

ROBO BILLIARDS

DESCRIPTION: Prior to the competition, the contestants will design and build a **single** robot capable of placing standard billiard balls into containers located at each corner of a square table. **Robots and transmitter(s) must be impounded prior to the competition.**

TEAM OF UP: 2 **APPROXIMATE TIME:** 20 minutes **RUNNING TIME** 5 minutes

1. ROBOT AND CONTROL SYSTEM: **IMPOUND:** Yes

- a) Robots and control system may be constructed from any materials that do not present a safety hazard to the contestants, judges, or spectators.
- b) The robot may be operated by radio control, control panel(s) connected by wires, or both. One transmitter/control panel per participant may be used (maximum two).
- c) All Radio Control Transmitters and Receivers must comply with Federal Communications Commission (FCC) regulations. Only unmodified, commercially available equipment intended for license free operation of model surface devices may be used. Equipment using frequencies restricted to model aircraft may not be used. Transmitters/receivers must use batteries as specified by their manufacturer.
- d) All energy used to power the robot must be derived from one or more commercially available batteries connected so that the total voltage does not exceed **9.6 volts**. The voltage stated on the batteries, by the manufacturer, will be accepted.
- e) Prior to starting the competition, the robot, excluding transmitter(s) and/or control panel(s) and connecting wires, must fit into a 30 cm x 30 cm x 30 cm cube.

2. THE COMPETITION

- a) Table (See Figure 1):
 - i) The competition will take place on a flat, **level** table, without side rails, approximately 1.2m (4ft) x 1.2m (4ft) square, supported at each corner by a 3 lb. coffee can or similar item. The cans also serve as pockets to place the balls in.
 - ii) **The table will be covered with a relatively smooth, dense, short nap carpet.** A 30 cm x 30 cm square will be marked on the carpet with one side centered on and adjacent to one of the table's edges.
 - iii) Each corner of the table is cut out to facilitate placing the balls in the pockets.
- b) The balls will be placed on the **table** in **numerical order as shown in Figure 1** before starting the competition.
- c) **The cue ball will be placed on the table adjacent to the center of the square's side nearest the center of the table. The remaining balls form an equilateral triangle with one side parallel to and 20 cm away from table's edge opposite the square.**
- d) Immediately prior to starting the run, the robot will be placed on the tabletop within the 30 cm x 30 cm square in any orientation.
- e) At the judge's signal, teams will be allowed 5 minutes to remove all balls from the tabletop. The robot may remove the balls individually or in groups of any number.
- f) Balls leaving the tabletop out of the robot's control, which are not in a pocket, are out of play and receive no points.

This is a draft of the proposed rules for 2003. Please see the 2003 Coaches Manual And Rules Book for the final official version.

- g) Judges will measure the time required to complete the task. Time starts when the robot first moves, and ends if all of the balls are off the table out of the robot's control, or 5 minutes have elapsed, whichever occurs first.
- h) **If the robot leaves the table it is to be placed in the starting square. The clock never stops. Any billiard balls within the square will be removed from play.**
- i) **If a student touches the robot or a scorable item, or uses the wires or control box to physically move the robot or a scorable item, the competition ceases at that point and the score will be determined prior to the violation**

3. SCORING:

- a) The cue ball **has no value. It is a wild card and** may be used in place of either a striped or solid colored ball (not both), whichever generates the higher score for the pocket. The eight ball will be counted as a solid colored ball.
- b) A maximum of 8 points per pocket may be awarded as follows:
 - i) One point for each ball placed in a pocket. (Maximum 4 points per pocket)
 - ii) One point if the pocket contains a solid colored ball and its matching color striped ball. (Maximum 2 points per pocket)
 - iii) One point if the pocket contains two or more striped balls.
 - iv) One point if the pocket contains two or more solid colored balls.
- c) Teams with higher scores will be ranked above those with lower scores. Ties will be broken in favor of teams with the shorter elapsed time. The sum of the numbers on the balls in each pocket will break remaining ties. The team with the highest total for any pocket will win (additional pocket totals will be used if necessary).
- d) Robots that do not comply with one or more of specifications "b-e" under paragraph #1, Robot And Control System, will be allowed to compete, however, they will be ranked behind all robots that meet the specifications. Robots that fail to meet specification "a" under paragraph #1 **and those that violate the FCC regulations** will not be allowed to run and will receive participation point(s) only.

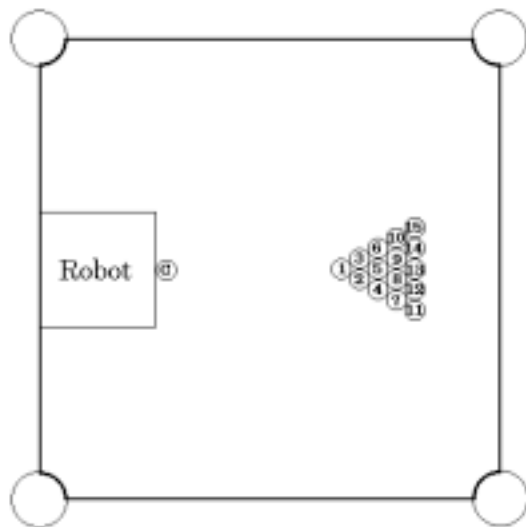


Figure 1