INTELLIGENT ROBOT CONTEST

1. OBJECTIVE

The participating team is required to design and build either a single autonomous robot or multiple autonomous/corporate robots to collect 15 foam balls in a competition arena. The balls are in green, yellow and pink colours. Each colour has 5 foam balls. The collected colour balls are delivered into 3 different goal-containers according to their respective colours within 6 minutes. The colour foam balls are placed at the right section of the competition arena. They are located at least 100mm away from the nearest edge. The competing robots either go through the tunnel that is 390mm height or take a longer path to reach the ball collecting area.

2. ROBOT SPECIFICATIONS

The overall size of all participating robots shall not exceed 450mm (Length) x 450mm (Width) x 900mm (Height). The overall weight of all robots shall not exceed 20Kg. All robots operate autonomously or they perform corporately among themselves.

Each robot has to provide a start/stop switch for the handler to commence the contest. In the case of multiple robots, the handler has to activate all the start/stop switches together. Otherwise, one of the competing robots has to provide a master start/stop switch to activate all robots. If the competing robots communicate through radio frequency (r.f.), the handler has to declare the frequency upon the submission of the entry.

Please note that no external input on selection of tactics on any robot is permitted throughout the competition. The use of external power is also not allowed.

3. COMPETITION FIELD SPECIFICATION

A 3D view of competition arena is shown in figure 1. The 2D drawings with dimensions and markings of the field, the goal-container and the tunnel are shown in figure 3, 4 and 5.

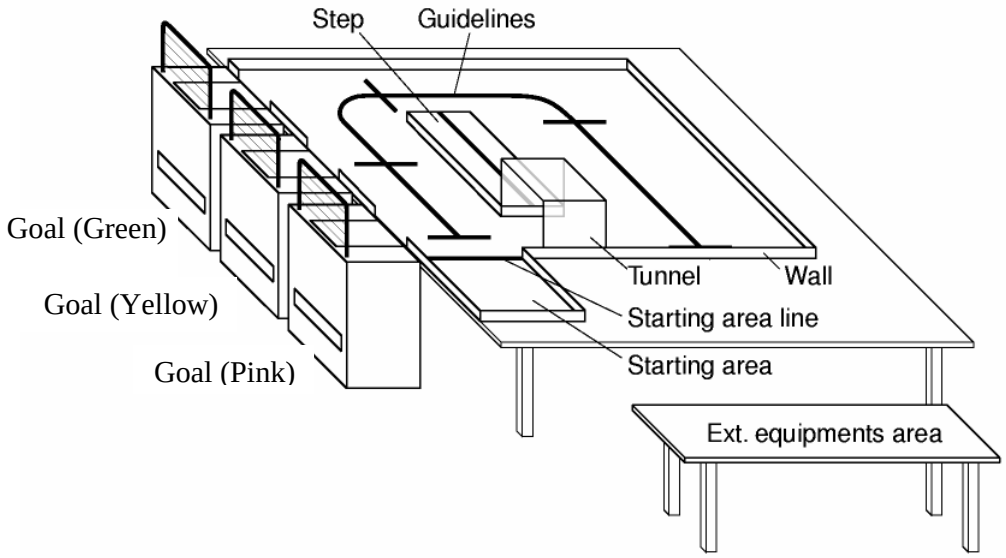


Figure 1: The 3D View of Competition Arena

4. COLOR FOAM BALL SPECIFICATIONS

The diameter of color foam balls varies from 65mm to 70mm. The weight of each ball varies from 10g to 15g. The colors are in green, yellow and pink. There are 5 balls in each color. One of the suppliers is from http://www.promostressball.com.

5. COMPETITION RULES

Figure 2 shows the competition layout. There are 8 regions where the balls will be placed. Note that these regions, which are appeared as 4x2 dotted-line matrix in the figure, will not be marked on the actual competition platform. The position of the balls will be made known only after all the participating robots are submitted. The same arrangement of balls will be used for all the participants.

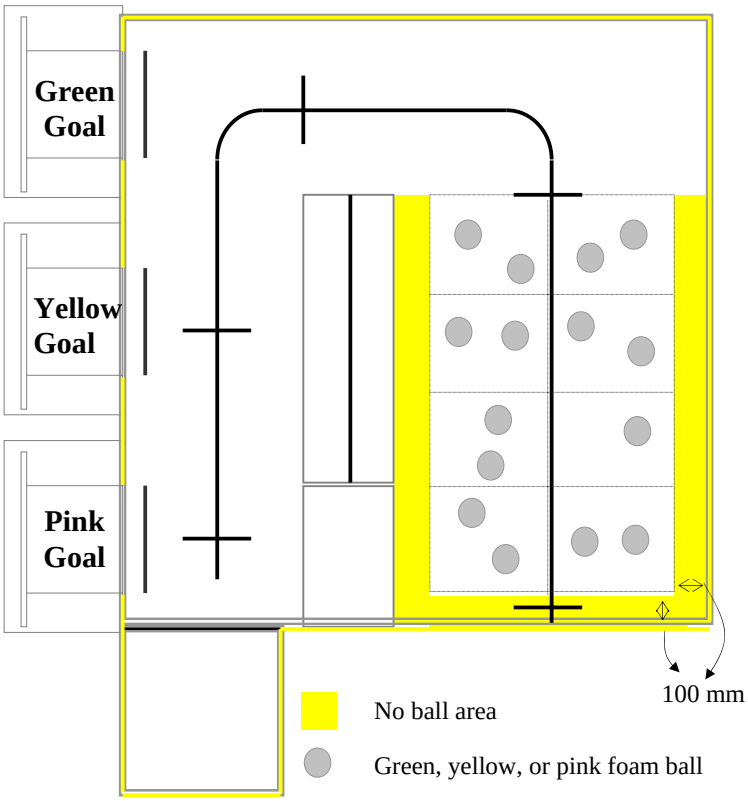


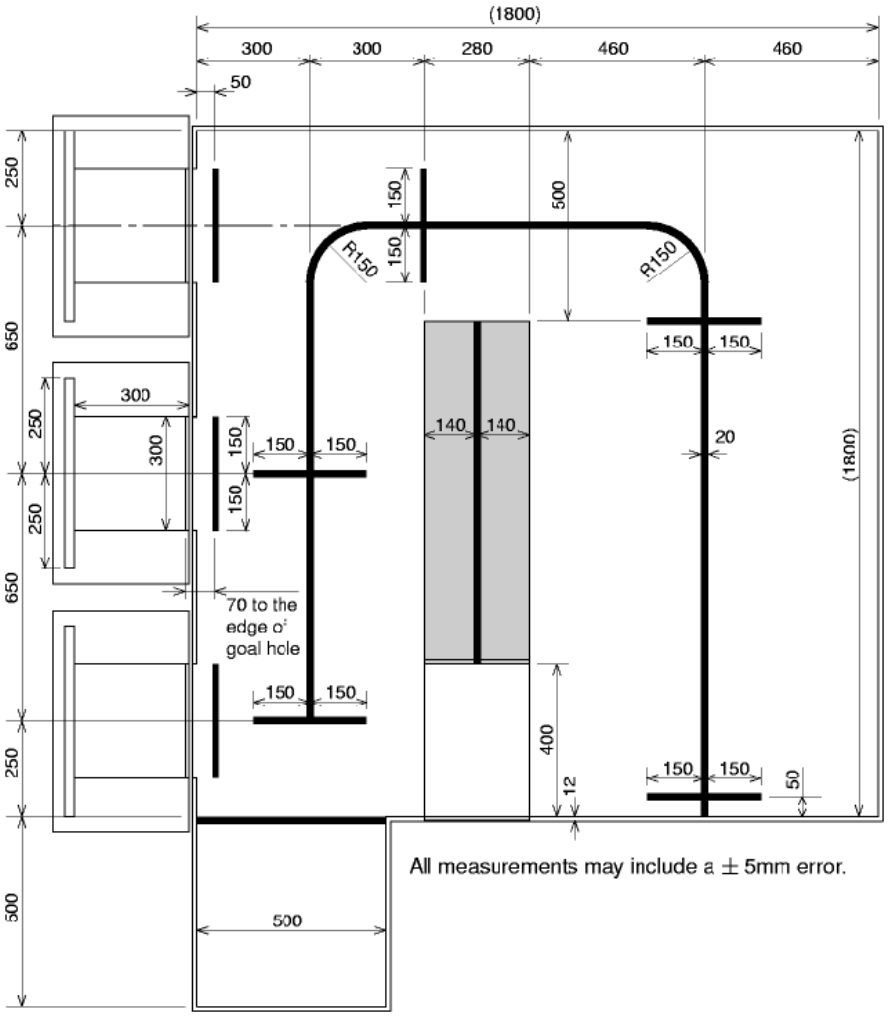
Figure 2: The Competition Layout

6. COMPETITION RULES

6.1. Each entry is given 1-minute setup time to get ready and 6-minute competition time to perform. Upon the setup time is over, the handler may request for 1-minute timeout otherwise the competition time starts even through the entry is not ready. Only one timeout is given to each entry.

6.2. The handler has to place all the competing robots within the starting area. The handler is only allowed to press the start/stop switch once to start the competition. For multiple robots, handler needs to press the start/stop switches on each robot together or one after another without any waiting interval.

6.3. Once the robot is pressed, it has to leave the starting area within 30 seconds otherwise it is judged as a crash. For multiple robots, at least one robot has to leave the starting area within 30 seconds otherwise the entry is judged as a crash.



Field	:	the floor: Made by lauan [19], Thickness: 15mm
	:	the wall: Made by lauan [19], Thickness: 12mm
	:	Color: horizontal surface=white vertical surface=yellow (painted)
Step	:	Made by lauan [19], Height: 40mm
	:	Color: horizontal surface=white vertical surface=yellow (painted)
Tunnel	:	Made by acrylic plate, Thickness: 10mm
Guiding Line	:	vinyl tape, Width: 19mm, Max. Error of width: -2mm, Color: black
Box of Goal	:	Thickness: 9mm, Made by lauan [19] , Color: blue, yellow and red (painted)
Bucket	:	plastics
Net	:	Green Net for baseball with 40mm×40mm stitch
Frame of the Net	:	pipes (dimeter is 28mm)
Starting Area Line	:	Same with the Guiding Line

Figure 3: The 2D Drawing of Competition field

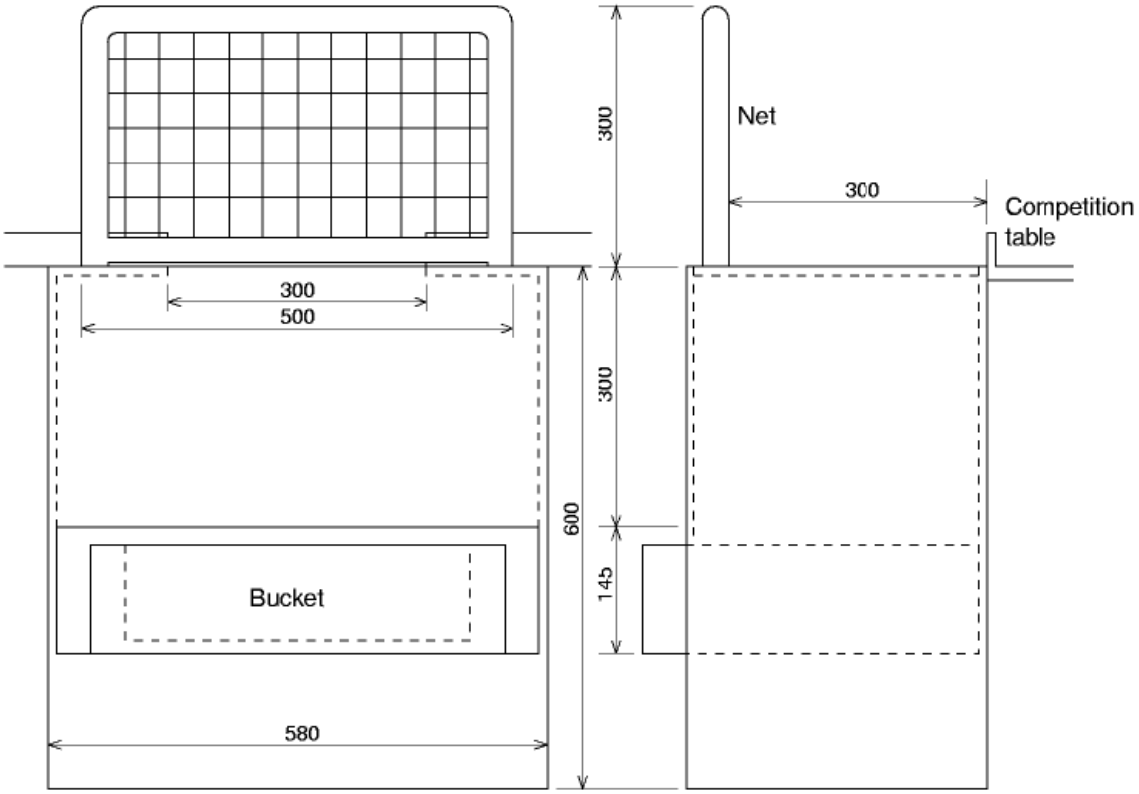


Figure 4: The Drawing of Goal-container

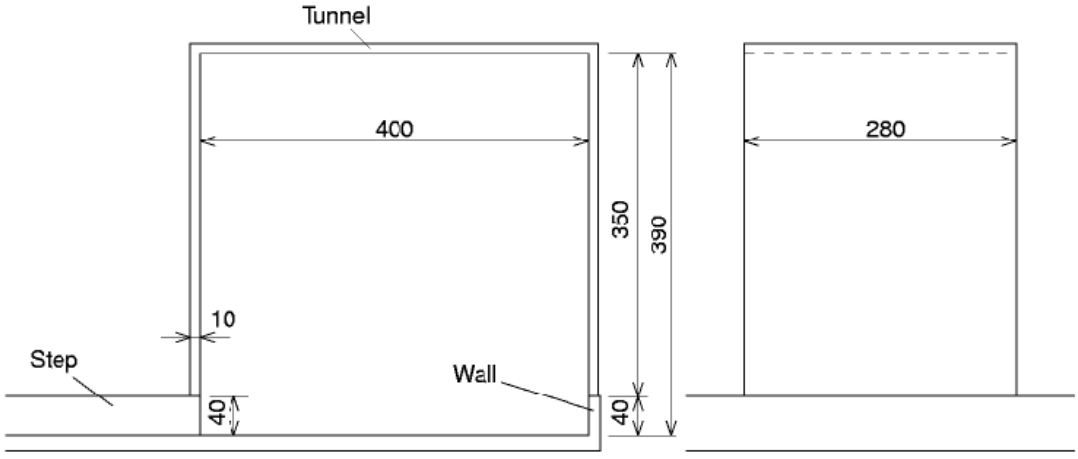


Figure 5: The Drawing of Tunnel

6.4. Each entry is given 5 chances of crash. A crash defines as whenever a competing robot is not able to perform such as any robot does not move or jam in the arena. When the handler wishes to restart the robot after a crash occurs, the handler needs to seek the

judge's permission to stop the robot. For the multiple robots, all robots must stop and restart. Before restart, the handler needs to empty any tennis ball retained by the robots.

6.5. For the multiple robots using r.f. communication among them, the handler has to anticipate the interference arising in the environment. If any case happens and the interference is not able to resolve, the handler needs to bear with it to proceed for the competition.

6.6. The entry shall withdraw from the competition if the entry crashes 5 times or the 6-minute competition time elapsed or the entry is dangerous to audience.

6.7. The number of color foam balls collected and delivered into the right goal-container by the robots determines the event winners. 1 point is given to the team for the robot to deliver a ball into the right container. If a robot delivered a color ball into the wrong container, 1 point will be deduced from the team score. If there is a tie, using the number of tennis ball retained by the robots determines the winners. If the tie still remains, using the elapsed time to complete the competition determines the winners.

6.8. In the event of any ambiguity in the competition rules, the judge's interpretation shall prevail. Should a situation arise that is not addressed in the rules, the judges will decide on the matter and their decision will be final.