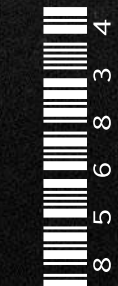


ENGINEERING BOOK CHARGED UP

2022-2023



8 5 6 8 3 4

TEAM
5427

STEEL TALONS

SERVE. INSPIRE. BUILD.

The Steel Talons take pride in serving our community and disadvantaged youth in our reach. We strive to inspire the next generation of leaders in STEM, creating an international network through our perseverance and determination. We are actively working towards a legacy that gives back all the opportunities that FIRST has entrusted to our team!



THE PROCESS

1.

BRAINSTORM

All members including rookies get together to draw ideas from each other.

2.

SKETCH

The brainstorming is transferred on paper to conceptualize designs in a visual manner.

3.

PROTOTYPE

Rough prototypes are made to test ideas and gauge how executable they are.

4.

CAD

The best results from prototyping are put into a detailed CAD file to lay out the groundwork.

5.

PARTS

Parts from the CAD files are cut out and prepared in an orderly manner.

6.

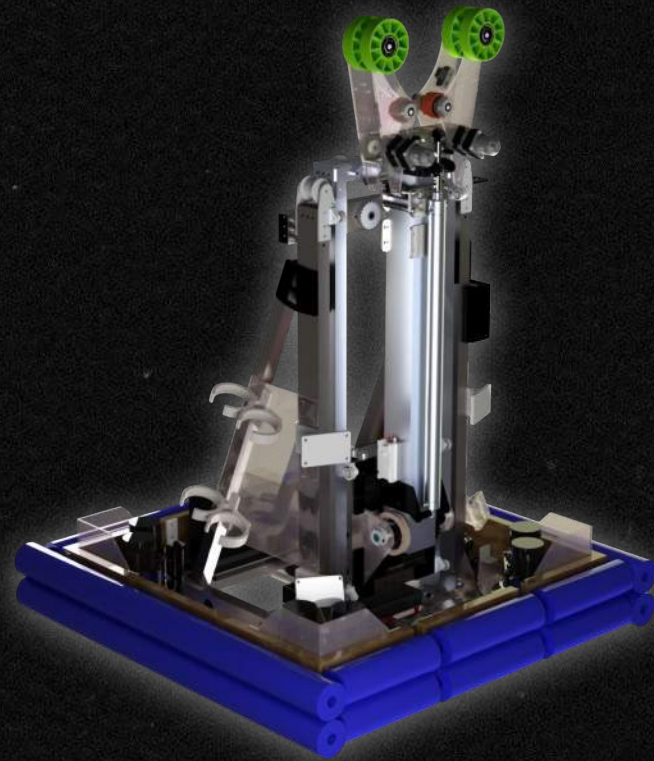
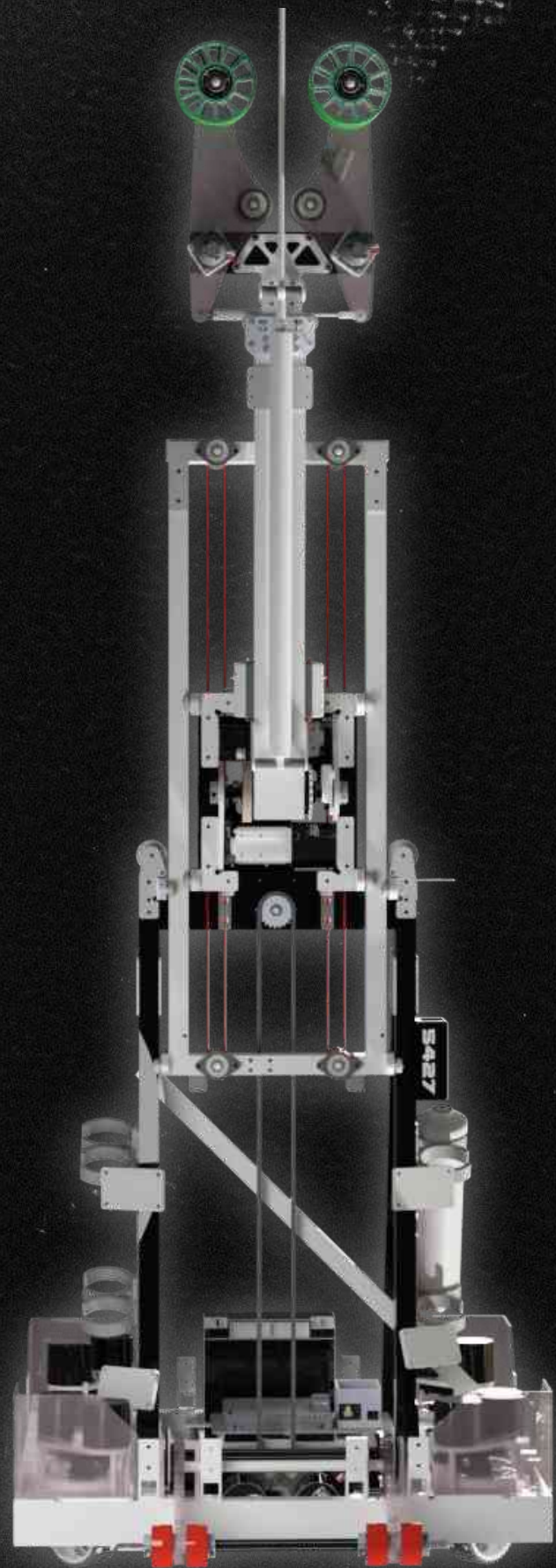
ASSEMBLE

The parts of assembled together and any problems are fixed and fine tuned.

INTRODUCING OUR ROBOT

drumroll...

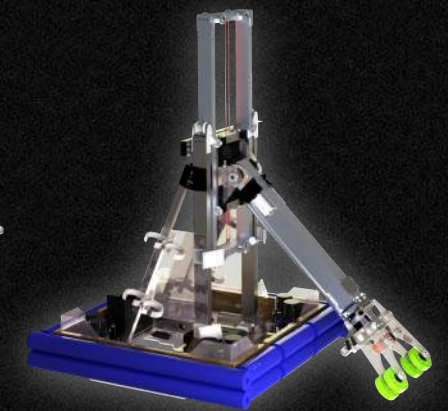
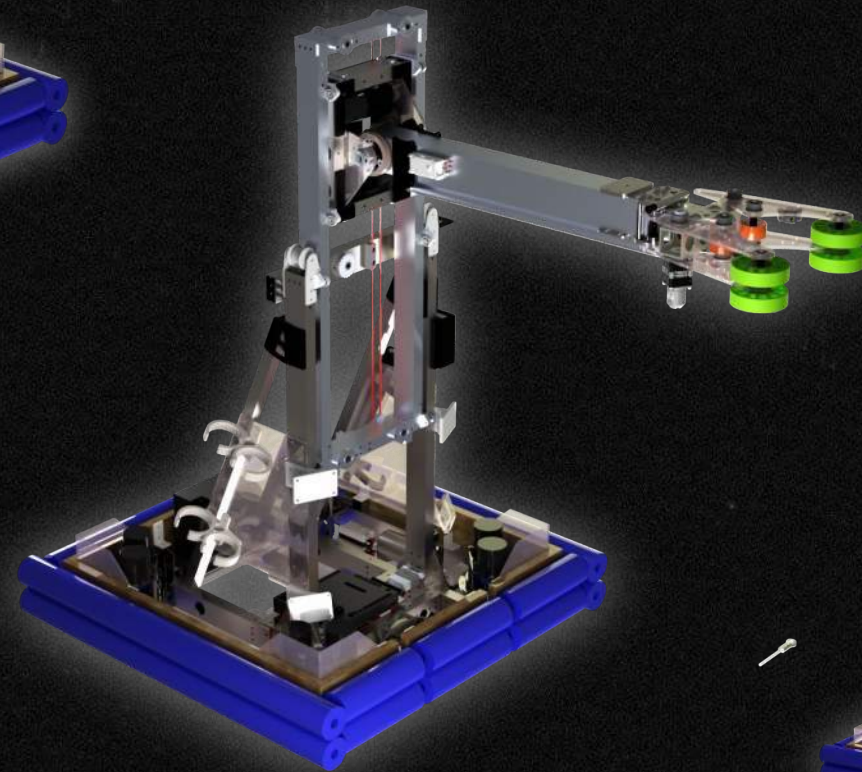




ACE

5427

**logo designed by vicky*





THE PROGRAMMING APPROACH

General Code Structure

Because our robot is a command based robot, we are utilizing the efficiency of subsystems and commands to organize them and make the coding and debugging substantially easier, along with storing our constants in our constants file to access commonly used variables, the code is easy to read and straightforward.

Localization-based automation

Using a combination of apriltags through computer vision pipelines, and sensors like the CTRE Pigeon2 IMU, we patched the gaps in human input with artificial precision, enabling our robot to perform seamlessly.



THE SUB-SYSTEMS

01. CASCADE ELEVATOR

A two stage elevator system with the arm carriage acting as the second stage

02. DRIVE TRAIN

A swerve drive base comprised of 4 SDS Mk 4 Swerve Modules

03. ELECTRICAL

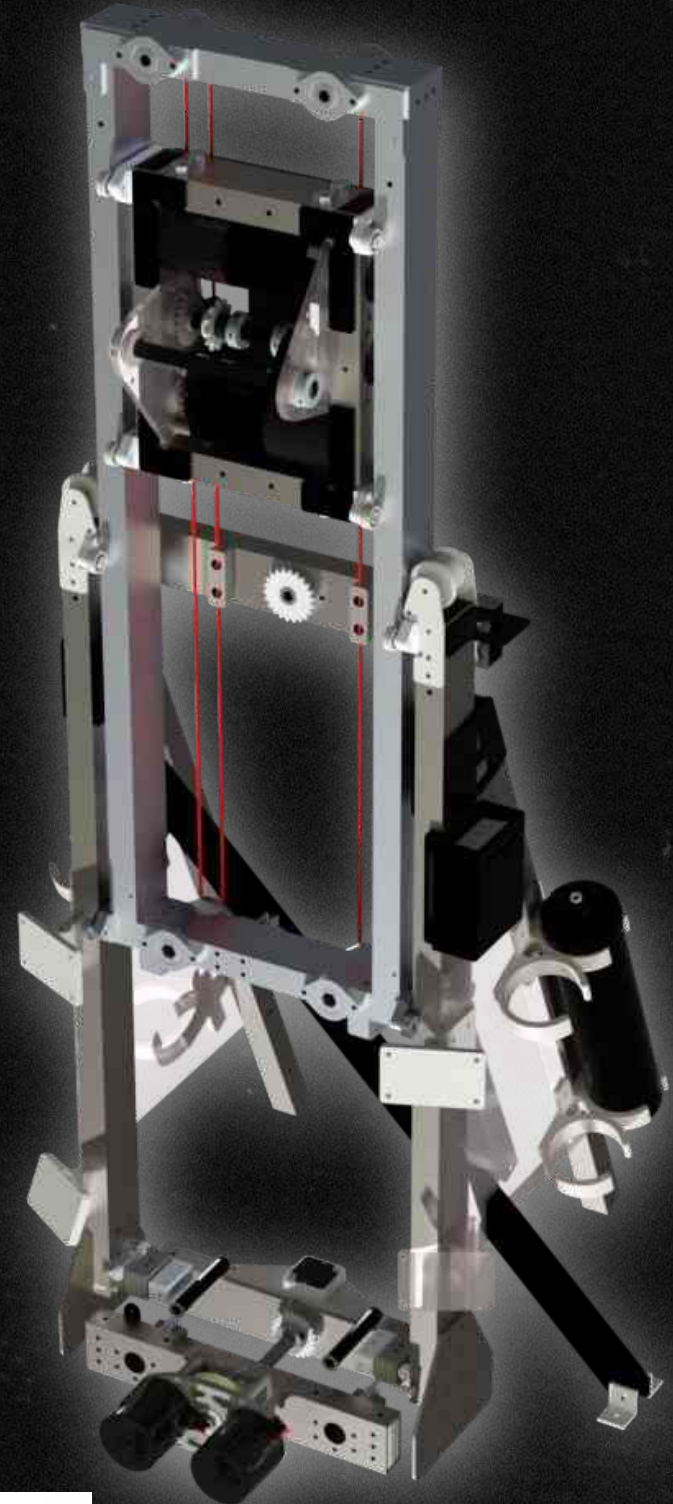
A complex system of custom components and vendor-bought hardware, optimized to deliver peak performance.

04. INTAKE

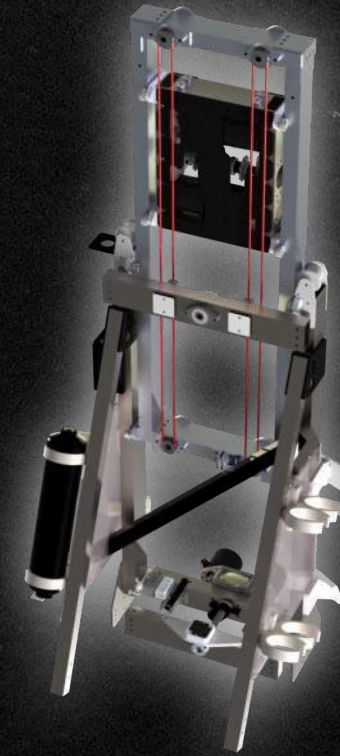
Utilizes a symmetric claw and a piston to hold the game pieces

cascade extended

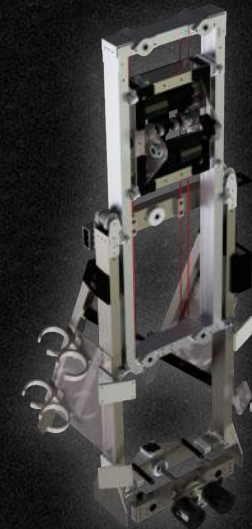
front view



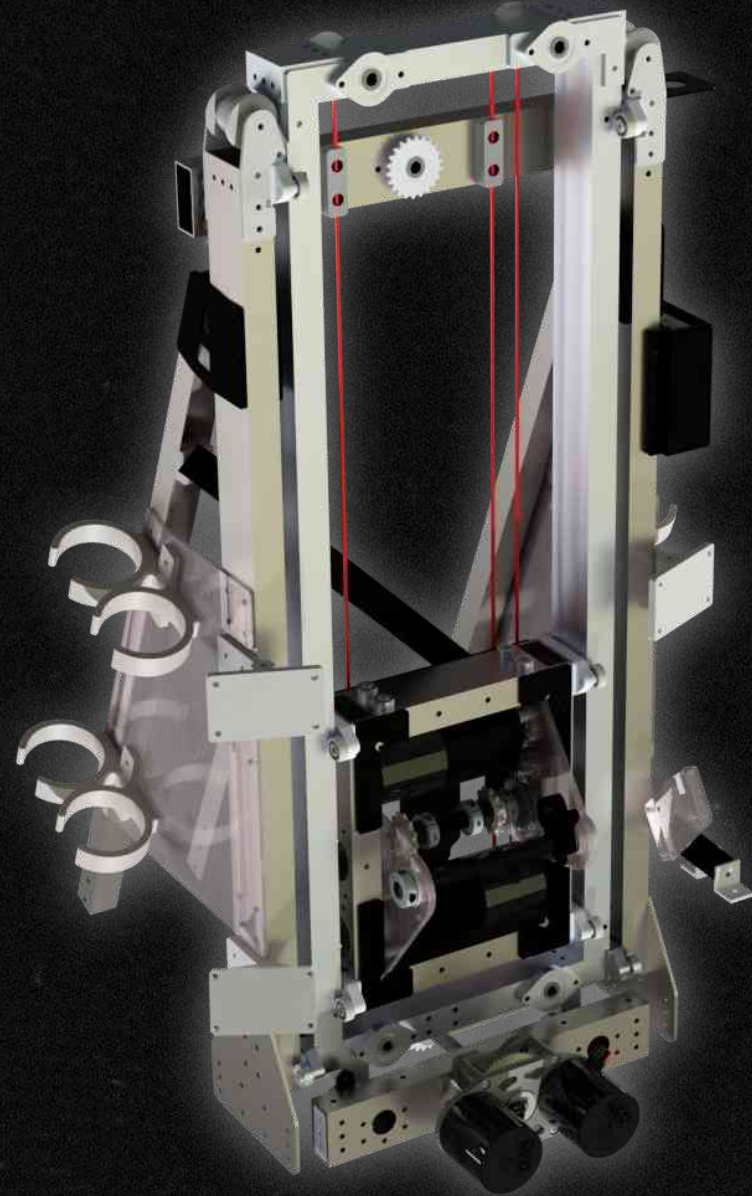
back view



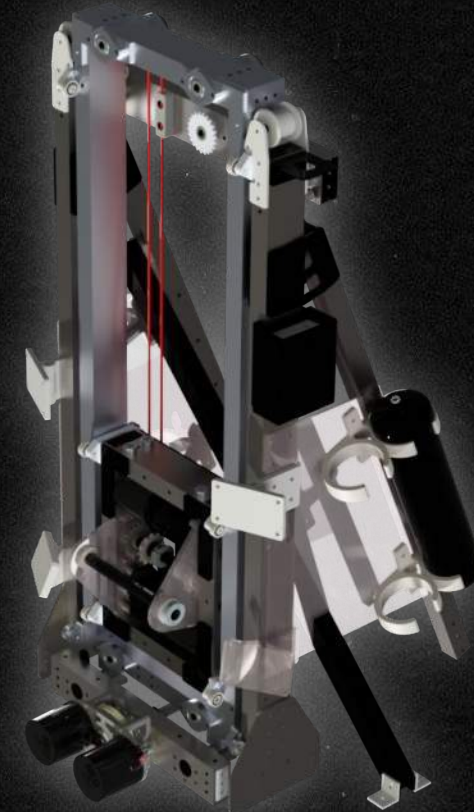
side view



cascade retracted



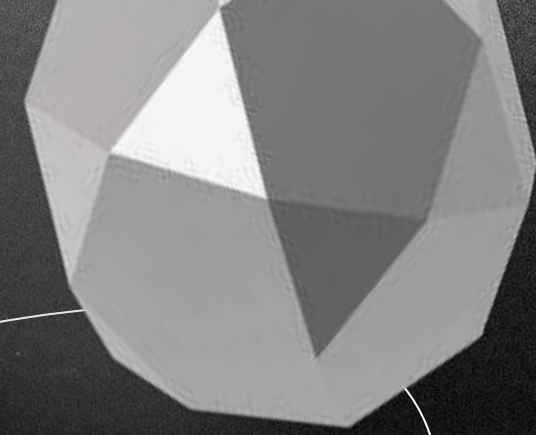
front view



side view

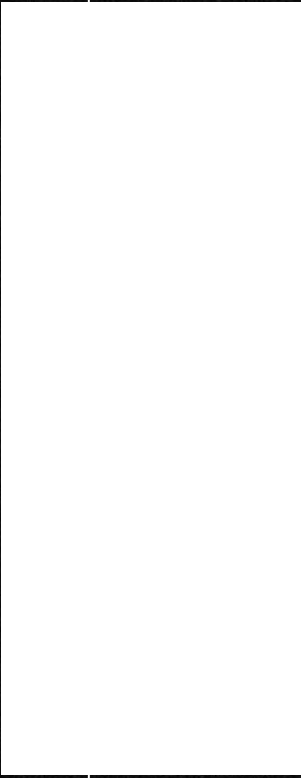


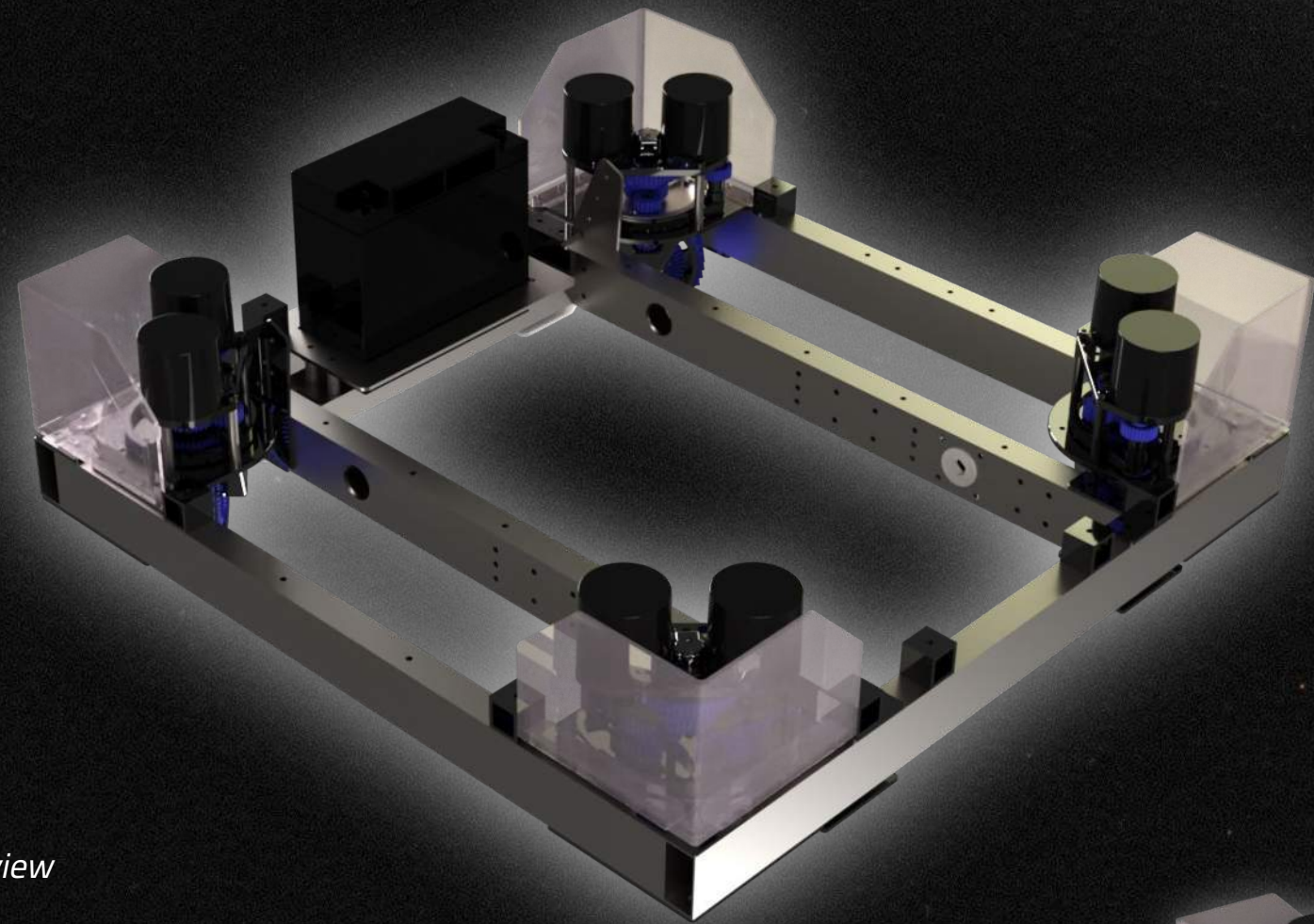
STEEL TALONS



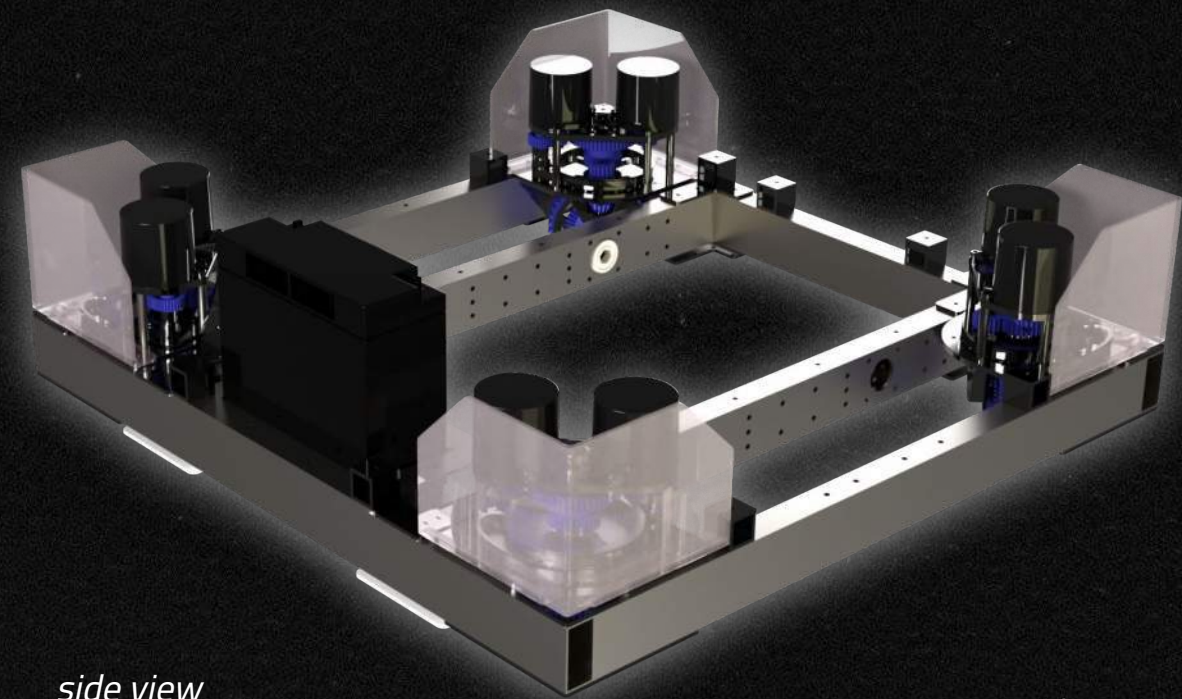
03.

DRIVE TRAIN





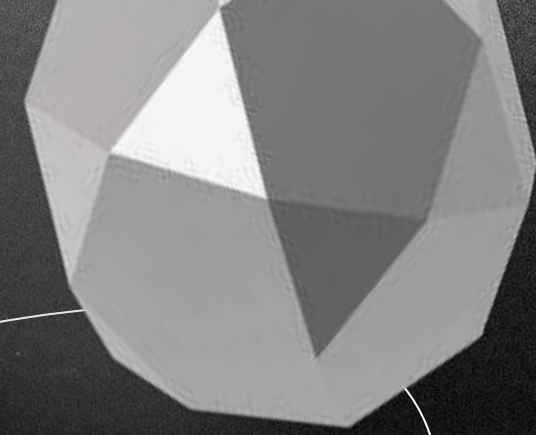
front view



side view

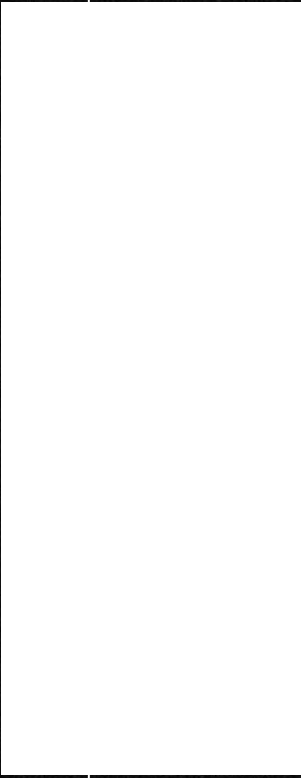


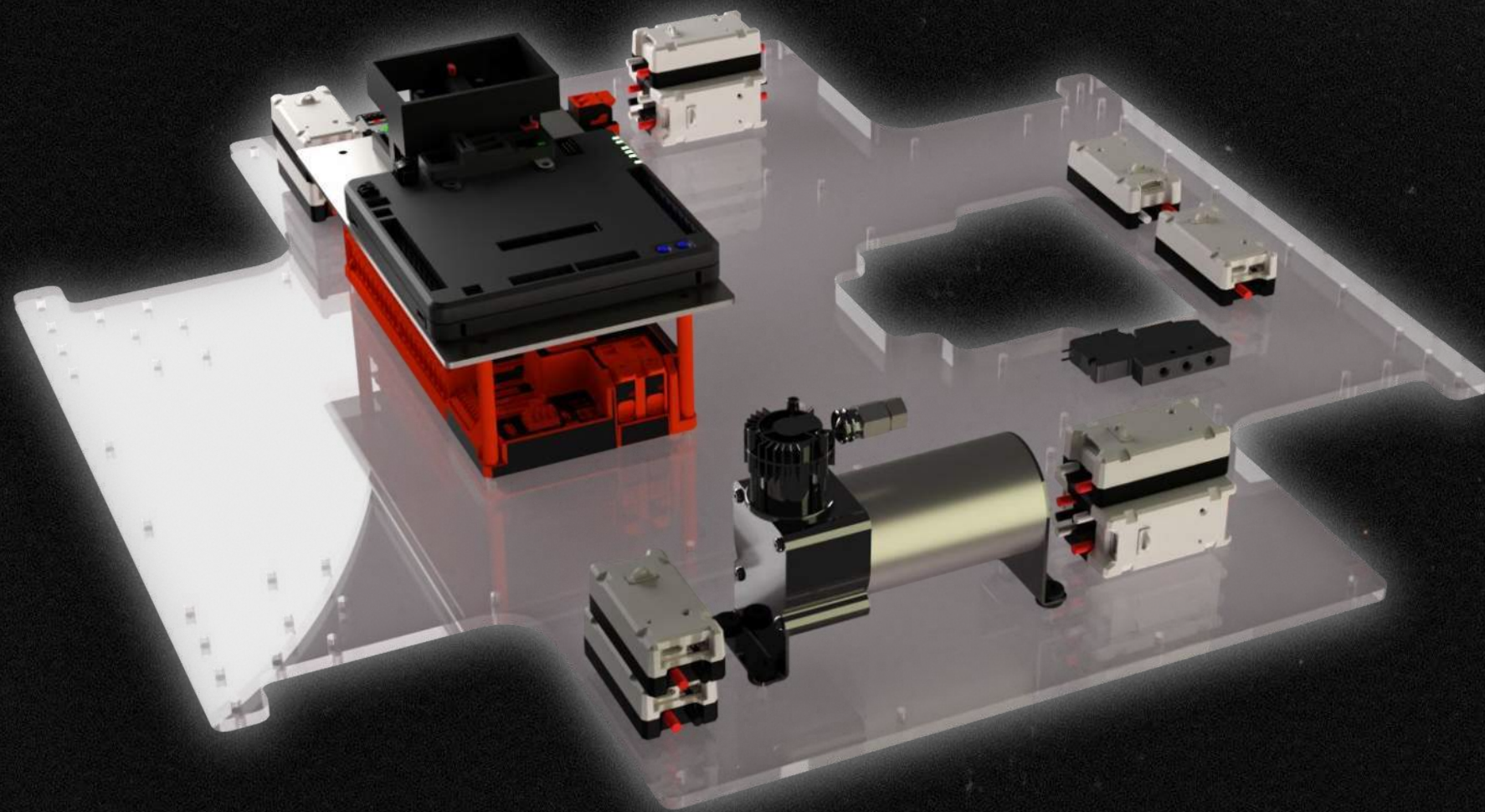
STEEL TALONS



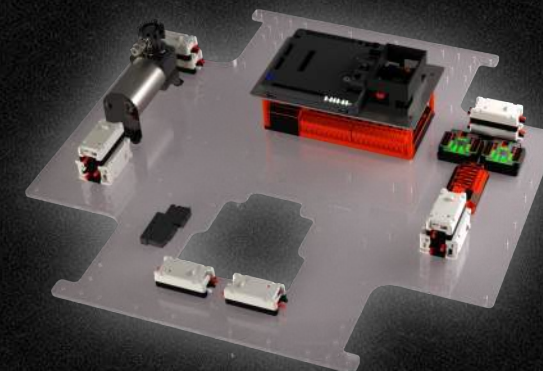
03.

ELECTRICAL

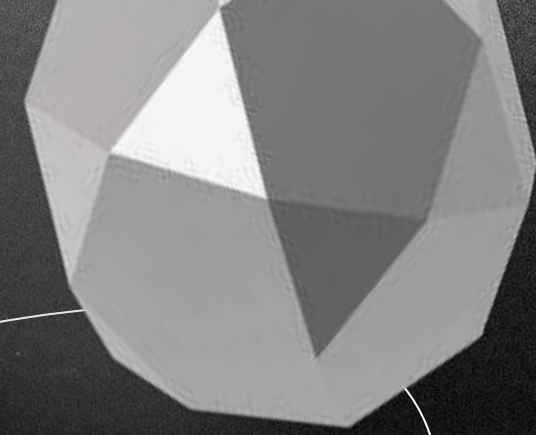




electrical belly pan

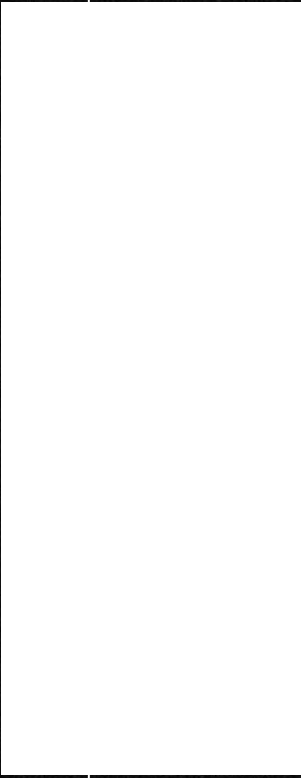


STEEL TALONS



04.

INTAKE

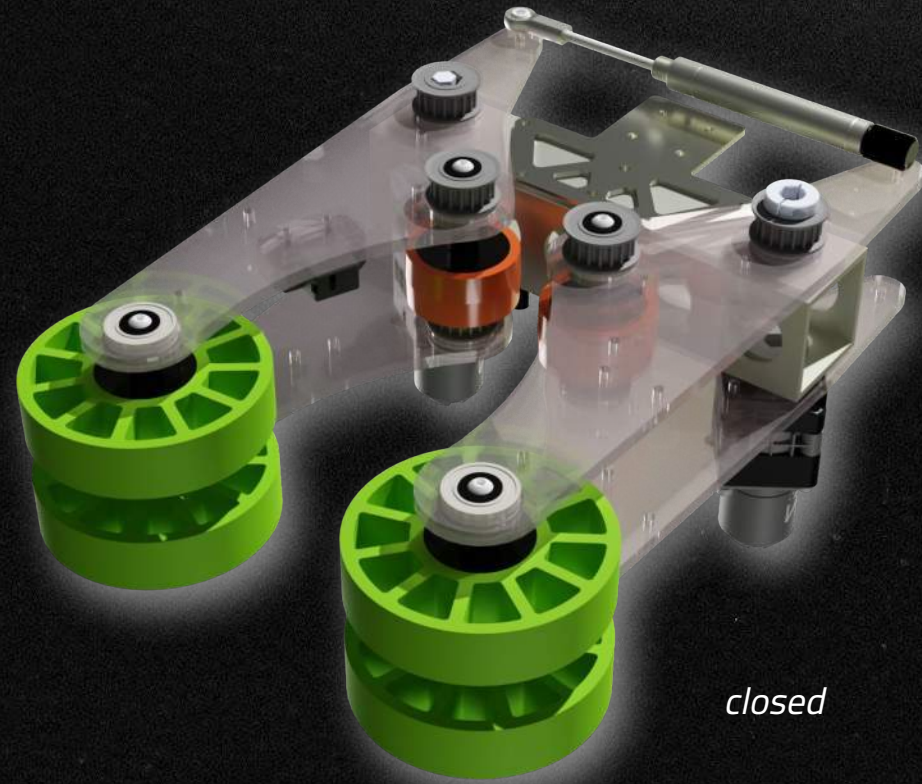


claw

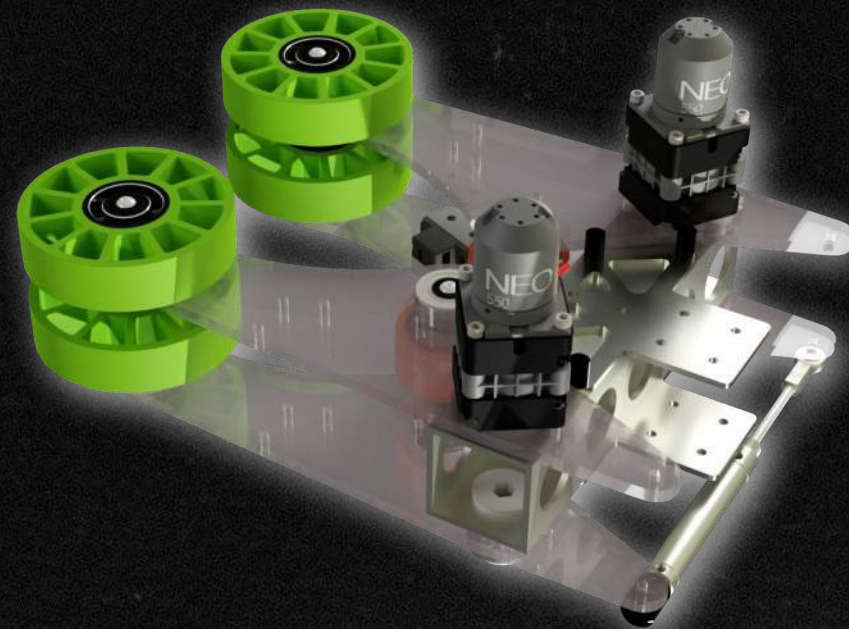
open



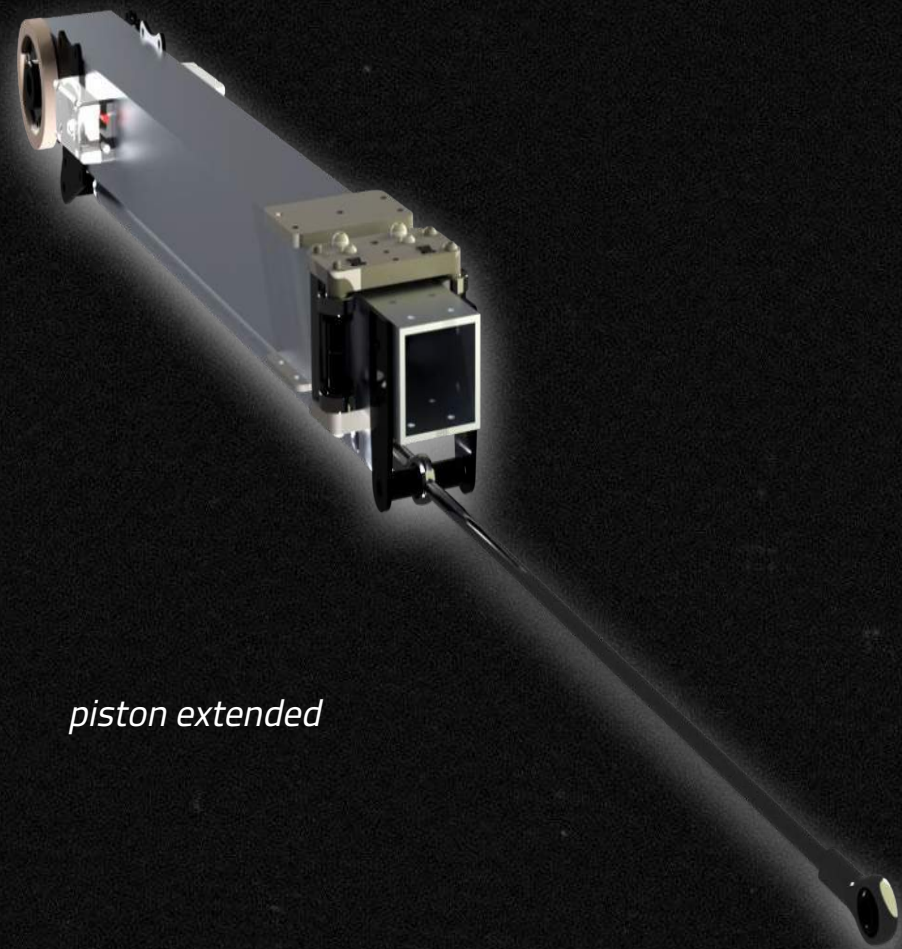
closed



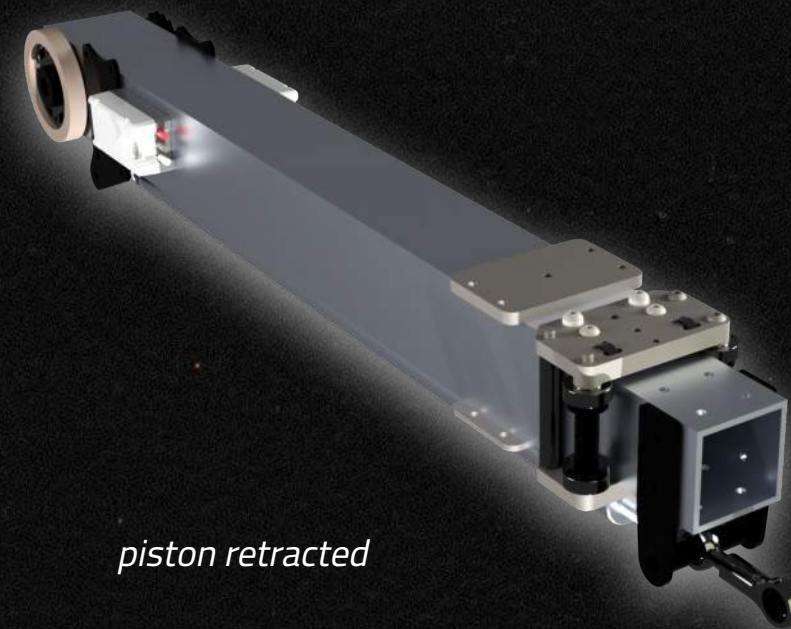
bottom view



pneumatic arm



piston extended



piston retracted



OUR STEEL TALONS FAMILY

