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2.007 Design and Manufacturing I
Spring 2009

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2.007 Contest Rules

1. Timing

- a. Each round of the contest is 45 seconds long.
- b. Contestants must be able to setup and remove their machines from the contest table within 30 seconds.

2. Winning

- a. The winner is the contestant with the highest score at the end of the round.
- b. Each contestant's score is found using the following algorithm: $\text{Score} = (\text{mass} + 100 \text{ grams}) \times (\text{cumulative rotation of platter} + 1 \text{ radian})$
- c. The mass is recorded in grams. Only ball and pucks can be used to increase weight score. Sacrificial robots and force applying robots (ie. a jack arm) are NOT allowed.
- d. Rotation of ball pyramid table is recorded in radians.
- e. Rotation of ball pyramid table is recorded regardless of the direction the table is spun. Partial revolutions of the table are counted. Rotation scores cannot decrease.
- f. Seeding rounds will be held during the lab time. Machines will compete against the table unopposed. A contestant's seed will be determined by their score and the staff's discretion.
- g. Contestants loading the scales to more than 400 newtons (90 lbf approx.) will be immediately disqualified.
- h. Deliberate damage or destruction of an opponent, the contest table, or a control box will result in disqualification! See 5a and 5b below.

3. Driving

- a. Contestants must drive their own machines.
- b. Contestants may have one person help drive their machine (e.g. trigger a mechanism at a certain time, etc.)
- c. Contestants and Assistant Drivers must wear **safety glasses** (prescription glasses are acceptable) when in the vicinity of the table.

4. Starting Configuration

- a. On the day before the competition, your machine will be size-checked. It must fit into the green FREM box including the remote control receiver box and batteries in its starting configuration. **The purple lid must fit on the box.** No bulging. Oversize machines must compete, but are not eligible to win.
- b. Machines will also be weighed on the day before the competition. Machines must weigh no more than 10 lbs. (4.54 kg.), not including batteries and the control box.
- c. When setup on the table prior to the start of a round (the starting configuration), machines can touch only the carpet, crossover rails, or sidewalls at the appropriate colored zone. The machine must be constrained vertically by the same sized zone to the height of 21 inches. No part of the machine can be more than 21 inches above the surface of the table. Machines may also occupy 2 inches of space outside of the colored starting zones where the colored zone touches the plastic side walls. **When the machine is set up in the starting area, it must still fit within a volume less than or equal to the internal volume of the green FREM box.**
- d. During the setup process, contestants may "attach" their machines to the table, but would do well to be mindful of rule 5g-i.
- e. No energy may be stored in the rubber bands prior to the start of the contest.

- f. Pucks: Prior to the start of each round, the staff will place a stack of ten hockey pucks on each table, midway between the edge of the rotating platter and the table edge.
- g. Street Hockey Balls: Prior to the start of each round, the staff will load each rotating pyramid table with fifty-five street hockey balls. Consult the Contest Table page for the location of balls and pucks.
- h. Each contestant must supply 8 of their their own AA batteries of whatever readily available commercial type they choose. The batteries are to be used as two sets of 4 in series.

5. During the Round

- a. Machines should be prepared for interaction with their opponent, but malicious destruction of an opponent's machine will not be tolerated. The judges will disqualify contestants who in their opinion have maliciously damaged an opponent's machine.
- b. Contestants who damage the table or either of the control boxes may be disqualified. The table will not be disqualified for damaging contestants' machines. As above, the judges will act at their discretion.
- c. Contestants may not directly interfere with the motion of the table or the machines.
- d. Contestants may not interfere with the operation of the provided control system or with the operation of any autonomous control system.
- e. Street hockey balls, hockey pucks, machines, parts of machines, etc. that depart the table will not be re-introduced.
- f. A one inch wide dividing line will be placed down the middle of the table and around the rotating tables. Contestants may not cross this line or deploy any offensive tactics across this line until they have placed weight (a ball or puck) on their own scale. Offensive tactics include barriers and molestabots, as well as engaging, covering, encircling, etc their opponent's rotating table, pyramid of balls, or puck stack. Please see supreme court for more details.
- g. **ABSOLUTELY NO NETS OR ENTANGLEMENT DEVICES.**
- h. **ABSOLUTELY NO SPIKED WHEELS.**
- i. **NO DANGEROUS MACHINES. THE "NAKED PHONE BOOTH" RULE WILL APPLY AT ALL TIMES.**
- j. No metal gears or anything that may act to abrade the table may touch the rotating table with the pyramid of balls.
- k. No wedges or similar devices may be used to stop the rotating table.

Additional clarification of rules can be found on the Supreme Court Decisions Page.

These rules are subject to optimization, and may be altered by the staff to preserve the "spirit" of the contest.