



2. **ARENA** This contest will make use of the Cube Quest arena.
  - a. Size: 6x6 foot
  - b. Floor Material: Gray Carpet from Lowes, item #97937
  - c. Boxes: 12x12 inches +/- 1 inch located at opposite corners of the arena against the wall. The boxes may be cardboard, foam, or other suitable material.
  - d. Walls: Wooden boards 2.25" tall, painted green.
  - e. Obstacles: 3" White PVC Pipes cut to 3.5" long, may have manufacturer's markings. Located at the corner along each route, with an 18" gap between the obstacle and each wall.
  - f. Start Area: 12x12 inches. The front of the Start Area will be marked on the carpet and/or the wall. The robot may start anywhere within the start area, provided no part of the robot protrudes out of the start area.
  
3. **TIME** A time limit of 90 seconds will be imposed.
  
4. **STARTING PLACEMENT** Each robot will start at one of the two starting locations. The judges will not reveal in advance which of the two routes each robot will take.
  
5. **START TIMING** Robots will have a 5 second delayed start. Expansion or other movement of the robot is not permitted during this time.
  
6. **ROBOTS**
  - a. Robots must initially fit within a 12x12 inch square.
  - b. Robots may expand but must at all times fit within an 18 inch cylinder.
  - c. Robot height must be no greater than 18 inches.
  - d. Robot weight must not exceed 20 pounds.
  - e. Swarm bots or other multiple bots are not permitted.
  - f. Judges may deem any robot unsafe and subject to disqualification.
  - g. Robots may not deposit anything on the playing surface.
  - h. Robots must be autonomous, human intervention and remote control are not permitted.
  - i. The robot's brain must be contained within the robot - no external processing.
  - j. Streaming telemetry from the robot to an external device is permitted.
  - k. External devices are not permitted to send any signals back to the robot, with the exception that a manually operated remote kill switch is permitted.
  - l. The robot must be prepared to run either of the two routes. Reprogramming is not allowed once the judge assigns each robot to a path for that round. Reconfiguration of the robot is permitted provided it takes less than 15 seconds.

## 7. SCORING

- a. Round Robin (Preferred)
  - i. The robot that completes the course in the fastest time is awarded 1 point, provided there are no penalties.
  - ii. Time permitting, each match may be run twice, once in each starting position.
  - iii. The robot that collects the highest number of points after all matches wins. If there is a tie at the end, head to head match(es) between the tied robots will determine the winner.
- b. Double Elimination Bracket
  - i. If a large number of competitors are entered, a round robin may not be possible in the allotted time and a double elimination bracket will be used.
  - ii. Each robot will run on only one of the two paths. There will be no option to run twice, once on each path.
  - iii. One of the robots must be declared the winner. If both robots commit penalties during their run, the match may be rerun one time. Otherwise the winner may be determined via rock-paper-scissors, coin flip, or other means at the judge's discretion.
- c. Penalties
  - i. A robot will be ineligible to earn a point if it does any of the following:
    1. The robot cuts through the center of the arena: any part of the robot crosses an imaginary diagonal line drawn between the two obstacles.
    2. The robot moves an obstacle by more than 1/4"
    3. Any part of the robot exits the arena or rides along the top of the arena walls
    4. The robot does not complete the course within 90 seconds.

*NOTE: The run does not immediately stop if one of the above penalties occurs. If both robots commit a penalty during the run, neither robot will receive points regardless of which robot committed a penalty first.*
  - ii. The round will immediately end and a point will automatically be granted to the opponent if a robot does any of the following:
    1. The robot causes any physical interference with the path or motion of the opposing robot.
    2. The robot moves the box more than 1".
    3. The robot moves the arena significantly as determined by the judges
  - iii. A robot will be disqualified from the competition if it does any of the following:
    1. The robot damages a box in a way that compromises the ability for the competition to continue. This includes but is not limited to severely denting or puncturing the box. Judges shall have final authority.