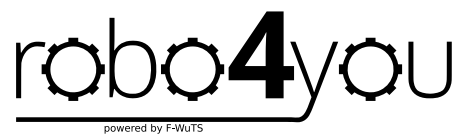


Regulations of the Aerial Junior Competition



Organized by robo4you and the Practical Robotics Institute Austria

ECER 2024
Version 1.1

Revision History

- Version 1.0: 13. 12. 2023
Initial Release
- Version 1.1: 15. 01. 2024
Conciser Definition

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1 General

1.1 General provisions

1. The competition will take place from 08. 04. 2024 to 12. 04. 2024 in Vienna, Austria, in conjunction with the European Conference on Educational Robotics 2024.
2. The organizer is not responsible for any damage caused by competitors or viewers.

1.2 Equipment requirements

The use of the **DJI Tello EDU** is strongly recommended. Nonetheless, the following drones are allowed:

- **DJI Tello EDU**
- DJI Tello

1.3 Safety rules

- It is completely forbidden to fly drones outside the designated flight zones.
- Only judges and two team members are allowed in the track area at a time.
- A pilot who exhibits unsafe behaviour will be disqualified.

2 Competition

2.1 Gameboard

Definition 2.1: Gameboard

See the end of this document for exact Gameboard specifications.

- **Size** - 2.90m x 2.10m
- **Mission Pads** - are placed in the center of every circle. The Mission Pad IDs match the circle IDs.

Definition 2.2: Mission Pad

These are original / genuine mission pads, that come with the Tello Drones. See Figure 2.1



Figure 2.1: Tello Mission Pads

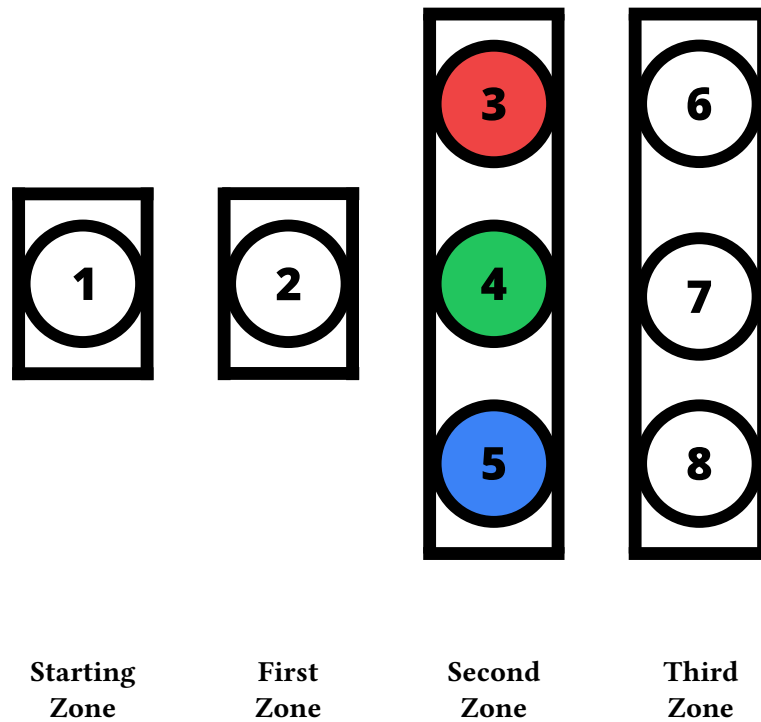


Figure 2.2: Schematic Representation of the Game board. Dimensions not accurate!

2.2 Term Definitions

Definition 2.3: to land

The drone must rest on the ground with rotors turned off. Note: One needs to take off first, in order to land.

Definition 2.4: Land in a Circle

To score points for the landing in the circle, it is enough if **some part of the drone is touching** the circle.

Definition 2.5: Land in a Zone

To score the points for landing in the zone, the drone must be **fully within** the zone and resting on the ground. (Landing in the circle also counts as landing in the zone!)

3 Challenges

- The challenges can be completed in an arbitrary order.
- Not all challenges need to be completed.

Challenge 3.1: Starting Zone

The starting zone is at the very beginning of the gameboard. The drone should take off and exit the zone.

Takeoff - Is awarded, when the drone is completely in the air.

Leave the Zone - To score, the drone must completely exit the vertical projection of the starting zone.

Points:

Challenge	Points
Takeoff	5
Leave the Zone	10

See [Figure 2.2](#) "Starting Zone"

Challenge 3.2: First Zone

The drone should land within the circle. However, points can also be scored when landing inside the zone itself.

Land in the Zone - See definition [2.5](#)

Land in the Circle - See definition [2.4](#)

Flip - To score this multiplier, the drone needs to land in the circle, take off, do a flip and only leave the zone.

Points:

Challenge	Points
Land in the Zone	5
Land in the Circle	10
Flip	x2

See [Figure 2.2](#) "First Zone"

Challenge 3.3: Second Zone

The judges will specify in which of the three circles (red, green or blue) the drone should land. The judges will tell the team the color, and the team must type in their program where the drone should land. (For example: using the `input()` function.)

Land in the correct Circle - The drone must land in the correct circle, as chosen by the judges. In general, see 2.4.

Land in the Zone - See definition 2.5

Points:

Challenge	Points
Land in the correct Circle	10
Land in the the Zone	5

See *Figure 2.2 "Second Zone"*

Challenge 3.4: Third Zone

Here the judges will give the team the numbers "6", "7" and "8" in a specific order. The drone then has to land in the circle in the correct order. For example, if the judges give the numbers: "7", "8" and "6", the drone should first land in the circle "7" then in the circle "8" and then in the circle "6". If you miss a landing, you are not able to score for the successive circles.

Land in the correct Circle - The drone must land in the correct circles, as chosen by the judges. In general, see definition 2.4.

Land in the Zone - See definition 2.5.

Points:

Challenge	Points
Land in the correct Circle 1	10
Land in the correct Circle 2	10
Land in the correct Circle 3	20
Land in the Zone	5

See *Figure 2.2 "Third Zone"*

Challenge 3.5: Bonus Points

Bonus 1 - This bonus is scored, when landing in all four zones.

Points:

Challenge	Points
Bonus 1	10

3.1 Scoring Sheet

See next page.

Teamname: _____ Time (hh:mm): _____

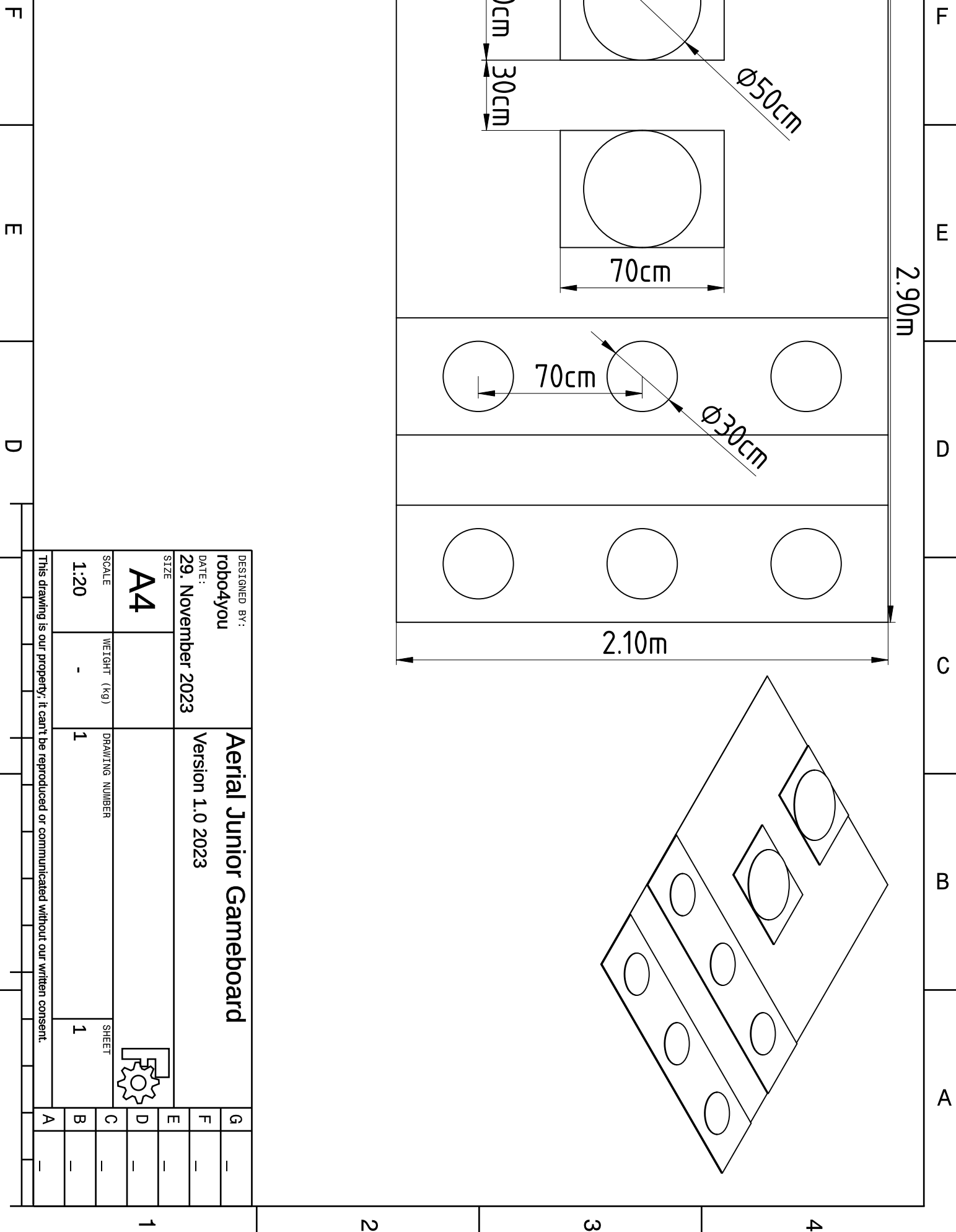
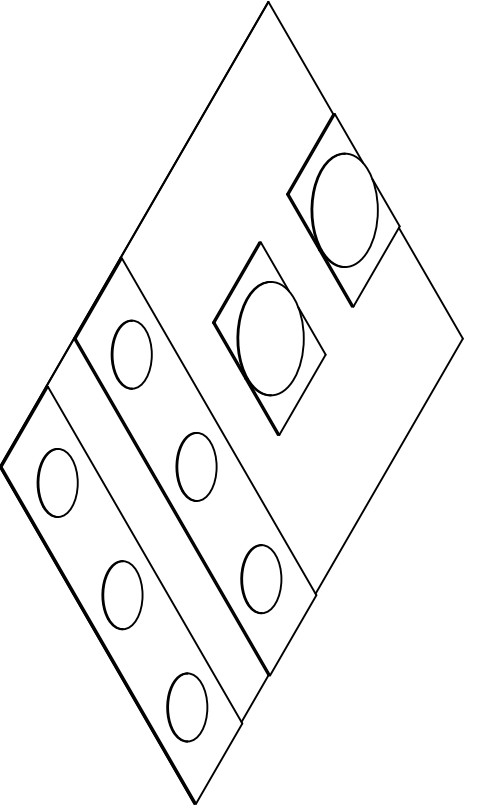
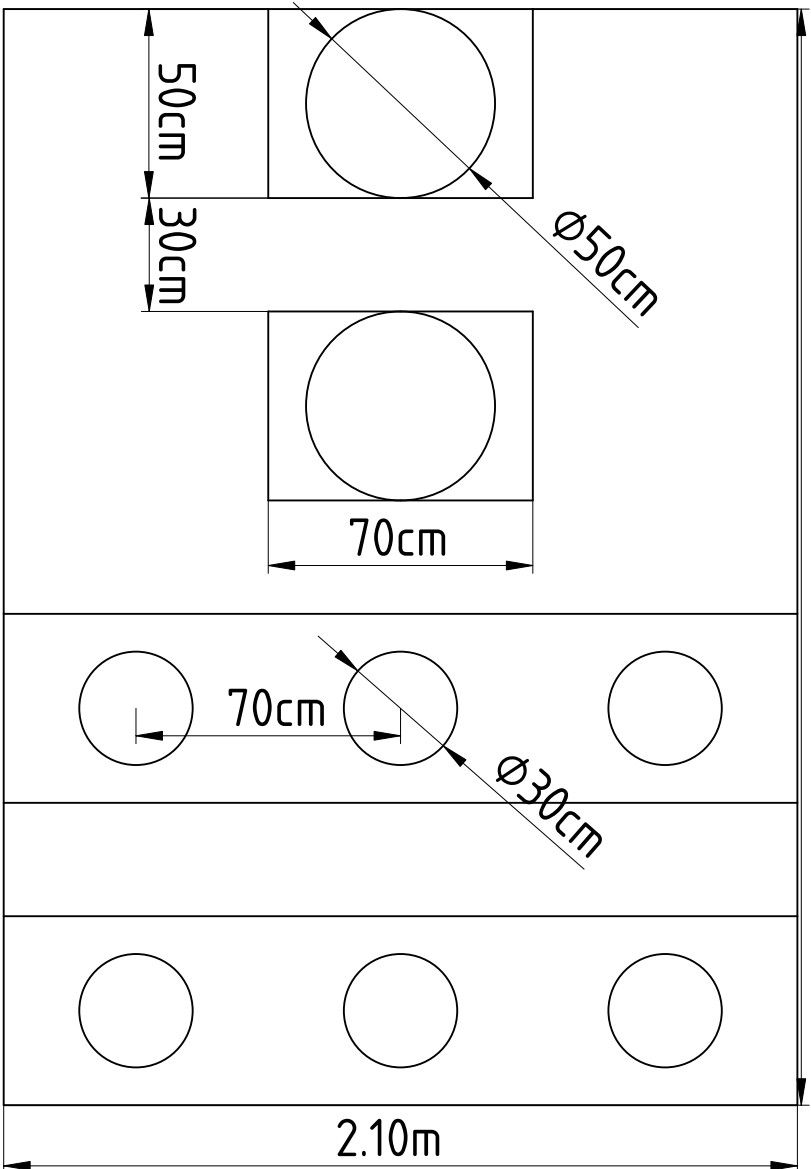
Challenge	Score	Total
Starting Zone		
	Takeoff <input type="checkbox"/> +5	= _____
Leave Zone	<input type="checkbox"/> +10	= _____
First Zone		
	Land in Zone <input type="checkbox"/> +5	= _____
	Land in Circle <input type="checkbox"/> +10	= _____
Flip	<input type="checkbox"/> x2	= _____
Second Zone		
	Land in Zone <input type="checkbox"/> +5	= _____
Land in correct Circle	<input type="checkbox"/> +10	= _____
Third Zone		
	Land in Zone <input type="checkbox"/> +5	= _____
	First Circle correct <input type="checkbox"/> +10	= _____
	Second Circle correct <input type="checkbox"/> +10	= _____
Third Circle correct	<input type="checkbox"/> +20	= _____
Bonus Points		
	Bonus 1 <input type="checkbox"/> +10	= _____
Total		_____

Signatures:

Team: _____ Judge: _____

3.2 Competition Procedure

- Each team will have at least three **runs**. One run lasts for exactly **ten minutes**.
- At the beginning of each run, the judges tell the teams the correct circle for the second zone and the three numbers for the third zone.
- For every run, teams will have **three attempts**. In each attempt:
 1. The Team-Leader places the drone on the Gameboard.
 2. The Team-Leader starts the code
 3. After the drone is finished (either landed by itself or shut-off by the Team-Leader) the Team-Leader decides whether to try again or score.
- The last attempt scores for a run.
- The Judges add up all the scores. The Team-Leader checks the scores and signs the scoring sheet.
- The sum of the best two runs count as the overall score.



DESIGNED BY:		robo4you		Version 1.0 2023		G	-
DATE:		29. November 2023		Version 1.0 2023		F	-
SIZE:		A4		Version 1.0 2023		E	-
SCALE:		1:20		Version 1.0 2023		D	-
WEIGHT (kg):		-		Version 1.0 2023		C	-
DRAWING NUMBER:		1		Version 1.0 2023		B	-
SHEET:		1		Version 1.0 2023		A	-



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Figure 1: A real gameboard, as per the specifications