Barrel Racing Competition
(rule version 20250320)

Objective: The robots will race around a course of three competition soda cans set in an equilateral triangular pattern, circling each can: the first can in a counterclockwise direction and the second and third cans in a clockwise direction. The course starts from a starting line set opposed to the apex can, forming a tilted rectangular arena. The first can is to the left of the starting line, the second can is to the right of the start line and the third can, at the apex of the triangle is opposite the start line. The three cans will be set upside down and an optic yellow colored tennis ball in good condition will be placed on the top of each can. The adhesion of the can to the arena floor will be modified using a "grippy" material that will resist the cans' ability to slide.

Robot: Competing robots must run autonomously but are <u>not</u> required to be self-contained. Robot size is limited to 18x18 inches. The maximum robot weight is 20 pounds.

Self-Contained Definition: Self-contained means that all computing power used to run the robot is carried on the robot platform.

Run Definition: A run starts when the robot is placed in the waiting area of the arena, given a signal from the judge, and crosses the starting line. If the robot fails to move, the competitor can remove the robot and try again at the end of the round. If the robot doesn't move when given this 2nd chance, its run is forfeited. The run ends whenever the robot completes the objectives, or malfunctions after moving, or 3 minutes have elapsed. Each robot is allowed 1 run per contest round.

Round Definition: A round consists of a single run by each competing robot. The competition consists of 3 rounds.

Play: At the start of the competition, the robot is placed in the waiting zone, facing the start/finish line. The start/finish line is in front of the waiting zone and is marked with blue painter's tape. The center line of the robot must cross over the start/finish line at the beginning and end of the course. After passing the start line, the robot turns towards the first can (left side) and moves around the can in a counterclockwise direction. The robot moves to the second can (right side) and moves around the can in a clockwise direction. After traveling around the second can, the robot moves to the third can (apex) and moves around the can in a clockwise direction. Finally, the robot travels past the finish line. See the diagram.

Start/Finish Line
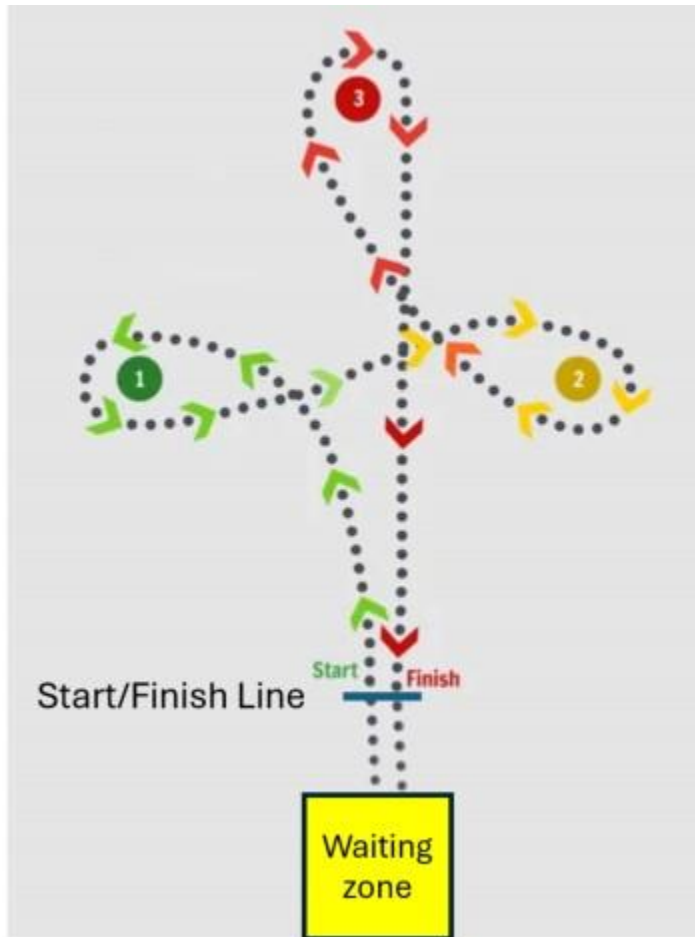
Knocking over a can or displacing a tennis ball ends the run. Beacons or other navigational aids cannot be used.

Course: The course consists of a equilateral triangular pattern of three DPRG competition soda cans (see: dprg-can-design-v20141202). These cans will be turned upside down and an optic yellow colored tennis ball in good condition will be placed on the top of each can. The adhesion of the can to the arena floor will be modified using a "grippy" material that will resist the cans' ability to slide. The sides of the course's triangle are determined by the judges at the time of the competition. The ideal side size is considered 6 to 8 feet. The start/finish line should be 2 to 3 feet in front of the base of the triangle of cans. The waiting zone, 18" x18", should be two feet in front of the starting line. The length of the start/finish line is only 9 inches long and the centerline of the robot must pass over the line at the start and finish of the course. All markings are made with blue painter's tape.

The purpose of the waiting zone and the placement of the starting line is to allow the robot to build some speed before entering the course and to prevent aiming at the first can prematurely. The pattern the robot runs should resemble a clover leaf

Scoring: A robot's run score is the time that the robot takes to run the course. Knocking over a competition can or displacing a tennis ball disqualifies the run. The winner is determined by the fastest time the course is successfully run. The same for second and third place winners.

Judging: One or more judges will referee the contest. They will ensure the rules are followed and impose scoring penalties or remove a robot from competition if the robot is operating in an unsafe manner or not complying with the rules. The decisions of the judges are final.

Safety: If the behavior of a robot is determined to be unsafe or might damage the course environment, the judge will withdraw the robot from the competition. The decisions of the judges regarding safety matters are final.