PIONEER ROBOTICS 30589

Notre Dame High School

ENGINEERING PORTFOLIO

2025-2026 DECODE

Meet the Team

Grant Regan
Sophomore
Team Lead
Mechanical

Andre Bergeaux
Sophomore
CAD

Ethan Krueger
Sophomore
Mechanical

We are Pioneer Robotics, a rookie team of 7 members with both sophomores and freshmen.

Most of our members have had previous experience with FLL and wanted to continue learning more about robotics.

We approached our school about starting an FTC team last year and, together, made a plan that covered finding coaches, mentors, a suitable space to host the team, and funding for our program.

Our team goal is to advance to and compete at the FIRST® World Festival in Houston.

Our long-term mission is to establish a team with a variety of skills whose members mentor and support future members.

John Keith Hensgens
Freshman
Outreach

Jackson Prevost
Freshman
Mechanical

Xander Richard
Freshman
Outreach

Nicholas Himel
Freshman
Programming

Coaches:
Diana Broussard
Tessa Himel

Overall Outreach

4	5	9
Projects	Community Interactions	Team Interactions

Our outreach goal is to interact with our community and garner interest for our team.
For a new team like us, outreach is especially important as it helps establish connections with potential sponsors and mentors in our community, and attracts future members.

We gave presentations about FIRST® and shared our Engineering Portfolio with two local chapters of Rotary International, Rayne Rotary and Crowley Rotary.

CONNECT: We develop relationships with industry professionals to help us hone our skills.

Blueline Manufacturing

- Learned how CAD and 3D printing is used in machining and custom parts fabrication
- Presented our portfolio

Stella Maris, LLC

- Learned about electrical control systems and CAD in the oil and gas industry
- Gave a presentation about FIRST® and our Engineering Portfolio

Techneaux Technology Services

- Learned about software development, industrial control systems, and teamwork
- Presented our portfolio

REACH: One of our long-term goals is to recruit more students into our team.

Notre Dame Parent Night

Parents considering enrolling their children at Notre Dame visited the school on the night of November 4th.

We showcased our robot and answered questions about our team to parents at the event.

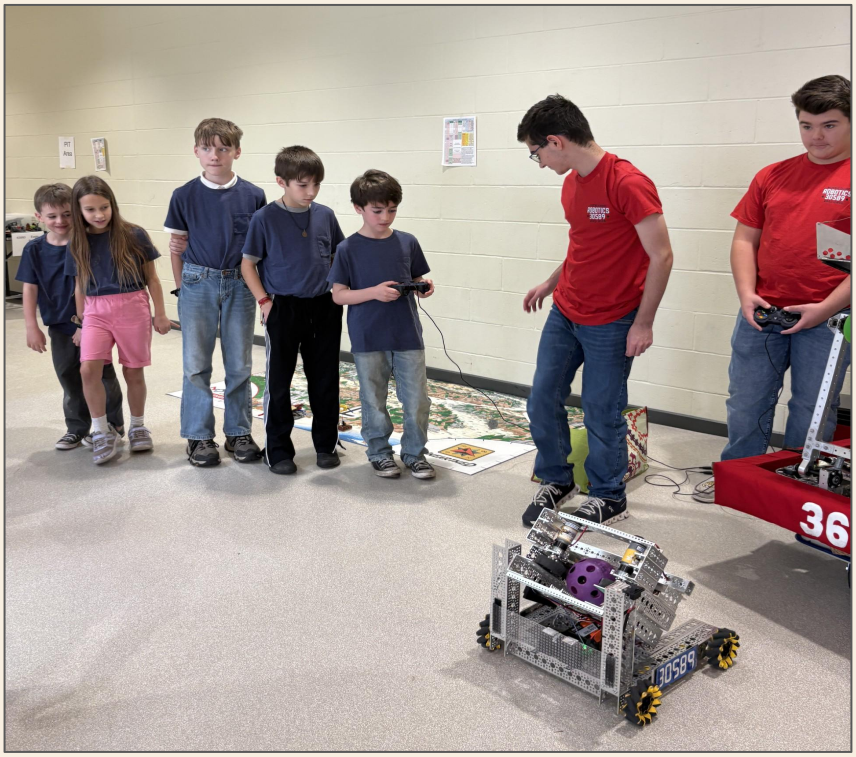
Notre Dame 8th Grade Day

Students in 8th grade from our feeder elementary schools visited Notre Dame on November 4, 2025.
We made a booth to demonstrate our robot and share information about our team.
We reached 77 8th grade students during the one hour event.

FLL Qualifier at Comeaux High School

Our team volunteered at the FLL Regional Qualifier hosted at Comeaux High School on December 13, 2025.

We assisted at the practice table and demonstrated our robot throughout the qualifier.



St. Michael Holiday Fair

Our team demonstrated our robot at St. Michael School's Holiday Fair on November 15, 2025 where we assisted their FLL teams with their jambalaya sale.

We connected with over 20 people during the four hours that we were there.

Financial Sustainability

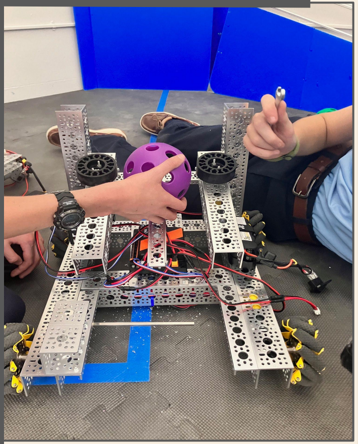
EXPENSES		
GoBilda Starter Bot	$849.99	
GoBilda Strafer Chassis	$699.99	
Control & Communication Set	$535.00	
REV Robotics Hub (new electronics)	$325.00	
Shipping	$104.73	
Total Kit of Parts Costs		$2,514.71
FIRST FTC Season Registration Fee	$325	
Event Registration Fee	$200.00	
Discretionary Items		
Computers	$275.00	
Misc Parts & Supplies	$277.85	
Food	$108.62	
		$0.00
Total Expenses		**$2,514.71**
INCOME		
Grants	$0.00	
Sponsorship	$4,000.00	
Fundraisers	$100.00	
Donations	$2,235.71	
Total Income		**$6,335.71**
NET		
Credit/Deficit		**$ 3,821.00**

Season Timeline

Summer
- Organized with school for a room & coaches
- Ordered kit of parts for robot & field
- Attended online FTC workshops

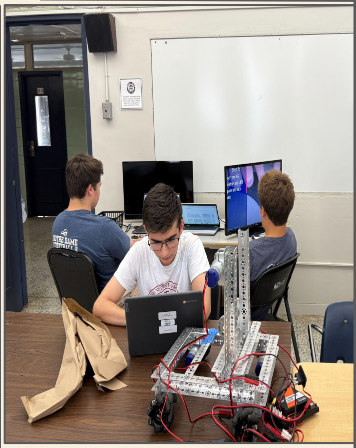
September
- Attended FTC kickoff event
- Built chassis
- Made a design for our robot

October
- Built most of our robot
- Programmed everything for Teleop



November
- Finished robot
- Worked on Auto & portfolio
- Spoke to students & parents at Notre Dame Day
- Assisted at St. Michael Holiday Fair

December
- Finished Auto programs
- Finished most of the portfolio
- Assisted at FLL Qualifier in Comeaux High School



January
- Spoke with 3 companies
- Spoke at 2 rotary meetings
- Began competing

INNOVATE: We wanted to build a competitive robot in our rookie season.

Problem → Solution

Problems:

1. We had the wrong shooter mounts.
2. Our shooter was wobbling.
3. Aiming into the depot with our robot was difficult.
4. Our intake was bulging.

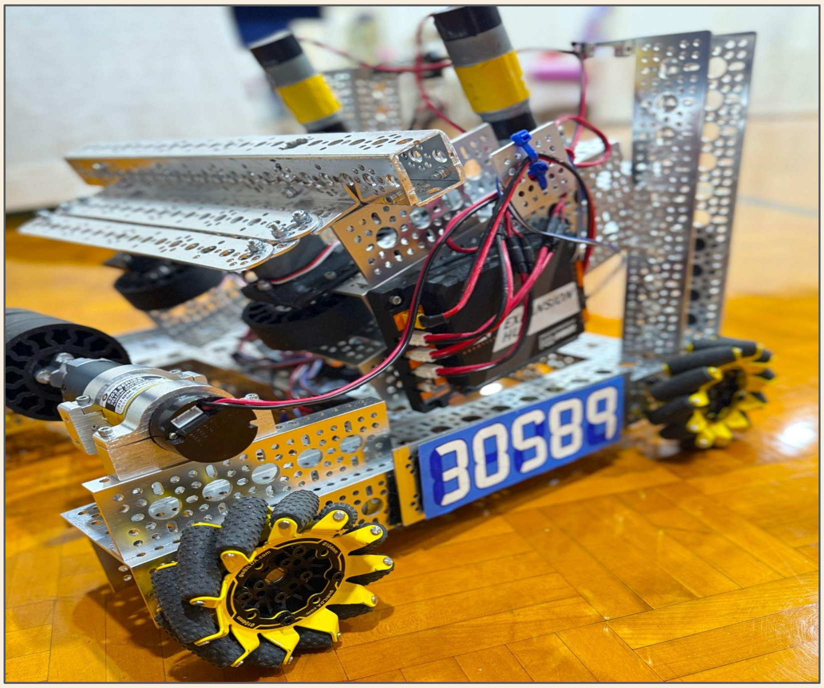
Solutions:

1. We made our own mounts.
2. We added a stabilizer.
3. We gave our robot the capability to shoot closer to the depot.
4. We stretched out our intake to better fit the artifacts without issues.

Drivetrain

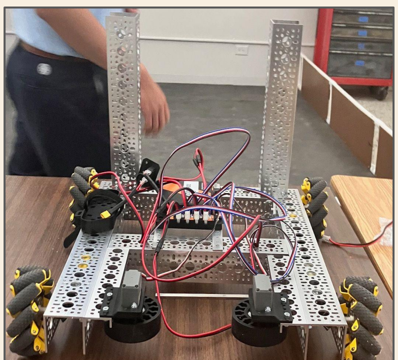
We use GoBuilda strafer chassis for our drivetrain.

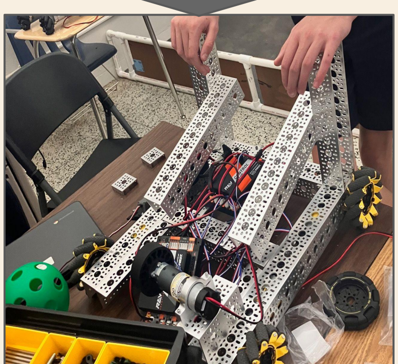
It allows for great mobility by allowing our robot to move in all directions.

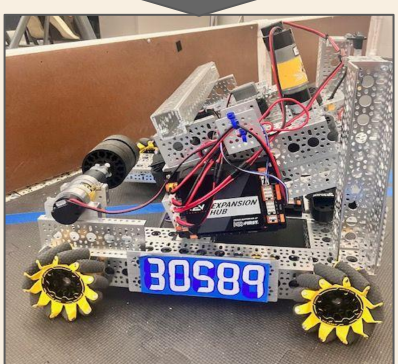


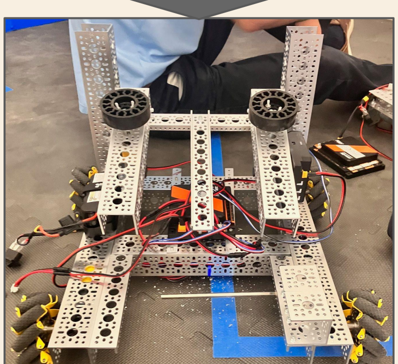
Our Robot

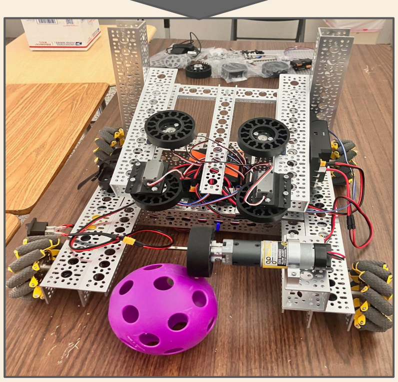
Our robot is capable of shooting at both close and far ranges.
It has a total of 7 motors and 4 servos.
It fits nicely within the size restrictions.











Robot Evolution

We started with a servo intake but switched to a motor intake.

We then removed our intake temporarily to work on our shooter, which we tweaked many times.

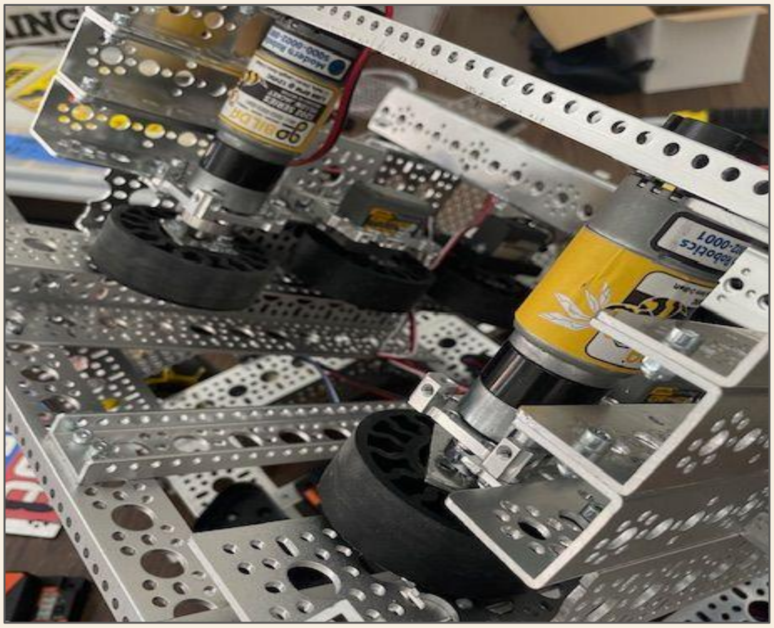
Later, we adjusted the entire shooter to slant up at a steeper angle.

Robot Mechanisms

Shooter

Our shooter is made from 2 6,000 rpm motors.

These allow us to shoot artifacts into the depot from both close and far distances.

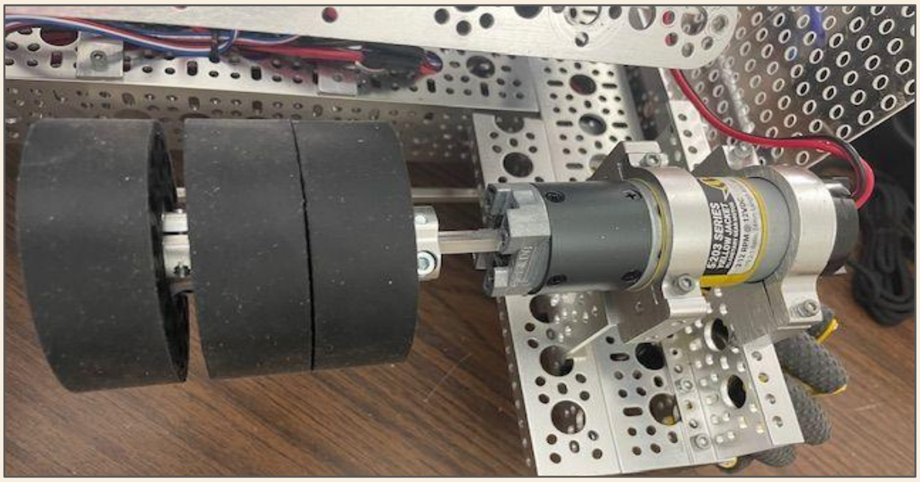


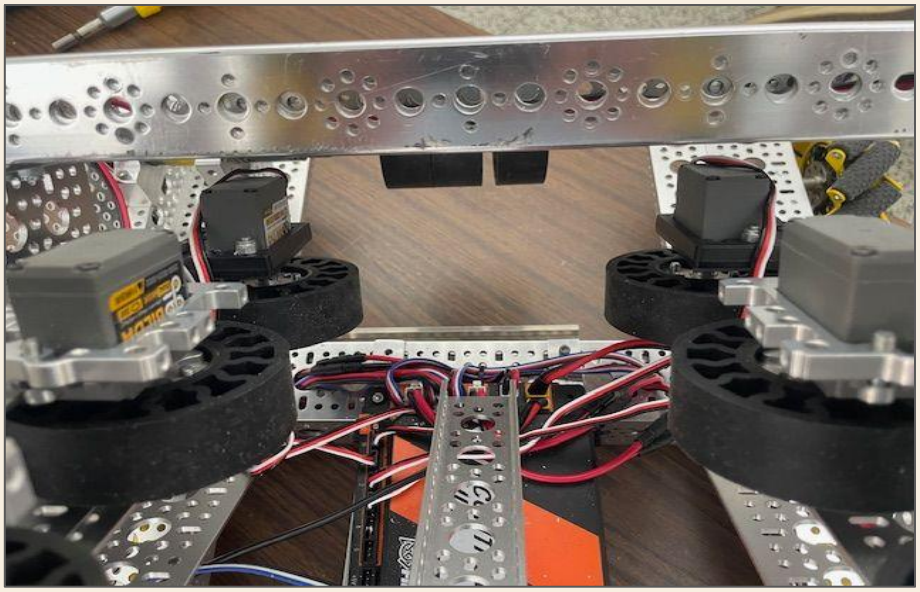
Intake

Our intake uses a 312 rpm motor along with 4 continuous rotation servos.

The motor pulls artifacts off of the ground and into our robot.

The 4 servos pull the artifacts up our robot and into our shooter.



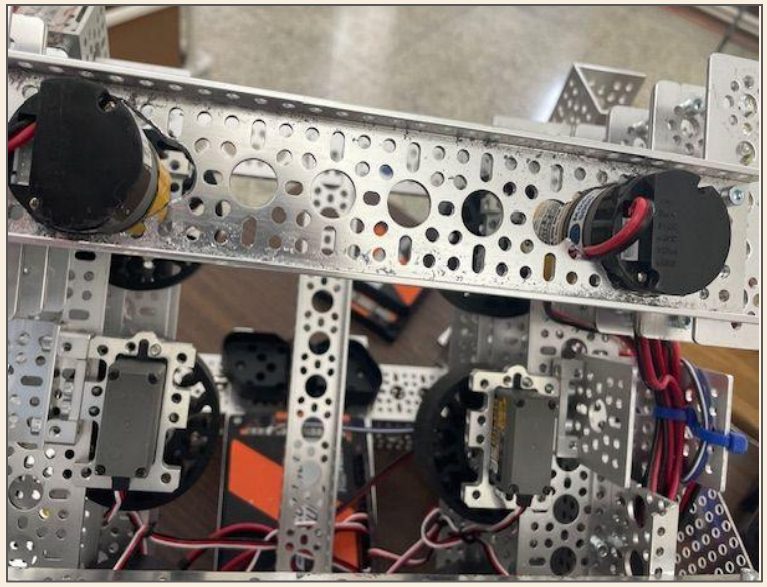


Other Robot Mechanisms

Shooter Stabilizer

It prevents artifacts from exiting our intake while they are being pulled up to the shooter.

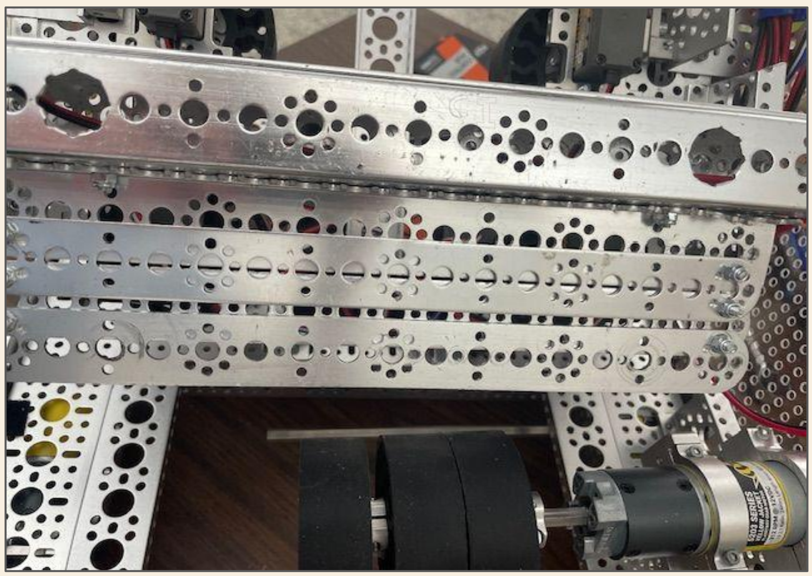
The mechanism consists of cut and bent metal beams.



Artifact Holder

It prevents our shooter from bouncing around and loosening during a match.

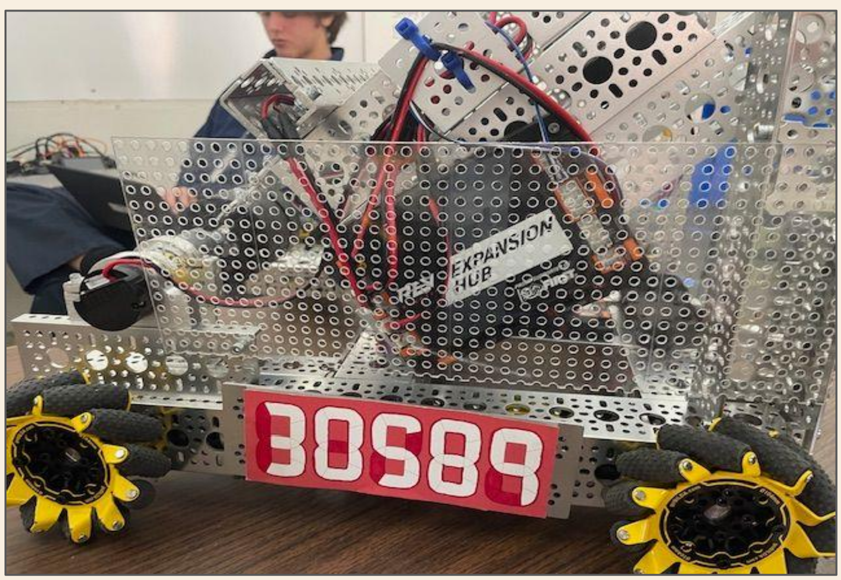
This consists of a metal beam with large holes drilled in.



Protectors

These shield both our expansion hub and battery from damage.

They are simple plastic pieces from GoBuilda.



Manufactured Materials

An adapter was made to connect the shooter wheels to the 6,000 rpm motors.
This was done as the motors did not come with an adapter and as shipping would have been too slow.

A bracket across the top of the robot was built to hold the motors in place.
This bracket was needed to counteract the motors' extreme vibrations that loosened bolts.

Another manufactured part was a tube to contain and protect some of the wires.
This was made with two U-shaped beams bolted together and then bolted to the robot.

Other manufactured parts include U-shaped beams for the robot's structure, a beam on the robot's underside for holding the control hub,
and protectors for both the expansion hub and the wire plugging into it.

Game Strategy

AUTO

Our robot can be in either starting position and is preloaded with two artifacts.

Once the autonomous period starts, our robot goes towards the middle of the field to shoot.

Then, it intakes the artifacts farthest from the depot to be ready to shoot again in the middle durrying Teleop.

TELEOP

When Teleop starts, we intake up to two artifacts from either our human player or the field.

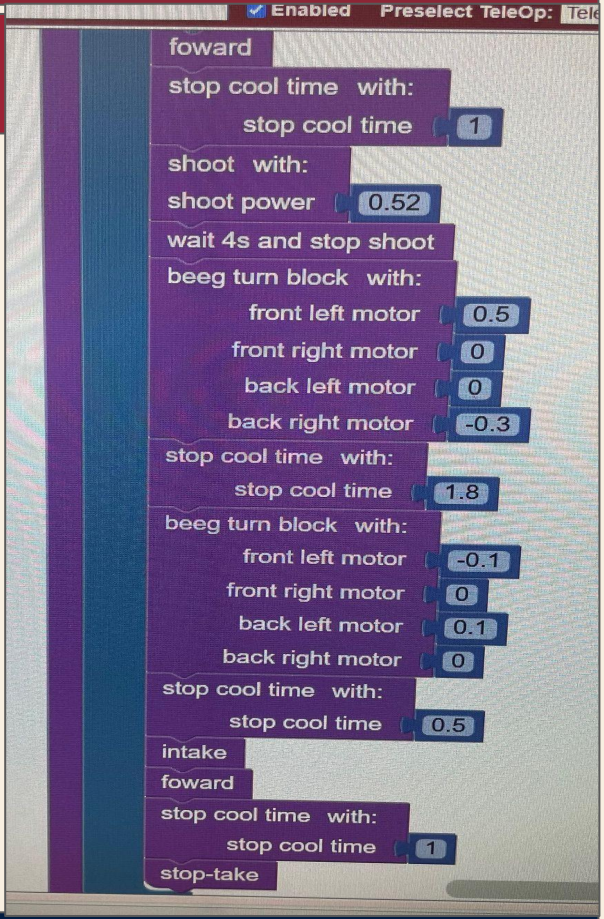
Afterwards, we go to the center of the field to shoot into the depot.

If the center is crowded, we go to the launch zone farther from the depot.

We repeat these actions until only a few seconds of the match are left where we then aim for parking points.

Programming - Autonomous

We chose to make our autonomous segment shoot from a close range because at an LSU scrimmage we found that teams that have a closer shoot range score points more consistently.
The benefits that our auto has is that is capable of scoring up to 15 points without the bonuses from the random pattern system. Since we have 2 autos per color and one extra auto that works on both sides of the field, we are capable of adapting to our alliance members' strategy.



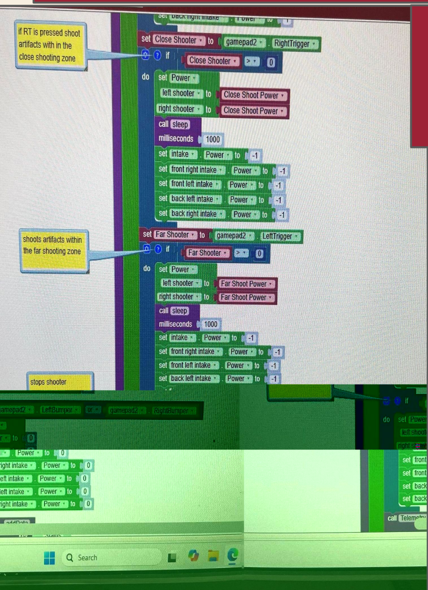
OnBotJava Blocks

We used OnBotJava Blocks to code.The benefit of using Block code is its simplicity, especially for a rookie team, such as ourselves,since we didn't have time before our season to learn a new coding language. A unique part of block coding is the simplicity of functions or "MyBlocks" for our former FLL team members that have experience with block-based coding.

Our Unique Functions

Stop "Cool Time"- uses the robot's internal timer and variable blocks to stop all movement motors in a certain amount of time without having to individually set the motor power of each motor to zero.
Directional Movement (forward, strafe left, diagonal right forward, ect.)- by using different combinations of motor directions in each wheel to move around the field without turning, which is imprecise.
"**Beeg Turn**"- uses variable inputs to change the motor power of individual motors without having to create unique turning blocks for each turn.
Intake/Outtake/Stop-take- causes all intake motors and servos to spin or stop spinning to adjust the placement of artifacts in the robot.

Programming - Tele-Op

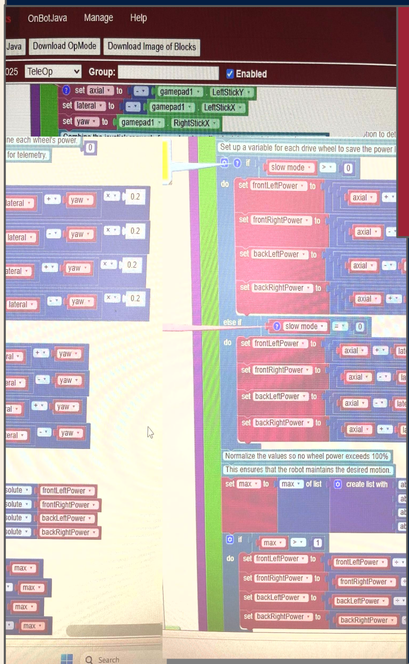


Shooter Code

Our shooter system consist of two 6,000 rpm motors that we can the motor power of depending on where on the field our robot is. For a close range shot our motor power is **.57** and for shots that are further away our motor power is **.75**. The 2 shooting modes are bound to different button on our operating controller (controller 2). Close shooting is bound to the RT button and far shooting is bound to the LT button.

Intake Code

Our shooting system is made up of 4 continuous rotations servos and one 312 rpm motor. The motor intakes artifacts from the floor of the competition field, and the 4 servos feed the ball from the floor directly to the shooting system. On the operating controller, the inputs for the intake system are “A” to intake artifacts from the floor, “B” to completely stop the intake system, and “Y” to reverse the direction of the intake system.



Mecanum Wheel Code + Slow-Mode

By changing the “basic omni wheel test” in OnBotJava Blocks, our robot is capable of moving 360 degrees with only one controller joystick; the other is for turning. One of the additions our team made to the premade code is adding a slow-mode that assists our driver in making precise adjustments in turns and slowly moving into the endgame zone by changing the robot’s speed to 20% of its max. The input for activating the slow mode is RT.