

## Chairman's Award - Team 2137

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2018 - Team 2137

### Team Number

2137

### Team Name, Corporate/University Sponsors

FCA Foundation/ARC Investment of Auburn Hills/Oxford High School Career Technical Education/CEC Controls Company/Oakland University - School of Engineering and Computer Science/SMC Corporation/Kettering University/Oakland Orthopaedic Surgeons/Casemer Tool/CAMS CNC Software/Dessault Systems (Solidworks)/Village Tees/Michigan Department of Education/Stage 3 Productions/Quality Fastener and Supply/Pillar Design&Oxford High School

### Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2017/2018 year and the preceding two to five years

TORC helps students gain different sets of skills from engineering and fabrication to business and leadership skills. Students gain self-confidence by training in the shop and are assisted in resume writing and interviewing skills. Our Alumni to date have earned \$1M+ in scholarships and 94.4% of TORC alumni went into STEM degrees. Three student alumni have started their own businesses.

### Describe the impact of the *FIRST* program on your community with special emphasis on the 2017/2018 year and the preceding two to five years

TORC impacts our community through education and charity events. We worked with our district to create the OHS Academy of Engineering and Technology which implemented 15 STEM courses and 3 middle school pre-engineering courses. Our most impactful event to date is coordinating a water drive for Flint during the lead crisis. As a team we are always learning the importance of serving our community and in doing so, we are able to carry what we learn forward to impact the future of our world.

### Team's innovative or creative method to spread the *FIRST* message

TORC spreads the message of *FIRST* by inspiring others to join the community in the appreciation of STEM. We participated in the MI state PLTW/STEM, and Gov. Snyder's Call to Action STEM Seminar. We coordinated a Flint water drive with 4 other schools, 8 FRC teams, and our local fire department. We have introduced local elementary students to *FIRST* through robot parties. We spread the message of *FIRST* with our team trailer which features pictures of our robots and team sponsor logos.

### Describe examples of how your team members act as role models and inspire other *FIRST* team members to emulate

As a veteran team, TORC acts as a role model through how we interact and assist other teams on and off the field. We share the mature practices such as our 5 level machine certification system and our developed process of collecting scouting data. We lead by example by helping other teams learn to solve problems through SWAT and direct team to team cooperation.

**Describe the team's initiatives to help start or form other FRC teams**

TORC inspires educators, government officials and businesses to help form FRC teams. TORC made a proposal to Senator Marleau and State Rep. Jacobsen seeking funds for FRC teams bringing Michigan Department of Education Grants in 2014. As a result, 50 new teams were formed. TORC also gives assistance to teams in other school districts by providing published resources, hosting a Week 0 event with open machine shop services and supplies, and by providing sponsorship guidance.

**Describe the team's initiatives to help start or form other *FIRST* teams (including Jr.FLL, FLL, & FTC)**

TORC established the Oxford *FIRST* Family, ensuring *FIRST* opportunities in all 7 of our schools. We donate funds annually to teams, help them secure sponsors, build FLL practice tables, provide NXT kits, laptops, and access to machinery. We recruit and train adult mentors for FLL, Jr.FLL, and FTC teams as well as recruit team members by giving engineering workshops to 6th- 8th graders and robot demos to pre-K - 5th graders. To date we helped start and mentor 24 FLL, 7 Jr.FLL, and 3 FTC teams.

**Describe the team's initiatives on assisting other *FIRST* teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the *FIRST* program**

TORC members serve as mentors and judges for FLL, Jr.FLL, and FTC teams and events. TORC volunteered at 2 Jr.FLL events and hosted 1 FLL and 2 Jr.FLL events. TORC established a feeder system for *FIRST* in our district and secured donation of 1500 sq. ft. of retail space dedicated to *FIRST*. TORC has guided all Oxford Jr.FLL and FLL teams to follow *FIRST* registration guidelines. We also provide 3 FTC teams access to our facility.

**Describe how your team works with other *FIRST* teams to serve as mentors to younger or less experienced *FIRST* teams (includes Jr.FLL, FLL, FTC, & FRC teams)**

Our mentorship includes on-site assistance, online postings, materials, knowledge and role models. Students/alumni mentor *FIRST* teams and help access sponsorship opportunities. Since TORC's assistance has been implemented in our district Jr.FLL and FLL teams have quadrupled and FTC teams have tripled. By partnering with other *FIRST* teams we assisted FRC 3536 at 2 FTC events and FRC 217 at 1 FLL event by supplying volunteers. We worked with FTC 5291 to mentor Jr.FLL and FLL teams.

**Describe your Corporate/University Sponsors**

TORC's Sponsors are individuals and organizations who have partnered with us to reach the goal of achieving the *FIRST* mission. They assist us with funds, materials, and services. More importantly, they extend to us their name and reputation. We have 86 sponsorship sources from 2013-current: Auto/Tech \$67,628+ School District \$39,800+ Foreign \$6,000+ University \$15,000+ Small Businesses/Retail \$16,800+ Government \$47,352+ Alumni/Family \$8,435+

**Describe the strength of your partnership with your sponsors with special emphasis on the 2017/2018 year and the preceding two to five years**

TORC and its sponsors have a strong partnership. Our sponsors have supplied support for 5+ years, provided 11 student recognition awards, awarded 12 scholarships, supplied 18 internships, and painted 4 TORC robots. In return TORC hosted 5 sponsor appreciation BBQ's, created the team newsletter "IMPACT" to provide regular updates, provided tours of our facility and robot demo's, toured sponsor facilities, and supported sponsor events.

**Describe how your team would explain what *FIRST* is to someone who has never heard of it**

*FIRST* is hard fun that exposes students to future possibilities. *FIRST* gives students confidence and the ability to set and achieve long-term goals, fosters a positive environment that promotes STEM and intellectual growth, helps students gain an understanding of the application of STEM concepts, builds a network that opens options to internships and career opportunities, nurtures meaningful relationships, encourages students to engage with their community and inspires creative problem solving.

**Briefly describe other matters of interest to the *FIRST* judges, if any**

On TORC every interested student is given an equal opportunity to participate regardless of their background. We have involvement from students who are enrolled in traditional, virtual, homeschool, international and special education. Our students go through an application, resume, and interview process to develop soft skills. To develop technical skills, we have implemented a machine certification program to ensure safety of our students.

**Team Captain/Student Representative that has double-checked this submission.**

Mackenzie Funke

## Essay

TORC brings our students, mentors, community, and competitors together to inspire future leaders, innovators, and problem solvers. We are changing the culture from a robot-focused group to a team that celebrates science, technology, engineering, art, and math. Since 2007, we have grown from a team of 5 students and 1 mentor to a team of 42 students and 29 mentors. In a continuous cycle of learning and problem solving we as individuals and as a team are able to transform the future of the world.

To start that cycle we first focus on providing our students with needed knowledge and tools. In TORC, we have created a student-led environment that encourages the learning and development of critical skills and concepts. We encourage student involvement in technical areas regardless of their level of experience. Students are able to engage in programming by learning Java and LabVIEW. In fabrication and CAD, they become familiar with machinery such as TIG welders and lathes. Not only do members learn technical skills but they also learn key soft skills. Students are given opportunities to develop written, media and oral presentation skills by creating our team newsletter, brochures, and videos. Our students benefit from the skills they learn which aid them in obtaining scholarships and sponsorships. With these experiences, our members are able to become strong communicators and leaders.

Like the real world, our leaders go through an application and interview process. Our mentors are comprised of engineers, teachers, and professionals from our community. They select captains who lead the team in robot design/build and communication/logistics subgroups. This approach allows us to execute student-driven projects. Mentors and student captains aim to ensure adherence to timelines, engineering processes and facilitate group meetings. To sustain leadership throughout the years, captains mentor the assistant captains. Since 2013, TORC has developed 69 student leaders. Through these hands-on experiences, our innovators and problem solvers gain abilities which inspire them to become leaders. Using these skills, TORC students gain self-confidence to become leaders and are inspired to spread the message of FIRST.

In our efforts to spread the message of FIRST, we have given special attention to working with state and federal legislature. In 2013, TORC was invited to speak at Gov. Rick Snyder's Call to Action STEM Seminar and the Michigan State PLTW/STEM Conference, giving us the opportunity to inspire hundreds of educators at all levels to encourage STEM curriculum in schools. In 2016, a TORC student attended the National Advocacy Conference in Washington, DC. Students from across the country met with congressmen and senators to explore passing a bill that would promote funding for STEM education and in particular Every Student Succeeds Act (ESSA). Prior to student lobbying the ESSA was funded at approximately \$800 million, currently, the bill has an approved funding rate of \$2.1 billion.

TORC engages with students, sponsors, charities, businesses and our community to help the world. Through volunteer service, we contribute to as many as 108 humanitarian efforts, like bowling for Cystic Fibrosis and the Susan G. Komen Walk for a Cure. We've broadened our impact globally by gathering glasses and hearing aids for India, collecting thousands of pill bottles to be sent throughout Africa for safe medication distribution, and filling hundreds of shoeboxes through Samaritan's Purse to be distributed to kids in need across the globe.

Closer to home, we recognized the water crisis affecting Flint, MI and initiated a community water drive in 2016. Utilizing multiple media outlets to rally other FIRST teams, our community, sponsors and businesses, we were able to procure over 3,100 gallons of water. Eight FIRST teams and community volunteers met at Kettering University and traveled to Foss Avenue Food Bank for distribution. Our efforts enabled Flint residents to safely shower and cook during this crisis. In addition to our global humanitarian efforts, we worked with our school district to expand the learning experiences and interest in STEM. We have reached over 4,000 students, Pre-K to 8th grade, by offering robot demonstrations, workshops, and engineering classes. Over the past six years, our efforts have led Oxford schools to implement 3 pre-engineering classes at the middle school and 15 STEM-related courses at the high school. TORC's determination has motivated Oxford schools to build facilities and invest in new curriculum providing more than 1,800 students a year with additional STEM courses. The areas of skilled trades blended with STEM offer students career opportunities that were not present before.

We believe it is also important to have good relationships with our sponsors. To show our sponsors how they help us we host sponsor appreciation luncheons where our students provide a presentation and robot demonstration. Nine TORC students have benefited from these relationships by earning internships with our sponsors. For example, a third-year TORC student interned at Kawasaki Robotics and a fourth-year student interned at Valeo. Valeo had visited TORC at one of our competitions and had recognized the value in our machine certification system. The student that created the system subsequently interned at Valeo and implemented a modified version of the system in their facility.

In 2014, as entrepreneurs, we helped jump-start a STEM focused business, Brick It Up, in our community. TORC met with Brick It Up, a LEGO® based educational facility and Kettering University to create a curriculum that TORC members continue to enhance. Classes are held at Brick It Up and at schools. As a result, Brick It Up has hired 4 members who have introduced more than 3,000 students to robotics, engineering, and animation-based programs. By combining STEM related activities and service, we strive to bring awareness and opportunity to the community around us by strengthening current relationships and building new ones.

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Founded by TORC, the Oxford FIRST Family is used as a feeder system to further develop bonds with our Jr.FLL, FLL, and FTC teams. These bonds allow us to inspire a lasting interest for STEM to facilitate and sustain FIRST in our district. To cover the cost of starting and operating numerous new teams, TORC applied for grants ensuring every student interested has a place on a team regardless of financial background or prior experience. With the quadrupling of Jr.FLL/FLL teams and the tripling of FTC teams, FIRST is now represented in all 7 of our district schools. In light of this growth, we recognized the need for new space and secured 1,500 sq. ft. of local retail space for the FIRST Oxford Robotics Center (FORC). One of only two official FIRST centers in Michigan, FORC is stocked with practice tables, computers and access to LEGOs? for all the schools. This space, along with TORC student assistance, ensures sustainability and allows for continued growth of FIRST our district and community.

Being a part of FIRST, TORC members have been able to continuously help not only the teams in our district but other veteran and rookie FRC teams. We've been able to create relationships with other teams by dedicating countless hours to assist in the formation and growth of rookie and veteran teams. During build season, TORC has helped many teams with the fabrication of robot components, refinement of programming, and donation of supplies. We assist teams at competitions; enabling them to compete year after year by helping pass inspection, resolving pre-match coding bugs and more. We also assist newer teams with match planning, scouting strategy as well as alliance selections. TORC has put an emphasis on mentoring young teams such as 5155, committing Sundays and many hours to help with programming and electrical issues during their early years. We also aided the rookie Team 6136 by building a climber for their robot which they were able to compete with at the week 1 Southfield event last season. Since 2013, we host an annual Week Zero practice event. We provide each team a pit to work from, access to our machine shop, supplies, and a practice field set up for testing and mock matches. Since the start of this event, we've helped 10 rookie teams complete their robot. TORC supports other teams year round on the field and off the field. Last year one of our student captains was accepted into the FIRST RITO program (Robots in the Outback) traveling across the Outback, sharing their experience and spreading the message of FIRST. The students in these remote communities will benefit from a new vision of future possibilities and a desire to learn, stimulating opportunities for educational growth. The mentors will grow from within, expanding their own knowledge, creativity, and innovation along the way.

We believe FIRST doesn't just change and grow minds, but entire communities when they realize the value of student experiences. TORC works with FIRST by offering an intricate connection to the fields of science, technology, engineering, art, and math. We are a team, a family, a community and WE BUILD more than robots. We transform the future.