ROBOT RAMBLE

DESCRIPTION: The object of this event is to design and build a robot capable of performing certain tasks on a prescribed playing field. Each team may enter one robot that must be built prior to the competition.
A TEAM OF UP TO: 2 APPROXIMATE TIME: 5 minutes/Team IMPOUND: Yes

1. MATERIALS:
a) The robot may be constructed of any material.
b) The robot may be controlled remotely and/or with a control box that has wires leading to the robot. c) At the start of the competition, there is a size restriction for the robot. The robot must be able to fit into a cube that is 30 cm x 30 cm x 30 cm, with the exception of the wires that connect to the student control box.
d) The robot circuits must be energized by one or more commercial batteries with a voltage not to exceed 9.6 volts. The voltage stated on commercial batteries will be accepted.
e) Each robot function (such as drive train, arm, etc.) may have its own independent circuit, source of electrical energy, and control mechanism.
£) Hydraulics, pneumatics, and fluidics will not be allowed. Only electric circuits may be used in the activation of the robot.
g) If the robot is "radio-controlled" (RlC), they may be controlled by more than one transmitter. Each transmitter must be energized by one or more commercial batteries with a total voltage not to exceed 9.6 volts per transmitter.
h) Radio control equipment used for this event must operate on frequencies designated by the Federal Communications Commission (FCC) regulations for surface devices (cars, boats, etc.). Allowable frequencies are: 75 Mhz band (75.41 through 75.99 Mhz), which contains 30 channels/27 Mhz band (26.995 through 27.255 Mhz) may be used but is not encouraged for the competition.
49 Mhz band (49.8302 through 49-890) may also be used but is not encouraged for the competition. This band is generally used by the toy industry for Radio Controlled (RlC) toys.
72.0-73.0 Mhz band is restricted by the FCC for RlC model aircraft and cannot be used for the competition. Teams using this band may not compete in the event. It is illegal to use this Band for surface craft and the user is subject to a penalty by the FCc.

2.PLAYING FIELD: See www.soinc.org for color diagram of the Playing Field
a) The playing field for the event shall be constructed on a piece of smooth, dense, short nap carpet approximately 4 feet by 8 feet.
b) The playing field will be marked on the carpet with a permanent ink-marking pen. Each line on the playing field will be approximately 1/2 inch wide.
c) The playing field will be a rectangular configuration one meter wide by two meters. It will be further divided into two zones by a centerline running through the center of the rectangle, making each zone one meter wide by one meter long. One zone will be Zone A; the other zone will be Zone B.
d) Zone A will contain the goal box and will also be the starting position for the robot.
e) Zone B will contain all of the scorable items at the start of the competition and in the approximate center there will be an equilateral triangle drawn on the playing field. Each side of the triangle will be 30 centimeters in length with the side nearest the centerline being parallel to the centerline of the playing field.

3. COMPETITION:
a) All robots and control systems must be impounded before the start of the competition and will be released one hour after the last team has competed unless there are appeals pending.
b) At the start of the competition, the event supervisor will place in Zone A the following objects: 10 PingPong balls (approx. diameter 38 rom), 3 golf balls, 3 35 mm film canisters without lids, and 2 cardboard cylinders (empty paper towel roll tube or 2 empty toilet tissue tubes taped together) approximate size 39-45 rom diameter x 230-280 rom length.
c) A film canister (open side up) will be placed on each corner of the equilateral triangle and a golf ball will be placed on the open end of each canister.
d) A cardboard cylinder containing 5 ping-pong balls will be placed in a vertical position on the centerline that divides Zone A from Zone B approximately 15 cm from the edge of the playing field. A second cylinder containing 5 ping-pong balls will be placed in a vertical position approximately 15 cm from the edge of the playing field on the opposite end of the centerline.

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e) A goal "box" with inside dimensions of 30 cm x 30 cm x 30 cm, with no bottom or top will be placed inside of the playing field with an open side up opposite to the robot in Zone B. The goal box must be made of Plexiglas or wood.

f) The goal box must remain inside of the playing field. If it is pushed out of bounds by the robot, the robot may push it back inbounds.

g) At the start of the competition, students will place their robot in the designated starting position located in Zone B adjacent to and at the midpoint of the centerline.

h) Once the robot is in place, the event supervisor will place a qualifying cube over the robot. The qualifying cube will be 30 cm x 30 cm x 30 cm and constructed of Plexiglas. If the robot fits in the cube, the competition will continue. If the robot does not fit in the cube, the students will be allowed to compete but their robot will be ranked behind all of the other robots that qualify by fitting into the qualifying cube.

i) The event supervisor will then remove the cube. At this point, students may not touch their robot and the two-minute competition will begin.

j) During the two-minute competition, the robot must pick up the items that are in Zone A and place them in the goal box. The robot may pick up the scorable items individually or collectively. Miscellaneous robot parts, or the entire robot, may end up in the goal box without penalty. At the end of two minutes, points will be awarded based on the number and types of items that were placed in the goal box.

k) If a scorable item (ping-pong ball, golf ball, film canister, or cardboard cylinder) is moved by the control wires, it will become out of play and may not be used to attain any points.

1) If a student touches or uses the wires or control box to physically move the-robot, the competition ceases at that point and the score will be determined prior to the violation (touching the robot).

m) At the end of the 2-minute competition, if any part of the goal box is out of bounds, the scorable items contained within will have no point value.

4. <u>SCORING:</u>

a) Any scorable item that breaks the plane of the outer boundaries of the playing field, even if it is under the control of the robot, it is out of play and may not be used to attain any points.

b) A team will receive the following points for each item placed in the goal box:

Ping-pong balls = 5 points, maximum 50 points
Golf balls = 10 points, maximum 30 points
Film canisters = 5 points, maximum 15 points
Cardboard cylinders = 10 points, maximum 20 points

c) For every scorable item removed from Zone A and placed in the goal box or in Zone B, the team will receive 1 point (maximum 18 points)

d) At the end of the competition, if the robot (parts touching the ground) is completely in the playing field, the team will receive 10 points. At the end of the competition, the event supervisor will allow 10 seconds for the robot to "come to rest" with the power off to determine if any parts are touching the ground outside of the playing field.

e) The goal box will be considered part of the playing field and must in bounds at the end of the competition in order for the scorable items that it contains to have any point value.

f) The team with the most points will be the winner. In case of a tie, the tie will be broken first by time then by mass of the robot. In the case of a tie, the team that completed the task in the shortest length of time will receive the more favorable score value. If teams still have identical scores, the tie will be broken by massing the robot-(which includes robot and batteries). The robot and its batteries with the least mass will receive the more favorable score value (ranking).

g) Robots that fail to meet any of the specifications under "Materials" will be allowed to compete but will be ranked behind those that do, except robots that violate the FCC regulations will not be allowed to run and will receive participation point(s) only.

h) Maximum score:

All items removed from Zone A = 18 points
10 Ping-Pong balls = 50 points.
3 golf balls = 30 points.
3 film canisters = 15 points
2 cardboard cylinders = 20 points.
Robot in Playing field at the end of the 2 minute event = 10 points