



BENELUX CHAMPIONSHIP

February 11, 2023

SintLucas | Eindhoven

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



PRESENTED BY  **Raytheon**
Technologies



PRESENTED BY **Qualcomm**

About *FIRST*



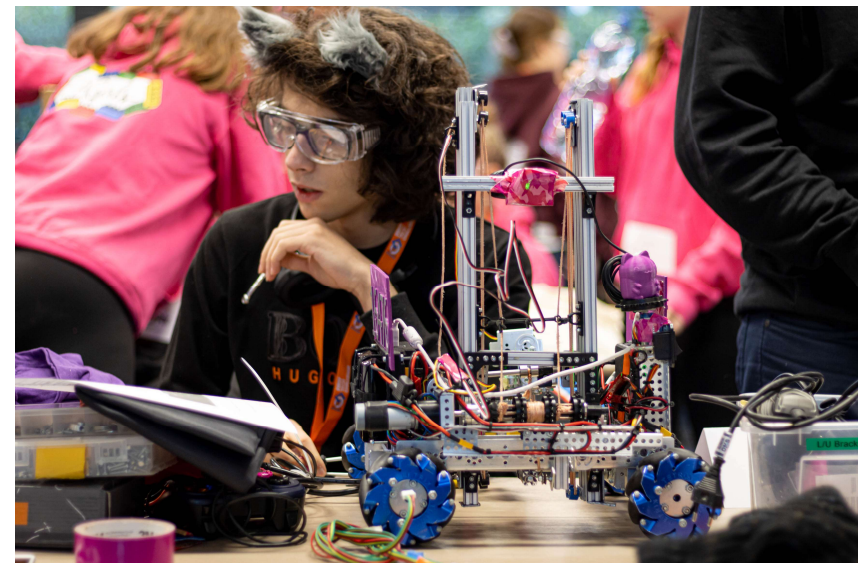
FIRST® (For Inspiration and Recognition of Science and Technology) was founded in 1989 to inspire young people's interest and participation in science and technology. Based in Manchester, NH, the 501(c)(3) not-for-profit public charity designs accessible, innovative programs that motivate young people 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*™ *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.

About *FIRST* Tech Challenge

FIRST® **Tech Challenge** is an exciting, fun, global robotics program for students in ages 12-18. 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



Tournament Schedule

08:30	Team Check-In, Pits Open
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09:00 – 12:30	Inspections
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09:00	Drivers and coach Meeting
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09:00 – 12:00	Master Classes
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09:20 – 12:00	Judge Interviews
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12:30 – 13:15	Lunch Break
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13:15	Opening Ceremony
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13:30 – 15:00	Judge Pit Visits
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13:30 – 17:00	Side Program non-qualified teams
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13:30 – 17:00	Qualification Matches
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17:00	Alliance Selection
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17.30 – 18.30	Dinner Break
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18:30 – 19:30	Elimination and Final Rounds
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19:30	Award Ceremony
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20:00	Pits Close
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* 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.

Match Play and Elimination Rounds

During the Qualifying 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

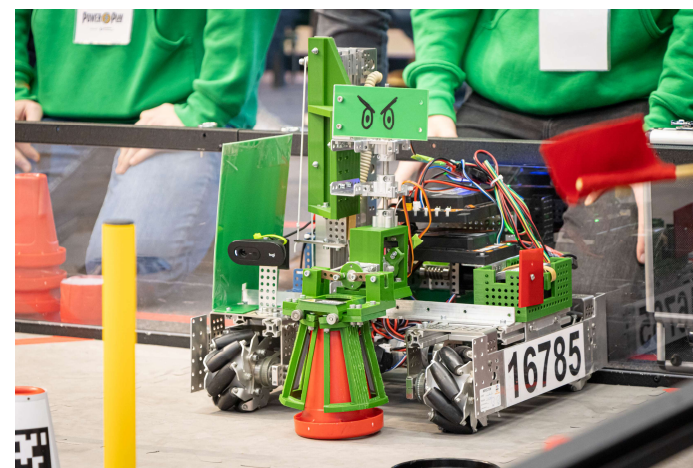
After all qualifying matches, all teams will be ranked from first through last based on their averaged Ranking Points (RPs). If multiple teams have the same number of ranking points, then the teams will be ranked based on their averaged tiebreaker points (TBP). There are two types of Tiebreaker points; TBP1 and TBP2. TBP1 is their alliances autonomous period score. TBP2 is the alliances end game 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.

Alliance Selection

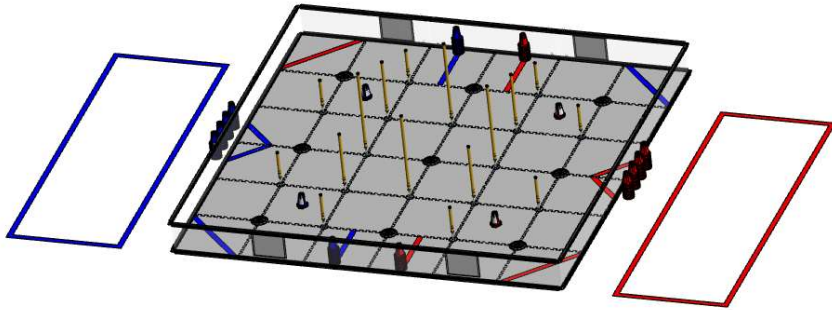
After all the qualifying matches are held, the Alliance Section begins. Four alliance captains are selected based on team rank. These captains then pick one or two additional teams (based on event size) to be their alliance partners for the Elimination Matches.

Elimination Matches

Alliances get a win, loss, or tie. The advancing alliance is the first one to win two matches.



Game Description



The Game:

POWERPLAYSM 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.

Game Description, continued

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

Participating Teams

TEAM #	TEAM NAME	SCHOOL/ ORGANIZATION	CITY, STATE
3954	Pink to the Future	Maerlant Lyceum	The Hague, NL
10183	F.R.O.G.	Königin-Katharina-Stift	Stuttgart, DE
10918	SPACE	Newmancollege	Breda, NL
12463	KKST	Königin-Katharina-Stift	Stuttgart, DE
12475	Beyond Reach	Zwijzen College	Veghel, NL
12819	Queen Bee	Zwijzen College	Veghel, NL
14144	EAgirls	Ernst-Abbe-Gymnasium	Oberkochen, DE
14183	Dukes of Brabant	Summa College	Eindhoven, NL
16382	Casimir Tech	Lorentz Casimir Lyceum	Eindhoven, NL
16383	Frits Philips Robotics team	Frits Philips Lyceum-mavo	Eindhoven, NL
16409	Team Orange	Newmancollege	Breda, NL
16410	GentleBotz	Newmancollege	Breda, NL
16441	Pretty Smart Robotics	Science&Robotics vereniging Pretty Smart	Saldeburen, NL
16785	Team ProBotiX	Pius X College	Bladel, NL
16788	The Encrypted Gentlemen	Sondervick College	Veldhoven, NL
16850	Breul-1	KSG De Breul	Zeist, NL
17258	The Scrapyrd-Warriors	Northgo College	Noordwijk, NL
18425	Ubbo Tech Team	Ubbo Emmius SG	Stadskanaal, NL
18710	Stanislas Tech Academy	Stanislas College	Delft, NL
19444	Lorentz Engineering	Lorentz Casmir Lyceum	Eindhoven, NL
20091	Blood Sweat and Gears	Maerlant Lyceum	The Hague, NL
20361	RoboRev	Revijs Lyceum	Doom, NL
20738	Secbirdmachine 2	d'Oultermontcollege	Drunen, NL
21658	Thunder Wonder	Emmauscollege	Rotterdam, NL
22020	Gymnasium Haganum	Gymnasium Haganum	The Hague, NL
22042	Lituanica X	Visuomenės iniciatyvų paramos fondas	Vilnius, LT
22107	Tectura 1	GO! Scholengemeenschap	Gent, BE
22173	Red Monkeys	Buurtcollege Maas en Peel	Panningen, NL

FIRST Tech Challenge 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

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

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

MOTIVATE

Sparking others to embrace the culture of *FIRST*! This team embraces the culture of *FIRST* and clearly demonstrates what it means to be a team. This is a team who makes a collective effort to make *FIRST* known throughout their school and community, and sparks others to embrace the culture of *FIRST*.

FIRST Tech Challenge Awards, continued

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.

JUDGES CHOICE

The Judges Choice Award recognizes a Team for their outstanding efforts but does not factor into the advancement criteria.

WINNING ALLIANCE

The winning alliance is recognized for their achievement in robot game performance.

**Thank You *FIRST* Tech Challenge
Season Sponsors!**



FIRST 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.

FIRST Core Values

FIRST is committed to fostering, cultivating, and preserving a culture of equity, diversity, and inclusion that opens STEM opportunities for all. The *FIRST* community thrives under the set of *FIRST* Core Values:

Discovery

We explore new skills and ideas.



Innovation

We use creativity and persistence to solve problems.



Impact

We apply what we learn to improve our world.



Inclusion

We respect each other and embrace our differences.



Teamwork

We are stronger when we work together.



Fun

We enjoy and celebrate what we do!



Thank You, Tournament Volunteers!

List volunteers here

Ben, Joep, Andrei T, Vladimir, Victor, Lucas, Astrid, Bas, Jochem, Radu, Rene, Lisa C, Guus, Mathijs, Koen, Rick, Bianca, Laurens, Rob, Stefan, Jiri, Vlad, Andrei P, Wouter, Niels, Felix, Ine, Stan, Angela, Cezar, Steven, Carlos, Corne, Lisa D, Tijn, Floor, Karen, Jacqueline, Tamar, Ronald, Nigel, Tjeerd

Thank you to all our additional volunteers whose names did not make it into the printed program!

Thank You, 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.



FIRST® the *FIRST*® logo, *FIRST*® Robotics Competition, *FIRST*® Tech Challenge, *Coopertition*®, *Gracious Professionalism*®, *More Than Robots*®, *POWERPLAY*®, and *FIRST ENERGIZE*® are trademarks of For Inspiration and Recognition of Science and Technology (*FIRST*). *LEGO*® is a trademark of the LEGO Group. *FIRST*® LEGO® League is a jointly held trademark of *FIRST* and the LEGO Group. All other trademarks are the property of their respective owners.
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