

Artificial Intelligent Related Drone (AIR Drone) Competition Rules

(FPV Drone Race)

CHOK KONG YU

Politenik Ibrahim Sultan

chok73@gmail.com

MOHD FARIS BIN HASHIMUDDIN

Politeknik Merlimau Melaka

alphariziqd@gmail.com

WONG WEI MING

Politeknik Port Dickson

wongweiming5351@gmail.com

1.0 General Information

- 1.1 Team members - Each team, consists of 2 Students and 1 Supervisor.
- 1.2 In order to improve the research on Drone stability, Teams drone may use any stability or avoidance sensors. Mission should be completed without relying on GPS/GNSS data.
- 1.3 Participant should be around the competition field or pit stop during the competition.
- 1.4 If the team late for 10 minutes after the referee called, the team will be considered as walkover for that attempt.

2.0 Types of Drones

- 2.1 A single drone competes in each attempt. Teams are allowed to use different drones for different attempts.
- 2.2 Whoop drone with 65mm and 75mm frame are recommended. Figure 1 show the example of 65mm whoop drone
- 2.3 All pilots must utilize a Video Transmitter capable of broadcasting on the **Raceband** frequency set.

- Authorized Channels: Only **Raceband Channels 1 through 8** are permitted for use during the event.
- Hardware Compatibility: Any aircraft lacking Raceband support is strictly prohibited from competition.
- Ineligible Aircraft: **Entry-level or "Ready-to-Fly" (RTF)** models that do not support standard Raceband frequencies (e.g., **Cetus, Cetus Pro**, and similar micro-drones) are not permitted to compete.

2.4 **On-Screen Display (OSD)** Configuration - For identification and officiating purposes, all pilots must configure their OSD settings prior to tech inspection.

- Pilot Identification: The pilot's **registered Name or Callsign** must be clearly visible and active on the OSD at all times during flight.
- Visibility: Ensure the text placement does not obstruct critical flight data but remains legible for the race officials' DVR recording.



Figure 1 : BetaFPV Air Whoop 65mm Drone

3.0 During Game

- 3.1 Referee can stop the game anytime if the drone may damage the field or injure a person.
- 3.2 Participants cannot fly or hover the drone if there is a person in the competition fields.
- 3.3 Participants cannot entered in the competition field once the game started.
- 3.4 Enable 'turtle mode' to flip if crash. No crew will turn over your quad in-field during race.
- 3.5 No team members are allowed to enter the competition field once the game started

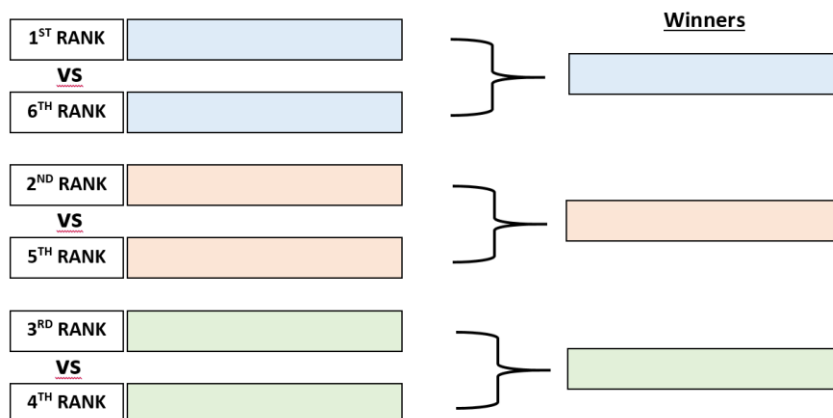
4.0 Rules Of The Game

- 4.1 These rules are directing to develop a first person view (FPV) drone for the manual control use in the inspection.
- 4.2 Physical specification of the drones must abide by the rules below. Otherwise, the drone is not allowed to take part in the competition.
- 4.3 The **size of the drone should be smaller than 12 cm** (Maximum size of tello without propellar).
- 4.4 The weight of the drone (when flying) should be less than 1 kg.
- 4.5 Only electric motors and actuators are allowed, using fuel-based motors is not allowed.
- 4.6 There is no limitation on the type of drone (airship, helicopter, ...) except that the drone should be capable of vertical flight.
- 4.7 Drone must have prop guard to avoid the drone damage the race field.
- 4.8 All the decision made by the game officials is final.
- 4.9 Referees have the right to rule out any attempt if any suspicious activity or an unfair attempt is found and also to stop any dangerous run.

5.0 Game Structure

- 5.1 In this competition, the competition formats will be in **Three (3) Rounds**, there are: **1st Round (Qualifying Round)**, **2nd Round (Knock-Out System)** & **Final Round (Medal Bout)**.
- 5.2 In the **1st Round (Qualifying Round)**, each team will send a pilot and the pilot will be given **Three (3) Minutes** for each round and the fastest lap will be taken as the final score for the team to be ranked. The **Six (6)** highest rank teams will advance to the 2nd Round.
- 5.3 In the **2nd Round (Knock-Out System)**, the highest 6 rank teams will compete in the knockout system to select the 3 winners to advance to the 3rd Round where the 1st Rank Team in the previous round will versus 6th Rank Team, 2nd Rank Team will versus 5th Rank team and the 3rd Rank Team will versus 4th Rank Team as stated in the following charts. Both teams will be racing together from the take-off pad. The first team that completed the 5 laps will be declared as the winner. If none of the team has completed the 5 laps, the furthest travelled team will be declared as the winner.

2ND ROUND – 5 LAPS (KNOCK-OUT SYSTEM)



5.4 In the **Final Round (Medal Bout)**, the 3 winners from the 2nd round will be racing together from the take-off pad. The first team that completed the 5 laps will be declared as the Champion and the second will be the Runner-Up and the last will be the Second Runner-Up. If none of the team has completed the 5 laps, the furthest travelled team will be declared as the Champion and the second furthest team will be the Runner-Up and the third furthest will be the Second Runner-Up.

FINAL ROUND – 5 LAPS (MEDAL BOUT)

	<u>INSTITUTION</u>	<u>TIME</u>
		
		
		

5.5 In the Figure 2, Figure 3 and Figure 4 show the example of the possible gate that will be using during the game.



Figure 2 : Box Types Gate



Figure 3 : Circle Types Gate



Figure 4 : Flag

6.0 Field of Play

6.1 Field of play is a simple field consist of take-off pad, landing pad, and gates. The size of the gate are vary and 75mm frame drone are able to fly through it.

7.0 Drone Master Selection

- 7.1 The Drone Master Award is given to the team with the highest total score from all Air Drone challenges. Points are awarded based on medal rankings: 3 points for a Gold medal, 2 points for a Silver medal, and 1 point for a Bronze medal.
- 7.2 If two or more teams have the same total score, the tie is broken by the team with the higher achievement in the Emergency Delivery and tower inspection.
- 7.3 If the tied teams did not participate in the Emergency Delivery and tower inspection, the tie is broken based on the highest achievement in the Autonomous Race.

8.0 Amendment

Year	Version	Location	Changes
2024	1.2		Grammar and format
2024	1.3		Game structure
2026	1.5	2.3,2.4 5.1	Add on types of drone allowed 1 st Round (Qualifying Round)

