

HVA

RoHAWKtics

ERC 3824




Table of Contents

2	—————	Welcome
4	—————	Our Story
6	—————	By The Numbers
8	—————	The “Word”
10	—————	Local Outreach
12	—————	FIRST Outreach
14	—	Government, Corporate, 3D Printing
16	—————	The ERSTE Initiative
18	—————	Sponsors
20	—————	Awards & Competitions
23	—————	Press
24	—————	Snapshots
28	—————	Outreach Timeline

Welcome

The FIRST Team 3824 HVA RoHAWKtics is a robotics team from Hardin Valley Academy in Knoxville, TN. What started as a 15 member team working out of a closet has now become a 50+ student organization who previously found their home at the Manufacturing Demonstration Facility (MDF), a part of Oak Ridge National Laboratory (ORNL). Due to unexpected growth within ORNL, the HVA RoHAWKtics are currently in a space graciously offered to them by FRC 3140. The team, established in 2011, is in its eighth year of competition in the FIRST Robotics Competition.



The team stresses its values in all that it does, sticking to its motto “Stay Hungry, Stay Humble”: in spreading STEM education, cooperating, collaborating, and competing with fellow teams, learning and committing to new technologies, preparing students for the future workforce, and both inspiring others and being inspired by all that FIRST and STEM have to offer. From competition, to outreach, to the everyday build, Team 3824 invites you to come and learn more!


Our Story

With some interest by a student at Hardin Valley Academy in 2011, and willingness to participate by a computer science teacher, there came the beginnings of FIRST Team 3824 The HVA RoHAWKtics. After finding enough funds and members to participate, the team quickly found a significant problem: they were working out of a school closet, and had no shop. Yet, with a 3D printer sitting at the school, and a mentor who knew how to use it, there came the solution that would soon drive the RoHAWKtics story.

The 2011 season brought both Rookie All Star and Highest Rookie Seed awards to, as well as an invitation to work at the Oak Ridge National Laboratory's (ORNL) Manufacturing Demonstration Facility, a state of the art home to developments in additive manufacturing. That following year, the team was able to achieve the Engineering Excellence and Industrial Design awards. Soon, they made a commitment to integrate 3D printing into their robots as much as possible. Though this presented a risk, as the technology was relatively new and not field tested, the risk certainly paid off.

The RoHAWKtics' work with 3D printing was noticed by government and industry leaders, allowing them to present at many large events to vouch for the practicality and viability of additives as the new source of manufacturing. They also continued to succeed in competition, earning a Regional Champion title and trip to FIRST Championships.

As the team progressed, far more of the robot became 3D printed, culminating in the Black Lotus in 2014, the first fully 3D printed robot. This robot not only brought success on the field, with a Regional title, Industrial Safety, and Industrial Design awards, but it also served to inspire people with the possibilities the technology offered, namely for the car company Local Motors, who would go on to print the world's first 3D printed car, the Strati, on the same printer that the robot was printed on.



With the 2015 season came a continued push to integrate the 3D printing, which helped the team achieve the Regional Champion title at both of the competitions that they attended. The following year, the team pushed their material boundaries, incorporating pultruded fiberglass into the robot frame, while also using a new visual processing system. The robot earned an Innovation in Control for the system, along with the title of Champion at the Smoky Mountains Regional.

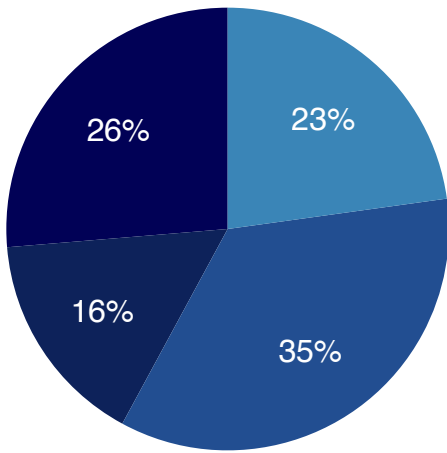
In their 2016 season, the team began their grandest adventure, hosting and welcoming German students into our team and traveling across the ocean to establish a FIRST-based German exchange program and help start FIRST teams in their area. In the 2017 season, the RoHAWKtics launched The ERSTE Initiative (*erste* is *first* in German, and stands for Encouraging Robotics and STEAM Through Exchange) in order to help make an impact through exchange on a larger scale.

The initial success of the ERSTE Initiative set the tone for the rest of the 2017 season. The HVA RoHAWKtics left the Palmetto Regional as the Regional Champions. They went on to the Smoky Mountains Regional where they became the first team in their region to win the Chairman's Award.

And so goes the story of the RoHAWKtics as they have evolved over the past eight years, as they have grown and found new opportunities, as they have taken risks, found rewards, and, most importantly, spread the word of FIRST and the future of technology.

By The Numbers

● Freshman ● Sophomore ● Junior
● Senior



36%
new members

1:4
mentor to
student ratio

338%
growth rate

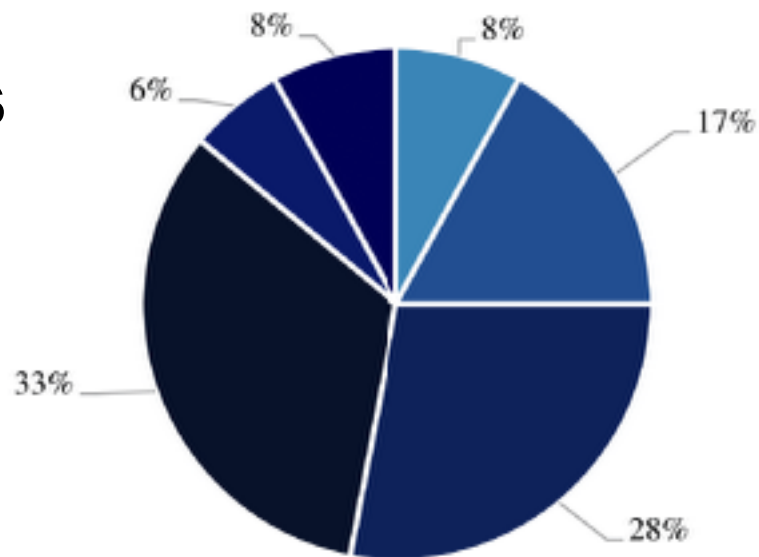
57
members

139

**FLL teams attending
our event**

80%

**alumni in
STEAM fields**



■ Other ■ Computer Sciences ■ Life Sciences ■ Engineering ■ Mathematics ■ Art

The “Word”

“We are not just building a robot, we are building a community.”

- John Tilson, FIRST Team 3824 Lead Teacher Mentor

“Technology is an ever-changing field, constantly altering the way we live our lives. FIRST Team 3824 is striving to stay on the forefront of this ever-changing technological landscape.”

- Jacob Messing, FIRST Team 3824 Member

“FIRST gives me a future. Being on this team, I’ve realized I can do anything.”


- Charlotte Whitmer, FIRST Team 3824 Member

“When you watch the kids at Hardin Valley Academy build robots, you see the likes of a STEM education we haven’t seen in America ever before.”

- Jay Rogers, CEO of Local Motors

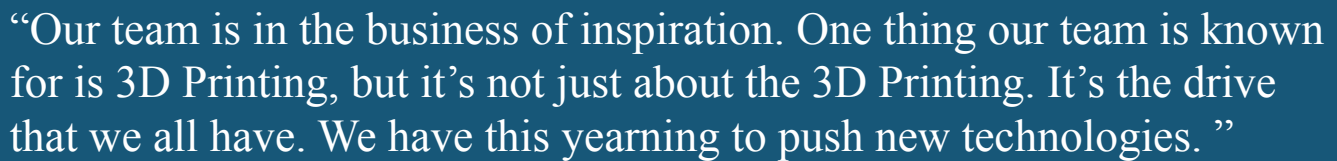
“I think I am most impressed with this year’s business team. I looked at the Chairman’s video for the first time last night and was totally blown away by how they told the story of the team, the quality of the audio, and how the story flowed.”

- Chris Marion, FIRST Team 3824 Parent and Mentor



“I was really impressed by how everyone is friends with everyone, and everyone supports everyone. I have been amazed by the opportunities for summer internships and jobs that they can get right out of high school, and the connections that those have led to. I am also impressed by the development all around, socially, time management, and other good skills.”

- Laura Young, FIRST Team 3824 Parent



“Our team is in the business of inspiration. One thing our team is known for is 3D Printing, but it’s not just about the 3D Printing. It’s the drive that we all have. We have this yearning to push new technologies. ”

- Sean Toll, FIRST Team 3824 Member

“One of our biggest contributors last year was the Hardin Valley team. If we needed anything, we just asked them, and they would be there to help us. They’ve continued to help us this year, too.”

- Christina Paris, FIRST Team 5571 Member

“Anyone can join FIRST. Anyone can learn something new. Anyone can do it. That’s what our team has showed me.”

- Parker Plumly, FIRST Team 3824 Member

Local Outreach



Fantasy of Trees

As part of our dedication to the East Tennessee Children's Hospital, we decorate and donate a tree to be auctioned off the annual Fantasy of Trees event. To put our own personal spin on it, the ornaments and tree toppers are all 3D printed, with a robotics theme to them.



4th of July Parade

The past three summers, we have participated in the Farragut Fourth of July Parade, a community event of over 10,000 spectators. With our 2014 Black Lotus Robot, we shot and rolled the ball into the crowd and handed out bouncy balls. We also pulled a trailer with all of our past robots.



Barnes & Noble Makerfaire

During the nationwide Barnes & Noble Makerfaire, we demonstrated our robot and spoke about FIRST to the 3,000 people that attended. Our students also ran activity tables, helping to involve younger generations in the “maker” revolution.

Elementary School Visits

We have done many visits to local elementary schools for things such as the Dogwood Elementary Art Show and the Bluegrass Elementary STEM Night over the past 4 years. Many team members say that these school visits are the most memorable outreach in which they have participated.



MUSE Robotics Revolution

Put on by MUSE, a children’s STEM activity center, this event allows kids to see and experience a variety of different robotics themed things, from FRC and FLL teams to companies showing off advanced military robots. Our team was able to talk about STEM education, demonstrate our robot, and teach some future engineers how to drive the robot.



NightHawk

In a continual effort to Make It Loud and show school spirit along the way, our team has developed a t-shirt cannon called the Nighthawk, equipped with LEDs and speakers. The t-shirt shooting robot is a crowd favorite at our school sporting events.



FIRST Outreach

In the spirit of FIRST and Coopertition, we have pushed to collaborate with, bring together, and support other FRC teams and to offer support, opportunities, and guidance to the ever expanding FLL programs.



Lunch and Learn

Beginning in the fall of 2011, our team began hosting Lunch and Learn Saturdays, a time for teams from all over the area to come together at the MDF to collaborate, problem solve, ask questions, and offer solutions. We have had 14 teams participate. This program has been expanded by 3824 Alumni at the University of Tennessee. Along with this FRC event, we have also integrated the Tennessee School for the Deaf into our own team, as well as helping to start Bearden FIRST Team 5571 RATCHET Robotics.



FLL Mentoring

Beginning in the fall of 2011, our team began hosting Lunch and Learn. Our team members have mentored several FLL teams, including the Eyases (the name for baby Hawks).



FLL Regional Qualifying Tournament

Team 3824 annually hosts a regional qualifying tournament at our high school, Hardin Valley Academy, with 28-36 teams competing for the right to attend the state tournament. Students and mentors of the team volunteer for set up, break down, competition preparations, and the actual running of the tournament. This can range

from refereeing, running practice tables, assisting judges, and much more.



The ERSTE Initiative

Encouraging Robotics and STEAM Through Exchange



In pursuit of spreading the word of *FIRST* and STEAM beyond our local community, our team has established The ERSTE Initiative, which is based around our school-to-school German Exchange. In 2016, the pilot year of the exchange, our team hosted eight German students and made them a part of our team. ERSTE, which is the German word for *first*, was officially launched in 2017 to coincide with the arrival of 12 German students and 3 mentors for our second exchange. The ERSTE Initiative is far more than just the exchange itself, it encompasses the values of *FIRST*, the benefits of a lasting intercultural community, and the longterm goals of the program concerning the growth of *FIRST*, FTC, and FRC in Germany.





We spoke out about the program on local radio. In May, we presented at FIRST Championships, inviting and encouraging other FIRST Teams to get involved, and explaining the long-term goals of the program: to establish a repeatable model, and grow the number of FIRST teams in Germany in order to eventually establish a European Regional.



In June, our team members traveled to Germany, took part in classes, helped set up equipment and a 3D printer in the robotics and programming lab to start FTC Team 11515, and recruited students interested in participating the next year. This year, there are 12 students traveling to the US, and another group of RoHAWKtics will be traveling back to Göttingen this summer. Having been given FIRST's blessing, we intend to grow the program to include more teams and schools in the US and Germany.

The ERSTE Initiative
Encouraging Robotics & STEAM Through Exchange

Sponsors

Bechtel: They were founded in 1898 and are now the largest construction and civil engineering corporation in the United States. Their projects span from mining operations to the building of power plants.


Consolidated Nuclear Security (CNS): They manage the Y-12 Security Complex and the Texas Pantex Plant, which is a nuclear assembly and disassembly plant.

Knox County Schools: This is the team's school system and we are located in its largest city, Knoxville.

Techmer Polymer Modifiers: Techmer is one of the leading producers in the plastics and fiber industries.

Tennessee Valley Authority (TVA): TVA is a southeastern electric company providing to 9 million people in parts of 7 states.

The Sharp Companies: It is a construction company who has been around since 1964, and they have remained a family business since then. The company's president was named ageing-in-place specialist by the National Association of Home Builders.



Oak Ridge National Laboratory (ORNL): ORNL is a government facility that works in areas such as supercomputing, nuclear science, and national security.

Home Depot: Home Depot is the world's largest home improvement retailer.

UT Batelle: UT Batelle functions as the management contractor for the Department of Energy's Oak Ridge Nation Laboratory.

Electric Power Research Institute (EPRI): EPRI is an electric company that researches and developed the delivery, generation, and use of electricity to the public.

Institute of Electrical and Electronics Engineers (IEEE): This is a group of professional engineers who work on furthering technical advancement for humanity.

ARCOR Foundation: The Aluminum Company of America is the world's third largest producer of Aluminum.

Tuff Torq: Tuff Torq is a U.S. drive systems manufacturer that specializes in lawn mowers.

Awards & Comps



2017

Palmetto Regional

Regional Winner, rank #2

Judge's Award

Smoky Mountain Regional

Chairman's Award

FIRST Championships

Roebing Division Semi-finalists,
rank #27

Indiana Robotics Invitational



2016

Palmetto Regional

Semifinalist, rank #7

Innovation in Control

Smoky Mountain Regional

Regional Winner, rank #3

Excellence in Engineering

FIRST Championships

Carson Division Quarter Finalist,
rank # 46

Indiana Robotics Invitational

Quarter Finalists, rank #46



2015

Palmetto Regional

Regional Winner, rank #1

Industrial Design

Smoky Mountain Regional

Regional Winner, rank #1

Excellence in Engineering

Industrial Safety

FIRST Championships

Tesla Division Finalist, rank #11

Indiana Robotics Invitational



2014

Palmetto Regional

Regional Winner, rank #1
Industrial Design

Smoky Mountain Regional

Woodie Flowers Finalist
(Lonnie Love)
Industrial Design
Industrial Safety

FIRST Championships

Newton Division rank #45



2013

Palmetto Regional

Regional Finalist, rank #27
Excellence in Engineering

Smoky Mountain Regional

Regional Winner, rank #1
Excellence in Engineering

FIRST Championships

Curie Division rank #10

Cont. & Press



2012

Smoky Mountains Regional
Engineering Excellence
Peachtree Regional
Industrial Design



2011

Smoky Mountains Regional
Rookie All Star
Highest Rookie Seed
FIRST Championships
Galileo Division, rank # 59

RoHAWKtics, FHS Flagship team, BHS Robotics at world event

BY ALAN SLOAN

Hardin Valley Academy's ROHAWKtics 3824 FIRST Robotics team captured its championship-winning wage during the 2014 FIRST Robotics Regional Tournament Thursday through Saturday April 3-5 at the University of Tennessee. The team placed a new level of excellence among a 31-team field from several states while also earning the Quality Award. Meanwhile, Hardin Valley Academy's robotics team (3177) placed region champ 10th, and Flagship 1189 in St. Louis last week. (Wednesday through Saturday, April 2-5) Hardin Valley Academy's 3824 team also earned Region III National (top 100) ranking. (Hardin Valley Academy's 3824 team placed 10th in the region, and 3177 placed 10th in the region, and 1189 placed 10th in the region.)

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RowHAWKtics win regional, heading to worlds



Hardin Valley Academy's RowHAWKtics 3824 team "stepped up" the program's third consecutive regional tournament championship in as many years. Combining efforts with two teams from South Carolina after scoring the most points in preliminary rounds. (Hardin Valley Academy's 3824 team placed 10th in the region, and 3177 placed 10th in the region, and 1189 placed 10th in the region.)

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Due to successes, participation in events, and efforts to "Make It Loud," Team 3824 has made appearances in local newspapers, on TV evening news, and on a regional radio station. We have used these opportunities to spread the word of FIRST, encouraging people to donate, visit events, and learn more about the programs.

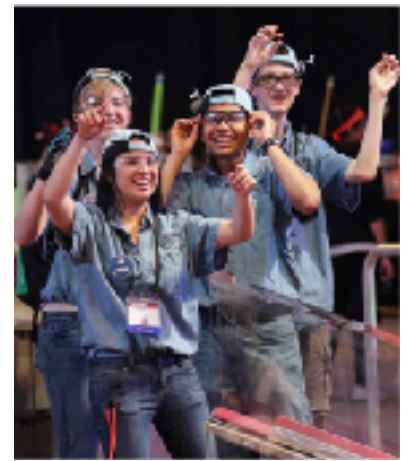
RowHAWKtics... They also showed a gracious professionalism in the way they handled themselves before and after the victory. Tison added about his 8 member team, which also includes Beth Love, FVA English teacher, who is 3824's first-time team coach. RowHAWKtics was led by team captain Sierra Palmer, a senior, who was among four "on the disc team," Tison said. "We were probably better prepared than most teams coming in there because we got our robot finished in time to test it before we had to put it in the bag," Tison added about the roughly six-week period each FIRST Robotics team gets nationwide to build its main robot before having to ship and "bag it," which left only 17 days. Conquered with the RowHAWKtics.

Snapshots









Outreach Timeline

- Summer 2011: We spoke to Sullivan County School Board members about starting FIRST teams in their area.
- Fall 2011: We began our partnership with Oak Ridge National Laboratory's Manufacturing Demonstration Facility which invited us to work in their facility; we, in turn, asked if we could share this space with other FIRST teams in East Tennessee. We had nine teams take us up on this offer. We were so excited about the prospect of working with these other FRC enthusiasts all in one place, we decided to create a program entitled "Lunch and Learn" in which we ate lunch, collaborated and problem-solved about our robots. Last year it grew to 14 teams showing up for our Saturday sessions. We continue to attract new teams to participate in this event.
- Fall 2011: We volunteered at Farragut Fall 5K and Pet Parade by leading runners and their four-legged friends around the trail.
- December 2011: We were invited to demonstrate our robot from the Logo Motion game at the FLL Cookeville Regional Tournament. We have been invited to showcase our robots at this event each year since.
- Spring 2012: We grabbed the attention of the incoming freshmen at our high school by showing off our robot at Freshman Day.
- Summer 2012: We hosted a workshop for rookie team mentors in order to help them start-up a successful team. Word of this workshop spread, encouraging veteran teams to participate as well.
- Summer 2012: We hosted a cookout for an inner-city Atlanta FRC team and introduced them to additive manufacturing.

- Summer 2012: Team members volunteered at an HVA STEM Camp for younger elementary-aged children. With the kids, we built a large hovercraft out of plywood and then let the children take the reins. They then duplicated it on a smaller scale, creating one out of a CD.
- July 2012: We were invited to play a pickup game of basketball with our robot from Rebound Rumble to raise money for Oak Ridge National Laboratory's United Way fundraiser.
- Fall 2012: We volunteered with the Shangri La Therapeutic Riding Academy (STAR), a place for persons with special needs or disabilities to participate in horse-related activities. For two weekends, we mucked out stalls and did general maintenance jobs around the campus. Last spring, we partnered students from our team with clients of STAR. RoHAWKtics members helped clients to stay focused and build confidence in themselves.
- Fall 2012: We began sponsoring two FLL teams, providing them with the funds to finance their team. We also mentored one of the teams with kids from our FRC team. This year, we took on mentoring a second FLL team.
- January 2013: We collected over 200 pairs of glasses at our school and the MDF to send with a local eye doctor, Dr. Dorian Lain on his annual trip to Ghana, West Africa.
- March 2013: Alcoa Regional Advanced Manufacturing Partnership (RAMP). Assisted LJ Robinson in promoting TN FIRST, talked to local manufacturers and companies, and talked about the importance of STEM education.

- November 2013: We planned and hosted an FLL qualifying tournament for teams to advance to the FLL Cookeville Regional Tournament. Volunteers from our team and various FRC teams from our community offered their time and talents to help make this event a success. 2013 Carbon Fiber Facility Ribbon Cutting: Our team talked to Governor Haslam and other dignitaries about our program and we showcased our robot.
- July 2014: For Farragut's Fourth of July Parade we created a float and showcased our robot as we walked down the streets handing out flyers and bouncy balls. We also showcased 3D printing and our robot at Farragut's Red, White, and Blues community celebration.
- July 2014: 3D Printing Demo Kick-Off: An hour and half presentation on additive manufacturing and how to use CAD and the 3D printers. We also explained characteristics of each printer, common problems and how to fix them.
- July 2014: Valleypalooza open house for HVA students. Introduced student body to the robotics team.
- Summer 2014: Created a t-shirt cannon for HVA home football games.
- Fall 2014: Robot and 3D printing demonstration at MUSE Children's Museum in Knoxville.
- November 2014: Team members designed 3D ornaments and decorated a tree for East Tennessee Children's Hospital's Fantasy of Trees, which draws 20,000 people over a 3-day period. We also sold glow sticks at HVA football games to raise funds for ETCH.
- Fall 2014: Team members volunteered to mentor two FLL teams.
- December 2014: Team coordinated and hosted a FLL qualifying tournament and demonstrated FRC robots to participants.

- Build season 2015: Welcomed FRC Rookie Team 5571 to the MDF. Continued its popular MDF Lunch and Learn Saturday series. Incorporated safety education at these meetings.
- July 2015: Farragut's Fourth of July Parade.
- August 2015: Valleypalooza and demonstration at the MUSE Robotics Revolution event.
- Fall 2015: Continued attending football and even basketball games with the newly designed Nighthawk, the t-shirt cannon.
- October 2015: Sold glow sticks for the Mighty Maya Campaign. Also, the team collected glasses and calculators for Glasses for Ghana. Also, the team travelled to Blue Grass Elementary School to show the kids 3D printing and one of the robots.
- November 2015: Once again, the team participated in the Fantasy of Trees.
- December 2015: Hosted FLL qualifying tournament at HVA again.
- Build Season 2016: The team showed students from the Tennessee School of the Deaf the MDF and integrated many as new members.
- Build Season 2016: We continued to attend athletic events with the Nighthawk, and travelled to Dogwood Elementary School to show the students 3D printing and one of the robots.
- Season 2016: We hosted 6 German Exchange students as part of a FIRST-based exchange with a German school. They attended meetings, participated in a robotics class, created their own "German Defense" robot, and attended the Smoky Mountains Regional.
- May 2016: At FIRST Championships, the Team hosted a seminar about the FIRST-based German Exchange Program. They discussed the goals of the program, and how to get other teams involved.

- June 2016: Team 3824 went to Germany as a part of the FIRST-based GAPP German Exchange program. Eight of our members stayed with German host students, participated in the schools robotics class, helped to establish their new FTC team, and recruit students for the next year.
- July 2016: Farragut's Fourth of July Parade.
- August 2016: MUSE Robotics Revolution demonstrations and Valleypalooza recruitment.
- September 2016: The team collected money for Mighty Maya by selling glow sticks at our school's home football games.
- October 2016: Bluegrass Elementary School STEM Night demonstrations and presentations.
- November 2016: Barnes and Noble MakerFaire demonstration and running booths. Also, Fantasy of Trees, an East Tennessee Children's Hospital Fundraiser for which we 3D printed Christmas ornaments.
- December 2016: 3824 hosted the annual FLL Regional Qualifying tournament.
- March 2017: Official launch of the ERSTE Initiative, Team members hosted 12 German students to participate in the second year of the exchange program, and 3824 was present at HVA's 8th grade night.
- June 2017: Farragut's Fourth of July Parade.
- July 2017: Two Blue's STEM Camp, IRI, and Valleypalooza.
- November 2017: Demoed at a Mini Makerfaire at Barnes and Nobel.
- December 2017: 3824 hosted the annual FLL Regional Qualifying tournament.
- Planned events: Elementary school visits, school demonstrations, and a trip to Germany as the second half of the German Exchange program.