FIRST TECH CHALLENGE

Hawai‘i League Tournament

Dec. 10, 2022

Hawai‘i FIRST Robotics | Honolulu, HI

Compete in an energy-driven game and test the limits of performance, efficiency, and endurance to power innovations forward.

POWER PLAY℠

PRESENTED BY Raytheon Technologies

FIRST ENERGIZE℠

PRESENTED BY Qualcomm

FIRST® (**F**or **I**nspiration and **R**ecognition of **S**cience and **T**echnology) was founded in 1989 to inspire young people's interest and participation in science and technology. Based in Manchester, NH, the 501(c)(3) not-for-profit public charity designs accessible, innovative programs that motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

FIRST is *More Than Robots.*SM *FIRST* participation is proven to encourage students to pursue education and careers in STEM-related fields, inspire them to become leaders and innovators, and enhance their 21st century work-life skills.

***FIRST*® Tech Challenge** is an exciting, fun, global robotics program for students in grades 7-12. Teams are responsible for designing, building, and programming their robot to compete in an alliance format with and against other teams. The standard robot kit is reusable and can be programmed using a variety of java-based programming languages. Teams compete on and off the playing field for awards that celebrate robot design and performance, community outreach, *Gracious Professionalism*,® and sharing and spreading *FIRST* in their communities. Being on a *FIRST* team empowers students to:

- Think, explore, and project plan like scientists and engineers
- Have a fun, creative, and hands on STEAM experience
- Experiment, iterate, and overcome obstacles
- Apply real life math and science skills
- Build self-esteem and confidence
- 90% of participating students report learning how STEM can solve real world problems

Hawai'i FIRST Robotics [HFR], is an all volunteer, non-profit organization dedicated to providing FIRST programs for Hawai'i's children in grades 2 to 12.
Please support our efforts by volunteering at HFR events or by making a donation. Visit us at **hawaiifirstrobotics.org** for more information. Mahalo!

MAHALO to our Hawai'i Sponsors

Thank you to all who help make this program possible for our students. *FIRST* could not exist without the support of the army of mentors, parents, teachers, and volunteers who step up to provide their time and expertise to inspire our young people to get excited about science, technology, engineering, and math.

HITACHI
Inspire the Next

HAWAII PETROLEUM
Ohana Fuels · Mini Stop · HFN

Aloha Air Cargo

YOUNG BROTHERS

PART OF THE SALTCHUK FAMILY OF COMPANIES

TOURNAMENT AGENDA

7:30am	Team Check-In, Pits Open
8:00 - 10:00am	Inspections, Judge Interviews, Practice
10:10am	Drivers Meeting
10:30am	Opening Ceremony
10:45am - 12:30pm	Matches Begin
12:30pm - 1:10pm	Lunch Break
1:10 - 3:00pm	Matches Continued
3:10pm	Awards & Closing Ceremony
4:00pm	Pits Close, Clean up

* Please note that the tournament schedule might have changed after this program book went to print. All times are subject to change. For any changes to the event's schedule, check in with Pit Admin.

During the Matches

After all teams have gone through the robot and field inspections, they are randomly assigned into alliances of two teams. A team's alliance partner in one match may be their opponent in another match.

Team Rank

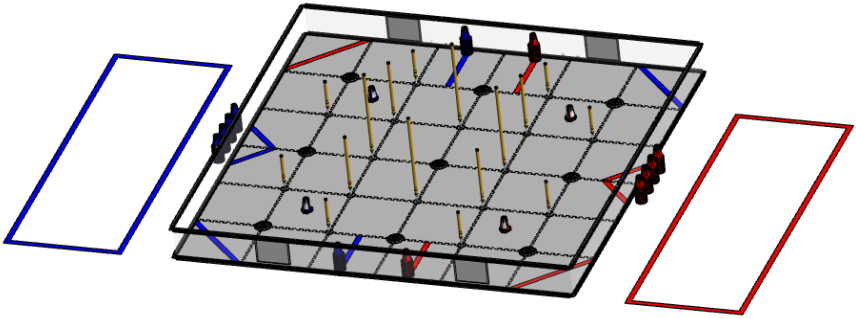
After all matches, all teams will be ranked from first through last based on their averaged Ranking Points (RPs). Averaged Ranking Points come from the season's 10 best matches, plus the 5 matches played at the League Tournament.

If multiple teams have the same number of ranking points, then the teams will be ranked based on their averaged tiebreaker points (TBP). There are two types of Tiebreaker points; TBP1 and TBP2. TBP1 is their alliances autonomous period score. TBP2 is the alliances endgame score If multiple teams have the same tiebreaker points as well, the teams will be ranked based on their highest match score. If this comparison still results in a tie, the next highest match score will be used until the tie is broken.

Advancement To Championship

The 16 top-ranked teams will advance to the Hawai'i Championship on January 14, 2023.

The Game



POWERPLAY℠ presented by Raytheon Technologies is played on a 12 ft. x 12 ft. (3.7m x 3.7m) square field with approximately 1 ft. (0.3 m) high walls and a soft foam mat floor. There are two Alliances – "red" and "blue" – made up of two Robots each. Cones are the Alliance-specific scoring elements. There are 60 Cones, 30 red and 30 blue. There are also four Cone-shaped Signals that are used as indicators for the Autonomous Period to direct the Robots to specific scoring areas. At opposite corners of the field are two Alliance-specific Terminals. On the sides of the field are Alliance-specific Substations. In the middle of the field are twenty-five Junctions of various heights.

Robots must traverse around the field to access Cones located against the front or back field wall. Cones may also be placed by the Human Player into the Substation for Robots to access and score on the Junctions. Cones are placed on Ground, Low, Medium, and High Junctions to score different amounts of points based on the height of the Junction.

Prior to the start of the Match, Robots must be touching the wall closest to their alliance station at specified locations and may possess one Pre-Load Cone. Teams may place their own designed Signal Sleeve over the Signal located directly in front of their Robot. Teams may also manufacture an Alliance-colored Beacon and place it in their Substation Storage area for use during the End Game.

Matches have two distinct periods of play: a 30-second Autonomous period followed by a two-minute Driver-Controlled period. The last thirty

seconds of the Driver-Controlled period is called the End Game which adds new scoring opportunities for the Robots to achieve.

Autonomous Period:

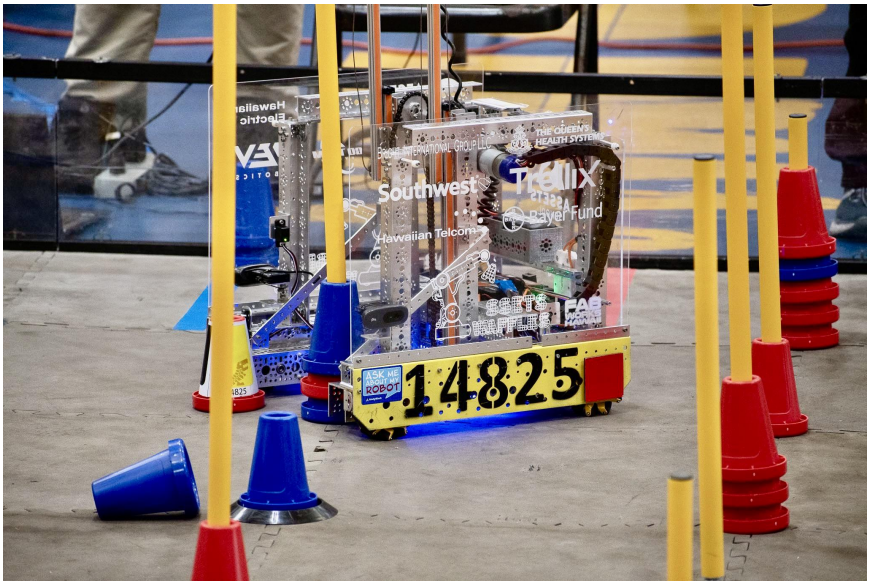
Robots may place Cones in their corresponding Terminal closest to their Alliance Station or on any of the Junctions. They can park in several locations at the end of the period for different points. They can also use their Signal Sleeve to help them determine in what Signal Zone to park.

Driver-Controlled Period:

Alliances earn points by having their Robots place Cones in Terminals and on Junctions of different heights.

End Game:

Alliances may continue to score Cones on Junctions. They may also use their Beacon to Cap a Junction and convey ownership of that Junction. Ownership is also conveyed by having the topmost Cone on a Junction at the end of the Match. Alliances that complete a Circuit (a connected string of owned Junctions and Terminals) will earn Bonus points. Additional points are scored if a Robot is parked in a Terminal at the end of the Match.



Scoring

Autonomous Period Scoring:

Navigating:

Parked In Alliance Substation:	2 points
Parked In closest Alliance Terminal:	2 points

Cones:

Placed In closest Terminal:	1 point
Secured on Ground Junction:	2 points
Secured on Low Junction:	3 points
Secured on Medium Junction:	4 points
Secured on High Junction:	5 points

Signal Bonus – Parked Completely In Signal Zone:

Using Playing Field-supplied Signal:	10 points
Using Team-supplied Signal Sleeve:	20 points

Driver-Controlled Period Scoring:

Cones:

Placed In matching color Terminal:	1 point
Secured on Ground Junction:	2 points
Secured on Low Junction:	3 points
Secured on Medium Junction:	4 points
Secured on High Junction:	5 points

End Game Scoring:

Junction Ownership:

Conveyed by top Scored Cone:	3 points
Conveyed by capped Beacon:	10 points

Completed Circuit:	20 points
Parked In a Terminal:	2 points

Team #	Name	School/Organization	Home Town
5159	X-bots	Punahou School	Honolulu
6175	License To Shred	Punahou School	Honolulu
6962	Pokébolts	Punahou School	Honolulu
7438	Hot Spot Robotics	Mililani High School	Mililani
8740	Iobotics	Iolani School	Honolulu
8741	Iobotics	Iolani School	Honolulu
8898	Iobotics	Iolani School	Honolulu
9378	Magma Robotics	Kalani High School	Honolulu
13088	Cyber Saints	St Catherine School	Kapaa
14825	Waffles	Assets School	Honolulu
15076	Iobotics	Iolani School	Honolulu
15236	Mid-Pacific Owl Robotics	Mid-Pacific Institute	Honolulu
16374	M.E.A.F.	Assets School	Honolulu
17063	Hot Shot Robotics	Mililani High School	Mililani
17445	Waimea Robotics	Waimea High School	Waimea
18883	Waimea High Robotics	Waimea High School	Waimea
20060	Explosive Aioli	Punahou School	Honolulu
20061	Omega 2	Punahou School	Honolulu
20062	Diffused Kittens	Punahou School	Honolulu
20063	Punahou WF 1	Punahou School	Honolulu
20064	Wolfeschlegelsteinhausenbergerdorff	Punahou School	Honolulu
20065	Punahou WF 3	Punahou School	Honolulu
20066	High Explosives Experts	Punahou School	Honolulu
20076	Le Jardin Academy	Le Jardin Academy	Kailua
20311	Eyeland Skool	Island School	Lihue
20423	Obsidian Robotics	Kalani High School	Honolulu
22492	Futures	Family/Community	Kapaa
22517	RoboWarriors	Kapaa High School	Kapaa
22536	Crusaders	St Louis School	Honolulu
22748	WHS	Waimea High School	Waimea

Grants and Scholarships for FIRST Alumni

Participants and alumni of *FIRST* programs gain access to education and career discovery opportunities, connections to exclusive scholarships and employers, and a place in the *FIRST* community for life. Learn more about scholarships, internships, and alumni opportunities at **www.firstinspires.org/alumni**. If you're a graduating senior, make sure to register in our dashboard so we can stay in touch!

Awards

INSPIRE

The highest award that a team can be given. This judged award is given to the team that truly embodied the "challenge" of the program. The team that receives this award is a strong ambassador for *FIRST* programs and a role model team. This team is a top contender for many other judged awards and is a gracious competitor. The Inspire Award winner is an inspiration to other teams, acting with *Gracious Professionalism*® both on and off the Playing Field.

THINK

Removing engineering obstacles through creative thinking. This judged award is given to the team that best reflects the journey the team took as they experienced the engineering design process during the build season.

CONNECT

Connecting the dots between community, *FIRST*, and the diversity of the engineering world. This judged award is given to the team that most connects with their local science, technology, engineering, and math (STEM) community.

INNOVATE Award sponsored by Raytheon Technologies

Bringing great ideas from concept to reality. This judged award celebrates a team that not only thinks outside the box, but also has the ingenuity and inventiveness to make its designs come to life. This judged award is given to the team that has the most innovative and creative robot design solution to any or all specific field elements or components in the game.

CONTROL Award sponsored by Arm

Mastering robot intelligence. This judged award celebrates a team that uses sensors and software to enhance the robot's functionality on the field.

DESIGN

Industrial design at its best. This judged award recognizes design elements of the robot that are both functional and aesthetic. All successful robots have innovative design aspects; however, the Design Award is presented to teams that incorporate industrial design elements into their solution.

ELIMINATION TOURNAMENT AWARDS

The winning alliance and finalist alliance are both recognized for their achievement in robot game performance.

Mahalo to our Volunteers & Event Hosts

Hawai'i FIRST Robotics events are made possible through the support of volunteers who are passionate about empowering the next generation of talented problem solvers and community leaders. The following individuals made this Hawai'i FIRST Tech Challenge season possible.

Regional Partners: Aaron Dengler, Blake Uramoto, Jenny Uramoto**Event Hosts:** 'Iolani School, Island School, Le Jardin Academy, Mililani High School, Kalani High School, Kukui Grove Mall**Judges:** Teri Nobriga, Michelle Bradley, Chris Branyord, Brian Catlin, Adam Ching, Tim Donlon, Hyejin Hickey, Hugh Mosher, Dale Zane, Yvette Maskrey

Head Referee: Tyson Kikugawa

Event Support: Terry Allen, Reid Arakaki, Danielle Au, Michael Babineck, Roxanne Kate Balanay. Donnie Banquil, Christopher Barnhart, Michelle Bradley, Sandy Catlin, Enrique Che, Keith, Endow, Rosabel Fontaine, Jim Guerber, Tracy Hakikawa, Peter Han, Cynthia Hannah-White. Raimi Ishikawa, Jesse Jong, Soojin Jun, Kenneth Kawamura, Nan Ketpura-Ching, Danette Kobayashi, Joshua Kuakini, Cory Kubota, Yeong Han Lau, Kristalyn Lee, Julius Lett, Lisa Miyamoto Matsuda, Ron Morinishi, Mason Nagata, Stephen Nava, Millie Ng, Sharon Nishi, Leilani Phan, LeNyia Preston, Carrie Scheib, Daniel Shiraki, Bryan Silver, Madisyn Sim, Shannon Sumida, Kylie Swider, Marian Swider, William Swider, Jennifer Thym, Leah Toma,Sylvia Wang, Andrew White, Beren Wong, Errol Wong, Angela Yang, Chase Yasunaga, Ayaka Yoshii, Dale Zane

We invite you to volunteer and energize the next generation to build a better future. earn more at firstinspires.org/ways-to-help/volunteer

FIRST Core Values

Gracious Professionalism® — Dr. Woodie Flowers, *FIRST* Distinguished Advisor and Pappalardo Professor Emeritus of Mechanical Engineering, Massachusetts Institute of Technology, coined the term *Gracious Professionalism.*

Gracious Professionalism is part of the ethos of *FIRST*. It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

With *Gracious Professionalism*, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy but treat one another with respect and kindness in the process. They avoid treating anyone like losers. No chest thumping tough talk, but no sticky-sweet platitudes either. Knowledge, competition, and empathy are comfortably blended.

In the long run, *Gracious Professionalism* is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing one has acted with integrity and sensitivity.

Coopertition® — *Coopertition* produces innovation. At *FIRST*, *Coopertition* is displaying unqualified kindness and respect in the face of fierce competition. *Coopertition* is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete.

Coopertition involves learning from teammates. It is teaching teammates. It is learning from mentors. And it is managing and being managed. *Coopertition* means competing always and assisting and enabling others when you can.
