

RobotChallenge LEAGUE Leap

Steel Melody Theme Competition Rules

Revised on November 28, 2024

Competition Theme: "Steel Clashes with Notes, Igniting a Sensory Feast! The 'Steel Melody' Music Festival is Here!"

This is no ordinary music festival—it's a sensory revolution! We've meticulously combined stunning stage design, electrifying atmosphere, immersive interactive experiences, and performances by top-tier musicians to deliver an unprecedented fusion of technology and art!

Prepare to ignite your passion and unleash your soul in the collision of steel and melody! The "Steel Melody" Music Festival awaits!

Music Performance

Numerous robot bands will perform on stage, interpreting passionate steel melodies and showcasing their unique musical talents and playing techniques, bringing a stunning music feast to fans.

≤ 14 years old

1 Competition Field

A. Field dimensions: 0.9m x 2m; material: UV knife-coated fabric.



2 Robot Requirements

A. Participants must bring their own equipment and programming devices. Components must be plastic building blocks. Recommended kits include LEGO Spike Prime 45678, EV3, VEX IQ, Whale AI Module, Aikeruite micro:bit, Zhongming , or equivalent.



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- B. Each robot may use only 1 controller and no more than 4 motors.
- C. No restrictions on the types or quantity of sensors.
- D. Robots must be constructed with plastic interlocking blocks; 3D-printed parts are prohibited.
- E. Teams may bring pre-assembled robots and task-specific structures, which can be replaced during the competition based on task requirements.
- F. Robot size must not exceed the START area dimensions (no restrictions on height or weight).

3 Competition Tasks

3.1 Task Overview

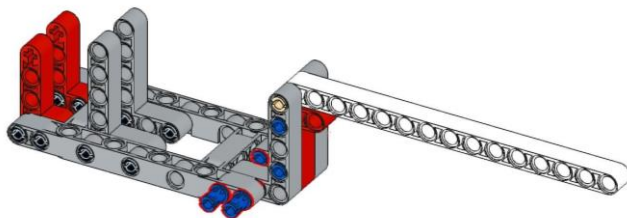
The music festival begins! Band members take the stage to activate equipment such as circuits, microphones, lighting, sound effects, screens, and cameras, ensuring the show runs smoothly.



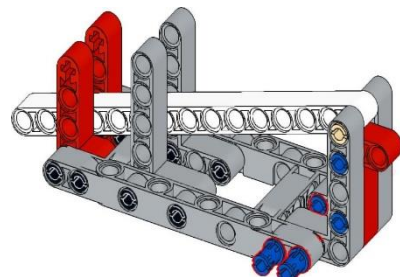
3.2 Task Details

3.2.1 Circuit Inspection

- A. Two cable interfaces are on the field. Inspect both nodes to ensure circuits are closed.
- B. Scoring: Each node with the beam pressed into the gap earns 15 points.



初始状态



完成状态

3.2.2 Microphones

- A. Three microphones must be positioned (initially placed within dashed circles on the field, upright).
- B. Scoring:

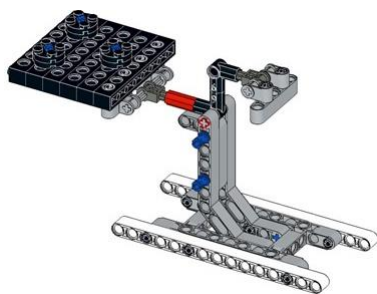
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- a) 10 points per microphone if placed within the correct area (partial projection allowed) and upright.
- b) 5 points per microphone if placed in the correct area but not upright.
- c) 3 points per microphone if not in the correct area but fully moved from the initial position.

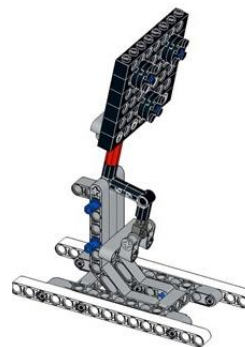


3.2.3 Raise Speakers

- A. Two speakers on the field must be raised.
- B. Scoring: 10 points per speaker if upright.



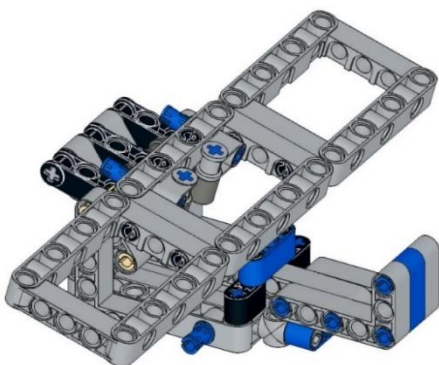
初始状态



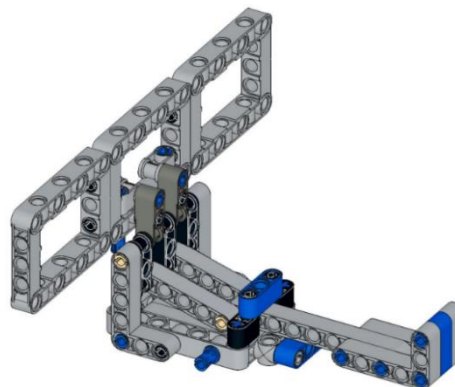
完成状态

3.2.4 Deploy Screen

- A. Activate the large screen to display background videos.
- B. Scoring: 10 points for triggering the model to deploy the screen.



初始状态



完成状态

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3.2.5 Band Members' Entrance

A. Five band members (Model random) are in the START area; deploy them in any order.

B. Scoring:

a) 10 points per figurine if placed within the designated area (partial projection allowed) and upright.

b) 5 points per figurine if in the area but not upright.

c) 3 points per figurine if not in the designated area but on the field (excluding START).

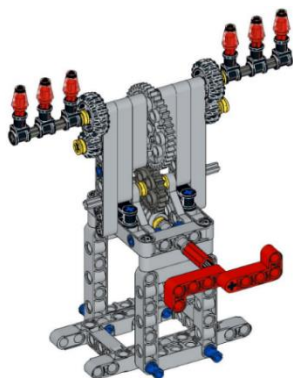
d) No points for manually placed figurines.



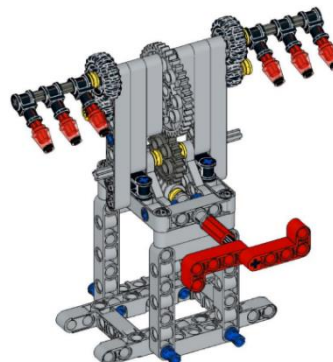
3.2.6 Activate Lighting

A. Activate stage lighting effects.

B. Scoring: 25 points for rotating the model >90 degrees to direct light toward performers.



初始状态

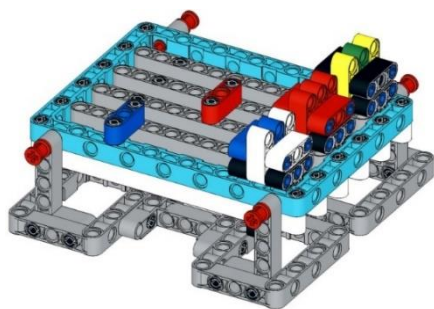


完成状态

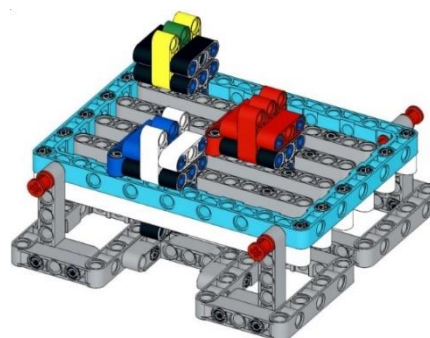
3.2.7 Activate Sound Effects

A. Activate sound effects.

B. Scoring: 10 points per switch pushed to the designated position (max 30 points).



初始状态



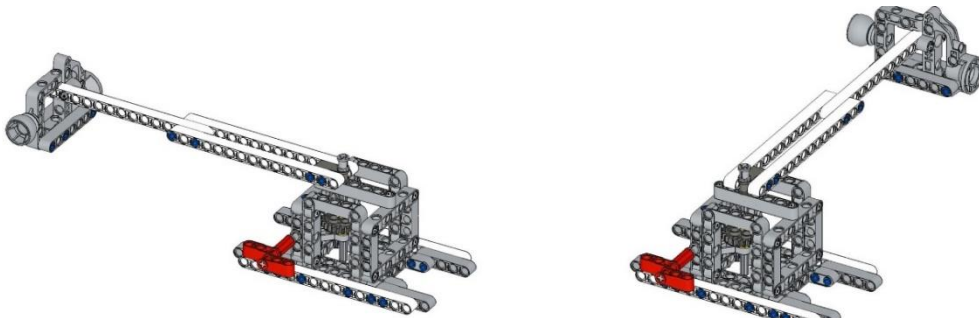
完成状态

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3.2.8 Camera Crane Operation

A. A fixed camera crane is on the field.

B. Scoring: 25 points for rotating the crane handle clockwise >90 degrees.



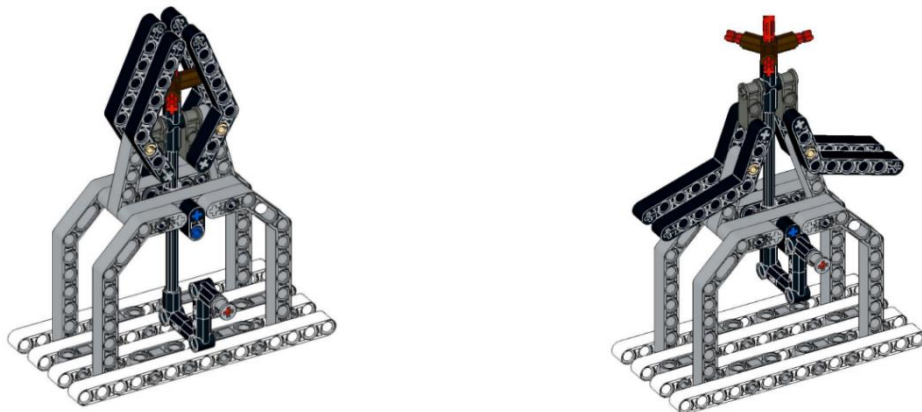
初始状态

完成状态

3.2.9 Cold Fireworks Display

A. Trigger cold fireworks on both sides of the stage.

B. Scoring: 10 points per fully opened fireworks model.



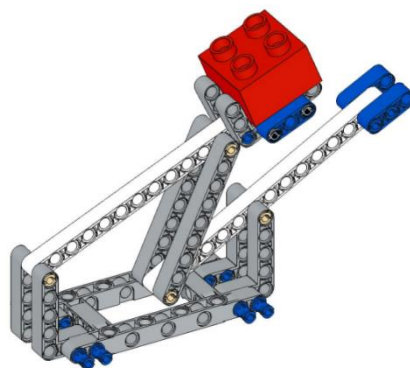
初始状态

完成状态

3.2.10 "Stage Dive"

A. Trigger the "stage dive" platform to move the prop outside the team's field.

B. Scoring: 25 points if the prop exits the field; 10 points if it remains within the field.



3.2.11 Bonus Task (World Championship)

A. Bonus tasks (announced before on-site debugging) earn 30 points upon completion.

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B. Tasks align with basic tasks but require real-time program adjustments based on prop positions.

3.2.12 Robot Integrity

5 points if no parts detach during the competition (structural changes excluded).

3.2.13 Retry Penalty

5 points deducted per retry (see 4.4).

3.2.14 Total Score

A. Base score: 270 points; with bonus tasks: 300 points.

B. Remaining time score = 10% of total points.

C. Remaining time score = (Remaining seconds ÷ Total seconds) × 30.

D. Total score = Task score + Remaining time score.

4 Competition Requirements

4.1 Competition Time

A. 60 minutes for pre-competition debugging; 3 minutes per round.

B. The round stops immediately when time ends; judges tally scores.

4.2 Competition Rounds

Each team competes in two consecutive rounds.

4.3 Start of Competition

Judges count down "3, 2, 1" before whistling; teams activate robots.

4.4 Retry Rules

A. Retry conditions:

a) Touching robots or props outside the START area.

b) Robot drive wheels leave the boundary of the field or malfunction on the field.

c) Robot cannot autonomously return to START (The complete entry of the robot drive wheel into the START area is considered a return).

B. 5 points deducted per retry.

C. Field remains unchanged; robot is moved back to START.

4.5 Ranking

A. Rankings based on the best of two rounds.

B. Tiebreaker: Team with more remaining time ranks higher.

C. Further tiebreaker: Compare second-highest scores and remaining time.

5 Notes

A. Field props have randomized colors.

B. Spare parts must not be placed within the field boundaries.

C. Task order is flexible.

D. Robots may restart tasks if they return autonomously to START.

E. If a robot fails to start, adjustments are allowed without stopping the timer.

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F. Final scoring occurs post-competition.

"Music Performance" Score Sheet

		Judge Items	Value	Points	Score
1	Circuit Inspection	Beam pressed into the gap on the other side.	0 1 2	15	
2	Microphones	Microphone placed within the correct area (partial projection allowed) and upright.	0 1 2 3	10	
		Microphone placed within the correct area (partial projection allowed) but not upright.	0 1 2 3	5	
		Microphone not in the correct area but fully moved from the initial position.	0 1 2 3	3	
3	Raise Speakers	Speaker erected in an upright position.	0 1 2	10	
4	Deploy Screen	Trigger the prop model to unfold the large screen.	0 1 (N) (Y)	10	
5	Band Members' Entrance	Figurine deployed in the designated area (partial projection allowed) and upright.	0 1 2 3 4 5	10	
		Figurine deployed in the designated area (partial projection allowed) but not upright.	0 1 2 3 4 5	5	
		Figurine not in the designated area but on the field (excluding START area).	0 1 2 3 4 5	3	
6	Activate Lighting	Rotate the model to direct light toward performers, with a rotation angle exceeding 90°.	0 1 (N) (Y)	25	
7	Activate Sound Effects	Sound effect switch pushed to the designated position.	0 1 2 3	10	
8	Camera Crane Operation	Rotate the crane handle clockwise by more than 90°.	0 1 (N) (Y)	25	
9	Cold Fireworks Display	Trigger the prop model to fully open the cold fireworks.	0 1 2	10	
10	Stage Dive	Trigger the "stage dive" platform to move the prop outside the team' s field.	0 1 (N) (Y)	25	
		Trigger the "stage dive" platform, with the prop landing within the team' s field.	0 1 (N) (Y)	10	
11	Bonus tasks	Complete bonus tasks	0 1 (N) (Y)	30	
12	Robot remains intact throughout the operation (no detached parts).		0 1 (N) (Y)	5	
13	Number of retries (retry penalty, 5 points per retry)			-5	
14	Time bonus = (Remaining time (seconds) ÷ Total time (seconds)) × 30 (10% of total score)				
			Total Score		
			Remaining Time:		