



Search and Rescue

Objective:

Most urban communities today have ETF "Emergency Task Force Robots" for Police use in duties that would endanger human life. In this competition you are the Robot Operator using your remote-controlled (RC) robot or vehicle to perform a rescue in a life threatening situation. You are competing to perform the quickest rescue with the least penalties.

Description:

These events are intended to showcase remote-controlled operation of small robot-vehicles to rescue someone in a building too dangerous for people to enter. Scoring is based on speed, operator skill, creativity of design-build and the use of some autonomous control.

Competitor Design Parameters:

(Class-1 for any RC vehicles, Class-2 for robots, kits, customs, semi-autonomous)
Class decisions by Judges are final. Please raise any questions upon check-in.

RC Vehicle Specifications. The RC Vehicle can be any size but smaller is obviously better and slow controlled movements are optimum-Please note the Rescue Field information below. These vehicles may use wired or wireless remote control. The control frequencies of these vehicles may be more subject to interference so this is strictly at the risk of the competitors and no allowances for this can or will be made in operations, judging or scoring.

Robot Specifications. The robot must be less than 23 cm (9 inches) long and less than 23 cm (9 inches) wide. It is controlled by an operator using IR or R/C control. Robot R/C must be a ground frequency for it to be allowed. To qualify for additional scoring the robot should be able to operate for a minimum of 10 seconds autonomously. The robot may be an unmodified kit, built from a construction set such as the TAB Sumobot, VEX, or LEGO. It can also be built from scratch, an RC vehicle or any combination. Bonus points will be awarded to a robot based upon the originality of its design/build.

The Competition Platform: Rescue Field

The Rescue-Field is 122 cm (48 inches) by 244 cm (96 inches) area surrounded by 10 cm (4 inch) high white walls to prevent a rogue robot from leaving the field. The field floor is painted white, and the moveable walls are painted black on top and white on their tall sides. The field corners are “kitty cornered” at 45 degrees to help prevent robots from getting stuck. Moveable walls that are (12 or 18 or 24 inches) long by 10 cm (4 inches) high will be placed on the field to create a maze of rooms. All openings will be a minimum of 30.5 cm (12 inches) wide to allow passage of the robot. There will be a home position where the robot will be required to start from and return to upon completion of its mission. Judges will determine and position, the number and complexity of maze walls-layout so that all competitors in each heat will face the same maze layout-challenge.

Lighting levels are unpredictable and may include camera flashes. The robot must be able to operate over a wide range of indoor lighting conditions field conditions. Auto-focus cameras are likely to be in use during the competition. The robot must be able to operate while exposed to infrared auto-focusing devices.

The Rules:

The aim of the Search & Rescue competition is to in the shortest time complete the rescue of an injured person or rescue-target represented by a mini stuffed animal, approx. 4” cubed in size (which can be caught by standard hook & loop Velcro which will be available in 1” lengths for all competitors to stick 1 piece onto their robots) or they may use their own grapple arm-device added to their robot to attempt to rescue the target.

The robot or vehicle will be placed at the home position by the operator and will be activated by the operator when indicated to by the judge.

For Class 2 only:

There is a 10 second start up phase where the operator may only use their controller to start their robot, they must then place their controller on the floor for 10 seconds and may not pick it-up till signaled from the judge to continue. During this phase the robot may operate autonomously towards the rescue goal if the operator chooses so. Any distance traveled will be a bonus to the operator as less time will be needed to get the mission accomplished.

At the end of this 10 second phase the judge will indicate to the operator to pick up his controller and at this point the operator controls their robot to their rescue target. If the operator should be careless and move a wall, 10 seconds will be added to their time for every such incident. If they knock a wall over 20 seconds will be added to their time for every such incident. If they pick up their controller too soon or disregard the judge’s instructions for each incident 10 seconds will be added to their time as a penalty.

For Class 1 & 2:

Once their rescue-target has been reached and they have secured it by Velcro or a grappler claw to their robot/vehicle they must control their robot/vehicle to return to the starting position and at that point the timer will stop and the judges will calculate the operators score and note it. There is a maximum time of 3 minutes to a run before penalties or bonus times are included. The operator's score is based on the lowest time combined with least operator errors or penalties. If the rescue target comes loose from the robot/vehicle the operator must re-acquire it before continuing to home.

The arena layout will not be made available until the day of the event.

Each robot will be examined and judged on the creativity of its design: max -30 sec bonus.

Once a "run" has begun it can only be ended either by:

- the rescue task being completed or
- the 3 minutes max time has expired or
- if an operator chooses to reset then that run will be counted as 3 minutes or
- at judges discretion i.e. if a robot "dies" the judge may end the run after 15 seconds of no robot progress.

Scoring Method:

1. Scoring will be based on the time it takes to accomplish the task. The Judge will use a stop watch to start, stop and record the time of each rescue attempt. For every incident "wall shifted from its outlined position" 10 seconds will be added to the overall time. If a wall is knocked over 20 seconds will be added to the time for every such incident. All judges' decisions and scoring are final.

2. If the 10 second autonomous phase is used the distance traveled is the bonus to the operator lessening the operator's time.

3. There will be a special creativity bonus of up to -30 seconds; these will be awarded at the judges' discretion based on the originality of the robot design.

4. Other competitors causing interference via their controllers deemed intentional by the Judge will result in their automatic disqualification and expulsion from the host facility.

5. A competition schedule via # of rounds will be announced based on registrants and Judges will record the progress of all competitors and announce the ongoing progress of the competition as the day proceeds.