

# ROBOTICON

## TAMPA BAY

### ROBOTICON 2020 Live Online! November 6-21

#### **FIRST Robotics Competition Remote Game Play Options**

Developed by *FIRST* Robotics Competition team 5276, the Edgar Allan Ohms, our ROBOTICON Live challenges consist of several categories, mostly coming from the original elements of the 2020 game, INFINITE RECHARGE, with a random game element thrown in for fun. Each category will have several challenges. Challenges will be selected based on the number of teams participating and their stated capabilities. Practice field diagram is shown as an example only, with the understanding that most teams have no practice field, or only mocked up game elements.

A challenge may be:

- **Solo** - Challenges that can be done by one team playing on a practice field or with mocked up game elements in an open area
- **Cooperative** – For teams that have access to a full or partial field and can play one on one in a cooperative fashion, as well as remotely against with others teams in modified cooperative challenges and
- **Competitive** – Some competitive challenges can be remote, where solo teams are given assigned times to run their challenges and two at a time will be livestreamed in a split screen view, or , as in the cooperative challenge opportunity, two local teams with access to a full or partial field can compete one on one

#### Categories:

- Power Port
- Shield Generator Switch
- Control panel
- Power cells
- Speed
- The Engineering Ball™

\* All challenges are 2 minutes and 30 seconds long, unless otherwise stated. Most begin with a 15 second autonomous period, and any points scored during that period are tripled.

# Solo Challenges

## Power Supply

In this challenge, robots will be delivering power cells to the power port (or a facsimile thereof) as quickly as possible.

Robots can begin on any starting line and can be preloaded. During the challenge, robots will pick up power cells from the loading bay and deposit them in the power port. Each delivered power cell is worth 3 points.

## *Control panel challenges*

### Seeing Colors

In this challenge, robots will need to move the control panel to specified colors as quickly as possible.

Robots must begin behind the starting line on the trench side. At the start of the match, the ROBOTICON challenge facilitator will select a color. The robot will then have to approach the control panel and spin it to the specified color. This is worth 2 points. Once completed, the robot will have to move back behind the starting line for the next color to be supplied.

### Getting Dizzy

In this challenge, robots will need to move the control panel a specified number of times.

Robots must begin behind the starting line on the trench side. At the start of the match, the ROBOTICON facilitator will select a random number between 3 and 12. The robot will then have to approach the control panel and spin it the specified number of times. Points are awarded based on accuracy. Ending the wheel exactly at the right point awards 8 points. Being 1 color slice away in either direction awards 4 points. Being 2 color slices away awards 2 points. Being 3 color slices away awards 1 point. Once completed, the robot will have to move back behind the starting line for the next number to be chosen.

### ***Engineering Ball***

*for those who may have \*The Engineering Ball™ the FTC exercise ball, as seen here <https://www.andymark.com/products/red-exercise-ball-with-pump> or a similar size yoga/exercise ball*

### **Bounce Back**

In this challenge, robots will try to bounce The Engineering Ball™ between the two alliance walls.

The robot will start behind any starting line. The Engineering Ball™ will start behind the same starting line. 4 points are awarded every time The Engineering Ball™ makes contact with the opposing alliance wall, and is then moved (via the robot or naturally) back behind the starting line.

## Cooperative Challenges

### ***Power Port Challenges*** **Conductivity**

In this challenge, robots will be delivering power cells to the power port as quickly as possible, passing cells between robots along the way.

Robots can begin on any starting line and can be preloaded. During the challenge, robots will pick up power cells from the loading bay and deposit them in the power port. A power cell cannot be deposited by the robot that picked it up. It must be transferred to the second robot for delivery. This does not apply to preloaded cells. Each delivered power cell is worth 3 points. Both teams are awarded their cumulative total at the end of the challenge.

### ***Shield Generator Challenge***

#### **The Prisoner's Dilemma (Cooperative/Competitive)**

*Note: This challenge does not follow the standard time scheme.*

In this challenge, robots will compare how fast they can climb onto and balance the shield generator switch - with the option of sabotaging their opponent's trust.

A randomly selected team will go first. Their robot will start from any starting line, and then hang from and balance the shield generator. The time it takes to do so will be recorded. If the team does not hang during the game period, a time of 2:30 will be recorded.

Next, the second team will perform the same task. Finally, both teams will have to hang from and balance the shield generator switch if participating together, or with split screen remote participation, the time recorded will be how long it takes for both switches to be balanced. Points are then awarded as follows.

- If one team's time was faster than both their opponent's time and the cooperative time, that team earns 15 points while the other team earns 5 points.
- If the cooperative time was faster than both team's individual times, both teams earn 25 points.
- Any other condition results in all teams earning 5 points.

## ***Power Cell Challenges***

### **Power distribution**

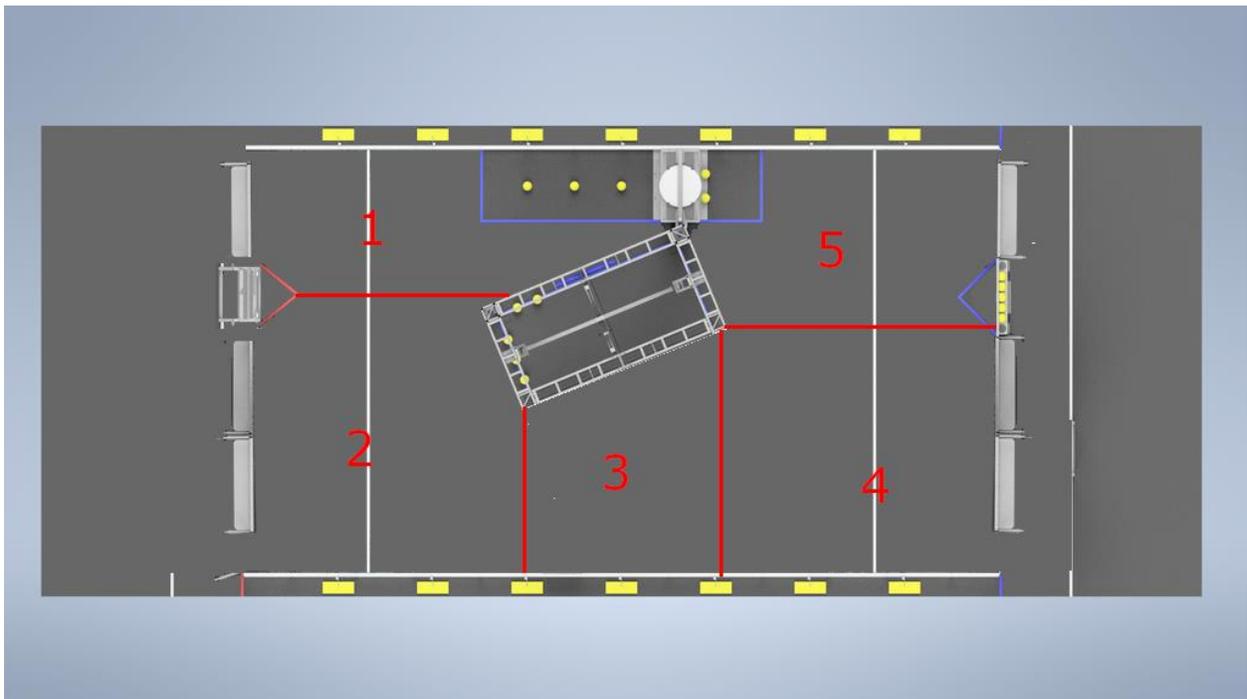
In this challenge, a pair of robots will need to deliver power cells to specific zones as quickly as possible. Teams playing individually from remote locations will be assigned zones.

Robots can be preloaded with 1 power cell. They will need to gather the rest of the power cells from the loading bay. During the match, robots want to get each zone (depicted below) to hold one and only one power cell. If the match ends before each zone has exactly one power cell in it, points are awarded as follows:

- 4 points for each zone with exactly one power cell in it.
- 2 points for each robot behind any starting line when the match ends

If each zone has exactly one power cell in it before the match ends, points are awarded as follows:

- Flat 20 points
- 1 point for every 4 seconds remaining in the match



## Roundabout Relay

In this challenge, robots will traverse around the field, while possibly completing other tasks.

Robots will start touching the alliance wall with the loading bay. One robot will then begin the relay. The only *requirement* for a successful relay is that the robot crosses the opposing starting line, then returns to the alliance wall. This is worth 1 point. However, they can perform other tasks along the way:

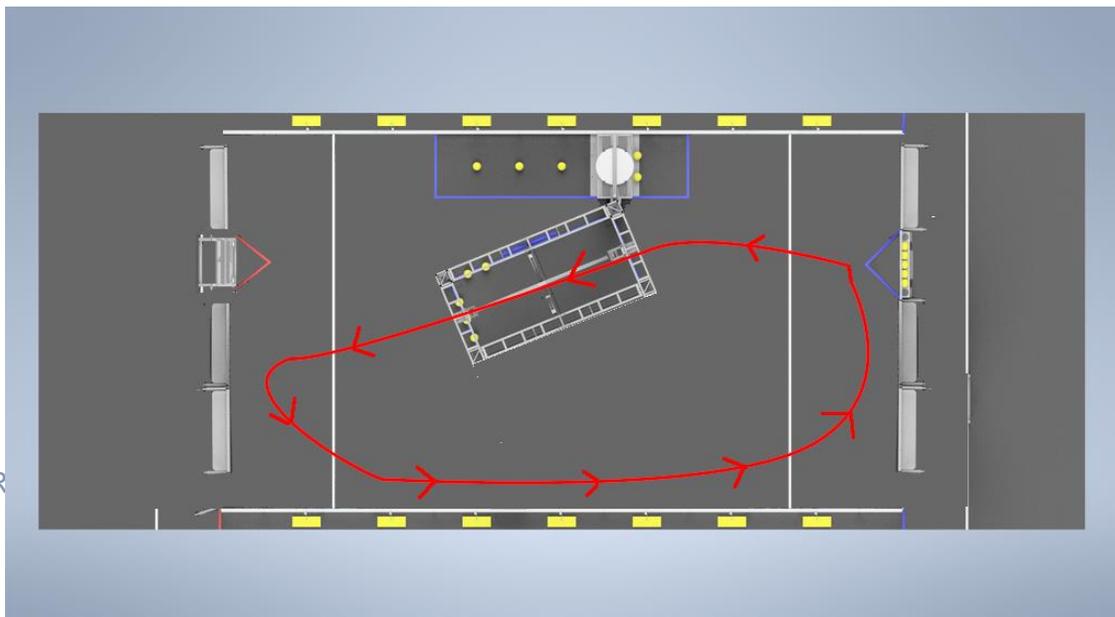
- Move the shield generator switch any visible amount - 2 points
- Lift off the ground using the shield generator switch - 4 points
- Spin the control panel at least one rotation - 3 points
- Pick up a power cell from the loading bay - 1 point
- Deposit a power cell in the power port - 2 points

Each task can be completed at most one time per relay. Once the robot returns to the alliance wall, that relay is considered completed and the second robot can begin moving. Teams are both awarded their cumulative point total.

## Around the block

In this challenge, robots will need to carry The Engineering Ball™ around the field and then hand it off to their partner, if playing on site together, or drop in a relay zone on their field, indicating that the other remote team can then pick up their ball and do their round.

Robots will start touching the alliance wall with the loading bay. Teams can place The Engineering Ball™ anywhere to begin, provided it is behind the starting line. Robots will then need to guide The Engineering Ball™ on the path depicted below. Once the robot crosses the starting line, the other robot can perform the same task. Each successful loop is worth 6 points. Teams are both awarded their cumulative point total.



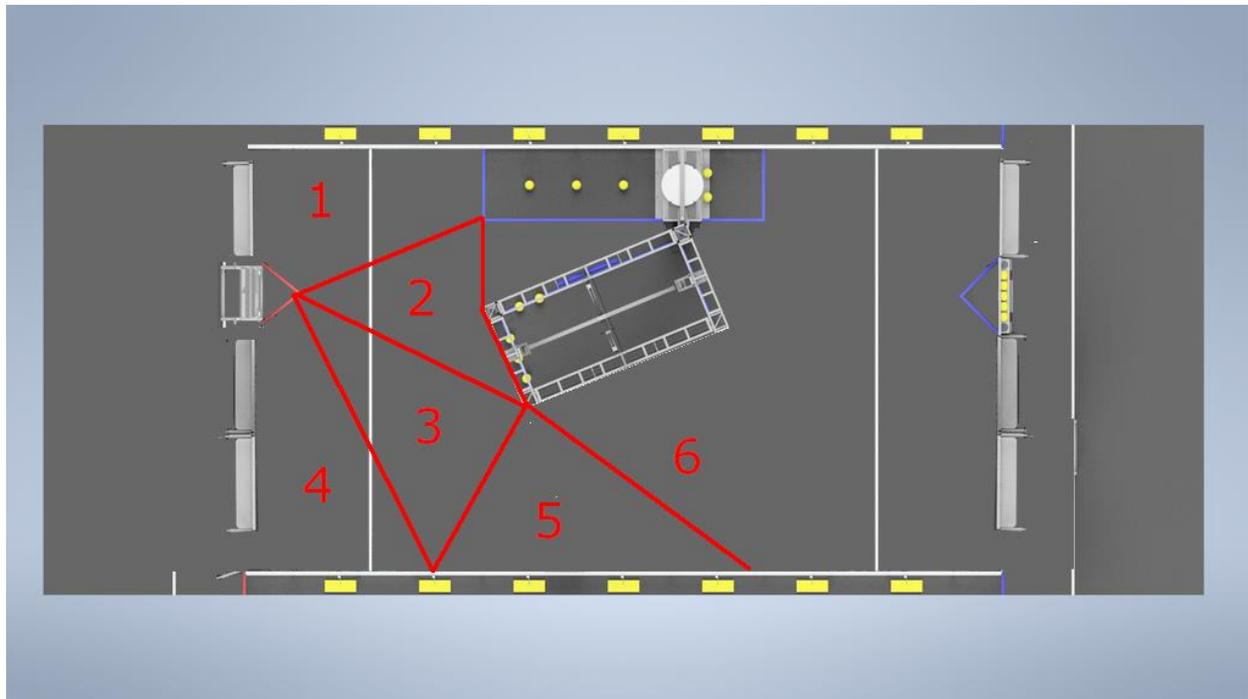
# Competitive Challenges

## *Power Port Challenges*

### **Angles Matter**

In this challenge, teams will have to shoot power cells into the outer or inner port. Teams are awarded more points for shooting from a variety of locations around the field

The field will be divided into 6 zones, as depicted below. Shooting a power cell into the outer port from any zone is initially worth 5 points. After successfully making a shot, the next shot from that same section will be worth 4 points. This will continue to decrease until the section is only worth 1 point. Shots to the Inner Port are worth double of the current value of the zone. At the end of the challenge, the team with the most points will be awarded their point total. The losing team will be awarded half of their point total, rounded up.



## Speed Challenges

### Back and forth

In this challenge, robots will need to traverse from one side of the field to the other as fast as possible, while avoiding their opponent, or as a timed trial for remote, individual teams.

Robots will start behind any starting line. Robots earn 1 point each time they successfully pass the opposite starting line and return back. Robots can attempt to block or deter their opponent throughout the challenge. At the end of the challenge, the team with the most points will be awarded their point total. The losing team will be awarded half of their point total, rounded up.

### Dance Party

In this challenge, robots will need to complete a randomized set of dance moves as fast as possible, while possibly avoiding their opponent.

For the duration of the challenge, a series of “dance moves” will be continually generated and given to the teams. The first 5 dance moves will be given in advance, for the purposes of autonomous. Each dance move is worth 1 point.

The dance moves are:

- Move to quadrant 1, 2, 3, or 4 (quadrants specified below)
- Spin clockwise
- Spin counterclockwise
- Shake (move back and forth)
- Slide (move from one end of any starting line to the other end)

At the end of the challenge, the team with the most points will be awarded their point total. The losing team will be awarded half of their point total, rounded up.

