2023 FAI e-Drone Racing Cup

A first online FAI e-Drone Racing event, named *'2023 FAI e-Drone Racing Cup*', will be organised as sub-event of the 2023 World Drone Racing Championship (WDRC). This online event will be run with the EreaDrone simulator and with the simulation of the 2023 WDRC track.

1. Model

There is a predefined "standard" model available in EreaDrone.

Every user may also edit its own model by fixing different parameters within a precise defined range which respects the specifications stated in the FAI F9U rules.

List of the model parameters:
  - Mass
  - Motor KV
  - Battery voltage (16.8 V/4S or 25.2 V/6S)
  - Propeller diameter and pitch
  - Air drags
  - Rotation inertia
  - Ground effect
  - Motor attack speed and torque

It is also possible to fix some of these parameters for a specific event (Example: battery voltage fixed at 25.2 V).

2. Event organisation

2.1. Qualification stage

The qualification stage is run asynchronous, meaning that each pilot is flying alone without being impacted by the other pilots flying at the same moment.

Qualification period: *Friday 1st September 00:00 GMT time to Sunday 24th September 24:00 GMT time.*

The qualification stage ranking will be done considering the fastest time to complete 3 (three) consecutive laps. In case of a tie between pilots concerned by the selection for the final stage, the second fastest time to complete three consecutive laps will be considered to split the tie, and then if necessary the third one in necessary, and so on until the tie will be solved.

Every pilot will be authorised 12 attempts maximum to register times on three consecutive laps during the qualification period. The pilot may do the attempts whenever during the defined period of time, on different days and at any time of each day.

Note: The simulation of the track of the 2023 WDRC will be available on the EreaDrone simulator before the beginning of the qualification period 2023 FAI e-Drone Racing Cup. All competitors participating to the WDRC will have the same possibility to train on the simulator getting, where appropriate, an EreaDrone licence for free. So, it could not be argued that the 2023 WDRC competitors who will not participate to the e-Drone Racing event may be disadvantaged compared to those who will participate.
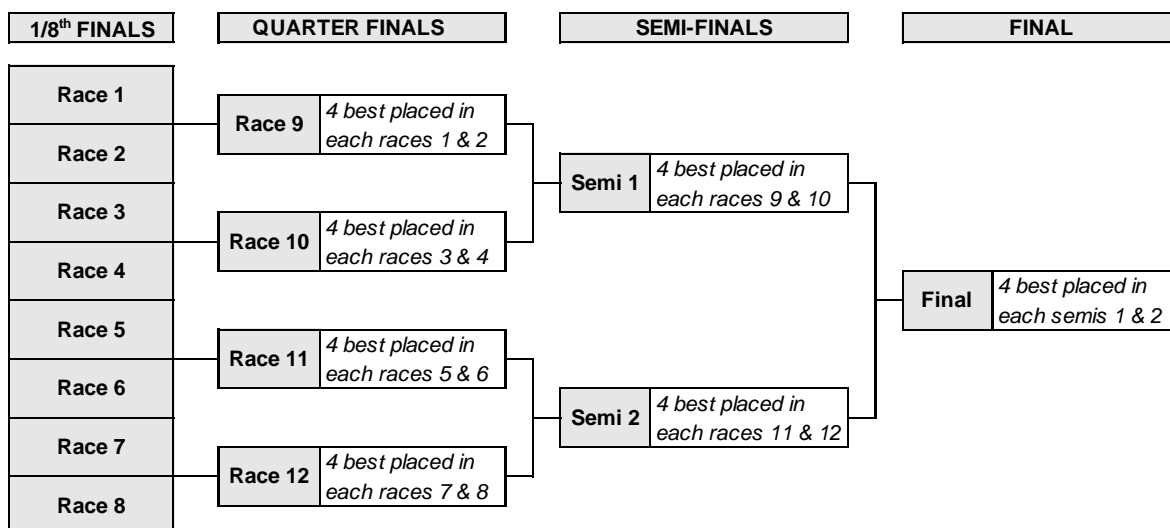
2.2. Final stage

The final stage is run synchronous, meaning that the pilots of a race are flying simultaneously with possibility to see the other models.

All races will be run on 3 (three) laps.

The format of the final stage is based on 1/8th finals followed by 1/4th finals, semi-finals and the final. Each race will include 8 (eight) pilots. So, the final stage will concern 64 pilots selected from the qualification stage.

The four best placed pilots in each race are selected for the next round up to the final race according to the following table.

1/8th FINALS	QUARTER FINALS		SEMI-FINALS		FINAL	
Race 1						
Race 2	Race 9	*4 best placed in each races 1 & 2*				
Race 3			Semi 1	*4 best placed in each races 9 & 10*		
Race 4	Race 10	*4 best placed in each races 3 & 4*			Final	*4 best placed in each semis 1 & 2*
Race 5						
Race 6	Race 11	*4 best placed in each races 5 & 6*				
Race 7			Semi 2	*4 best placed in each races 11 & 12*		
Race 8	Race 12	*4 best placed in each races 7 & 8*				

The composition of the races' groups for the 1/8th finals round will be done as follows considering the ranking of the 64 best placed pilots from the qualification stage.

Race 1	Selected 1st	Selected 16th	Selected 24th	Selected 32th	Selected 40th	Selected 48th	Selected 56th	Selected 64th
Race 2	Selected 8th	Selected 9th	Selected 17th	Selected 25th	Selected 33th	Selected 41th	Selected 49th	Selected 57th
Race 3	Selected 6th	Selected 11th	Selected 19th	Selected 27th	Selected 35th	Selected 43th	Selected 51th	Selected 59th
Race 4	Selected 4th	Selected 13th	Selected 21th	Selected 29th	Selected 37th	Selected 45th	Selected 53th	Selected 61th
Race 5	Selected 3th	Selected 14th	Selected 22th	Selected 30th	Selected 38th	Selected 46th	Selected 54th	Selected 62th
Race 6	Selected 5th	Selected 12th	Selected 20th	Selected 28th	Selected 36th	Selected 44th	Selected 52th	Selected 60th
Race 7	Selected 7th	Selected 10th	Selected 18th	Selected 26th	Selected 34th	Selected 42th	Selected 50th	Selected 58th
Race 8	Selected 2th	Selected 15th	Selected 23th	Selected 31th	Selected 39th	Selected 47th	Selected 55th	Selected 63th

Placing for each race is simple to determine: first arrived in first place, and so on.

The final stage will be run during the Namwon 2023 WDRC.

Note: A room with appropriate equipments will be available for the final stage for the pilots present on the venue (Chunhyangol Sports Complex).

Provisional schedule for the final stage:
   - *Friday October 6: 1/8th finals round (8 races).*
   - *Saturday October 7: Quarter finals to the final (7 races).*

Each race will need 10 minutes Including the pilots' preparation, the race itself, and the checking of the result of the race. This will give time for the commentators to comment the race, analyse it with replays and stats, and do the announcement of the following race.

Each day, the live streaming session will start with an introduction (10 to 15 minutes) by the commentators, and eventually a debrief time (10 to 15 minutes) after the last race.

This means a total time of 2 hours for the first day, and about 1 hour 45 minutes for the second day.

2.3. Others

Safety volume

In the simulator, the environment has a bounding box (volume).

When a model crosses that box, a popup shows up informing the pilot concerned that he/she gets 7 seconds to go back inside the bounding box. If after 7 seconds the model is still outside the box, the pilot concerned is disqualified from the race.

Start

The model cannot be armed before the start signal. At the start signal, the model is automatically armed once the pilot sets the throttle; setting the throttle at its maximum before the start signal does not permit to get the maximum power right after the start signal.

So, it is not necessary to consider a possibility of early start justifying a disqualification from the race.

Case of an obstacle not crossed correctly

Each obstacle to be crossed is marked and the pilots may see a small indicator showing them which is the next obstacle to be crossed. The following obstacles cannot be validated as long as the previous one is not validated.

A lap is validated only once all the obstacles have been crossed in the good order.

Collision between models

Pilots see the other drones but can't touch them. Therefore, it is not possible to have a crash due to a collision with another model.

Reflight

It is not necessary to provide any possibility of reflight considering:
  - Video issue may not occur with a simulator.
  - Collision between two models may not arrive.
  - In situation of a crash, the pilot concerned may immediately take-off again.

Note: A non stable internet connection may generate a problem during a race for the pilot concerned. The pilot will be considered as responsible of the quality of his/her internet connection. So, a complaint based on a disconnection during the race will not be accepted.

Allocation of the colours

A colour is allocated to each model for the race.

EreaDrone simulator can accept any colour. Find below a suggestion of eight (8) distinct colours defined in hexadecimal:
  - #F58231 (Orange)
  - #4363D8 (Blue)
  - #3CB44B (Green)
  - #E6194B (Red)
  - #FFE119 (Yellow)
  - #911EB4 (Purple)
  - #42D4F4 (Cyan)
  - #F032E6 (Pink)

3. Specifications of the equipments to support EreaDrone

A Windows computer and a controller such as a radio controller (e.g., Taranis, Radiomaster, etc.) or a game controller (e.g., Xbox Controller) are necessary.

Note: Use of a FPV google headset will not be required due to the difficulty to set up properly such a device on a computer.

Minimum configuration for the computer:

OS: Windows 7 64 bits

CPU: Intel® Core™ i5-4460 / AMD Ryzen 3 1200

Graphics: Nvidia GeForce GTX 980 4GB / AMD Radeon RX 470 4GB

Memory: 8 GB RAM - Storage: 35 GB HDD

Recommended configuration for the computer:

OS: Windows 10 64 bits

CPU: Intel® Core™ i5-9600K / AMD Ryzen 5 2600X

Graphics: Nvidia GeForce GTX 1080 8GB / AMD Radeon RX 590 8GB

Memory: 12 GB RAM - Storage: 35 GB SSD

4. Participants

Any person registered on the EreaDrone application may participate to the qualification stage. The registration process will be opened before end August

Note: Use of the simulator requires an EreaDrone licence.

There will be no entry fee to pay to participate to the 2023 FAI e-Drone Racing Cup.

Data requested at the registration:
  - First name and last name (family name).
  - Gender.
  - Date of birth.
  - Nationality.
  - Country of residence.

Considering the event is sanctioned by FAI, a valid FAI Sporting Licence or FAI Drone Permission will be required to participate to the final stage.

Note: A reserve list based on the pilots ranked over 64 from the qualification stage will be established in order to replace the pilots selected for the final stage who will withdraw to participate, or will not hold a valid FAI Sporting Licence or Drone Permission.

5. Awards and prizes

A FAI diploma will be awarded to the pilots participating to the final race.

Prizes money (cash) will be awarded by the organiser. Additional prizes may be also awarded.