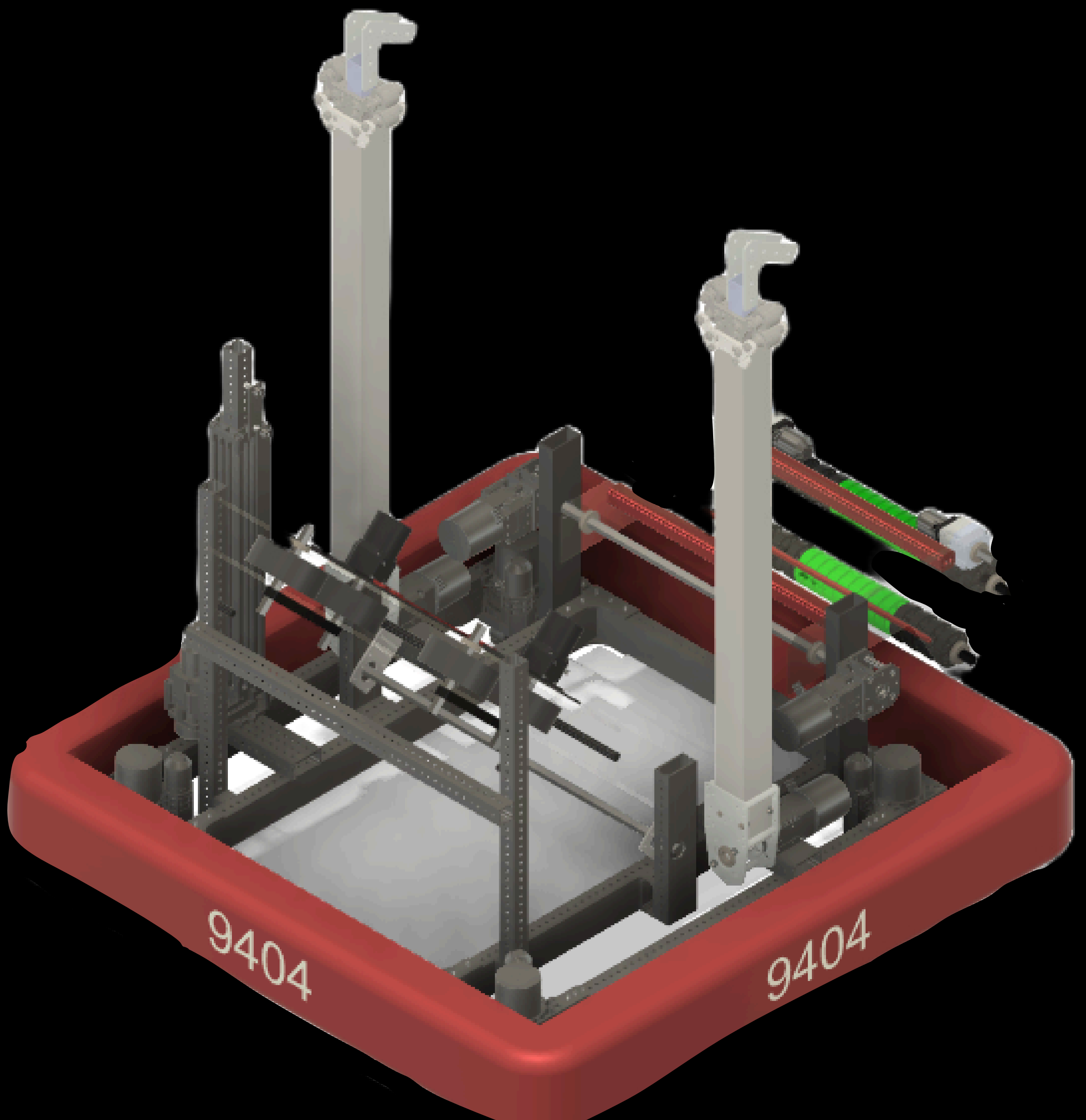




FORGE

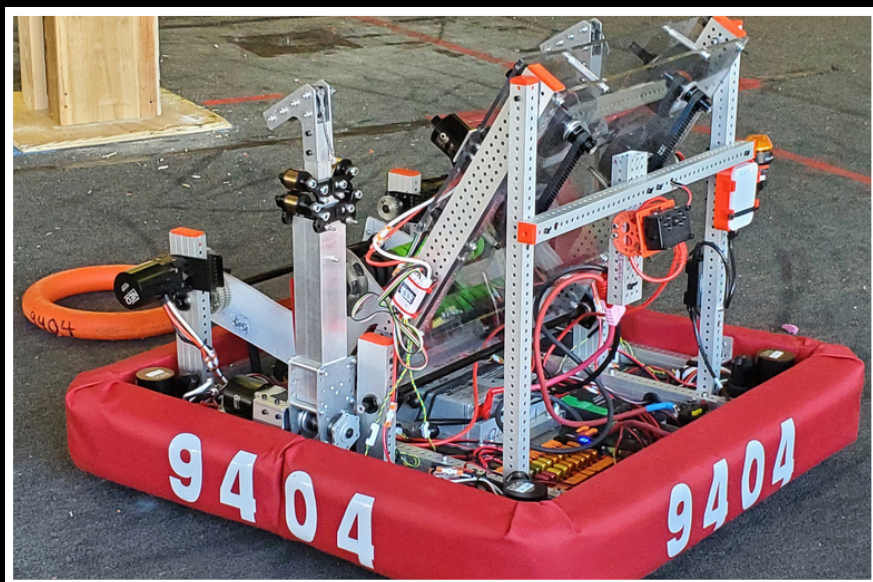
9404

TECHNICAL SUMMARY



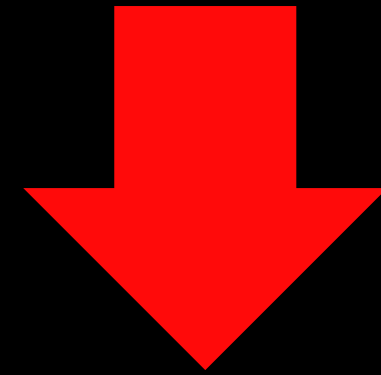
DESIGN PROCESS

ITERATIONS, PROTOTYPES & PLANNING



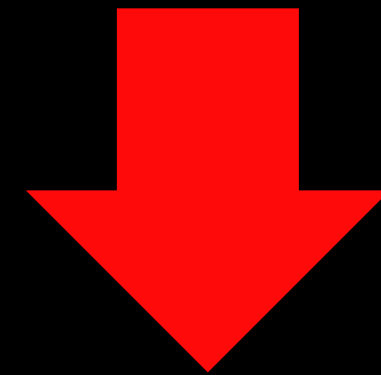
MVP 1

1. **Drivetrain**
2. **Fixed shooting**
3. **Pickup from top (source)**



MVP 2

1. **Pivot Shooter**
2. **Climbing Mechanism**
3. **Pickup from ground**



MVP 3

1. **Shooter Pivot**
2. **Note Detection**
3. **LEDs Notification**

PROJECT: Flame

Forge 9404

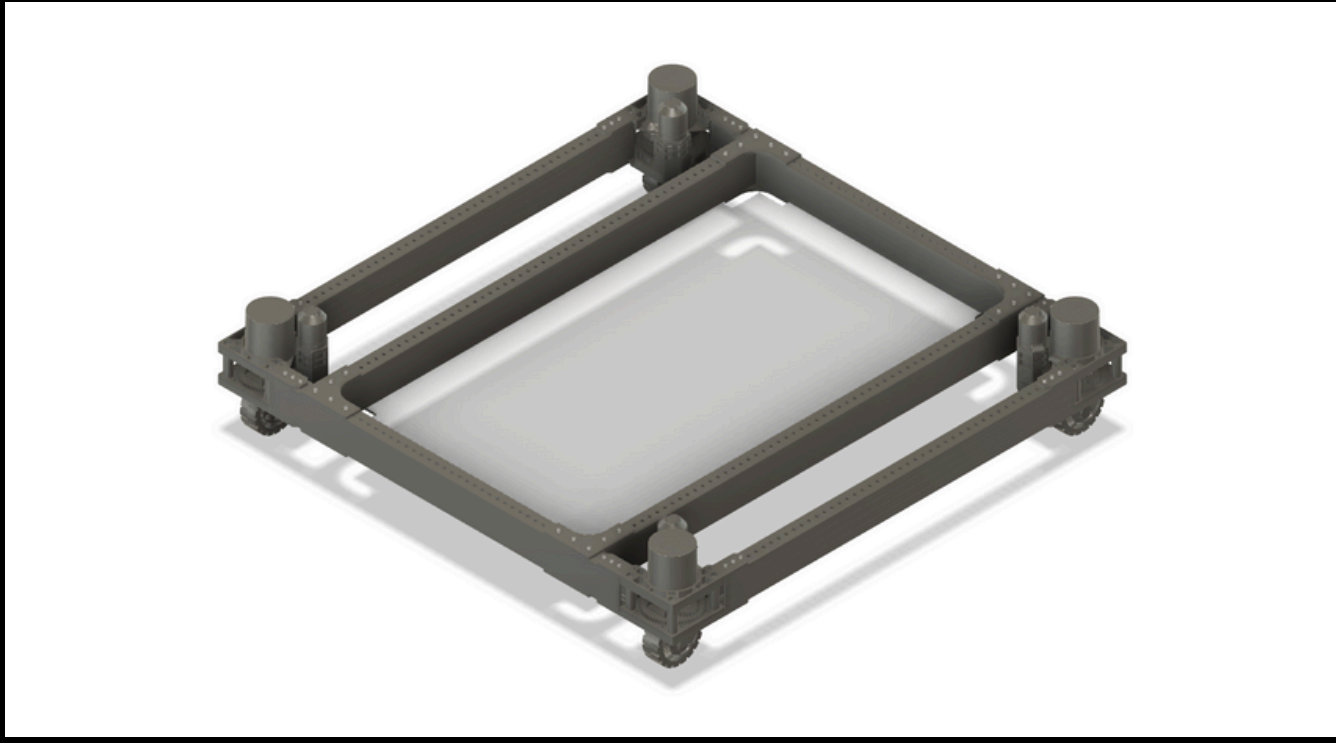
Legend: On track Low risk Med risk High risk Unassigned

Project start date: 1/6/2024
Scrolling increment: 0

Milestone description	Category	Progress	Start	Finish	Days
Breakdown and Prototype					
Game Breakdown	On Track	100%	4/1/2024	4/3/2024	2
Prototyping	On Track	75%	4/2/2024	*****	14
Flame V1					
Shooter Cartridge	High Risk	0%	*****	*****	2
Top Intake	Low Risk	0%	*****	*****	1
Drive Train	Low Risk	75%	*****	*****	3
Basic Auto	Med Risk	*****	*****	*****	2
V1 Complete	Milestone	*****	*****	*****	1
Flame V2					
Intake	High Risk	*****	5/1/2024	*****	8
Indexing	Med Risk	*****	5/1/2024	5/2/2024	1
Climb	Low Risk	*****	5/1/2024	5/8/2024	7
Auto - Shoot and Pass Line	High Risk	*****	5/1/2024	5/8/2024	7
V2 Complete	Milestone	*****	5/8/2024	5/9/2024	1
Flame V3					
Shooter Tilt	Med Risk	*****	*****	*****	3
Deviator	Low Risk	*****	*****	*****	3
Limelight	Med Risk	*****	*****	*****	1
Drive Automations	Med Risk	*****	*****	*****	9
V3 Complete	Milestone	*****	*****	*****	1
Competitions					
Swamp Scrimmage	Goal	*****	*****	*****	1
South Florida Tallahassee	Goal	*****	3/3/2024	*****	4
Task 4	Goal	*****	*****	*****	4

To add more data, insert new rows.

DRIVETRAIN



Swerve Drive Train

- REV Max Swerve Modules
- Our drivetrain has 4 Steering motors and 4 Propulsion Motors
- Gear ratio of 5.08:1 - L2
- PID controlled, 1 Rev Throughbore and Absolute encoder

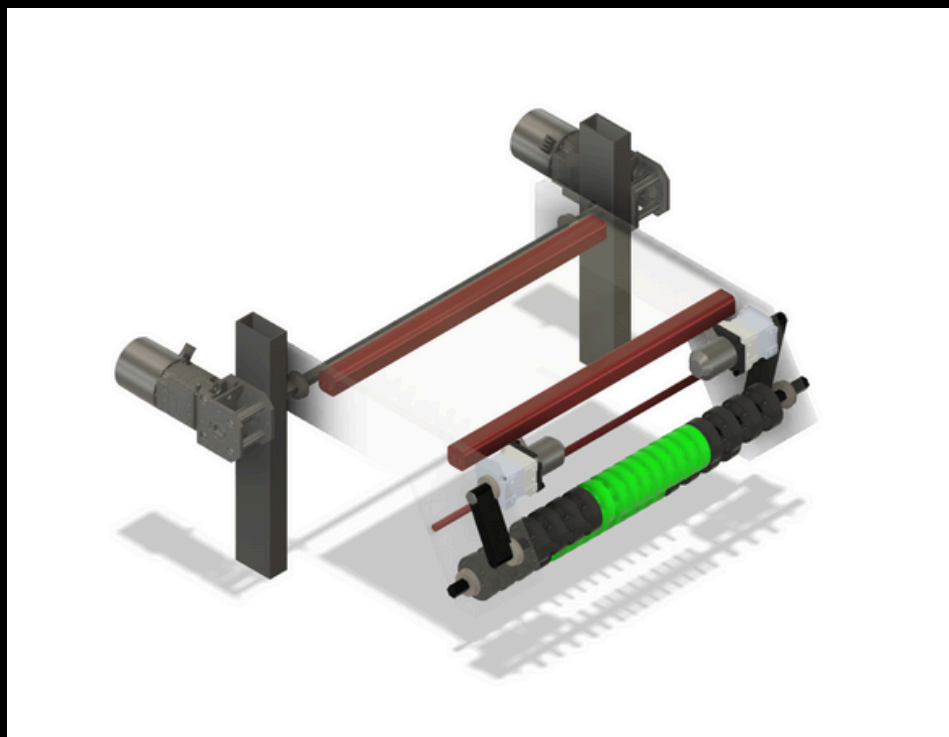
CLIMBING MECHANISM



Climber

- Pair of 2 Stage Telescoping Climbers
- 36:1 AM Sport Gear Box
- REV NEO in Break Mode

INTAKE



Intake

- We use a Rev 90-degree gearbox to power our intake.
- Our over the bumper ground intake was inspired by Cranberry Alarms RI3D design.
- Thrifty Bot and Andymark compliant wheels
- Harder outer wheels to center notes
- Neo 550 attached to a VersaPlanetary gearbox with 4:1 reduction.

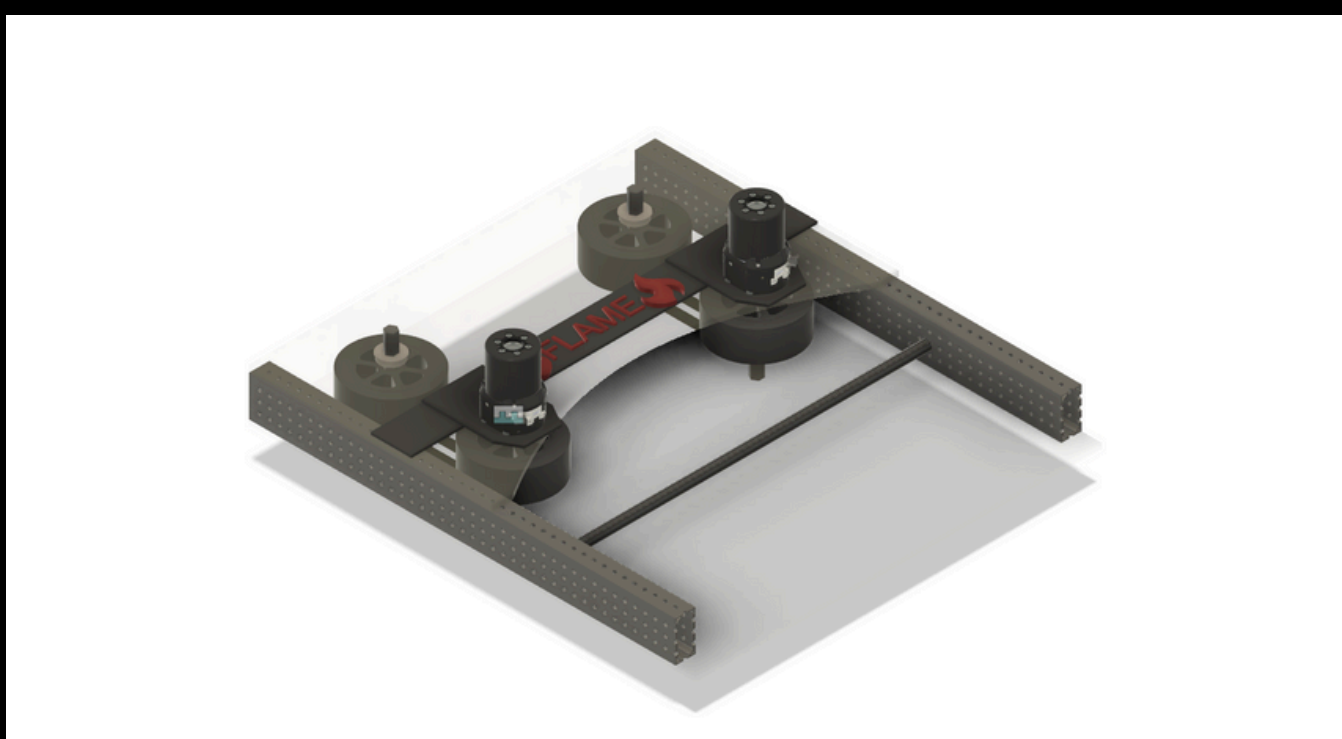
SHOOTER PIVOT



Linear Actuator

- REV Linear Actuator
- NEO 550 with 25:1 reduction
- Mounted on a 180-degree gearbox with a 1:1 belt ratio
- Allow for us to pivot our shooter and shoot from farther away.

SHOOTER

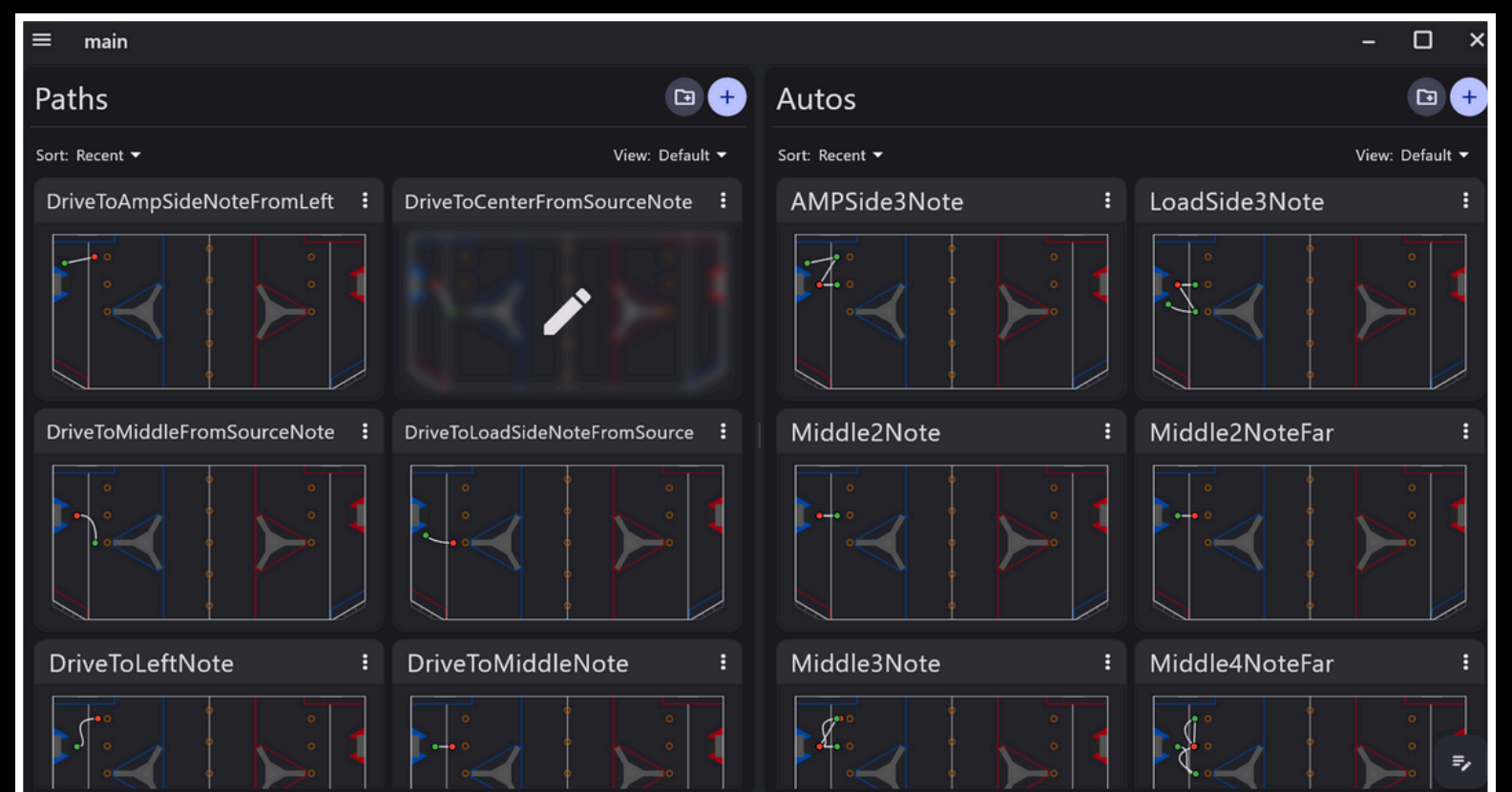
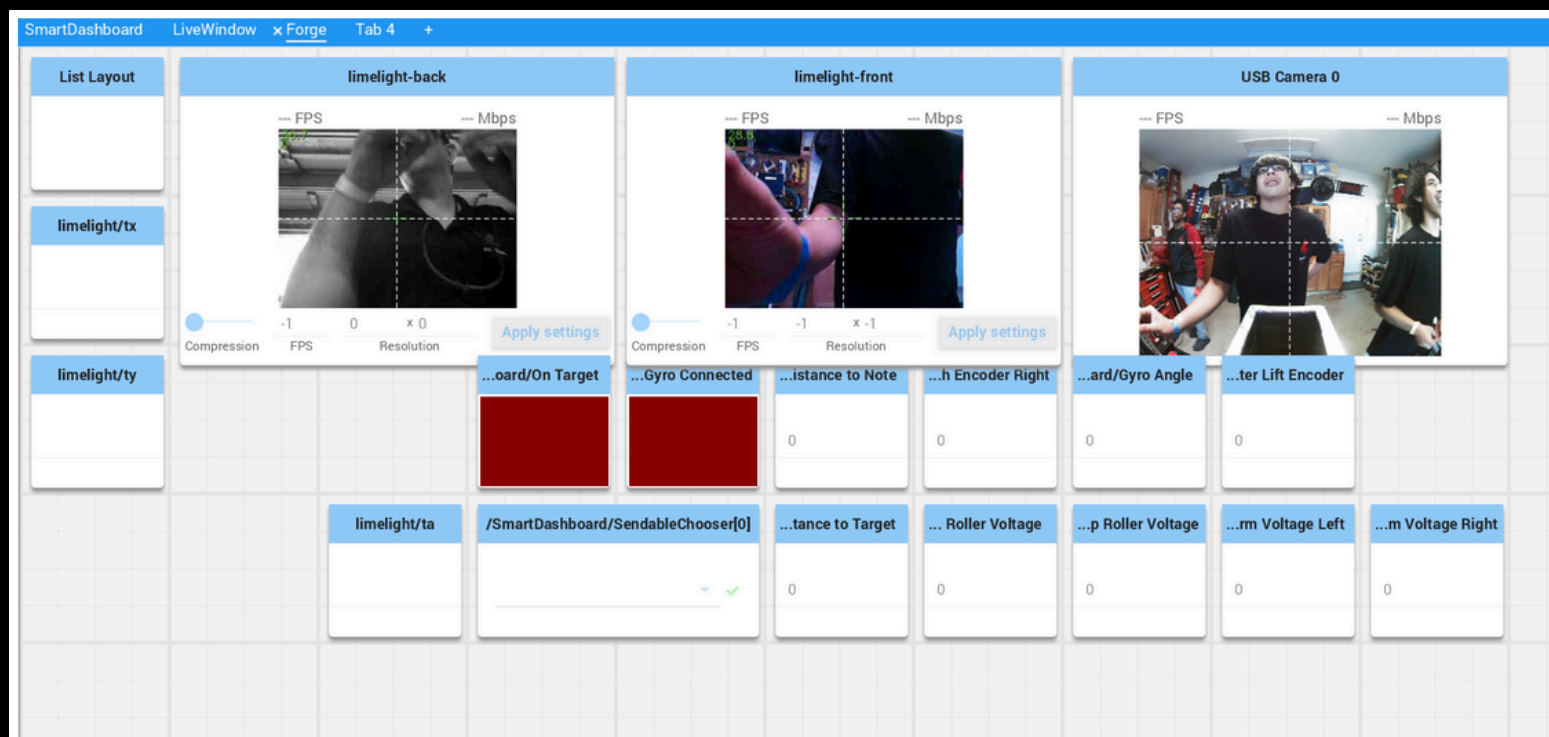


Shooter

- Runs off of two NEO Vortex's 1:1
- Inspired by Cranberry Alarm's RI3D
- Supports pickup from source from the top in case our intake failure
- Has a curvature in the Polycarbonate in order to better catch onto the note when it is passed by the intake.
- Thin preforated Rev 2x1 for weight reduction

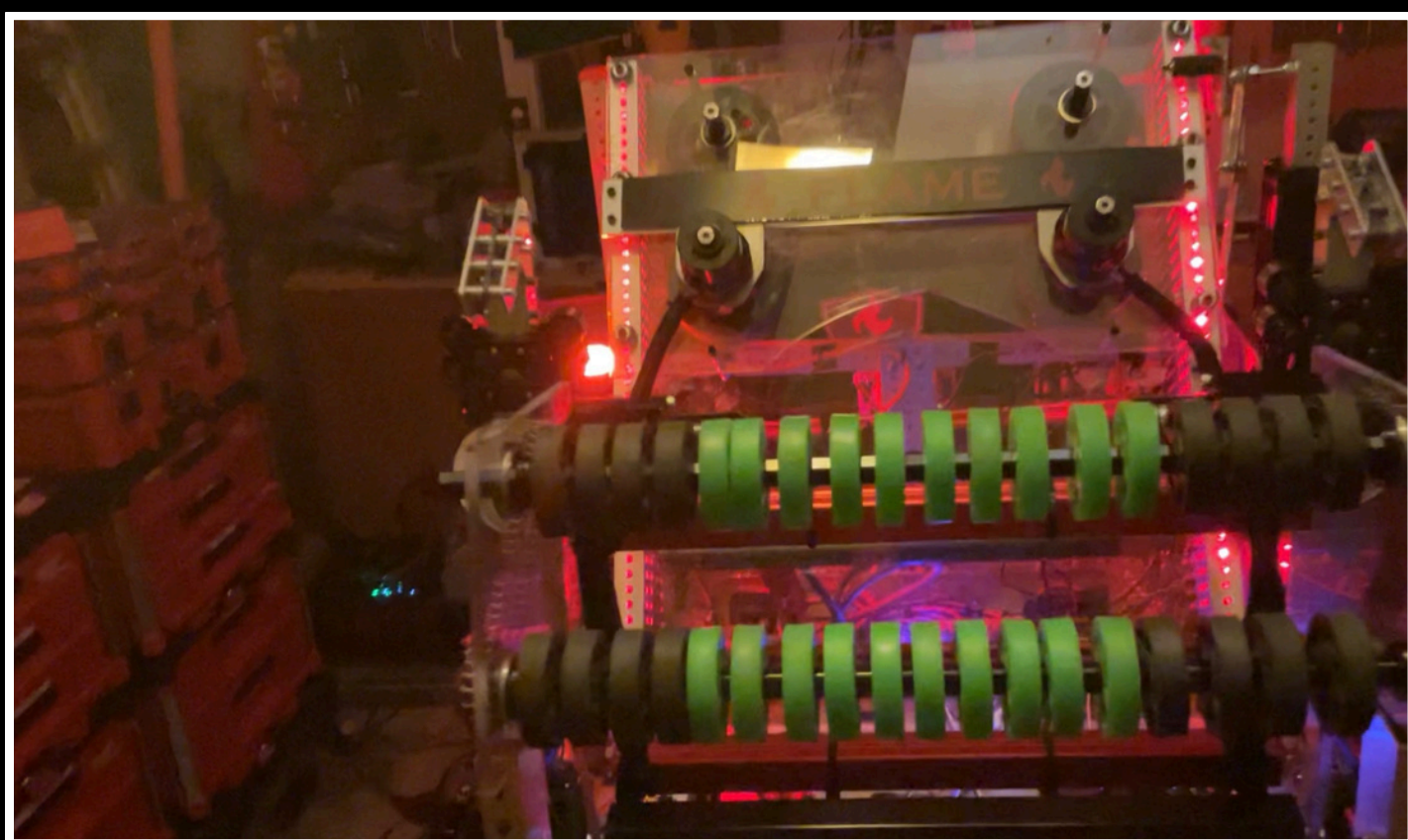
KEY AUTOMATIONS

SHUFFLEBOARD/ PATHPLANNER



This season, we began with PathPlanner, which now allows us to create individual paths and put together our auto's quicker. We also currently use Shuffleboard which allows us to easily select our auto's. In addition, we were able to code to have the LED's on our robot turn red when the note is in range as an indication for our driver. We also have an indication on the screen that flashes green. Lastly, we have all of our cameras displayed on Shuffleboard for easy viewing.

NOTE DETECTION

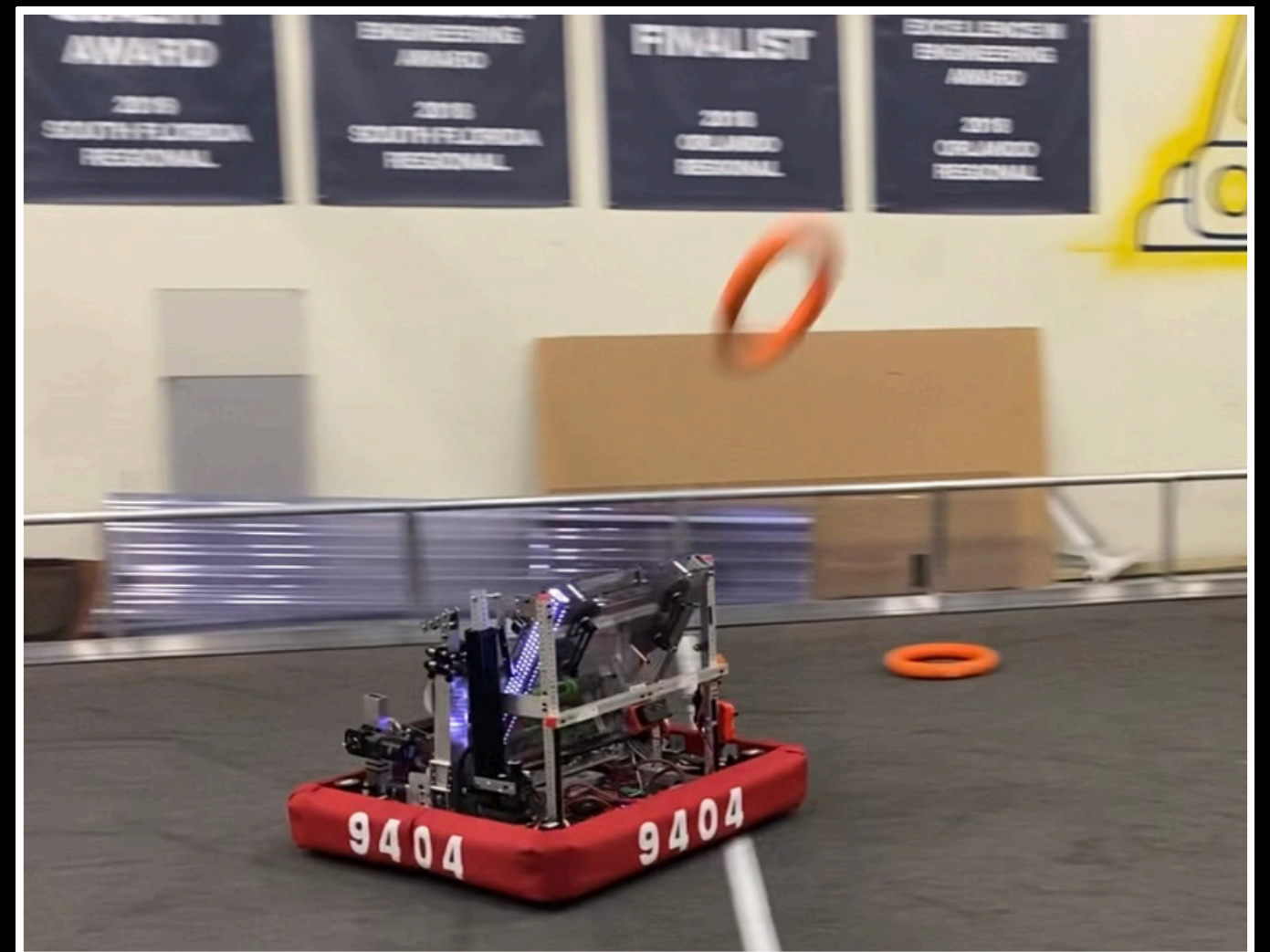


Through the use of a Google Coral attached to a Limelight 3 we are able to detect notes on the field. In addition, to an indication on the screen for our driver, on the robot the LED's turn red when the note is in ranged to be picked up as another indication. We were able to integrate the Google Coral through the use of a public library that has pictures of notes already trained to detect a note.

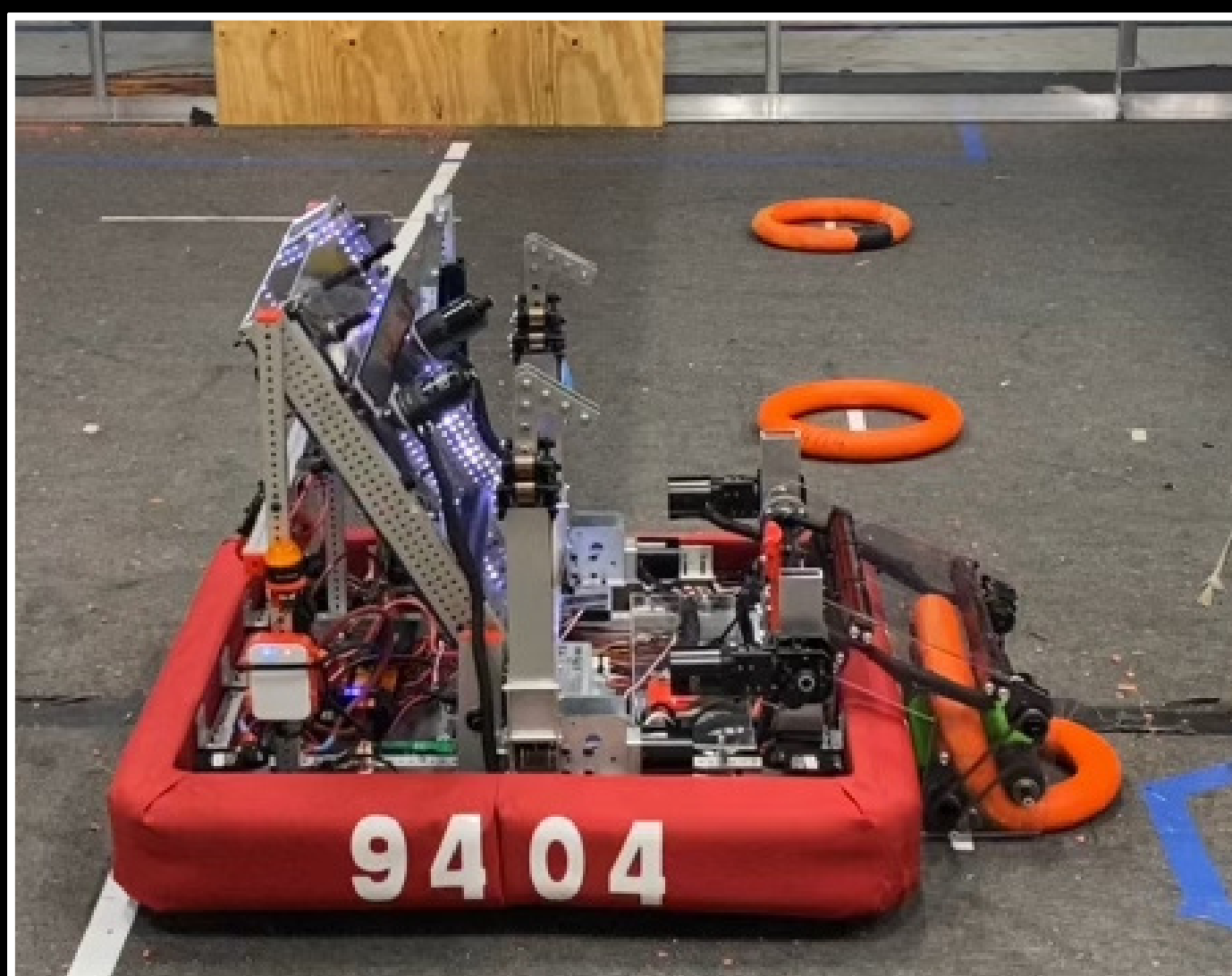
DRIVER AUTOMATIONS



Automated Amp Scoring based off on our predetermined Encoder value to find the best position and speed to score into the Amp.



We also created a Shoot Note Low Command, which allows us to shoot notes across the field and feed our alliance partners.



Automatic fast pickup of the note. Through our automatic pickup we are able to quickly drop our intake, run our rollers and drive forward to pickup our notes.



Through the use of a linear actuator we are able to pivot our shooter in order to shoot from farther away. Our shooter is able to stop automatically based off our encoder values to go to the raised and lowered positions.