

## Chairman's Award - Team 2557

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2018 - Team 2557

### Team Number

2557

### Team Name, Corporate/University Sponsors

Boeing/OSPI/Tacoma School District/F5 Networks, Inc/Amazon/Zumar Industries Incorporated/Blue Origin/Hewitt Cabinets & Interiors/Intellectual Ventures/Elements of Education Partners/Marco Heidner foundation/FIRST Washington/Multicare/Microsoft/Aluminumand Bronze Fabricators/Pierce Aluminum Company/Northwest Pipe and Steel/Lakewood Rotary Club & Science and Math Institute & Industrial Design Engineering and Art High School & Tacoma School of the Arts

### 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

As SOTAbots, we believe that a team thrives when everyone works together. Current members learn technical workshop skills, entrepreneurship, computer programming, collaboration, perseverance, and effective leadership. Our students graduate as proactive, independent, and charismatic leaders; 88% of our alumni over the last 3 years are studying STEAM in the pursuit of employment in related fields.

### 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

The SOTAbots showcase our team and FIRST programs in our community. Outreach includes Tacoma School Board meetings, LeMay Car Museum events, our school retreats, Back-to-School Nights, middle school College & Career Nights, and Tacoma Rainiers STEM Night. We facilitate events including Camp Amazon, the Children's Museum Gingerbread Jamboree and the Tacoma Highland Games. We also have brought dinners to TreeHouse Family Housing at Mary Bridge Children's Hospital and refurbished their playground.

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

The SOTAbots culture of STEAM (Science, Technology, Engineering, Arts, and Math) drives us to bring FIRST Robotics into our community. We run hands-on innovative activities in school classrooms, robot drawing, building, and driving stations at the LeMay Car Museum, and creative programming puzzles at summer camp. Integrating critical thinking skills and hands-on creative activities helps youth gain a passion for STEAM.

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

Throughout our history, the SOTAbots actions show that competing fairly and supporting other teams is a strength and not a weakness. These qualities ripple outward from our team as we engage other teams in Coopertition, bringing extra materials and supporting our alliances. We also model Gracious Professionalism, by volunteering over 1,500 hours each year at FIRST events at every level since 2014.

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

The SOTAbots currently connected 14 FRC teams through the Tacoma Robotics Alliance (TRA). In addition to a practice field that we build every season, mentors and members across the TRA collaborate to help all the teams learn, grow, and have an enriching FIRST experience. Our team has assisted and helped mentor FRC teams 2555, 2929, 3393, 3576, 3781, 3826, and 4918 as they got started and found their footing in the FIRST program.

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

We present FIRST in Tacoma classrooms, inspiring teachers to start FIRST teams. The SOTAbots has helped start teams including: 4 FTC teams at SAMi and SOTA in 2009 3 FTC teams at Mason and Stewart middle schools and Charles Wright Academy in 2012 5 FLL teams at Washington and Grant elementary schools in 2016 1 FTC team at Jason Lee Middle School in 2017 2 FLL Jr. teams at The Goddard School Redmond 2 in 2017 We are also laying foundation for 6 FLL teams at Sherman Elementary to compete in 2018

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

The SOTAbots assist FIRST teams through the Tacoma Robotics Alliance (TRA), an open alliance for FIRST teams to share ideas, tools, space, and mentors. We mentor FLL Jr., FLL and FTC teams, run the FTC Salk and Watt League events, as well as run an annual FRC Workshop. By assisting FLL Jr. and FLL teams, we cultivating future FTC and FRC members. We are present in all levels of FIRST in the Washington area, creating a pipeline for students to progress through the FIRST program.

**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)**

We've started and sustained 4 FTC teams at SOTA and SAMI, sparking a passion for STEAM and FIRST in students outside the SOTAbots. We are also assisting two Pre-K FLL Jr. teams at The Goddard School Redmond 2 for their first season this year. Our mentors also serve as valuable resources to other FIRST mentors in the area, giving advice to emerging FRC teams and guiding them on how to navigate FIRST, especially in the early years.

**Describe your Corporate/University Sponsors**

Our 25 sponsors are invaluable assets to our team; they provide monetary support, raw materials, and mentors. We are fiscally sponsored by grants from Washington's Office of Superintendent of Public Instruction and organizations featuring Boeing, and Amazon, and Intellectual Ventures. We received material donations from companies including MultiCare, Tacoma Public Schools, Zumar, and Blue Origin. We are supported by mentors from Green River College, University of Puget Sound, F5, and Microsoft.

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

We are grateful for the diverse array of resources and knowledge our sponsors provide. Our mentors come from many different professions, supporting us not only in building a robot, but also in programming, business, and design. Our sponsors make the SOTAbots a successful team that provides team members with a project-based learning environment incorporating a wide variety of real-world skills. We proactively connect with our sponsors via email, social media and invitations to competitions.

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

FIRST is an organization that encourages teamwork and leadership through project-based learning. It was created to inspire students to pursue science and technology careers. While FIRST is a robotics-based organization, it is about more than the robots. Students on FIRST teams can learn business and technical skills, create digital media, and program apps. FIRST focusing on positively impacting students and communities, by promoting STEM (Science, Technology, Engineering, and Math) worldwide.

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

SOTAbots members are encouraged to turn their STEAM ideas for innovative projects into reality, often in unexpected arenas. These projects include a collaborative scouting alliance, research on gender demographics in FRC, and a robotic feeder for the elephants at the Point Defiance Zoo. In 2016, a member contacted AbrePuertas, a community center in Coya, Peru. We started a robotics program there, introducing STEM to a village with few other opportunities to explore technology.

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

Addie Bjornson

## Essay

### I. The SOTAbots Mission: "Ready Player Two"

We are FRC Team 2557, the SOTAbots, and our quest is to "Ready Player Two." Our team members are "Player One," skilled in robot fabrication, computer science, entrepreneurship, innovation, collaboration, and leadership. In turn, we share our passion for STEAM (Science, Technology, Engineering, Arts, and Math) with "Player Two," the youth of the Tacoma and beyond. We spark a passion for STEAM in young people, inspiring them to pursue these fields when they grow up and become the next generation of "Player One." Our mission is to develop the youth of today into STEAM leaders of tomorrow.

#### Team Dynamic

The SOTAbots has been a team of diverse leaders and learners since its founding in 2007. We began at the Tacoma School of the Arts (SOTA), a non-traditional, arts-based public school in Tacoma, WA. Our initial members and mentors believed that art and creativity are crucial components of successful innovation and engineering, a mindset we continue to have today. The team has since expanded to include students and mentors from the Science and Math Institute (SAMi) and the school of Industrial Design, Engineering, and Art (iDEA), resulting in a vibrant and multifaceted team.

Students on the SOTAbots are trained with our well-established Jedi/Padawan mentorship program that reflects our "Player One/Player Two" methodology. Inspired by the sci-fi franchise Star Wars, Jedis are the role-models of the team, teaching their Padawans technical skills as well as maturity, confidence, and leadership. By training and wholly embracing all of our team members, we work to create an innovative, sustainable, and growing team.

### II. Ready the Teams!

#### Tacoma Robotics Alliance

Co-founded by the SOTAbots in 2009, the Tacoma Robotics Alliance (TRA) is an open alliance for FIRST teams to share ideas, tools, space, and mentors. The TRA currently connects 14 FRC teams, 4 FTC teams, 2 FLL teams, and 2 FLL Jr. teams, promoting camaraderie and friendship between teams outside of competition.

In the TRA, we run an FRC Workshop, preparing teams for the next robotics season. A total of 20 FRC teams attended our 5th annual workshop in November 2017, where 37 classes were taught by SOTAbots members, mentors, FIRST staff, and other FIRST teams. There were many introductory and advanced classes, providing a valuable learning opportunity for both Player One and Player Two attendees.

In addition, we construct and run an up-to-spec practice field to support TRA teams. We have provided this resource every season since 2009. Teams from across Washington travel to the field to test their autonomous programs and driving strategies for competition. Finding space for a field has always been a struggle; for the past four years the SOTAbots has been forced to relocate our workspace and field every year. This year, we worked with FRC Team 360 to secure a location so local teams have a field to practice driving their robot.

#### Involvement with FIRST Teams and Competitions

SOTAbots mentor other teams to grow the FIRST program and help students learn and thrive. This year, we started an FTC team at Jason Lee Middle School, where there are no other resources for extracurricular STEM activities. Team 13707, the Jason Lee Botcats, advanced to the League competition this year. We have laid groundwork for the Botcats to have mentoring and funding to compete next season. We are also assisting two Pre-K FLL Jr. teams with a SOTAbots alumna at The Goddard School Redmond 2.

The SOTAbots show our dedication to FIRST by being Event Managers for the FTC Watt League and FTC Salk Interleague events since 2014. We love this opportunity to connect and reconnect with local teams and support them in their first weeks of competitions. Furthermore, the SOTAbots are a reliable volunteering resource at FRC events in competition season and at Peak Performance and Girls Gen. For the past five years, team members have assisted at every competition we have attended, often setting up fields and taking them down. We come prepared with extra materials and tools in case other teams need them, often sharing scouts and scouting data with teams. This year we are developing a collaborative scouting system so the teams involved work smarter, not harder, to gather scouting data at competitions. The volunteering culture on the SOTAbots is strong because we value creating a better FIRST experience for all participants.

#### Girls FIRST Initiative - Gender Demographic Research

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The SOTAbots are dedicated to increasing female participation in the FRC community. Last season, we started a research project with the Girls FIRST Initiative to collect, analyze, and share information about the gender demographics of the FRC Pacific Northwest District. The purpose of this project is to document the gender demographics of participants in FRC and promote discussion about strategies to engage more girls and women. A total of 56 FRC teams participated in the 2017 survey, and hundreds of people attended workshops on the research findings in Tacoma, WA, Auburn, WA, Portland, OR, and Houston, TX. A blog detailing the research findings was published on a national, peer-reviewed website called FIRST Ladies ([ladiesinfirst.com/blog/archives/09-2017](http://ladiesinfirst.com/blog/archives/09-2017)) in September 2017, and on the SOTAbots website ([sotabots.com/girls-in-first](http://sotabots.com/girls-in-first)). The project also inspired a similar study of the gender demographics of FRC teams in Ontario, Canada. This year, 68 teams participated in the study, and more workshops on the findings will be run at competitions throughout the season.

### III. Ready the Community!

#### Connecting with the School District and Government

We are vocal about FIRST programs to representatives in the Tacoma School District and state government, conveying the positive impact of FIRST and the necessity for administrative support. We promote FIRST at several Tacoma Public Schools events every year; for example, this year we presented at school board meetings, Next Move Luncheons, and an open house of SAMi's new Environmental Learning Center. We also communicate with our government representatives, have rallied in Olympia with other FIRST teams, and talk with our legislators about FIRST and the importance of the OSPI grant that strengthens many teams. Governor Jay Inslee and Representative Laurie Jenkins have toured our shop, seeing firsthand the higher education and workforce preparation platform that the SOTAbots and FIRST provide students.

#### Our Busy Summer

The SOTAbots are inspiring interest in FIRST and STEAM throughout our broader community. Last summer, we turned a Tacoma Rainiers baseball game into a vibrant night of STEM. Many baseball fans quickly became robotics fans, pitching questions to our members about our robots, our FIRST experience, and how to get involved. We also partnered to implement Camp Amazon, the first summer camp in the Amazon fulfillment center in DuPont, WA. We introduced 90 campers to robotics at the FLL level at Amazon's impressive robot-integrated warehouse. Additionally, we formed a new connection with the Proctor Farmers' Market in Tacoma. On many summer weekends we teach children how to drive Lego Mindstorm robots and demo our FRC competition robot. Our team members love to engage kids in robotics activities and pique their interest in STEAM and FIRST.

#### Sustained Community Partnerships

The SOTAbots are proud of our sustained partnership with several Tacoma organizations. One such partnership started in 2016 with the Tacoma Children's Museum, where we introduce robotics to many young kids every month. We also visit the museum's preschool, supporting their early childhood education program, teaching kids about the basic functions of the robots, and forming valuable relationships. At the LeMay Car Museum, we have regularly showcased our robots and facilitated engineering activities since 2016. Additionally, SOTAbots members have visited Mary Bridge Children's Hospital every other week since 2013, bringing safe, small robots for bedridden patients and their siblings who are waiting in the playroom. Our team members exercise empathy and optimism, providing a welcome distraction from challenges that the children and their families face.

#### Teaching Students in the Tacoma School District

We are committed to connecting underprivileged youth with robotics and STEAM. Many Tacoma families are low-income, with 58% of students qualifying for free-and-reduced lunch. We visit scores of elementary and middle schools throughout the district, teaching engineering concepts and leading hands-on activities. Our lessons focus on the importance of STEAM, fostering students' creative thinking, persistence, and collaboration skills. Last January we visited 40 classrooms and science fairs, and this year we visited 21 more. In the summer, the SOTAbots have led camps at Tacoma Public School's 6-week summer Xplore program. Students in 3rd-8th grade learn about STEAM and are provided breakfast, lunch, and snacks. At Xplore, SOTAbots members and alumni have taught over 3,000 students how to use Lego Mindstorm programs to direct robots through different challenges. This year, SOTAbots members also led an Xplore boat-making camp, teaching students technical workshop skills to build functional wooden boats. Both camps trained students to innovate, collaborate, and persevere in order to accomplish a goal, equipping them with skills to be successful in school.

### IV. Conclusion: Ready "Player Two"

We are the SOTAbots, and we are cultivating the next generation of thinkers, workers, and leaders. We are sharing our passion for STEAM with thousands of youth and promoting FIRST programs to teachers, businesspeople, government officials, and community members. We are readying the "Player Twos" of today to become the "Player Ones" of tomorrow, fulfilling the SOTAbots legacy of STEAM innovation and leadership.