

## Chairman's Award - Team 2220

### Team Number

2220

### Team Name, Corporate/University Sponsors

3M / Thomson Reuters / HBFuller / Ergotron / Xcel Energy / Lancet Software / Gopher Resource / Skyline Exhibits & Eagan Senior High

### Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2016/2017 year and the preceding two to five years

-Team 2220 members gain valuable experience in leadership; more than 71% of students are involved in leading a subteam, team event, or outreach event -Spending time on Team 2220 gives students a clear idea of future educational pursuits; 100% seek a higher educational degree, over 90% in STEM -Through alumni, Team 2220 contributes to FIRST by starting and mentoring new FRC teams, mentoring existing teams and tutoring college students in CAD material developed by Team 2220

### Describe the impact of the *FIRST* program on your community with special emphasis on the 2016/2017 year and the preceding two to five years

-Team 2220 is involved in 229 events that enable us to spread the FIRST message and the importance of STEM - The ISD 196 STEM Career Fair, started by Team 2220 in 2013, has encouraged over 2000 students to pursue education in STEM -We helped develop stronger STEM curriculum at our local high school (5 classes), exposing future college students to the value of STEM -A sustained relationship with the Wescott Library has created a community Makerspace and a technology themed summer program

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

-Through our Robots Without Borders organization, Team 2220 spreads FIRST's message internationally, visiting schools, government offices and sponsors -Team 2220's Women In Robotics Empowering Sisters (WIRES) program encourages exposure of FIRST to female students -Team 2220 led the first annual World Advocacy Conference at the United Nations working to expand UN involvement in STEM education -Working with Eagan Robotics teams, Team 2220 started Bots-To-Go, an interactive intro to robotics

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

-Team 2220 hosts and runs 4 FRC, FTC and FLL competitions each year -Our annual 2,220 Hours Outreach Challenge resulted in over 4,440 hours through 47 unique events this season. Every team member is involved in STEM outreach - Our members are committed to teaching other teams the importance of mentoring other teams. -Since the start of WIRES, we have increased the percent of women on the team to nearly 50% and we have 50% female involvement at our FLL competitions

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

-Through Team 2220's RWB organization, students travelled through Poland and Germany to encourage the growth of FRC internationally, working in collaboration with Team 5883 and government officials -Team 2220 collaborated with 5883, governments, and global sponsors to create a grassroots foundation to enable FRC growth in Europe -Members of Team 2220 mentored 26 new FRC teams over the past three years in topics such as design reviews, stage gates, CAD, safety and competition preparedness

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

-Team 2220 started 59 FIRST teams -Through multiple grants, Team 2220 was able to start an FLL team in every ISD 196 elementary school -After starting the first FTC team in the district, Team 2220 got a grant to triple the program the following season; currently there are 15 teams in Eagan Robotics -Robots Without Borders started 4 FLL teams in Europe, creating the umbrella program in Poland -Team 2220's umbrella program has helped enable 55 similar programs worldwide

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

-Team 2220 hosts and runs seminars to educate other FIRST teams on design processes, CAD, project management, safety, team structure & development, and leadership at 4 annual events -Team 2220 members host and run annual classes, camps and FLL practice competitions; many of these FLL students have been inspired to continue in FIRST and join FTC & FRC teams -Team 2220 regularly transitions FLL teams to FTC teams and welcomes all students to join the FRC team

**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)**

-Team 2220 has mentored 68 FIRST teams -Team 2220 regularly mentors teams beyond our immediate community by utilizing electronic communication -Through a collaborative, shared workspace team members regularly participate in younger FIRST teams' meetings to develop skills and excellence in other students and teams -This year, 5 of the 15 FTC teams in our umbrella program demonstrated the excellence of Eagan robotics by earning the Inspire Award for role model teams

**Describe your Corporate/University Sponsors**

-International sponsors of Team 2220 like Thomson Reuters and 3M support the team by giving financial aid, in-kind donations, valuable mentors and international initiative support -Team 2220 is supported by local businesses like Blanda Inc., Prime Design and Skyline Exhibits through in-kind donations, design reviews and individual training for members - Other sponsors: Eagan Rotary, Agribank, Eagan Foundation, Lancet Software, Ergotron, Gopher Resource, Genysis, Superior Auto, Dakota Electric

**Describe the strength of your partnership with your sponsors with special emphasis on the 2016/2017 year and the preceding two to five years**

-2220 has strengthened 3M's support as a sponsor of FIRST by increasing international financial support by \$10,000 for new teams and providing new mentors through RWB -Through sponsors' events, Team 2220 actively educates employees about FIRST -2220 ensures that sponsors are aware of the team's activities throughout the year, with open houses, season recap presentations and appreciation visits -Event Summary Forms and timesheets allow sponsors to see the impact they enable in their community

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

-FIRST is More Than Robots; students learn lifelong skills like communication, leadership and project management while working alongside professionals in an environment that encourages the growth of each participating student -Within FIRST, students have the opportunity to explore almost every career opportunity, from engineering to marketing -FIRST is the most valuable activity for students to be a part of and provides lifelong skills.

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

-Through Robot Without Borders organization we increased access and awareness of FIRST and STEM education around the world -Dedicating over 4,440 hours of STEM outreach this season Team 2220 continues to reach new audiences -Through WIRES our team's female membership has more than doubled to nearly 50% -Team 2220 strengthens sponsors relationships with our team and FIRST -71% of our students take on a leadership role demonstrating our value of brightening the future workforce

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

Hans Mueller

**Essay**

Eagan High School FRC Team 2220 - Blue Twilight shines brightly through our all encompassing outreach, team member development and expansion of FIRST globally. Team 2220 continues to light up robotics and light up the world.

**Outreach**

In the last 5 years, Team 2220 Blue Twilight has conducted 229 outreach events. These events range from community demonstrations to annual mock competitions for other FIRST teams. Last year we exceeded our annual 2,220 hours of STEM outreach challenge with 3,614 hours of outreach. This year, Blue Twilight overshot our goal with more than 4,440 hours. Some of our annual events include the MN State Fair, 4th of July parade, and Coding Camp for Girls. The 2,220 hours challenge inspires team members to reach out to others and make a difference in our community. We track all of our outreach events with the Outreach Summary Forms to provide documentation for our events and ensure sustainability.

In 2013 Team 2220 founded Women In Robotics Empowering Sisters (WIRES). WIRES hosts events to introduce women to career opportunities in STEM and related topics such as robotics. These events include tours of industrial and medical facilities, presentations by female scientists, and trips to government facilities to show female involvement in typically male dominated fields. WIRES also conducts social events to reach more students, both male and female. These events build strong bonds between our team members. One of the trips this summer was to the Xcel Monticello Nuclear Training Center where the students met with female engineers. They also visited the mock control room to experience the response to a simulated nuclear meltdown. Other visits include the Minnesota FBI and Mayo Clinic where we toured their facilities and gave a speech about WIRES. The students of WIRES will continue to expand the exposure of STEM careers to more females at upcoming outreach events, regionals and championships.

Blue Twilight, in partnership with our Eagan Robotics umbrella program, started Bots-To-Go, safe and portable robots designed for outreach activities. By creating simple, effective, and robust robots that are easy to transport, set up, and fix if needed, our outreach events are able to touch a broader audience than ever before. Overall, Team 2220 has been able to bring an easy yet effective hands-on activity to a diverse community of children, students, and parents around the world.

We advocate for STEM education and exposure for all students in our local, state, national, and international governments including the United Nations. In an effort to expose our officials to what skills STEM education and FIRST programs equip students with, Blue Twilight regularly meets with those officials to show them first-hand the effects of STEM in our community and around the world and around the world. United States Senator Al Franken (MN) has visited Eagan High School twice in the past four years where students advocated for STEM education. Our team regularly meets with Minnesota State Senator Jim Carlson to promote STEM education. Additionally, Minnesota State Representative Laurie Halverson has presented Team 2220 with a House Ordinance recognizing our efforts to further STEM recognition in government, and has a strong relationship with our team. Team 2220 Blue Twilight continuously seeks out opportunities to meet with representatives to advocate for STEM education and FIRST programs. One of the ways Team 2220 has done this is traveling to the United Nations (New York) to meet specifically with the United Nations Educational Scientific Cultural Organization (UNESCO) to advocate for the importance of STEM education in the world's governments.

#### Team Member Development

Team 2220 not only prepares students for the world after graduation but we keep sustainability in the forefront year after year. Through our Google documentation system, we've developed a tracking system to ensure we meet our team goals and improve and expand them. For each event, a student fills out an Event Summary Form with details of preparation needed, key contact people and a synopsis of the event. They assist us in improving our outreach to capture a larger audience, provide better assistance to teams, and ensure our outreach is efficient and effective from year to year. On top of these Event Summary Forms, students fill out timesheets to keep a record of their day to day work in robotics. This includes attended meetings, individual work, outreach, and volunteering. Providing these details to our current and prospective sponsors allows for a strengthened partnership by showing the impact they have. Also, timesheet and event form analysis is done to ensure Team 2220 is achieving our strategic vision for expanding STEM outreach to light up the world.

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Safety is a top priority on Team 2220 where we continuously improve our culture of safety. We do this by conducting hands-on training for tools, personal protective equipment, fire safety, First Aid, CPR and AED training. The students also read and demonstrate an understanding of the FIRST Safety Manual. Through innovative safety training, all members of Team 2220 develop a deep value for putting safety first. On Blue Twilight, members are so well versed in safety that any team member is qualified to be the safety captain. They must pass a quiz after training and sign a Safety contract. Team 2220 creates online safety videos and makes them available to other teams. Some examples include safe robot lifting and battery spill response. Team 2220 was recognized for the excellence of our safety program by winning eight safety awards in the past three years, including the UL Industrial Safety Award at FIRST Championships last year in St. Louis.

Team 2220 prepares students to succeed in the years following their FIRST Robotics experience. Our students are consistently working one-on-one with mentors to develop design, engineering, communication, and business skills. Graduated students continuously report back that these skills have taken them above and beyond in their workplace. Because of the level of preparedness of Team 2220 students, 100% of students continue on to higher education and more than 90% go into STEM careers. Our alumni continue the passions that have been instilled in them after being on Team 2220 by starting and mentoring teams in other states, as well as tutoring fellow students in CAD using Team 2220 material.

### FIRST Expansion

Team 2220 founded the Robots Without Borders (RWB) organization to spread the universe of FIRST and STEM education by creating and sustaining new teams beyond our borders. Due to the abundance of FIRST teams in Minnesota with over 700 FLL, 180 FTC, and 210 FRC teams, we looked globally to where we could expand FIRST and STEM education. Because Europe is one of the most underserved areas in the world in terms of FIRST teams per capita, Team 2220 sent several students and mentors to Poland and Germany for ten days. We collaborated with FIRST FRC Team 5883 to lay the foundation to create new FIRST teams. During our visit we traveled over 871 km around Poland. We demonstrated robots and taught students about FIRST and STEM education at schools, businesses, and government offices. This collaboration was in an effort to expand the FIRST universe to Poland. Alongside Team 5883, we were able to start the first umbrella program in Poland by providing three FLL kits to schools. In addition, we visited sponsors to strengthen sponsor relations, provided access to [www.robotswithoutborders.space](http://www.robotswithoutborders.space) for future reference, and mentored Team 5883 to then mentor other teams. Similarly, Team 2220 traveled to Germany where we gave demonstrations at schools and donated a FLL kit, visited sponsors, and worked with local college students to mentor future FIRST teams.

Each year, Blue Twilight holds a series of seminars for a variety of FIRST teams. We held 23 roundtable sessions at multiple events like the University of Minnesota's MN Splash, Minnesota Robotics Invitational and our annual FRC Week Zero practice competition. These seminars include team project management, outreach fundamentals, safety captain training, and Women In Robotics Empowering Sisters (WIRES). This has provided valuable connections among FIRST teams.

Team 2220 has a culture of helping others shine brightly. We have mentored 68, started 59, and assisted hundreds of FIRST teams. We have ensured that all of our school district's 18 elementary schools have at least one FLL team. All four district high schools have an FRC team and all district middle schools have access to both FLL and FTC teams. In addition, all of the high school FRC teams have umbrella programs to ensure sustainability. This demonstrates the culture of STEM education that has been created in our community with more than 550 students involved in FIRST robotics in ISD 196. Team 2220 mentors teams on how to mentor other teams. The teams under our Eagan Robotics umbrella program have STEM outreach as a huge part of their culture with five of our teams earning the Inspire Awards at qualifying events this year, demonstrating their strong dedication to the FIRST principles and those of Eagan Robotics. For the past three years over 30% of our teams have qualified for the FTC Minnesota State Championship. Last season, Eagan Robotics FTC Team 7655, was one of four FTC teams in the world to be an Inspire Award finalist at FIRST Championships in St. Louis further demonstrating our value of excellence when we start, mentor and assist teams.

Team 2220's motto is "Lighting Up Robotics Lighting Up the World" and we have just gotten started these past 10 years. We will not stop until every individual, community, team, and nation is shining among the brightest of stars lighting up the FIRST Robotics Universe.