ROBOTIC ENGINEERING CHALLENGE

NOVICE RULES

GENERAL

1. Teams are not allowed to alter or interfere with a competing team's robot or programs. Violation of this rule will lead to immediate disqualification of the offending team.

2. Teams are not allowed to bring anything to the competition that would give their team an unfair advantage such as pre-constructed robots, books, notes or programming tools. Paper, pens, pencils, and instructions on programming will be provided to each team upon arrival at the competition. Students should **bring a calculator** to answer the Challenge questions.

3. Any situation not covered by the enclosed rules will be determined by a ruling from the appropriate Arena Judge. All Judges' rulings are final.

TEAM COMPOSITION

1. Each team is composed of a faculty sponsor and up to four (4) students. One student will act as the team leader.

2. Each student must attend the school that they are representing.

3. The faculty sponsor along with team representatives must attend the Robotic Engineering Challenge.

4. Faculty sponsors **are allowed** to assist student teams directly with each challenge.

CHALLENGES

1. Team Kits are assigned at check-in. **Teams should check-in no later than 9:00 AM.**

2. The Challenge instruction and Challenge Question Packet will be in each team kit.

3. The Challenge Question Packets **must be turned into the Judges stand no later than 1 PM**. Keep all question together in the Challenge Question Packet. Answer as many questions as possible.

4. **Challenges must be completed sequentially: a team may only move onto the next challenge if they successful completed the previous challenge or had three (3) voided timed runs of the previous challenge.**

5. Each team will be given access to the Challenge Area for test runs. A team performing a test run will have two (2) minutes to complete their testing.

6. Teams are allowed **as many test runs as they desire**, however upon completion of a test run they must re-enter the queue to await another run.

7. A team will have three (3) qualifying runs to perform the assigned challenge. Each team will **declare** to an Arena Judge that they are prepared to perform a timed run and provide the judge with their score sheet. The Arena Judge will then time the team's run. When all three runs are completed, the Arena Judge will retain the team's score sheet.

8. Teams **may** alter or modify their robots between runs.

9. All robot programs will be stored in ***Program 5*** for timed runs.

10. Each team will have fifteen (15) seconds to activate their robot at the beginning of each timed run. Failure to start within the specified time may void that timed run and reduce the number of timed runs available to the team by one (1).

11. If a team voids all three attempts for a given Challenge, they may move to the next Challenge. Once all teams have completed or attempted to complete a Challenge, a team that voided all three (3) timed runs may repeat that Challenge.

12. The Robotic Engineering Challenge will run from **9:00AM until 3:00 PM**. During this time period, the teams will attempt to successfully complete as many challenges as possible. Scoring will be completed at 3:00 PM with a brief awards ceremony held immediately following the scoring.

13. The competition ends at 3:00 PM. Only a team currently completing a timed run will be allowed to finish that run. All other runs are void. Any team in the queue at that time **will not** be allowed to run their robot.

SCORING

1. Base points are assigned to each Challenge. In addition to the awarding of base points, the team will gain 20% of the points received from their Challenge Question Packet for each base point award from the Robotic Challenges (to a maximum of 100%).

Example: If a team receives 30 points from their Challenge Question Packet and get the base points on three out of five of the Challenges – then they would receive 60% of the points awarded from their Challenge Question Packet:

60% x 30 points = 18 points awarded to their final score.

2. Some Challenges may have bonus points added to the collected base points. Typically, bonus points are determined by taking the fastest run time accomplished by a team during their three (3)-timed runs and dividing it into an established point value for that Challenge. The team's score will be the addition of the base points plus the bonus points.

3. Awards will be based on the team's total point accumulation for all Challenges and Challenge Question Pack results.

ROBOTIC ENGINEERING CHALLENGE 2008

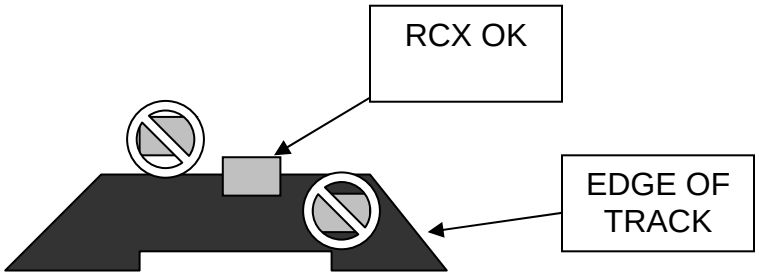
NOVICE CHALLENGE ONE

GOAL

Complete **ONE** lap around the outside edge of the Binary 500 Raceway as fast as possible.

RESTRICTIONS and GUIDELINES

The RCX must straddle the outside edge of the track during the entire run.



The leading edge of the RCX must be placed on the **blue** start arrow along the side of the track.

The robot may travel clockwise or counter-clockwise around the track.

Only one robot on the track at a time.

All other rules apply.

Maximum Time Limit per Run: 60 seconds

SCORING

Bonus Points are added to the Base Points to determine the total score.

Base Points: complete ONE lap: 10 points.

Bonus Points: team's fastest time in seconds divided into 200 and rounded down.

SCORE SHEET FOR CHALLENGE ONE

SCHOOL NAME_____

TEAM NAME _____

		STAMP
TIME FOR RUN 1		
TIME FOR RUN 2		
TIME FOR RUN 3		

JUDGE:_____

Score = 10 pts for one lap + (200 / fastest time in seconds)

_____ = 10 + (200 /_____)

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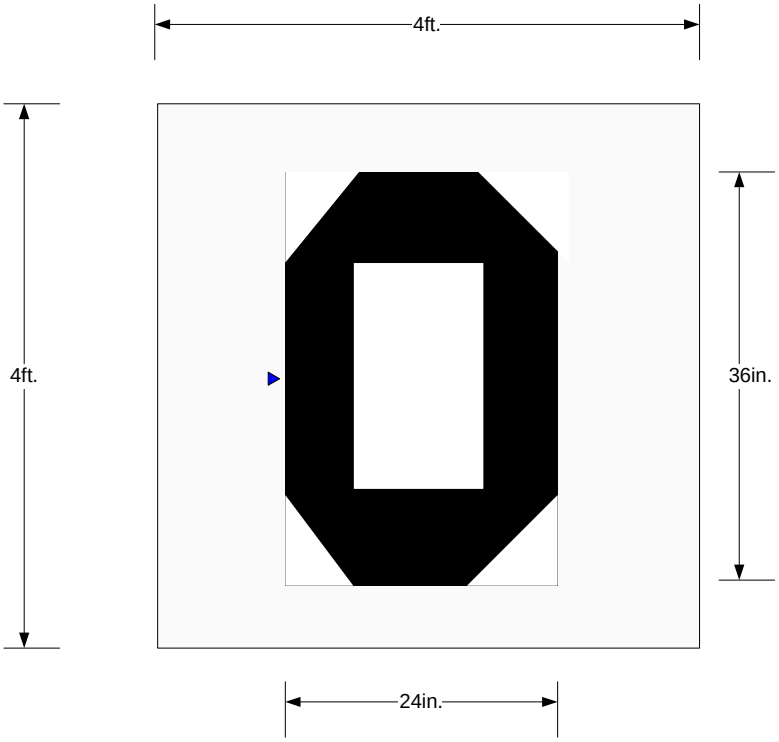
Novice Challenge One

Last Update: Thursday, January 18, 2007



TOP VIEW

ROBOTIC ENGINEERING CHALLENGE 2008

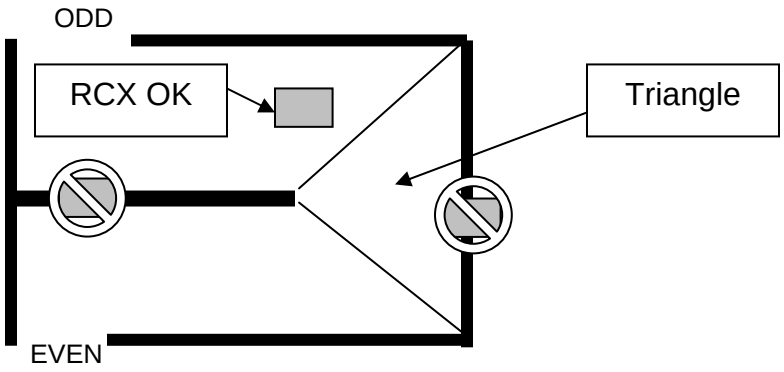
NOVICE CHALLENGE TWO

GOAL

Travel through the maze as fast as possible and exit out the opposite opening.

RESTRICTIONS and GUIDELINES

The RCX may NOT straddle, crawl over or crossover any wall in the maze.



The team leader will roll a **die** for **EACH** timed run:

-if the value of the roll is even, start at the even entrance

-if the value of the roll is odd, start at the odd entrance

The RCX must be placed over the **blue** start arrow at the entrance to the maze to begin the run. The robot must navigate through the maze while traveling toward the exit.

The clock is stopped when the RCX **breaks** the exit plane.

If the RCX exits through the entrance the run will be void.

Only one robot on the track at any time.

All other rules apply.

Maximum Time Limit per Run: 60 seconds

SCORING

Bonus Points are added to the Base Points to determine the total score.

Base Points:

Any part of RCX moves into the triangle area: 10 points

Bonus Points:

Team’s fastest time in seconds divided into 150 and rounded down.

SCORE SHEET FOR CHALLENGE TWO

SCHOOL NAME_____

TEAM NAME _____

ROLL: EVEN / ODD

ENTER TRIANGLE (10)

TIME FOR RUN 1

STAMP

ROLL: EVEN / ODD

ENTER TRIANGLE (10)

TIME FOR RUN 2

ROLL: EVEN / ODD

ENTER TRIANGLE (10)

TIME FOR RUN 3

JUDGE:_____

Score = 10 pts for Triangle + (150 / fastest time in seconds)

_____ = 10 + (150 /_____)

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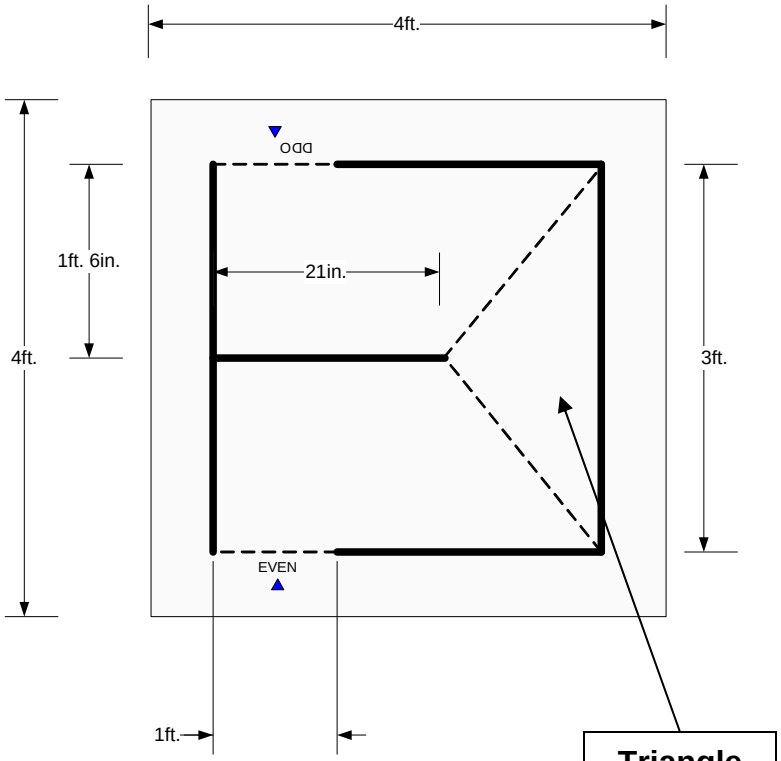
Novice Challenge Two

Last Update: Thursday, January 18, 2007



TOP VIEW

ROBOTIC ENGINEERING CHALLENGE 2008

NOVICE CHALLENGE THREE

GOAL

Push the house robot completely out of the black circle or ring.

RESTRICTIONS and GUIDELINES

“Contact” is defined as the front of the challenger impacting the front, top, sides, bottom or back of the house robot.

“Survive” is defined as the continuous autonomous running of the challenger robot.

The house robot and challenger (your robot) will be placed on the perimeter of the ring facing opposite each other to start.

The challenger (your robot) must confine its search to the ring.

The RCX of the house robot must be completely out of the ring to count as a takedown.

The challenger should always remain in contact with the ring expect as outlined below:

If the challenger leaves the playing area during the search phase and does not attempt to return to the ring the run is voided.

Only one challenger on the track at anytime.

All other rules apply.

Maximum Time Limit per Run: 60 seconds

SCORING

Bonus Points are added to the Base Points to determine the total score.

Base Points:

Make contact with the house robot: 10 points

Bonus Points:

Survive 60 seconds with the House Robot : 30 points
(receive these points if House Robot knocked out of ring or is immobile in less than 60 seconds)

Render the house robot immobile: 50 points

Team's fastest time in seconds to push the house robot out of the ring (takedown) divided into 200 and rounded down.

SCORE SHEET FOR CHALLENGE THREE

SCHOOL NAME_____

TEAM NAME _____

RUN 1: HOUSE OUT TIME

CONTACT (10)
SURVIVE (30)
IMMOBLE (50)

STAMP

_____

RUN 2: HOUSE OUT TIME

CONTACT
SURVIVE
IMMOBLE

STAMP

_____

RUN 3: HOUSE OUT TIME

CONTACT
SURVIVE
IMMOBLE

STAMP

JUDGE:_____

Score = base + (200 / fastest time in seconds)

_____ = _____ + (200 /_____)

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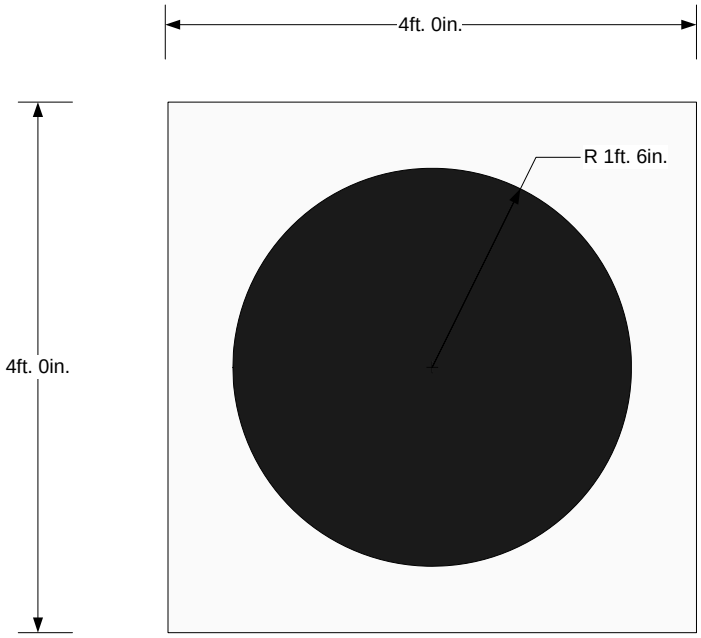
Novice Challenge Three

Last Update: Thursday, January 18, 2007



TOP VIEW

ROBOTIC ENGINEERING CHALLENGE 2008

NOVICE CHALLENGE FOUR

GOAL

Sink as many of the fifteen pool balls into any pocket as fast as possible.

RESTRICTIONS and GUIDELINES

Any pool ball knocked out of the playing area may **NOT** be returned to the table during the current run.

Fifteen pool balls are placed in the rack area of the table. The RCX is placed over the **blue** start triangle. The robot faces in the direction of the point of the **blue** start triangle.

If the robot leaves the table the run is voided.

Only one robot on the track at anytime.

All other rules apply.

Maximum Time Limit per Run: 30 seconds

SCORING

Bonus Points are added to the Base Points to determine the total score.

Base Points: Place at least one ball into any pocket: 10 points

Bonus Points: team's fastest time in seconds divided into 10 X (pocket points) and rounded down.

Pocket Points:

Either Front	:	5 pts
Either Side	:	10 pts
Either Back	:	20 pts

SCORE SHEET FOR CHALLENGE FOUR

SCHOOL NAME_____

TEAM NAME _____

TIME FOR RUN 1	NUMBER OF BALLS (F/S/B)	STAMP
	/ /	

_____

TIME FOR RUN 2	NUMBER OF BALLS (F/S/B)	STAMP
	/ /	

_____

TIME FOR RUN 3	NUMBER OF BALLS (F/S/B)	STAMP
	/ /	

JUDGE:_____

Score = 10 pts for one ball + ({10 x pocket points} / fastest time in seconds)

_____ = 10 + (10 x _____ /_____)

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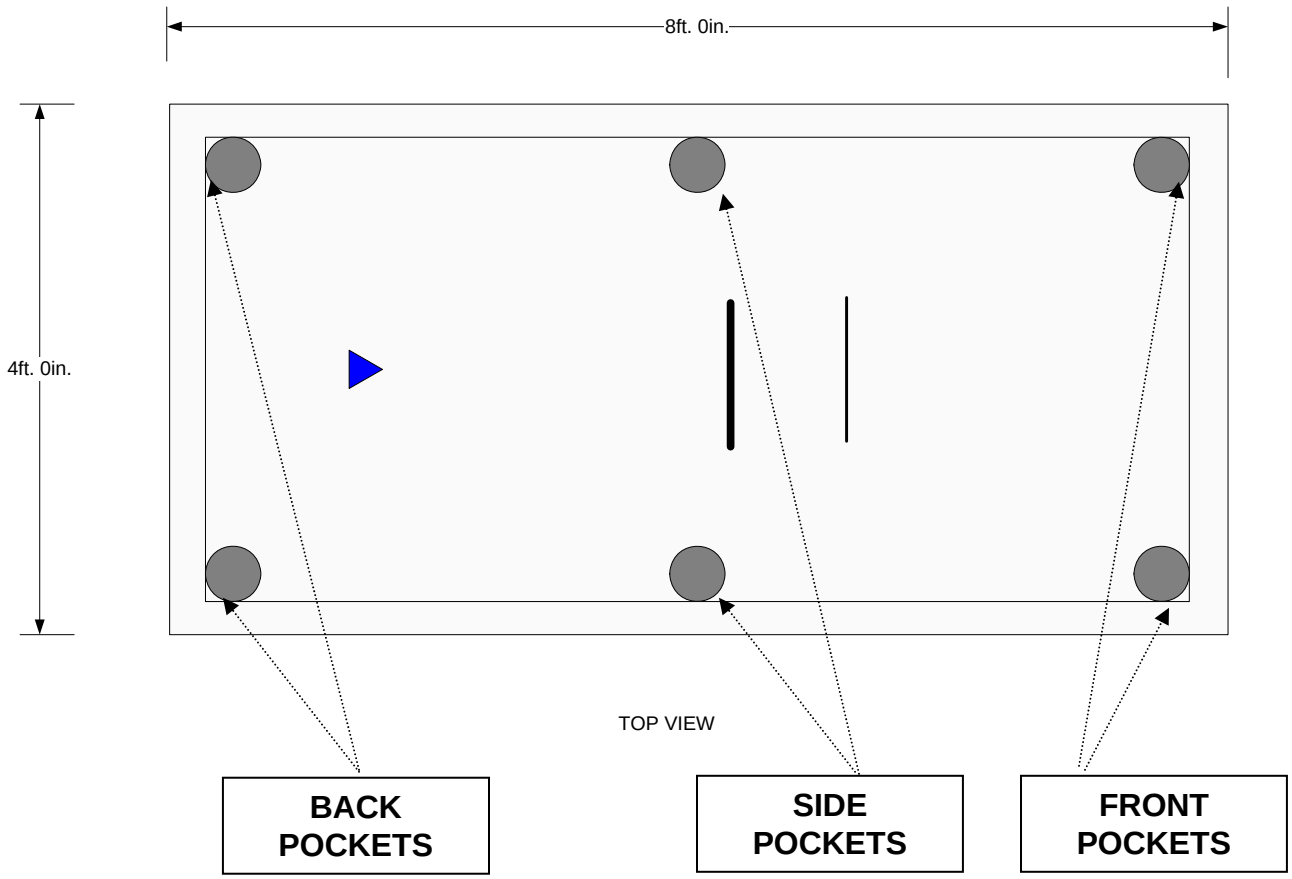
Novice Challenge Four

Last Update: Thursday, January 18, 2007



ROBOTIC ENGINEERING CHALLENGE 2008

NOVICE CHALLENGE FIVE

GOAL

Move through the rooms knocking down randomly placed cones to release the suspended scoring ball as fast as possible and return to the start point.

RESTRICTIONS and GUIDELINES

The robot will start from the start circle and seek out cones in the rooms. Once a cone is located, the robot is to knock it over to release the scoring ball. There are six (6) scoring balls each with a point value of ten (10) points. A scoring ball's points will not count if it is catch between the wall and the cone.

The robot **may not** climb over the walls to move into a room.

The robot **may** touch the walls during the run.

For maximum points, **once all the cones are down** the robot should return to the start circle and stop.

If the robot returns to the start circle at **anytime** prior to downing all pins the run is complete.

If the robot leaves the playing area the run is voided. Only one robot on the track at anytime. All other rules apply.

Maximum Time Limit per Run: 60 seconds

SCORING

Bonus Points are added to the Base Points to determine the total score.

Base Points: Down at least one cone: 10 points

Bonus Points: team's fastest time in seconds divided into 50 X (scoring ball points) and rounded down.

If all cones are down and the robot returns to the start and stops: 50 points

SCORE SHEET FOR CHALLENGE FIVE

SCHOOL NAME_____

TEAM NAME _____

TIME FOR RUN 1	SCORING BALL POINTS	STAMP

ALL CONES DOWNED RETURN TO START AND STOPPED? YES / NO

TIME FOR RUN 2	SCORING BALL POINTS	STAMP

ALL CONES DOWNED RETURN TO START AND STOPPED? YES / NO

TIME FOR RUN 3	SCORING BALL POINTS	STAMP

ALL CONES DOWNED RETURN TO START AND STOPPED? YES / NO

JUDGE:_____

Score = 10 pts for one ball + (RETURN 50pts) + ({50 x Scoring Ball Points} / fastest time in seconds)

_____ = 10 + (_____) + (_____ /_____)

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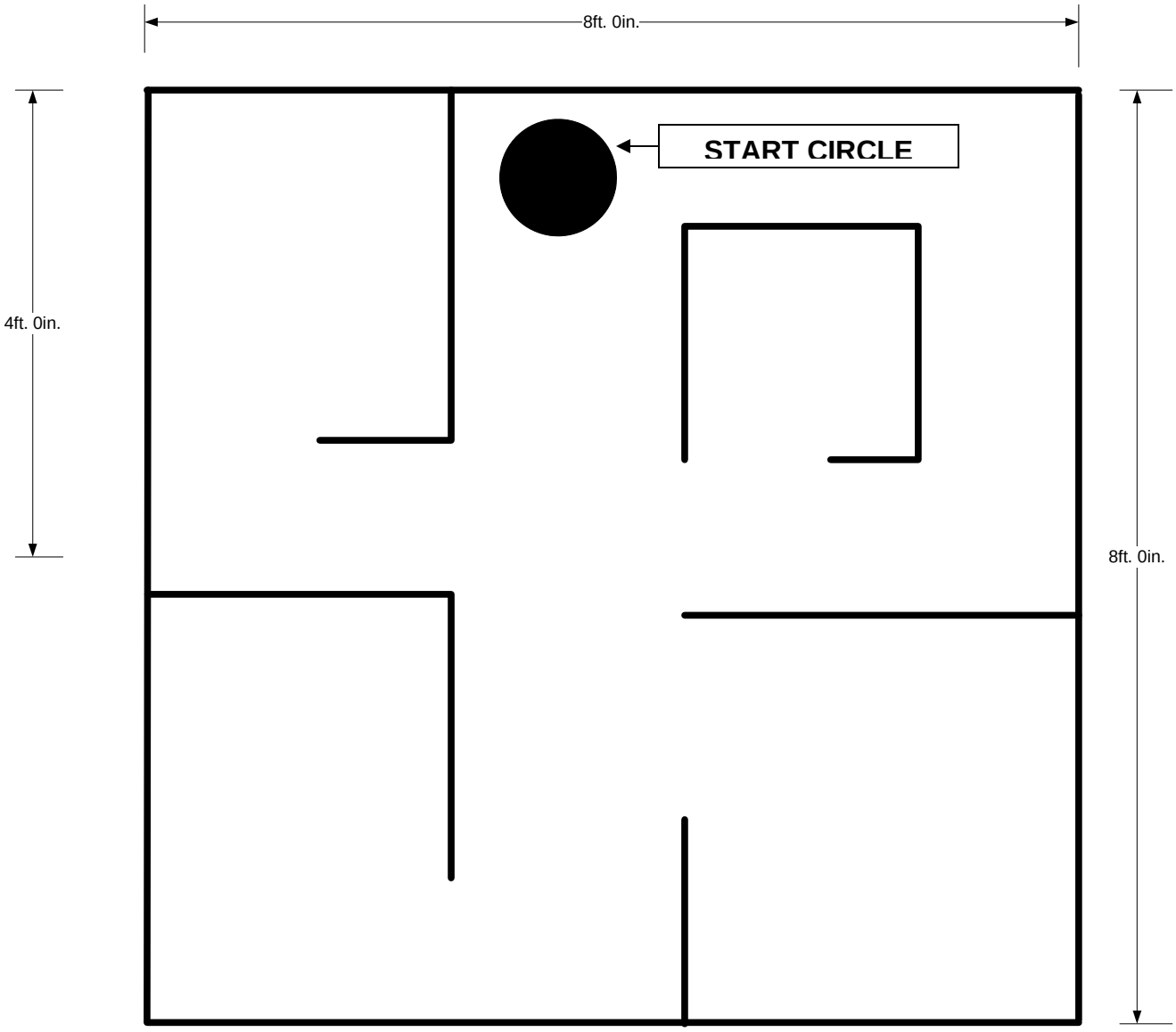
Novice Challenge Five

Last Update: Thursday, January 18, 2007



TOP VIEW