

Would you like to purchase a ticket for the Regal Eagle Railroad? If so, hold tight—because this is going to be the ride of your life!

Before we get to the first stop, let us give you a brief introduction to the Regal Eagles. Fifty years ago, less than a mile from where we build our robots, some of the most brilliant engineering minds at the Grumman Corporation built the Apollo Lunar Module. Inspired by the technological leaps made in our hometown, our school district established FRC team 2869 back in 2009: “One Small Step.” We changed our name to thp[ke Regal Eagles—but our spirit and passion for advancing the world through STEM remains.

The Regal Eagle Railroad consists of several trains: Conductor, Mechanical, Programming, Electrical, Carpentry, Marketing, and Outreach, to name a few. Each of these individual trains work together to form a bustling network that transports knowledge, skills, experience, and more. In our mechanical sector, we have a group of dedicated students who design and assemble using CAD and machinery. In electrical, our members ensure that our railroad is powered up and running. Our programmers give directions, while carpenters build the surrounding necessary structures. Marketing keeps our railroad running with funds for improvement, while outreach expands the distances we can reach. With around 35 members and a great mentor, we keep the Regal Eagle Railroad running smoothly.

#### First stop on the Regal Eagle Railroad: The Regal Eagle Lab!

Our lab consists of a smaller than average classroom and a single hallway. But it’s all hands on deck, and together we get the job done. Our innovative thinking and teamwork don’t just develop robots, but also create experienced builders, thinkers, communicators and collaborators.

Over the years, we have seen a tremendous increase in female involvement. This year 75% of our leadership and 53% of all members are female. A surge in female interest in mechanical and electrical breaks gender stereotypes. We are training two sophomore girls to take leadership in the electrical subgroup for next year. For members (especially girls) who are hesitant about building, we have several tasks involving art that keep them engaged; these members get to experience the team, and always come back to get mechanically involved. Our cultural diversity is also a strong aspect of our team. Our diversity in culture not only presents us with a new way of thinking, but bonds us together as a conglomerate family.

Through off season training sessions and projects led by our 4 senior leaders, transporting knowledge to the younger members is a huge focus of our legacy. During the last three years, communicating, encouraging the right trains of thought based on FIRST principles, and planning our path ahead with documentation are areas we’ve greatly improved upon. We have been heading in the right direction on the right track, and are still constantly on the move for improving our team.

### Coming up: Our City

Inspired by the Regal Eagles in the past, our school district established STEM labs in our elementary schools and an FLL team in our middle school. As role models for our school community, we actively mentor our younger generation. By helping the newly started elementary school and middle school Hackathon teams, we prepare students while offering the advisors our experience. Our FLL team continues to have close ties with current Regal Eagles – former Robo Eagles – as we guide them through their builds and presentations. We continue to volunteer at district-wide events like STEM Nights, Safe Halloween and the Back to School Bash by demonstrating our robot, and repurposing old Regal Rampage field parts as games for children to enjoy.

We even see the direct impact of our team at our high school. Upperclassmen inspired younger members to take a computer, physics, and/or engineering class, subjects previously met with less interest. We currently have the highest enrollment in AP Computer Science Principles. AP Computer Science A is now a class that is offered every year, thanks to a sudden jump in interest. To keep our peers in the loop on what we do, we started a program this year to include weekly segments—"Checking in with the bot build"—in our high school's morning newscast.

This year, as we recover from the pandemic and look forward, we are forging new paths as a team. We received green lights from our Director of Technology, and started several new initiatives. These initiatives are just around the corner for 2022, and we are laying the tracks for future years. Our robotics team created a district wide program called Engineers Helping Engineers; through this program, our members will go to elementary schools in the spring to give our younger generation a deeper understanding of what it means to be involved in engineering. With a presentation on what engineering means and how it can lead to many careers, a short activity with snap circuits and pasta towers follows. Trailing that, we give students an overview of all the STEM opportunities available in our middle and high school. We also will be leading activities in our district-wide Hour of Code event. Seeing a gap in knowledge from our FLL to FRC team, we additionally decided to develop an FRC summer camp for middle schoolers in hopes of instilling confidence in their skills and inspiring interest in our club in high school. The curriculum involves lessons on circuitry, CAD, and includes a tour of the Regal Eagle Lab.

### Next stop on the Regal Eagle Railroad: FIRST City

On Long Island, we have a community with over 81 FRC teams and 40 FLL teams. With a heavily STEM-focused area comes unique experiences and perspectives.

Therefore, we created Regal Roundtables, an event where we invite local teams to come visit our high school and create a 10 minute presentation on a topic their team is experienced in. In the past we have had teams present on topics such as safety, outreach, strategy, and their own scouting apps. We make sure to post these presentations and teams on our website, so that we and every other team can improve and learn from others. Like any railroad, our train tracks always need improvements, and train cars need to be repainted. Year after year, even during our virtual Regal Roundtables event last year, we learn something new that we add into our own

team. For example, inspired by the PoBots (Team 353) School of Engineering program, we developed our own training groups following their model and have found great success. Through Roundtables, we aim to implement the essence of Gracious Professionalism in our own FRC City.

One thing we realized as a team a few years ago was that it was difficult for us to find a place to practice driving the robot. The closest practice field was more than 100 miles away, and so we decided to take matters into our own hands and create Regal Rampage. Due to a break from COVID-19, we know that this year more than ever our Rampage event will benefit teams. In our own high school, we go the extra mile and make our own full-sized wooden field complete with paint and real game elements to provide a space for us to practice alongside other teams in our area. The event mimics regional events at a smaller scale, providing crucial time for strategizing, collaborating, troubleshooting, networking, and exposure to coopertition. It also allows us to feature our middle school's FLL team as well as our local sponsors. Many community members come to view the event, and as a result many children are inspired to join either our FLL or FRC team.

For teams outside our local reach, we are in the process of publishing a platform agnostic Scouting app as well as developing an Augmented Reality (AR) app to allow interaction with the field for teams who don't have resources to build them. Through our hosting of Regal Roundtables and Regal Rampage, we prioritize fostering collaboration and opportunity for FIRST teams. We are as excited to learn from other teams as we are excited to share our skills/experiences.

#### We are now passing through the community at large

This year's focus is to involve the public community. Local businesses that sponsor us include the Grindhouse, Long Island Smoothie, and Alegna Soaps; we in turn promote these businesses at our bake sales. We also send all of our sponsors monthly newsletter updates called the Regal Report. To inspire people to join the FIRST community, we assisted a local school that is thinking of starting an FRC team by inviting them into our lab, providing resources, and sharing advice. To inspire engineers even outside Long Island, we are very active on social media. We have 1,500 followers on Instagram and started a TikTok account this year. On our team website, where we post highlights, updates, and our build blog, we have 100,000 unique visitors. We are also collaborating with Siemens on publishing a blogpost highlighting the impact FRC made on our lives. All these outlets serve as ways for us to spread our passion for STEM at a public level.

#### Now returning home. We hope you enjoyed your ride on the Regal Eagle Railroad!

Robotics is our home away from home. Each member experiences their own unique impact from FRC, often from both the technical and operational aspects of our team. Over the last 3 years our team has been on a journey of positive internal change, as well as growth in

technical skill. Now that we've strengthened our team, we have focused on making similar impacts in our local community and are starting to expand globally again.

We are laying the tracks for the next generation of engineers, thinkers, and leaders. We are working to change people's minds about STEM, one robot at a time. Just like one small step changed the world over 50 years ago. We are ready for take off—when you see the Regal Eagles soar with the next generation on board, we hope you remember this little trip on the Regal Eagle Railroad that showed the start of it all.