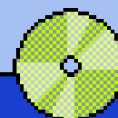
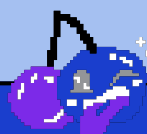


2022 - 2023

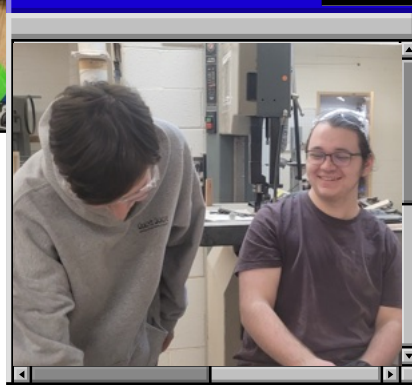
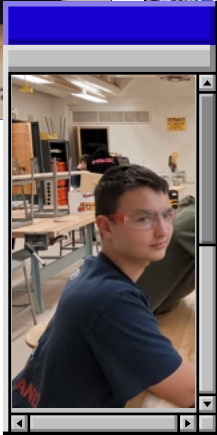
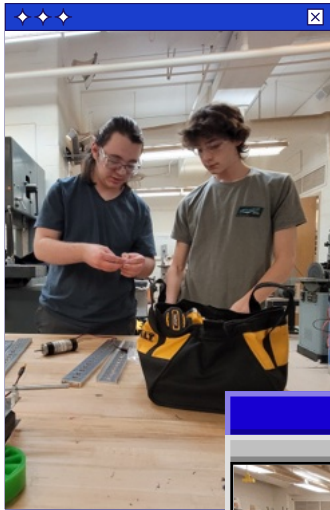
CYBIRDS 3583



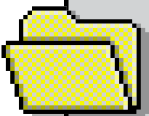
FIRST
TECH
CHALLENGE



TEAM Who Are We?



FTC Cybirds, team 3583, is located in Edgewater, Maryland. The team has been working together since 2009. breaking boundaries and promoting STEM in our community.

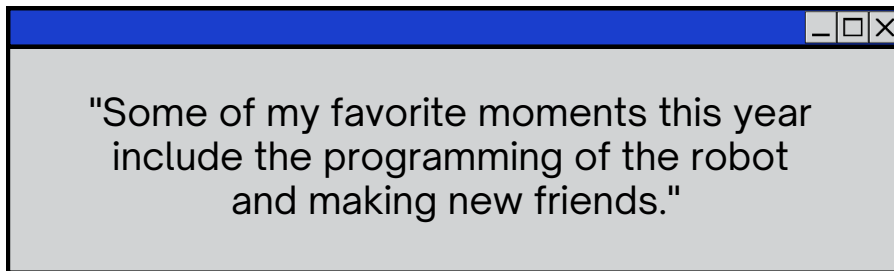


TEAM Quotes



"I enjoy having this opportunity to show leadership. I was able to pass down my knowledge from my past experience being in the club last year."

ROBERT (HE/HIM) - TEAM CAPTAIN

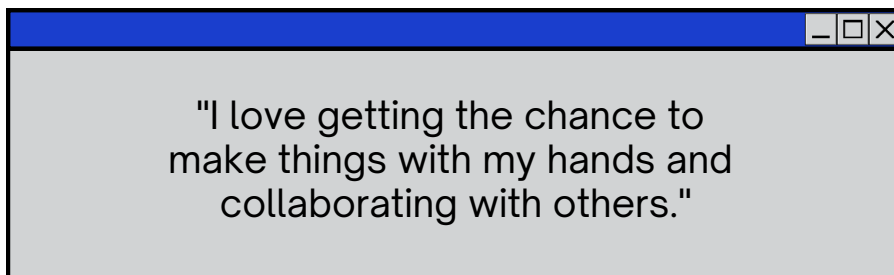


JACK (HE/HIM) - PROGRAMMING TEAM CAPTAIN



"My favorite thing about robotics is the strong sense of community and teamwork that we have."

LARA JAE (SHE/HER) - BUSINESS TEAM CAPTAIN



ASTER (THEY/THEM) - BUILD MEMBER & OPERATOR



TEAM Quotes



"my favorite part of robotics is seeing the finished product work and run on the field."

MITCHELL (HE/HIM) - BUILD MEMBER & DRIVER

"Robotics provides a gateway into a new world of technology, FTC provides a great experience into that world."

JACOB (HE/HIM) - BUILD MEMBER & DRIVE CAPTAIN



"Robotics is cool, and it's really neat. I would recommend it to people who are interested in STEM and engineering."

LEO (HE/HIM) - BUILD MEMBER

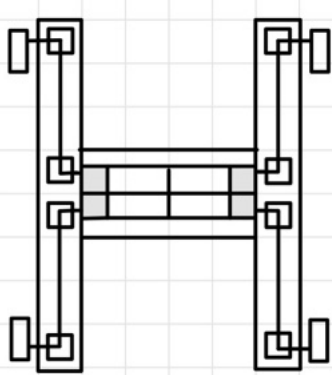


"I like robotics because I learn about more engineering concepts and I want to apply them to my own projects."

VINCENT (HE/HIM) - BUILD MEMBER



ROBOT Design Process



"Traditional" Chassis

- Neverest Motors
- Actobotics Channel
- Belt/Chain Drive
- Gobuilder wheels
- tensioner

Pros:

- Best motors and wheels
- Good center of mass
- Most compact
- Already have most parts

Cons:

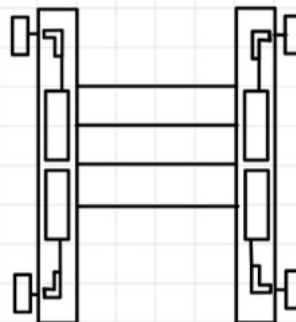
- Belt drive can slip
- No room for odometry

Pros:

- Work well if all GoBILDA
- Leaves room in the middle

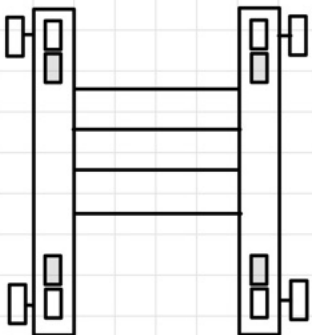
Cons:

- Open/Exposed gears
- Motors in way of mounting



Gobuilda 90° Chassis

- Gobuilda motors (maybe neverest)
- Gobuilda Channel
- Motor Gears
- Gobuilda wheels



Rev 90° Chassis

- Rev motors (maybe neverest)
- 90° Gear Boxes
- Gobuild or rev wheels

Pros:

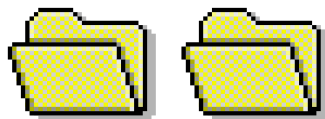
- Self-contained 90 degree tilt
- Works well with the slide

Cons:

- Requires adaptors
- Not the best parts
- Need more supplies

ROBOT

Engineering Design Process



What is the problem?
What is the challenge?
What are the limits?
How can you solve it?

Explore

Find out what others have done. Gather materials and create new ideas!

Design

Think up lots of ideas.
Pick one and make a plan.
Make drawings and models of the plan.

Create

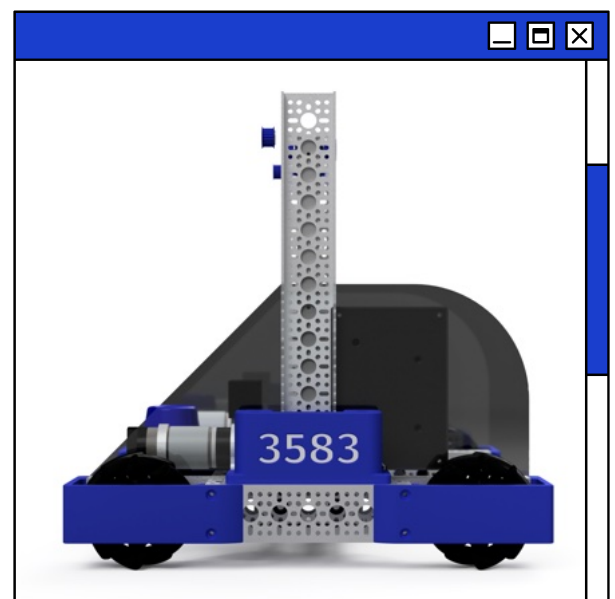
Use your plan to build your ideas.

Try it out

Test your idea.

Make it better

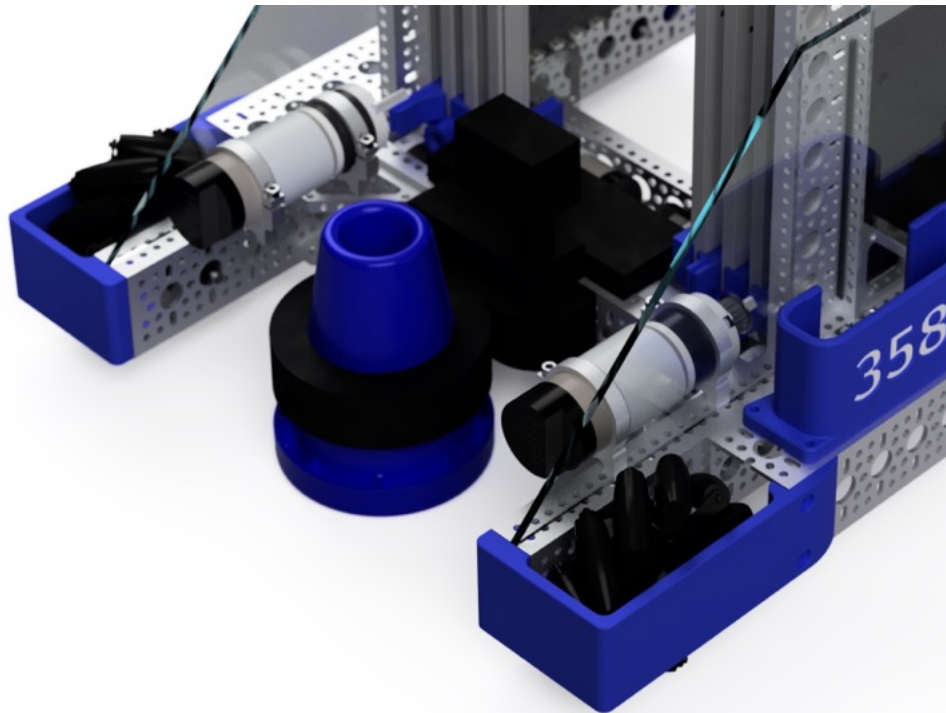
Think about how your design could be improved. Modify your design and try again



BUILD PROCESS

Intake Mechanism

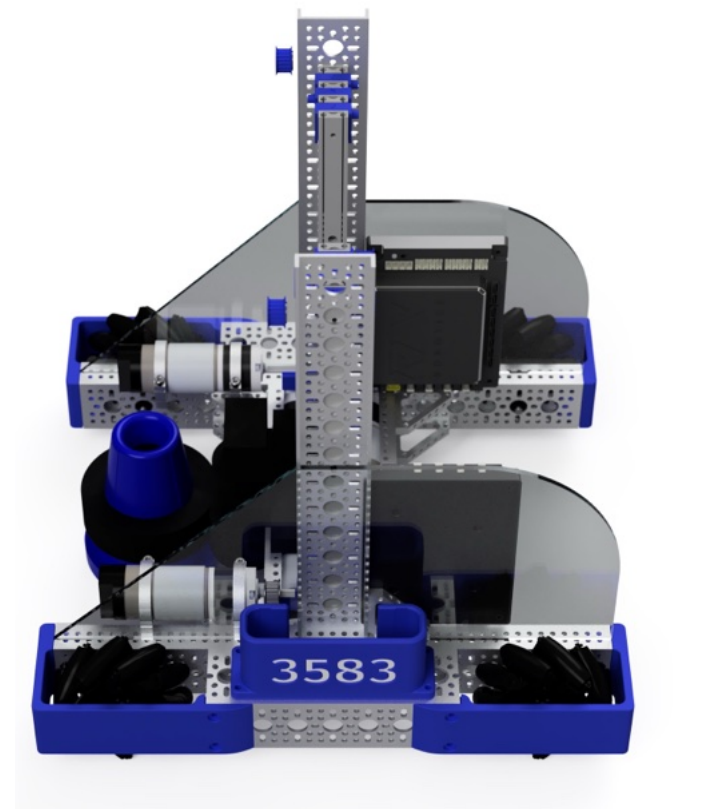
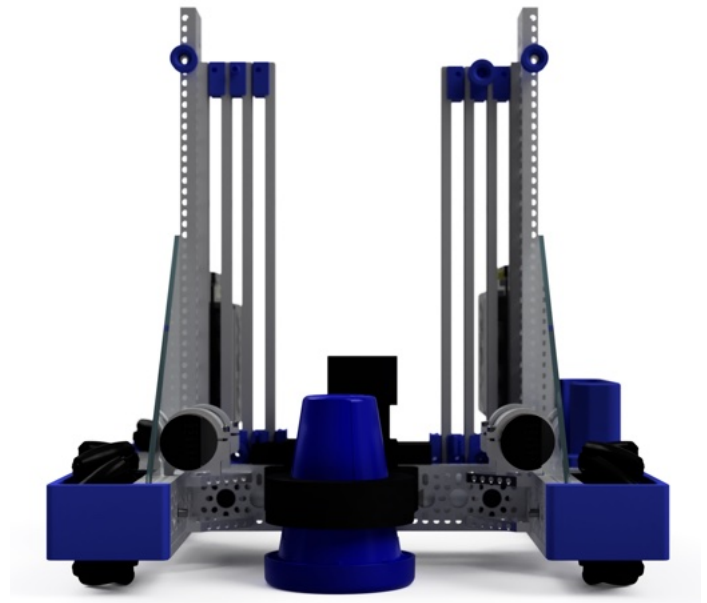
Our intake mechanism is a claw powered by a servo on one side. The design is symmetrical and uses gears to connect the two halves of the claw. The design is simple yet effective, it has padding and lines of hot glue to increase grip strength. The claw is attached to the linear slide allowing us to score on the highest poles. This design was developed with the help of CAD, through digital prototyping we were able to better stabilize the claw on the chassis.



BUILD PROCESS

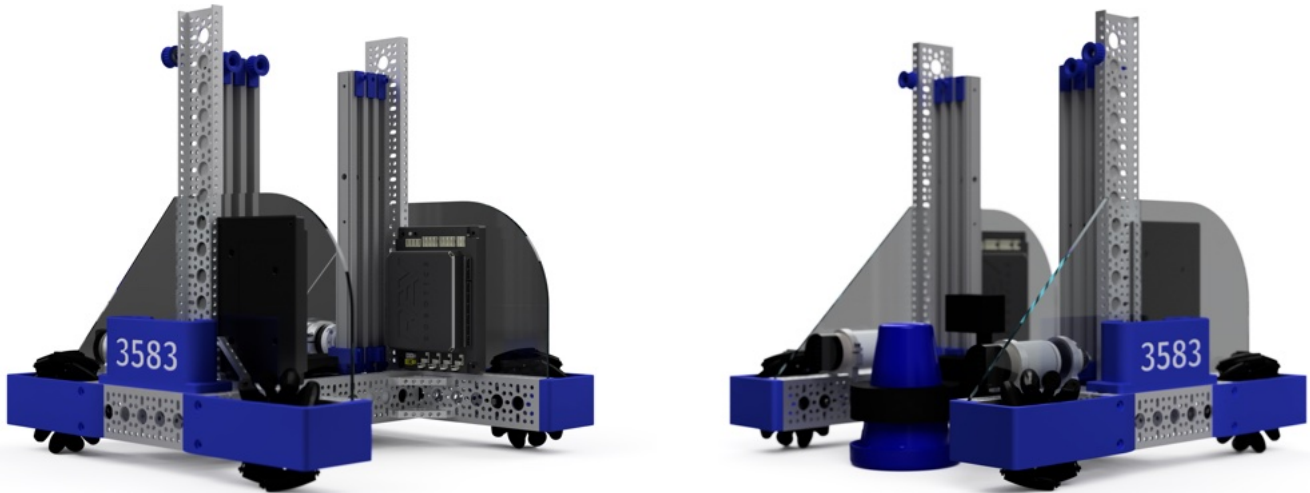
Linear Slide

The linear slide is a 4-stage cascade lift made of drawer slides with 3D printed connectors between the slides. We picked the Misumi lightweight slides (S240) as they were easier to move and seemed to be more precise. We decided to use belts to drive each stage of the lift as they would provide more consistent movement. We cut the belts in half lengthwise to make them lighter and 3D printed custom pulleys to make them fit. Due to the cascade lift style and 20:1 motors, the lift is fast while remaining precise and simple.



BUILD PROCESS

Chassis & Structure



The chassis and structure of the robot are made of goBILDA channel. We decided on an H-style layout as our original intent was to be able to input and output on either side of the robot. We placed the motors in the center which would help with maneuverability and precision of autonomous movement.

The motors are connected to the wheels using belts and pulleys, which were a perfect fit. The vertical aspects of the H chassis were made of 2 opposing shallow u channels, which had enough space for the pulleys and saved space overall. We attached channel pieces on the side between the wheels in order to house the odometry parts.

ROBOT Timeline

October:

- CAD robot with Actobotics build system
- Switched to a GoBILDA system



November:

- **Craft Fair** outreach
- Completed chassis/drive
- Test fit connector sub-assembly
- Redesigned lift connector sub-assembly and pulley



December:

- Assembled one side linear slide v2
- Had to make a custom spacer to mount slide correctly
- Linear slide
- Prototyped intake part
- Lift connector assembly



January:

- **Lego Day** outreach
- **Women in STEM** outreach event
- Prepare for competition

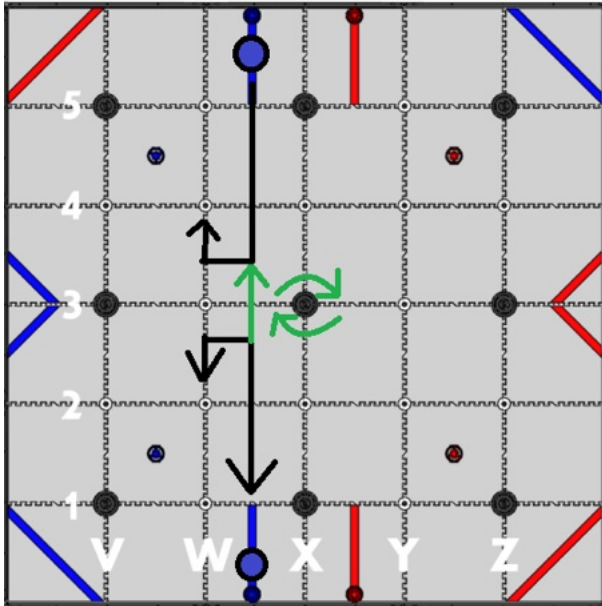
AUTONOMOUS

Autonomous Plan



STRATEGIC PLAN

Teleop Plan #1

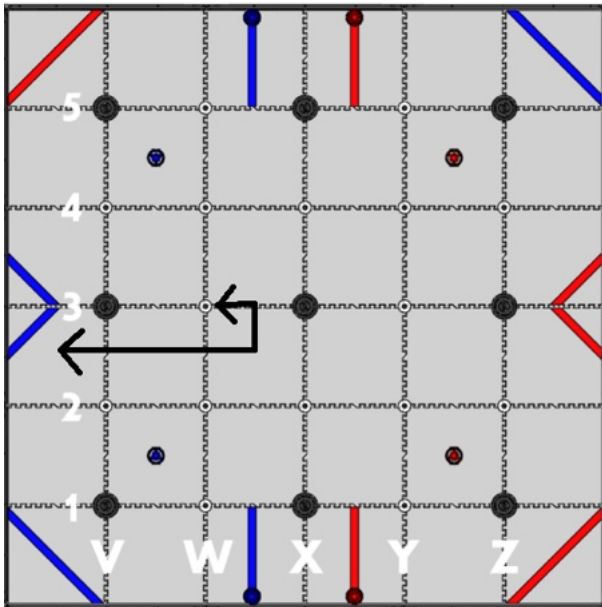


Audience

DRIVER CONTROL

For the driver control period, we will cycle between either side terminals or the main terminal onto the closest 5-point junction with minimal turning. While not shown in a routing map, the robot could also attempt to own as many unique junctions as possible for even more points.

Teleop Plan #2



Audience

ENDGAME

While the endgame strategy is very similar to the tele-op tactics, there are a few important details. The beacon should be placed on the junction the opposing alliance uses the most, or one they are excessively using for a circuit completion. Instead of attempting to create a circuit, we will prevent the opposing alliance from creating a circuit, unless we previously planned with the other team to create one.

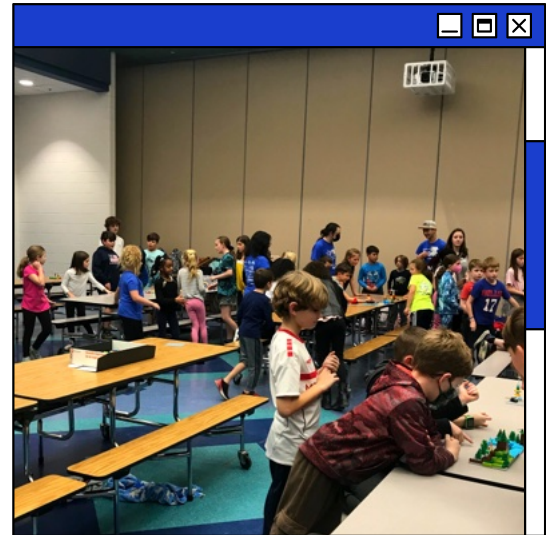
OUTREACH

Tiger Trot:

We hosted an event where we set up last year's robots to showcase the competition and technology for elementary students and middle schoolers. This event helped recruit more members to the team for this season.

LEGO Day:

We assisted another FTC team with their outreach at a local elementary school and worked with kids to build LEGO creations based on challenges that were prepared for them to promote ideas of STEM, creativity and team collaboration.



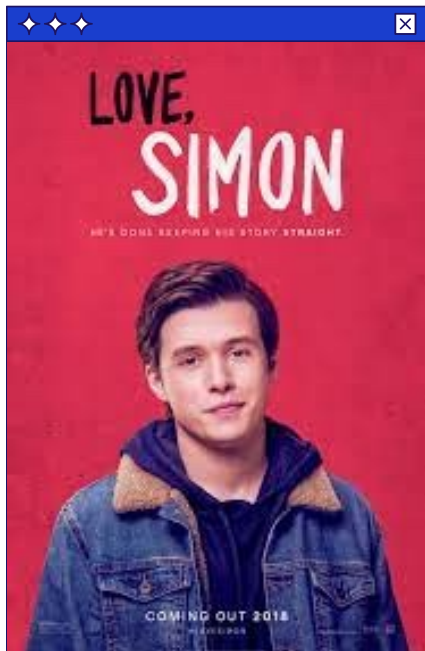
Women in STEM:

We hosted a virtual event with women panelists that discussed and answered questions about their experiences and challenges in professional STEM fields. It also provided an opportunity for middle and high school girls to showcase their STEM-related projects. This was an impactful program for all in attendance.

OUTREACH

Craft Fair:

We set up a booth at a local high school's annual craft fair promoting our team's values while collecting donations for the annual Harvest for the Hungry Campaign.



Open Discussion Event:

As silver tier partners with LGBTQ+ of First, we plan to host an open discussion to discuss recent events in the LGBTQ community and steps to make STEM more inclusive



LGBTQ+ Movie Night:

We will be hosting a Movie Night where we will be showing "Love, Simon" at a local high school. We hope that this event will bring more awareness to the LGBTQ+ Community in STEM. This event will take place March 10th, 2023.

BUSINESS

Sustainability

The Cybirds have been a team since 2009, and sustainability has proven to be essential. In ensuring that the team continues to thrive, recruitment and STEM education have become a large part of our outreach.

We attend STEM expos and club fairs to get students interested in joining FTC. We want to continue recruitment to ensure we have enough team members as our old members graduate and leave. Education is vital for the Cybirds to continue as a team. It is one of our main focuses for older experienced members to work with newer members and teach them the skills for FTC. This method has been constructive for the newer members, teaching them about FIRST® and preventing mistakes made in prior seasons from being repeated. It also ensures that we pass on the lessons we have learned in previous years and do not forget our history.

Between these two focuses, we can ensure that the Cybirds will continue to survive and thrive.

BUSINESS Sponsors & Grants

The Cybirds Team 3583 takes great pride in our community involvement. This includes the help provided to the team by our local sponsors and advertisers. These businesses help us to make purchases and fund the season for all of our members. We also seek grants from multiple resources and have had good fortune with that in the recent past.

