



# FAI Sporting Code

*Fédération  
Aéronautique  
Internationale*

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## Section 4 – Aeromodelling

# Volume F5 Radio Control Electric Powered Model Aircraft

2012 Edition

Effective 1st January 2012

- F5A - ELECTRIC AEROBATICS
- F5B - ELECTRIC MOTOR GLIDER
- F5D - ELECTRIC PYLON
- F5E - ELECTRIC SOLAR MODEL AIRCRAFT (Provisional)
- F5F - ELECTRIC 4 CELL MOTOR GLIDERS (Provisional)
- F5G - ELECTRIC BIG GLIDERS (Provisional)
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- F5J - ELECTRIC THERMAL DURATION GLIDERS (PROVISIONAL)
- ANNEX 5 A - F5A MANOEUVRE DRAWINGS
- ANNEX 5 E - RULES FOR WORLD CUP EVENTS

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FOR THE ANNEXES, REFER TO THE SEPARATE DOCUMENT ENTITLED "VOLUME F5,  
RADIO CONTROLLED ELECTRIC POWERED MODEL AIRCRAFT, ANNEXES 5A & 5E"



## **FEDERATION AERONAUTIQUE INTERNATIONALE**

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1 FAI Statutes, Chapter 1, para. 1.6

2 FAI Sporting Code, General Section, Chapter 3, para 3.1.3.

3 FAI Statutes, Chapter 1, para 1.8.1

4 FAI Statutes, Chapter 5, para 2.1.1; 2.4.2; 2.5.2; 2.7.2

5 FAI Bylaws, Chapter 1, para 1.2.1

6 FAI Statutes, Chapter 2, para 2.4.2.2.5,

7 FAI Bylaws, Chapter 1, para 1.2.3

8 FAI Statutes, Chapter 5, para 5.1.1; 5.5; 5.6

9 FAI Sporting Code, General Section, Chapter 3, para 3.1.7

10 FAI Sporting Code, General Section, Chapter 1, paras 1.2. and 1.4

11 FAI Statutes, Chapter 5, para 5.6.3

12 FAI Bylaws, Chapter 1, para 1.2.2

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# VOLUME F5

## SECTION 4C – MODEL AIRCRAFT – F5 – ELECTRIC POWERED

### Part Five – Technical Regulations for Radio Controlled Contests

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Annex 5E Rules for World Cup Events

**Note: Annexes 5A & 5E are in a separate document called "Volume F5, Radio Control Electric Powered, Annexes 5A & 5E".**

**THIS 2012 EDITION INCLUDES THE FOLLOWING AMENDMENTS MADE TO THE 2011 CODE**

**These amendments are marked by a double line in the right margin of this edition**

Paragraph	Plenary meeting approving change	Brief description of change	Change incorporated by
<b>F5B</b> 5.5.2.1 a)	2011	Definition of an official flight.	Emil Giezendanner, F5 S-C Chairman
5.5.2.6	2011	Consequential change: deleted 5.5.5 and added 5.5.10 & 5.5.11	Jo Halman Technical Secretary
5.5.4.1 b)	2011	Model Aircraft specifications, cells and weight.	Emil Giezendanner, F5 S-C Chairman
5.5.4.4 d)		Re-defined launching; safety plane infraction.	
5.5.4.5 d)		Distance task: crossing the safety zone. (Re-phrased for English – Technical Secretary).	
5.5.4.6 h)		Distance course infraction and penalty.	
F5C 5.5.5		Class deleted.	
5.5.7, 5.5.8, 5.5.9, 5.5.10		Rationalised the class titles by adding “Electric”.	
F5H 5.5.10		New class F5H – Electric Open Motor Glider.	
F5J 5.5.11		New class F5J – Electric Thermal Duration Gliders.	
Page 5	n/a	Changed layout of class names to bring in line with other volumes. Consequential change to the Annex name.	Technical Secretary
5.5.1.5		Sub-paragraphs numbers with bracket instead of full stop.	
5.5.3.1		Corrected formatting.	
5.5.4.4 a)		Changed “stopwatch” to “device” to follow F5 convention.	
5.5.11.6 & 5.5.11.12		Corrected the English.	
Throughout		“Meter/s” changed to “metre/s” where appropriate.	

**Four-Year Rolling Amendments for Reference**

Paragraph	Plenary meeting approving change	Brief description of change	Change incorporated by
Rule Freeze	2010	New text to clarify rule change cycles. Consequential change to ABR reference from A.12 to A.13.	Technical Secretary
5.5.1.3	2010	Additional text for signal strength and voltage.	Emil Giezendanner, F5 S-C Chairman
5.5.6.3 b)		Amended for the start signal.	
5.5.6.6 i)		Additional text regarding the starter.	
5.5.6.7 a) – d)		Amended for the starting signals.	
5.5.6.7 e) – f)		New paragraph e) and existing paragraph e) amended & re-numbered to f) regarding starting procedures.	
5.5.6.8 e)		Amended for starting signal and laps.	

**Four-Year Rolling Amendments for Reference .../cont**

<b>Four-Year Rolling Amendments for Reference</b>			
<b>Paragraph</b>	<b>Plenary meeting approving change</b>	<b>Brief description of change</b>	<b>Change incorporated by</b>
5.5.1.5	2009	New paragraph for limiter checking & re-number subsequent paragraphs.	Technical Secretary on behalf of Emil Giezendanner, F5 S-C Chairman
5.5.4.5		Clarification of counting legs and signalling & re-number subsequent paragraphs	
5.5.4.6		Score-keeping device	
5.5.1.4	2008	Energy Limiters.	Technical Secretary Apr 2008
5.5.2.2.j		Annulled scores re energy limiters.	
5.5.2.5.		Energy Limiters.	
5.5.4.1		F5B: Definitions – battery change.	
5.5.4.15.5.4.1.d		F5B: Repair of battery packs.	
5.5.4.1.e	n/a	Added text for clarity	F5 S-C Chairman
5.5.4.1.f	2008	F5B: Starting order for other competitions.	Technical Secretary Apr 2008
5.5.6.2.a		F5D: Model weight.	
5.5.6.2.b		F5D: Batteries.	
5.5.6.2.c		F5D: Energy limiter & battery change.	
5.5.8.1		F5F: Technical Specification change – batteries.	
5.5.4.1 b) & c)	2007	New paragraph c) for F5B: definition, model aircraft specifications and number of battery packs. Re-number subsequent paragraph	Emil Giezendanner F5 S-C Chairman
5.5.6.2 b)		F5D: technical specifications, battery	
5.5.6.3 d)		F5D: delete chin strap	
5.5.6.5 a)		F5D: delete "caller" & "mechanic"	
5.5.6.7 a)		F5D: defined when timing begins	
5.5.6.9 b)		F5D: deleted timing sentence as consequence of above	
5.5.6.7 d)	F5D: defined action after a crash		
5.5.4.2	n/a	F5B corrected paragraph title	Jo Halman Technical Secretary Nov 2007
5.5.5.4		Added paragraph title and updated diagram	
5.5.6.2.b	n/a	Re-order the paragraph for clarity	Jo Halman Technical Secretary Dec 2006
5.5.6.3		Identify the sub-paragraphs by alpha for clarity	
5.5.2.2	n/a	English language changes for clarity	
5.5.3.2.d			
5.5.6.3 a, b, g			

## **RULE FREEZE FOR THIS VOLUME**

With reference to paragraph A.13 of Volume ABR:

In all classes, the two-year rule for no changes to model aircraft/space model specifications, manoeuvre schedules and competition rules will be strictly enforced. For Championship classes, changes may be proposed in the year of the World Championship of each category.

For official classes without Championship status, the two-year cycle begins in the year that the Plenary Meeting approved the official status of the class. For official classes, changes may be proposed in the second year of the two-year cycle.

This means that in Volume F5:

- (a) changes can be next agreed at the Plenary meeting 2012 for application from January 2013;
- (b) provisional classes are not subject to this restriction.

The only exceptions allowed to the two-year rule freeze are genuine and urgent safety matters, indispensable rule clarifications and noise rulings.



## VOLUME F5

### PART FIVE – TECHNICAL REGULATIONS FOR RADIO CONTROLLED CONTESTS

#### 5.5. CATEGORY F5 - ELECTRIC POWERED MODEL AIRCRAFT

##### 5.5.1 GENERAL RULES

###### 5.5.1.1 Definition of Electric Powered Model Aircraft

Model aircraft in which lift is generated by aerodynamic forces acting on surfaces remaining fixed in flight except control surfaces and which performs manoeuvres controlled by the pilot on the ground, using radio control, or by rotating surfaces in case of helicopters. The power pack for the electric motor may not have any fixed connection to the ground or another model aircraft in the air. Recharging of the power pack during flight by solar cells is permitted.

###### 5.5.1.2 Builder of the Model Aircraft

Rule B.3.1. of Section 4b (builder of the model aircraft) is not applicable to category F5.

###### 5.5.1.3 General Characteristics of RC Electric Powered Model Aircraft F5

(For helicopters see para 5.5.5.3)

Maximum total area	150 dm <sup>2</sup>
Maximum weight	5 kg
Loading	12 to 75 g/dm <sup>2</sup> (for Pylon see para 5.5.6.2)

- The power source shall consist of any kind of rechargeable batteries (or secondary cells), the maximum no load voltage must not exceed 42 volts. In case the voltage is measured, this shall be done at the moment the preparation time for the pilot starts. After the measurement has been taken, the pilot is allowed 5 minutes preparation time as per 5.5.2.4.
- Battery specifications in F5B, F5D and F5F are written in the special rules of these classes.
- Mechanical or chemical modification of the individual cells, e.g. to reduce their weight, is not allowed except that insulation sleeves of individual cells may be changed.
- Any transmission of information from the model aircraft to the pilot is prohibited with the exception of signal strength and voltage of the receiver battery.

###### 5.5.1.4 Energy Limiter

In classes where an energy limit is defined an energy limiter device must be used. The energy limiter cuts off the motor when the given energy limit is reached. The energy limiter is located in the electric circuit between the battery and the motor. The interruption must either persist permanently or for a defined period of time.

###### 5.5.1.5 Procedure for Limiter Checking

- The general procedure of limiter checking follows B.17. in Section 4B, General Rules for International Contests.
- The check shall be carried out immediately after landing. All limiters/loggers shall be tested using the same method.
- The organiser will check if the limiter is correctly connected to RX, LiPo pack and ESC. There must not be any type of "jumper" present in the RX cable or on the current sensor.
- The limiter in each model should be provided with cables and 6 mm connectors, so that it can easily be checked in series with the checking system. In cases where the limiter device has other types of connectors, the competitor must provide adapters to match the 6 mm connectors used by the organiser.
- JR/Futaba connectors should be provided on the limiter, or adapters, so that the receiver output and ESC input connections can be made to the test unit.

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- f) A variable current load should be used, simulating, as far as possible, a typical flight.
- g) The organiser shall use SM UniLog or similar devices as energy counters for measurements in each category.
- h) A tolerance of 2% on the measurement of the limit is permitted.
- i) The competitor may check his limiters prior to and during the contest, but he must provide a fully charged lithium battery as a power source.

#### **5.5.1.6 Number of Model Aircraft**

The competitor may use two model aircraft, three in pylon, in the contest. The competitor may combine the parts of the model aircraft during the contest, provided the resulting model aircraft conforms to the rules and that the parts have been checked before the start of the contest.

#### **5.5.1.7 Competitor and Helper**

Each competitor must operate his radio equipment personally. Each competitor is permitted two helpers and the team manager.

### **5.5.2 CONTEST RULES**

#### **5.5.2.1 Definition of an Official Flight**

##### **5.5.2.1 Definition of an Official Flight**

- a) During a two (2) minute starting period, the competitor is allowed an unrestricted number of attempts, hand launches or starts from the ground (except F5B, para 5.5.4.4 d). An attempt starts when the model aircraft is released by the competitor or his helper(s). After the first attempt, it is no longer allowed to take another model aircraft. The timekeeper will start the timing device at each attempt. After two minutes, no further launching or take off is allowed and the flight is being considered as official, the model aircraft being airborne or not. The pilot may repeat a second two-minute starting period only if:
  - b) The competitor cannot perform a flight due to outside interference verified by the organiser.
  - c) No scoring was made for reasons outside the control of the competitor. In such cases, the flight may be repeated at any other time decided by the Contest Director.

##### **5.5.2.2 Cancelling of a Flight and Disqualification**

The flight is annulled:

- a) If the pilot uses a model aircraft that does not conform to the FAI rules. In the case of intentional or flagrant violation of the rules, in the judgement of the Contest Director, the competitor may be disqualified.
- b) If the model aircraft loses any part during the flight time. The losing of a part during landing (ie. contact with the ground or another obstacle) during the flight due to a collision with another model is not taken into account;
- c) If the model aircraft was already used by another competitor at the same contest;
- d) If the pilot uses more than two helpers;
- e) If any part of the model aircraft does not come to rest and remain at rest within 100 metres from the landing spot. For powered gliders, this rule applies only after the duration and landing task has started.
- f) If for powered gliders the duration and landing task has not been started and also the landing does not occur on the designated flying side of the security line and within 100 m from the intersection of that line with Base A or B.
- g) If in contrast with the declaration of the competitor the model aircraft carried more than the allowed number of cells as power source for the motor or the voltage exceeds 42 volts.

cont/...

- h) The competitor is disqualified if the model aircraft is controlled by anyone other than the competitor.
- i) If the model aircraft touches either the competitor or his helper during landing manoeuvres, no landing points will be given.
- j) If an infringement of energy limitation rules occurs the result of that round is discarded.

#### **5.5.2.3 Organisation of the Contest**

For transmitter and frequency control see Section 4b, Para B.8.

The official in charge will issue the transmitter to the competitor only at the beginning of his preparation time, according to 5.5.2.4.

#### **5.5.2.4 Organisation of Starts**

The competitors shall be combined in groups, in accordance with the radio frequencies used, to permit as many flights simultaneously as practical. The combination is organised in such a way that, as far as possible, there are no pilots of the same nation or team in one group. The flying order of different groups is also established in accordance with the frequencies used. The competitors are entitled to five minutes of preparation time before they are called for the start.

#### **5.5.2.5 Processing of Energy Limiters**

The organiser of an event has to provide power supply equipment for energy limiter processing. The competitor must have the ability to check his limiters prior to and during the contest.

#### **5.5.2.6 Judging**

The organiser must appoint a panel of at least three judges of different nationalities who are selected from the official CIAM Judges List.

Note: These General Rules and Contest Rules are applicable to the F5 Classes: Aerobatics (5.5.3.), Motor Gliders (5.5.4.), Pylon Race (5.5.6.).

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### **5.5.3 CLASS F5A ELECTRIC POWERED AEROBATIC MODEL AIRCRAFT**

#### **5.5.3.1 Definition**

These rules for contests with electric powered aerobatic model aircraft will use the advantages and peculiarities of the electric powered propulsion. The contests could take place on sport fields and recreation areas.

- a) General rules 5.5.1 and Contest rules 5.5.2 are applicable except otherwise stated.
- b) Model aircraft specifications  
Maximum weight 3 kg

#### **5.5.3.2 Organisation of F5A Contests**

- a) Starting Order

The starting order for the first round will be established by random draw. The starting order for the second round will follow the inverted ranking list. In each case, frequency will not follow frequency and team members will be separated by at least one competitor. The starting order for the final round will be established by a second random draw

- b) Number of Flights

Competitors will have at least three preliminary flights with the same schedule. If more than two flights are flown, the lowest score will be discarded. The top ten or the first third of the competitors of ranking list, whichever is less, after the three preliminary rounds, will fly in addition one final. The final round consists of one music compulsory freestyle flight.

- c) Number of Attempts

Each competitor is entitled to one attempt for each official flight and there is an official flight when an attempt is made whatever the result.

- d) Course Layout

The course layout depends on the size of contest site and consists of a box of 110 by 75 by 75 metres. The competitor while flying must stay in the middle of base b of the box on the spectator side. Judges must be seated 3 to 5 metres behind the competitor. Base b is also the safety line. The landing field is 25 to 50 m and parallel to base b.

- e) Definition of an Official Flight

During a two (2) minute starting period, the competitor is allowed an unrestricted number of attempts (hand launches or on undercarriage). It is allowed to use the second model aircraft. After the two minute limit, no further take-off may happen and the flight is considered as official, whether the model aircraft is airborne or not.

- f) Execution Time

The flight must be completed in 6 minutes including the 2 minute starting period. If the model aircraft lands after 6 minutes, 50 points will be deducted from the score. The same penalty is given, if the music is longer than 6 minutes. Time starts with an audio signal or with the beginning of the music (decision by the flightline director) and ends when the model aircraft touches the ground.

- g) Classification

The addition of the 2 best preliminary flights and the average of the two final rounds will count for the final classification.

#### **5.5.3.3 Schedule of Manoeuvres**

- a) Composition of Schedule

Each competitor chooses for his preliminary flights a maximum of 8 and for the final flight a maximum of 12 manoeuvres out of the catalogue (5.5.3.4). The schedules for the preliminary

flights must be provided by the competitors and collected by the organiser one hour before the first round will begin. The turn-around manoeuvres are free and must not be printed. The schedule for the final flights must be printed by the competitors, together with his music cassette to the organiser after the results of the preliminary rounds are displayed. The choice of the music is free.

#### b) Execution of Manoeuvres

The manoeuvres must be executed in the centre of the box in front of the judges during an uninterrupted flight in the order in which they are listed by the competitor. Each (centre) manoeuvre must be performed between approximately 25 and 75 metres in front of the competitor. Rolls and knife edge flights must be executed along a line parallel to base b, other manoeuvres can be flown also perpendicular to base b. Each manoeuvre starts and ends in a horizontal line on the same heading.

### 5.5.3.4 Judging

#### a) Judges Panel

The organiser must appoint a panel of four or five judges, for international competitions preferably of different nationalities and who are selected from the official CIAM Judges list.

Before every competition there shall be a briefing for the judges. Also warm-up flights shall be flown by a competitor that is determined by a random draw and is not in the first five of the flight order.

#### b) Marking System

Each flight will be awarded by each judge with marks between 0 and 10 as follows:

K-Factor Principles of judging	Preliminary flights		Final flight Freestyle	
	K max	Max Points	K max	Max Points
Precision of each manoeuvre, perfection	50 (max 12 manoeuvres)	500		
Overall impression (including turn-arounds, take-off and landing) display of manoeuvres landing in- or outside of the landing field	50 (45 without landing gear)	500 (450)	50 (45)	500 (450)
Harmony, rhythm, and gracefulness			10	100
<b>TOTAL</b>	<b>100 (95)</b>	<b>1000 (950)</b>	<b>60 (55)</b>	<b>600 (550)</b>

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**5.5.3.5 A Turn-around manoeuvres**

## a) Principle

Turn-around manoeuvres connect one centre manoeuvre with the following centre manoeuvre. They are free and shall be combinations of all possibilities of manoeuvres or parts of manoeuvres. I.e. Turns Humpty Bumps, Loops, Spins, etc.

## b) Positioning

All turn-around manoeuvres shall be flown inside the box. The turn-around manoeuvres and the centre manoeuvres must be separated by a horizontal line a minimum of 10 metres.

## c) Judging

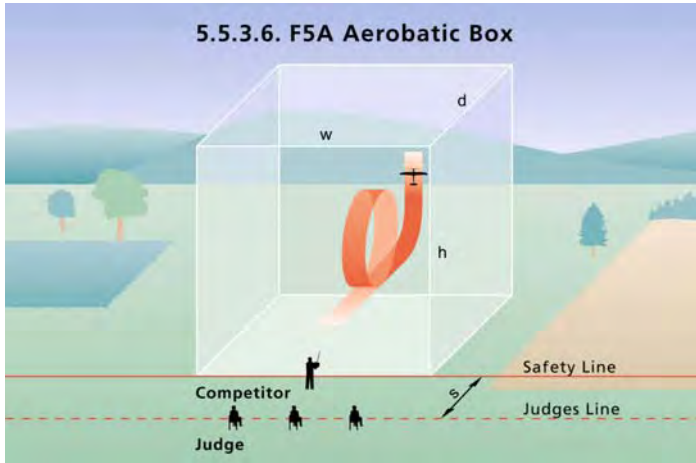
The turn-around manoeuvres must not be judged separately. The performance of this manoeuvre will count for the overall impression. Also flying outside of the box will downgrade the overall look.

**5.5.3.5 B Manoeuvres**

	Basic Manoeuvre	K	Option 1	K	Option 2	K	Option 3	K
1	Loopings positive (min. 2)	2	With roll(s)	3	With snap	4	Rosette	7
2	Loopings negative (min. 2)	3	With roll(s)	4	With snap	5	Rosette	8
3	Square Looping	3	With 2 half rolls	4	With 4 half rolls	5	With 4 full rolls	6
4	Cuban-Eight	3	Horizontal square eight	4	Vertical square eight	5	Vertical square eight with two half rolls	6
5	Roll(s)	2	Two rolls	3	Slow roll	4	2 rolls in opposite	5
6	Pointed roll (min.2 points)	3	4-points	4	8-points	5	4-reverse point roll	6
7	Knife edge flight	3	Reversed with half roll	4	Reversed with full roll	5	Reversed with ½ snap	6
7a	Knife edge flight circle	6	Knife edge flight eight on a horizontal plane	7	Knife edge flight looping	8	Knife edge flight eight on a vertical plane	9
8	Rolling circle with 4 half rolls	4	With 4 full rolls	5	With 4 full rolls in opposite	7	With one roll	8
9	Spin	1	3 turns	2	2 turns in opposite	3	3 turns inverted	4
10	Immelmann	2	Combined with half rolls	3	Combined with full rolls	4	Combined with roll and snap	5
11	Humpty bump positive	2	Humpty bump negative	3	Humpty bump negative or positive combined with half and pointed rolls	4	Humpty bump negative or positive combined with roll(s) and snap	5
12	Torque rolls (min. 1)	3	Two	5	Three	6	More than three	8
13	Top hat positive with 2 half rolls	3	Positive with full rolls	4	Negative with half or pointed rolls	5	Negative with full roll and snap	6
	Stall Turn	2	With half rolls up and down	3	With full rolls up and down	4	With roll up and snap down	5

See Annex 5.A for Manoeuvre Drawings

### 5.5.3.6 F5A Aerobatic Box



w = 110 m  
d = 75 m  
h = 75 m  
s = 3-5 m



## 5.5.4 CLASS F5B - ELECTRIC POWERED MOTOR GLIDERS

### 5.5.4.1 Definition

- a) Definition: This contest is a multi-task event for RC Electric Powered Motor Gliders including two tasks:

- 1) Distance
- 2) Duration and landing

These two tasks are executed without interruption in one flight. A minimum of two and a maximum of 8 flights must be flown. If more than three flights are flown, the lowest score of each competitor will be discarded.

- b) Model Aircraft specifications:

Minimum weight without battery	1000 g
Minimum surface area	26.66 dm <sup>2</sup>
Type of battery	Lithium Polymer
Maximum number of equivalent cells in series	10
Cells in parallel are not permitted.	
Minimum weight of battery pack	450 g
Limitation of energy by an electronic limiter that stops the motor	max 1750 Watt-min
The limiter is checked by the organiser during the contest.	

- c) Maximum number of battery packs to enter the contest: 1 pack per 2 rounds; 1 pack for reflights.
- d) Repair of battery packs is permitted providing the cells used in the repair come from battery packs that were checked at the start of the contest for that pilot.
- e) Starting order for World and Continental Championships: the starting order for the first round will be established by random draw. For the next rounds the starting order will follow the reversed ranking list. Frequency will not follow frequency and team member will not follow team members.
- f) Starting order for other competitions:

The starting order for the first round will be established by random draw.

The number of pilots is then divided by the number of rounds giving "x" result.

For each subsequent round, the first number "x" of pilots in the starting order moves to the end of the starting order

Example:

Given that there are 24 pilots and four rounds then the calculation results in 6.

The starting order for the rounds would then be as follows:

- |          |                                                                                                          |
|----------|----------------------------------------------------------------------------------------------------------|
| Round 1: | Starting order 1-24.                                                                                     |
| Round 2: | Starting order – the first six pilots move to the end of the starting order which is now 7-24 and 1-6.   |
| Round 3: | Starting order – the first six pilots move to the end of the starting order which is now 13-24 and 1-12  |
| Round 4: | Starting order – the first six pilots move to the end of the starting order which is now 19-24 and 1-18. |

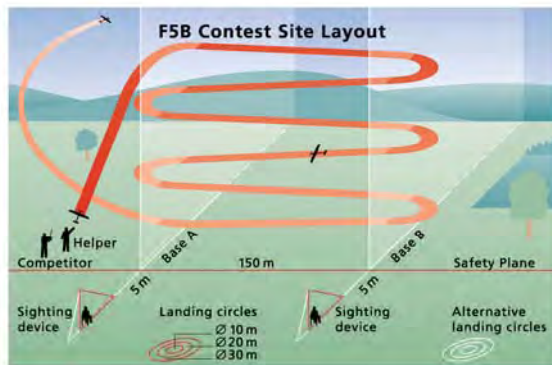
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### 5.5.4.2 Course Layout and Organisation

- Two imaginary vertical planes at a distance of 150 m from each other determine the turnlines and are named Base A and Base B. A safety plane is established perpendicular to these planes. The sighting devices used to detect the crossing of the Bases A and B are placed at a distance of 5 m from the safety plane.
- For landing, the organiser must provide three concentric circles 30, 20 and 10 m in diameter, located at a place on the field where no danger of collision exists with model aircraft simultaneously flying either the distance.

#### 5.5.4.2 F5B Contest Site Layout

Base B can either be to the left or right of Base A.



#### 5.5.4.3 Scoring

- For each flight the total score is compiled by adding the partial score A and B for each competitor;
- The individual result of each round is normalised to the points of the best competitor of that round.

$$P_{\text{round}} = 1000 \times \frac{\text{Individual points}}{\text{Points of the best competitor}}$$

The normalised points shall be recorded to the first decimal number.

- In order to decide the winner when there is a tie, the best discarded flight shall be taken into account.

#### 5.5.4.4 Launching

- Before launching, the competitor has to show to his timekeeper how he controls his motor(s) on his transmitter (on, off, reversing);
- The launch will occur behind the safety line within 10 m from Base A.
- The model aircraft is released into flight directly from the hands of the competitor or his helper, without assistance. The model aircraft shall not be launched from a height greater than the flier's normal reach above the ground.
- After the aircraft is hand-launched and the timing device is started, no further launching is allowed. The flight is considered official, whether the model aircraft is airborne or not.

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#### 5.5.4.5 Distance Task

- a) This task begins when the model aircraft is hand-launched and ends after 200 seconds. Time of release is to be taken by one timekeeper.

This task must be carried out with at least two climbs with motor running however no more than ten climbs with the motor running are allowed. No points will be awarded for the legs completed after an eleventh or more climb with motor running.

The competitor has to decide how much time he will use for each climb (motor run) and how much for gliding.

- b) When after stopping the motor the model aircraft first crosses the Base A in the direction of Base B, counting of the legs begins. The model aircraft must complete as many legs as possible from the starting point Base A to the Base B and return;
- c) Restarting the motor stops counting the legs, as does the expiration of the 200 seconds.
- d) A timekeeper announces to the competitor when his model aircraft crosses the Base A and Base B. The absence of a signal will indicate that the model aircraft has failed to correctly cross the base. The instruments used to check the crossing of the vertical plane must assure the parallelism of such planes.

During the scoring in this task, flying with any part of the model aircraft on the forbidden side of the safety plane will give ZERO points for the whole flight, distance and duration.

Circumstances beyond the control of the pilot (malfunction of the scoring equipment, interruptions etc) do not permit crossing of the safety plane. A reflight is not permitted if the safety plane is crossed without the permission of the contest director.

- e) The competitor, his helper(s) and the team manager must remain at Base A until the distance part of the flight is completed. Nobody, other than the Base B signal operator, may stay in the B line and give signals.
- f) Every completed leg will be awarded 10 points. When the model aircraft fails to complete at least one leg after either of the first two climbs, 30 points will be deducted from the score of this task; after 200 seconds of this task, which will be indicated by an audio signal, the duration task begins immediately.

#### 5.5.4.6 Duration and Landing Task

- a) This task must be completed within 600 seconds from the moment the audio signal is given.
- b) The competitor has to decide how much and how often he will switch on the motor.
- c) The duration task score-keeping device keeps track of the motor run time as well as the glide time. Duration task scoring ends when the model aircraft comes to rest after landing.
- d) Duration time is cumulative and one point will be awarded for each full second the model aircraft is gliding with the motor off.
- e) One point will be deducted for each full second flown in excess of 600 seconds.
- f) Additional points will be awarded for landing; when the model aircraft comes to rest in the 30 m circle, 10 points will be given while coming to rest in the 20 m circle gives 20 points, and when coming to rest in the 10 m circle 30 points will be given. The distances are measured from the centre of the circle to the nose of the model aircraft.
- g) No additional points will be awarded if the landing occurs more than 630 seconds after beginning of this task (as per 5.5.4.6.a)).
- h) Flying through or close to the distance course in a manner that interferes with another competitor's distance task flight will result in a penalty of 100 points deducted from the offending competitor's score of this round. This penalty can be applied by the contest director or a designated official.

**5.5.4.7 Site**

The competition must be held at a site having reasonable level terrain with a reasonable low probability of slope or wave soaring.

## 5.5.6. CLASS F5D - ELECTRIC POWERED PYLON RACING MODEL AIRCRAFT

### 5.5.6.1 General

General Rules 5.5.1. and Contest Rules 5.5.2. are applicable except where otherwise stated.

### 5.5.6.2 Technical Specifications

a) Model Aircraft

Minimum weight ready to fly: 1,000 g

Maximum surface loading 65 g/dm<sup>2</sup>

b) Battery

Battery Type: Lithium-Polymer

Minimum weight of battery pack: 200 g

Maximum weight of battery pack: 400 g

The weight of battery includes soldering, insulation, cables and connectors.

Number of cells in serial connection: up to 5 (S)

Cells in parallel are not permitted.

Limitation of energy by an electronic limiter that stops the motor: max 1000 watt-min.

c) Energy Limiter

The interruption must persist for minimum period of 10 seconds. When the pilot has finished his race or has left the pylon course flight path the motor may be switched on again.

d) Each competitor may use a maximum of three model aircraft during the contest.

e) Any one model aircraft may not be used by more than one team, nor may roles be interchanged in a team.

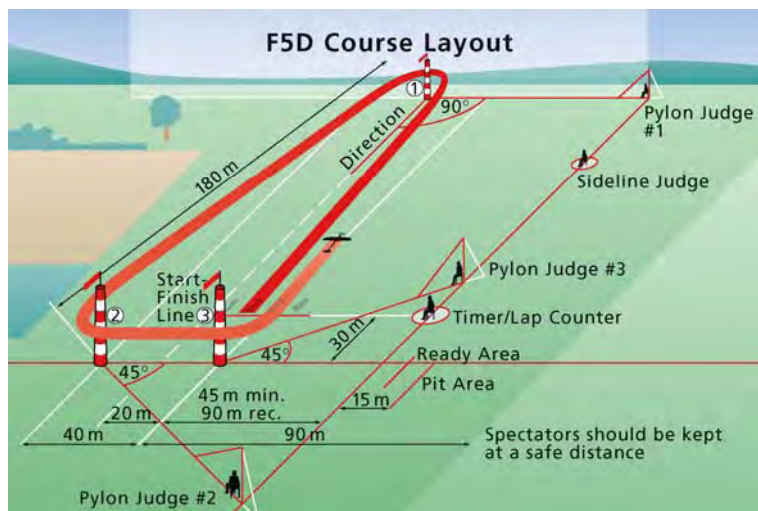
### 5.5.6.3 Safety Rules

- a) All officials (timekeepers, lap counters and pylon judges) must stay a minimum distance of 45 m outside the course on the spectators' side.
- b) The pilot and helper have to stay inside the pylon course from the first start signal until the last model of the heat has finished the race or has left the pylon course flight path.
- c) A Sideline Judge will be posted in the front on the pit area on the spectator side of the racing course. The Sideline Judge will record as an infringement, any over flight of the pit or spectator areas.
- d) All officials on the race course and all competitors must wear a crash helmet.
- e) The racecourse specification may be modified in the interest of safety.
- f) The contest director has the right to request any competitor to make a flight to demonstrate the airworthiness of his model aircraft and/or his ability to fly the aircraft around the course. If during the race, the contest director considers any model aircraft to be flying erratically, dangerously or so low as to endanger the other competitors, callers and officials, he may disqualify the competitor from that heat or from all heats and require the model aircraft to be landed immediately. Persistent flying below the top of the pylons may be considered dangerous.
- g) For transmitter and frequency control see Section 4b, Para. B.8. Heats shall be arranged in accordance with the radio frequencies in use to permit simultaneous flights. Each competitor has to introduce two different frequencies, distant of a minimum of 20 kHz, which he must be able to use on all his model aircraft entered in the contest.

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#### 5.5.6.4 Racing Course Specification

The triangular course will be laid out as follows: the distance between pylon No. 1 and No. 2 is 180 m. The distance between pylon No.1 and No. 3 is also 180 m. The distance between pylon No. 2 and pylon No. 3 is 40 m. The start/finish line is some 30 m from No. 3 in the direction of No. 1. The course is ten (10) laps with individual length of 400 m. Total distance length is 4 km. The race starts at the start/finish line. All takeoffs will be hand launched; no mechanical device will be used. The race is terminated at the start/ finish line 10 full laps later. The pylons must have a minimum height of 4 m and maximum of 5 m.



#### 5.5.6.5 Helper

- All competitors must be accompanied by only one helper (caller) for reasons of safety. The helper can be the team manager, another competitor from the same team, or a third party. The pilot or helper of one team may act as helper in one or more other teams.
- He may release the model aircraft at the start and give the pilot verbal information regarding the flying course of his model aircraft and official signals.
- In all cases the caller must be the holder of an FAI licence not necessarily issued by the NAC of the pilot and must have paid the entry fee.

#### 5.5.6.6 Officials

- Each competitor shall be assigned four (4) officials during each heat:
- One official, the timekeeper/lap counter will time the competitor's aircraft for the required ten laps. In doing so, he will count the laps flown and advise the pilot by visual or audio system when he has completed the necessary ten laps. He will keep the recorded time on his timing device until he has entered the time on the score sheet.
- At the No.1 pylon there will be one official as pylon judge and signaller for each competitor in the heat. The pylon judge/signaller will stand perpendicular to the direction of the course on the safety side of the course. Each pylon signaller will have a distinctive colour allocated, and the contest director will arrange for each model aircraft to be identified by one pylon judge - signaller before the start of every heat.
- The pylon judge - signaller will have his flag in a ready position, or his light off as the aircraft reach midcourse between No. 3 and No. 1 pylons, or earlier. At the instant the model aircraft draws level with the No.1 pylon he will briskly lower his flag or switch his light on. There will be no pilot's helpers at any of the pylons.
- Note: Signals may be coloured flags, lights or shutters.
- Pylon judge No. 2 is placed behind the base of the triangle at a safe distance in a 45 degrees angle to the line between pylon 2 and 3.

- g) Pylon judge No. 3 is placed at a safe distance in a 45 degrees angle to the line between pylon 2 and 3 in the direction of pylon No. 1.
- h) The judges at the No. 2 and No. 3 pylons will record pylon cuts (infringement). At the end of each race the sideline and pylon Judges will inform the starter of any infringements by any competitor.
- i) The starter is in charge of each heat. He will first ensure that all competitors and officials are ready to commence. Each signaller will have a flag or light of a distinctive colour. The starter will arrange for each model aircraft to be identified by one signaller before the start of any heat. A radio operation check from each competitor will be made prior to identification. The contest director may also be the starter.

#### **5.5.6.7 Starting Procedure**

- a) Starting positions in all races will be determined by draw. Model aircraft will be signalled for start by the starter via flag, light or acoustic information at 1 second intervals with timing commencing when the model aircraft crosses the start/finish line for the first time.
- b) A maximum of one minute will be allowed after identification of all model aircraft of the heat at which point the race will commence. A competitor whose model aircraft is not ready to fly at the end of the one minute period, will be disqualified from the heat.
- c) No competitor shall be permitted to launch once the first model aircraft has passed the start/finish line heading from No. 1 to No. 2 pylon on the first lap and no time shall be given him for that heat.
- d) After the start signal, any contact between model aircraft shall be considered a collision and the model aircraft involved leave the flight path immediately and land as soon as possible. The Contest Director is required to give such competitors a second opportunity to record a score in that round, provided that in his opinion the aircraft are still airworthy or the competitors have airworthy reserve model aircraft. If a competitor fails to stop racing immediately after the collision, then he will be disqualified from that round,
- e) The starter announces the direction of the launch at least 10 minutes before the first heat on each competition day. If the wind direction changes during the competition and the starter must adopt the launch direction a minimum of 10 minutes preparation time before the next heat must be given. The helper must launch the model within +/-45° of the given launch direction.
- f) A penalty will be incurred if the competitor releases the model aircraft before the start signal, or in the wrong direction, cuts a pylon or flies outside the sideline. Two infringements constitute disqualification for that flight.

#### **5.5.6.8 Operation of the Race**

- a) A maximum of three (3) model aircraft per heat will be allowed.
- b) All laps are to be flown counter-clockwise with turns to the left.
- c) At the completion of the ten laps, the lap counter/timekeeper must immediately instruct the competitor to remove his aircraft from the course.
- d) In the event of a malfunction of the timing, lap counting, signalling or such equipment which is the responsibility of the organisers, the competitor(s) affected by such malfunction shall be given the opportunity to record a score for that round.
- e) The loss of any part of the model aircraft after start signal and before 10 laps are completed disqualifies the model aircraft for that flight except as a result of a collision when Para. 5.5.6.7 d) applies.

#### **5.5.6.9 Scoring**

- a) As many heats as practical will be flown but at least three.
- b) The flight of each model aircraft shall be timed with electronic stopwatch or timing device measuring to at least 1/10 second by a lap counter/timekeeper.

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- c) The lap counter/timekeeper stops his stopwatch or timing device after ten laps have been completed by the competitor. The elapsed time of each competitor will be transmitted, supervised by the Contest Director (CD), from the stopwatch or timing device into the competitor's score sheet.
- d) At the completion of each heat, the pylon and side-line judges notify the CD as to which model aircraft have infringed. The CD then advises the person who is responsible for the score sheet of those who will record the total number of infringements for each competitor on the individual score sheet.
- e) The score sheets are then processed by a scorer who will:
  - if one infringement has incurred, add 10% of the flyer's time for ten laps to give the corrected time;
  - if two or more or intentional infringements were incurred, cancel the flight;
  - round the competitor's corrected time to the nearest 1/10 of a second.
- f) Points shall be awarded after each race as follows:
  - the competitor's score is his corrected time in seconds to the first decimal place;
  - if a competitor fails to complete his flight or is disqualified the score shall be 200.
- g) The winner of the event is the competitor who has accumulated the lowest score after the conclusion of all heats. If four or more rounds are flown, each competitor's worst score shall be discarded. If nine or more rounds are flown, each competitor's worst two scores shall be discarded.
- h) If time permits, and there is no frequency conflict, ties for first, second and third place shall be resolved by a fly-off race. If not, the places are shared.



## **5.5.7 F5E – ELECTRIC SOLAR POWERED MODEL AIRCRAFT (PROVISIONAL)**

Same rules as F5B, except:

### **5.5.7.1 Model Aircraft Specifications**

Power source            solar cells only

Maximum surface       75 dm<sup>2</sup>

Maximum voltage       42 V

No kind of buffer in the power system may be used.

### **5.5.7.2 Distance Task**

The Distance Task must be completed within 600 seconds from the moment the model aircraft is hand launched.

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**5.5.8 F5F – ELECTRIC 4 CELL MOTOR GLIDERS (PROVISIONAL)**

Same rules as F5B except:

**5.5.8.1 Model Aircraft Specifications:**

Minimum weight (ready to fly)	1500g
Minimum surface area	36 dm <sup>2</sup>
Maximum surface loading	75 g/dm <sup>2</sup>

Type of battery Lithium Polymer

Maximum number of only serial cells 4

Cells in parallel are not permitted.

Minimum weight of battery pack: 300 g

Limitation of energy by an electronic limiter that stops the motor max 1300 watt-min.

The limiter is checked by the organiser during the contest.

Maximum number of battery packs to enter the contest: 1 pack per 2 rounds; 1 pack for reflights.

Repair of battery packs is permitted providing the cells used in the repair come from battery packs that were checked at the start of the contest for that pilot.

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**5.5.9 F5G – ELECTRIC POWERED BIG GLIDERS (PROVISIONAL)**

**5.5.9.1 Definition**

This contest is a duration and landing event for electric powered semi-scale gliders.

**5.5.9.2 Model Aircraft Specifications:**

Minimum wingspan	3.75 m
Maximum weight	7.5 kg

**5.5.9.3 Duration and Landing Task**

- a) The duration task consists of 600 seconds gliding time and 30 seconds additional (free) motor run time.
- b) The duration task starts from the moment the model aircraft is hand launched or started by a rubber catapult and ends with the first touch of the ground.
- c) If more than 60 seconds motor run time are used, one point will be deducted for each full second flown in excess of 600 seconds.
- d) The competitor has to decide how much and how often he will switch on the motor.
- e) Gliding time is cumulative and one point will be awarded for each full second the model aircraft is gliding.
- f) Additional points will be awarded for landing; when the model aircraft first touches the ground in one of the three concentric landing circles as follows:

30 m diameter circle	10 points
20 m diameter circle	20 points
10 m diameter circle	30 points

No additional points will be awarded if the landing occurs more than 630 seconds after beginning of this task.

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**5.5.10 F5H - ELECTRIC POWERED OPEN MOTOR GLIDER**

Same rules as F5B except:.

5.5.10.1 Model Aircraft specifications:

- b) Limitation of energy by an electronic limiter that stops the motor and which depends on the minimum weight, including battery, of:
  - 1.0 kg    500 Watt-min
  - 1.5 kg    750 Watt-min

**Note 1:** This class shall be carried out in combination with F5B and F5F contests using the same contest site and the same timing equipment etc. Competitors of classes F5B or F5F may not compete in F5H at the same contest.

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**5.5.11 CLASS F5J – ELECTRIC POWERED THERMAL DURATION GLIDERS (Provisional)**

**Object:** To provide a man-on-man contest for competitors flying electric powered radio-controlled thermal duration soaring gliders. Several qualifying rounds will be flown in the contest. In each qualifying round, competitors are divided into groups and competitors' scores in each group are normalized to produce meaningful scores irrespective of changing weather conditions during the competition. The competitors with the top aggregate scores in the qualifying rounds then fly from two (2) up to four (4) Fly-off rounds, as a single group to determine the final placing. The exact number of Fly-off rounds will be announced by the organizer before the start of the event.

**5.5.11.1. General Rules**

**5.5.11.1.1. Definition of a Radio Controlled Glider with Electric Motor**

A model aircraft which is equipped with an electric motor, as a launching device, and in which lift is generated by aerodynamic forces acting on surfaces which remain fixed (except control surfaces). Model aircraft with variable geometry or area must comply with the specification when the surfaces are in maximum and minimum extended mode. The model aircraft must be controlled by the competitor on the ground using radio control. Any variation of geometry or area must be actuated at distance by radio control.

The power pack for the electric motor may not have any fixed connection to the ground or another model aircraft in the air. Recharging of the power pack during flight by solar cells or any other mean is not permitted.

**5.5.11.1.2. Prefabrication of the Model aircraft**

Paragraph B.3.1 a) of Section 4, Part 2 (builder of the model aircraft) is not applicable to this class.

**5.5.11.1.3. Characteristics of Electric Powered Radio Controlled Gliders with electric motor and altimeter / motor run timer**

- a) Maximum Surface Area ..... 150 dm<sup>2</sup>
- Maximum Flying Mass ..... 5 kg
- Maximum wingspan ..... 4 m
- Loading ..... 12 to 75 g/dm<sup>2</sup>
- Type of battery ..... Any type of rechargeable batteries
- Type of motor ..... Any type can be used
- b) The radio shall be able to operate simultaneously with other equipment at 10 kHz spacing below 50 MHz and at 20 KHz spacing above 50 MHz. When the radio does not meet this requirement, the working bandwidth (max. 50 KHz) shall be specified by the competitor.
- c) Any device for the transmission of information from the model aircraft to the competitor is prohibited. Any use of telecommunication devices (including transceivers and telephones) in the field by competitors, helpers or team managers is not allowed.
- d) A Spread Spectrum technology receiver that transmits information back to the competitor-operated transmitter, is not considered to be a "device for the transmission of information from the model aircraft to the competitor", provided that the only information that is transmitted, is for the safe operation of the model aircraft, ie. signal strength and voltage of the receiver battery.
- e) The competitor may use three model aircraft in the contest.
- f) The competitor may combine the parts of the model aircraft during the contest, provided the resulting model aircraft conforms to the rules and the parts have been checked before the start of the contest.
- g) For the sake of randomness of the starting order among the successive rounds, each competitor must enter three different transmitter frequencies with 10 kHz minimum

spacing. The organizer is entitled to use any of these three frequencies for setting the flight matrices. Once the competitor is allocated one of these three frequencies he must not change to another frequency for all flights during the whole of the preliminary rounds other than for re-flights. In case of a re-flight the competitor can be called to use any of these three frequencies for this re-flight only, as long as the call is made at least 1/2 hour prior to the beginning of the re-flight in written form to the competitor (or team manager where applicable). The content of this paragraph (g) is not applicable, if competitor uses a Spread Spectrum technology system.

- h) All ballast must be carried internally and fastened securely within the airframe.
- i) No fixed or retractable arresting device (ie. bolt, saw tooth-like protuberance, etc) is allowed to slow down the model aircraft on the ground during landing. The underside of the model aircraft must not have any protuberances. A folding prop or the tail, including the fin, is not considered as protuberance or arresting device.
- j) Each model shall be fitted with an approved device, which records the maximum altitude reached between the time that the model leaves the competitor or his helper hand and 10 seconds after the motor is stopped. The device must also stop the motor 30 seconds after it is started at launch, if not already stopped within this time limit by the competitor. The device must not allow the motor to be restarted during flight
- k) To facilitate initial technical processing, all altimeters / motor run timers must be easily removable for compliance checking. To enable subsequent flight line processing, the units must be equipped with a display, or alternatively with a plug into which an external display unit can be connected, in order to facilitate the timekeeper recording the required data for scoring purposes, without the need to disconnect the unit from the receiver and/or the ESC. (Electronic Speed Controller) or remove it, from the model.
- l) Any device other than an approved unit, which is carried in or on the model and which enables total or partial independent control over the model's electric drive motor operation, is prohibited. Receiver and ESC are not affected by this rule.

In Appendix A relating to this rule, the following information is included:

- Specifications for the altimeter / motor run timer
- Installation environment
- Approved devices

#### **5.5.11.2. Competitors and Helpers**

- a) The competitor must operate his radio equipment himself.
- b) Each competitor is allowed one helper. When a team manager is allowed, he is also permitted to help the competitor.

#### **5.5.11.3. The Flying Site**

**5.5.11.3.1.** The competition must be held on a site having reasonably level terrain, which minimizes the possibility of slope and wave soaring.

- a) The flying site shall include a marked launch corridor of 6 m width, with a central launch line. The launching corridor shall be arranged crosswind and shall include launch marks on the central launch line, at a minimum of 10 m. apart, one for each competitor of a group.
- b) The flying site shall include landing spots, one for each competitor in a group. Each landing spot will correspond to one of the launching marks and will be arranged at least 15m downwind of the launching corridor.

**5.5.11.3.2** The landing spots and the launch line must always be marked. It is at the discretion of the Contest Director, to define the means, by which the distance from the landing spot is measured, such as a tape. Also at the discretion of the Contest Director the landing area dimensions can be adjusted to allow best usage of the available space.

**5.5.11.4 Safety Rules**

- a) No part of the model aircraft must land or come to rest within the safety area, as defined by the Contest Director.
- b) The model aircraft must not be flown at low level (below 3 metres) over the safety area.
- c) Every single action against the safety rules will be penalized by deduction of 100 points from the competitor's final score. Penalties shall be listed on the score sheet of the round in which the infringement(s) occurred. This penalty is also applied, in cases where the infringement(s) of the rule happened to a discarded attempt or round. A penalty earned in the preliminary rounds is not carried forward into the fly off rounds.

**5.5.11.5. Contest Flights**

- 5.5.11.5.1.** a) The competitor will be allowed a minimum of four (4), preferably more, official flights.
- b) The competitor will be allowed only one attempt at each official flight.
- c) There is an official attempt when the model aircraft is released by the competitor or his helper.
- d) All attempts are to be timed by a timekeeper. If no official time has been recorded, the competitor is entitled to a new working time according to the priorities mentioned in paragraph 5.5.11.6.

**5.5.11.6. Re-flights**

- a) The competitor is entitled to a re-flight if:
  - i) his model in flight or in the process of being launched collides with another model in flight, or with a model in the process of being launched.
  - ii) the attempt has not been judged by the official timekeeper.
  - iii) his attempt was hindered or aborted by an unexpected event, not within his control.
- b) To claim a re-flight considering the above mentioned conditions, the competitor has to make sure that the official timekeeper has noticed the hindering condition and land his model as soon as possible after this event.

Note that if the competitor continues to launch or continues to fly, after the hindering condition affected his flight, he is deemed to have waived his right to a new working time.

- c) The new working time is to be granted to the competitor according to the following order of priorities:
  - i) In an incomplete group, or in a complete group on additional launching/landing spots;
  - ii) If this is not achievable, then in a new group of several (minimum 4) re-flyers. The new group of re-flyers can be made up by other four (4) competitors selected by random draw. If the frequency or team membership of the drawn competitor does not fit or the competitor will not fly, the draw is repeated;
  - iii) If this is also not achievable, then with his original group at the end of the ongoing round.
  - iv) In priority-case ii) and iii), the better of the two results of the original flight and the re-flight will be the official score, except for the competitors who are allocated the new attempt. For those the result of the re-flight is the official score. A competitor of this group who was not allocated the new attempt will not be entitled to another working time in case of hindering during the re-flight.

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**5.5.11.7. Cancellation of a flight and/or disqualification**

- a) The flight is cancelled and recorded as a zero score if the competitor used a model aircraft not conforming to any item of rule 5.5.11.1. In the case of intentional or flagrant violation of the rules, in the judgment of the Contest Director, the competitor may be disqualified.
- b) The flight in progress is annulled and recorded as a zero score if the model aircraft loses any part during the launch or the flight, except when this occurs as the result of a mid-air collision with another model aircraft.
- c) The loss of any part of the model aircraft during the landing (coming into contact with the ground) is not taken into account.
- d) The flight is cancelled and recorded as a zero score if the model aircraft is piloted by anyone other than the competitor.
- e) The flight is cancelled and recorded as a zero score if, during landing, some part of the model aircraft does not come to rest within 75 metres of the centre of the competitor's designated landing spot.

**5.5.11.8. Organisation of the Flying.**

**5.5.11.8.1. Rounds and Groups**

- a) The flying order for the initial qualifying rounds shall be arranged in accordance with the transmitter frequencies in use, to permit as many simultaneous flights as possible. A minimum of 6 competitors should be scheduled for each group.
- b) The flying order shall be scheduled in rounds sub-divided into groups.

**5.5.11.8.2. Flying in Groups**

- a) Competitors are entitled to five minutes preparation time, which is counted from the moment their group is called to take position at the designated launching area, to the start of the group's working time.
- b) The working time allowed to each competitor in a group shall be of exactly ten (10) minutes duration.
- c) The organizers must positively indicate the start of a group's working time, by audible signal; see 5.5.11.14.1 for details.
- d) Audible signal must be given when eight (8) minutes, of the group's working time has elapsed.
- e) The end of the group's working time must be positively indicated by audible signal, as for the start.

**5.5.11.9. Control of Transmitters**

All provisions mentioned in Section 4, Volume ABR, section B.11 are applicable to this class as well.

**5.5.11.10. Launching**

- a) At all times, the models must be launched into wind and within four (4) metres of the competitor's launch mark. An attempt is annulled and recorded as zero, if the model aircraft is not launched within the above specified distance. The launches must be straight forward, with the motor running. Any other type of launch is not allowed.
- b) In zero or variable light wind conditions, the launch and final approach to touchdown direction, will be set by the contest director. Any other direction is not allowed.
- c) An attempt is annulled and recorded as zero, if the model aircraft is launched before the start of a group's working time.

*cont/...*

- d) Prior to launch all altimeters /motor run timers, must be initialized on the designated landing spots, at ground level.
- e) Zooming is not allowed. It is defined as the storage of extra energy in the form of kinetic energy (speed), which is then converted into potential energy (height) after the height reading is made. Any model observed by the designated timekeeper or Contest Director, to be attempting any zooming techniques, after the period of 10 seconds has elapsed, will be penalized by deduction of 100 points from the round score.

#### **5.5.11.11. Landing**

Before the contest commences, organizers must allocate a landing spot to each competitor for all rounds. It is the competitor's responsibility to ensure, that he always uses the correct spot for landing.

Officials (timekeepers) must remain upwind and at least 15 m away of the designated landing spot, during the working time until immediately prior to the landing.

- c) After landing, competitors may retrieve their model aircraft before the end of their working time providing they do not impede other competitors or model aircraft in their group.

#### **5.5.11.12. Scoring**

- a) The attempt will be timed from moment of release from the hand of the competitor or his helper to either:
  - i) The model aircraft first touches the ground; or
  - ii) The model aircraft first touches any object in contact with the ground; or
  - iii) Completion of the group's working time.
- b) The flight time in seconds, shall be rounded down to the nearest second (mm:ss)
- c) One point will be awarded for each full second of flight within the working time, up to a maximum of 600 points (ie. 10 minutes maximum) for the preliminary rounds or 900 points (ie.15 minutes maximum) for the Fly Off rounds.
- d) The launch altitude for scoring purposes shall be the maximum altitude recorded from the moment the model leaves the launchers hand until 10 seconds after the motor is stopped.
- e) The altitude in metres shall be rounded down to the nearest metre.
- f) Each metre of the launch altitude will result in the deduction of half (0,5) a point (0,5) point up to 200 metres and 3 points above 200 metres.
- g) A zero score will be recorded for overflying the end of the group's working time by more than one (1) minute.

*cont/...*

- h) A landing bonus will be awarded in accordance with distance from the landing spot marked by the organizers according to the following tabulation:

Distance (m)	Points
Up to 1	50
2	45
3	40
4	35
5	30
6	25
7	20
8	15
9	10
10	5
over 10	0

- i) The distance for landing bonus is measured from the model aircraft nose at rest to the landing spot allocated to the competitor by the organizers.
- j) If the model aircraft touches either the competitor or his helper during the landing procedure, no landing points will be allocated.
- k) No landing bonus points will be awarded if the model aircraft overflies the end of the group's working time.
- l) The competitor who achieves the highest aggregate of points comprising of flight points, plus landing bonus points, less launch height deduction, less penalty points will be the group winner and will be awarded a corrected score of one thousand (1000) points for that group.
- m) The remaining competitors in the group will be awarded a corrected score based on their percentage of the group winner's total score before correction (ie. before being normalized for that group) and calculated from their own total score as follows:

Competitor's own score multiplied by 1000

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Highest points total scored in the group before correction

#### 5.5.11.13. Final Classification

- a) If four (4) or less qualifying rounds are flown, the aggregate score achieved by the competitor, will be the sum of his scores for all rounds flown. If more than four (4) rounds are flown, then his lowest score will be discarded before determining his aggregate score.
- b) At the end of the qualifying rounds, a minimum of ten (10) competitors with the highest aggregate scores will be placed together in a single group for the fly-off rounds.
- c) The working time for each competitor who qualifies for the fly-off rounds will be fifteen (15) minutes duration. As before, audible signal will be given at the start of the group working time, at exactly thirteen (13) minutes and at exactly fifteen (15) minutes.
- d) The scoring of the fly-off rounds shall be as in section 5.5.11.12.

cont/...

- e) Final placing of the competitors who qualify for the fly-off, shall be determined by their aggregate scores in the fly-off rounds; their scores in the qualifying rounds being discarded.
- f) In the event that two or more competitors have the same aggregate fly-off score, final positions of those competitors shall be determined by their respective position in the qualifying rounds; the higher positioned competitor being awarded the higher final position.

#### **5.5.11.14. Advisory Information**

##### **5.5.11.14.1. Organisational Requirements**

- a) The organizer shall ensure that each competitor has no doubt about the precise second that the group's working time starts and finishes.
- b) Audible indication may be by automobile horn, bell or public address system etc. It must be remembered that sound does not travel far against the wind; therefore, the positioning of the audio source must be given some thought.
- c) To be a fair contest, the minimum number of fliers in any one group is six (6). As the contest proceeds, some competitors may be obliged to drop out for various reasons. When a group occurs with five (5) or fewer competitors in it, the organizer should move up a competitor from a later group, ensuring if possible, that he has not flown against any of the others in previous rounds and of course that his frequency is compatible.

##### **5.5.11.14.2. Time-keeper Duties**

The organizer must ensure that all timekeepers are fully aware of just how important their duties are and make certain that they are conversant with the rules particularly those that require quick positive action in order not to jeopardize a competitor's chances in the contest.

##### **5.5.11.14.3 Groups**

- a) The composition of groups should minimize the situations where any competitor flies against another many times, except in the fly-off. It is recognized that, in practice, with certain numbers of competitors or where more than three rounds are flown, a situation where a competitor flies against another more than once may be unavoidable. This should be kept to a minimum.
- b) In order to minimize the time needed to run the contest, it is very important to arrange the starting order to get the minimum number of groups per round, with the maximum possible competitors in each group. It is recommended that groups with vacant starting positions are put at the end of each round, to keep space free for any re-flights.

## APPENDIX A

### 1. Specifications for the altimeter / motor run timer

An electronic altimeter / motor run timer carried in an F5J model shall fulfil the following technical specifications:

- a) Must use barometric measurement technique.
- b) Altitude indication must be based on the International Standard Atmosphere, as defined in ICAO Document 7488/2.
- c) Must record the maximum difference in pressure altitude from initialization until 10 seconds after the motor is stopped manually by the competitor or automatically by the motor run timer, whichever occurs first. At initialization, the altimeter must set a zero reference level so that the actual pressure altitude above ground level is recorded and displayed by the device.
- d) Must retain the data until specifically cleared, as is required before flight
- e) Give the data readout by visual means directly from the altimeter, with an internal or external display unit.
- f) Displayed altitude in metres shall be rounded down to the nearest metre.
- g) Device must stop the motor 30 seconds after it is started at launch, if not already stopped within this time limit by the competitor.
- h) Device must not allow any further restart of the motor.
- i) Can operate with all types of ESC.
- j) Power will be only from receiver battery if OPTO ESC is used, or from motor drive power batteries if BEC ESC is used.
- k) Use of universal plugs (JR/Futaba).

### 2. Installation environment

- a) The electronic altimeter / motor run timer must be installed in such a way that it is protected from pressure fluctuations other than changes in atmospheric pressure which results from the height of the model above ground level.
- b) The device must be placed inside the model as supplied by the manufacturer. The use of any method that modifies the true barometric pressure at any time is prohibited.
- c) The ESC must always operate via its series connection to the altimeter / motor run timer and not with direct connection with to the receiver.