



# RoboParade

*Fully autonomous robot floats follow an indoor parade route*

V 1.0– Final Version for 2023 Season and World Championship

This file can be found under the **Get Involved / RoboParade** page on the website  
Each country may clarify/adapt/change rules for each country's qualifying competitions

**Coaches are responsible for communicating rules updates to participants**

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# 1. RoboParade Overview

## Learning Objectives

- STEM learning with Arts and Design
- Artistic creativity
- Autonomous navigation
- Basic computer programming logic
- Line following
- Object detection
- Autonomous stopping and restarting
- Adjusting to environmental conditions
- Problem solving
- Teamwork skills

## Synopsis

- An Open Category competition. No qualifying competitions for this challenge
- Hosted at the Robofest World Championship
- Local events may also host RoboParade (Teams must re-register for World Championship event)
- Fully autonomous robot floats constructed and programmed by student participants
- Programmed to follow an indoor parade route while detecting other robots in front of them. Robot must stop and start without human help
- A great STEAM (Science, Technology, Engineering, Arts, and Math) learning opportunity for students
- An ideal event for beginners in autonomous robotics

## 2. RoboParade Theme

Robofest World Championship 2023 event theme:

# Animation

Other local hosts may choose their own theme

# 3. RoboParade Age Division and Team Size

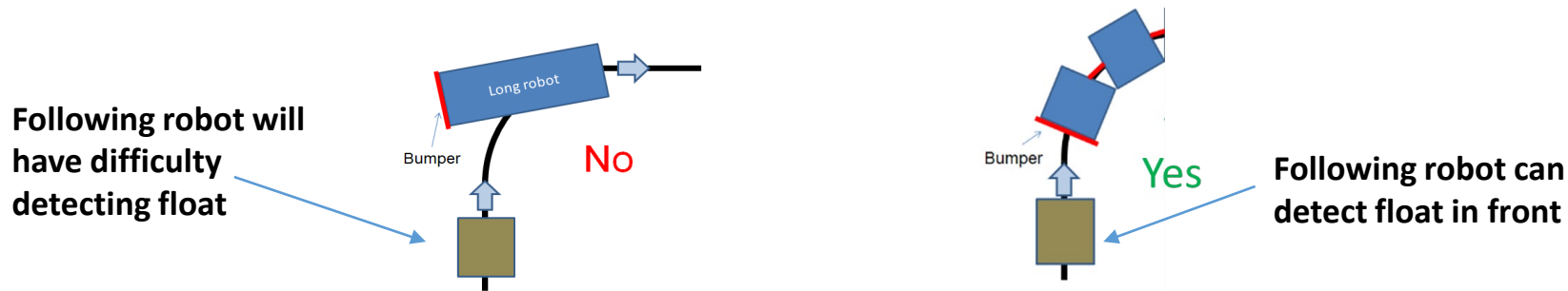
- One Age Division: Grades 4~8
- Team Size: Maximum five (5) members
- A team can enter only one robot float
- Team Registration Fee: \$75 at the Robofest World Championship (Registration fee at local events may be different)
- Related important document: Robofest 2023 [General Rules](#) on the robofest.net website
- Each team member must bring the signed [Robofest Consent and Release Form](#) on the day of the event, if not completed on-line

# 4. Robot Requirements (1/2)

- Number of robot controllers, sensors (any type), or motors: unlimited
- Each robot is required to carry a small flag with a number, which will be given once the robot passes the Test Parade
- Each robot may have its own sponsor logos
- Wireless interaction between the robot and team players using sound, ultrasonic, vision, or light sensors is encouraged
- Robot data display
  - Examples: current speed, distance (traveled in cm, for example), and elapsed time
  - Robots that do not display data can still participate, but it will be a factor in judging  
See Judging Rubric <http://www.robofest.net/images/1920/RoboParade2022Rubric.pdf>
- No overall height or weight limitations
- Maximum width 35cm (13.78 in)

# 4. Robot Requirements (2/2)

- The rear of the float must have a flat bumper *at least 10cm (3.9") tall and 28 cm (11") wide* and be 2.54cm (1 inch) off the ground so that the robot behind is able to sense your robot using its distance sensors
- Maximum overall length is 60cm. If longer than 35cm (13.78 in), it must have train-like flexible bending structures at curves as shown:

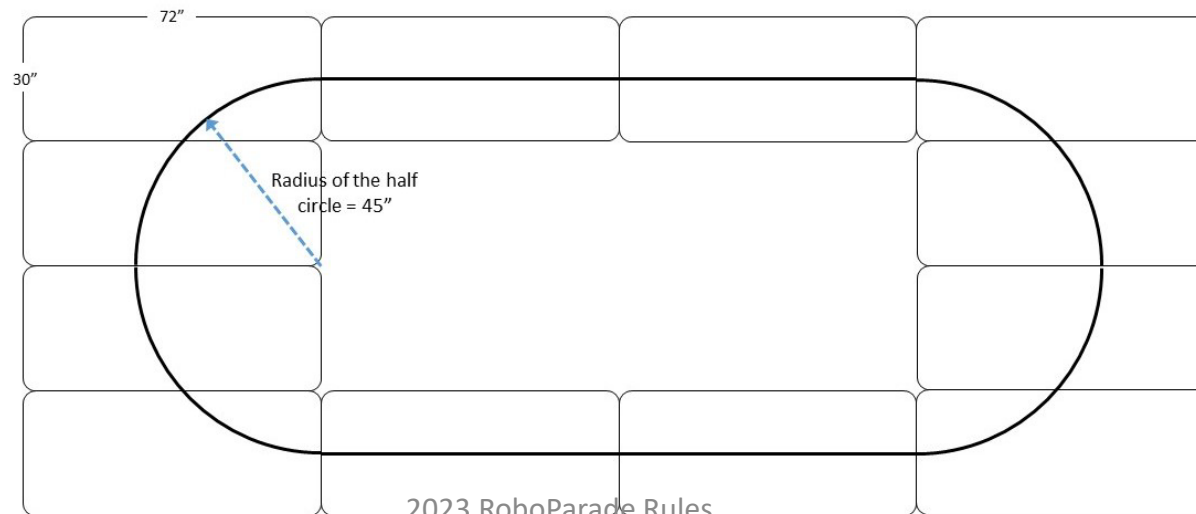


- Robot must have a reliable program to follow a black line on a bright surface
- Robot must be able to follow both clockwise or counter-clockwise parade routes
- Robot must have the ability to detect a vehicle in front of it without touching it and stop. Robot then must automatically restart when the vehicle in front has cleared
- Robot speed must be between 9 cm/sec and 18 cm/sec

# 5. RoboParade Route Tables (1/3)

- Parade route is made from plastic folding tables 30in x 72in. (actual size is about 75cm x 182 cm)
- Recommended brand is “Lifetime” <https://www.lifetime.com/lifetime-2901g-6-foot-folding-table-commercial>
- Tables can be placed on the floor using the table legs, or on a crate with the table legs folded in. Alternatively, a table covered with white paper or white vinyl table cover can be used
- Standard black electrical tape can be used to make a closed rectangular shape with 4 rounded corners

example of a possible official parade route configuration



# 5. RoboParade Route Tables (2/3)

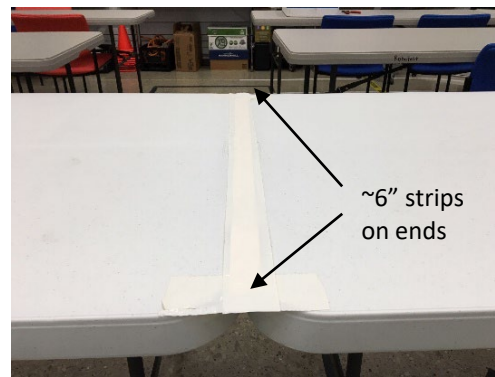
- A thin strip of poster paper is used to cover the joints formed by the table edges
- 2in wide tape (colored duct tape, masking tape, or similar) can be used to connect and hold tables together. The tape should have a color that matches the table
- Standard black electrical tape is then applied to the tables and over the joints



a) table joint with gap



b) with poster paper filler (~1"wide)



c) with 2" tape



d) Finished connections with 2" tape and black line from electrical tape



# 5. RoboParade Route Tables (3/3)

- Parade route at World Championship may have retaining walls
- Walls made of 2x2 wood attached to tables with dual lock tape

2019 World  
Championship  
course with  
2x2 retaining walls



# 6. RoboParade Competition Procedure.

- Each team must pass a **Test Parade** to ensure that all robot vehicles meet the specifications and functional requirements
  - World Championship Qualifying will be available the day before the competition date
- Early qualification is encouraged. This gives a team early feedback on whether they are ready or what they need to improve
- The parade route will be made available for practice before the qualification period begins
- No limit to the number of qualifying attempts
- Upon passing the Test Parade, the float ID (flag) will be given which allows the robot to participate in the official parade
- Teams that do not fully meet requirements may still be given a flag and allowed to compete, though ability to meet requirements will be considered in the judges' evaluations

# 7.1 RoboParade Test Parade Checklist

<b>Test Item</b>	<b>Details</b>	<b>Pass / No Pass</b>	<b>Note</b>
Line following	<i>Clockwise, counter-clockwise</i>		
Object Detection	<i>Wait and restart</i>		
Speed limit	<i>9cm/sec ~ 18cm/sec</i>		
Rear bumper	<ul style="list-style-type: none"> <li>• <i>at least 10cm tall and 28 cm wide</i></li> <li>• <i>2.54cm off the ground</i></li> </ul>		
Width	<i>Maximum 35cm</i>		
Length	<i>Maximum 60cm</i>		<i>For a float longer than 35cm it must have multiple units connected</i>

# 7.2 RoboParade Judging Rubric

(\*) Judging Score

<b>5: Strongly Agree</b>	excellent, outstanding, advanced, exemplary, or amazing
<b>4: Agree</b>	good, accomplished, or proficient
<b>3: Neutral</b>	average, intermediate level, or acceptable
<b>2: Somewhat Disagree</b>	attempted but needs work
<b>1: Disagree</b>	little attempted or needs lots of help

<https://www.robofest.net/images/2223/RoboParade2023Rubric.pdf>

1 ~ 5

Judging Category	Sub Categories	Weight	Score*
1. Artistic creativity	Robot float is unique, artistically appealing, and aligned with theme.	15%	
2. Technical creativity	Students applied unique technically creative and innovative elements to the robotics project.	15%	
3. Interactions	There are elements of wireless interaction between the robot and the team players using sensors or other communication technologies.	10%	
4. Robot design and performance	Robot mechanical design is creative, user-friendly, and sturdy. Robot reliably and successfully negotiates the official parade route. No human touch is required. Robot meets all qualifying requirements.	20%	
5. Teamwork	Teamwork and team spirit are evident. <i>Note: If the team only has one member, the score should be 1.</i>	10%	
6. Robot display	Useful data (speed, distance, etc) is displayed in clear manner.	10%	
	Students are able to demonstrate and explain display and data.	10%	
7. Team independence	I believe the project was mostly designed, developed, and programmed by the students, not by adult coaches, parents, or mentors.	10%	

100%

# 8. RoboParade Judging

- Each team member who participates in the official RoboParade will receive a medal
- A panel of Judges will score the team's performance using the RoboParade Judging Rubric by observing teams all day and especially official parade times
- Judges will interview teams
- Winner trophies will be awarded based on the overall scores
- Special award trophies may be given to recognize an extraordinary aspect of a parade float