



ENGINEERING A BRIGHTER FUTURE  
TEAM NEWSLETTER



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FRC Ventura Regional

## BUILD SEASON !

We are more than exhilarated to dive into our 2022 build

season! Read below for more information about Team 599's build season 2022 as we start to prepare for competition! Keep in touch with future newsletters to find more about the LA Regionals from the photo above!



# KICK-OFF DAY!

## JANUARY 8, 2022

For this year's season in the FIRST Robotics Competition, the Robodox was more than fortunate to be able to watch the kick-off livestream in the shop together!



### HOW WAS YOUR EXPERIENCE DURING KICKOFF?

Ian (Operations Exec):

It has been really great! We are trying to figure out how do we want to design the robot and what we want to focus on this year. Trying to find a way on how to make everything flow, which has been really interesting! Especially with the whole team.



### HOW ABOUT PROTOTYPING?

Ian (Operations Exec):

Prototyping has also been very fun and interesting! For us, at least, we are trying to work on a cascading lift (for this year's robot for *Rapid React*)



# PROTOTYPING

For this year, the team decided to focus on shooting for the lower goal and climbing up to the second rung. With that being said, we broke up into various groups to make prototypes of each subsystem!

## ““ CONVEYOR INTAKE

The conveyer intake is somewhat similar to our 2019 robot's intake because this would try to intake balls in a linear manner and feed it towards the shooter.



## ““ ROLLER CUTOUT INTAKE

The roller cutout intake utilizes mecanum wheels on a rotating steel shaft, which attempts to intake the balls and also feed it to the shooter



## ““ CATAPULT SHOOTER

The prototype group above attempted to make a catapult out of plywood and rubbers/ropes for this year's shooter subsystem!



””

# PROTOTYPING

For this year, the team has decided to focus on shooting for the lower goal and climbing up to the second rung. With this said, we have broken up into various groups to make prototypes of each subsystem!



## DOUBLE-CLAW CLIMB

The double-claw climb has two pairs of claws on the opposite ends of the robot.



## VECTORED MECANUM INTAKE

With the used of mecanum wheels, this group was planning to vector it in the same direction so that the cargo freely moves towards the shooter.



## EXTENSIBLE ARM CLIMB

This extensible arm climb has two pairs of arms to reach for the different rung on the traversal plane of the field! Interestingly, this prototype is the design that we settled for our climb.



# PRESENTING PROTOTYPES!

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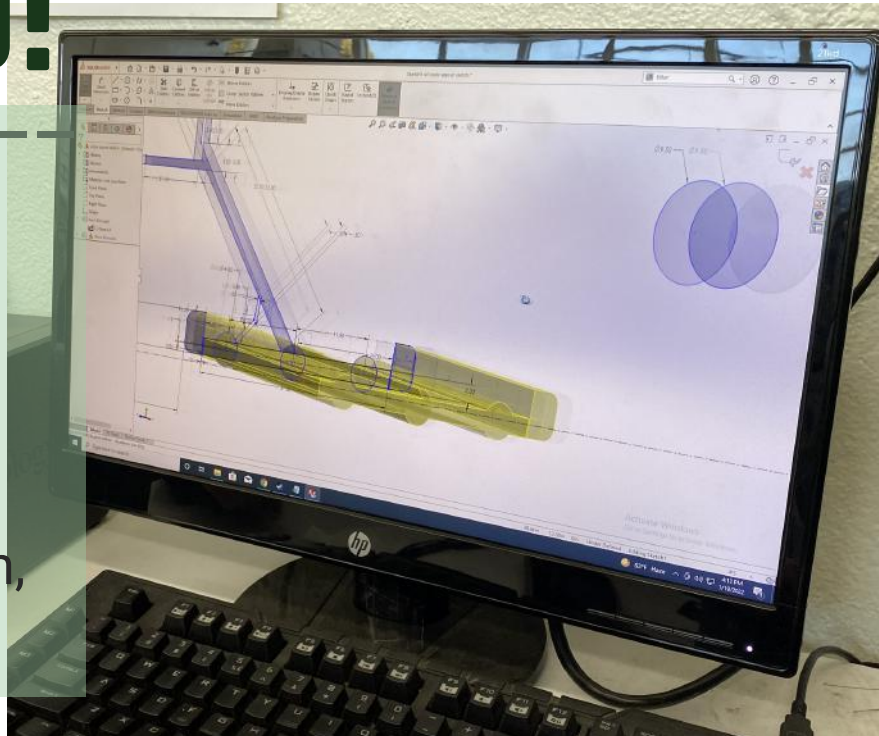
Once all the groups finished creating their prototypes, it was time for the prototype presentations! During each presentation, each group had the chance to briefly explain their prototype and would have the chance to answer any questions other team members had about their prototypes.

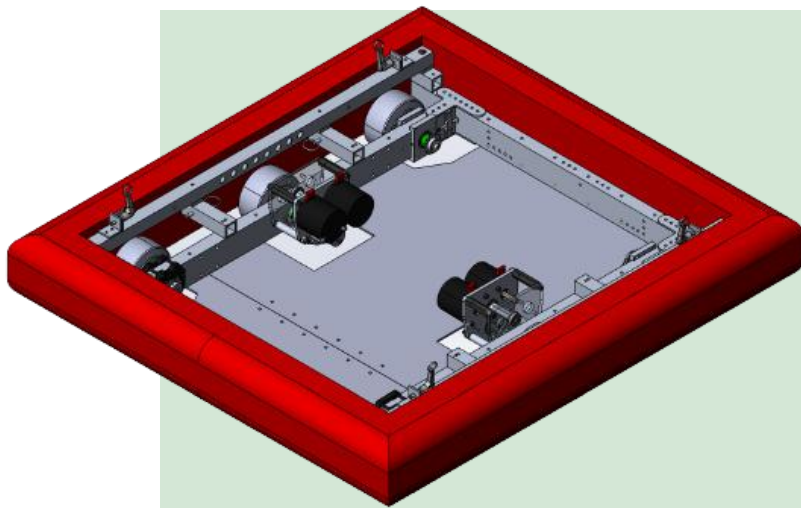


# START CAD!

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Once the rough sketch of the robot was finalized, the CAD Division was split up into pairs/triads to work each sub-system. The sub-systems composed of: drive, climb, arm, and intake-outtake.



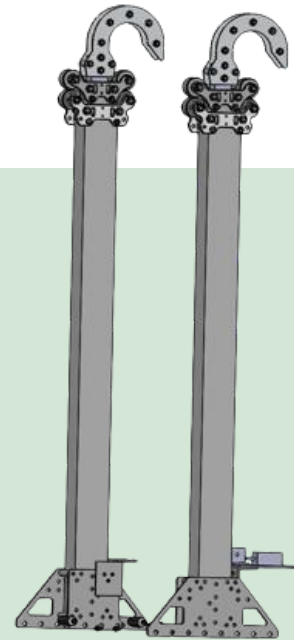


## DRIVE!

This year's drive has a We have six 4" Colsons wheels West-Coast Drive with two NEO motors on each side. We also have quick-release bumper mounts on the drive.

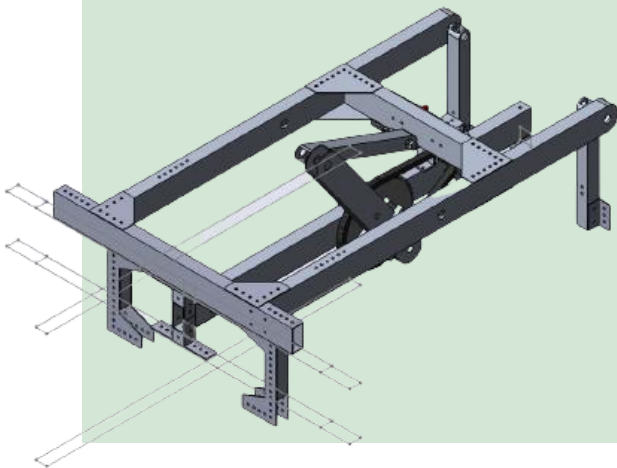
## CLIMB!

The climb is made up of two extending aluminum arms with a simple design which stretches out fast and long enough to reach the second rung.

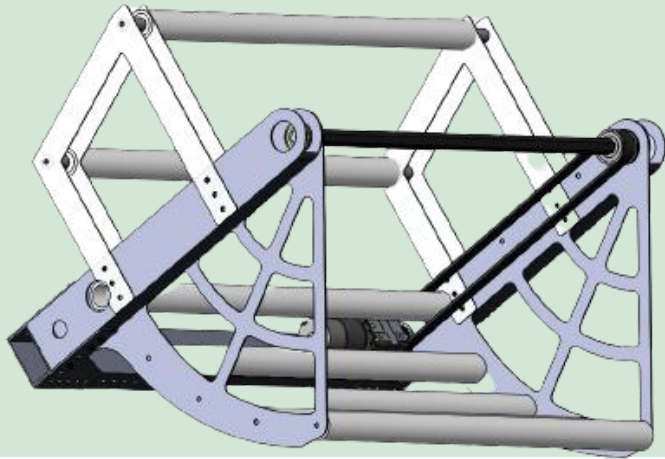


## ARM!

This subsystem was designed with the purpose of supporting the intake-outtake system. This arm is made out of aluminum with a NEO Motor to keep the mechanism moving up and down, making the intake-outtake subsystem reach from the floor to the lower hub.



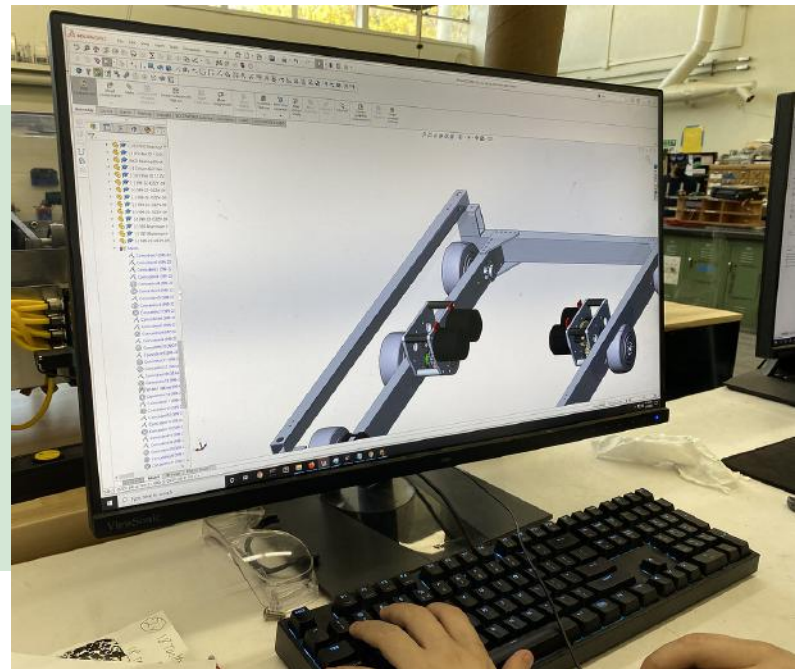
## INTAKE-OUTTAKE



The design of this intake-outtake subsystem was meant to be minimalistic and compact. It uses a spring-balanced arm with mecanum wheels and PVC pipes. The design also produces a more efficient cycle time and an easier approach with maintenance and repair.

## GOAL FOR CAD

The CAD Division is aiming to reach their deadline on January 29th! With that said, CAD has about 3 weeks to work, so everyone has been tirelessly CADing!



## E&P!

During the three weeks, the Electronics & Pneumatics Division worked on the dummy board in collaboration with the programming division.



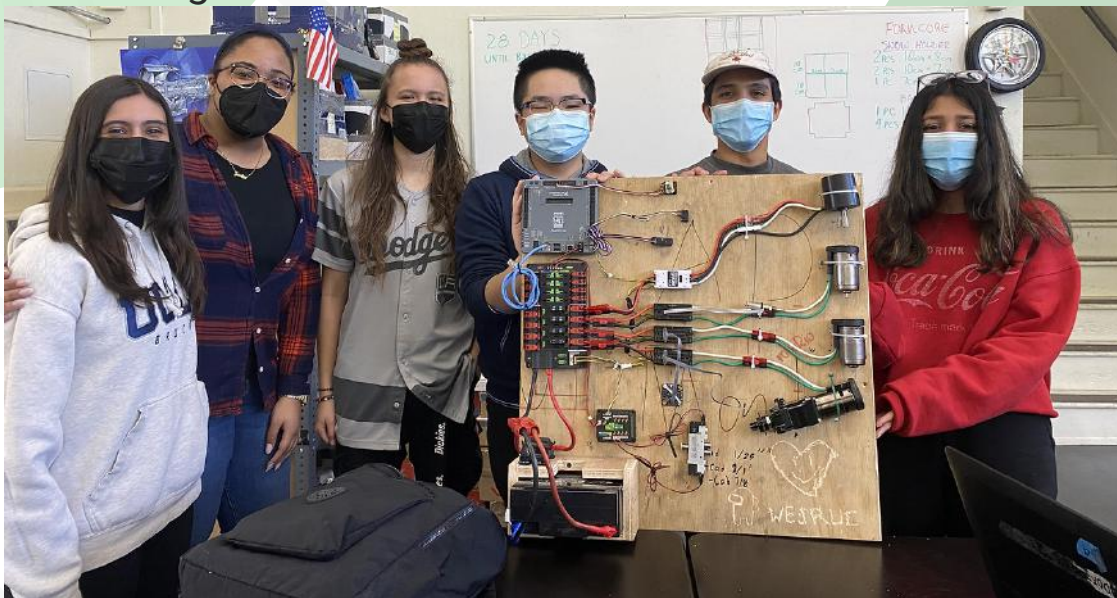
# DUMMY E&P



Programming and E&P have been working together on testing the dummy board as well as adding light sensors and wiring potentiometers.

## PROGRAMMING + DUMMY E&P

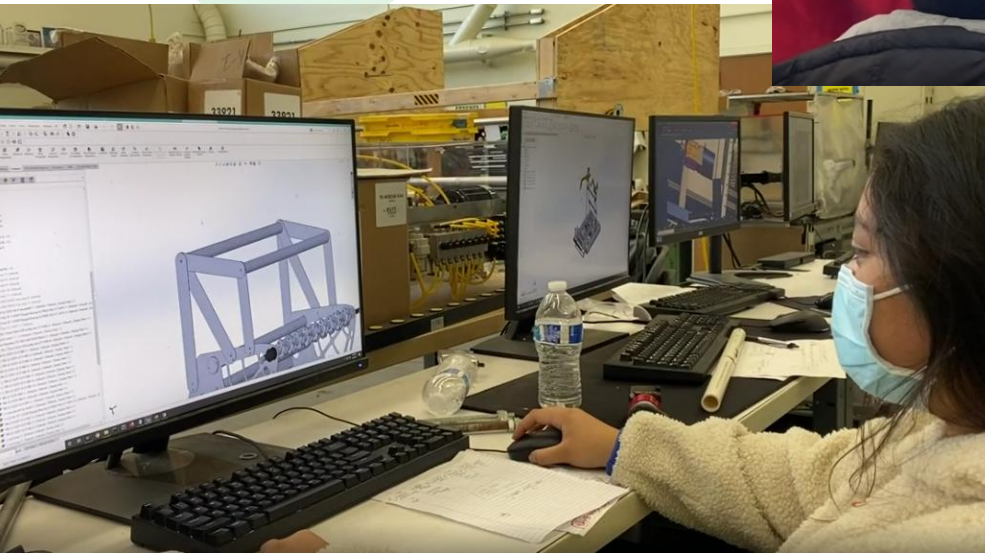
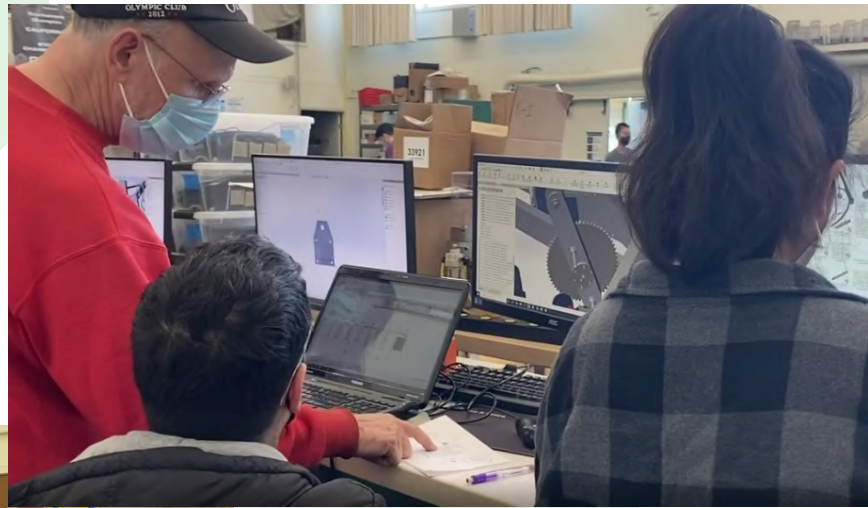
The electronics and pneumatics division made sure that the wiring of the robot was functional by conducting various wire checks in order to ensure that nothing needs to be replaced in the middle of the competition as well as knowing what spare electrical components and batteries need to be packed just in case. We also had to pack for the competition including the pits, trailer, and everything else that we may have needed. All in all, there was so much preparation that the team had to undergo in order to do as well as we possibly could and the fact that we did it in such little time was really quite amazing.





## CAD UPDATE!

During week 4 of the Dox's build season, the CAD Division continues to work diligently in order to finish designing each sub-division.



After week 4, CAD has now completed the robot's drive train and climb. The shooter/intake assembly of the robot is still a work in progress.

## PROGRAMMING!

During the 4th week programming continued to help test the Dummy board with E&P. They also began practicing on the dummy board in preparation for working on the code for autonomous, climb, vision, and drive.



## CAD PROGRESS!

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The CAD division has been finalizing their designs of the various subsystems for Ozzy. Additionally, the CAD division has also been making the drawings for each part of the drive train and climb.



## PROGRAMMING

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For the Programming division, our programmers have started testing their code on a simulation, separate drive train, and on the intake/outtake subsystem.



## BUMPERS!

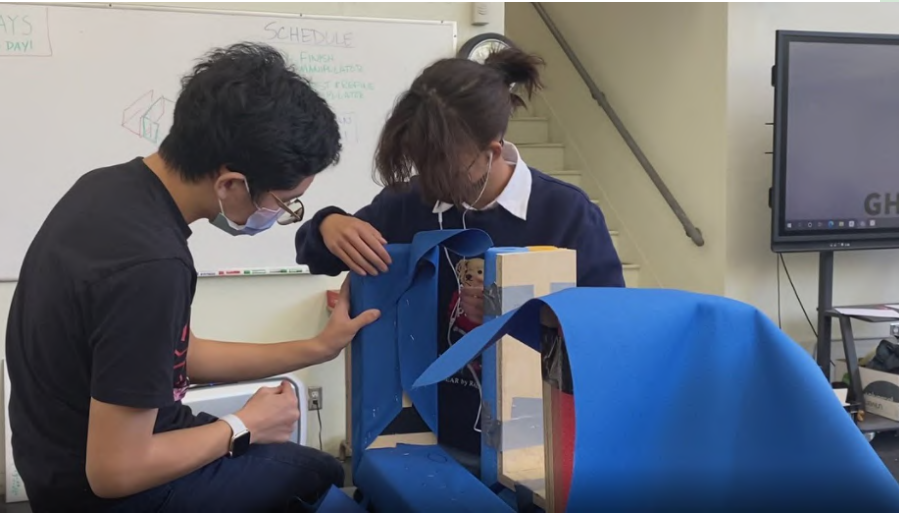
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Our bumpers are regulation bumpers, which has 1/8" of clearance on the front and back. Our bumpers are made out of 3/4 plywood and pool noodles wrapped around in fabric.



## BUMPERS!

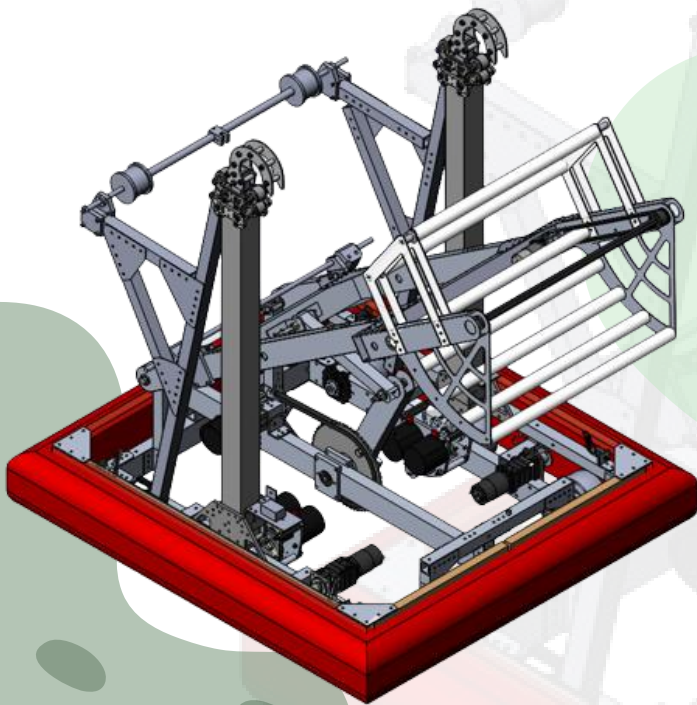
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For the attachment, we used quick-release pins on the left and right together with L-brackets to hold them up on the front and back. This makes the bumper switching possible in minute or less.

## FINAL CAD

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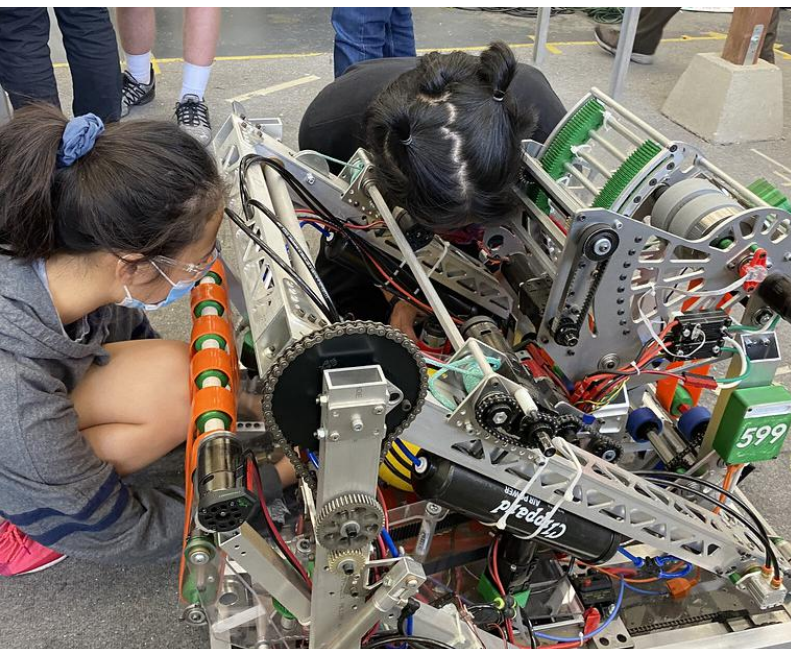
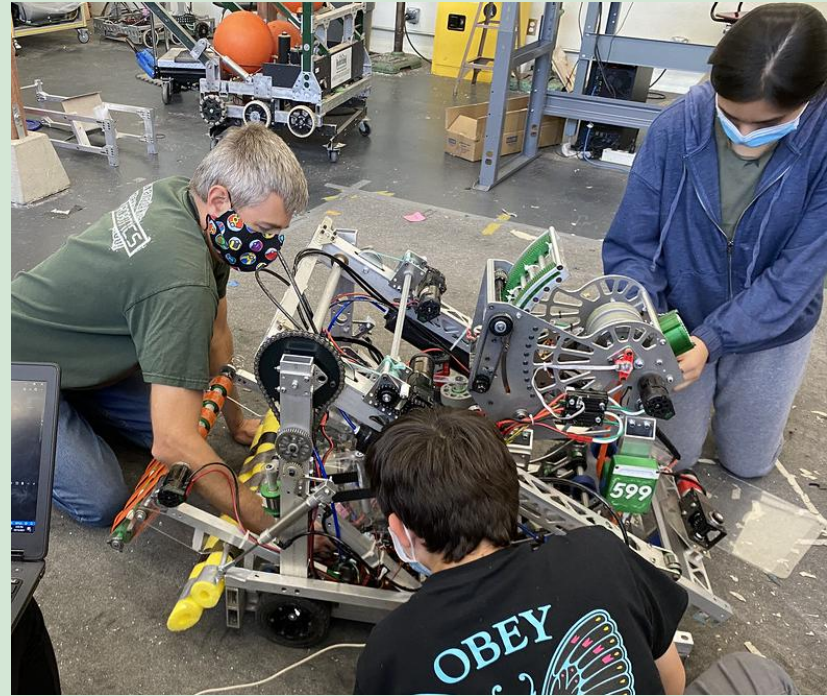


The Robodex for this year's FRC season have successfully come together to create a robot which focuses on shooting for the low hub and climbing up the second rung. Since adapted inspiration from the EVERYBOT, the Robodex thanks Team 118 for its design!

# ROBOT ASSEMBLY

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After finalizing the CAD for the robot, the fabrication division continued to fabricate more parts for the Ozzy. The logistics team also kept track of the parts that were getting drawn by CAD, being fabricated and assembled by Fabrication.



With Ozzy's parts fabricated, they started to assemble the robot by subsystems then they moved on to assembling the whole robot.

# E&P + PROGRAMMING

Since E&P has installed their belly pan on to the robot, the next step was to finish wiring the robot. After finishing the wiring of the robot, it has been sent to the programming division for more testing and troubleshooting of the code.



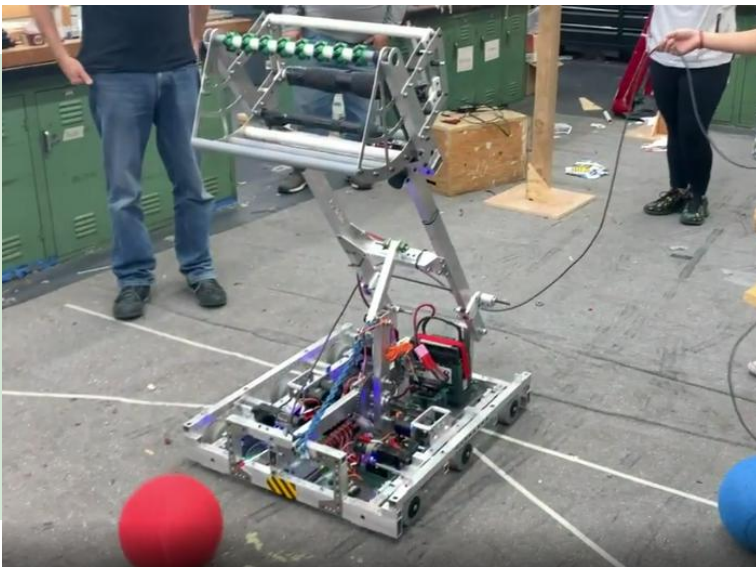
# ASSEMBLY

For assembly, fabrication broke into subgroups to make each subsystem based on the parts that were already made. They had to assemble the drive train, intake/outtake, arm, and the climb for the past two weeks. After fabrication has finished the robot, it has been sent for driver practice!

# DRIVER PRACTICE!

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For driver practice, we laid out a practice field in the shop, with a built a hangar one and the lower hub goal.



Throughout the course of driver practice, we fixed and improved Ozzy from the problems that we have discovered!

Ozzy has been successful in shooting cargo into the lower hub, and its intake/outtake system has been improved with the use of mecanum wheels. The next step for Ozzy is now to compete at Ventura regionals!

# PIT PACKING!

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For Ventura Regionals, the fabrication and operations division have worked to organize and clean the pits, making the tools and cargo ready for transportation and load in.



The load-in and practice day for Ventura regionals will play a crucial role in finding out key parts of the robot to fix, and by preparing the adequate materials for the pits, we will surely be prepared for maintenance and fixing Ozzy!

# FRC VENTURA REGIONALS!

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Last March 10 thru March 12 or 2022, the Robodox went to it's first FRC competition since 2019! The Dox were excited to be at Port Hueneme, Ventura for the Regional competition with Ozzy the Opthamologist!



Our drive team is composed of our chief engineer as our driver, events lead as our drive coach, and various leads from different divisions (CAD, Programming, Fabrication, etc.)

Throughout the competition, our robot encountered a lot of obstacles, but nonetheless, our Pit crew worked tirelessly to try and debug and troubleshoot the problems in a short period of time!





# FRC VENTURA REGIONALS!

More snapshots from the competition!



# THANK YOU TO OUR SPONSORS!

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