

## “KEGELRING FOR INTERMEDIATES” CONTEST RULES

*Version 2.7 dated April 19, 2015  
According to the version of the Open Robotics tournament  
for the Polytechnical Museum Cup*

### 1. Competition rules

- 1.1. There are 8 white skittles placed at the ring before the competition start. The robot is placed in the center of the ring.
- 1.2. In the allotted time the robot within a circle which outline the ring, should push the 8 white skittles out. After the robot pushed all the skittles out, the game stops and the elapsed time is considered as the time of the game. If the robot does not manage to push all skittles out during the round a penalty time is assigned for every missed skittle. Winning robot is the one which completes the task at a minimum time which in its turn equals to the time of the match plus fines.
- 1.3. There are 60 seconds given for the ring cleaning. The robot has to stop at the end of the allotted time for playing.
- 1.4. Participants of commands should not touch robots, skittles or ring during the contest.

### 2. Ring

- 2.1. The ring color is light.
- 2.2. The constraint line color is black.
- 2.3. The diameter of the ring is 1.5 m (white circle).
- 2.4. The constraint line width is 50 mm.

### 3. Skittles

- 3.1. Skittles are tin cylinders made of empty standard cans (330 ml) used for beverages.
- 3.2. Skittle diameter is 70 mm.
- 3.3. Skittle height is 120 mm.
- 3.4. Skittle weight is no more than 50 g.

### 4. Robot

- 4.1. The maximum width of the robot is 20 cm, its length is 20 cm.
- 4.2. Height and weight of the robot is unlimited.
- 4.3. The robot must be self-sustained.

- 4.4. Dimensions of the robot must remain intact and must not go beyond 20 x 20 cm during the competition.
- 4.5. The robot should not have any devices for pushing of skittles (mechanical, pneumatic, vibrating, acoustic, etc.).
- 4.6. Robot should push the skittles exclusively by its body.
- 4.7. It is prohibited to use any adhesive devices on the robot body for skittles collecting.

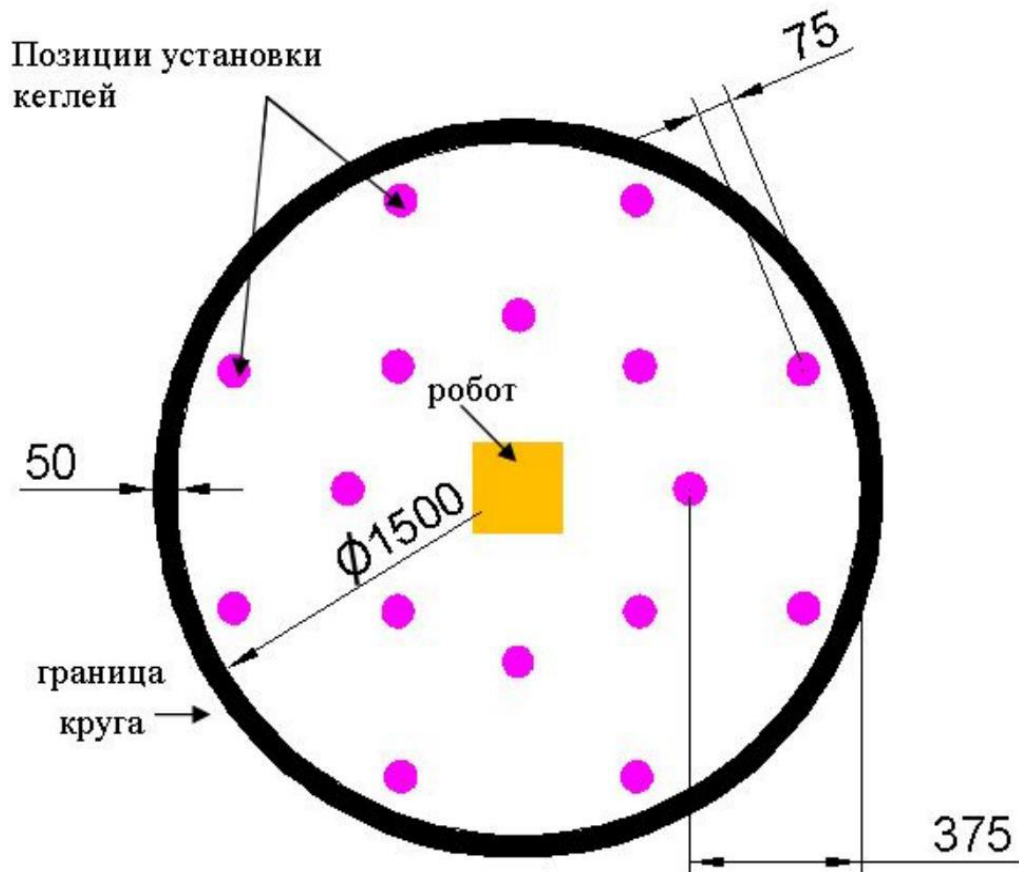


Fig. 1. Ring

## 5. Game

- 5.1. The robot is placed strictly in the center of the ring.
- 5.2. 8 skittles are evenly placed within the ring circle. Skittles are placed on the two distances of 75 mm and 375 mm from the restrictive black line. Contest participant can rearrange location of the skittles before game start.
- 5.3. Placement of skittles is determined by results of the drawing procedure.
- 5.4. When the skittles are placed the competition participant starts the robot on referees command. Then no one shall interfere in its work. Participant shall not change the initial orientation of the robot before its start.
- 5.5. Robot should not entirely leave the ring during the contest. If no part of the robot is above the white circle of the ring, the robot scores a loose (disqualification).
- 5.6. 60 seconds are given for the exercise. Then the robot has to stop. Otherwise it is scored a loose (disqualification).

- 5.7. Goal of the robot is to push all skittles out of the circle restricted by the line. After the robot pushed all the skittles out, the game stops and the elapsed time is considered as the time of the game. If the robot does not manage to push all skittles out during the round a penalty time of 10 seconds is assigned for every missed skittle. Winning robot is the one which completes the task at a minimum time which in its turn equals to the time of the match plus fine time for missed white skittles.
- 5.8. If in the allotted time of the round robot didn't pushed out any skittles, it is scored a loose (disqualification).
- 5.9. Skittle is considered as pushed out, if no part of it is inside a white circle, restricted by the line.
- 5.10. Skittle which was out of the ring once is considered to be pushed out and can be removed from the ring in the case of reverse rolling.
- 5.11. Remote control and issue of any commands for the robot are prohibited.
- 5.12. When the last skittle is pushed out, the robot shall remain inside the white circle for at least 5 seconds.

## **6. Rules for selecting a winner**

- 6.1. Each team has no less than 2 attempts (exact number is determined by the referee committee on the competition date).
- 6.2. The best time result is counted.
- 6.3. If the prize is claimed by several participants with the same time result, they are assigned additional rounds until the winner is identified.