



FAI 2018-Radio Control-F3U-Drone Racing



FAI Sporting Code

*Fédération
Aéronautique
Internationale*

Section 4 - Aeromodelling

Volume F3 Radio Control Drone Racing

2018 Edition

Effective 15 March 2018

DRONE RACING WORLD CUP RULES

F3U (Provisional class) - RC MULTI-ROTOR FPV RACING RULES

*Maison du Sport International
Avenue de Rhodanie 54
CH-1007 Lausanne
Switzerland
Tel: +41(0)21/345.10.70
Fax: +41(0)21/345.10.77
Email: sec@fai.org
Web: www.fai.org*

FEDERATION AERONAUTIQUE INTERNATIONALE

Maison du Sport International, Avenue de Rhodanie 54, 1007 LAUSANNE, Switzerland

Copyright 2018

All rights reserved. Copyright in this document is owned by the Fédération Aéronautique Internationale (FAI). Any person acting on behalf of the FAI or one of its Members is hereby authorised to copy, print, and distribute this document, subject to the following conditions:

- 1. The document may be used for information only and may not be exploited for commercial purposes.**
- 2. Any copy of this document or portion thereof must include this copyright notice.**
- 3. Regulations applicable to air law, air traffic and control in the respective countries are reserved in any event. They must be observed and, where applicable, take precedence over any sport regulations**

Note that any product, process or technology described in the document may be the subject of other Intellectual Property rights reserved by the Fédération Aéronautique Internationale or other entities and is not licensed hereunder.

RIGHTS TO FAI INTERNATIONAL SPORTING EVENTS

All international sporting events organised wholly or partly under the rules of the Fédération Aéronautique Internationale (FAI) Sporting Code¹ are termed *FAI International Sporting Events*². Under the FAI Statutes³, FAI owns and controls all rights relating to FAI International Sporting Events. FAI Members⁴ shall, within their national territories⁵, enforce FAI ownership of FAI International Sporting Events and require them to be registered in the FAI Sporting Calendar⁶.

An event organiser who wishes to exploit rights to any commercial activity at such events shall seek prior agreement with FAI. The rights owned by FAI which may, by agreement, be transferred to event organisers include, but are not limited to advertising at or for FAI events, use of the event name or logo for merchandising purposes and use of any sound, image, program and/or data, whether recorded electronically or otherwise or transmitted in real time. This includes specifically all rights to the use of any material, electronic or other, including software that forms part of any method or system for judging, scoring, performance evaluation or information utilised in any FAI International Sporting Event⁷.

Each FAI Air Sport Commission⁸ may negotiate agreements, with FAI Members or other entities authorised by the appropriate FAI Member, for the transfer of all or parts of the rights to any FAI International Sporting Event (except World Air Games events⁹) in the discipline¹⁰, for which it is responsible¹¹ or waive the rights. Any such agreement or waiver, after approval by the appropriate Air Sport Commission President, shall be signed by FAI Officers¹².

Any person or legal entity that accepts responsibility for organising an FAI Sporting Event, whether or not by written agreement, in doing so also accepts the proprietary rights of FAI as stated above. Where no transfer of rights has been agreed in writing, FAI shall retain all rights to the event. Regardless of any agreement or transfer of rights, FAI shall have, free of charge for its own archival and/or promotional use, full access to any sound and/or visual images of any FAI Sporting Event. The FAI also reserves the right to arrange at its own expense for any and all parts of any event to be recorded.

-
- 1 FAI Statutes, Chapter 1, para. 1.6
 - 2 FAI Sporting Code, Gen. Section, Chapter 4, para 4.1.2
 - 3 FAI Statutes, Chapter 1, para 1.8.1
 - 4 FAI Statutes, Chapter 2, para 2.1.1; 2.4.2; 2.5.2 and 2.7.2
 - 5 FAI By-Laws, Chapter 1, para 1.2.1
 - 6 FAI Statutes, Chapter 2, para 2.4.2.2.5
 - 7 FAI By-Laws, Chapter 1, paras 1.2.2 to 1.2.5
 - 8 FAI Statutes, Chapter 5, paras 5.1.1, 5.2, 5.2.3 and 5.2.3.3
 - 9 FAI Sporting Code, Gen. Section, Chapter 4, para 4.1.5
 - 10 FAI Sporting Code, Gen. Section, Chapter 2, para 2.2.
 - 11 FAI Statutes, Chapter 5, para 5.2.3.3.7
 - 12 FAI Statutes, Chapter 6, para 6.1.2.1.3

A. DRONE RACING WORLD CUP RULES

A.1. CLASS

The FAI provisional class F3U (Multi-rotor FPV Racing) is recognised for Drone Racing World Cup contests.

A.2. COMPETITORS

All competitors in the specified open international contests are eligible for the World Cup.

A.3. CONTESTS

Only the FAI Open International contests may be considered for the World Cup.

The selection of the contests eligible for inclusion in the World Cup for a particular year will be done before the end of the preceding year. In duly justified cases, a contest can be exceptionally added after this date at the FPV Racing and similar activities Subcommittee Chairman discretion.

Contests included in the World Cup will be indicated on the FAI Contest Calendar and must be run according to the FAI Sporting Code.

A maximum of two contests may be selected for any country on its own behalf unless the country extends over more than three time zones; in that case, one contest may be selected within each time zone of the country with a maximum of four contests for the country on its own behalf.

A country may choose to fly a World Cup contest at a flying site in another country provided that the registration of the contest on the FAI calendar is submitted by the organising country and the name of the organising country is included in the title of the contest. Any country may host a maximum of one contest on behalf of another organising country regardless of whether or not the host country extends over more than three time zones.

A.4. POINTS ALLOCATION

In a contest, points for the World Cup will only be allocated if the competitors who have completed a flight are from at least two different countries.

The points to be allocated to competitors will depend on the number (N) of competitors who have completed at least one flight in the contest.

Points are allocated to the competitors who have completed at least one flight in the contest, according to their placing in the results, as following.

a) $N > 40$

Placing	1	2	3	4	5	6	.....	40	41 and after
Points	40	39	38	37	36	35	.....	1	0

A bonus of 8 points is given to the first placed competitor; 5 points to the second placed and 3 points to the third placed.

b) $N = 40$ or $N < 40$

Placing	1	2	3	4	5	6	.....	N-1	N
Points	N	N-1	N-2	N-3	N-4	N-5	.....	2	1

The bonus is defined as follows:

- for the first placed competitor, $N/5$ rounded up to the nearest whole number of points with a maximum of 8 points;
- for the second placed competitor, $N/8$ rounded up to the nearest whole number of points with a maximum of 5 points;
- for the third placed competitor, $N/13$ rounded up to the nearest whole number of points with a maximum of 3 points.

In the situation of a tie for any placing, the competitors with that placing will share the points which would have been awarded to the places covered had the tie been resolved (round up the score to the nearest whole number of points).

A.5. CLASSIFICATION

The World Cup results are determined by considering the points obtained by each competitor in the World Cup contests.

For each competitor, one contest result per organising country may be considered for the World Cup placing (better number of points for any organising country in which the competitor has scored in two contests). For a country which extends over more than three time zones, one contest may be counted for this organising country within each time zone of the country.

The total World Cup score of the competitor is the sum of his /her best four contest results (numbers of points). The winner of the World Cup is the competitor with the greatest total score, and so on for the placing.

In the situation of a tie for first, second or third place, placing will be determined by taking in account for the competitors in question, their best fifth result, then if necessary their sixth best result, and so on. If this does not separate the tied competitors, then the placing will be determined by considering for their best four results the points that they obtained in each of those four contests multiplied by the number of competitors who will have completed at least one flight in the contest; the winner is the one with the greatest total thus calculated.

A.6. AWARDS

The winner is awarded the title of the winner of the World Cup.

Medals, trophies, prizes, or certificates may also be awarded as available.

A.7. ORGANISATION

Administration, collect of the results, calculation of the placing and regular publication of the current World Cup positions are normally done by the FPV Racing and similar activities Subcommittee Chairman.

A dedicated World Cup Coordinator may be nominated. Such a nomination is done by the CIAM Bureau on proposition of the FPV Racing and similar activities Subcommittee Chairman.

A.8. COMMUNICATION

The World Cup results and placing could be distributed to the news agencies and also be available, by payment of a subscription, to any interested bodies or individuals.

Final results of the World Cup must be sent also to the CIAM with the annual report to be done by the World Cup Coordinator.

A.9. RESPONSIBILITIES OF CONTEST ORGANISER

The contest organisers must propose their contest for inclusion in the World Cup on the CIAM form for registration on the FAI Aeromodelling Sporting Calendar.

The selection of the contests eligible for inclusion in the World Cup will be done from those proposals as specified in paragraph 3.

Immediately after the contest, the organiser must send the results in electronic form to the World Cup coordinator, at least within one month as required by the CIAM rules. Any failure to return results promptly will be reviewed when considering the contests for inclusion in the World Cup for the following year.

A.10. WORLD CUP BOARD

A Board of three persons shall be nominated by the FPV Racing and similar activities Subcommittee Chairman to rule on any issue concerning the implementation of World Cup rules during a year. Any such issue must be submitted in writing to the Subcommittee Chairman. The World Cup Board is not entitled to deal with any kind of complaint or protest concerning a single contest, which must be considered by the FAI Jury for that contest.

B. F3U (PROVISIONAL CLASS) - RC MULTI-ROTOR FPV RACING

Multi-rotor FPV (First Person View) Racing consists of several multi-rotor model aircraft flying together through a closed racing circuit.

Note: A multi-rotor is a rotary wing radio-controlled model aircraft equipped with at least three power driven propeller devices.

The generic term 'model' will be used in the present document.

Each model is operated by an FPV pilot who is considered as the competitor. The FPV pilot is equipped with a headset goggle which allows him/her to pilot from the video picture of the onboard camera which is transmitted in real time on his/her headset goggle.

The FPV pilot is assisted by one and only one helper who stays next to him during the whole flight. The main task of the helper is to keep the model in visual line of sight. Besides that, the helper must inform the pilot of anything occurring that can affect his/her piloting, especially about safety. If the helper requests the pilot to land or to cut off the engines, the pilot must do it immediately. In case of emergency, the helper is authorised to shut off the transmitter in order to trigger the fail-safe device.

B.1. GENERAL SPECIFICATIONS FOR MODELS

A 1 % tolerance is applicable for inaccuracy of the measurement devices for size, weight and batteries tension.

The model must be equipped with a fail-safe device, the triggering of which stops the motorization.

Are strictly forbidden:

- Pre-programmed manoeuvring device.
- System for automatic positioning and/or path rectification in longitude, latitude or height.

Note: Software recovery modes such as 'anti Turtle' or 'anti crash' and automatic system or which can be activated by the pilot in order to level back the model after a crash are authorised.

B.1.1. Weight and size

The total weight of the model including all equipment necessary for flight (including batteries) shall not exceed 1 kg.

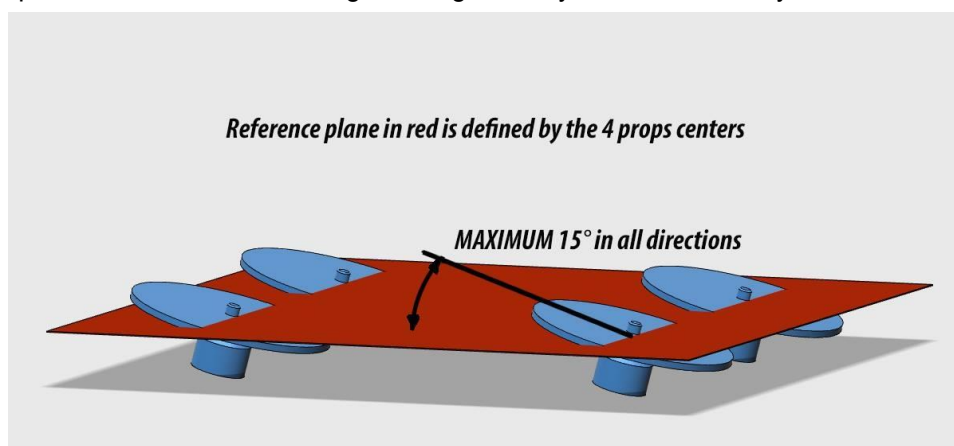
Distance between axes of the engines shall be less than 330 mm. This distance is measured on the diagonal of the engines' axes.

B.1.2. Motorization

Only electric motors with a maximum voltage of 17.0 volts (4S) are allowed. The voltage measurement is done before the flight.

The reference plane is defined with propellers centers. Each motor can be tilted up to 15° maximum angle in each direction.

On a tri-copter, the inclination of an engine in flight is only allowed with the yaw order.



B.1.3. Propellers

Maximum diameter: 6 inches (15.2 cm).

Full metal propellers are forbidden.

Any propeller protection device is forbidden.

B.1.4. Radio control equipment

Any 2.4 GHz spread spectrum technology radio control equipment may be used.

Competitors may be authorised by the organiser to use other equipments, such as for example 868 MHz and/or 915 MHz TBS Crossfire module, as long as it is compliant with frequencies regulations of the organiser country. This possibility must be available well before the contest.

Frequencies and emission power can only be those authorised in the organiser country. Any competitor using a forbidden frequency may be disqualified from the contest by the contest director.

In order to limit risk of potential problems during the races (signal loss, frequency interference,...) with unwanted emission, the organiser may define restrictions for use of radio control systems equipments outside the racing circuit.

B.1.5. Video system

The organiser must inform before the contest about the video system that will be used for races.

The organiser may define a list of authorised video transmitters (VTX) in order to minimize risk of video problems and/or permit live transmission of the pilot view on large screens for the spectators and/or media production with the appropriate quality. The list of authorised VTX must be available well before the contest.

Note: *The organiser may not restrict to only one VTX. The list must not be defined with commercial consideration.*

The organiser may also request use of a certain type of VTX antennas with the appropriate polarization.

In order to limit risk of potential problems during the races (signal loss, frequency interference, ...) with unwanted emission, the organiser may define restrictions for use of video transmitters outside the racing circuit.

Frequencies and emission power can only be those authorised in the organiser country. Any competitor who does not respect the maximum emission power or other restriction for use of the video transmitters defined by the organiser may be disqualified from the contest by the contest director.

B.1.6. LED light unit (Optional device)

In order to provide for the public the best view of the models during the races and to facilitate the task of the judges, each model must be clearly recognisable with, for example, a brightly coloured part of the frame or a custom canopy.

In addition, the organiser may request the competitors to equip their models with a LED light unit including possibility to choose the colour so that each model in flight has a different colour. In that situation, the organiser must define well before the contest the specifications of the LED light unit (minimum number of LED's, mandatory colours, RGB controller) or a list of authorised devices.

Note: *In case a LED light unit is requested, the colour and the video frequency, may be assigned for each race according to the draw order in the group. This will simplify the organisation and improve the understanding of the races by the public.*

B.1.7. Identification mark

Each model shall carry the national identification mark followed by the FAI Sporting Licence ID number (or the National FAI licence). The letters and numbers must be at least 6 mm high and appear at least once on each model.

B.2. RACING CIRCUIT

The minimum recommended developed size of racing circuit is:

- 250 m for an outdoor field.
- 80 m for an indoor circuit or in woods (named 'short circuit').

For an outdoor field, a racing circuit within a 180 m x 100 m rectangle is recommended considering those dimensions allow to practice on a football field.

The organiser may keep secret the circuit or make it public before the contest. In both cases, the organiser must do the best for an equal treatment between all competitors and to prevent any unfair advantage to some competitors. If the circuit is made public, it is recommended to publish it two weeks minimum before the contest.

See Annex 1 for the racing circuit specifications and recommendations.



B.3. NUMBER OF MODELS

Each competitor can register and use 3 models for the entire contest.

A model can be used by one competitor only in the same contest.

In case of an infringement to that rule, the concerned competitors will be disqualified from the contest by the contest director.



The competitor can change the model:

- before the start of the race as long the competitor hasn't left the preparation area,
- or between two rounds of the qualification stage and elimination stage.

B.4. MODEL REGISTRATION AND PROCESSING

Each competitor can register up to three models. The organiser will mark each registered model with an easily visible, difficult to falsify identification such as a sticker.

During registration, the specifications of the model may be checked by the organiser. It is then recommended to check the following points:

- Identification mark.
- Weight and size.
- Motorization and batteries.
- Fail-safe and associated device to cut off the engines.
- VTX and camera.
- LED light unit if such a device is required by the organiser.



When, after the model processing a model is lost or damaged, the competitor shall have the right to present a further model for checking up to one hour before the official starting time of the contest.

Random processing of models could be made after flights in any round.

A competitor whose model wouldn't be compliant may be disqualified from the contest by the contest director.

B.5. PRACTICE FLIGHTS



Practice flights on the racing circuit other than those authorised by the organiser are strictly forbidden under threat of being disqualified from the contest by the contest director.

A practice session will be organised at the beginning of the contest. Each competitor will only enter this practice session when he/she has finished models' registration and processing.

The organiser defines the conditions of the practice session according to the available time and the number of competitors. The conditions must be announced before the contest.

It can be a free practice session organised by groups with an allocated time identical for each group. The allocated time and the number of competitors per group are defined by the organiser.

The practice session can also be organised together with the first round of qualifying flights. Each group will be granted one or more practice flights of 3 minutes each. The number of practice flights is defined by the organiser and must be the same for all groups. After its last practice flight, the group will stay on the circuit for its first qualifying flight; a three minutes break to change the battery pack of the model or to change the model is given before the start of the qualifying flight.

In any case, each competitor can do during the practice time allowed as many circuit laps as the competitor wants. Once the practice time is over, competitors still in flight can complete their ongoing circuit lap before landing.

In case of a crash, and when the model cannot go on, the model must stay on ground with engine cut off until the end of the practice session. The competitor cannot request another practice time except if the reason for the crash cannot be attributed to him.

B.6. CONTEST ORGANISATION

A contest is normally organised on the basis of three stages:

- Qualification stage (rounds for qualification for the elimination stage).
- Elimination stage (to qualify for the final stage by successive elimination rounds).
- Final stage.

Note: When the total number of competitors is low (especially below 16), the contest may be organised on one stage only with a fixed round's number for every competitor instead to organise the contest on three stages (qualification, elimination and final). In that situation, it is recommended to apply rules defined in B.6.7 (Additional rounds sequence).

Each round for the qualification stage and the elimination stage is organised by groups (subdivision of the round corresponding to the number of pilots flying at the same time in the same race).

Rounds in every stage will be organised by groups of 4 (four) or 6 (six) pilots. The pilot's number per group may be different for the qualifying stage but will be the same for all elimination and final rounds.

B.6.1. Timekeeping

It is recommended to use an electronic timing system whenever possible instead manual timekeeping.

Except when specified differently, timekeeping is triggered at the start of the race by the Starter.

B.6.2. Procedure for the start of the race

The start of the race will be done by the starter as follows:

- After the models have been placed on the start area, the starter will request the competitors if they are ready to start.
- When the starter considers that the competitors are ready, the starter will announce clearly 'Arm your quads'.
- In less than five seconds after this announcement and taking care of an equivalent start time for all races, the starter will give a brief and intelligible sound signal for the start of the race (toot, monosyllable voiced signal such as 'Go', ...); no countdown (3, 2, 1) will be done before the start signal.

When the starter considers to proceed wrongly, he/she may then immediately stop the race and do a new start. Before the new start, the competitors will have the possibility to change the battery pack or their model.

B.6.3. Qualification stage

The number of qualifying rounds is defined by the organiser according to the available time with, whenever possible, 3 (three) qualifying rounds.

For each qualifying round, the composition of the groups, the order in each group (for positioning on the start line) and the flight order of the groups will be determined with a blind draw. Wherever possible, the draw will be done so that one competitor only per country may be in the same group.

Reflights will be flown at the end of the concerned round.

Races with fewer than the required pilot's number (4 or 6), for example in case of withdrawal of a pilot, will be put at the end of the draw of the round, in order to allow a complete pilots race with pilot(s) that have been granted a reflight in that round.

If necessary, the last groups of each qualifying round may be rearranged by the contest director (under supervision of a FAI Jury member) in order to get as far as possible a minimum of:

- 3 pilots per group when the required pilot's number for the round is 4.
- 4 pilots per group when the required pilot's number for the round is 6.

Each qualification round will be done on a number of circuit laps defined by the organiser. The recommended number of circuit laps is 3 for an outdoor field and 5 for a short circuit. The number of circuit laps must be announced before the start of the contest.

a) Electronic timekeeping

For each model, timekeeping is triggered when the model passes the timekeeping sensor. After the start of the flight, each pilot must go directly to the first air gate where the timekeeping sensor is positioned without possibility to do flight recognition of the track.

The result of each competitor for the qualification stage will be the average of the 3 (three) best times recorded to perform one valid circuit lap taking in account all the qualifying rounds.

The best times may be done in the same qualifying round or in different ones.

A provisional ranking will be established at the end of the qualifying stage, taking into account the result obtained by each competitor. In case of a tie for the last place(s) for selection to the elimination stage, the 4th best time recorded to perform one valid circuit lap result will be considered to split the tie, and then if necessary the 5th one, and so on. In case the times are not sufficient, a tie-break flight will be organised between the competitors still concerned by the tie.

If the number of competitors required for the elimination stage is not reached with the competitors getting 3 (three) times, competitors getting only 2 (two) times to perform one valid circuit lap will be considered taking in account the average of their 2 times. If it is still not sufficient, competitors getting only 1 (one) time to perform one valid circuit lap will be considered.

If the number of competitors required for the elimination stage is still finally not reached, an additional qualifying flight will be organised for the competitors who have not been able to set a time at that stage. This will be repeated until the appropriate number of competitors for the elimination stage is reached.

b) Manual timekeeping

For each competitor, the result of the qualification round corresponds to his/her registered time to complete the required number of laps increased when required according to the time penalties as defined in B.7.1.

A provisional ranking will be established at the end of the qualifying stage, taking into account the best result obtained by each competitor on its qualifying flights. In case of a tie for the last place(s) for selection to the elimination round, the 2nd best result will be considered to split the tie, and then if necessary the 3rd result. In case the results of the qualifying flights are not sufficient, a tie-break flight will be organised between the competitors still concerned by the tie.

If the number of competitors required for the elimination stage is not reached, an additional qualifying flight will be organised for the competitors who have not been able to set a time at that stage. This will be repeated until the appropriate number of competitors for the elimination stage is reached.

In any case (electronic or manual timekeeping), the competitors who need an additional qualifying flight to achieve a time to be selected for the elimination stage will be placed after those who are already selected, and then those who need a second additional flight, and so on.

B.6.4. Elimination stage

The elimination stage will be organised according to one of the following scenarios:

- Scenario A - 4 (four) pilots per group with 1/4th final round (4 groups) as first elimination round (16 competitors selected from qualification stage).
- Scenario B - 4 (four) pilots per group with 1/8th final round (8 groups) as first elimination round (32 competitors selected from qualification stage).
- Scenario C - 4 (four) pilots per group with 1/16th final round (16 groups) as first elimination round (64 competitors selected from qualification stage).
- Scenario D - 6 (six) pilots per group with 1/8th final round (8 groups) as first elimination round (48 competitors selected from qualification stage).
- Scenario E - 6 (six) pilots per group with 1/16th final round (16 groups) as first elimination round (96 competitors selected from qualification stage).

The choice will be done before the beginning of the contest considering total number of competitors and video system restriction on pilot's number per group.

All races of the elimination stage will be run on a defined number of laps taking into consideration the performance achieved during the qualification stage. Except under exceptional circumstances, the number of laps will be identical for all rounds of the elimination stage.

Reflights will be flown at the end of the concerned round.

Races with fewer than the required pilot's number (4 or 6), for example in case of withdrawal of a pilot, will be put at the end of the draw of the round in question, in order to allow a complete pilots race with pilot(s) that have been granted a reflight in that round.

If necessary, the last groups of each qualifying round may be rearranged by the contest director (under supervision of a FAI Jury member) in order to get as far as possible a minimum of:

- 3 pilots per group when the required pilot's number for the round is 4.
- 4 pilots per group when the required pilot's number for the round is 6.

The placing for each race is determined taking into account the time achieved when the number of laps is completed. For those who will not finish their flight, placing will be done considering the distance completed (number of laps and part of the last lap completed) when they stop their flight, competitors disqualified being placed last.

When in a race, none of the competitors of the group has been in a situation to finish it (crash or other reason), a new race is immediately organized for this group.

Modalities of selection for the next elimination round

The two best placed will be directly selected for the next elimination round. In case of a tie for the second place, the placing in the provisional ranking established at the end of the qualifying stage will be considered to define who is directly selected for the next round.

When the elimination stage is organised with 6 (six) pilots per group, other competitors necessary to get the required competitor's number for the next round will be selected considering times achieved in the round (identified Tn in the annexes).

Organisation of the races

For the first evaluation round, the composition of the groups for the races will be defined considering the provisional ranking established at the end of the qualifying stage.

For the different elimination rounds, composition of the groups for the races and order positioning on the start line are defined in:

- Annex 2 for scenario A (4 pilots per group and 1/4th final round as first elimination round).
- Annex 3 for scenario B (4 pilots per group and 1/8th final round as first elimination round).
- Annex 4 for scenario C (4 pilots per group and 1/16th final round as first elimination round).
- Annex 5 for scenario D (6 pilots per group and 1/8th final round as first elimination round).
- Annex 6 for scenario E (6 pilots per group and 1/16th final round as first elimination round).

B.6.5. Final stage

In scenario A, B or C, the two best placed competitors in each of the two semi-finals flights are selected for the final to determine their final ranking from 1st to 4th place.

In scenario C or D, the three best placed competitors in each of the two semi-finals flights are selected for the final to determine their final ranking from 1st to 6th place.

The other competitors from the semi-final round will fly a small final to determine their final ranking.

The order positioning on the start line is defined according to the following tables.

Elimination stage with

4 pilots per group (Scenario A, B or C)

SMALL FINAL	4 th semi 1
	3 rd semi 1
	3 rd semi 2
	4 th semi 2
FINAL	2 nd semi 1
	1 st semi 1
	1 st semi 2
	2 nd semi 2

6 pilots per group (Scenario D or E)

SMALL FINAL	T12 semi-final
	T10 semi-final
	T8 semi-final
	T7 semi-final
	T9 semi-final
	T11 semi-final
FINAL	3 rd semi 1
	2 nd semi 1
	1 st semi 1
	1 st semi 2
	2 nd semi 2
	3 rd semi 2

Note: For the small final with 6 pilots per group, competitors are identified Tn considering times they achieved in the semi-final round.

The number of circuit laps to complete may be increased for the final (not applicable for the small final) but cannot be more than twice the number of circuit laps retained for the evaluation stage. It is defined

by the contest director taking into consideration the autonomy of the batteries to guarantee safe flights.

Those who will not be able to finish the final or the small final (crash or other reason) will be ranked considering the distance completed (number of laps and part of the last lap completed) when they stop their flight, disqualified competitors being placed at the end.

B.6.6. Second chance flight (Optional sequence)

This sequence which concerns the evaluation stage is not mandatory and may be introduced at the discretion of the organiser.

When such a sequence is introduced, the competitors who are not selected for the next evaluation round are entitled a second chance instead their direct elimination.

For such a second chance sequence, composition of the groups for the races and order positioning on the start line are defined in the annexes 2 to 6. Complementary rounds will be organised as necessary in order to define the final placing of the remaining competitors.

B.6.7. Additional rounds (Optional sequence)

This sequence is not mandatory and may be introduced at the discretion of the organiser.

When such a sequence is introduced, the competitors who are not selected after the qualification stage for the first evaluation round are entitled additional rounds to determine their final placing. Number of additional rounds is defined by the organiser considering available time.

For those additional rounds, the pilot's number per group will be the same as for the evaluation stage.

For each additional round, of the groups for the races, order positioning on the start line and flight order of the groups will be determined with a blind draw. Wherever possible, the draw will be done so that one competitor only per country may be in the same group.

Reflights will be flown at the end of the concerned round.

Races with fewer than the required pilot's number (4 or 6), for example in case of withdrawal of a pilot, will be put at the end of the draw of the round in question, in order to allow a complete pilots race with pilot(s) that have been granted a reflight in that round.

When at the end of the round, a race does not finally contain the required pilot's number (4 or 6), volunteers (from different nations) will be requested to allow the remaining race to start with four pilots. If there are too many volunteers, the contest director (under supervision of a FAI Jury member) will conduct a blind draw to determine the necessary volunteers and then a separate draw for the order in each group (for positioning on the start line).

If there are insufficient volunteers, the race will start with fewer than the required pilot's number (4 or 6).

The volunteer(s) shall not be eligible to have their result registered or to be granted a reflight from this race.

At the end of each race, each pilot is awarded as follows a number of points corresponding to his/her place:

- a) **Pilot's number per group of 4:** 1 point for the first placed, 2 points for the second, 3 points for the third and 4 points for the fourth. A pilot who do not fly in a race or does not finish it gets 5 points. A pilot who is disqualified for the race gets 6 points.
- b) **Pilot's number per group of 6:** 1 point for the first placed, 2 points for the second, 3 points for the third, and so on. A pilot who do not fly in a race or does not finish it gets 7 points. A pilot who is disqualified for the race gets 8 points.

The final placing will be done taking in account the sum of the points got by every competitor in all the additional rounds. The competitor with the lower number of points is placed ahead, and so on.

In case of a tie, the placing in the provisional ranking established at the end of the qualifying stage will be considered to split the tie for the concerned competitors.

B.7. FLIGHT OCCURRENCES

B.7.1. Faults and penalties

In case an air gate or an obstacle that needs to be crossed is not effectively crossed, the pilot may try to execute a manoeuvre to cross the air gate or the obstacle again.

If during this manoeuvre the pilot has a collision with another model, the pilot will be disqualified for the race. The pilot whose model has been collided may get a reflight if his/her assigned judge considers that this collision has clearly penalised the pilot.

If the pilot does not cross an air gate or an obstacle to be crossed, the corresponding circuit lap will not be validated by his/her assigned judge.

Note: *If an air gate or an obstacle is accidentally broken during a race, the race will continue and every pilot must do the best to follow the track and not take advantage of this situation.*

In case of a circuit cut (for example during a turn), the pilot must execute as soon as possible a manoeuvre to come back into the circuit where the pilot left it. If his/her assigned judge considers that the pilot has not made the manoeuvre with sufficient urgency, the judge can decide that the corresponding circuit lap is not validated. If during this manoeuvre the pilot has a collision with another model, the pilot will be disqualified for the race. The pilot whose model has been collided may get a reflight if his/her assigned judge considers that this collision has clearly penalised the pilot.

Indoor circuit with numerous structural elements or circuit in woods:

In case doing a U-turn because of missing an obstacle or making a circuit cut can be a problem for safety, above rules may be replaced by time penalties added to the result of the flight and by circuit lap penalties.

The penalties for faults (air gate not crossed or obstacle not crossed or circuit cut) are defined as follows:

- 1st fault: 10 seconds.
- 2nd fault: 20 seconds (in addition to the 1st time penalty).
- 3rd fault: 30 seconds (in addition to the previous time penalties).
- 4th fault: 1 circuit lap removed (in addition to the previous time penalties).
- 5th fault: 1 more circuit lap removed (in addition to the previous penalties).
- And so on until a circuit lap is remaining.

When the assigned judge considers that a circuit cut is a voluntary cut to reach the finish line faster, then the judge can decide that the corresponding circuit lap is not validated rather than to give a time penalty for the fault.

When this system of time penalties is used, all flights need to be timed.

Note: *Both systems (requirement of a manoeuvre and time penalty) cannot be mixed.*

B.7.2. Disqualification from the race

A pilot may also be disqualified in a race in case of:

- a start before the starter signal if it is considered that this early start gives a clear advantage to the concerned pilot;
- a circuit exit (crossing of the safety line);
- a celebratory manoeuvre especially after the pilot finishes.

The disqualification is decided at the discretion of the judge in charge of the concerned pilot.

The judge can also pronounce a disqualification if the judge considers that:

- the pilot flies so high that it does not allow to judge the performance's pilot on the track;
- the piloting is hazardous or if safety is involved.

When a pilot is disqualified, the concerned pilot must immediately land. In any case, the result of the pilot for the race will not be validated. If the pilot is considered not being sufficiently cooperative to land, the concerned pilot may be disqualified from the contest by the FAI Jury on request of the assigned judge.

B.7.3. Crash

When a model crashes, the concerned pilot can go on again if the pilot is in a situation to do so. However, the pilot can be requested by his/her assigned judge to stop the flight if the judge considers that the model no longer meets acceptable safety standards.

When the model cannot go on, it must stay on ground with engines cut off until the end of the race: the concerned pilot cannot request a reflight.

B.7.4. Video issues

When a pilot gets a video problem which leads the pilot to consider not to be able to continue the flight, a reflight can only be granted if it is proved that the problem is caused by an identifiable external cause. In any case, it is not possible to turn against the organiser.

In case of a failure of the video system which does not allow the judge to perform his/her task:

- In a qualifying flight, the concerned pilot is granted a reflight.
- In any flight in the elimination stage, the judge lets his/her assigned pilot finish the flight and does best to judge and validate the circuit laps. When the result permits the pilot him to be directly selected for the next elimination round (or for the final), the concerned pilot is granted a reflight.
- For the final, the judge lets his/her assigned pilot finish the flight and does best to judge and validate the circuit laps. If the pilot is placed in the three first, the final is re-run; this does not concern the small final.

When a pilot is granted a reflight, the flight for which the pilot gets the reflight is then definitively cancelled.

B.7.5. Reflight

Apart from the possibilities of reflight mentioned above, a reflight can be granted when either the start of the model or the flight cannot be done in normal conditions because of an unexpected cause beyond the pilot's control.

A reflight can be granted when, for a reason of safety, either the preparation of the model or the flight cannot be made in the allotted time limit or when either is disrupted by an external interference.

A reflight can be granted if, for a reason independent from the pilot's will, the pilot has been forced to land on request of an official.

Failures of the model, motorization or radio cannot be considered as reasons independent from the pilot's will.

Incidents during races such as collisions between models or with obstacles cannot justify a reflight.

Noise in the environment of the pilots (noise in the public, noise from other competitors, ...) cannot justify a reflight.

A reflight may be considered for a pilot in case of his/her chair clearly affects his/her flight. If the pilot's helper is at the origin of the problem, a reflight cannot be granted.

Final granting of a reflight is the responsibility of the contest director. For the pilot being granted a reflight, the flight for which the pilot has been granted the reflight is then definitively cancelled.

B.8. CLASSIFICATION

When both second chance sequence (B.6.6) and additional rounds sequence (B.6.7) are applied, the individual general placing will be established as follows.

A- Scenario A (4 pilots per group and 1/4th final round as first elimination round)

- a) 1st to 4th places - Ranking according to the result of the final.
- b) 5th to 8th places - Ranking according to the result of the small final.
- c) 9th to 16th places - Ranking according to the second chance sequence results (see B.6.6):
 - At the end of the first round (races 5 and 6), competitors not selected for the second round will be placed from 13th to 16th places according to the provisional ranking after the qualifying phase.
 - At the end of the second round (race 7), competitors will be placed from 9th to 12th places according to their placing in the race.

For each round, competitors who finished their flight will be placed before those who did not finished and competitors disqualified will be placed at the end. Then, placing will be done according to the provisional ranking after the qualifying phase.

- d) 17th place and beyond - Ranking according to the additional rounds sequence results (see B.6.7).

B- Scenario B (4 pilots per group and 1/8th final round as first elimination round)

- a) 1st to 4th places - Ranking according to the result of the final.
- b) 5th to 8th places - Ranking according to the result of the small final.
- c) 9th to 32th places - Ranking according to the second chance sequence results (see B.6.6):
 - At the end of the first round (races 9 to 12), competitors not selected for the second round will be placed from 25th to 32th places according to the provisional ranking after the qualifying phase.
 - At the end of the second round (races 17 to 20), competitors will be placed from 17th to 24th places according to their placing in the race.
 - Remaining competitors will be placed from 9th to 16th places according to the results of the complementary rounds organised in the second chance sequence.

For each round, competitors who finished their flight will be placed before those who did not finished and competitors disqualified will be placed at the end. Then, placing will be done according to the provisional ranking after the qualifying phase.
- d) 33th place and beyond - Ranking according to the additional rounds sequence results (see B.6.7).

C- Scenario C (4 pilots per group and 1/16th final round as first elimination round)

- a) 1st to 4th places - Ranking according to the result of the final.
- b) 5th to 8th places - Ranking according to the result of the small final.
- c) 9th to 64th places - Ranking according to the second chance sequence results (see B.6.6):
 - At the end of the first round (races 17 to 24), competitors not selected for the second round will be placed from 49th to 64th places according to the provisional ranking after the qualifying phase.
 - At the end of the second round (races 33 to 40), competitors not selected for the third round will be placed from 33th to 48th places according to the provisional ranking after the qualifying phase.
 - At the end of the third round (races 45 to 50), competitors not selected for the fourth round will be placed from 21th to 32th places according to the provisional ranking after the qualifying phase.
 - Remaining competitors will be placed from 9th to 20th places according to the results of the complementary rounds organised in the second chance sequence.

For each round, competitors who finished their flight will be placed before those who did not finished and competitors disqualified will be placed at the end. Then, placing will be done according to the provisional ranking after the qualifying phase.
- d) 65th place and beyond - Ranking according to the additional rounds sequence results (see B.6.7).

D- Scenario D (6 pilots per group and 1/8th final round as first elimination round)

- a) 1st to 6th places - Ranking according to the result of the final.
- b) 7th to 12th places - Ranking according to the result of the small final.
- c) 13th to 48th places - Ranking according to the second chance sequence results (see B.6.6):
 - At the end of the first round (races 9 to 12), competitors not selected for the second round will be placed from 37th to 48th places according to the provisional ranking after the qualifying phase.
 - At the end of the second round (races 17 to 20), competitors not selected for the third round will be placed from 25th to 36th places according to the provisional ranking after the qualifying phase.
 - Remaining competitors will be placed from 13th to 24th places according to the results of the complementary rounds organised in the second chance sequence.

For each round, competitors who finished their flight will be placed before those who did not finished and competitors disqualified will be placed at the end. Then, placing will be done according to the provisional ranking after the qualifying phase.
- d) 49th place and beyond - Ranking according to the additional rounds sequence results (see B.6.7).

E- Scenario E (6 pilots per group and 1/16th final round as first elimination round)

- a) 1st to 6th places - Ranking according to the result of the final.
- b) 7th to 12th places - Ranking according to the result of the small final.
- c) 13th to 96th places - Ranking according to the second chance sequence results (see B.6.6):
 - At the end of the first round (races 17 to 24), competitors not selected for the second round will be placed from 73th to 96th places.
 - At the end of the second round (races 33 to 40), competitors not selected for the third round will be placed from 49th to 72th places according to the provisional ranking after the qualifying phase.
 - At the end of the third round (races 45 to 50), competitors not selected for the fourth round will be placed from 31th to 48th places according to the provisional ranking after the qualifying phase.
 - Remaining competitors will be placed from 13th to 30th places according to the results of the complementary rounds organised in the second chance sequence.

For each round, competitors who finished their flight will be placed before those who did not finished and competitors disqualified will be placed at the end. Then, placing will be done according to the provisional ranking after the qualifying phase.
- d) 97th place and beyond - Ranking according to the additional rounds sequence results (see B.6.7).

Second chance sequence (B.6.6) not applied

Instead of ranking as defined in sub-paragraphs c) above, a new provisional ranking will be established at the end of each elimination round from the previous provisional ranking.

The competitors who have participated in the considered elimination round and who are selected for the next round will be ranked on top (with a placing based on the provisional ranking after the qualifying phase), followed by those who are not selected for the next round (with a placing based on the provisional ranking after the qualifying phase).

Ranking of the other competitors will be based on the previous provisional ranking.

Additional rounds sequence (B.6.7) not applied

Instead of ranking as defined in sub-paragraphs d) above, competitors not selected after the qualification stage for the first evaluation round will be placed according to the provisional ranking after the qualifying phase.

Competitors who have not been able to achieve a result during the qualifying stage will not be placed.

B.9. OFFICIALS**B.9.1. Officials needed to run the contest**

The running of a contest requires the following officials:

- Contest director in charge of preparation, organisation and oversight of the contest. The contest director has especially to ensure compliance with the applicable rules and safety during the whole contest.
- Starter and assistant in charge of calling competitors for racing, of conditions under which models are prepared and of checking their preparation, of checking flight times; for oversight of the models during transfer to the take-off area, and of giving the start signal for each flight with an audible device (whistle, foghorn, ...).
- Judges (one per pilot) in charge of checking all aspects of the pilot's racing on the circuit and of timekeeping.
- Official responsible for checking the models' weights and identification marks (number and height of lettering).
- Official responsible for score sheet gathering.
- Official responsible for results accounting.

When the timekeeping is done manually, one timekeeper per pilot is recommended in addition to the judge.

According to the contest standing and the number of competitors, some official tasks may be assumed by the same person.

B.9.2. FAI Jury

In any FAI Open International contest, an FAI Jury must be nominated according to Volume CIAM General Rules C.7.1 and C.7.3.

B.9.3. Judges

In each race, each FPV pilot will be accompanied by a judge standing next to or behind him.

The judge will have a video device (video screen or headset goggle) allowing him to follow the flight of his/her assigned pilot sharing all the time the same picture as the pilot.

The judge must clearly inform his/her assigned pilot when an air gate or an obstacle is not considered to be crossed, or in case of a circuit cut. The judge will monitor that the pilot goes back and crosses the gate or the obstacle correctly or comes back to the point where the cut happened.

Note: *The organiser can also provide dedicated line judge(s) in charge of informing the flight judges if a model crosses the safety line (exit of the circuit).*

At the end of the flight, each judge informs his/her assigned pilot if the flight is considered to be valid or if a disqualification has been pronounced; in the case of disqualification, the number of circuit laps done at the moment of the disqualification will be mentioned by the judge to the concerned pilot and registered.

B.10. INTERRUPTION OF THE CONTEST

The contest director may interrupt the contest or delay the start of a race if the wind is continuously stronger than 9 m/s measured at two (2) metres above the ground near the preparation area for at least one (1) minute.

When interruption occurs during an official flight, this flight is cancelled.

If the contest cannot go on, the final ranking will be the last available provisional ranking.

B.11. COMPETITORS' INFORMATION

The organiser has to display on the site:

- FAI Jury composition;
- start list for every round;
- results after every round;
- provisional rankings and final placing.

Note: *A posting on Internet is also advised if conditions permit it, in order to make it possible for those who are not at the site to follow the progress of the contest.*