Rules Briefing - 9/13/18

Pre-Match:

Starting locations for the robot:

- Latched to the lander
    - The robot must be completely latched to the lander support bracket on their alliance's specific side. The lowest point on the robot and team marker may not be any closer than 4 inches to the floor.
- Deployed from the lander
    - The robot must be in the landing zone within the vertical projection of the lander support bracket. A portion of the robot must be below the bracket. The robot can not start in the opposing alliances landing zone.

Once the robots are either latched or deployed and the autonomous programs have been initialized, the referee will signal the drive team to tell them:

- Drive teams may no longer touch the robots until the conclusion of the match.
- Drive teams may no longer touch their driver stations or controllers until the autonomous period has ended, except to start the autonomous program.
- Two silver and one gold sample will be randomly placed in each sampling station

Autonomous Period:

The autonomous period in which robots are controlled by a preloaded autonomous program, lasts for thirty seconds and starts at the countdown of a timer.

The autonomous score is calculated based on performing the following tasks:

- Landing
    - Robots that begin on the lander may lower themselves onto the playing field. Each robot that is in contact with the floor and the lander earns 30 points.

- Claiming
    - Each robot that successfully places their team marker in their alliance's depot earns 15 points. You are not allowed to launch, shoot, or throw the marker into the depot, only place it.
        - If a depot is claimed, then minerals can not be taken from the depot by the opposing alliance during the driver-controlled period
- Parking
    - Each robot in a crater at the end of an autonomous period earns 10 points.
- Sampling
    - Each sample field that has its gold mineral out of the corresponding taped area and the 2 silver minerals remaining in place will earns 25 points for the alliance that moved the gold mineral.

Minerals that are placed in depot or cargo hold during the autonomous period are scored the same way they are during the driver-controlled period.

<u>Driver-Controlled Period</u>

Following the autonomous period, each alliance has 5 seconds plus a 3 second countdown to prepare their driver stations for the driver-controlled period.

The driver-control period is scored based on completion of the following tasks:

- Minerals in the depot
    - Minerals placed into an alliances depot earn 2 points each. Minerals removed from an alliances depot deduct 2 points each.
- Gold minerals in the cargo hold
    - Gold minerals placed in the gold cargo hold in the lander earn 5 points
- Silver minerals in the cargo hold
    - Silver minerals placed in the silver cargo hold in the lander earn 5 points

        - Gold minerals in the silver cargo hold and silver minerals in the gold cargo hold are considered contaminants and are worth 0 points
        - To be considered scored, a mineral must be completely in the area defined by either the depot or the cargo hold

End Game:

The last 30 seconds of the driver-controlled period are called the end game. Driver-controlled period scoring can still take place during the end game.

Points are rewarded at the end of the match for the following end game achievements:

- Robots latched
    - Each robot that deployed during pre-game or in the course of game play and is latched into either of their alliance's specific lander support brackets at the end of the match scores 50 points.
- Robots parked in any crater
    - Each robot that is parked in any crater at the end of the match earns 15 points.
- Robots parked in any crater
    - Each robot that is parked in any crater at the end of the match earns 25 points.

Rules and Resource Updates - 10/9/18

- A critical update has been made to the navigation targets to correct a scaling issue on two of the images.
- A robot may control or possess a maximum of two minerals at a time. However, due to the density of minerals within the crater, robots may temporarily exceed this limit while collecting minerals that are in the Crater. Robots are required to shed excess minerals before performing any other gameplay activities. Within the crater, plowing through any quantity of minerals is allowed but herding or directing multiple minerals beyond the allotted maximum to gain a strategic advantage is not allowed.
- Robots in a crater are not eligible to score minerals. Violations of this rule will result in a minor penalty per offense. Additional occurrences of violations of this rule will escalate to yellow cards quickly.
- Robots may not obstruct another robot's path of travel in the area between the lander and a crater for more than 5 seconds. If a referee determines this rule is violated, the offending alliance will receive a minor penalty for every five seconds that they are in violation of this rule. This rule only applies during the driver-controlled period.
- The robot main power switch must control all power provided by the robot main battery pack. FIRST requires teams to use either the TETRIX (part # W39129), MATRIX (part # 50- 0030), or REV (REV-31-1387) power switch. The robot main power switch MUST be mounted or positioned to be readily accessible and visible to competition personnel. A main robot power label must be placed near the main power switch of the robot.
- UVC compatible cameras are allowed for computer vision-related tasks. It is recommended that UVC compatible cameras be connected to the robot controller through a powered USB hub that is in turn connected to the robot controller through an OTG adapter.