RoboCup Junior Tasmania

Guide to Rescue

2006

Someone has sent a distress call asking for a rescue. The victim has fallen into a swamp.

The swamp can only be found by following the road. The robot should find the swamp, locate and push the victim from the swamp to safety.

You have 90 seconds to complete the mission.

This Guide is provided by Robotics Tasmania to help teams prepare for the RoboCup Junior Tasmanian (RCJT) Rescue and Premier Rescue competitions. It summarises, but is not intended to replace the official RCJA Rescue and Premier Rescue Rules (see www.robocupjunior.org.au for more details).

Note: An asterisk (*) indicates a modification of the national RCJA rules to suit the Tasmanian competition.

The Mission: Rescue v Premier Rescue

In both *Rescue* and *Premier Rescue*, your team's mission is to design, build and program a robot to rescue the victim as quickly as possible.

The robot is required to follow the line to the Australia-shaped 'swamp' (see below).

In *Rescue*, the mission is completed when the victim is moved clear of the swamp.

In *Premier Rescue*, the victim must be carried back to the starting position, following the line.

The Team*

Team members: Rescue teams consist of human team members and one robot. Substitution of robots at any time during a tournament is strictly forbidden.

Age limits (Rescue): Students up to Grade 9 or 15 years old are eligible to compete in the Rescue event.

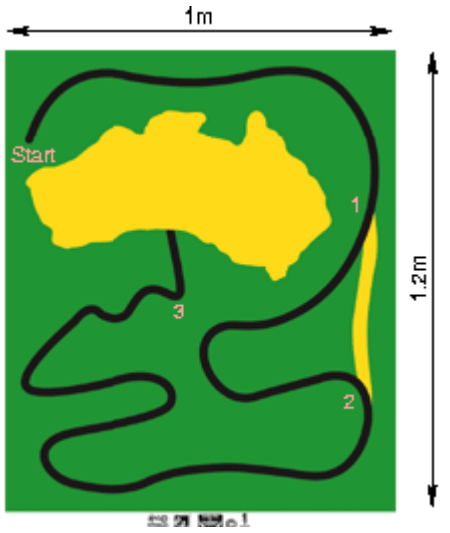
Age limits (Premier Rescue): Students up to Grade 12 or 18 years old are eligible to compete in Premier Rescue.

There is no minimum age limit for Premier Rescue participants. For example, a student in Grade 7 may compete in Rescue and/or Premier Rescue.

Competing in multiple events*: Although your team is welcome to register and compete in more than one event, please be aware that finals may run concurrently. Consequently, you must have enough robots and team members to cover all events.

For example, to enter both Rescue and Soccer, a team must have three robots and at least two human team members.

Playing field



Floor: The floor of the playing field is the Official RCJA Rescue Field, available from Educational Experience (www.edex.com.au).

The playing field should be placed so that it is flat and level, on a table or a floor.

It is recommended that robots are designed to cope with slight imperfections up to 3mm on the surface.

Lighting and magnetic conditions: Although organisers will aim to keep light levels consistent throughout the event and as low as possible, competitors must come prepared to calibrate their robots based on the lighting and magnetic conditions at the venue.

It is recommended that teams design their robots to cope with variations in lighting and magnetic conditions.

The Victim

The victim is a standard 375ml aluminium can with no markings or a standard 375ml aluminium can wrapped in aluminium foil or aluminium foil tape.

The can will contain material such as rice weighing 40 grams. A liquid should *not be used* to add weight to the can.

Further details on how to build a replacement victim are available from RoboCup Junior Australia (www.robocupjunior.org.au).

Yes, the victim has changed for 2006. This was necessary because Cadbury no longer produce the Yowie… ☹

The Interview and Journals*

Interview: During the event, each team is required to attend a 10-minute interview to discuss their entry. Although one purpose of the interview is to verify that the team's work is substantially their own, it is also an opportunity for teams to share their work and to be recognised for their efforts. In assessing the quality of team entries, the interviewers are looking for evidence of *engineering* and *programming* skills, *independence* and *commitment*.

Note: Along with sportsmanship and quality of play, the interview contributes to whether or not a team is selected to represent Tasmania at the Australian Open.

Interview questionnaire: Prior to the event, teams will be required to complete an interview questionnaire that will be used a starting point for the interview.

Journals: It is expected that all teams maintain journals of their competition preparation. As well as being good learning/assessment tools, they provide an excellent point of discussion in the interview.

If your team isn't already keeping a journal, start now!

The Robot

Size (Rescue): In *Rescue*, each robot must fit inside an upright 18 cm diameter cylinder and be no more than 18 cm in height.

Size (Premier Rescue): In *Premier Rescue*, each robot must fit inside an upright 27 cm diameter cylinder and be no more than 27 cm in height.

To satisfy these requirements, the robot must be upright and at its maximum size. i.e. anything that protrudes from the robot must be fully extended. If a moving part extends in more than one direction, the robot must be able operate without touching the measuring cylinder.

Control: The robot must be started manually by humans, but otherwise controlled autonomously. The use of a remote control of any kind is forbidden.

Marking and/or Colouring: Competitors are required to mark or decorate their robots to identify them.

Construction: Any commercial robot kit or raw hardware may be used as long as the design and construction are substantially the original work of the student(s).

Game play

Pre-game setup*: Access for calibration and testing will be provided to the venue one hour before the start of the event.

The Rescue and Premier Rescue events will be organised into five preliminary rounds, followed by a finals series.

Length of a game: A game will be 90 seconds long.

Start of the game: The robot is placed at the starting position and checked by the referee. At the instruction of the referee, the robot's handler is to start the robot. The robot shall begin immediately following the line.

Restarts: A robot may restart the run as the handler deems necessary within the 90 seconds game time. The robot must be positioned back at the start and checked by the referee. The game clock will continue to run during all restarts. There is no limit to the number of restarts within the 90 seconds game.

A robot must restart if:

- the robot ceases to follow the line,
- the robot is touched by a human,
- the robot moves off the field.

Following the line. The robot must follow the line completely to enter the swamp. The robot may follow the short cut (the yellow line) bypassing a section of the black path.

Some portion of the line segment the robot is following must be under the 'plan' view (viewed from the top) of the robot. Should the robot stray from the line, it will be deemed to have ceased following the line and have to restart.

Scoring*

Points are accrued by following the line past the check points on the field and achieving certain goals.

If the robot is not successful in completing its mission, then the points from its best run during the game are awarded and a time of 100 seconds is recorded.

Rescue	Points
The robot passes checkpoint 1	5
The robot passes checkpoint 2	5
The robot passes checkpoint 3	5
The robot enters the swamp	5
The robot moves the victim clear of the swamp	20
Maximum:	40

Premier Rescue	Points
The robot passes checkpoint 1	5
The robot passes checkpoint 2	5
The robot passes checkpoint 3	5
The robot lifts the victim out of the swamp	20
The robot removes the victim from the swamp	20
The robot regains the line to return	20
The robot passes checkpoint 3	5
The robot passes checkpoint 2	5
The robot passes checkpoint 1	5
The robot carries the victim back to the start	10
Maximum:	100

In *Premier Rescue*, the victim must be lifted off the field to obtain the points available on the return journey.

Event structure*

Preliminary rounds: There will be five (5) preliminary rounds. Each team will play one game per round.

Teams must be present at the start of a round. Teams failing to show at the start of the round may forfeit that round.

Victim position: The victim will be located in a new position in the swamp for each round. It will be in the same position for every game in that round.

Rankings: Teams will be ranked first by score and second by the overall time taken to rescue the victim.

Semi-finals: The top four ranked teams will be in the semi-finals.

- 1st ranked team vs 4th ranked team
- 2nd ranked team vs 3rd ranked team

Semi-finals shall be a head-to-head competition on two separate fields with the victim in the same position on both fields.

Teams in the semi-finals shall contest two (2) games, swapping fields between games.

The victim will be in the same position for all games.

Play-off for 3rd place: The play-off for 3rd place will consist of two rounds run like the semi-finals.

- Loser 1st/4th vs Loser 2nd/3rd

Grand final: The Grand Final shall consist of four (4) games between:

- Winner 1st/4th vs Winner 2nd/3rd

Teams shall swap fields between games. The victim will be placed in the same position for the first two rounds and a second position for the last two rounds.

Code of conduct

The aim of RoboCup Junior is to create an entertaining and educational experience that will continue into the future. To achieve this we all must create a spirit of collaboration, and not just competition. It is hoped that all entrants respect this aim.

Fair play: Humans (and robots for that matter) that cause deliberate interference to other robots or damage to the field or the victim will be disqualified.

Behaviour: All movement and behaviour at the event is to be of a subdued nature. Competitors are not to enter setup areas of other teams unless expressly invited to do so.

Mentors: Mentors are not to repair robots or be involved in programming of students' robots.

Sharing: It is an understanding of world RoboCup competitions that any technological and curricular developments should be shared with other participants after the event.

Resources and acknowledgements

RoboCup Junior Tasmania (www.robotas.idesigns.com.au).

For the official rules, please visit the RoboCup Junior Australia web site (www.robocupjunior.org.au).

This Guide was prepared by Rob Torok and is based on the RoboCup Junior Australia Rescue and Premier Rescue Rules 2004-2006, last updated 28/4/06 by RoboCup Junior Australia.