Chairman's Award Team
4613
2016 Team

Team Number 4613
Team Name, Corporate/University Sponsors
AARNet / Innovation First International & Barker College
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
FIRST ignites a passion for Science, Technology, Engineering & Mathematics (STEM). 85% of us are now preparing to study STEM subjects at University. Two recent alumni are testament to this, completing a dual degree & receiving an engineering scholarship. Becoming more creative & confident with solutions to the challenges of FIRST means the ability to transform these ideas into working machines continues to develop & improve; with each year's robot increasing in competence & complexity.
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
FIRST encourages us to promote STEM in our community. For 4 years, we have hosted an offseason event (DDU): the only competition for Australian teams pre2015. We also spread FIRST'S message locally (eg cocurricular evenings, presentations to business networks like PROBUS, School Awards in front of 2000 people) & help/mentor other teams (eg 4082, 5872, rookies ARTEMIS). We even went to the length of filming our Chairman's video in a Boeing 747 to be entertaining & to catch the public eye.
Team's innovative or creative method to spread the *FIRST* message
Our distribution of over 100 Redboxes to 13 countries spreads the FIRST message by supporting small international teams, to grow & catch the attention of their communities. Our video for the Chairman´s award is an humorous, attention grabbing imitation of an aircraft safety video, filmed within a Boeing 747. We hold regular robot demonstrations in our community, at cocurricular evenings, at graduation and at PROBUS a group of retired professionals, to further spread FIRST and STEM.
Describe examples of how your team members act as role models and inspire other *FIRST* team members to emulate
Our experienced members are role models to newcomers, exemplifying the 'gracious professionalism' of FIRST. Weekly, our students mentor our junior school's 2 FLL teams. We additionally helped many grassroots teams (eg Ivanhoe, ARTEMIS), to start up (eg onfield conduct, inspection, lending tools, establishing workable pit, game analysis etc.). In all that we do, the Redbacks aspire to maintain & pass on the spirit of camaraderie & inspiration that FIRST teaches us.
Describe the team's initiatives to help start or form other FRC teams
Our goal is to spread FIRST ideals to all corners of the globe. In 2015, we worked with 9 other teams to start up 30 Chinese Teams: assisting with building, offering advice + providing event support. Along with 1772, we also set up/mentored the Brazilian Team 5800 and continue to assist with supplying parts. The Redbox (designed, manufactured and distributed by 4613) allows newer grassroots teams in China, Australia, Turkey, Brazil & the US access to an efficient, lowcost gear box alternative
Describe the team's initiatives to help start or form other *FIRST* teams (including Jr.FLL, FLL, & FTC)
We have created two new FLL teams within the junior school for younger students who are not yet able to participate in FRC. We are expanding this to include Junior FLL & FTC within the 2016 season. Students & mentors from our team act as mentors for these teams twice a week, finding this time around their FRC & schooling commitments.
Describe the team's initiatives on assisting other *FIRST* teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the *FIRST* program
The RedBacks follow through with their support for fellow teams. We give FRC Teams access to our field for practice & host a scrimmage event prior to the regionals to give teams competition like experience with defensive robots. In the last 2 years we volunteered at 12 events including in China, hosted webinars for remote teams & provided various technical/strategic workshops for local teams.
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 sponsor school Barker College has set up 2 FLL teams at the junior campus. Every Tuesday & Thursday afternoon, 4613 students & mentors run an afterschool program in which grade 5 & 6 students are able to participate in FLL. In mentoring the FLL teams, the 4613 students are able to teach & demonstrate what they have learnt through their involvement in FRC & in FIRST. Our mentors also provide support to mentors of other teams via a twice weekly conference call.

Describe your Corporate/University Sponsors
IFIInnovation FIRST International (Robotic part manufacturer), AARNet Australian
Academic & Research Network (Telecommunication providers for research & education), Barker College (A High School), All Plastics (Plastic Suppliers), Aluminium Warehouse (Aluminium Suppliers), OBA (Barker Alumni), Auto One (Auto Shop), Rockwell Automation (Automation Suppliers), Treotham (Automation Suppliers), IGUS (Automation Suppliers), Solidworks (CAD Software), Autodesk (CAD Software Suppliers)
Describe the strength of your partnership with your sponsors with special emphasis on the 2015/2016 year and the preceding two to five years
Team 4613 has close ties with its sponsors. Benefitting from brand exposure like personalised promotional videos & invitations to events, they give more than just parts, providing guidance for outreach projects (eg Redbox) spreading FIRST robotics. Egs include: AllPlastics; supplying Polycarbonate, Acrylic for Redbox, IFI; with whom we showcase VEX parts to FRC teams, AARNet; providing industry mentors + helping to host webinars for remote teams around Australia to access mentoring.
Describe how your team would explain what *FIRST* is to someone who has never heard of it
FIRST is an organisation that aims to inspire a new generation of scientists and engineers through its core values of teamwork, creativity, ingenuity and gracious professionalism. Through 4 different competition levels, students build specified robots to face FIRST's challenges. The timepressured environment encourages the learning of technical skills in a team setting, building individual confidence thereby producing our future thinkers and innovators in a way that few other initiatives do.
Briefly describe other matters of interest to the *FIRST* judges, if any
Team 4613 encourages creative and outofthebox thinking. We want to show our team that anything is possible if you really put your mind to it. Showcasing this is our Chairman's video, filmed inside a Boeing 747. What started as a crazy idea quickly became very real, exemplifying our motto and inspiring us in the midst of having great fun. This is what FIRST does; it empowers us by giving us the confidence and competency to go out and achieve whatever goal we set for ourselves.
Essay
Inspiration is the driving force of scientific advancement. We as a team, want to show the world why we get so excited about STEM. This is a report of our small contribution to that. This is our part in inspiration.
Partnerships matter. Forging lasting partnerships across the many & varied sectors of our community; local, national or international is one of our core values. Rookie or globetrotting, if we see a team that needs assistance, we make it our priority to help out.

4613 fully understands the importance of a supportive community, due to the support we received as rookies. We strive to create a closerknit community, where collaboration & support are allowed to work alongside competition, further driving innovation & inspiration. Now in a position to give back to the community, we strive to share our resources & experience. When premier Australian team 3132 was unable to machine their chassis for Recycle Rush, we cut it on our CNC mill. We maintained that close community spirit during international travel & worked in partnership with 3132 to coordinate accommodation & transport for all Australian teams at the 2015 Championships. We hold numerous workshops for rookie teams, including electrical & pneumatics tutorials, building a basic drive base, tours of our lab setup & competition etiquette.

This year we hosted a kickoff day with local rookie team 5876 & assisted them in game analysis. During competition, we strive to embody Gracious Professionalism as we work collaboratively with other teams. When we host Australia's annual offseason event, Duel Down Under (DDU), we are in an even better position to help out, as the competition is onsite with our workshop. Air tanks, joysticks, controllers, tools, spare material, pneumatic fittings & electrical components are lent & given to various teams. We believe that these partnerships are key to preserving the spirit & camaraderie of FIRST, so any team knows there is a community to support them should the need arise.

We believe in sustained impact. 4613 supports teams in FIRST programs in a wide range of practical ways bothdirectly with individual teams & indirectly by hosting & assisting with events. Partnerships with STEM businesses are a vital part of longterm growth of FIRST. 4613 has partnered with AARNet to trial new collaboration software in order to more effectively mentor team 5800 from afar & we are currently testing a Lowcost prototype CNC router for an Australian based manufacturer. These partnerships allow us to give back to our sponsors, showing them the potential of FIRST.

4613 hosts Australia's annual offseason event DDU. Prior to the commencement of the first Sydney Regional event in 2015, DDU allowed FRC teams to compete without the need to travel internationally. It was the

springboard for FRC in Australia, creating widespread & longterm impact. DDU continues to provide a platform for new & aspiring Australian teams to experience a supportive yet competitive environment.
By acting as local aggregator for VEXpro, an international robotics supplier, we save local teams roughly $150 in transport costs for each order. We have placed over 10 orders in the last 3 weeks, saving $1500 for rookie teams who would otherwise not have been able to afford the parts.

Twice a week 4613 hosts a video conference call for all mentors in Australia, holding open discussion across all topics from rule clarification, design to funding issues, to part accessibility. This kind of assistance creates the supportive community that FIRST is renowned for.

The border is not the limit. Being an Australian team, 4613 had significant benefit from efforts to spread FIRST internationally. In fact, it's the only reason we exist. Ever since we've become able, we've sought to give back to that movement to grow FIRST internationally that we owe so much to. Our partnerships with international teams are an important part of building that interactive & growing global community. In 2015, 4613 travelled to to the Chinese Robotics Championship (CRC) in Shenzhen to take part in an initiative to grow FIRST within high schools in China. Along with nine other international teams, we taught rookie teams the basics of building & competing, & to pass on the FIRST spirit of camaraderie, inspiration & gracious professionalism. Before the competition, we took part in workshops helping to build & test rookie Chinese teams, & guide them along the path of designing & implementing new ideas. Our students later visited the teams during competition, & continued to assist them throughout the competition. Our students shared the success & learning experiences with Chinese teams, & formed friendships & partnerships that they never expected to form. We also participated in the setup of the competition itself.

4613 has partnered with 1772 to set up team 5800, increasing the number of Brazilian FRC teams for the first time since 2009, & continue to mentor them on an almost daily basis & assist them by supplying parts & funding. We also organise & fund the transportation of the Kit of Parts to both the teams due to the difficulty & cost involved in shipping directly to Brazil.

Introducing the REDBOX: our students' drive to inspire. Many international FRC teams, especially in their first year of competition, do not have the capacity required to purchase gearboxes & motors from U.S. based suppliers. A team of our students identified the large number of Denso Throttle motors that FIRST robotics teams have access to, yet due to the nonstandard design very few teams have been able to utilise the motor on their robot. Following this, they designed a low cost, light & reliable gearbox which ensures compatibility with FRC targeted components. The REDBOX gearbox gives new & inexperienced teams the capacity to build effective & competitive robot mechanisms, allowing them the ability to participate & compete effectively at the events they attend. Our team is manufacturing these gearboxes inhouse with assistance from one of our sponsors. We are distributing just over 100 REDBOXES to teams in China, Brazil, Turkey & the USA during the build season. The project has been shared with the FRC community, & teams who have access to machining resources are being encouraged to manufacture & distribute the gearboxes to teams in their area.

FIRST is more than just robots: it's about the attitude it teaches. Team 4613 encourages a culture of engagement with challenge & the team. The REDBOX is testament to the effect FIRST has on our team members. Our students now possess the selfconfidence, technical competence & collaboration skills required to make this project a reality. Team 4613 empowers our students in their drive to be confident Gracious Professionals.That drive makes them understand the importance of volunteering in all FIRST programs. Our team has volunteered at 12 different events across the state & China in the last two years. The majority of these are FLL events, due to time availability. The volunteers from our team have been involved in many different parts of the FLL competition program, including judging, refereeing & managing the FORD Australia Lego Vehicles Display. Volunteers from our team have also spent countless hours before FLL events, setting up & assisting event organisers to ensure that the events run smoothly the following day. It also inspires them to help out a little closer to home. Twice a week, our students travel to our Junior School to mentor the FLL team. They believe in the power of innovation in education, & their mentorship has given them the firsthand experience of seeing kids engage & focus on their challenges.

We want to inspire our world about innovation.
We are determined to show the world why we get so excited about STEM. Raising awareness of FIRST is critical if we are to inspire future innovators. To us, the first step was to take part in as many school presentations & events we were allowed. Throughout the year, we have succeeded in pushing the perception of FIRST within the school community from a frivolous nerd's pastime to a powerful & important program. We

attended extracurricular evenings alongside more traditional sporting activities, & held or participated in numerous presentations to the school at assemblies, award nights & information evenings. Outside our school we hold workshops to directly inspire the younger generation at neighbouring primary schools such as Murray Farm Public School, encouraging participation in jrFLL & FLL. We are also spreading awareness of FIRST & STEM amongst the wider community including parents & caretakers, with presentations to retired professionals. Their understanding is an often undervalued part of FIRST's message of inspiration, as they can influence the younger generation's participation. In our generation, the best way we can inspire innovation is through FIRST. Our FLL & FRC teams see real change in our students, as they grow in character & ability through overcoming challenge & engaging in teamwork. Our two recent alumni are a testament to this, as one student is now completing a dual degree in STEM at a top engineering university, & the other received an engineering scholarship into Macquarie University. 85% of our senior students are also preparing for engineering courses at University. Two of them were able to receive work experience at Google & CSIRO due to their FRC involvement, opportunities that they would not otherwise have been afforded.
We believe that the spirit of FIRST is just as important as any technical skill. Team 4613 shares the spirit of FIRST to our peers & then to anyone who will listen. We want the next generation to be confident Gracious Professionals, inspired by our goal of 'overcoming the challenge', & educated about the potential of technology. We believe that as a joint effort across FIRST, we can begin to share our love of STEM. This is our part in inspiration.