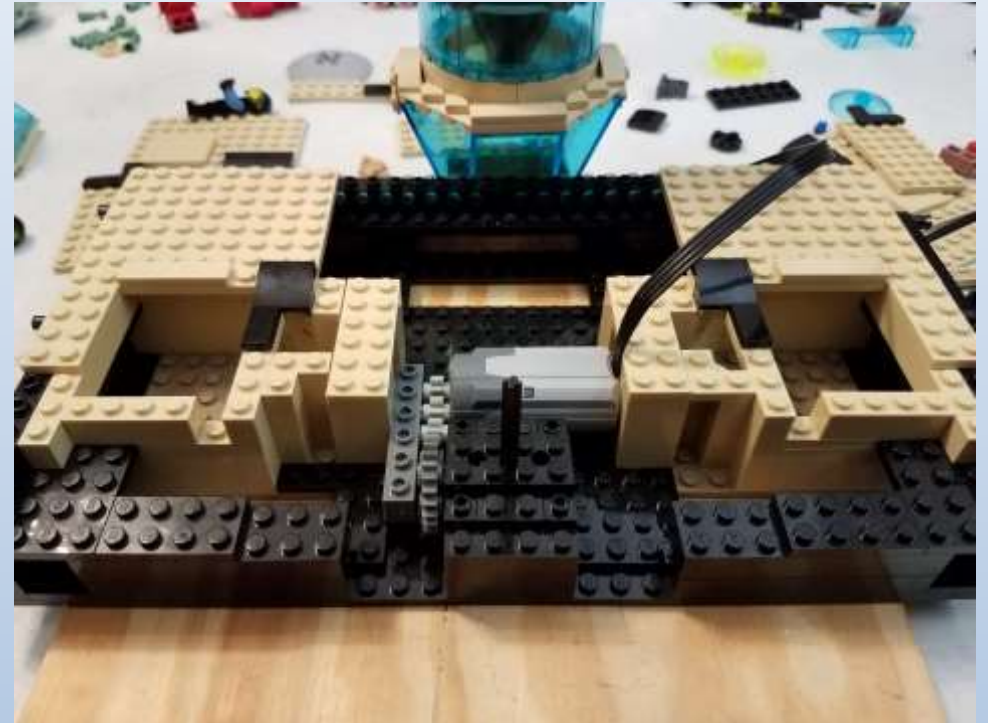
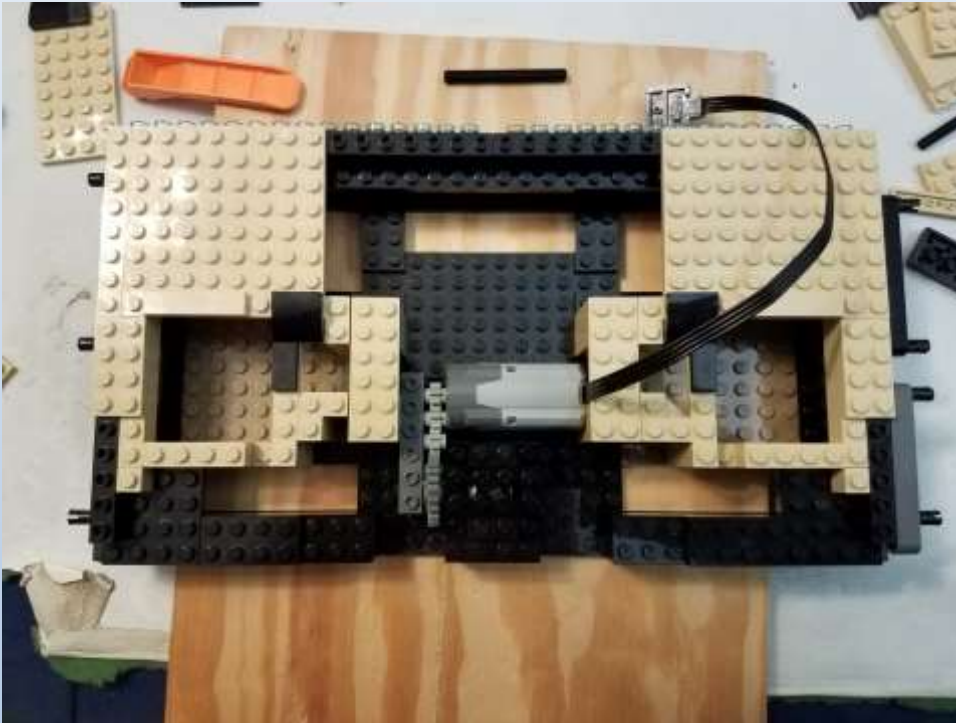
Vertical Generator Design



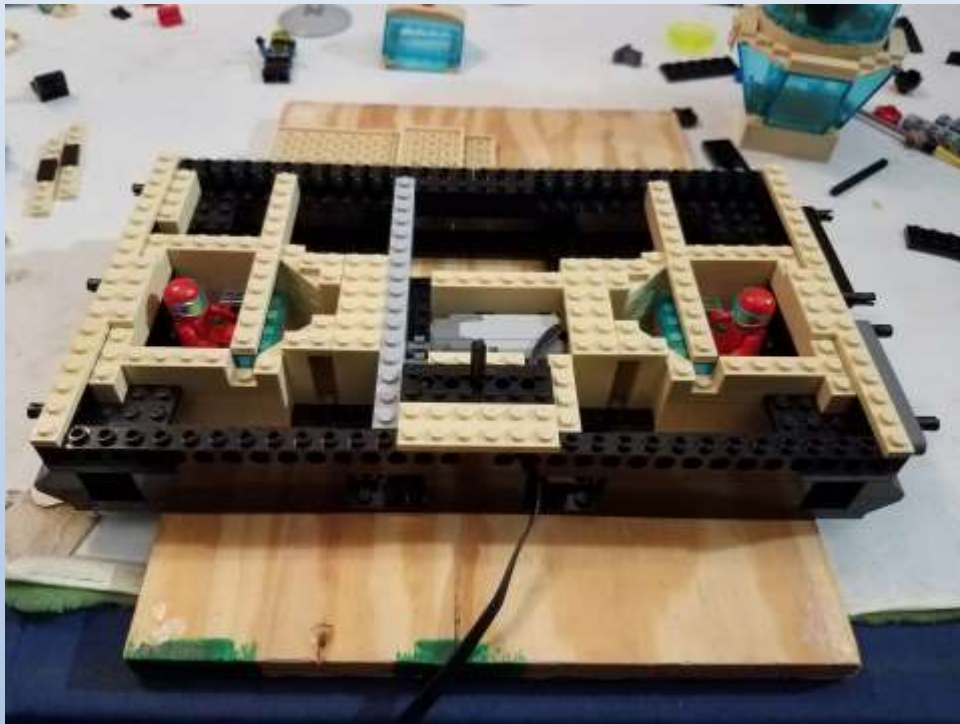
Vertical Generator Design



Vertical Generator Design



Vertical Generator Design



Vertical Generator Design

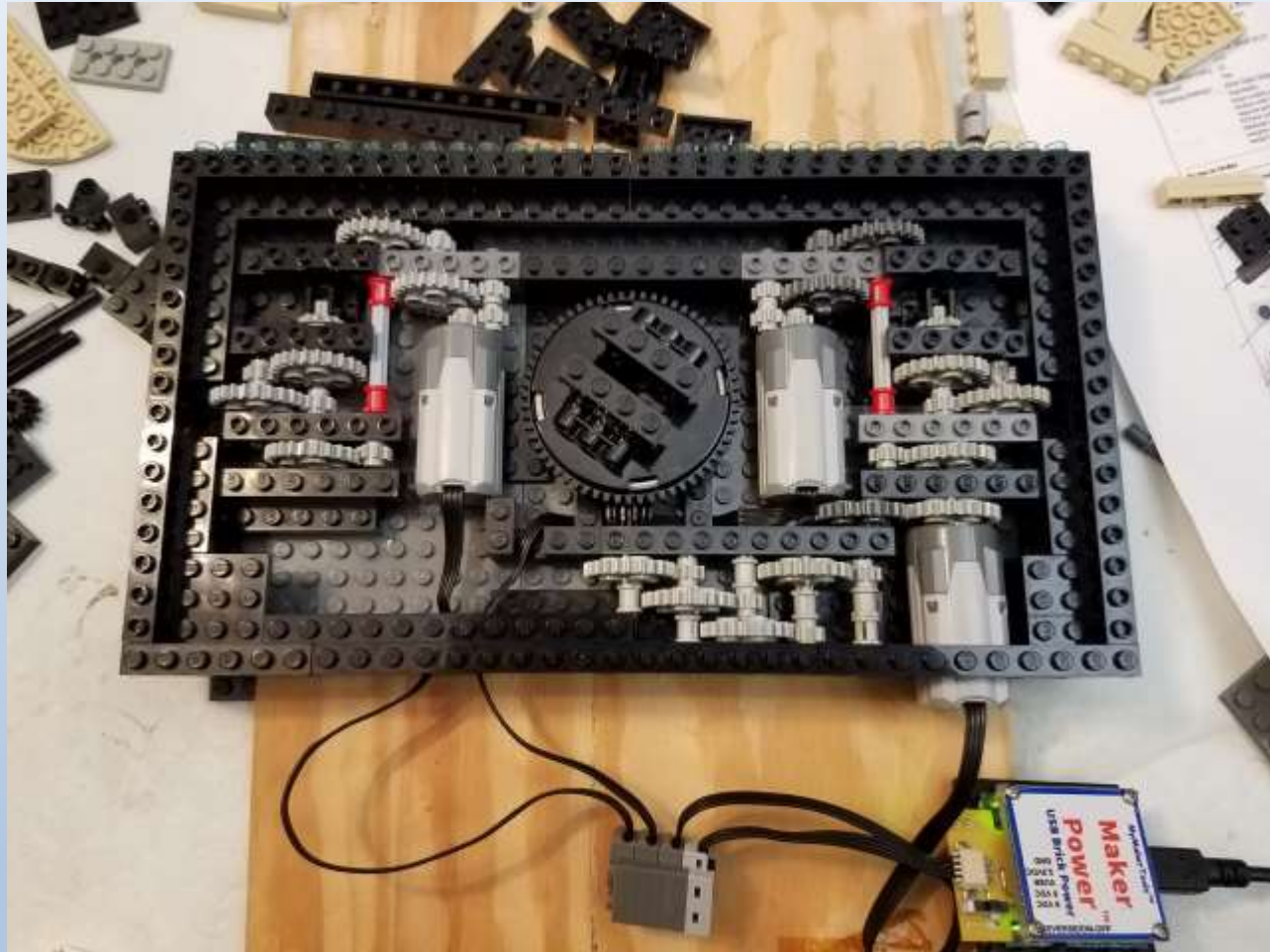


Large Laser Cannon Platform Design

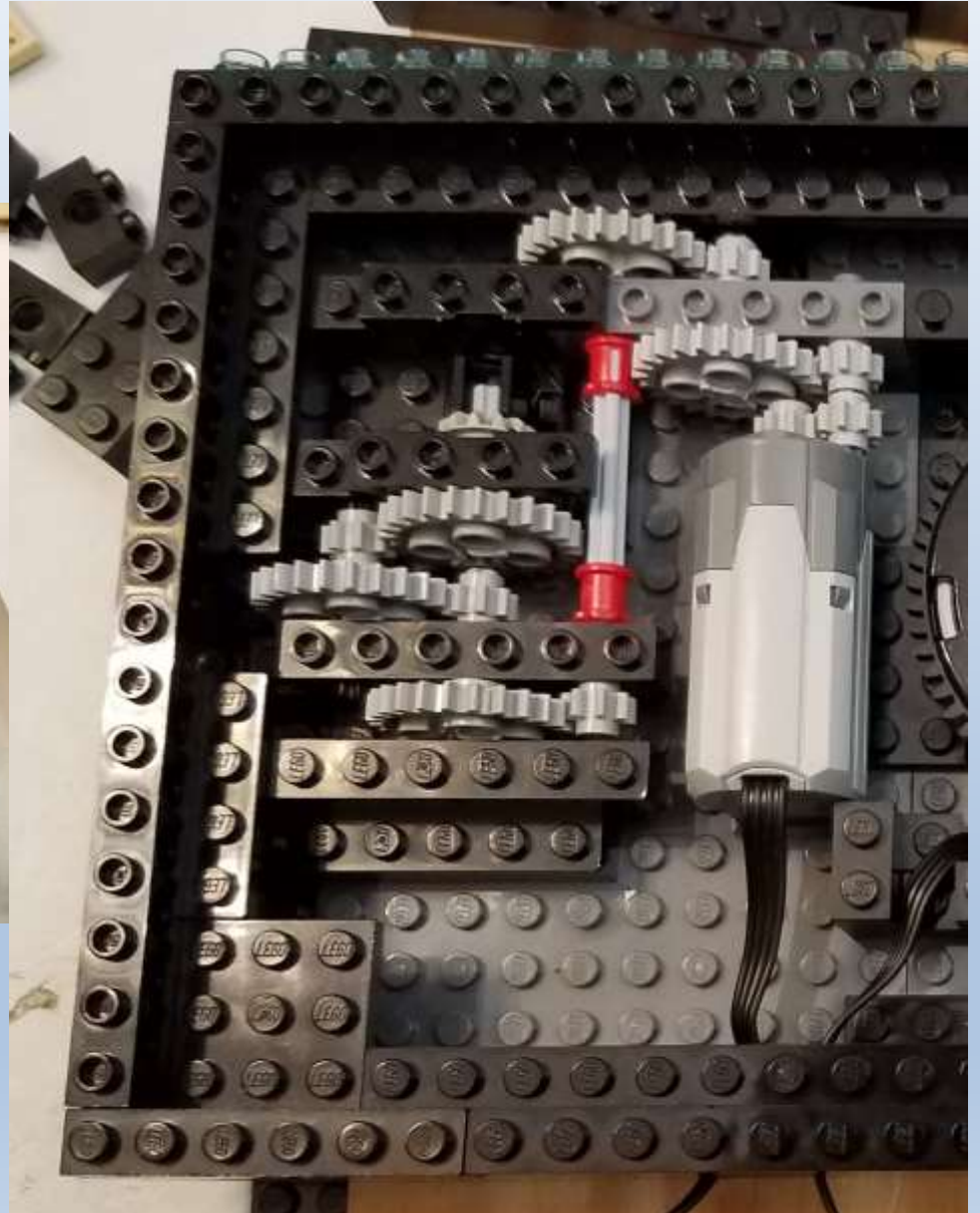
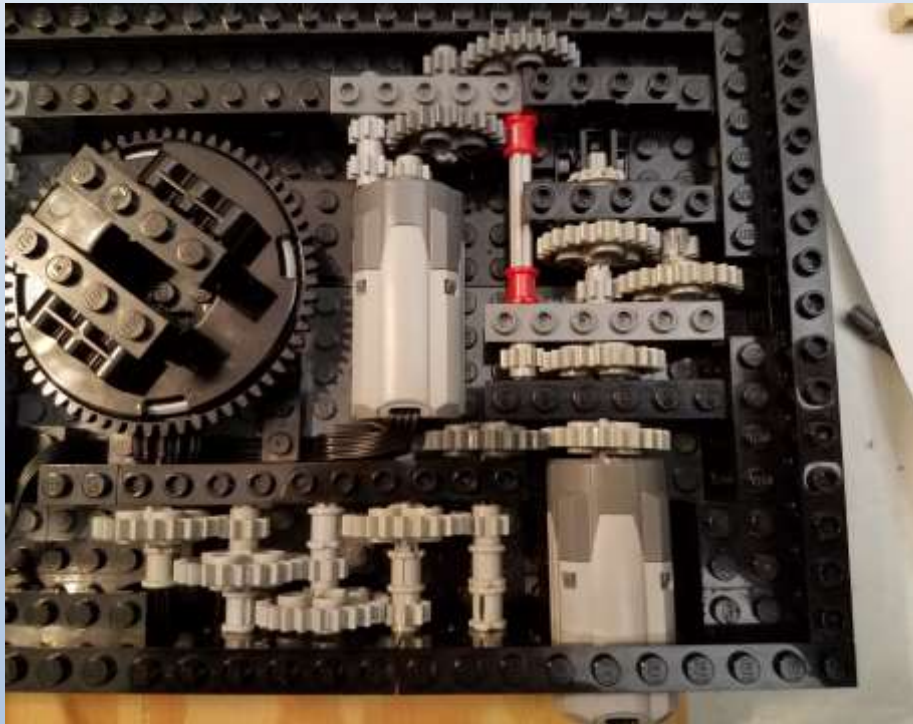
Features

- Four Motors/Multiple Separate LED channels
- Large Laser Cannon with
 - Azimuth Control
 - Elevation Control
 - LEDs
- Two Twin Mount Laser Cannons with
 - Azimuth Control
 - LEDs
- Overhead Power Structure with LEDs

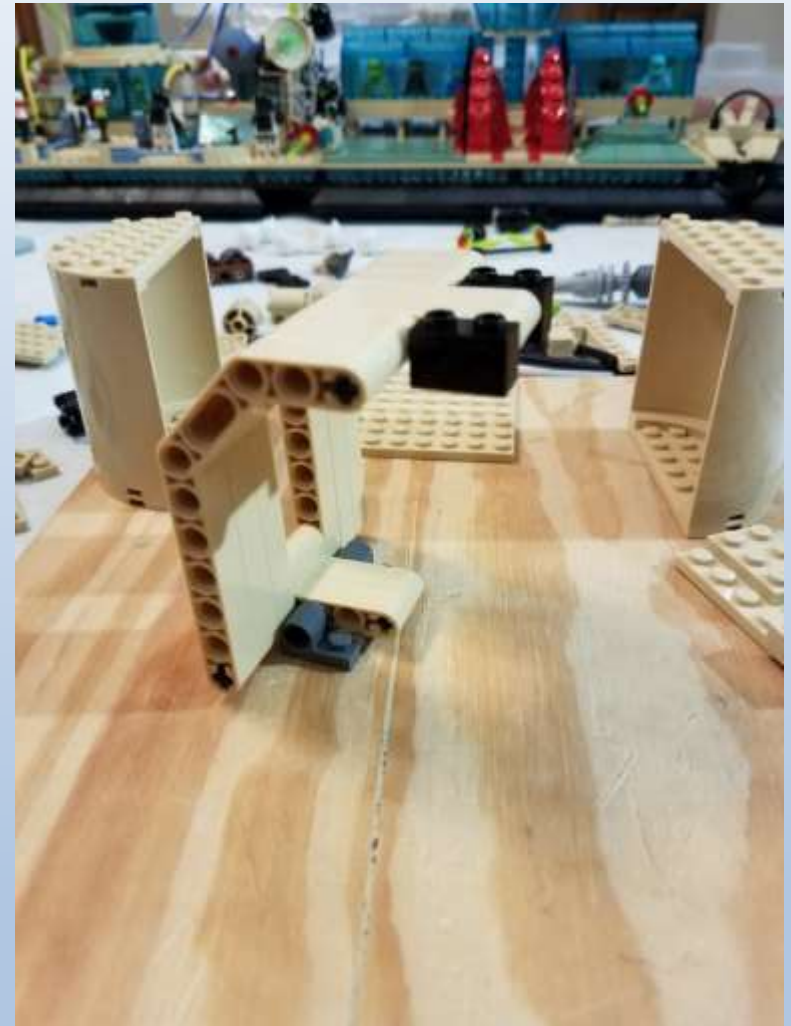
Large Laser Cannon Platform Design



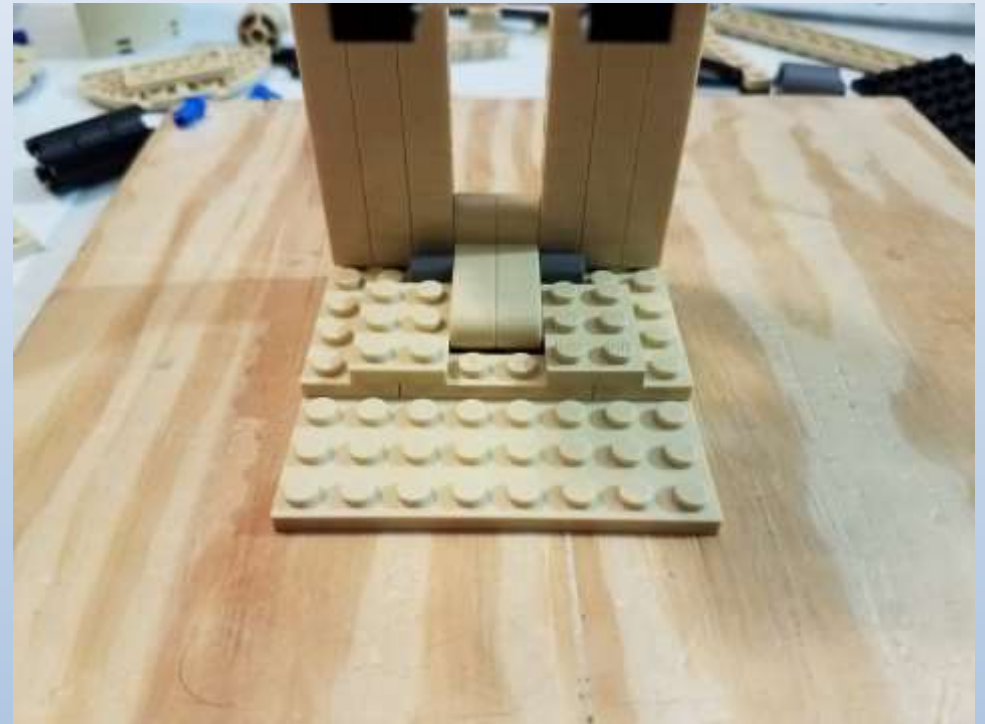
Large Laser Cannon Platform Design



Large Laser Cannon Design



Large Laser Cannon Design



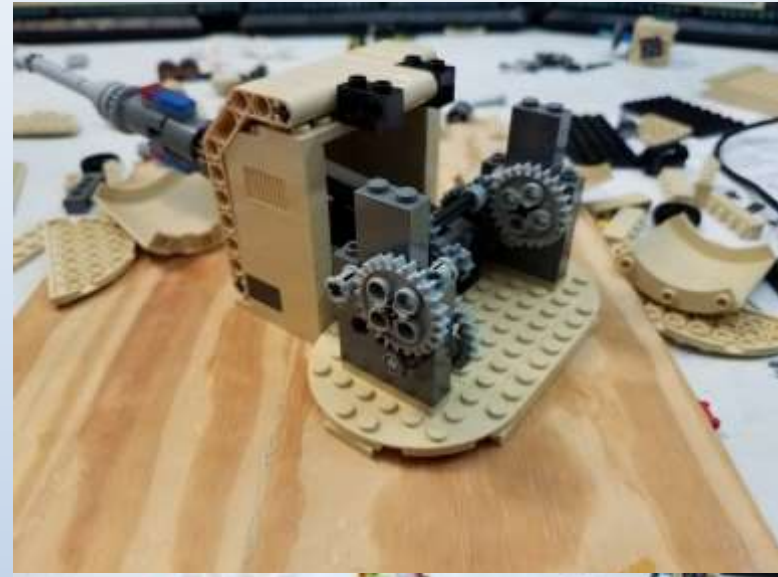
Large Laser Cannon Design



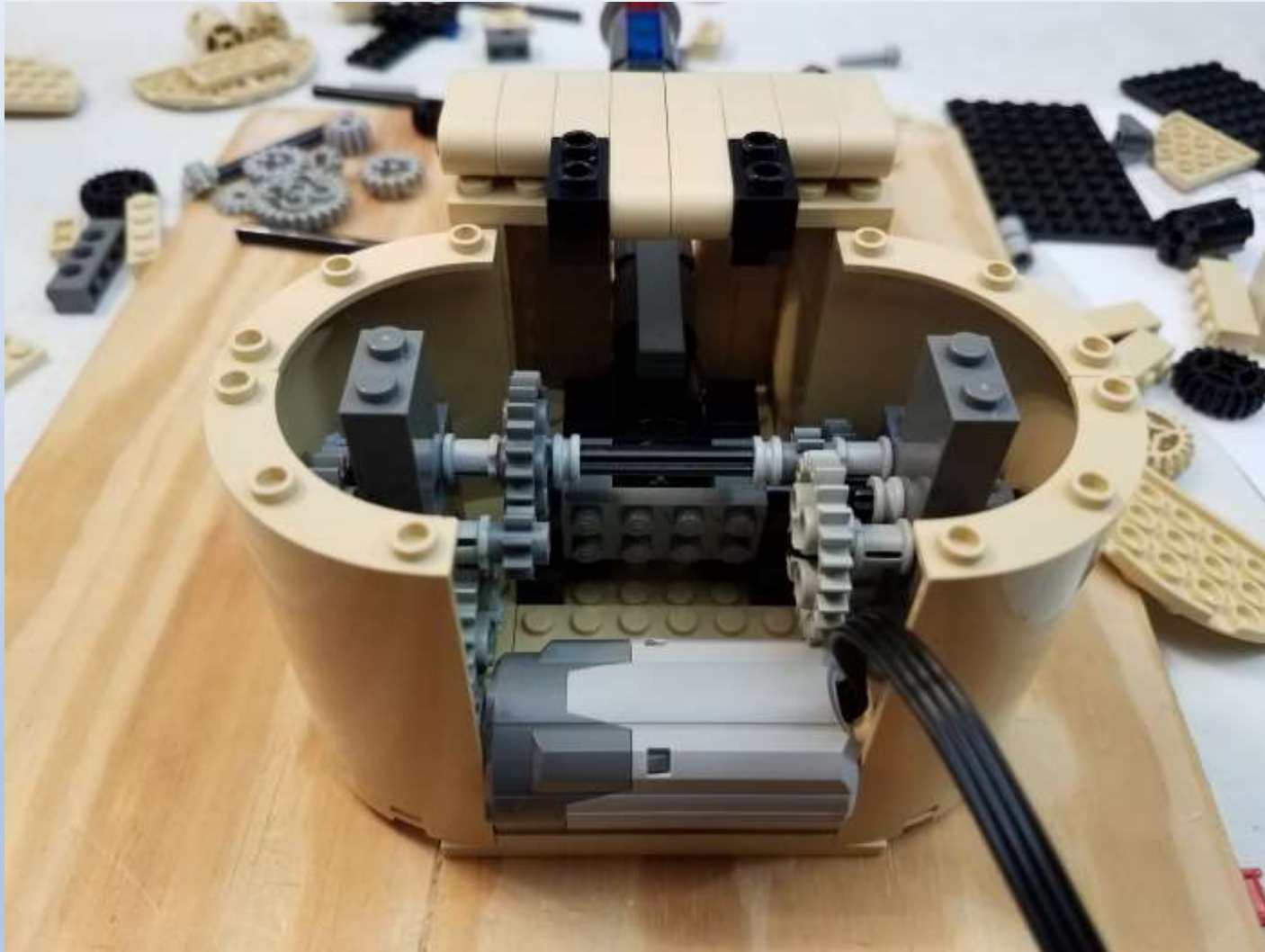
Large Laser Cannon Design



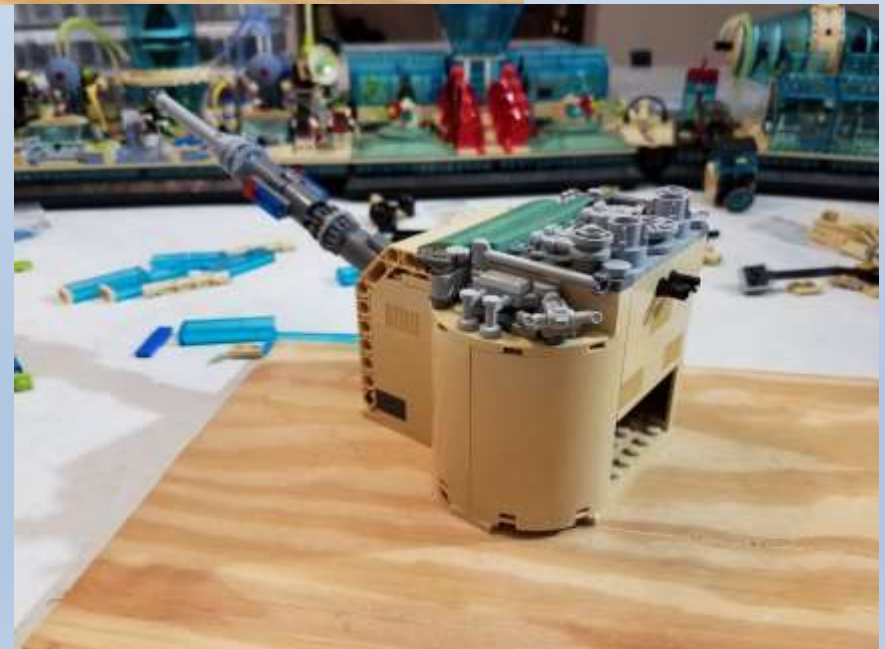
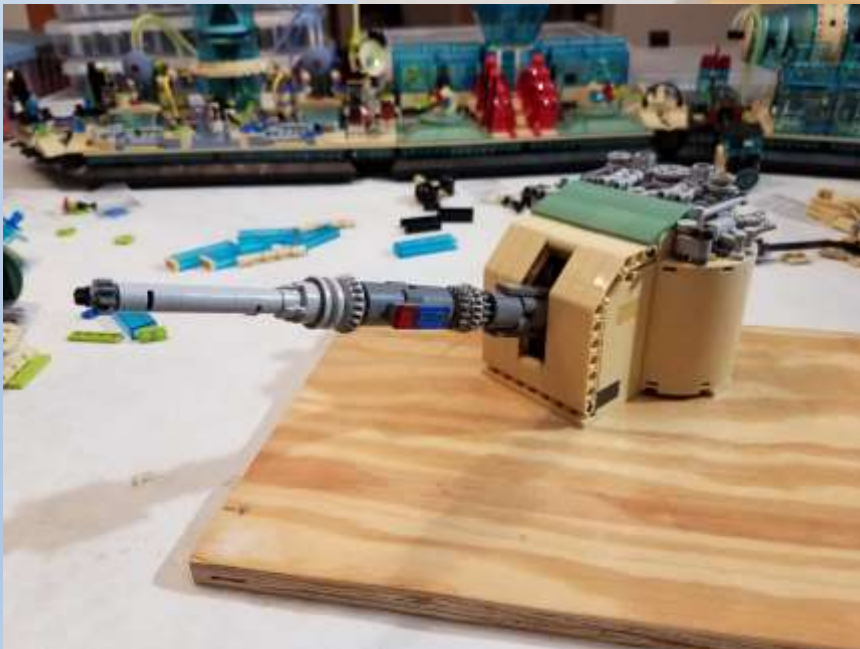
Large Laser Cannon Design



Large Laser Cannon Design



Large Laser Cannon Design



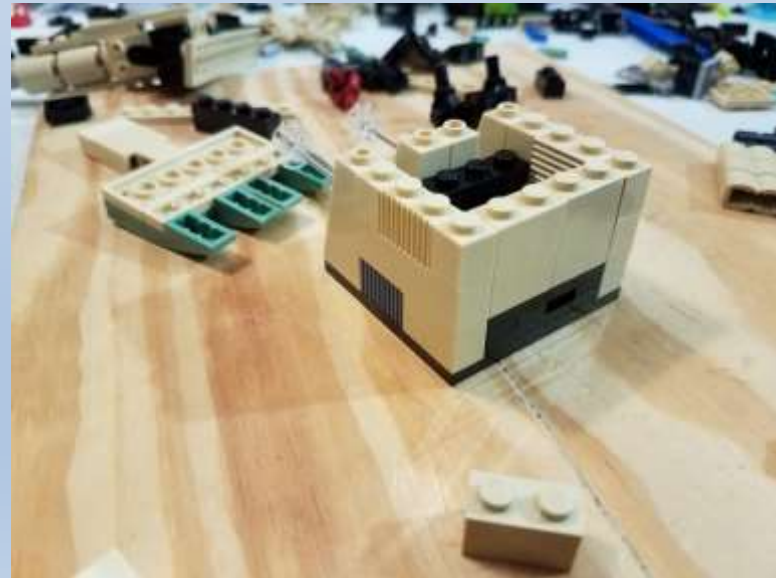
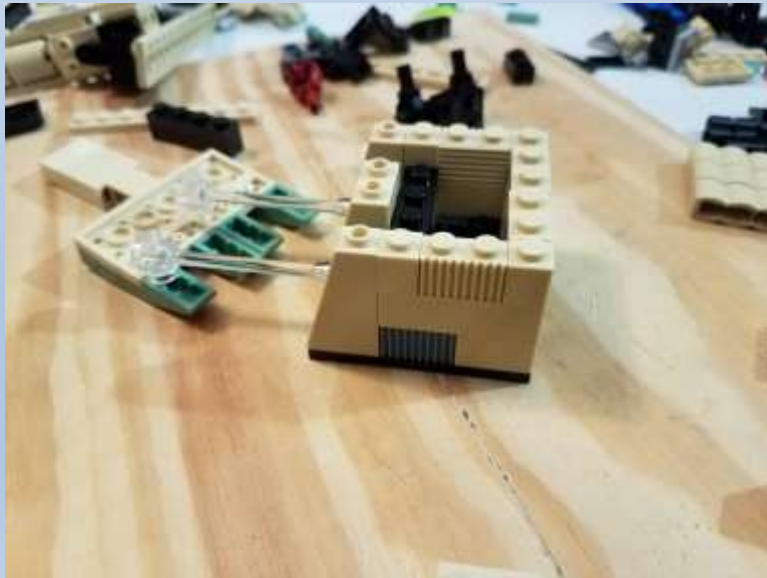
Twin Mount Laser Cannon Design Inspiration



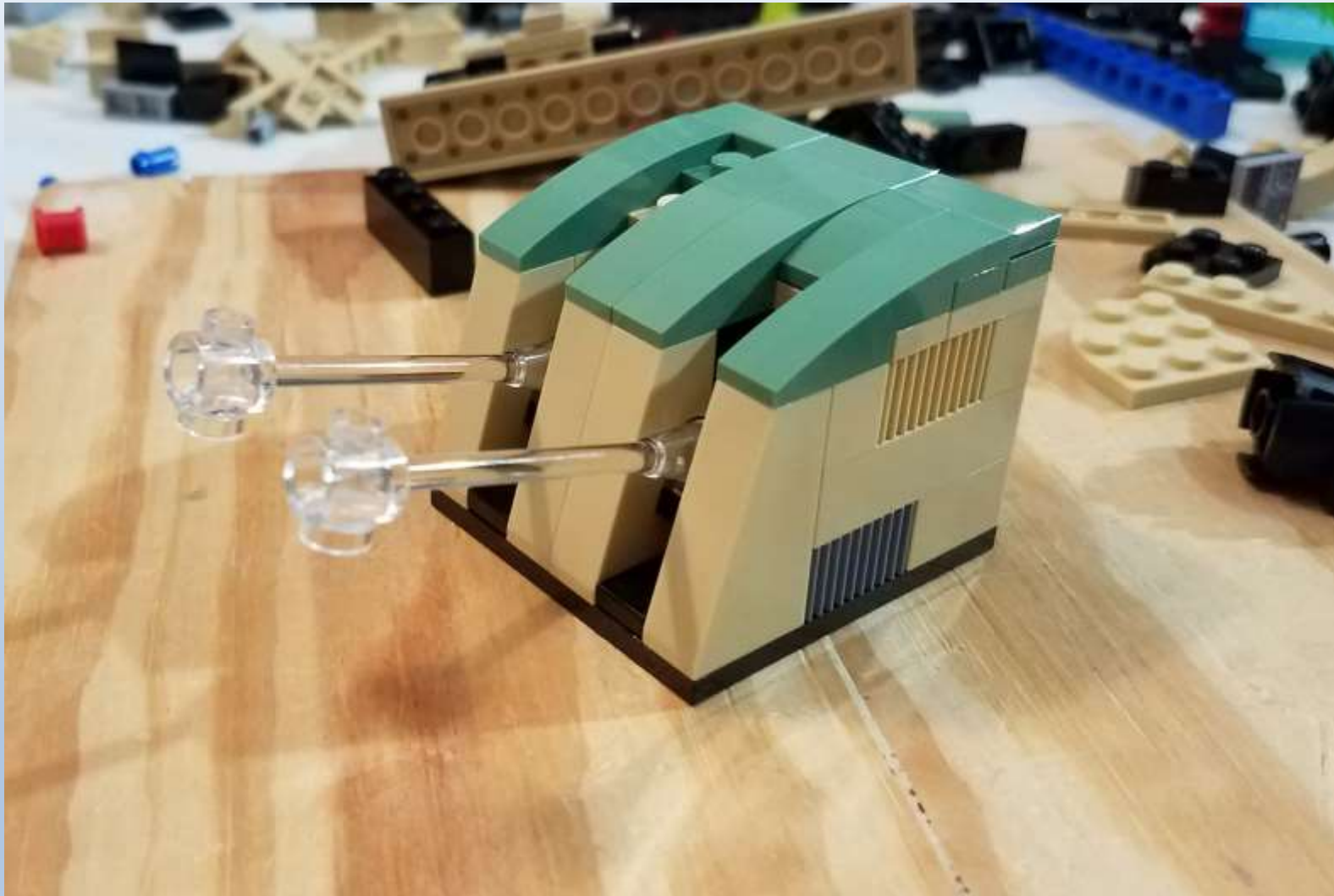
Twin Mount Laser Cannon Design



Twin Mount Laser Cannon Design



Twin Mount Laser Cannon Design



Large Laser Cannon Platform Design

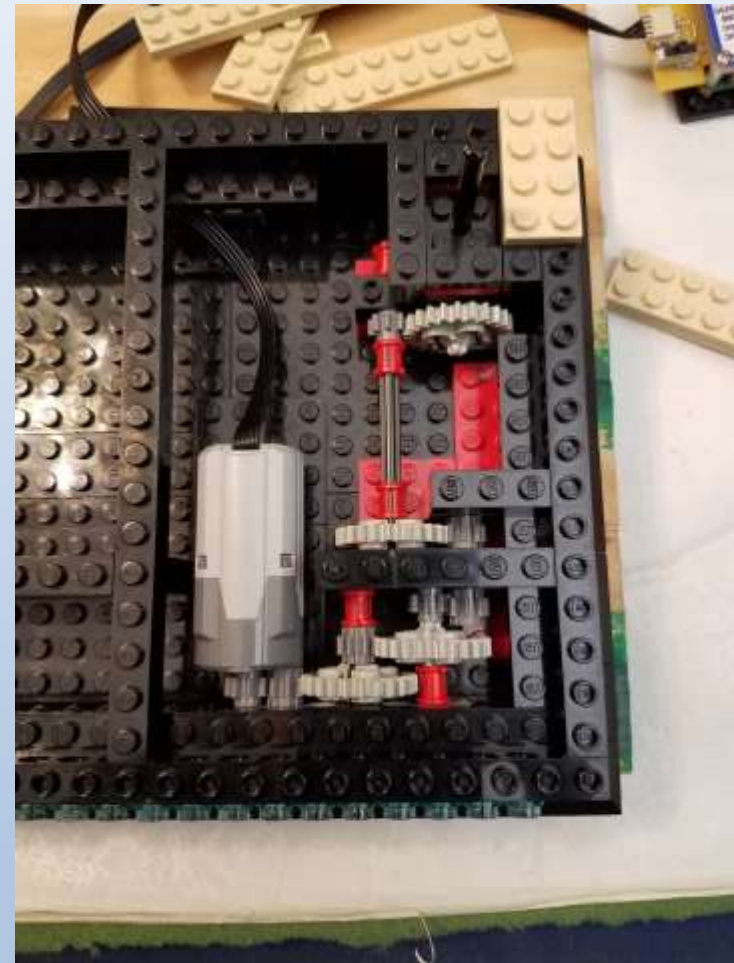
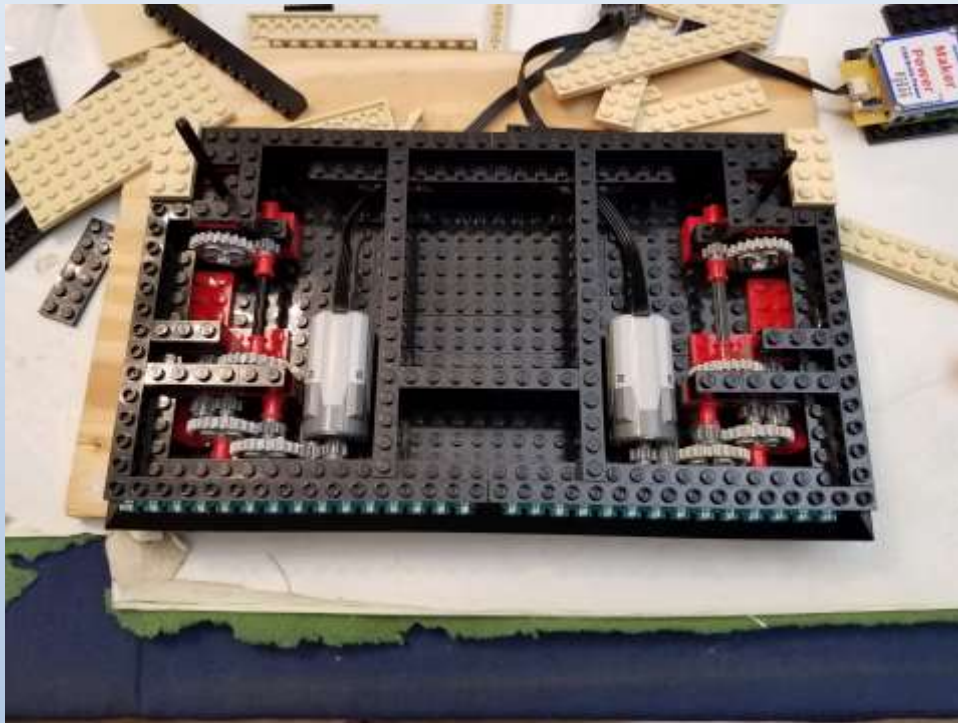


Jetpack Base Design

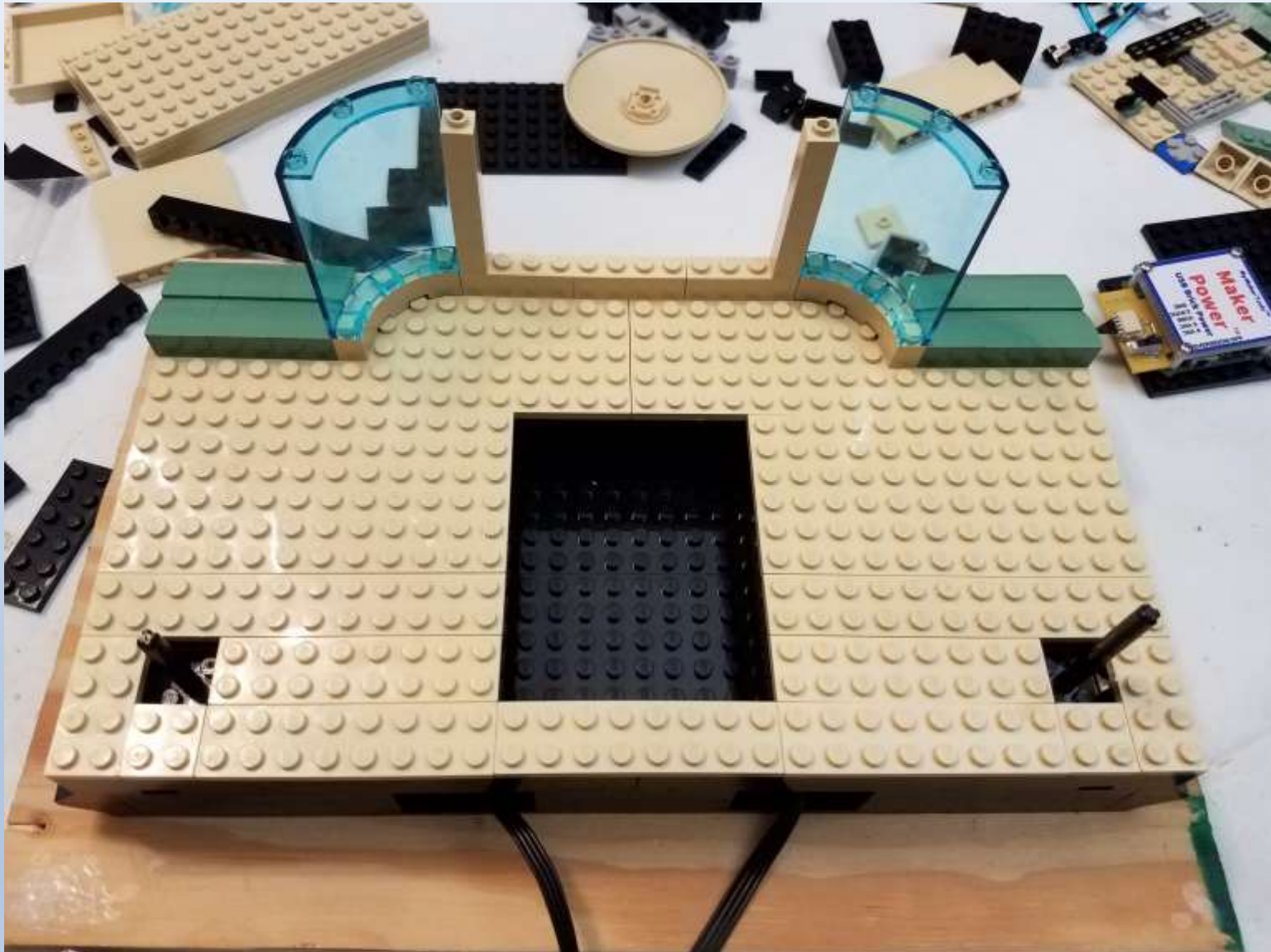
Features

- Two Motors/Three Separate LED channels
- Two Spinning Radar Towers
- Detailed preparation & launching area
- Detailed Control Area

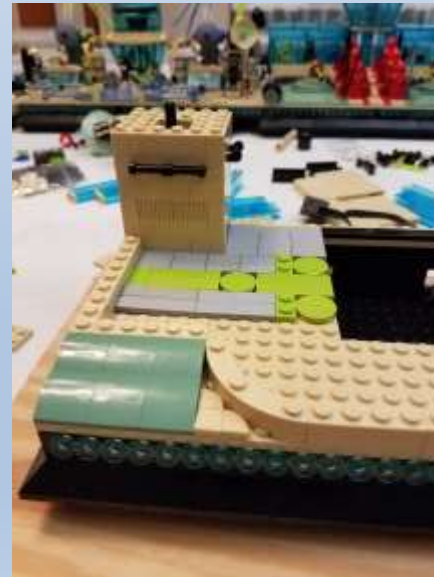
Jetpack Base Design



Jetpack Base Design



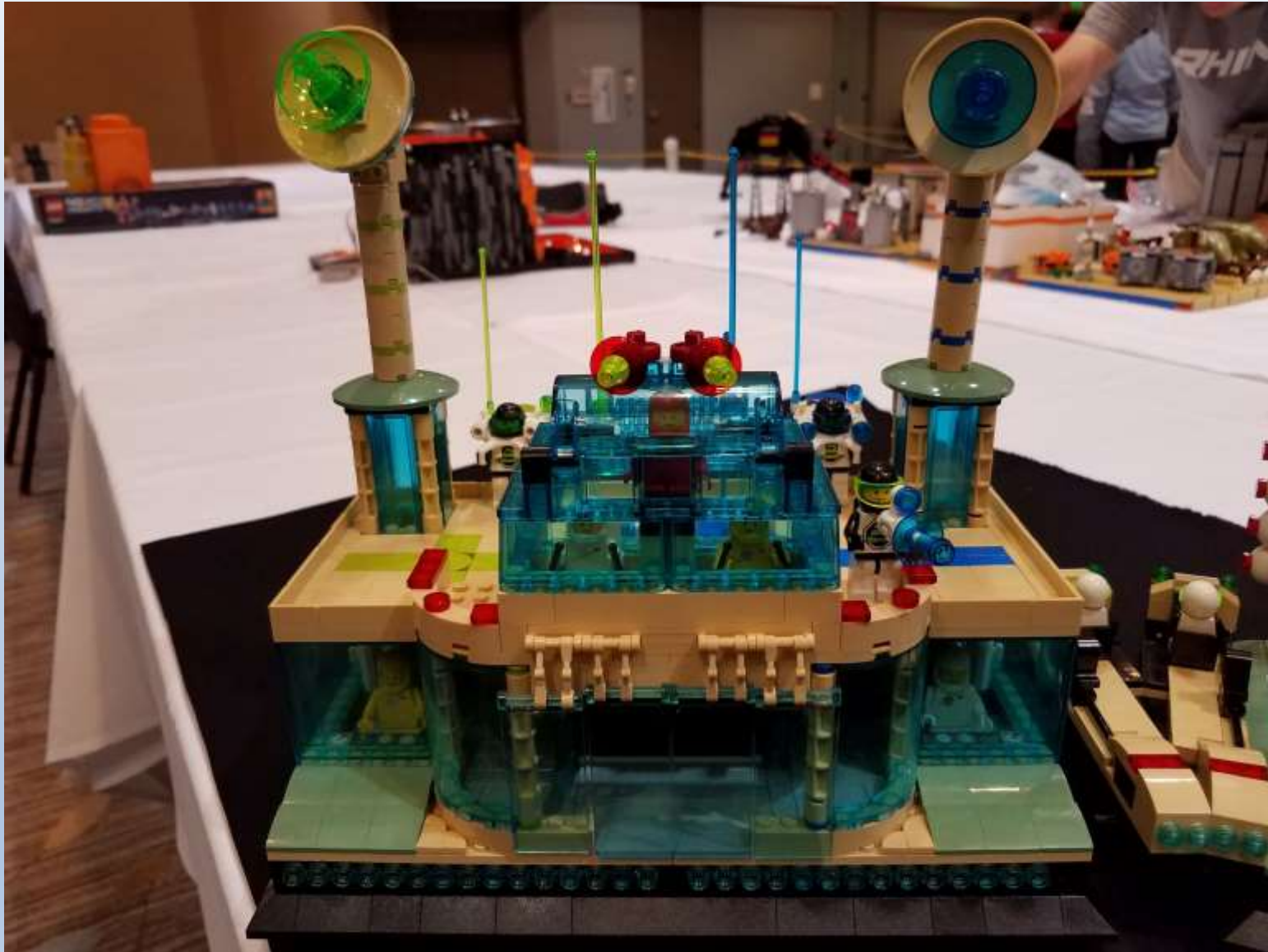
Jetpack Base Design



Jetpack Base Design



Jetpack Base Design



Questions

To Do List

- pictures of early space set used
- need more pictures of 40 degree modules
- control center pictures, not much here probably just the completed one or the transition to tan from black.
- command center pictures
- final jetpack base pictures
- Need picture of finished search light