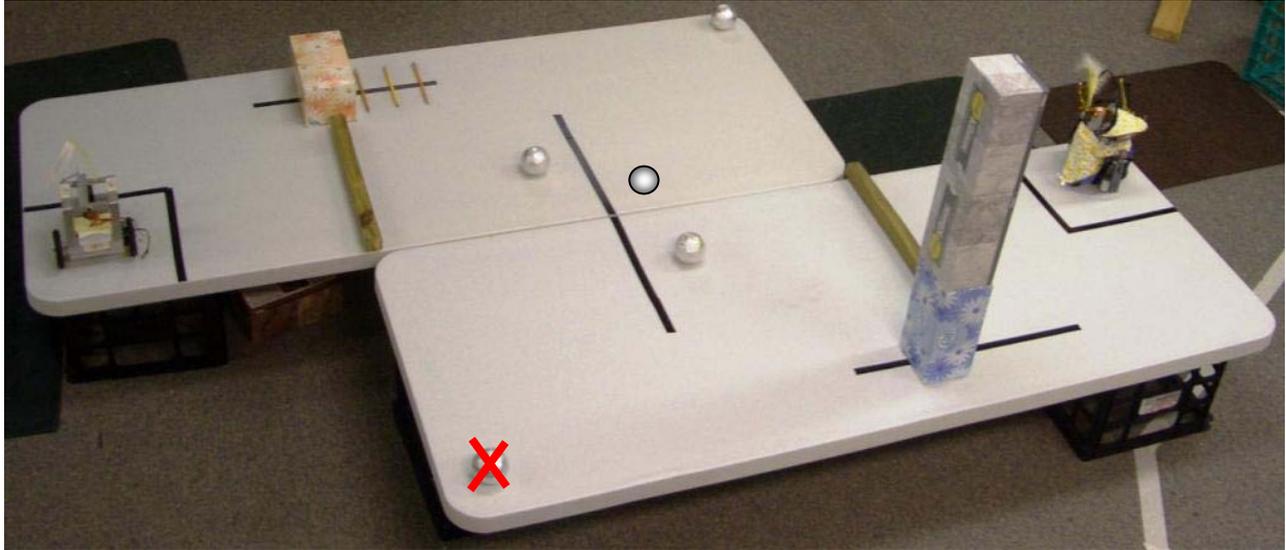


RoboSavers – ROBOFEST 2008 Game

V1.2 03-16-08 (official version, changes after V1.1 are in **bold blue color**)



[Figure 1] RoboSavers playing field configuration (Sr. Division - **Modified**)

Mission Synopsis

Four people are trapped in a pile of debris in a building or mine that has collapsed. It is too dangerous to send a human rescue team; instead, we send our robots! Their mission is to remove the debris (tissue boxes) and rescue the 4 trapped people (tennis balls wrapped with aluminum foil).

How to play the game and score

Two minutes per round are given to complete the game. **Each robot has a dedicated starting area** and can start any time after the game start signal is given.

The most important mission of this game is to bring back the trapped people safely to either safe zone (start area). If a ball touches (or passes) the safe zone line, the highest points (**25**) will be given. **The robot must carry the balls. Throwing ball is not allowed.**

If debris is completely removed from the table, 10 points will be awarded. No point will be given if boxes are just moved or pushed out of the way.

When the humans (balls) are touched (**moved out of rubber band**) by robots, but not rescued to home, 5 points are given. **Balls must be on the table and counted only once at the end of the game.**

However, if people are dropped off the table, you will receive penalties (**-2**).

Human players can pick up or touch the robots without penalty once any part of the robot has crossed (touched) the safe zone line. **If a robot is grabbed/touched outside the safe zone or falls off the table, one time penalty points (-5) will be given to the robot. Judge will place a red card or flag to the robot's home base.** Once grabbed, the robot must re-start from the start zone. There will be no penalty if a robot drops parts during the game. **However, there will be +5 bonus points if a robot is remained intact in the active zone throughout the game.**

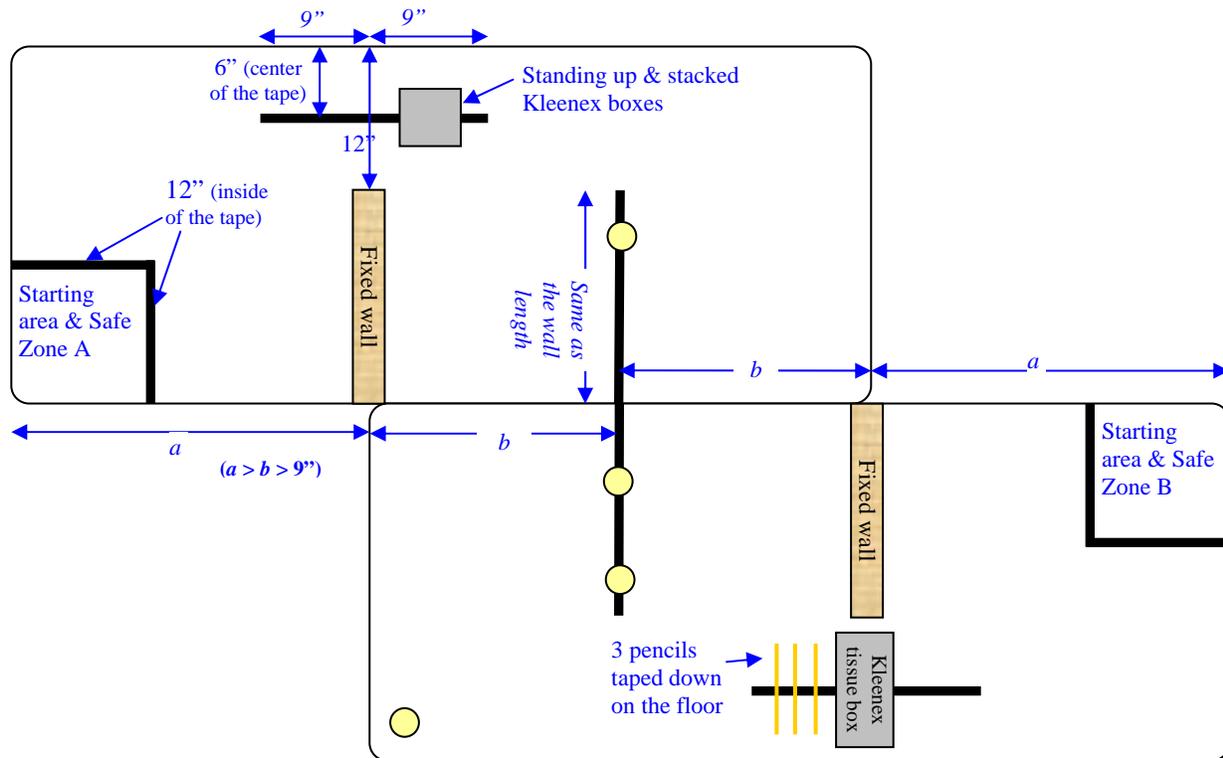
Note that there is no reset of the balls and debris, once the game is started this 2008 year. For detailed points, see the scoring sheet at the end of this document.

How to setup the playing field

Two same size folding tables are used to make a playing field. The surface is light in color; however, the exact color and brightness is unknown until the competition day. The exact size of the tables is also unknown. For example, it may be 30" x 72". The edges of the table may not be flat. Four corners of the table may be rounded. [Figure 1] shows possible mission filed configurations for Sr. Division. The table should be placed on the floor without legs to prevent from damaging robots when they fall off the table. Boxes or crates should be used to elevate the table approximately one foot off the floor. Suggested tables can be found on the web at:

<http://www.lifetime.com/tables/chairs/commercial6footfolding.aspx>

You can find the plastic folding tables at local discount stores like K-mart, Lowes, and Meijer's. Folding tables will be re-used in the future Robofest games. If your tables have a darker colored surface, then use white vinyl table cloths or paper. If you have center folding (fold-in-half) plastic tables, cover the center area with white tape or paper. White paper, poster boards, or ply wood can be used on a dark floor to create a practice field.



[Figure 2] Jr. Division playing field configuration with three balls
(Tape lengths for the lower table is same as that of the upper one.)

To make the walls, 2"x2" wood bars are attached using Velcro® or tape on the table. The wall should be attached in a way that would allow the robot to slide along it without getting hung up. For black lines, we will use standard electrical tape.

For simulating debris, standard Kleenex tissue boxes will be used. Size is *around* 4"x5"x9". For example: http://www.kleenex.com/USA/products/tissues_every_family_high.aspx

The boxes are unopened. It may be necessary to tape the opening. Note that the color of the boxes will be different. The standing Kleenex boxes will be placed on the black line, but the exact locations are unknown.

To simulate uneven terrain, 3 standard no. 2 pencils of various lengths will be taped down as bumps on the table on the black line as shown in [Figure 1 and 2] after the wall. The exact locations of pencils, lengths, and gaps between them are unknown and unveiled on the day of the competition. A Kleenex box will be placed on its side before the pencils. The gap between the pencils and the box is unknown.

Aluminum foil tape is used to cover the tennis ball completely. The ball will be placed **on a rubber band** to prevent from moving easily when the ball is touched by a robot. The diameter of the rubber bands will be around 1 3/8" (3.5 cm). Width of the rubber bands will be around 1/8" (3.2 mm).

Junior and senior divisions

	Junior	Senior
Number of standing Kleenex boxes	2 are stacked (not taped)	3 are stacked (not taped)
Location of the shiny tennis balls	Three balls will be placed anywhere on the black line before the game starts . One ball will be placed after the game starts at the corner of the table with pencils. The exact location is unknown.	Three balls placed before the game begins anywhere near the black line. (max. 6 inches away from the line, perpendicularly) One ball will be placed at the table corner after the game starts as shown in the modified Figure 1. The exact location is unknown.

Robot Specifications

- There is no size, height, or weight limitation. But the robot must be designed so that it stays alone inside the 12"x 12" in the safe zone to start. Any parts of the robot cannot pass the black line to start. The back of the robot may hang over the table. The orientation of the robot to start can be any direction.
- You must use only one robot controller for each robot.
- You may use any number of sensors / sensor types.
- You may use any number/type of motors/servo motors.
- You may use any material to construct your robot. You may use tape, glue, bolts and nuts, etc. Teams may modify (add or remove fixtures) robots if the robot is in the safe zone.
- You may use any programming language; we recommend an icon-based graphical programming language for the Junior division.

Procedures to play rounds

After a brief coach meeting, the pit will be closed. **Instead of oral exam, written test will be given to each team. The duration of the test is for 10 minutes. No computers are allowed to use. Cell phones are not permitted to use.** For the game competition, each team is given 2 chances (rounds, 2 minutes for a round). There is no final match. There is no "unknown problem" in 2008.

After the written test, teams will compete in a pre-determined order decided by the site host. **Then the emcee will visit each track for team introduction. Note that the team introduction will not be graded.** Teams may test and calibrate robots while other teams are doing the team introduction.

The Emcee will announce the following:

The use of cell phones, laptops and other communications devices is prohibited in this competition arena. Please turn off all such devices now. If you need to use any communications device, please leave the room first. Some robots can be controlled by Blue Tooth devices, and this is a competition for completely autonomous robots. If anyone sees someone using a cell phone, laptop or other communications devices, please get the attention of the nearest Robofest volunteer immediately. Only two team members can stay in the competition area; However, it is required that all other members be around the competition field during the game playing.

Teams will be called in the **reverse order** of the first round.

Bill of Materials to construct a field

	Estimated Unit Cost	Quantity	Cost
Folding Tables, 30" x 72"	\$50	2	\$100
Tissue Boxes, Kleenex 3 pack bundle	\$6	1	\$6
Tennis Balls	\$3	4	\$12
Aluminum foil tape	\$7	1	\$7
Wood bar (2"x2"x18+')	\$2	1	\$2
Clear packaging tape	\$3	1	\$3
Electrical tape	\$2	1	\$2
Pencil (Pack of 12)	\$1	1	\$1
Total			\$133

FAQ (Additional FAQs will be posted on the web at www.robofest.net)

- **Is there an unknown problem or missions as previous Robofest games?** - No, in 2008. Just exact locations of balls are unknown in 2008.
- **Can a robot climb over the wall?** - Yes
- **Do both robots have to rescue people?** - No. One can just remove boxes or pass balls to the other robot.
- **Can you restart a robot at the start area if you want it to go out again?** - Certainly
- **A robot is carrying the balls to the safe zone. When can a human player pick up the robot?** - Please touch your robot when the ball touches (passes) the black line. If human player picks up the robot when robot crosses (touches) the line, then they will not get the -5 penalty of touching robot, but note that the ball(s) are not saved yet! The judge shall put the ball(s) at the location when the robot was touched. Teams may plan a special program to retrieve dropped balls near the safe zone.
- **Both robots have to be home to get the maximum points?** - No
- **Will there be judging of the team's programs? In previous competitions the teams had to hand in program listings for evaluation and a score.** - We have stopped asking teams to submit hard copies of programs. There is few qualified judges who can evaluate all the codes within a very limited time. Game winners will be decided by only game scores and oral presentations.
- **What is the size of the area that the balls near the corners will be within?** - Unknown
- **A robot can start from other robot's starting area?** - No. Each robot must start from its own safe zone.

Acknowledgement

We thank all the Robofest coaches, team members, and site hosts organizers who gave valuable inputs to finalize this game rule.

ROBOFEST 2008 “RoboSavers” Challenge Scoring Sheet (3-16-08)

Division: Junior / Senior

Team Name: _____

Team School / Organization Name: _____ Team Number: _____

Round: First Second

Track No.: _____

	Count (circle one)		Point Value per count	Score Earned / Lost
Total number of people (balls in the baskets) rescued by the Robots	0 1 2 3 4		25	
Total number of people (balls) on the table, moved out of rubber bands, but not rescued to home – <i>counted only once at the end of the game</i>	0 1 2 3 4		5	
Total number of people (balls) dropped off the playing field	0 1 2 3 4		-2	
Total number of debris objects removed from the table by the Robot	Jr.	0 1 2 3	10	
	Sr.	0 1 2 3 4		
Robot touched by human outside of safe zone <i>or</i> Robot falls off field table (Number of red flags)	0 1 2		-5	
Total number of Robots remaining intact in the active zone throughout game	0 1 2		5	
			Total Score	
			Time if perfect score (*)	(sec. xx)

Judge Initial: _____

(*) The time will be used for Judging winners if more than a team get a perfect score.

Max. score possible for Jr. Division: 140

Max. score possible for Sr. Division: 150

*If there are multiple playing fields at the competition sites, balls and boxes on each playing field should be setup by **the Chief Judge** same on all playing fields for consistency.*