

Orange Rings, Red Strings, and Other Robotics Things

Meet RJHS's very own robotics team 3729 and learn about everything that goes into the season.

By Sam Fago '24

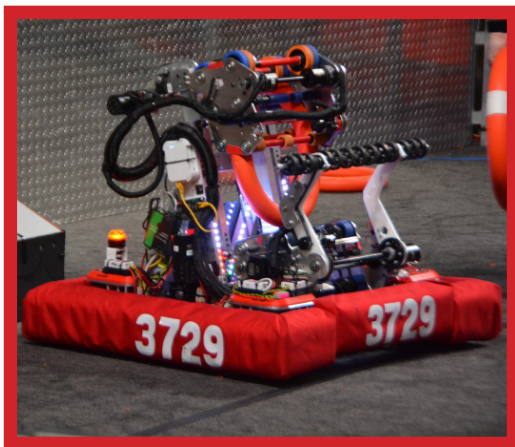
What is FRC?

Regis participates in the FIRST Robotics Competition (FRC), a global robotics program for high schoolers, with over 3,000 teams competing in the last year. Each season starts in January with an event called "Kickoff" where the "game," or objectives and field set up of the year, is announced. Then follows a six week "build" season where each team creates a unique robot from scratch that can complete all these tasks and score the highest number of points. Each team is given a 4-digit number to represent them; RJHS is team 3729!

Regis has been a part of FRC since 2010. Originally in the Boys Division, the team now works in the new Science and Innovation Center. They usually attend two competitions each year: this year, the Central Missouri Regional and the Colorado Regional.



David Fales '24, Arianna Morroni '24, Grant Rechlin '24, and Loten Vu '24 develop an early design for the robot during Kickoff. Photo by Sam Fago '24.



The robot on field, preparing for a match, at the 2024 Central Missouri Regional. Photo by Sam Fago '24.

In late February, the 6-week competition period begins, and teams from around the globe travel to regional events with anywhere from 30 to 60 teams attending. Matches follow a 3 v 3 format, where each team is matched randomly with 2 others on either the red or blue side and compete and score points as a team. These tournaments are over three to four days, the last of which is playoffs, where depending on the rankings from the previous matches, the top teams invite two others to join their alliance and compete with them for the remainder of the competition. The World Championship is held in Houston, TX every year, with the top teams from each regional event in attendance.

The Team

How do they build a working robot every year?

THE SUBTEAMS

Here are some of the teams that make up RJ 3729.

Build

The design, the measurements, the cutting, the Build team fabricates the robot from start to finish, using the plethora of power tools and machines in the Innovation Center. As it's the most time consuming, it's the largest sub team.

CAD

The Computer Aided Design team focuses on using CAD software, like OnShape, to create a digital prototype of the robot, which the Build and Electrical teams use and work from.

Electrical

Wires, sensors, and motors. Electrical oversees powering the robot as efficiently as possible, while making it aesthetically pleasing and safe to touch.

Programming

The programmers animate the robot by intertwining all the separate parts into one. The sub team works on making sure each individual mechanism is accurate and controllable. They also develop "autos" or automated cycles where the robot runs without any human control.

Media

Media team is comprised of designers, photographers, and artists who are passionate about both visual art and communication. They oversee advertising and social media, spreading the word about the team!



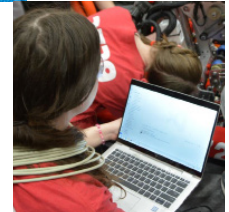
Diego Gutierrez-Raghunath '25, part of Build Team, works on the robot.

The CAD model of the 2024 Robot.



Xavier Lebermann '25 and Henry Hughes '25 adjust a Spark Max Motor Controller.

Katie Pauka '27 waits for the pit team to ready the robot so she can test her code.



Meet the Leads



CAPTAIN

Gabe Shekleton '25

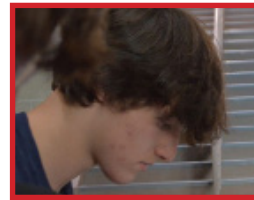
Gabe organizes meetings and leads the team, as well as manages every sub team. At competitions, he represents Regis and 3729 at alliance selection and is a part of the drive team, driving the machine during matches.



CO-CAPTAIN

Kanaan Kratzer '26

Kanaan acts as the internal captain of 3729 and is a CAD and Build Specialist. He can be seen leading debriefs and, at competitions, strategizing with the team and scouting other bots for playoffs.



PROGRAMMING

Nick Turner '25

Nick teaches other members of the Programming sub team the ins and outs of the code used to control the robot. In between matches at competitions, he double checks that each component of the robot is operating precisely.



SAFETY

Clare Keating '24

Clare has three big rules when near the robot or machinery: safety glasses always on, hair tied back, and hoodie strings tucked in. She makes sure everyone gets home in one piece after every meeting.

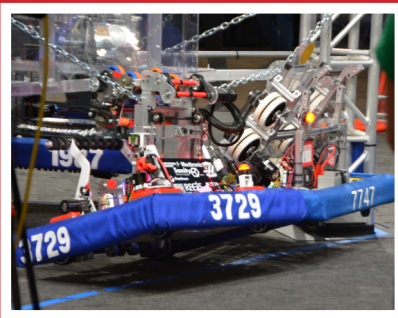
This Year's Game

FRC's 2024 Music Game

Every year, each match is comprised of two parts: the autonomous period (15 seconds) where drivers are not allowed to guide the robot, and the teleoperated period, in which drive team members control the machine (remaining 2 minutes and 15 seconds). The drive team is comprised of a driver, an operator, and a drive coach. Two other team members are a part of the Field Team: the technician and the human player.

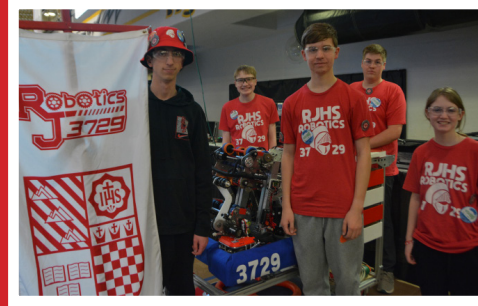
CRESCENDO™

PRESENTED BY 



RJ 3729 harmonizing with team 7747, Hancock High Tech, at the end of a qualification match.

Photo by Sam Fago '24.



3729's Field Team: Oliver Howe '24, Henry Hughes '25, Gabe Shekleton '25, Charlie Puschaver '26, and Elena Gott '27.

Photo by Sam Fago '24.

In this year's game, CRESCENDO, teams earn points by launching foam rings, or "notes," into different structures on the field: the Amp, the Speaker, and the Stage. Every time one is successfully scored in the Amp, it receives a charge, and two charges can be used to amplify the Speaker. When amplified, all notes scored are worth more points for ten seconds.

In the last seconds, teams must try to balance on a chain, and score one final note into the "stage" element of each side. There are also three Human players, one from each team, two who drop notes onto the field at the Source, and one who operates the Amp buttons, and can throw a final note on stage to land around a pole. This is called a Spotlight, and it gives extra points to a team only if there are robot(s) hanging on the chain directly beneath it. Two robots hanging on the same chain is called a Harmony.



AWARDS

At each event, a select few teams are awarded for having shown merit in engineering and professionalism. Last year, the team received the Innovation and Control Award at the Heartland Regional in Olathe, Kansas. The award recognizes excellence in "innovative control system or application of control components – electrical, mechanical or software – to provide unique machine functions." And this year, 3729 received the Creativity Award at the Central Missouri Regional in Sedalia, Missouri. The judges decided that the team's process exemplified "creativity that enhances strategy of play and was intentionally designed and not discovered."

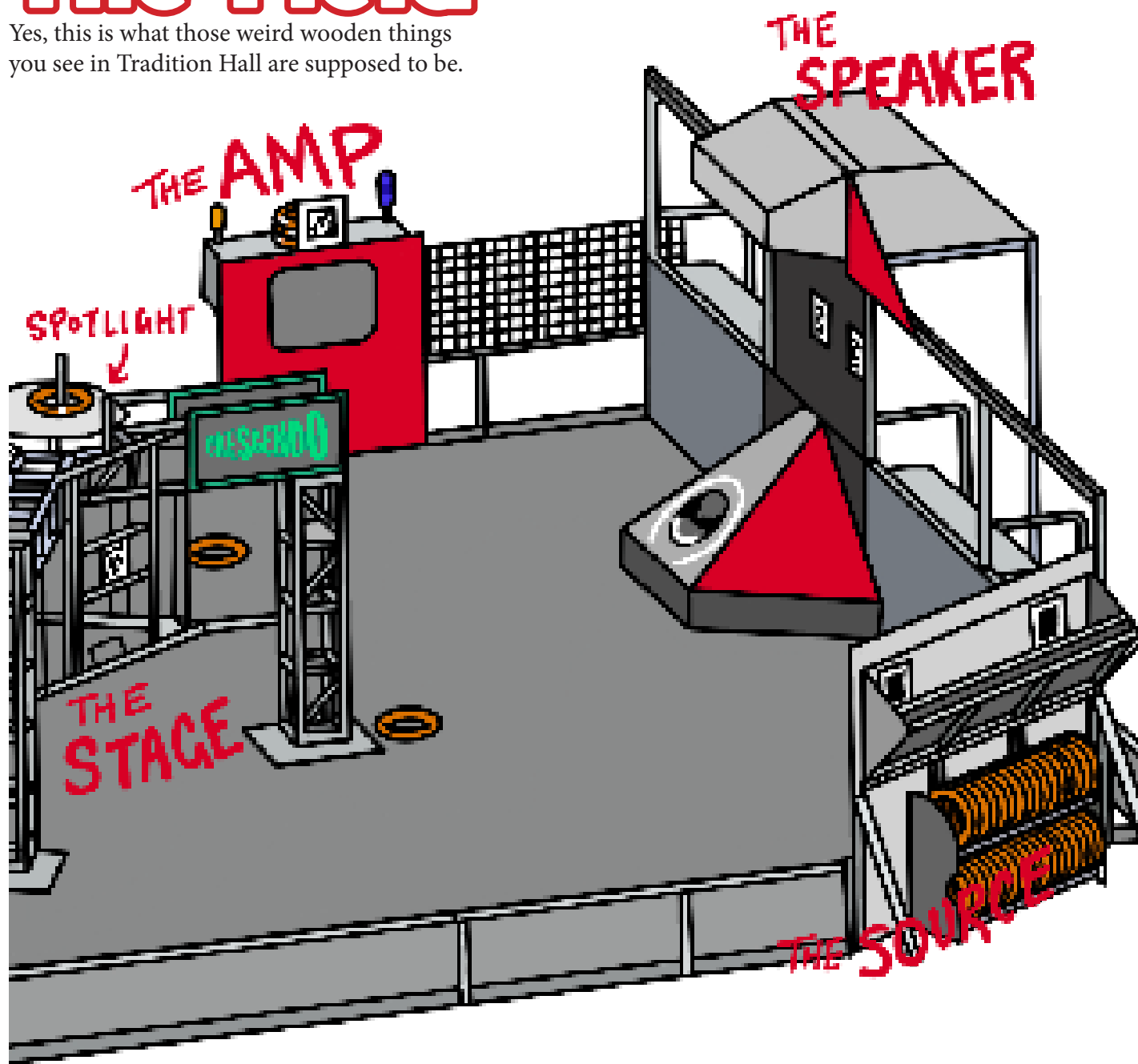


Sal Ramos '24, a member of the Electrical sub team, posing with the Creativity Award at the hotel in Sedalia, Missouri.

Stop by the Innovation Center, located on the first floor of the SIC, on Tuesdays or Thursdays after school to check it all out in person!

The Field

Yes, this is what those weird wooden things you see in Tradition Hall are supposed to be.



The team finishing a round with a climb on the stage at the Central Missouri Regional.



The robot preparing to score in the Amp in Tradition Hall.



The team scoring a note in the Speaker at the annual Coronado Scrimmage in Colorado Springs.

Photos by Sam Fago '24