

RULE BOOK

8.Dronetrix

B. FPV(Night)

TASK:

Participants will pilot FPV drones through a challenging course while wearing FPV goggles to navigate in real-time from the drone's perspective. The goal is to complete the course in the shortest time while maintaining control and adhering to the rules.

DESIGN SPECIFICATIONS:

- Maximum drone weight: **1.5 kg** (including battery).
- Maximum diagonal motor-to-motor size: **300mm**.
- Only FPV drones with 5" or smaller propellers are allowed.
- Onboard FPV camera with video transmission is mandatory.
- Video transmission frequency: **5.8 GHz** (all participants must confirm frequency/channel compatibility).
- Participants must use FPV goggles or an FPV monitor to navigate the drone.
- A fail-safe mechanism must be in place to ensure the drone lands immediately in case of signal loss.
- Battery voltage must not exceed **22.2V (6S)**.
- Maximum motor thrust per propeller: **2 kg thrust**.
- Participants must bring their own FPV goggles or monitor.
- Ensure compatibility with a **5.8 GHz video transmission system**.

GENERAL GUIDELINES:

- Participants will be given one trial run to familiarize themselves with the course.
- Timed runs to determine seeding for the final race.
- A multi-lap race where participants compete head-to-head.
- Each round must be completed within **5 minutes**.
- The final race will consist of **3 laps** through the designated course.
- Fastest time to complete the course (including penalties) will determine the winner.
- Missing a gate or obstacle: **+5 seconds** per instance.
- Colliding with gates, obstacles, or the ground: **+10 seconds** per instance.
- Exiting the designated flight path: **+15 seconds** per instance.
- Entering the no-fly zone or crossing safety barriers.
- Flying dangerously or in a manner deemed unsafe by judges.
- Intentional interference with another participant's drone.

Safety Rules

- All drones must be equipped with a return-to-home (RTH) or immediate landing failsafe in case of signal loss or emergency.
- Flying outside the designated course or into spectator areas will result in immediate disqualification.
- Pilots must remain in the designated pilot area while flying.
- Spectators are not allowed near the racecourse.
- Teams must ensure their drones are in proper working condition before the event.
- Organizers reserve the right to modify rules or the course layout based on safety or other considerations.

❖ Judging Criteria for FPV Drone Racing

The judging criteria for this FPV drone racing event are designed to evaluate each participant's performance in terms of speed, precision, safety, and technical proficiency. The ultimate goal is to ensure fairness, challenge the pilots' skill, and reward the fastest, most skilled, and safest competitors.

1. Completion Time (50 Points)

The primary factor for determining the winner is the total time taken to complete the course. The fastest time (including any penalties) to complete the multi-lap race will determine the winner.

- **Full Course Completion (40 Points):** Successfully completing the course within the 5-minute time limit, including 3 laps of the designated course.
- **Penalty for Time Violations (up to 10 Points):**
 - **+5 seconds** for each missed gate or obstacle.
 - **+10 seconds** for each collision with a gate, obstacle, or the ground.
 - **+15 seconds** for exiting the designated flight path.

2. Precision and Agility (20 Points)

This category assesses the pilot's ability to navigate the course with accuracy, smoothness, and control, particularly when flying through tight gates, narrow pathways, or high-speed sections.

- **Gate and Obstacle Navigation (10 Points):** Pilots must pass through each gate and obstacle without missing or skipping any, maintaining a steady flight trajectory.
- **Smoothness and Control (10 Points):** Pilots should demonstrate fluid, controlled movements, especially when navigating tight turns, slaloms, or obstacles at high speed. Abrupt movements, lack of control, or excessive correction may result in deductions.

3. Safety Compliance (15 Points)

Safety is critical in FPV drone racing, both for the pilots and for any spectators or other participants. Pilots and their drones must meet all safety regulations throughout the event.

- **Drone Fail-Safe Mechanism (5 Points):** Each drone must be equipped with a functional return-to-home (RTH) or immediate landing fail-safe to protect against signal loss or other emergencies. Judges will verify the fail-safe during the inspection.
- **Safety Compliance (5 Points):** Pilots must follow safety protocols, including maintaining a safe distance from the course boundaries, staying in the designated pilot area, and not flying into spectator zones. Dangerous or unsafe flying behavior will lead to penalties or disqualification.
- **Flight Path and Zone Adherence (5 Points):** Pilots must remain within the designated course boundaries. Any exit from the flight path or entry into no-fly zones will result in significant penalties.

4. Technical Performance (10 Points)

This category evaluates the technical performance of the drone, focusing on its ability to complete the course without issues related to hardware or malfunctioning systems.

- **Drone Performance (5 Points):** The drone must perform reliably throughout the race, including stable flight, functioning FPV camera and video transmission, and battery performance.
- **Signal and Transmission Stability (5 Points):** The FPV system should transmit a stable and clear video feed to the goggles or monitor without significant interference. Poor video quality, signal loss, or constant static will result in deductions.

5. Innovation and Design (5 Points)

This section rewards teams that display creative, effective, or innovative designs within the allowed specifications.

- **Drone Design and Setup (5 Points):** Points are awarded for innovative approaches to drone setup, frame design, or equipment configuration that contributes to overall performance, durability, or handling. This includes aspects like weight distribution, propeller size, and power-to-weight ratio.

6. Penalties for Violations (Variable)

Penalties will be applied for violations of the event rules and guidelines. Deductions from the total score will occur based on the severity of the infraction.

- **Flying Outside the Course (15 Seconds):** Exiting the designated flight path or entering no-fly zones results in a 15-second penalty.
- **Gate or Obstacle Violations (5 to 10 Seconds):** Missing a gate or obstacle incurs a 5-second penalty. Collisions with gates, obstacles, or the ground result in a 10-second penalty.
- **Unsafe Flying or Interference (Immediate Disqualification):** Flying in a manner deemed unsafe or intentionally interfering with another participant's drone will lead to immediate disqualification.

❖ Scoring Overview:

Criteria	Max Points
Completion Time	50
Precision and Agility	20
Safety Compliance	15
Technical Performance	10
Innovation and Design	5
Total Maximum Score	100

➤ Important Notes:

- The **fastest time** will be the primary factor in determining the winner, with penalties added for missed gates, collisions, or safety violations.
- **Time penalties** will be added for violations like missing gates, colliding with obstacles, or exiting the designated flight path.
- **Safety violations** or unsafe behaviour will lead to severe penalties or disqualification.
- **Ties** will be broken based on the fastest completion time. If needed, judges may review the precision of course navigation to resolve ties.