

## 2016 Chairman's' Award Essay

The fields of science, technology, engineering, and mathematics (STEM) are vital and growing in South Carolina, especially in the Lowcountry. The continued growth of STEM fields is necessary in order to continue advancing and improving the world. The Lowcountry of SC is expanding its manufacturing by more than 40% in the next 5 years as more and more companies come to the area. This is why FIRST is necessary; the program encourages the growth of STEM by inspiring young people to pursue fields in STEM, and encouraging those young people to find and follow their passions. Through this, they become a part of the necessary developing workforce in our region and will make advancements throughout the world with their creativity and innovations. FIRST Team 342, The Burning Magnetos, fully embodies this; the team's mission and motto is to "Take the message further!". We seek to spread this message to as many people as possible through our activities in local and global communities. Moreover, we have expanded our vision by seeking to instill a passion so strong that they will in turn inspire others.

After Team 342's inception in 1999, members consisted of students from 13 high schools, mainly those in Dorchester District 2 (DD2): Fort Dorchester (FDHS), Summerville, and Ashley Ridge. We supported area FLL teams, who became the basis for our successful FRC program. As the team advanced, we saw how FIRST positively impacted the students and community. 80%+ of students on the team went on to pursue careers in STEM, either after earning a degree or directly entering the workforce. Through our strong partnership with Robert Bosch, LLC, several have gone to the Bosch apprenticeship program in SC and later joined Bosch full time. 8 team alumni came back to mentor 342, and 20+ others have mentored FIRST Teams throughout SC, including FRC Teams 3196, 4451, 4171, sharing their knowledge and inspiring other students to take our message farther.

Our team has been a crucial part in the growth of FIRST in the Lowcountry, by working with Bosch and other local manufacturers. In 2010 during the Chairman's interview at the World Championships, our students were asked why one team represented 13 different schools – there was no good answer. On the drive home the students began planning how to “take the message further”. Since then, 342 has contributed to the formation of 9 FIRST FRC teams covering all 3 area school districts and home schooled students. Even today, 342 assists these teams by providing mentoring, training, supplies and funding support and helping troubleshoot. Team 342 became actively involved with the Palmetto Partners in moving the SC Palmetto Regional location to Charleston and supported its move to Myrtle Beach. We remain involved with the planning committee to make a successful event each year. Both teams' members and mentors collaborate and share knowledge; showing younger FIRST teams gracious professionalism in action at the event each year. Team 342 also focuses our attention on supporting teams at competitions in the spirit of cooptition and gracious professionalism by helping repair robots, giving parts, lending tools, and aiding in strategy.

We are actively involved with 6 FLL teams. Our team members attend the work sessions and mentor the young FLL students weekly, helping them develop their critical thinking through the research, design, and build aspects of their program, teaching them the core values of Gracious Professionalism and Co-optition. Many of our team members have come from these FLL teams. We plant the seeds for future involvement in FRC and success in STEM.

342 promotes awareness and the importance of STEM and FIRST throughout the community at every opportunity. Burnie, the team robot, is a regular at professional events like the Lowcountry Manufacturing Council's annual dinner, Charleston STEM Fest, Barcamp CHS and Dig South. This allows us to promote the message of FIRST to students, businesses, and the

community. We want to inspire local business leaders to become engaged with local teams. In the community, 342 volunteers in 10+ local events yearly, taking Burnie to the Walk for Autism, Water Missions International, Earth Day, and others. When not in competition, 342 team members spend more than 150 hours per student helping local organizations.

One of our greatest accomplishments is our work with our sponsors to establish a “Bosch Academy” at Fort Dorchester High School (FDHS). In September 2013, 342 met with the FDHS principal and the district planning committee to prepare a 4,000 sq. ft. open space in the school’s engineering wing for our robotics activities and fully integrate into the school’s STEM program and FDHS engineering curriculum; the initial steps for a Youth Apprenticeship program with Bosch Charleston. Two of our students were the first in the Bosch program. Initially the team moved materials and equipment to the room for use in training. Now we have a complete machining center, programming work stations, computer lab for business and support teams, an assembly area, and even an area for a practice field. By working at the school site, FRC and FIRST is becoming an integral part of the daily school life. We have an “open door” policy, inspiring more students to take part.

Bosch and DD2 see the value in having this Academy on site and transforming it into a well-developed “STEM Room”; helping to promote science and technology in the school and district. 342 is working to “take it further” with Bosch, DD2, and Trident Technical College (TTC) by helping form introductory machining and technical classes which will be conducted in our team’s facility. Classes will hopefully begin later this year; taught by Bosch and TTC instructors, with support/involvement of our team. This will be the ideal “Bosch Academy” at FDHS. This accelerates the process to train our future workforce. Our sponsor Phillips Industrial Services Corp. recently add chemical-resistant industrial-grade flooring, and Bosch has

professionally installed machining equipment to complete the room. This commitment from industry and school has helped promote STEM and has already become an attractive prospect to other schools in the district. Team 342 is assisting Team 3489 and will help others to spread the “STEM Room” concept across the Lowcountry. The target is to start one where each of the Lowcountry FIRST teams are.

In 2009, 342 established the concept of Summer PyGames, a programming competition to develop open-source educational games for elementary schools; but unfortunately it dissolved in 2012. The games were run on the XO laptops, a rugged, low-cost, and low-powered computer. The Palmetto Project, a non-profit founded by Phil Noble, distributed nearly 3000 XO laptops in a “One Laptop per Child program. Team 342 looked for a use of these computers, and a creative program to replace the Summer PyGames. We decided again to “take the message further” – this time globally. This is where Team 342 expanded STEM to Port Victoria, Kenya as part of the World Class Scholar initiative, aided by Envision SC. Through our link with the US Peace Corps there, Team 342 sent 3 XO laptops with educational games developed in the Summer PyGames as a pilot project in 2013. The laptops had a positive impact with their local school. Team 342 sent 10 additional computers, monitors, and other hardware later that year, organizing help of the international transportation company, Panalpina. Working together with their community leaders and the Peace Corp volunteer, we assisted in forming a community computer lab for adults and students in this small village. Due to the high demand, more XO laptops and computer hardware were sent in summer 2013, and Team 342, together with DD2 schools, set up a mobile classroom with four elementary schools in Port Victoria. These young international, under privileged students receive STEM lessons through the laptops, but more importantly exchange experiences with Lowcountry students about their culture and life. On days that classes use the computers,

attendance skyrockets! Children in Port Victoria have obstacles in their education, like poor educational infrastructure and the need for them to work to provide for their families. By sending these computers, Team 342 is increasing these students' desire to learn and go to school.

In February 2014, the first interaction occurred when representatives from 342 and DD2 communicated with Port Victoria high schoolers through video call helped by FLL Team 13275, asking and answering questions about life and education. The program now has expanded through Envision SC into more than 8 countries and 12 schools in SC. Although not involved in all of the expansions, we provide support to the local schools as the program advances further. In FDHS, there have been classes partnered with Kenya, Spain, Jamaica, and Romania. These classes call one another periodically using the VGo Robot, a drivable robot with a camera and screen. It is our plan to continue to help expand this program to more classes and schools with a 3 year plan, using FIRST FLL and FRC robotics in order to "Take the Message Further!"

We have learned from our FIRST experience of the value to give back what we have learned. From the Chairman's interview question in 2010 of why we were one team with 13 schools to today, where we work on the local advancement and support of the STEM initiative and FIRST activities to our global commitment to help students less fortunate, we have made good progress, but it's not enough. We know the needs of our community to build the future workforce, with emphasis on STEM Careers and the responsibility of all to ensure our world is ready for what the future brings. This is where Team 342 remains focused and will be successful in "Taking the message further".