

## Chairman's Award - Team 3880

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2018 - Team 3880

### Team Number

3880

### Team Name, Corporate/University Sponsors

NASA, BAE Systems, Friends of Hawaii Robotics, Maui Economic Development Board, Ace Hardware, UH Manoa College of Engineering, Thirty Meter Telescope, HELCO, Oceanic Time Warner Cable, ABC Stores, Andy Mark, Robotics Organizing Committee(ROC), Cyanotech, / Society of Women Engineers & KEALAKEHE 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

Every member plays a valuable part in our team's success; from fabrication to documentation, from coding to website design, we help push each other and together we strive for the summit. Our team provides our students with skills and knowledge in order to explore STEM opportunities. Our member diversity enables us to approach problems from a variety of angles and create innovative, creative, and effective solutions to specific and broad problems in our community.

### 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

By coordinating annually over 40 events, the Tiki Techs strive to introduce and incorporate STEM to our community. Through quarterly exhibitions, students showcase what they have learned and inspire others to invest time and resources into STEM. We further reach out into our community through the creation and development of programs like STEM Camp and STEM Academy. Through community outreach, the Tiki Techs are leveraging STEM education to reshape and elevate our community.

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

Through our many STEM-filled programs we share and spread the message of FIRST throughout the Asia Pacific. Through team swag, a series of children's books, and almost weekly community demos, the Tiki Techs take pride in introducing the mission and values of FIRST to our global community. Over the last 6 years, our Hawaii Island Robotics Showcase and Exploration(HI-RES) has created a "carnival of STEM" in connection with our Jr. FLL/FLL/FTC tournament for over 5,000 people.

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

The Tiki Techs, have made it a mission to shape our students into people who stand out as role models for others to emulate. Through programs such as the Kona STEM Camp, students are given leadership roles where they hone their skills and show the next generation what it is to be responsible, hardworking and innovative. Through activities in the community our innovators teach prospective STEM community members about the life and values of a Tiki Tech.

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

In collaboration with neighborhood schools, the Tiki Techs have supported over 15 programs in eight schools and consistently lend resources to help other teams. We have mentors in places including New York, California, Texas, and Japan developing teams there. While most high schools on our island have had an FRC program, multiple teams have discontinued their programs due to lack of resources. As a community, we are working to provide funding and resources for them to start back up again.

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

The Tiki techs alumni are working in Oahu, New York, and more helping establish new robotics teams globally. Our team members also are active in supporting ROV and Botball teams together with the development of STEM based programs throughout our state. In addition we also work to establish FLL, Jr FLL, and VEX IQ Teams in other schools and run many tournaments annually. Our team also secured funding to provide robots for schools, host tours and teacher PD, and house a competition practice room.

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

Regardless of alliance we are willing to help in anyway possible. FIRST kick-off holds true tradition in our program: with every Tiki Tech piled into the robotics room, kick-off greets us before the sun does with students from 7 schools. We are active on Chief Delphi, produce help & weekly update videos, and work with the state to formalize robotics funding for newer teams. We assist other FRC teams by bringing mentors specifically designated for helping other teams in need at competitions.

**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)**

Annually leading the West Hawaii Tech Community FRC Robotics Design Review at NELHA, we educate those in the community and other teams about FRC strategy and build. While FRC Kickoff gives us an opportunity to invite other teams into our workspace, engaging them in the season's game, having fun sharing our ideas and collaborating. We've assisted multiple Jr. FLL and FLL teams by hosting an annual FLL Scrimmage, tournaments, and summer robotics skills development for students and teachers.

**Describe your Corporate/University Sponsors**

Sponsors are an important aspect of any teams, at 3880, they're our Ohana. We have an innovative, culturally-based donor system--the Ahupua'a of Giving--that celebrates sustainable partnerships & addresses our program's needs. Our program applauds all donations: all donors receive a special gift package. We've received financial support from over 500 individuals, foundations, & corporations. With a \$30,000 stock reserve, we use funding raising to expand our program with no fear of shutting down.

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

Building long-lasting partnerships is essential to any FIRST robotics team, with several strategic partners that donate \$1,000 annually, and six \$25,000+ private donations, we have established our own professional machine shop & design building for our team. To foster these relationships, we hold exhibitions where our team presents to donors, illustrating the impact of their donation on our students and the opportunities it gives them.

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

FIRST unites and inspires students in exploration of the future of STEM. Each year, FRC releases a new & exciting game to challenge students to work collaboratively in creating innovative, effective, & elegant robots for competition. FIRST is not only a competition, but a bonding experience, challenging students to design & fabricate robots, creating something for and in themselves that rivals any athletic endeavor in rigor, perseverance, and collaboration.

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

As students graduate, it seems like critical institutional knowledge is lost and many teams' experience success dips. Despite heavy senior losses the last couple of years, the program has maintained an upward trend. We capture our "team DNA" and ensure that our veteran students aren't just learners and leaders, but legacy makers. To do this, the senior leadership group commits to student leader meetings every week to organize and plan each session with a focus on capturing what we do.

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

Hope Kudo

## Essay

Team 3880's motto—*kulia i ka nu'u* (strive for the summit)—embodies our rigorous preparation & relentless pursuit of excellence sought since the inception of our team. Throughout the 2018 FIRST Robotics Competition (FRC) season, we continue to develop partnerships, creating a sustainable platform to embolden students' in their creative & technical capabilities. In addition, we've become catalysts of change within our community, we excel in enriching our communities' awareness of STEM education & sparking curiosity for STEM in the younger generation. In the midst of our 9th season, the Chairman's Award gives us an opportunity to reflect & showcase the perseverance & tenacity of our Tiki Techs. We've expanded our team's scope to establish a deeper understanding for our students & a quality STEM education-oriented community development plan.

The formation of our team in 2010, is attributed to two students who felt unchallenged in the everyday school curriculum. In 2011, our team entered with no engineering mentors, a \$1,500 budget, & utilizing a bench as our workspace. Our 1st season served as an extensive learning experience. In week 4 of build season, our team discovered a sizing issue, forcing us to remove 60 pounds of materials & start fresh with no spare materials. The laptop with all of our program files was stolen the week before competition. We discovered during inspection day of the HI Regional, we misinterpreted a motor rule requiring us to remake 2 of our subsystems while students accurately re-constructed every hole, weld, wire, & line of code. Despite these obstacles, we proved ourselves to be one of the strongest defensive robots in competition, we joined the winning alliance, & secured a spot at FIRST Championships. For our robust robot, our team also received the General Motors Industrial Design Award. In the community, based on the success in our first season, Governor Abercrombie declared July 4, 2011 "Kealakehe Robotics Team Day." Admiring the Gracious Professionalism & Cooperation the FRC community displayed in our first season, we evolved from an afterschool project into a year-long program, & now a community-changing movement.

In our 2nd year, we built upon this success winning the Engineering Inspiration (EI) Award & traveling to compete at World Championships. In our third year, we won our 2nd EI Award at the LA Regional & first Chairman's Award. Additionally, we captured the Xerox Creativity Award at the Inland Empire Regional in recognition of our students display of exceptional ambassadors of STEM. Team 3880 was the youngest team to win a Chairman's Award in 2013, the only Hawaii school to win an EI Award, the 2nd Hawaiian school to win a Chairman's Award at a mainland competition, & qualified for World Championships in St. Louis. In 2014, 3880 earned its fourth straight spot in the World Championships, our third EI award, & our first Dean's List Finalist. In 2015, our team was honored to win the Hawaii Regional along with teams 359 & 368, received EI awards at the Hawaii & Silicon Valley regionals, & our 2nd Dean's List Finalist. In 2016, we won the Regional Chairman's Award at the HI Regional & our mentor, Justin Brown, was a Woodie Flowers Finalist, & we also received the EI award at the Orlando Regional. In 2017, we won the Team Spirit Award at the LA Regional, experiencing a huge induction of amateur builders, a majority of season was spent building capabilities & team assimilation. The Team Spirit Award perfectly captures our dedication to pursuing an inclusive & supportive community. Our success in FRC allows us to attract more students & take on increasingly difficult challenges. We've won over 110 additional awards over our first 8 years in other competitions & compete in programs ranging from Pacific Symposium, Science Fair, BotBall, CyberPatriot, FLL, FTC, TARC, Mate ROV, VEX, & more. Competitions once foreign to our islands were introduced by the willingness of our team to expand their learning experience.

Our team never strays from our Vision: "developing a generation of socially conscientious students who can responsibly guide our community through paradigm shifts in technology by pursuing excellence & bringing out excellence in others." We open our doors to all students facilitating the development of personal passions & skills. From graphic design to welding, our students are encouraged to do what they love with greatness. Housing a microcosm of talented students transforms our work beyond the production of quality mechanisms & into audacious goals, tenacious problem-seeking, and a vibrant sense of purpose. We leverage our team's previous successes to broker new relations that increase our communities' understanding of & investment in STEM education while remaining guided by our Core Values:

- 1) Develop rigorous STEM aptitudes for all students;
- 2) Create a premier program that benefits future generations of students;
- 3) Create lifelong learners passionate about problem solving & finding innovative solutions;
- 4) Cultivate a safe place for students to explore their passions while developing discipline, empathy, communication skills, & responsible risk taking.

Team 3880 seeks to expose students to rigorous, time-bound, & professional problems in hopes of preparing them to excel in the 21st century. The drive possessed by our current members & alumni has translated team success into personal opportunities. Our alumni have advanced to universities such as Stanford, U. Michigan, UCLA, Occidental, CalTech, UPenn, Princeton, Yale, Cornell, Rice, Columbia, NYU, Duke, University of Washington, Tsukuba & Kyoto University in Japan, among others. With a passionate focus on accessibility for all learners, our ethnic diversity (more than 24 different heritages), gender equality (females compose half of our project captains & 60% of team members), & economic diversity (majority of team classified as economically disadvantaged) empowers our innovative solutions.

**Essay - page 2**

Community outreach remains a major priority for our team. In addition to our 40 outreach events & team mentoring, we created & hosted the Kona STEM Camp (KSC). Since 2013, we've hosted 8 STEM Camps for over a collective thousands of 3rd-8th graders. They're introduced to a week of STEMtastic days filled with experiments, robot design, computer programming, & engineering challenges. Our student project leaders work with professional communities from around the state to bring in pioneers of the field. While campers enjoyed the renowned scholars & practitioners, most campers said the work with our student facilitators was the most enjoyable. KSC has lead to many new STEM programs in our community as we send supplies & robotics kits from KSC to local schools, incentivizing STEM-learning within our community. Our new partnership with the Stanford FabLearn network allows the KSC to serve as launching pads for MakerSpaces in 5 West Hawaii schools this year.

Focusing on creating a supportive environment for innovators, we've established specialized subsets during season, creating a true synergy, allowing us to find unique solutions to engineering & design problems. Through our history of technical success, community development, & educational opportunities, our focus has recently expanded to the stars with our selection for MoonRIDERS by Superintendent Matayoshi to represent Hawaii high schools & our nation. We partnered with PISCES, NASA Kennedy Space Center (KSC), Iolani School, & Google Lunar X Prize teams to test the Electrodynamic Dust Shield (EDS) on the Lunar Surface. With three NASA site research weeks & Mauna Kea testing under our belts, we are ready to send the first high school experiment in history to the lunar surface. Additionally, in the Fall of 2017, our team was selected to partner with Lemelson-MIT to participate in InvenTeams: comprised of high school students, educators, & mentors that receive a grant to invent technological solutions to real-world problems of their choosing, our team is 1 of 12 groups selected & the first ever team from Hawaii to participate. Our team decided to address the issue of drunk driving in our community by measuring blood alcohol level with near infrared spectrography. In 2016, we launched the first-ever Kona STEM Academy(KSA) on our island, creating a school within a school. Taking 30 students in the first cohort, KSA has grown immensely in the short few years of its existence & is now recognized statewide for their accomplishments in STEM & community outreach. The Academy incorporates 26 STEM competitions from the after-school robotics program directly into the daily curriculum. We hope to develop a generation of pioneers who apply their opportunities with KSA into community building STEM infrastructure & field-tested operationalization experience. In November 2017, students have been granted the opportunity to work hand-in-hand with Canada-France-Hawaii Telescope(CFHT) through Mauna Kea Scholars, they'll utilize telescopes at the science reserve atop Mauna Kea for in-depth research and will visit CFHT's Waimea headquarters for a night of remote observing in the telescope control room.

With our core values, motto, & team vision, we embody the FIRST values while personalizing them to our community's needs. We practice gracious professionalism & coopertition on & off the field through our friendly relations with other robotics teams in our area. Within the Big Island network of teams, we've emerged as local leaders coordinating off-season events & frequently lending materials, improving collective capacity & organizing socials to build ohana. Our team is passionate about everything we do; the number of wins & scholarships earned is not merely as important as the skills & love for STEM our students take with them as they enter new paths. To the world we are Kealakehe Robotics, Tiki Techs, or Team 3880; to us, we are ohana. We are Kealakehe Robotics & we will strive for the summit.