INTELLIGENT ROBOT – CHALLENGE COURSE

1. OBJECTIVE

1.1 The participant is required to design and build either a single robot or multiple robots to collect 15 tennis balls which are scattered on top of the specified arena plus a given tennis ball to the robot(s). The robot(s) needs to deliver all tennis balls in any 3 goal-containers within 10 minutes. The event is similar to the Intelligent Robot – Challenge Course event organized by Robofesta, Japan.

2. ROBOT SPECIFICATIONS

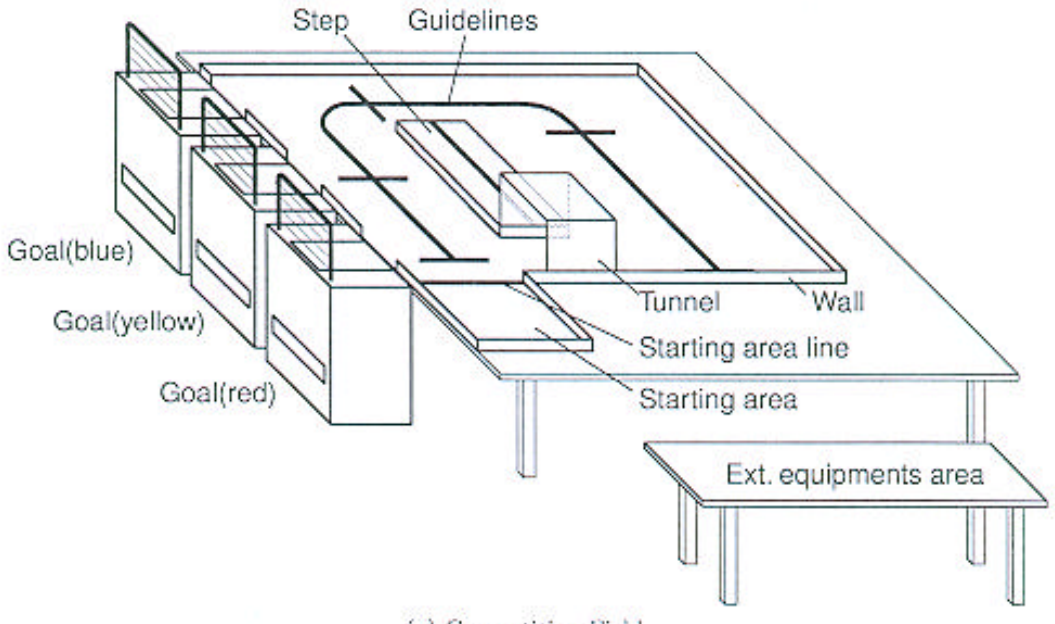
The dimensions of a robot shall not exceed 450mm (Length) x 450mm (Width) x 900mm (Height). If an entry submits multiple robots then all robots must be placed within the starting area which is 500mm (Length) x 500mm (Width). The overall robot weight shall not exceed 20 Kg.

The robot must be fully autonomous (One switch or a single key on the keyboard is only allowed to operate the robot). A robot can be self-contained or only contains the necessary parts to perform tasks in the competition arena and the host computer (system) to process the tasks shall be placed at a given table next to the arena. The connection between the host computer (system) and the robot is either by cables or by wireless modems.

If the connection is by cables, no part of the cables shall touch any objects in the arena otherwise the robot shall be disqualified. If the connection is by wireless modems, the handler must get approval from the SRG committee for the frequency that uses during registration.

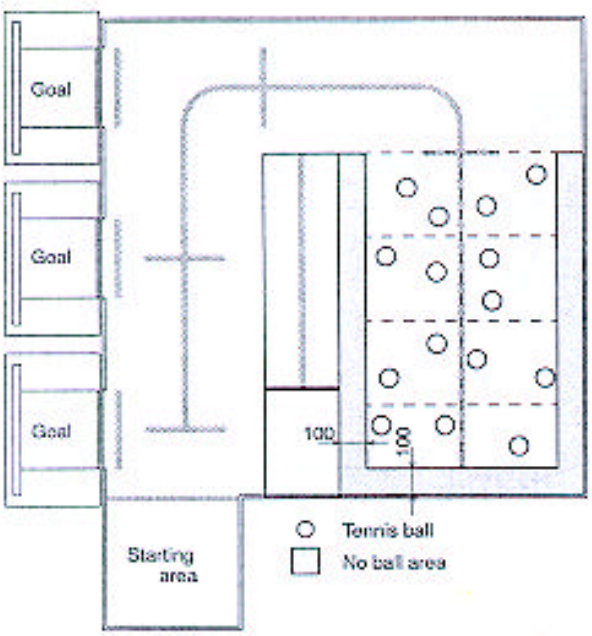
3. COMPETITION FIELD SPECIFICATION

The 3-Dimensions view of the competition Field is shown in figure (a). The field contains 3 goal-containers at the left edge of competition field. A step is located at about the middle of the field. There are guidelines (markings) on the floor indicating the positions of the goal-containers (goal-boxes), the tennis balls area, and the step area.

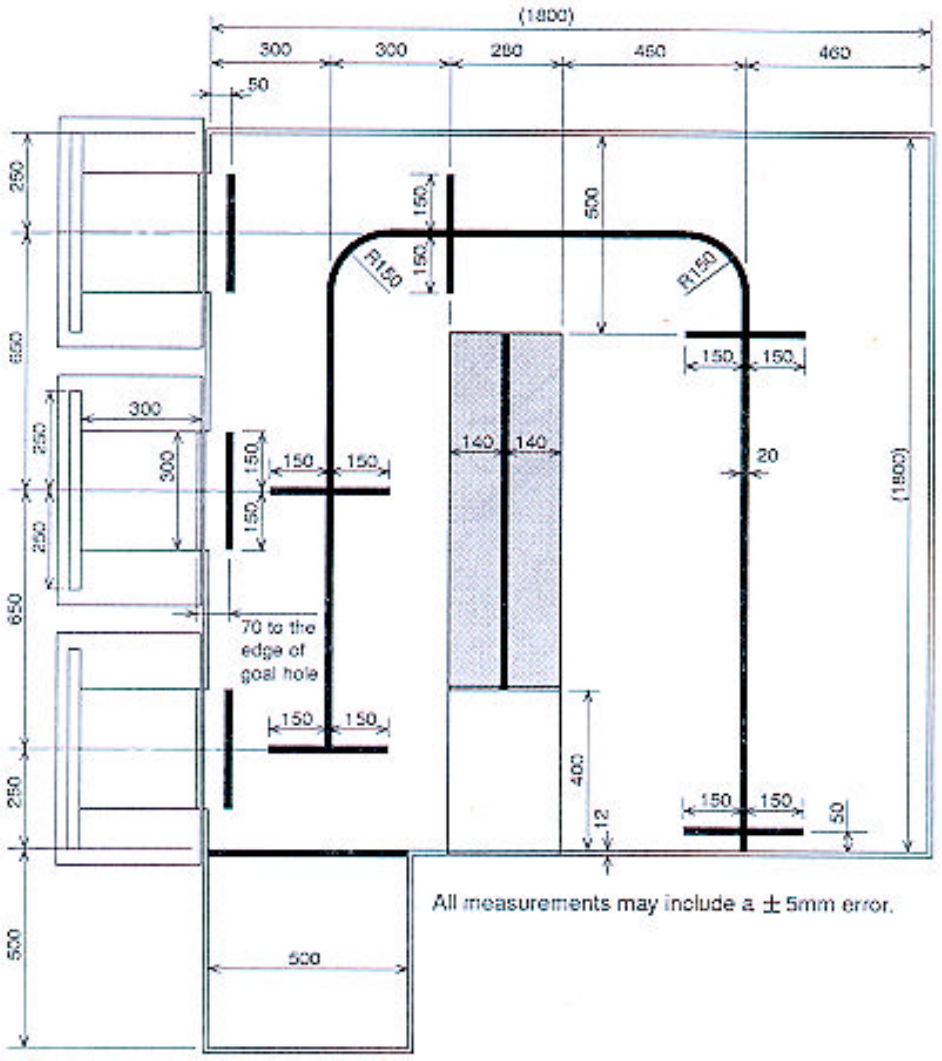


(a) Competition Field

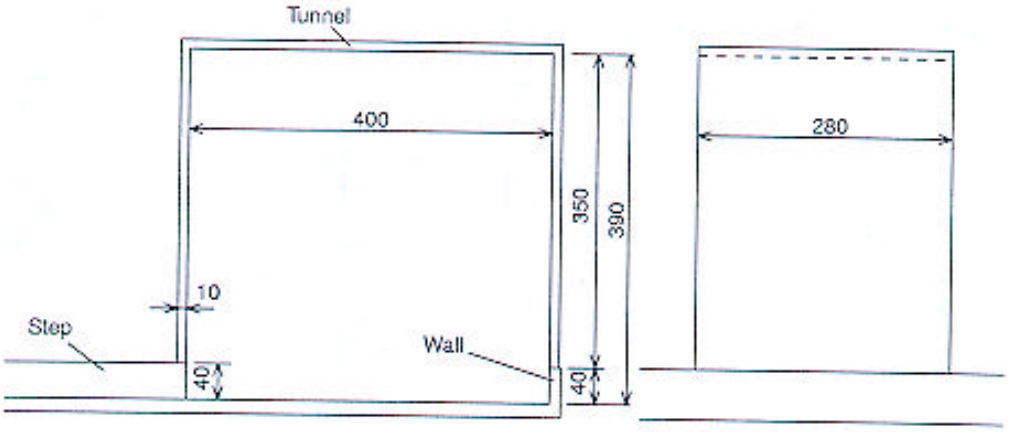
The details of the dimensions of the competition field, an example of the tennis balls arrangement, and the designs of the goal-container and the tunnel are shown in figure (c), (b), and (d).



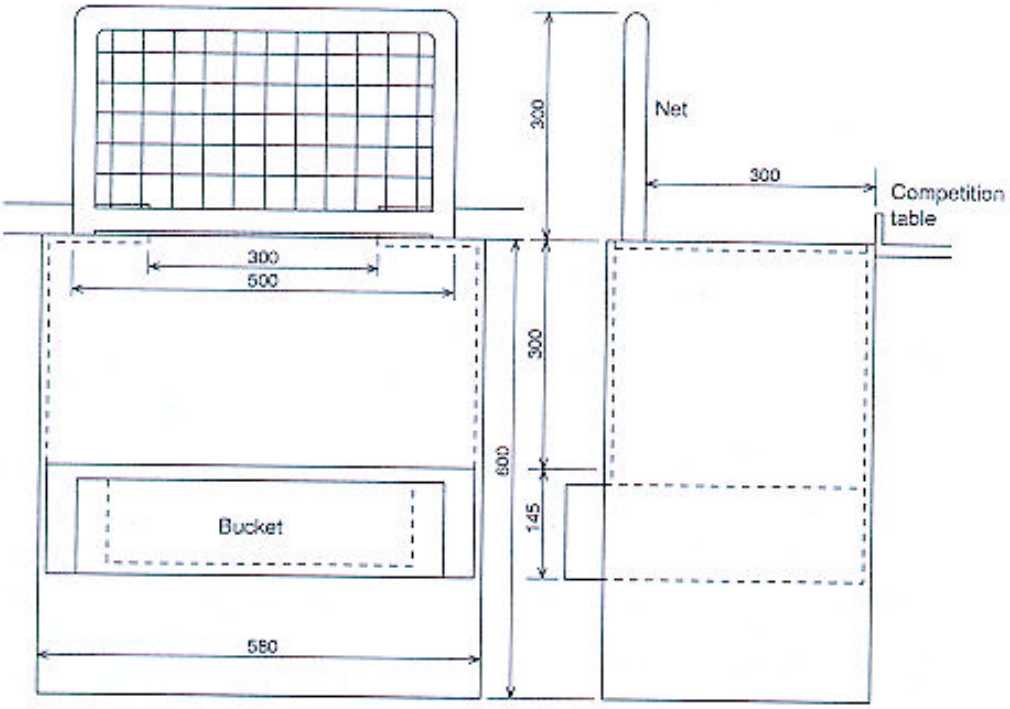
(b) An Example for Tennis Balls arrangement of Challenge Course



(c) The Details of Dimensions of Competition Field



(a) Tunnel Details



(b) Goal Box Detail

Fig 3: Goal Box and Tunnel

(d) The Designs of the Goal-container and the Tunnel

4. GAME RULES

4.1 The robot(s) shall be placed at the starting area before the game starts. Each handler shall be given 2 minutes setup time. Any handler may start the robot(s) if he/she is ready within 2

minutes. Only single press is allowed to activate the robot. If the entry contains more than one robot, the handler is allowed to press once per robot.

4.2 Each entry is given 10 minutes to perform. The robot(s) may follow the guidelines to the tennis ball disposal area or go through the tunnel with the height limit of 390mm. The robot must be fully autonomous to search the tennis balls, to collect them and to deliver the balls to any goal-containers.

4.3 Each entry is given 5 chances of crash. A crash is defined as whenever a robot is not able to perform such as the robot(s) does not move or jams in the competition field. When a crash occurs, the handler must seek the judge's permission to stop the robot. Before the handler restarts, the robot must empty any tennis ball collected. The handler is only allowed to press once to restart the robot.

4.4 Once the robot starts, the robot is given 30 seconds to leave the starting area otherwise the robot is considered as a crash.

4.5 An entry needs to withdraw from the competition if the robot(s) reaches 5 crashes or the 10-minute competition time reaches or the judge decides that the entry is dangerous to audience.

4.6 The performance of each entry judges by the number of tennis balls delivered to the goal-containers. If there is a tied, the time taken to deliver the tennis balls, the number of tennis balls collected but does not able to deliver and the number of crashes will be taken into consideration.

4.7 In the event of any ambiguity in the competition guidelines or rules, the judge's interpretation shall prevail.

4.8 Should a situation arise that is not addressed in the guidelines and rules, the organizers and judges will decide on the matter, and their decision will be final.