

Chairman's Award - Team 1622

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2016 - Team 1622

Team Number

1622

Team Name, Corporate/University Sponsors

Evolution Controls Inc. / Qualcomm / ViaSat / Abbott Fund / Cubic / PTC / Palomar Technologies / BAE Systems / General Atomics Aeronautical Systems Inc. / The Todd and Mari Gutschow Family Foundation / Northrop Grumman / NDEP / INCOSE / Raytheon Integrated Defense Systems / TechFlow / JINX / Cymer / SAIC / Mark Owensby of the San Diego Robotics Club / IMS Electronics Recycling / Sullivan Solar Power / City of Poway / Performance Titanium Group / Malgorzata Couture & Poway High

Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2015/2016 year and the preceding two to five years

The reason that Team Spyder is now home to over 60 students is the influence provided by FIRST programs. Our members strive to seek the opportunities provided by FIRST's scholarships, and because of FIRST's influence, all of our members have either pursued college or military service. Through FIRST, Spydery get business and entrepreneurial experience, team values like cooperation and leadership, and real-world understanding of everyday problem-solving.

Describe the impact of the *FIRST* program on your community with special emphasis on the 2015/2016 year and the preceding two to five years

Because of our efforts to infuse the values of FIRST in our community, we've been able to spread the message of STEM through countless events like elementary school science fairs, parades, maker faires, STEM conventions, company demos, and even our own FLL regional open to the greater San Diego area. The Spyder brand has had personal connections with people from Poway to Switzerland, and with it comes an understanding and appreciation of the fundamental values of both FIRST and STEM as a whole.

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

Team Spyder is always working to spread the FIRST message in unique and effective ways. We do so through our Twitter and Youtube accounts, our television appearances, our efforts to organize a robotics badge for the local Boy Scouts, and of course, the thousands of hours that we invest in events. We've gone to 22 events in the last year, from parades to libraries to museums to STEM conferences, and since our inception, we've spread our passion of FIRST to millions.

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

The mentorships we offer, the competitions we run, and the work we do in our community are all sources of pride for us as a team, but the field that we're probably known as role models the most in is safety. In our machine shop, we work to be safe, whether by referencing Material Safety Data Sheets, or just by putting on safety glasses. This year, we are 100% CPR/AED and First Aid certified--we've even run workshops on safety, and we're currently developing a safety app to spread our example.

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

In 2005, our team was the only FIRST program in our district. But over the last 11 years, we've worked hard to pave the way for all the robotics programs we can. We've donated a lot of our machines and our equipment, led safety and fundraising workshops, and personally advised almost every team that's emerged in the area. In fact, we've inspired and helped every school not just in our district, but in the neighboring district as well to create an FRC program.

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

Similarly to FRC teams, when we started our program in 2005, there were no Jr.FLL, FLL, or FTC programs in our district. However, over the years, our demonstrations for elementary schools, middle schools, and the community at large have resulted in the formation of 11 Jr.FLL, FLL, and FTC teams, as well as 7 VEX teams. We have personally advised many of these start-ups, and we believe that our dedication to STEM at all levels has truly shown.

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

One of the largest events we organize is specifically intended to help the younger robotics programs of our community: an annual FLL regional. Combined with our annual VEX regional, these competitions saw around 580 students this year! In addition, we've frequently given aid to Meadowbrook's Engineering classes, and we've donated equipment to FRC teams like 2658 Team Pedestrian, 2235 Metal Heads, 3341 Manhattan Project, and 3749 Team Optix.

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 consider mentorship the best avenue to spark an inspiration for STEM; that's why we mentor all seven local middle schools' VEX teams, and another five FLL teams. Every member of Team Spyder has put in the time to mentor or to otherwise assist at least one VEX or FLL team, and with a team 60 members strong, this dedication really makes a difference!

Describe your Corporate/University Sponsors

To operate year to year, travel and register for *FIRST* events, and maintain and update our own machine shop, Team Spyder raises around \$60,000 per year. About half of this \$60,000 comes from local and national companies that are generous enough to sponsor us. Team Spyder is especially proud to work with its business partners like Cubic, Northrop Grumman, Qualcomm, and Teradata. Our sponsors provide us with the resources we need to operate on a yearly basis, and we couldn't do it without them.

Describe the strength of your partnership with your sponsors with special emphasis on the 2015/2016 year and the preceding two to five years

To pursue personal relationships with our business partners, we typically travel to and present our robot at the companies that sponsor us, but our relationship doesn't end there. Companies generally offer us materials, entrepreneurial experience, and sometimes even internships. In addition, we always invite them to serve as our mentors and we participate at some public events through these sponsors, like Lockheed Martin and Northrop Grumman's Women in Engineering Days.

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

FIRST is a program that offers opportunities in robotics and STEM to children of all ages by organizing robotics competitions including Jr. FLL, FLL, FTC, and FRC. But, (at least for Team Spyder) it's a lot more than that. It's a way for elementary, middle, and high school students to engage in a hands-on challenge, learning countless real-world values like teamwork, leadership, determination, dedication, competition, and cooperation, with plenty of friends to be made along the way.

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

One of the single largest efforts Team Spyder has made has been in working to create an entire Engineering Pathway at our school. This comprehensive series of courses has everything from Architectural Design to Computer Integrated Manufacturing, and officially became an Academy last school year. Now, any student at Poway High can enroll for all four years of high school, immersed in what we consider a more hands-on, practical, and rewarding topic of study than any other offered here.

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

Reid Johnson

Essay

"The secret of change is to focus all of your energy, not on fighting the old, but on building the new." -Socrates

Eleven years ago, seven ordinary students came together at Poway High to build something entirely new. With a goal of improving their world, a commitment to the values of STEM, and a hand-drawn Spyder logo, these students would go on to do the impossible. Today, their logo can be found at events all over the country, broadcasting the impassioned spirit and indomitable values of Team Spyder. This eight-legged emblem is the embodiment of everything *FIRST* stands for: an outlet for kids to channel their creative energy, a hands-on educational opportunity for children of all ages, and a unique way for mentors and students alike to change their world. To uphold these values over the last five years, Team Spyder has conducted over 12,000 hours of outreach, mentored and assisted over 100 younger teams, and even built an entire Engineering Academy within our school. Thanks to our efforts, a lot about our club and our community has changed over the years, but in essence, we still strive, quite simply, to make a difference.

This difference is what drives us to work every year on building new leaders within our team. In the fall season, we offer our rookie Spyderlings tutorials on the knowledge and values of STEM, feedback from veterans on their progress, and one-on-one experience with professionals. Veterans and their protégés together go through the experience of VEX Robotics to put their training to the test. They spend at least five hours a week designing, building, programming, and

documenting their way to a fully functional robot. And finally, with a solid foundation in robotics, these students are ready to divide and conquer to take on their biggest challenge yet: FIRST Robotics Competition.

Based on their VEX experiences, students are free to follow their passions in the Chairman's, Electrical, Entrepreneurship, Mechanical, Political Action, Programming, Safety, Spirit, Strategy, or Web & Media subteam. The veterans in each of these subteams will, as John Maxwell puts it, "know the way, go the way, and show the way," to form a well-practiced, well-trained, and well-prepared team that is ready to get to business. During build season, each team member will spend at least 20 hours a week to experience what can easily be considered the hardest fun we'll ever have. We'll have hard days and long nights, but in the end, we'll get the job done. We'll go to at least three events across the country, and we'll do the best we can at all of them before finally getting a chance to slow down. But in the end, this frantic six week rush is not what makes us who we are. What makes us who we are is the steps that we take all year round to improve our community by making a concrete difference.

One of the most monumental efforts we've made within our school is the formation of an Engineering Academy and Pathway, in coordination with Project Lead the Way. Over the last five years, we've molded what used to be a single class into a full-on Engineering Academy, which offers nine courses, each with a distinct focus. Complete with three 3D printers, three mills, two chop-saws, two lathes, a bandsaw, a laser cutter, a CNC router, a sand blaster box, and 300 students, this section of the school dedicated to engineering is made up of classes that offer useful, hands-on instruction and dual credit with Palomar Community College. In this case, we've spent five years literally building the new--a new division of Poway High that's fostered a burning passion for engineering throughout the entire campus. As Principal Ron Garrett attests, "...watching the Academy grow has been a great honor. It's drawn some of our best students to a field that's fun, relevant, and certainly high-paying."

But the change we've made spans far beyond Poway High. Among the people we influence, we're especially motivated to share the power of robotics and of STEM with the children of our community. That's why we host both an FLL regional and a VEX regional every year, together offering a fun day to 580 kids. For the robotics community at large, each member of Team Spyder works to assist or mentor at least one VEX or FLL team every year. In addition, we've set up a robotics merit badge for the Boy Scouts in our area, and we've helped to establish an ASES robotics program at every middle school in the district. And for the young girls in our community, we've presented at Northrop Grumman and Lockheed Martin's Women in Engineering Days, and we've worked alongside the San Diego Science Alliance at the Sally Ride Science Festival to further their mission of getting girls excited about STEM.

Within our robotics community, we're always happy to help as much as we can with teams of all ages; over the years, we've taken steps to assist a total of 16 FLL teams, 40 VEX teams, and 46 FRC teams. For example, after Neo-Tech Robotics lost the bulk of their adult mentors, we helped them figure out the logistics of transporting their team and robot, and even donated some of our equipment to them. Similarly, we gave the SuperNURDs one of our bandsaws, and we've played a large part in forming FRC teams like Team Pedestrian, Metal Heads, Manhattan Project, and Team Optix.

Through spreading our passion for FIRST, we're constantly working to build strong student leaders and to infuse the values of STEM throughout our community. Over the years, we've participated in over 220 events, a persistence strong enough to literally change the culture of our community. Through these events, we've created positive relationships with community members, colleges, and younger and older students; for instance, after the MIT Enterprise Forum, the MIT official who directed the event even came to one of our meetings and bought pizza for all 60 of us! To spread the message of FIRST to millions more, we've appeared several times on FOX, KUSI, and Channel 10, with active accounts on Twitter (@1622) and Youtube (Spyder 1622) and frequent appearances in local newspapers, like the Poway Chieftain and the San Diego Union. We've also given back to our community not just in STEM fields, but in general--in fact, we are active at several events each year that are entirely for charity, like Finish Chelsea's Run, which offers scholarships to passionate and innovative students.

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And our impact isn't just limited to local social and cultural influence--our dedication to the promotion of STEM has also resulted in a significant political impact. One of our mentors, for instance, has been on the Ramona School Board for 12 years, creating policies and courses that support STEM education. And to further promote this STEM education, this year, we've started to have an active presence at Poway Unified School District (PUSD) board meetings, with the team speaking at every meeting since August, 2015. In the spirit not of fighting the old, but of building the new, we've been working in the trenches to secure benefits for teachers, coaches, and students in STEM programs at a local level. Since we've started rallying to support these causes, a legal Memorandum of Understanding between robotics coaches and PUSD has been written to increase robotics coaches' stipends, and robotics can now be shown on students' transcripts in every school in the district. Our resolutions to the School Board and the City Council for a Robotics Day are soon to be on the agenda, and we've directly corresponded with politically powerful individuals including the School Board members, the mayor of the City of Poway, and the governor of California. City Council member Dave Grosch summed it up best when he said, "These kids and their robots are amazing!"

The "amazing" students of Spyder are of course benefitted by an understanding and a practical training in all of the disciplines of STEM, but they receive many other benefits too. The experience that Spydere gain in our club propels 100% of us to go to either college or the military, while 93% of us end up majoring in STEM subjects. Spydere get scholarships, lifelong friends, relationships with companies that could become employers, CPR/AED and First Aid

training, and even some amazing opportunities to travel: this year, for example, to Salt Lake City, Boise, and hopefully St. Louis. One of our members from Switzerland who returned to his home town is even currently setting up a robotics program in Winterthur.

Finally, Team Spyder gives members valuable experience in business in general. Members learn how to organize events, coordinate within and between groups, and master the art of branding and fundraising. This fundraising skill comes from the fact that to participate in so many events, maintain and supplement our machine shop, and travel around the country, we need to raise about \$60,000 per year. To achieve this lofty goal, we seek relationships with the business partners you can see on the back of our shirts, who give us grants, tours, community outreach, and even some mentors. We also volunteer at Poway High's concession stands, sell See's Candies and America's Freedom Deals Discount Cards, and even run our own "E-waste" event, which allows us to help people clear out around 35,000 pounds of dangerous electronic waste, interact with community members all throughout the day, and earn around \$6,000 in the process.

Through this E-waste event and the hundreds like it, Team Spyder has mastered the secret of change by building the new. For some, change may be difficult and it may be uncomfortable, but we believe that it's the foundation for what will ultimately be a better life. We work every day of the week in order to create this change, and because of it, our little logo's web of influence spans all over the world. With this worldwide influence, we're now 60 students and 25 mentors strong. but in a sense, we are still those seven students and a mentor with the same vision of building the new.