



BONDS Week 3 Newsletter

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Introduction

Welcome to the third week of the BONDS Status Report of the 2023 season! In this entry, you will see what BONDS Robotics accomplished in the third week of our official season for this season's 2023 FRC competition, Charged Up!

Our team worked exceptionally well on designing the robot this week with little time before the critical design review day. We made many crucial decisions with numerous changes to the CAD and calculated cycle time and average point scoring to inform the panel during our critical design review (CDR). Our team made a list of questions that will need to be answered in CDR and started working on the presentation, with our responses to their prior questions and a CAD assembly of the final robot. We have also been deliberating on robot names and t-shirt designs this season! As a team, we used suction cups as our intake mechanism. We came up with names that were part of our James Bonds theme and concluded that we should make it an octopus theme this year. Finally, we are ready to present to the panel at CDR and show them our CAD of the final robot!



Articulation Mechanism

On Monday, January 23rd, our team agreed that the intake mechanism needed to be modified and improved before CDR. Luckily, we had one intake design set off to the side that could still be used and built for CDR. We broke into strategy-based groups, and the intake group started working on the intake design that used suction cups. Surprisingly, this intake mechanism worked better than we all expected, which was great news for everyone.

As a team, we made the executive decision to go with suction cups as our intake design. With little time to spare, our intake mechanism team got to work testing out suction cups with every possible scenario we could think of. With testing on Tuesday and Wednesday, we concluded that flatter suction cups would work well for both cones and cubes because of their wider surface area. For the rest of the week, our

team tested the articulation of the suction cup by swinging it to see if it would attach to the game piece. We have had successes and misfortunes; nonetheless, we hope to finish prototyping and have successes with our intake mechanism before CDR.

Intake Mechanism

From Tuesday, January 24th, through Saturday, January 28th, our team worked on improving the articulation mechanism before CDR. We decided to first work on refining our CAD before developing any parts to the arm. We made plates on either side of the arm to mount the motor and did this using our X-Carve machine. On Saturday, we had one student build the gearbox with the proper calculations, and a group tested the belt that would go on the arm. We will continue to enhance our arm articulation before CDR.

Programming Team

Our programming team started to work on vision using limelight. Limelight uses a camera to see its surroundings and detect April Tags used in the FIRST Robotics Competition field for the first time this year. This is the first year in a couple of seasons to use vision seriously for our team, and our programming team is making significant progress. This will significantly help our drivers align and score when it is time for them to practice and compete. The programming team also upgraded an old kit bot so that the new programmers would have a chance to learn how to program a chassis. We are grateful that our programming team is expanding to newer, interested students who want to learn how to program a robot soon.



We want to give a big thank you to all of our sponsors! Our team can compete because of your support, and none of this would be possible without our sponsor's help. Our team, BONDS, will keep improving and continue learning STEM skills and values this season.

To see our season's progress, please follow us on Instagram, Youtube, Tiktok, Twitter, and our official website for weekly newsletters.