SQUEAK Info Packet

Overview

The Competition

Our team, Team FRC 6201 The Highlanders, designed and built a robot to compete in the 2024 FIRST Robotics Competition, CRESENDO.
The game CRESENDO consist of two alliances, with three teams on per alliance. The responsibility of each alliance is to score notes (orange, donut shaped, foam) in order to gain points while playing the game.

During the first 15 seconds of the match, robots are programmed to run autonomously, meaning the robot is not controlled by humans, only code. During autonomous, a team can:

- Score points by leaving their starting alliance zone
- Score notes into the speaker or amp

In the 2 minute and 15 second portion of the game, also known as tele-op, teams can score by:

- Collecting notes and scoring them into the amp or speaker
- Amplification (allowing their speaker points to increase by pressing the amplification button)

Finally, in the remaining 15 seconds, known as endgame, teams can obtain extra points by:

- Getting onstage (Using their robot to climb a chain)
- Scoring Trap (A place for notes inside the stage)
- Spotlight (scoring notes into poles on top of the stage)

Our Goals

The goals for our upcoming off-Season competition, NERD, is to score as many points possible. To achieve this during auto, we will leave our starting zone and shoot our pre-loaded note into the speaker. We will continue to do this during Tele-op along with defense and retrieving notes from our source. Finally, during endgame we will continue to collect notes and spotlight our team.

Overview

The Strategy

After NERD, we chose to improve some parts of our robot:

Mechanical

Our mechanical team worked on upgrading the intake and shooter system from our robot as well as adapting its electrical components to fit the new design. They also chose to create better organization use larger wheels. This was especially important because after noticing other flaws in Squeak, we decided to set our sights on improving our game mechanisms to compete better. Our upcoming scrimmage event with our 2023 competition robot, Slink, was quickly approaching. Our decision to upgrade our mechanical systems resulted in better robot

Programming:

Our programming team chose to fix the input codes and improve them to make the code run smoother, along with improving autonomous. The programming team has also chosen to make the drivability of the robot better.

Electrical:

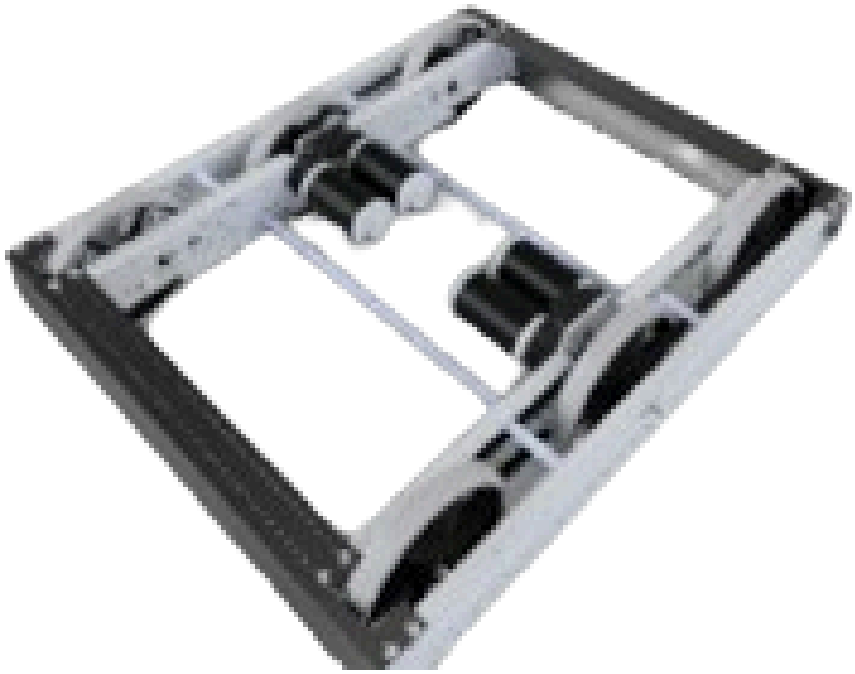
The electrical team chose to rearrange the electrical components in order to be compatible with the new design our mechanical team chose to go forward with.

Subsystem Specifications

Our robot is made out of different subsystems. Each subsystem was designed to in order to try to get as many points as possible while being realistic for the team to build in terms of skill, time and budget. The table below lists each subsystem and describes what functionality it provides.

#	Subsystem	Description	Functionality
1	Drive Train	Drive Trains are the main base used on a robot to help it move. Some types include swerve and tank drive.	Drive
2	Superstructure	The superstructure is everything that is above the drivebase.	Intake, Shoot notes

Subsystem - Drivetrain



Instead of using swerve like in previous years, this year we decided to go back to our original tank drive (a type of drivetrain) to help teach new robotics members. It's one of the most basic bases we could use, however, the easiest to understand and put together. Although one of the simplest types of bases for a robot its one of the most popular types of drive trains. It is important in competitions which focus on speed and agility.

One of our previous robots using this base was Bonk. Bonk was a robot that has successful cycles, picking up red/blue balls and throwing them into a sky net. It did this using the tank drive, showing us we can have success with this type of base.

The base is made out of aluminum which is usefully as it is light weight, therefore better in helping us pass the weight limit which is up to 125 pounds. Tank drives use a ToughBox Mini S Gearbox which is useful because it is a simple-speed gearbox that allows for the robot to move efficiently.

Subsystem - Superstructure

Our super structure is made up of many parts consisting of frames and motors. All these parts helped to make the robot shoot notes and score points use the:

SHOOTER

The shooter is one of the major components, half of the whole structure, that is made of parallel plexiglass that the note would reside until it was shot out by two motors in between the plexiglass. Using momentum generated from the spinning motors, the note would be shot out and if the aim is true, go into the speaker. However, during the N.E.R.D. we noticed the shooters accuracy wasn't as true as we wanted it to be. The motors being on one side created force only on one side of the note and that caused the note to be pushed diagonally from the shooter. To resolve this issue...

Thank You To Our Sponsors!

A huge thanks to our sponsors for helping our team continue our journey! Their generous donations are what made this robot possible.

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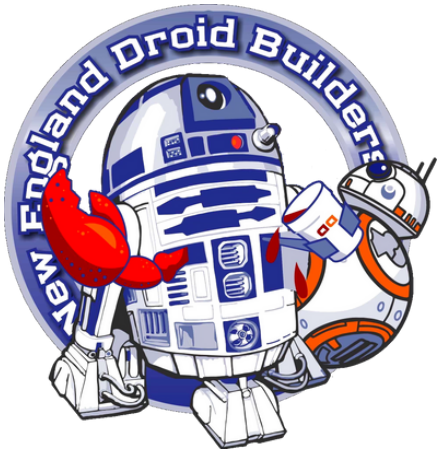

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Team Contact Information

If you have any questions about any of our subsystems whether it be a question about the planning, the CAD, the assembly or code then please feel free to contact us using our contacts below.

We would love to answer any questions!

Social Media Contacts

Website: team6201.com
Email: frc6201@gmail.com
Facebook: FRC Team 6201
Twitter: @frc6201
Instagram: @frc6201

Team Meeting Information

Location: 81 Highland Ave, Somerville, MA 02143
Dates and times:

- Monday - Wednesday: 5:00pm - 8:00pm
- Thursday - 2:45pm - 8:00pm
- Friday: 2:45pm - 5:00pm
- Saturday: 12:00pm - 6:00pm

Sponsorship Information

Checks can be made out and mailed to
Somerville High School Robotics

Mailing Address

Somerville High School Robotics
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Somerville, MA 02143