



FAI Sporting Code

*Fédération
Aéronautique
Internationale*

Section 4 – Aeromodelling

Volume F3 Radio Control Soaring Model Aircraft

2008 Edition

Effective 1st January 2008

- F3B – RC THERMAL SOARING
- F3J – RC THERMAL DURATION GLIDERS
- F3K – RC HAND LAUNCH GLIDERS
- F3F – RC SLOPE SOARING (Provisional)
- F3H – RC SOARING CROSS COUNTRY (Provisional)
- F3I – RC AERO-TOW GLIDERS (Provisional)
- ANNEX 3A – RULES FOR WORLD CUP EVENTS

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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 5.1.1.2; 5.5; 5.6 and 5.6.1.6

5 FAI Bylaws, Chapter 1, para 1.2.1

6 FAI Statutes, Chapter 2, para 2.3.2.2.5,

7 FAI Bylaws, Chapter 1, para 1.2.3

8 FAI Statutes, Chapter 5, para 5.1.1.2; 5.5; 5.6, 5.6.1.6

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 F3BJ

**SECTION 4C – MODEL AIRCRAFT – F3B, THERMAL SOARING;
– F3J, THERMAL DURATION GLIDERS**

Part Five – Technical Regulations for Radio Controlled Contests

5.3 Class F3B – Thermal Soaring

5.6 Class F3J – Thermal Duration Gliders

5.7 Class F3K – Hand Launch Gliders

Annex 3A – Rules for World Cup Events

Provisional Events:

5.F.1 Class F3F – Slope Soaring

5.H.1 Class F3H – Soaring Cross Country

5.I.1 Class F3I – Aero-Tow Gliders

THIS 2008 EDITION INCLUDES THE FOLLOWING AMENDMENTS MADE TO THE 2007 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
5.3.1.3	2007	Amended template	Tomas Bartovsky F3BJ S-C Chairman
5.3.1.7.b		Change of the penalty for part loss	
5.3.1.7.e		Change of the penalty for pulley loose	
5.3.1.7.f		Change of the penalty for winch failure	
5.3.1.8.b		Clarification (three competitors in a group)	
5.3.1.8.c		Clarification (re-fly if only one pilot has a result)	
5.3.1.10.b		Change of the penalty for landing in the safety area	
5.3.2.2.c		Removed the specification of winch drum width	
5.3.2.2.k		New formula for winch testing with shunt	
5.3.2.2.l		Modification of the winch measuring procedure	
5.3.2.2.n		Specification of tolerances between winch testing instruments	
5.3.2.2.p		Change of the penalty for wrong winch	
5.3.2.2.s		Limiting the number of winches	
5.3.2.5.h		Change of penalty for safety line crossing	
5.3.2.8.		Change of discarding rule	
F3K		Completely rewritten rules	
F3K		Change from provisional to official rules; re-numbering of paragraphs.	
F3K	n/a	Renumbering tasks to A – H	

Four-Year Rolling Amendments for Reference			
Paragraph	Plenary meeting approving change	Brief description of change	Change incorporated by
5.K.1	2006	Age limit for juniors changed from 15 to 18.	Tomas Bartovsky F3BJ S-C Chairman.
Rule Freeze		Rule freeze reduced to two years & provisional classes not included in the rule freeze..	
Throughout	n/a	To harmonise the text, a competing person is now called a "competitor" and not a "pilot" except in the F3H class where teams compete and the team member who controls the glider is called a "pilot".	
5.3.1	2005	Re-numbering of subparagraphs	Tomas Bartovský F3BJ S-C Chairman
5.3.2.1			
5.3.2.2			
5.3.1.7		Competitors of the same team should not be in one group	
5.3.2.2.a)		Only electric winch allowed for launching	
5.3.2.2.o)		Quick release mechanism at battery lead	
5.3.2.4.c)		Flagman removed	
5.3.2.4.d)		Identification of model at launch	
5.3.2.5.d)		Clarification of audio system	
5.F.1		Unlimited number of rounds allowed	

Four-year Rolling Amendments for Reference.../cont

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

5.F.2	2005	Minimum nose radius	Tomas Bartovský F3BJ S-C Chairman
5.F.5		Allowed to stay airborne by reflight	
5.F.6		Penalty for safety line crossing	
5.F.8		Shorter course allowed	
5.F.9		Fuselage nose as reference by turn	
5.F.10		Safety line defined	
5.F.12		Discarding of lowest results	
5.F.15		Clarification of conditions for reflight	
5.K.6.1		Wind speed limit set to 9 m/s	
5.3.1.7.e)		Deleted paragraph (hand launching) (consequential change – reference paragraph 5.3.2.2.a) & re-numbered subsequent paragraphs	
5.3.1.7.f)		Deleted indirect reference to hand launching (consequential change).	
5.3.1.7.g)		Deleted indirect reference to hand launching (consequential change).	
5.3.2.4.c)		The reference to flagman removed (consequential change connected with already changed paragraph 5.3.2.4.c).	
5.3.1.3	2003	Banning of telecommunication devices	Tomas Bartovský F3BJ S-C Chairman
5.3.2.2		Correction of battery specification by EN	
5.6.3		Reflight by timing failure	
5.6.4		Change of conditions for reflight	
5.F.5, 5.F.6		Flight level after finish	
		Fuselage height	

RULE FREEZE FOR THIS VOLUME

With reference to paragraph A.12 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, but in step with the World Championship cycle of each category. This means that in Volume F3BJ:

- a) for category F3B changes can next be agreed at the Plenary meeting 2009 for application from January 2010;
- b) for category F3J changes can next be agreed at the Plenary meeting 2008 for application from January 2009;
- c) 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 F3BJ

PART FIVE - TECHNICAL REGULATIONS FOR RADIO CONTROLLED CONTESTS

5.3. CLASS F3B - THERMAL SOARING MODEL AIRCRAFT

5.3.1. General Rules

5.3.1.1. Definition of a Radio Controlled Glider

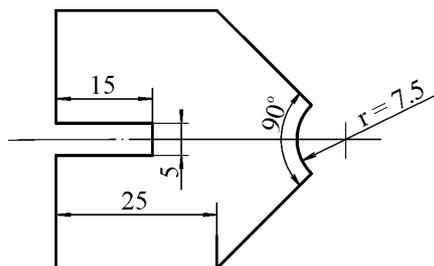
Model aircraft which is not provided with a propulsion device and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed in flight, except control surfaces. Model aircraft with variable geometry or area must comply with the specification when the surfaces are in maximum and 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.

5.3.1.2. Prefabrication of F3B Model Aircraft

Paragraph B.3.1. of Section 4B (Builder of the Model aircraft) is not applicable to class F3B.

5.3.1.3. Characteristics of Radio Controlled Gliders F3B

- a) Maximum surface area (St) 150 dm²
- Maximum flying mass 5 kg
- Loading 12 to 75 g/dm²
- Minimum radius of fuselage nose 7.5 mm (see template)



TEMPLATE FOR NOSE RADIUS, TOW HOOK AND MARKING

- b) No fixed or retractable arresting device (i.e. bolt, sawtooth-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 protuberance other than the tow-hook and surface control linkages. The tow-hook must not be larger than 5 mm in frontal width and 15 mm in frontal height.
- c) The radio shall be able to operate simultaneously with other equipment at 20 kHz spacing.
- d) Any device for transmission of information from the model aircraft to the competitor is prohibited. Any use of telecommunication devices (including transceivers and telephones) in the field to communicate with competitors, their helpers or team managers while doing the competition task is not allowed.
- 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 used for flight conforms to the rules and that the parts have been checked before the start of the contest. See also 5.3.2.1.
- g) For the sake of randomness of the starting order among the successive rounds, each competitor must enter two different frequencies, spaced at 20 kHz minimum. The competitor can be called to use any of these frequencies during the contest, so long as the call is made at least 1/2 hour prior to the beginning of a round and in written form to the affected team manager.

5.3.1.4. Competitors and Helpers

The competitor must operate his radio equipment personally. Each competitor is permitted four helpers, including the team manager, who must not give any turning signals near base B during tasks B and C.

5.3.1.5. Definition of an Attempt

- a) For each task (ref. 5.3.2.1.), during the working time allocated, the competitor is entitled an unlimited number of attempts. An attempt starts when the model aircraft is released from the hands of the competitor or his helper(s) under the tension of the tow-line. No change of model aircraft or parts of the model aircraft is allowed after starting the first attempt.
- b) The competitor is entitled to a new working time period if any of the following conditions occur and are duly witnessed by an official of the contest:
 - his model aircraft in flight collides with another model aircraft in flight, or another model aircraft in the process of launch (released for flight by the competitor or his helper) or, with a launch cable during the process of launching. Should the flight continue in a normal manner, the competitor may demand that the flight in progress be accepted as official, even if the demand is made at the end of the original working time
 - his model aircraft or launch cable in the process of launch collides with another model aircraft or launch cable also in the process of launch (released for flight by the competitor or his helper), or with another model aircraft in flight. Should the flight continue in a normal manner, the competitor may demand that the flight in progress be accepted as official, even if the demand is made at the end of the original working time
 - his launch cable is crossed or fouled by that of another competitor at the point of launch of his model aircraft (released for flight by the competitor or his helper).
 - the flight has not been judged by the fault of the judges or timekeepers.
 - in the case of an unexpected event, outside the competitor's control, the flight has been hindered or aborted.
- c) For all cases described above the competitor may demand that the flight in progress in which the event occurred will be accepted as official. Note is made that in the event the competitor continues to launch or does a re-launch after clearing of the hindering condition(s) he is deemed to waive his right to a new working time.
- d) When a competitor obtains a new working time period, and his model aircraft has been damaged beyond repair during the attempt where he obtained this new working time, he is entitled to continue flying the current round with his second model aircraft and this notwithstanding rule 5.3.2.1. This rule applies only when the damage inflicted to the model aircraft is directly linked to the incident that gave the right to the re-flight.
- e) In case of additional attempts in task A (Duration) during a round or task B (Distance) during a round, the competitors entitled to that additional attempt must fly within a group that is not complete in number or in one or more groups newly formed. If this is not possible due to a clash of frequencies, those entitled to another flight fly within their original group once more. The better of the two results will be the official score except for those competitors who are flying the additional attempt. For those the result of the repetition is the official score.

5.3.1.6. Definition of the Official Flight

The official flight is the last flight performed during the working time.

5.3.1.7. Cancellation of a Flight and Disqualification

- a) Unless otherwise specified a flight in progress will be annulled for an infraction of any rule. In the case of intentional or flagrant violation of the rules, in the judgement of the Contest Director, the competitor may be disqualified.
- b) The flight in progress will be penalised with 100 points if the model aircraft loses any part either during the launch or the flight. The loss of any part in a collision with another model aircraft or during landing (ie in contact with the ground) is not taken into account. The penalty of 100 points will be a deduction from the competitor's final score and shall be listed on the score sheet of the round in which the penalisation was applied.

- c) The competitor is disqualified if the model aircraft (in flight) is controlled by anyone other than the competitor.
- d) If the model aircraft touches either the competitor or his helper during landing manoeuvres of task A, no landing points will be given.
- e) The upwind turnaround device must be fixed safely to the ground. If the pulley comes loose from its mounting support or the turn around device is torn out of the ground, the competitor shall be given a penalty of 1000 points. The penalty of 1000 points will be a deduction from the from the competitor's final score and shall be listed on the score sheet of the round in which the penalisation was applied.
- f) The winch must be fixed safely to the ground. If the winch is torn out of the ground or rotating parts of the winch are separated (excluding parts of the tow-line) the flight is penalised with 1000 points. The penalty of 1000 points will be a deduction from the from the competitor's final score and shall be listed on the score sheet of the round in which the penalisation was applied.

5.3.1.8. Organisation of Starts

- a) The competitors shall be combined in groups with a draw, in accordance with the radio frequencies used, to permit as many flights simultaneously as possible. The draw is organised in such a way that, as far as possible, there are no competitors of the same team in the same group.
- b) The composition of the groups must be changed every round in order to have different combinations of competitors. For task A (duration), there must be a minimum of five competitors in a group. For task B (distance) there must be a minimum of three competitors in a group. For task C (speed) a group may consist of a minimum of eight competitors or all competitors.
- c) The result of a group is annulled if only one competitor has a valid result. In this case, the group will fly again and the result will be the official result.
- d) The flying order of different groups is established with the draw too. A different starting order shall be used for each round.
- e) The competitors are entitled to 5 minutes of preparation time before the starter gives the order to count off working time.

5.3.1.9. Organisation of Contests

- a) For transmitter and frequency control see Section 4B, para B.10.
- b) The official will issue the transmitter to the competitors only at the beginning of their preparation time, according to 5.3.1.8.
- c) Sighting apparatus, winches or any device constituting an obstacle, should be placed on Base A and Base B, a minimum of 5 metres from the safety line for task C. Apparatus for judging the safety line in task C shall be placed a minimum distance of 5 metres from Base A or B outside the course.

5.3.1.10. Safety Rules

- a) The organiser must clearly mark the boundary between the landing area and the safety area assigned for other activities.
- b) After release of the model aircraft from the hand of the competitor or helper, any contact of the model aircraft with any object (earth, car, stick, plant, tow-line, etc) or person within the safety area will be penalised by 300 points, except in the circumstances described in paragraph 5.3.1.5 b) items 1, 2, 3, and 5, and in the case of a line break at the moment of release of the model aircraft, The number of contacts during one flight does not matter (maximum one penalty for one flight). The penalty will be a deduction of 300 points from the competitor's final score and shall be listed on the score sheet of the round in which the contact occurred.

5.3.2. RULES FOR THERMAL SOARING CONTESTS

5.3.2.1. Definition

- a) This contest is a multi-task event for radio controlled gliders, which includes three tasks:
 - A) Duration
 - B) Distance
 - C) Speed
- b) The combination of task A, B and C constitutes a round. A minimum of two rounds must be flown. Except at World and Continental Championships the last round may be incomplete, i. e. only one task or any combination of two tasks. In the case of a World Championships each competitor is entitled a minimum of five rounds subject to the provision of rule B.13, Section 4B. At the discretion of the organiser any task may be flown first in a scheduled round.
- c) Any single round must be completed with the same model aircraft, without any change of parts. Only the addition of ballast (which must be located internally in the model aircraft and with which the model aircraft must conform to rule 5.3.1.3.) and/or change of angles of setting are allowed.
- d) Variation of geometry or area is allowed if actuated at distance by radio control.

5.3.2.2. Launching

- a) All launching shall take place in an area as designated by the organiser with provisions made for launching into the wind. All launches will be made with an electrical powered winch approved by the organiser or Contest Director.
- b) Upwind turnaround devices, which must be used, shall be no more than 200 m from the winch. The height of the axis of the turnaround pulley from the ground must not exceed 0.5 metre. Release of the model must occur within approximately 3 metres of the winch. An automatic means must be provided to prevent the line unwinding from the reel during launch.
- c) The winch shall be fitted with a single starter motor. The starter motor must come from serial production. It is allowed to fit the arbour of the rotor with ball or needle roller bearings at each end. The drum must be driven directly by the motor. Any further change of the original motor will lead to disqualification according to paragraph B.18.1. The drum must have a fixed diameter.
- d) The power source shall be a 12 volt lead/acid battery. The cold cranking capability of the winch battery must be specified according to one of the following standards:

300 amperes max. according to DIN 43539-02 (30s/9V at -18°C).
355 amperes max. according to IEC/CEI 95-1 (60s/8,4V at -18°C).
500 amperes max. according to SAE J537, 30s Test (30s/7,2V at 0°F).
510 amperes max. according to EN 60095-1 (10s/7.5V at -18°C).

Other standards are acceptable if evidence is provided that these standards are equivalent to one of the above stated standards.

- e) The battery must supply the winch motor with current through a magnetically or mechanically actuated switch. The use of any electronic device between the winch motor and the battery is forbidden. A competitor may interchange various parts as he wishes provided the resulting winch conforms to the rules.
- f) The battery must not be charged on the launching line. The motor must not be cooled, and the battery must not be heated.
- g) The purpose of this rule is to limit the power used for the launch. Therefore with the exception of the single winch battery, line stretch, and the small amount of energy in the rotating rotor and winch drum, no energy storage devices like flywheels, springs, weights, pneumatic devices or any similar devices is allowed.
- h) The complete winch (battery, cables, switch and motor) must have a total resistance of at least 23.0 milliohms. The allowed resistance may be obtained by adding a fixed resistor or resistors between the motor and battery. The design must not allow an easy change of the total resistance at the launch line (e.g. by shorting the resistor, or resistors) except opening and closing the circuit.

- i) The plus and minus pole of the battery must be readily accessible with alligator (crocodile) clips for voltage measurements. One of the cables from the battery (through which the total current flows) must be accessible for the clamp transducer (clamp meter) and the calibrated resistor.
- j) Measuring: The battery must stay unloaded for at least two minutes after the previous test or launch. The measuring of the circuit resistance consists of recording the battery voltage U_b immediately before closing the winch switch and of recording the current I_{300} and the voltage U_{300} 300 milliseconds (+-30 ms) after the winch current starts to flow. Before the end of this 300 ms interval the rotor of the motor shall stop rotating.
- k) For the test a digital voltage-measuring instrument (accuracy less or equal to 1%) is used, which enables the measurement of the voltage of the battery and the output voltage from the I/U-transducer 300 ms (+-30 ms) after the current to the winch is applied. The transducer for measuring the current may be a clamp transducer (range 0-600 or 0-1000A, accuracy less or equal to 2%) or a calibrated resistor (0.1 milliohm, accuracy less or equal to 0.5%) in the negative path of the circuit.

The resistance is calculated with the formula:

Measurement with clamp transducer $R_{tot} = 1000 \times U_b / I_{300}$

Measurement with shunt $R_{tot} = (1000 \times U_b / I_{300}) - 0.1$
 (R_{tot} in milliohms, U_b in volts, I_{300} in amperes)

- l) A first measurement is taken in order to check the correct functioning of the measuring equipment and is discarded.

Three subsequent measurements should be made with an interval of at least two minutes after the previous test or launch. The total resistance of the winch equipment is the average of these three respective results.

The winch equipment is declared as being in accordance with the rules if its total resistance is at least 23 mΩ.

- m) At the test of the winch before the competition the voltage of the battery U_{300} must be greater or equal to 9V; this does not apply for testing during the competition.

- n) The organiser must appoint at least two processing officials, who will process the winches with a single measuring apparatus, or several measuring apparatus proven to produce reproducible results within a tolerance of 0.5 %.

- o) There must be a quick release mechanism on the power lead to the battery in order to remove power from the motor in an emergency. (Connections to the battery must be removable without the need for tools).

- p) The flight is penalised with 1000 points if the winch is not in accordance with the rules; this is valid for the flight before the test. The penalty of 1000 points will be a deduction from the competitor's final score and shall be listed on the score sheet of the round in which the penalisation occurred.

- q) After release of the model aircraft from the towline, the towline should be rewound without delay by operating the winch, until the parachute (or pennant) is approximately 10 metres above the ground level. Then, the parachute should be retrieved by hand to the winch. A winch must not be operated when the towline is lying on the ground and across other towlines or strikes another towline during launching

- r) The towline (which must be of non-metallic material except for linkages) must be equipped with a pennant having a minimum area of 5 dm². A parachute (5 dm² minimum area) may be substituted for the pennant provided it is not attached to the model aircraft and remains inactive until the release of the cable. During complete rewinding of the line on to the winch, the parachute, if used, must be removed and inactivated.

- s) In the case of Continental and World Championships, a maximum of six winches and six batteries may be used during the competition by any complete team (3 pilots). Interchanging among winches and batteries while keeping compliance with the minimum resistance rule is totally under the responsibility of the team.

5.3.2.3. Task A - Duration

- a) This task must be completed within 12 minutes from the order of the starter, including the towing time.
- b) One point will be awarded for each full second from the time the model aircraft is free flying to the time the model aircraft comes to rest, up to a maximum of 600 points (i.e. 10 minutes maximum), for each full second of flight within the working time; no points will be awarded for flight time in excess of working time. The free flying of the model aircraft commences when the model aircraft is released from the towline.
- c) One point will be deducted for each full second flown in excess of 600 seconds (10 minutes).
- d) Additional points will be awarded for landing, depending upon distance from the spot marked by the organiser, according to the following table:

Distance from spot (m)	Points	Distance from spot (m)	Points
1	100	9	60
2	95	10	55
3	90	11	50
4	85	12	45
5	80	13	40
6	75	14	35
7	70	15	30
8	65	over 15	0

The distance is measured from the model aircraft nose when at rest to the centre of the spot.

No points will be awarded for the quality of landing.

No landing bonus will be awarded if the flight time exceeds 630 seconds.

The measured distance is rounded to the nearest higher metre.

- e) For model aircraft still in the air when the 12 minutes expire, the elapsed flight time only will be taken into consideration for scoring, without any additional points for the precision landing.
- f) A classification based on decreasing number of points awarded will be compiled, called "Partial Score A" - see 5.3.2.6.

5.3.2.4. Task B - Distance

- a) This task must be completed within 7 minutes from the order of the starter, including towing time. The trial begins only after the glider has been released from the tow.
- b) When the model aircraft, in flight, first crosses Base A (imaginary vertical plane) in the direction to Base B, the actual flight time of 4 minutes maximum starts, during which time the model aircraft must complete as many legs as possible from the starting Base A to Base B and conversely.
- c) An audio system or a combined audiovisual system announces to the competitor when his model aircraft crosses the Base A or Base B (imaginary vertical planes). 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 planes must assure the parallelism of such planes. Timing and signalling shall occur when the nose of the model aircraft crosses the base.
- d) The model aircraft must be identified by the contest director or designated official to the judges at Base A and B before or during the launch. The competitor must stay within a distance of 10 m either side of Base A during the timed flight.
- e) For a model aircraft which lands within 4 minutes flight time only the full 150 m legs will be counted. For model aircraft still in the air when the 4 minutes flight time or 7 minutes expires, whichever comes first, only the completed legs at that moment will be taken into account.
- f) A classification based on decreasing number of total flown legs during the flight time will be compiled, and points given as described in 5.3.2.6., thus establishing the "Partial Score B".

5.3.2.5. Task C - Speed

- a) This task must be completed within 4 minutes, from the order of the starter including towing time. The trial begins only after the glider has been released from the tow. After release of the tow-hook, the model aircraft must start the task at Base A within one minute. If the one minute period expires before the model aircraft has crossed Base A for the first time, flying from Base A to Base B, then the model aircraft must be landed and re-launched within the original working time period.
- b) The task consists of flying the distance starting from Base A, to Base B, and conversely, four legs in the shortest possible time.
- c) The flight time is recorded to at least 1/100 s when in flight the model aircraft first crosses Base A and completes four legs of the 150 m course.
- d) An audio system will inform the competitor when the model aircraft crosses base A or base B. The absence of a signal will indicate the model aircraft has failed to correctly cross the Base. The signal is given when the nose of the model aircraft crosses the base. The source of the signal (horn, loudspeaker) must not be further then 30 m away from the intersection of base A and the safety line.
- e) During the timed flight the competitor must stay within a distance of 10 m either side from Base A.
- f) After having completed the task, the model aircraft can land anywhere outside the safety area(s).
- g) Model aircraft which come to rest before having completed the task will score zero.
- h) During task C the timed flight shall take place to one side of the safety line, whilst all judges/time-keepers shall remain on the other side of the safety line. The side which is to be flown shall be indicated by the organisers taking into account the direction of the sun, etc.

The flight will be penalised with 1000 points, when sighted by means of an optical aid, the safety line is crossed by any part of the model aircraft. The penalty of 1000 points will be a deduction from the competitor's final score and shall be listed on the score sheet of the round in which the penalisation was applied.

- i) After release of the tow-hook, when the model aircraft has crossed Base A for the first time, flying in the direction from Base A to Base B, no further attempt is permitted unless the competitor signals his intention to re-launch before Base A is crossed.
- j) A classification based on increasing times to complete the four 150 m legs will be compiled, and points given as described in 5.3.2.6., thus establishing "Partial Score C".

5.3.2.6. Partial Scores

For each task the winner of each group receives 1000 points.

- a) Partial Score A for each competitor is determined as follows:

$$\text{Partial Score A} = 1000 \times \frac{P_1}{P_w}$$

Where P_1 = points of the competitor obtained as 5.3.2.3.

P_w = points of the winner in the related group.

- b) Partial Score B for each competitor is determined as follows

$$\text{Partial Score B} = 1000 \times \frac{D_1}{D_w}$$

Where D_1 = distance covered by the competitor as for 5.3.2.4

D_w = distance covered by the winner in the related group.

- c) Partial Score C for each competitor is determined as follows

$$\text{Partial Score C} = 1000 \times \frac{T_w}{T_1}$$

Where T_1 = time of the competitor as for 5.3.2.5.

T_w = time of the winner in the related group.

5.3.2.7. Total Score

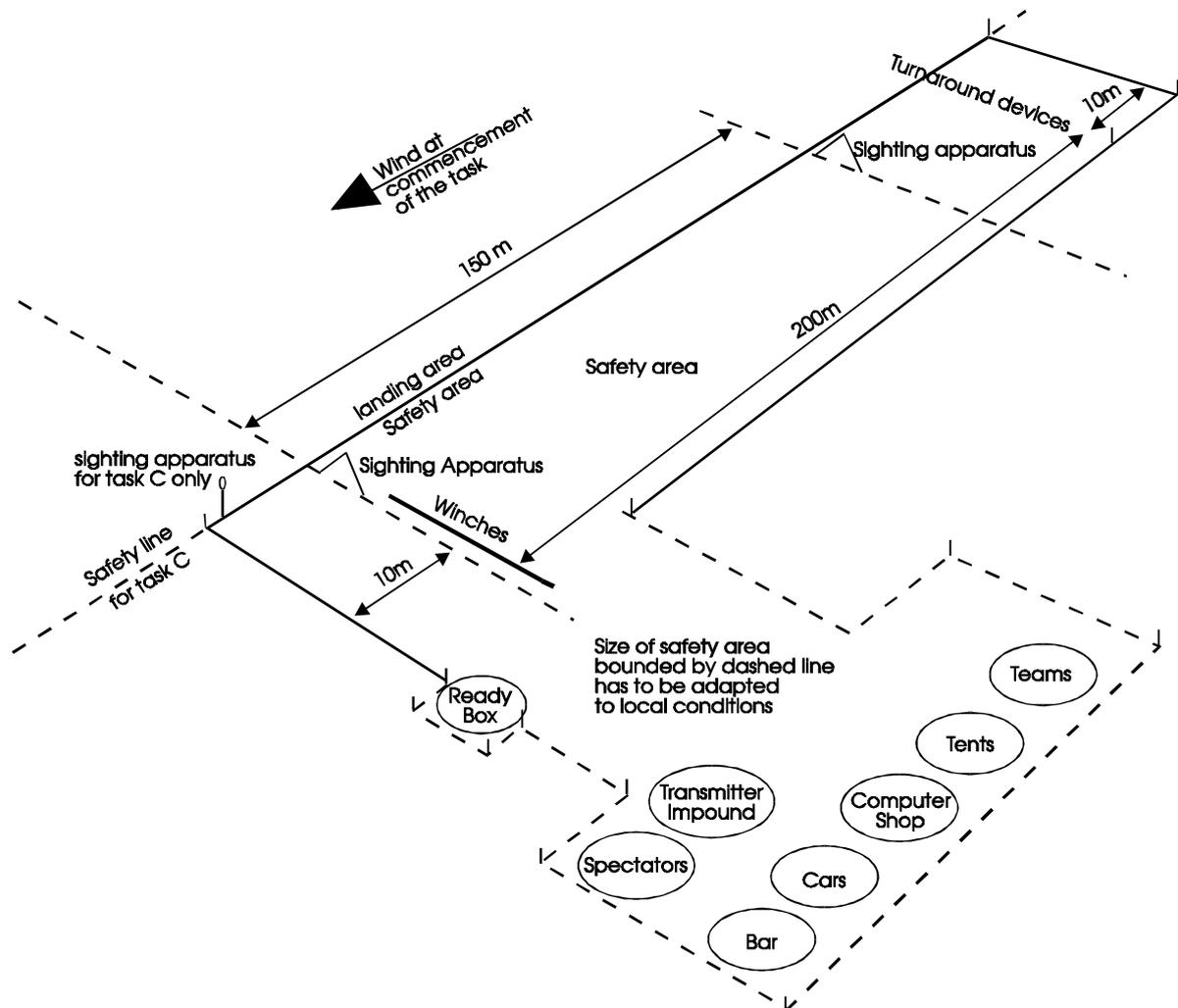
The competitor's Total Score for each round is compiled by adding the Partial Scores of all tasks.

5.3.2.8. Classification

If only five rounds are flown, the competitor's classification is determined by the sum of all Total Scores for each round. If more than five complete rounds are flown the lowest partial score of each task is omitted from the sum of all partial scores. To decide the winner when there is a tie, the two (or all who have the equal score) competitors will fly an additional round (three tasks).

5.3.2.9. Site

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



F3B FLYING FIELD LAYOUT

(left hand layout shown)

5.6. CLASS F3J - THERMAL DURATION GLIDERS

Object: To provide a man-on-man contest for competitors flying radio-controlled thermal duration soaring gliders. In the contest, several qualifying rounds are flown. For each qualifying round, competitors are divided into groups. The scores in each group are normalised to give them meaningful scores irrespective of changing weather conditions during a round. The competitors with the top aggregate scores in the qualifying rounds then fly at least two further fly-off rounds as a single group to determine the final placing. The scheduled number of fly-off rounds shall be announced by the Contest Director before the start of the contest.

5.6.1. General Rules

5.6.1.1. Definition of a Radio Controlled Glider

A model aircraft which is not provided with a propulsion device and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed. 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.

5.6.1.2. Prefabrication of the Model aircraft

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

5.6.1.3. Characteristics of Radio Controlled Gliders

- a) Maximum Surface Area 150 dm²
Maximum Flying Mass 5 kg
Loading 12 to 75 g/dm²
Minimum radius of fuselage nose 7.5 mm
- b) The radio shall be able to operate simultaneously with other equipment at 20 kHz spacing. 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) The competitor may use three model aircraft in the contest.
- e) 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.
- f) For the sake of randomness of the starting order among the successive rounds, each competitor must enter two different transmitter frequencies with 20 kHz minimum spacing. The competitor can be called to use either of these frequencies during the contest, so long as the call is made at least 1/2 hour prior to the beginning of a round in written form to the competitor (or team manager when applicable).
- g) All ballast must be carried internally and fastened securely within the airframe.
- h) No fixed or retractable arresting device (i.e. 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 other than the tow hook and surface control linkages (with or without fairings). The tow hook must not be larger than 5 mm in frontal width and 15 mm frontal height.

5.6.1.4. Competitors and Helpers

- a) The competitor must operate his radio equipment himself.
- b) Each competitor is allowed three helpers. When a team manager is required, he is also permitted to help the competitor. A maximum of two helpers are permitted for towing during the launch as described in 5.6.8.2.

5.6.2. The Flying Site

5.6.2.1. The competition must be held on a site having reasonably level terrain, which will minimise the possibility of slope and wave soaring.

5.6.2.2. 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 least 15 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 30 m downwind of the launching corridor.

5.6.2.3. The centres of the landing circles and the launch line must always be marked. At the discretion of the Contest Director, marks indicating the circumference of the circles may be omitted and replaced by the use of other means of measuring, such as a tape, to check distances from the centre of the circles.

5.6.2.4. Safety Rules

a) No part of the model aircraft must land or come to rest within the safety area.

b) The model aircraft must not be flown at low level (below 3 meters) over the safety area.

c) Every single action against the safety rules will be penalised 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.

5.6.3. Contest Flights

5.6.3.1. a) The competitor will be allowed a minimum of five (5), preferably more, official flights.

b) The competitor will be allowed two attempts at each official flight.

c) There is an official attempt when the model aircraft has left the hands of the competitor or those of a helper under the pull of the towline.

d) In the case of a second attempt the result of that flight will be the official score.

e) All attempts are to be timed by two stopwatches. If no official time has been recorded, the competitor is entitled to a new working time according to the priorities mentioned in paragraph 5.6.4.

5.6.4. Re-flights

The competitor is entitled to a new working time if:

a) 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.

b) his model in flight or in the process of being launched collides with another competitor's towline.

c) the competitor's towline is hit by another model in flight or in the process of being launched.

d) the attempt has not been judged by the official time-keepers.

e) his attempt was hindered or aborted by an unexpected event, not within his control. Crossed lines are not considered as reason for re-flight.

To claim a re-flight considering the above mentioned conditions, the competitor has to make sure that the official timekeepers have noticed the hindering conditions and land his model as soon as possible after this event.

Note that in the case the competitor continues to launch or continues to fly after hindering conditions affected his flight or does re-launch after clearing of the hindering condition(s), he is deemed to have waived his right to a new working time.

The new working time is to be granted to the competitor according to the following order of priorities:

1. in an incomplete group, or in a complete group on additional launching/landing spots;

2. if this is not achievable, then in a new group of several (minimum 4) re-flyers. New group of re-flyers can be completed by other competitors selected by random draw to the number of 4. If the frequency or team membership of the drawn competitor does not fit or the competitor will not fly, the draw is repeated;

3. if this is also not achievable, then with his original group at the end of the ongoing round.

In priority-case 2 and 3, 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.

5.6.5. Cancellation of a flight and/or disqualification

- 5.6.5.1.**
- 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 5.6.1. In the case of intentional or flagrant violation of the rules, in the judgement 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 or towline.
 - 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 circle.

5.6.6. Organisation of the Flying.

5.6.6.1. 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 and preferably 8 to 10 competitors should be scheduled for each group.
- b) The flying order shall be scheduled in rounds sub-divided into groups.
- c) The flying order shall be determined by a matrix system that minimises situations where competitors fly together more than once (see paragraph 5.6.12.5 at the end of these rules regarding suggested matrix sets).

5.6.6.2. Flying in Groups

- a) Competitors are entitled to five minutes preparation time, which is counted from the moment his 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 organisers must positively indicate the start of a group's working time, by audible signal; see 5.6.12.1 for details.
- d) Audible and visual signals 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.
- f) Any model aircraft airborne at the completion of the working time must land immediately.

5.6.7. Control of Transmitters

- 5.6.7.1.**
- a) The Contest Director will not start the contest until all competitors have handed over all transmitters to the organisers.
 - b) Failure to hand in a transmitter before the official starting time of the contest may result in the competitor forfeiting his first round flight.

- c) Any test transmission during the contest without permission of the Contest Director is forbidden and will result in disqualification.
- d) The competitor must hand over his transmitter to the designated official (usually the timekeeper) immediately after finishing his flight.

5.6.8. Launching

5.6.8.1. At all times, the models must be launched upwind in the marked launching corridor (5.6.2.2). An attempt is annulled and recorded as zero if the model aircraft is launched outside the launching corridor.

5.6.8.2. The launch of the model aircraft will be by hand held towline only.

- 5.6.8.3.**
- a) Tow persons are allowed no mechanical aids, other than pulleys, to facilitate towing but may use a hand reel (hand winch) to recover the towline after launching is complete.
 - b) Immediately after release of the model aircraft from the launching cable, without delay the towline helpers must either recover the towline on a hand reel (hand winch) or, when a pulley is used, they must continue to pull the towline until it is completely removed from the towing area in order to avoid crosscutting with other lines which are still in a state of towing or will be used for towing.
 - c) If towing with pulley, behind the pulley an unbreakable shield with diameter of minimum 15 cm must be fixed to protect the towing helpers against broken whipping line ends.

In the case of towing with a pulley two helpers have to operate the pulley and one of the following preventive measures must be taken:

- The pulley and protective shield must be connected to a 5 mm minimum diameter cord arranged in a V , the arms of which must have a length of 1,5 to 3,0 m and with hand loops on each end; or
- The pulley and protective shield must be connected to the centre of a sufficiently strong yoke of minimum 80 cm length with handholds at each end.

In the case of towing with a pulley, the towline end must be attached to a ground anchor, which is fixed by metal ropes to two additional safety pins. The length of the main stake must be at least 50 cm from the towline linkage. The safety stakes must be at least 30 cm long. The main stake must be driven into the ground to a depth at least 40 cm. The towline linkage must not exceed 10 cm above the ground. The ground anchor-dimensions and its setup could look like as shown in the drawing "Guideline for proven ground anchor setup".

5.6.8.4. The Contest Director will designate a launching area. Tow-persons must remain within this area whenever they are launching a model aircraft.

5.6.8.5. The launching device (hand-reel, pulley, anchor, if used, and all other equipment used during launch, except the launching cable with or without any attachment of maximum 5 cm³ or 5 grams) must neither come loose nor be released by the competitor or his helpers during the launch. The competitor will be penalised by the cancellation of his flight and no other attempt is permitted.

5.6.8.6. Any model aircraft launched prior to the start of a group's working time must be landed as soon as possible and re-launched within the working time. Failure to comply will result in cancellation of the competitor's score for that round.

5.6.8.7. Towlines

- a) Tow-lines for each competitor must be laid out only during the competitor's five-minute preparation time and must be retrieved by the end of his working time.
- b) The length of the towline shall not exceed 150 metres when tested under a tension of 20 N.
- c) The towline must be made of polyamide monofilament material throughout its length. It must have pennant with an area of 5 dm². A parachute (of five (5) dm² minimum area) may be substituted for the pennant provided it is not attached to the model aircraft and remains inactive until the release of the towline. Linkages (couplings, knots, loops, etc.) of different material are permitted up to a total length of 1.5 m. They shall be included in the total length of 150 m.

5.6.9. Landing

5.6.9.1. Before the contest commences, organisers must allocate a landing circle to each competitor. It is the competitor's responsibility to ensure that he always uses the correct circle for landing.

5.6.9.2. Officials (timekeepers) must remain upwind of the launch line during the landing process. The competitor and one helper are allowed inside the 15 m radius circle.

5.6.9.3. 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.

5.6.10. Scoring

5.6.10.1. The attempt will be timed from moment of release from the launching device to either:

- a) the model aircraft first touches the ground; or
- b) the model aircraft first touches any object in contact with the ground. Parts of launching devices (tow-lines) extending away from the ground shall not be interpreted as objects in contact with the ground; or
- c) completion of the group's working time.

5.6.10.2. The flight time in seconds shall be recorded to one decimal place.

5.6.10.3. A penalty of thirty (30) points will be deducted from the flight score for overflying the end of the group's working time for up to a maximum of one (1) minute.

5.6.10.4. A zero score will be recorded for overflying the end of the group's working time by more than one (1) minute.

5.6.10.5. A landing bonus will be awarded in accordance with distance from the landing spot marked by the organisers according to the following tabulation:

Distance from spot (meters)	points	Distance from spot (meters)	points
up to		up to	
1	100	9	60
2	95	10	55
3	90	11	50
4	85	12	45
5	80	13	40
6	75	14	35
7	70	15	30
8	65	over 15	0

5.6.10.6. The distance for landing bonus is measured from the model aircraft nose at rest to landing spot allocated to the competitor by the organisers.

5.6.10.7. A contest number, derived from the matrix, must be allocated to each competitor, which must be retained throughout the qualifying rounds.

5.6.10.8. If the model aircraft touches either the competitor or his helper during the landing manoeuvre, no landing points will be given.

5.6.10.9. No landing bonus points will be awarded if the model aircraft overflies the end of the group's working time.

5.6.10.10. The competitor who achieves the highest aggregate of points comprising of flight points plus landing bonus points minus penalty points will be the group winner and will be awarded a corrected score of one thousand points for that group. The corrected score shall be recorded to one decimal place.

5.6.10.11. 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 (i.e. normalised for that group) calculated from their own total score as follows:

$$\frac{\text{Competitor's own score multiplied by 1000}}{\text{Highest points total scored in the group before correction}}$$

5.6.11. Final Classification

- 5.6.11.1.** a) If five (5) or less qualifying rounds are flown, the aggregate score achieved by the competitor will be the sum of his scores for those five rounds. If more than five 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 nine (9) competitors with the highest aggregate scores will be placed together in a single group to fly the fly-off rounds. At the organiser's discretion, if frequencies permit, the number of competitors qualifying for the fly-off may be increased.
- 5.6.11.2.** The working time for each competitor who qualifies for the fly-off rounds will be of 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.
- 5.6.11.3.** The scoring of the fly-off rounds shall be as in section 5.6.10.
- 5.6.11.4.** Final placing of the competitors who qualify for the fly-off shall be determined by scores in fly-off; their scores in the qualifying rounds being discarded. If less than six (6) fly-off rounds are flown their aggregate scores over the fly-off rounds is counted, if six (6) or more fly-off rounds are flown the worst result of each competitor is discarded.

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.

5.6.12. Advisory Information

5.6.12.1. Organisational Requirements

- a) The organisers 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 four. As the contest proceeds, some competitors may be obliged to drop out for various reasons. When a group occurs with three (3) or fewer competitors in it, the organisers 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.

5.6.12.2. Time-keeper Duties

- a) Organisers must make sure that all who are to act as timekeepers are fully aware of just how important their duties are and to make certain that they are conversant with the rules particularly those that require quick positive action in order not to jeopardise a competitor's chances in the contest.
- b) The timekeepers will be responsible for handing transmitters to competitors prior to the start of the working time and for returning them to Control immediately after the end of the flight.
- c) The organisers must ensure that an official is nominated to note any competitor who overflies the end of the group's working time and to time his excess flight time.

5.6.12.3 Matrixes

- a) A matrix should be employed to minimise situations where any competitor flies against another more than once, except in the fly-off. It is recognised 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 must be kept to a minimum.
- b) The method by which each competitor is given a contest number from the matrix is left to the organisers.
- c) Once the contest has started, neither the matrix table nor contest numbers should be changed.
- d) In order to minimise the time needed to run the contest, it is very important that the matrix which gives the minimum number of groups per round, with the maximum possible competitors in each group, will be selected, and the number of frequency groups adjusted accordingly.

5.6.12.4. Frequency Groups

- a) Depending on the number of competitors in the contest and the frequencies available, the organisers will select a matrix and allocate the competitors into equally sized frequency groups according to their frequencies; reserve (dummy) places may be inserted into a frequency group at this stage. Each frequency group can comprise a number of different actual frequencies, but a frequency can only appear in one frequency group. These frequency groups are named "A", "B", "C" and so on, in the matrix tables that follow. At this stage, some competitors may have to change their radio frequencies in order to balance the numbers in each group.
- b) Organisers can then assign a unique contest number to each competitor from the matrix for round 1 of the contest; the competitor must keep this number for the remainder of the contest (rounds 2, 3,).

For example, in a contest with 36 competitors, using matrix B, a competitor may be grouped into frequency group B and then given competition number 8.

He then flies in flying group 2 in round 1, in flying group 1 in round 2, in flying group 3 in round 3.

5.6.12.5. The Matrixes

Matrix (a) 25 Competitors, identified by their competitor's number (1 - 25), divided equally into 5 frequency groups (A, B, C, D, E). Each round divided into 5 flying groups (1, 2, 3, 4, 5).

Round 1 Frequency Group					
	A	B	C	D	E
1)	1	2	3	4	5
2)	6	7	8	9	10
3)	11	12	13	14	15
4)	16	17	18	19	20
5)	21	22	23	24	25

Round 2 Frequency Group					
	A	B	C	D	E
1)	1	7	13	19	25
2)	6	12	18	24	5
3)	11	17	23	4	10
4)	16	22	3	9	15
5)	21	2	8	14	20

Round 3 Frequency Group					
	A	B	C	D	E
1)	1	12	23	9	20
2)	6	17	3	14	25
3)	11	22	8	19	5
4)	16	2	13	24	10
5)	21	7	18	4	15

Matrix (b) 36 competitors divided into 6 frequency groups (A, B, C, D, E, F). Each round divided into 6 flying groups (1, 2, 3, 4, 5, 6).

Round 1 Frequency Group						
	A	B	C	D	E	F
1)	1	2	3	4	5	6
2)	7	8	9	10	11	12
3)	13	14	15	16	17	18
4)	19	20	21	22	23	24
5)	25	26	27	28	29	30
6)	31	32	33	34	35	36

Round 2 Frequency Group						Round 3 Frequency Group							
	A	B	C	D	E	F		A	B	C	D	E	F
1)	1	8	15	22	29	36	1)	1	32	27	22	17	12
2)	7	14	21	28	35	6	2)	7	2	33	28	23	18
3)	13	20	27	34	5	12	3)	13	8	3	34	29	24
4)	19	26	33	4	11	18	4)	19	14	9	4	35	30
5)	25	32	3	10	17	24	5)	25	20	15	10	5	36
6)	31	2	9	16	23	30	6)	31	26	21	16	11	6

Continued overleaf

Matrix (c) 49 competitors divided into 7 frequency groups (A, B, C, D, E, F, G). Each round divided into 7 flying groups (1, 2, 3, 4, 5, 6, 7).

Round 1 Frequency Group								Round 2 Frequency Group							
	A	B	C	D	E	F	G		A	B	C	D	E	F	G
1)	1	2	3	4	5	6	7	1)	1	9	17	25	33	41	49
2)	8	9	10	11	12	13	14	2)	8	16	24	32	40	48	7
3)	15	16	17	18	19	20	21	3)	15	23	31	39	47	6	14
4)	22	23	24	25	26	27	28	4)	22	30	38	46	5	13	21
5)	29	30	31	32	33	34	35	5)	29	37	45	4	12	20	28
6)	36	37	38	39	40	41	42	6)	36	44	3	11	19	27	35
7)	43	44	45	46	47	48	49	7)	43	2	10	18	26	34	42

Round 3 Frequency Group							
	A	B	C	D	E	F	G
1)	1	44	38	32	26	20	14
2)	8	2	45	39	33	27	21
3)	15	9	3	46	40	34	28
4)	22	16	10	4	47	41	35
5)	29	23	17	11	5	48	42
6)	36	30	24	18	12	6	49
7)	43	37	31	25	19	13	7

Matrix (d) 64 Competitors divided into 8 frequency groups (A, B, C, D, E, F, G, H). Each round divided into 8 flying groups (1, 2, 3, 4, 5, 6, 7, 8).

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

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

Continued overleaf

Matrix (e) 81 competitors divided into 9 frequency groups (A, B, C, D, E, F, G, H, I). Each round divided into 9 flying groups (1, 2, 3, 4, 5, 6, 7, 8, 9).

		Round 1 Frequency Group								
	A	B	C	D	E	F	G	H	I	
1)	1	2	3	4	5	6	7	8	9	
2)	10	11	12	13	14	15	16	17	18	
3)	19	20	21	22	23	24	25	26	27	
4)	28	29	30	31	32	32	34	35	36	
5)	37	38	39	40	41	42	43	44	45	
6)	46	47	48	49	50	51	52	53	54	
7)	55	56	57	58	59	60	61	62	63	
8)	64	65	66	67	68	69	70	71	72	
9)	73	74	75	76	77	78	79	80	81	

		Round 2 Frequency Group								
	A	B	C	D	E	F	G	H	I	
1)	1	11	21	31	41	51	61	71	81	
2)	10	20	30	40	50	60	70	80	9	
3)	19	29	39	49	59	69	79	8	18	
4)	28	38	48	58	68	78	7	17	27	
5)	37	47	57	67	77	6	16	26	36	
6)	46	56	66	76	5	15	25	35	45	
7)	55	65	75	4	14	24	34	44	54	
8)	64	74	3	13	23	33	43	53	63	
9)	73	2	12	22	32	42	52	62	72	

		Round 3 Frequency Group								
	A	B	C	D	E	F	G	H	I	
1)	1	74	66	58	50	42	34	26	18	
2)	10	2	75	67	59	51	43	35	27	
3)	19	11	3	76	68	60	52	44	36	
4)	28	20	12	4	77	69	61	53	45	
5)	37	29	21	13	5	78	70	62	54	
6)	46	38	30	22	14	6	79	71	63	
7)	55	47	39	31	23	15	7	80	72	
8)	64	56	48	40	32	24	16	8	81	
9)	73	65	57	49	41	33	25	17	9	

Matrix (f) 100 Competitors divided into 10 frequency groups (A, B, C, D, E, F, G, H, I, J). Each round divided into 10 flying groups (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

Round 1
Frequency Group

	A	B	C	D	E	F	G	H	I	J
1)	1	2	3	4	5	6	7	8	9	10
2)	11	12	13	14	15	16	17	18	19	20
3)	21	22	23	24	25	26	27	28	29	30
4)	31	32	33	34	35	36	37	38	39	40
5)	41	42	43	44	45	46	47	48	49	50
6)	51	52	53	54	55	56	57	58	59	60
7)	61	62	63	64	65	66	67	68	69	70
8)	71	72	73	74	75	76	77	78	79	80
9)	81	82	83	84	85	86	86	88	89	90
10)	91	92	93	94	95	96	97	98	99	100

Round 2
Frequency Group

	A	B	C	D	E	F	G	H	I	J
1)	1	12	23	34	45	56	67	78	89	100
2)	11	22	33	44	55	66	77	88	99	10
3)	21	32	43	54	65	76	87	98	9	20
4)	31	42	53	64	75	86	97	8	19	30
5)	41	52	63	74	85	96	7	18	29	40
6)	51	62	73	84	95	6	17	28	39	50
7)	61	72	83	94	5	16	27	38	49	60
8)	71	82	93	4	15	26	37	48	59	70
9)	81	92	3	14	25	36	47	58	69	80
10)	91	2	13	24	35	46	57	68	79	90

Round 3
Frequency Group

	A	B	C	D	E	F	G	H	I	J
1)	1	92	83	74	65	56	47	38	29	20
2)	11	2	93	84	75	66	57	48	39	30
3)	21	12	3	94	85	76	67	58	49	40
4)	31	22	13	4	95	86	77	68	59	50
5)	41	32	23	14	5	96	87	78	69	60
6)	51	42	33	24	15	6	97	88	79	70
7)	61	52	43	34	25	16	7	98	89	80
8)	71	62	53	44	35	26	17	8	99	90
9)	81	72	63	54	45	36	27	18	9	100
10)	91	82	73	64	55	46	37	28	19	10

5.7. CLASS F3K - RADIO CONTROLLED HAND LAUNCH GLIDERS

5.7.1. General

This event is a multitasking contest where RC gliders must be hand-launched and accomplish specific tasks. In principle the contest should consist of at least five rounds. The organiser may announce more rounds to be flown before the start of the contest. In certain situations (for example bad weather conditions) the jury may decide that fewer rounds than initially announced will be flown. In these cases, the number of rounds may be fewer than five and all the rounds shall be considered as the final result.

5.7.1.1. Timekeepers

The organiser should provide a sufficient number of well-trained, official timekeepers in order to allow enough simultaneous flights at all time. The official timekeeper is not allowed to assist the competitor or his helper in any way. The competitor and his helper are entitled to read their results during the working time.

5.7.1.2. Helper

Each competitor is allowed one helper who is not allowed to become physically involved in the flight, except for retrieving the airplane, if it has landed outside the start and landing field. The helper is the only person allowed to help the competitor on the start and landing field. Team managers are not allowed to stand inside the start and landing field.

After the end of the working time the competitor and the timekeeper must sign the results of the round. If the result is not signed by the competitor, the score for the round will be 0 points.

5.7.1.3. Start Helper

Disabled persons may ask for assistance at launching and retrieving (catching) their model glider. This start helper has to be different in every round, meaning that every start helper can only be used once. The competitor has to touch the start helper before each launch of the model glider. During a competition with only one class, competitors of less than 1.5 m height may be assisted for launching and/or catching.

5.7.1.4. Transmitter Pound

The organiser should provide a transmitter pound where all transmitters and/or antennas are kept in custody while not in use during a flight or the corresponding preparation time.

5.7.2. Definition of model glider

5.7.2.1. Specifications

Model gliders are gliders with the following limitations:

Wingspan maximum 1500 mm

Weight maximum 600 g

Radius of the nose must be a minimum of 5 mm in all orientations. (See F3B nose definition for measurement technique.)

The model glider must be launched by hand and is controlled by radio equipment acting on an unlimited number of surfaces.

The use of gyros and variometers onboard the model glider is not allowed.

The model glider may be equipped with holes, pegs or reinforcements, which allow a better grip of the model glider by hand. The pegs must be stiff and an integral part of the model glider within the half-span of the wing, and be neither extendable nor retractable. Devices, which do not remain a part of the model glider during and after the launch, are not allowed.

5.7.2.2. Unintentional jettisoning

If the model glider suffers any unintentional jettisoning during the flight, then the flight shall be scored zero according to 5.3.1.7. If, during the landing, any unintentional jettisoning occurs (ref. 5.7.6.) after the first touch of the model glider with ground, any object or person, then the flight is valid.

5.7.2.3. Change of model glider

Each competitor is allowed to use five model gliders in the contest. It is permissible to change parts between these five model gliders. The competitor may change his model gliders at any time as long as they conform to the specifications and are operated on the assigned frequency. The organiser has to mark the five model gliders and all interchangeable parts of each of the five model gliders. All spare model gliders must stay outside the start and landing field and one of the spare model gliders may only be brought into the start and landing field for an immediate change. If changing the model gliders during the working time, then both model gliders must be in the start and landing field.

5.7.2.4. Retrieving of model glider

If the competitor lands the model glider outside the start and landing field, then it has to be retrieved back to the start and landing field either by the competitor or his helper. Other people, including the team manager, are not allowed to retrieve the model glider.

While retrieving the model, it is not permissible to fly it back to the start and landing field. Launching outside the start and landing field in this situation is penalised by 100 points that will be deducted from the final score.

5.7.2.5. Radio frequencies

Each competitor must provide at least two frequencies on which his model glider may be operated, and the organiser may assign any of these frequencies for the duration of the complete contest. The organiser is not allowed to change the frequency assigned to a competitor during the event. The organiser may re-assign frequencies to competitors only if a separate fly-off is flown and only for the duration of the complete fly-off.

5.7.2.6. Ballast

Para B3.1 of section 4 b (builder of the model airplane) is not applicable to class F3K. Any ballast must be inside the model glider and must be fixed safely.

5.7.3. Definition of the flying field

5.7.3.1. Flying field

The flying field should be reasonably level and large enough to allow several model gliders to fly simultaneously. The main source of lift should not be slope lift.

5.7.3.2. Start and landing field

The organiser must define the start and landing field before the start of the contest. Within the start and landing field each competitor must have adequate space to conduct his launches and landings, at least 30 m distance to any person in the start direction. The organiser should consider about 900 m² per competitor, (square of 30 m x 30 m).

All launches and landings must happen within this area. The border line defining the start and landing field is part of the start and landing field. Any launch or landing outside this area is scored zero for the flight.

Competitors may leave the start and landing field while flying their model glider, but starting, landing, and catching the model glider must only occur within the start and landing field.

5.7.4. Safety

5.7.4.1. Contact with person

In order to guarantee the highest level of safety, any contact between a flying model glider and any other person (except the competitor or start helper) either in or outside the start and landing field has to be avoided. If such contact happens during either the working or preparation time, the competitor will receive a penalty of 100 points on the total score. In addition, if the contact happens during the working time at the launch of the model glider, this will result in a zero score for the whole round.

5.7.4.2. Mid air collision

In cases of mid-air collisions of two or more model gliders the competitors will not be granted re-flights nor will penalties be levied.

5.7.4.3. Safety area

The organiser may define safety areas. The organiser must ensure that the safety areas are permanently controlled by well-trained personnel. A competitor will receive a penalty of 100 points, if:

- (a) His model glider lands inside the safety area or touches any ground based object like e.g. car or building,
- (b) The model glider flies below 3 metres over the safety area (measured from the ground).

5.7.4.4. Forbidden airspace

The organiser may define forbidden airspace, flying inside of which is strictly forbidden at any altitude. If a competitor flies his model glider inside such a forbidden airspace, a first warning is announced to the competitor. The competitor has to fly his model glider out of the forbidden airspace immediately and by the shortest route. If during the same flight the model glider enters the restricted airspace again, the competitor will receive 100 penalty points.

5.7.5. Weather conditions

The maximum wind speed for F3K contests is 9 m/s. The contest has to be interrupted or the start delayed by the contest director or the jury if the wind is continuously stronger than 9 m/s measured for at least one minute at two metres above the ground at the start and landing field. In case of rain, the contest director should consider interrupting the contest.

5.7.6. Definition of landing

5.7.6.1. Landing

The model glider is considered to have landed (and thereby terminated its flight) if:

- (a) The model glider comes to a rest anywhere
- (b) The competitor touches the model glider for the first time by hand or any part of his body (or if the competitor is disabled, the same applies for his start helper).

5.7.6.2. Valid landing

Landing is considered valid, if:

- (a) At least one part of the model glider at rest touches the start and landing field (or any ground based object within the start and landing field).
- (b) The competitor (or his helper) touches the model glider for the first time, while standing on the ground with both feet inside the starting and landing field.

5.7.7. Flight time

The flight time is measured from the moment the model glider leaves the hands of the competitor (or his start helper) until a landing of the model glider as defined in 5.7.6. or the working time expires.

The flight time is official if:

The launch happened from inside the start and landing field and the landing is valid according to 5.7.6., and The launch happened within the working time of the task.

This means that if the airplane is launched before the beginning of the working time then that flight receives a zero score.

In those tasks, where maximum or target flight times are specified, the flight time is scored up to this maximum or target flight time only.

5.7.8. Local rules

Local rules may **be used only in cases of safety issues** in local flying areas, but not for changing tasks.

5.7.9. Definition of a round

5.7.9.1. Groups

The contest is organised in rounds. In each round the competitors are arranged in as few groups as possible. A group must consist of at least 5 competitors. The composition of groups has to be different in each round.

The results are normalised within each group, 1000 points being the basis for the best score of the winner of the group. The result of a task is measured in seconds. The normalised scores within a

group are calculated by using the following formula: normalised points = competitor's score / best competitor's score x 1000

5.7.9.2. Working time

The working time allocated to a competitor is defined in the task list. The start and end of the working time must be announced with a distinct acoustic signal. The first moment, at which the acoustic signal can be heard, defines the start and end of the working time.

5.7.9.3. Landing window

No points are deducted for flying over the maximum flight time or past the end of the working time. Immediately after the end of the working time, or after each attempt for the task "all-up-last-down", the 30 seconds landing window will begin. Any model gliders still airborne must now land. If a model glider lands later, then that flight will be scored with 0 points.

The organiser should announce the last ten seconds of the landing window by counting down.

5.7.9.3. Preparation time

For each round, the competitors receive at least 5 minutes preparation time. This preparation time should ideally start 3 minutes before the end of the working time of the previous group (or at the beginning of the last attempt in the task "all-up-last-down" of the previous group), in order to save time.

At the beginning of a preparation time, the organisers must call the names and/or starting numbers of the competitors flying in the next group.

5.7.9.4. Flight testing time

After all the model gliders of the previous group have landed, the competitors flying in the next group receive at least 2 minutes of flight testing time, which is part of the preparation time. During this flight testing time the competitors are allowed to perform as many test flights inside the start and landing field as necessary for checking their radio and the neutral setting of their model gliders.

Each competitor has to ensure that he is finished in time with his test flights and is ready to start when the working time of the group begins. The last 5 seconds before the start of the working time have to be announced by the organiser.

Competitors who are not part of this group are not permitted to perform test flights either inside or outside the start and landing field and any competitor so doing will incur a penalty of 100 points .

A competitor will receive a penalty of 100 points if he starts or flies his model glider outside of the working and preparation time,

Competitors may test fly before the transmitter impound and after the last working time of the day.

5.7.10. Scoring

Each competitor must fly at least 3 rounds which have to be completed in order to get a valid final score.

5.7.10.1. Final score

The final score is the sum of normalised scores of rounds minus penalty points.

If 5 or more rounds are flown then the lowest score is dropped.

If 9 or more rounds are flown then the lowest two scores are dropped.

If 14 or more rounds are flown then the lowest 3 scores are dropped.

If 19 or more rounds are flown then the lowest 4 scores are dropped.

If 24 or more rounds are flown then the lowest 5 scores are dropped.

Penalty points must be shown in the results list with an indication of the round in which they were levied. The penalty points are retained even if the score of the round in which the offence occurred is dropped.

If a competitor collects more than 300 penalty points, he will be disqualified from the contest.

5.7.10.2. Resolution of a tie break

In the case of a tie break, the best dropped score defines the ranking. If the tie still exists, the next best dropped score (if enough rounds are flown) defines the ranking. If all dropped scores are used and a ranking cannot be achieved, a separate fly-off for the relevant competitors will be flown to achieve a ranking. In this case the contest jury will define one task that will be flown for the tie-break fly-off.

5.7.10.3. Fly-off

The organiser may announce a fly-off prior at the beginning of the event. The fly-off should consist of at least 3 rounds with a maximum of 6 rounds. If 5 or 6 rounds are flown, the lowest score is dropped.

The maximum number of competitors in a fly-off is limited to 12. The minimum number of competitors in a fly-off should be 10-15 % of the total number of competitors.

A junior fly-off may be held with the maximum number of competitors being 2/3 of the seniors fly-off. A separate junior fly-off is not mandatory.

If a fly-off is flown, the points of the previous rounds are not considered.

5.7.11. Definitions of tasks

Detailed specifications including the tasks to be flown for the day must be announced by the organiser before the start of the contest. The tasks of the program are defined below. Depending on the weather conditions and the number of competitors, the tasks and the related working time may be reduced by a decision of the organiser as defined in the task description.

5.7.11.1. Task A (Last flight):

Each competitor has an unlimited number of flights, but only the last flight is taken into account to determine the final result. The maximum length of the flight is limited to 300 seconds. Any subsequent launch of the model glider in the start and landing field annuls the previous time.

Working time: min 7 minutes, max 10 minutes

5.7.11.2. Task B (Next to last and last flight)

Each competitor has an unlimited number of flights, but only the next to last and the last flight will be scored.

Maximum time per flight is 240 seconds for 10 minutes working time. If the number of competitors is large, the maximum flight time may be reduced to 180 seconds and 7 minutes working time.

Example:	1st flight	65 s
	2nd flight	45 s
	3rd flight	55 s
	4th flight	85 s

Total score: 55 s + 85 s = 140 s

5.7.11.3. Task C (All up, last down, seconds):

All competitors of a group must launch their model gliders simultaneously, within 3 seconds of the organiser's acoustic signal. The maximum measured flight time is 180 seconds. The official timekeeper takes the individual flight time of the competitor according to 5.7.6 and 5.7.7 from the release of the model glider and not from the acoustic signal. Launching a model glider more than 3 seconds after the acoustic signal will result in a zero score for the flight.

The number of launches (3 to 5) must be announced by the organiser before the contest begins.

The preparation time between attempts is limited to 60 seconds after the 30 seconds landing window. During this time the competitor may retrieve or change his model glider or do repairs.

The flight times of all attempts of each competitor will be added together and will be normalised to calculate the final score for this task.

No working time is necessary.

Example:	Competitor A:	45+50+35 s = 130 s	= 812.50 points
	Competitor B:	50+50+60 s = 160 s	= 1000.00points
	Competitor C:	30+80+40 s = 150 s	= 937.50 points

5.7.11.4. Task D (Increasing time by 15 seconds):

Each competitor has an unlimited number of flights for each target flight time. Each competitor must try to complete the first flight of 30 seconds or more. Once this is accomplished, each of the next target flight times must be incremented by 15 seconds therefore flight times should be equal to or more than: 30 s; 45 s; 60 s; 75 s; 90 s; 105 s; 120 s. The longest target flight time is 120 seconds. The time of all the achieved target flight times is taken into account for scoring.

Working time is 10 minutes.

Example: 1st flight 32 s target time of 30 seconds is achieved; flight score is 30 points.
The next target flight is 45 seconds.
2nd flight 38 s 45 seconds not reached, score 0
3rd flight 42 s 45 seconds not reached, score 0
4th flight 47 s target time of 45 seconds is achieved; flight score is 45 points;
partial score is: 30 + 45 points. The next target flight is 60 seconds
5th flight 81 s target time of 60 seconds is achieved; flight score is 60 points.
The next target flight should be 75 seconds but the remaining working time is only 65 seconds therefore the next target flight cannot take place.
The total score for the task is: 30+45+60 = 135 points

5.7.11.5. Task E (Poker - variable target time)

Before the first launch, each competitor announces a target time to the official timekeeper. He can perform an unlimited number of launches to reach or exceed, this time. If the target is reached or exceeded, then the target time is credited and the competitor can announce the next target time, which may be lower, equal or higher, before he releases the model glider during the launch. If the target time is not reached, the announced target flight time can not be changed. The competitor may try to reach the announced target flight time until the end of the working time. Towards the end of the working time, the competitor must still announce a real time specified in minutes and/or seconds. Calling only "until the end of the working time" is not permitted.

The announcement may be repeated 5 times. The 5 flights with achieved targets are scored. The achieved target times are added together.

This task may be included in the competition program only if the organiser provides a sufficient number of official timekeepers, so that each competitor in the round is accompanied by one official timekeeper.

Working time is 10 minutes.

Example:	Announced time	Flight time	Scored time
	45 s	1st flight 46 s	45 s
	50 s	1st flight 48 s	0 s
		2nd flight 52 s	50 s
	47 s	1st flight 49 s	47 s
	47 s	1st flight 50 s	47 s
	60 s	1st flight 57 s	0 s
		2nd flight 63 s	60 s
	60 s	1st flight 65 s	60 s
	Total score is 262 s		

5.7.11.6. Task F (3 out of 6):

During the working time, the competitor may launch his model glider a maximum of 6 times. The maximum accounted single flight time is 180 s. The sum of the three longest flights up to the maximum of 180 s for each flight is taken for the final score.

Working time is 10 minutes.

5.7.11.7. Task G (Five longest flights)

Each competitor has an unlimited number of flights. Only the best five flights will be added together. The maximum accounted single flight time is 120 seconds.

Working time is 10 minutes.

5.7.11.8. Task H (One, two, three and four minute flights, any order)

During the working time, each competitor has an unlimited number of flights. He has to achieve four flights each of a different target duration. The target flight times are 60, 120, 180 and 240 seconds in any order. Thus the competitor's four longest flights flown in the working time are assigned to the four target times, so that his longest flight is assigned to the 240 seconds target, his 2nd longest flight to the 180 seconds target, his 3rd longest flight to the 120 seconds target and his 4th longest flight to the 60 seconds target. Flight seconds longer than the target seconds are not taken into account.

Working time is 10 minutes.

Example:

	Flight time	Scored time
1st flight	63 s	60 s
2nd flight	239 s	239 s
3rd flight	182 s	180 s
4th flight	90 s	90 s

Total score of this task would be 60 s + 239 s + 180 s + 90 s = 569 s

ANNEX 3A

RULES FOR WORLD CUP EVENTS

RC SOARING WORLD CUPS

1. **Classes:** The following separate classes are recognised for World Cup competition: F3B and F3J.
2. **Competitors:** All competitors in the open international contests are eligible for the World Cup.
3. **Contests:** Contests included in the World Cup must appear on the FAI contest calendar and be run according to the FAI Sporting Code. In the contests competitors of at least two different nations must take part.

Points Allocation

Class F3B and F3J

Points are to be allocated to competitors at each contest according to their placing in the results and to the number of participants as given in the following table and the conditions given below:

Placing	1	2	3	4	5	6	7	8	9	10	11	12
Points	50	40	30	25	20	19	18	17	16	15	14	13
Placing	13	14	15	16	17	18	19	20	21	22	23	24
Points	12	11	10	9	8	7	6	5	4	3	2	1

The number of competitors considered for the awarding of points is limited to those who completed at least one round (all three tasks).

The number of points awarded depends on the number of competitors. For every two competitors lacking to 51 one point is deducted from the points given in the table.

In the event 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).

5. Classification

The World Cup results are determined by considering the total number of points obtained by each competitor in the World Cup events. Each competitor may count the result of all competitions, except that only one competition may be counted from each country in Europe (taking the better score for any European country in which he has scored in two competitions). To determine the total score, up to three events may be counted, selecting each competitor's best results during the year.

In the event of a tie the winner will be determined according to the following scheme. The number of events counted will be increased from three, one at a time, until the winner is obtained. If this does not separate the tied competitors then the winner will be determined by considering the points obtained in the best three events multiplied by the number of competitors flying in each event. The winner is the one with the greatest total thus calculated.

6. Awards

The winner earns the title of Winner of the World Cup. Certificates, medals and trophies may be awarded by the Subcommittee as available.

7. Organisation

The Subcommittee shall be responsible for organising the World Cup and may nominate a responsible person or special subcommittee to administer the event.

8. Communications

The RC-Soaring Subcommittee should receive the results from each contest in the World Cup and then calculate and publish the current World Cup positions. These should be distributed to the news agencies and should also be available by payment of a subscription to any interested bodies or individuals. Latest results will also be sent to the organiser of each competition in the World Cup for display at the competition. Final results of the World Cup are to be sent also to the FAI, National Airports Controls and model aircraft press.

9. Responsibilities of Competition Organisers

Competition organisers must propose their event for inclusion in the World Cup when nominating events for the FAI International Sporting Calendar. The final selection of events from these proposals is made by the CIAM Bureau as defined in paragraph 3.

Immediately after the event, the competition organiser must send the results to the World Cup organiser, at least within one month as required in the Sporting Code B.6.5. Any failure to return results promptly will be reviewed by the CIAM Bureau when considering the competition calendar for the following year.

10. Jury

A Jury of three responsible people shall be nominated by the CIAM RC-Soaring Sub-committee to rule on any protest concerning the World Cup during a year. Any protest must be submitted in writing to the RC-Soaring Sub-committee Chairman and must be accompanied by a fee of 80 CHF (Swiss Francs). In the event of the Jury upholding the protest, the fee will be returned.

PROVISIONAL RULES
CLASS F3F - RADIO CONTROL SLOPE SOARING

5.F.1. Definition: This contest is a speed event for radio controlled slope gliders. A minimum of four rounds must be flown. The organiser shall run as many rounds as the conditions and time permits.

5.F.2. Characteristics of Radio Controlled Slope Gliders

Maximum surface area (St) 150 dm²

Maximum flying mass 5 kg

Loading on St between 12 and 75 g/dm²

Minimum radius of fuselage nose 7.5 mm in all orientations (see F3B nose definition for measuring technique).

The radio shall be able to operate simultaneously with other equipment at the normally used spacing in the allocated R/C bands (i.e. 35 MHz : 10 kHz).

The competitor may use three models in the contest. The competitor may combine the parts of the models between the rounds provided the resulting model used for flight conforms to the rules and that the parts have been checked before the start of the contest. Addition of ballast (which must be located internally in the model) and/or change of angles of setting are allowed. Variation of geometry or area is allowed only if it is actuated at distance by radio control.

5.F.3. Competitor and Helpers: The competitor must operate his radio equipment personally. Each competitor is permitted one helper. The helper is only to assist and advise the competitor until the model is passing Base A for the first time and after the timed flight is completed.

5.F.4. Definition of an Attempt: There is an attempt when the model has left the hands of the competitor or his helper.

5.F.5. Number of Attempts: The competitor has one attempt on each flight. An attempt can be repeated if:

- a) the launching attempt is impeded, hindered or aborted by circumstances beyond the control of the competitor, duly witnessed by the official judges;
- b) his model collides with another model in flight or other impediment and the competitor is not to blame on that account;
- c) the flight was not judged by the fault of the judges.
- d) the model (ie the fuselage nose) fails to pass above a horizontal plane, level with the starting area, within five seconds of exiting the course, due to circumstances beyond the control of the competitor, duly witnessed by the official judges.

The re-flight shall happen as soon as possible considering the local conditions and the radio frequencies. If possible, the model aircraft can stay airborne and has to be brought to launching height, launching speed and launching position before the new 30 second period is started by the judge.

5.F.6. Cancellation of a Flight: A flight is official when an attempt is carried out, whatever result is obtained.

A flight is official but gets a zero score if:

- a) the competitor used a model not conforming to FAI rules;
- b) the model loses any part while airborne;
- c) the helper advises the competitor during the timed flight;
- d) the model is controlled by anyone other than the competitor;
- e) the flight is not carried through;
- f) the model lands outside the assigned landing area;
- g) the model is not launched within 30 seconds from the moment the starting order is given.
- h) the model (i.e. the centre of gravity) fails to pass above a horizontal plane, level with the starting area, within five seconds of exiting the course.

5.F.7. Organisation of Starts: The flights are to be performed round by round. The starting order is settled by draw in accordance with the radio frequencies used.

The competitor is entitled to three minutes of preparation time from the moment he is called to the ready box. After the three minutes has elapsed, the starter may give the order to start. After the starter has given the order to start, the competitor or his helper is to launch the model within 30 seconds. The competitor or his helper is to launch the model by hand from the starting area indicated by the organiser.

If possible, the starting area, including the audio system, shall be situated in the middle of the course (equal distance from Base A and Base B).

The time from launch to the moment the model enters the speed course must not exceed thirty seconds.

If the model has not entered the speed course (i.e. first crossing of Base A in the direction of Base B) within the thirty seconds, the flight time will commence the moment the thirty seconds expires. If the model has not entered the speed course within the thirty seconds, this is to be announced by the judges.

5.F.8. The Flying Task: The flying task is to fly 10 legs on a closed speed course of 100 metres in the shortest possible time from the moment the model first crosses Base A in the direction of Base B. If some irremovable obstacles do not allow 100 m the course may be shorter but not less than 80 m. This exception does not apply for world or continental championships.

5.F.9. The Speed Course: The speed course is laid out along the edge of the slope and is marked at both ends with two clearly visible flags. The organiser must ensure that the two turning planes are mutually parallel and perpendicular to the slope.

Depending on the circumstances, the two planes are marked respectively Base A and Base B.

Base A is the official starting plane. At Base A and Base B, an Official announces the passing of the model (i.e. the fuselage nose of the model) with a sound signal when the model is flying out of the speed course. Furthermore, in the case of Base A, a signal announces the first time the model is crossing Base A in the direction of Base B.

5.F.10. Safety: The organiser must clearly mark a safety line representing a vertical plane which separates the speed course from the area where judges, other officials, competitors and spectators stay. Crossing the safety line by any part of the model aircraft during the measured flight will be penalised by 100 points subtracted from the sum after conversion, the penalty not being discarded with the result of the round. The organiser must appoint one judge to observe, using an optical sighting device, any crossing of the safety line.

5.F.11. Judging: The flights are judged by two judges who do not have to be the same for all competitors.

The judges' task is to control that the flights are performed according to the rules, to be time keepers and to ensure that the right distance is flown.

5.F.12. Scoring: The result of the flight is stated as the time in seconds and hundredths of seconds obtained by each competitor. For the purpose of calculating the result of the round, the competitor's result is converted this way:

$$1000 \times \frac{P_1}{P_W}$$

where P_W is the best result in the round, and P_1 is the competitor's result.

5.F.13. Classification: The sum of the competitor's round scores will determine his position in the final classification. If more than three rounds were flown the lowest round score of each competitor will be discarded and the others added to obtain the final score which will determine his position in the final classification. If more than fourteen rounds were flown, the two lowest round scores will be discarded.

To avoid ties in the classification concerning the five best scores, "classification rounds" are flown until the ties are broken. If this is not possible, the result of the discarded round will determine each competitor's position in the final classification.

5.F.14. Organisation of the Contest: The competition must be held at a site which is suitable for slope soaring.

When marking the starting and landing areas and the turning planes, the organiser must take into account the configuration of the terrain and the wind direction.

5.F.15. Changes: Any changes in the flight and landing areas may be made only between flight rounds.

5.F.16. Interruptions: A round in progress must temporarily be interrupted if:-

- a) the wind speed constantly is below 3 m/sec or more than 25 m/sec.
- b) the direction of the wind constantly deviates more than 45° from a line perpendicular to the main direction of the speed course.

If these conditions arise during the flight the competitor is entitled to a re-flight.

A round in progress is to be cancelled if:

- a) the interruption lasts more than thirty minutes;
- b) fewer than 50% of the competitors have been able to perform the task caused by marginal conditions. Without the condition "constantly" (i.e. 20 seconds) have been met and thus caused re-flights.

PROVISIONAL RULES

CLASS F3H - RADIO CONTROLLED SOARING CROSS COUNTRY RACING

5.H.1. Rules for Entry

- a) Open to any country affiliated with the FAI member National Airsports Control.
- b) Each National Airsports Control may enter up to two teams. A team consists of a pilot and up to two helpers, all of whom must be in possession of an FAI Sporting Licence, from their National Airsports Control.
- c) Each team shall include one timer who will be assigned by the organisers as official timer for another team. The official timer shall also be responsible to certify distance travelled if less than the full course distance.
- d) Each team may enter any number of gliders. Each glider must be flown on the same assigned frequency.
- e) There is no restriction on the type or number of chase ground vehicles. Suitable space must be provided in one of the vehicles for the official timer.
- f) All gliders shall fall within FAI limitations with regard to size and weight. (Refer to 5.3.1.3., Characteristics of Radio Controlled Gliders).
- g) There is no restriction on the number of controls or sensors.
- h) All ballast must be carried internally and cannot be jettisonable except for water ballast.
- l) All gliders shall bear the FAI Sporting Licence number and national flag of the primary flyer.

5.H. 2. Description of Task

- a) Object is to fly the course non-stop with one model. Fastest time wins. Any pilot of the team may fly the model.
- b) If all flights are less than the course length then the longest distance flown wins. In the case of ties, the shortest time will determine the winner.

5.H. 3. Description of Course

- a) Depending on local conditions, the course may be any of the following:
 - 1) Point A to Point B, (distance to a goal);
 - 2) Point A to Point B to Point C, (broken leg distance to a goal);
 - 3) Point A to Point B and return to Point A, (out and return);
 - 4) Distance around a closed course with three or more turn points (triangle, quadrilateral etc.);
 - 5) Free distance
- b) On the days of the competition, the organiser shall define the nature and length of the course to be consistent with the local wind and weather conditions which exist and/or are forecast for that day.
- c) The exact nature and length of the course will be announced by the organiser at a pilots' briefing held on the day of the event. A different task may be used on each day of a multi-day competition.
- d) Minimum course length for a World Championship event shall be 20 km. A World Championship event shall include at least three days of official flying.
- e) It is the responsibility of the organiser to provide sight gates and observers at the turn points, if any.

5.H.4. Launching

- a) All launching shall be by electric winches which shall be set-up and remain in a launch area designated by the organiser.
- b) Winches may be supplied by the organiser or may be supplied by the teams.
- c) Winches will be 12-volt launch systems with a maximum line length of 600 metres with the turn-around located 300 metres from the winch.

- d) The towline must be equipped with a pennant having a minimum area of 5 dm² (77.5 in².) A parachute (5 dm².) may be substituted for the pennant provided it is not attached to the model and remains inactive until the release of the cable.
- e) More than one team may share the use of the same winch.
- f) Each team will provide and is responsible for its own line retrieval.
- g) To prevent lines from fouling on the ground, immediately after release from the glider, every towline must be wound down to the turnaround. Failure to do so will allow the organiser to add a five minute time penalty to the flight time.

5.H.5. Flight Rules

- a) All launching sequences shall be at each team's discretion.
- b) Re-launches on the course are not permitted.
- c) Flight time for each attempt will begin only when the glider crosses the start line in the direction of the course. Prior to crossing the start line, the pilot is responsible to inform the officials that he is making a start. Flight time stops when any of the following occurs:
 - 1) the glider crosses the finish line; or
 - 2) the pilot declares the glider is lost; or
 - 3) the glider touches the ground.
- d) A team may change planes with no restrictions other than the initially assigned frequency must be used.
- e) Any number of attempts will be allowed within the contest time period; the best flight each day will be used in the final scoring.
- f) Once on the course the chase vehicle(s) must travel the designated route except for possible off-course retrievals.
- g) The glider need not fly directly over the prescribed route.
- h) In the event of off-course landings (less than full course length) the point of landing shall determine the distance flown.
- i) If the glider is destroyed in flight or goes out of sight for a period of not less than five minutes, the official timer will log its point of furthest progress up to that point.

5.H.6. Scoring

- a) The winner of each task shall receive 1000 points.
 - 1) Except for Free Distance, the fastest finisher is the winner of the task. If there are no finishers, the winner is the team which flew the longest distance.
 - 2) In Free Distance, the winner is the team which makes the longest distance flight.
- b) When a team lands off course, an imaginary perpendicular line from the course to the landing spot shall determine the distance flown. A marker shall be placed by the official timer at the projected point on the course.
- c) Score Computations:
 - 1) If there is a finisher:

Fastest finishing team's score:

$$\text{Score} = 1000$$

Other finishing teams' score:

$$\text{Score} = 700 + \left(\frac{T_w}{T_i} \times 300 \right)$$

Non-finishing team's score

$$\text{Score} = \frac{D_i}{D_w} \times 700$$

Where:-

T_i = team's time to finish the course;

T_W = fastest time to finish the course;

D_i = team's distance flown;

D_W = distance of the task.

2) If there are no finishers, each team receives a score as below:

Longest Distance Flight = 1000 points

$$\text{Score} = 1000 \times \frac{D_i}{D_W}$$

Where:

D_i = team's distance flown;

D_W = longest distance flown

3) The overall winner shall be determined by adding together all the daily scores.

5.H.7. Organiser Responsibility

- a) Provide sufficient personnel to ensure that all rules are observed and that the correct distances are measured.
- b) Control all frequencies assigned to the competing teams to ensure that each team has a clear frequency.
- c) Provide a map to each team describing the course area and pertinent features at least one month prior to the start of the event.

PROVISIONAL RULES

CLASS F3I - RADIO CONTROLLED AERO-TOW GLIDERS

5.I. 1. General Rules

5.I.1.1. Definition of an Aero-Tow Glider Contest: An aero-tow contest is a competition in which each competitor performs with the same glider two different tasks, speed and duration, after having been towed to soaring altitude.

This competition must take place on a reasonably flat and horizontal terrain with a low probability of slope or wave soaring.

5.I.1.2. Definition of a Round: A round includes two tasks; each is attempted after aero-tow release at 200 metres above ground level:

- a) one speed task: a 1000 metres distance flight performed on a 250 metres course;
- b) one duration task: flight with a maximum duration of 8 minutes and a precision landing.

The two tasks must be performed with the same glider without any change of parts (except in case of a collision with another model in flight).

During the duration task, competitors are arranged in as few as possible groups, consisting of 4 or 3 competitors. During this task, in order to release their models, groups of four competitors are allocated a time slice of 10 minutes. Groups of three competitors are allocated a time slice of 7 minutes 30 seconds.

5.I.1.3. Definition of the Speed Course: The speed flight is performed between two parallel vertical planes, 250 metres apart. Each vertical plane is established with a sighting apparatus to identify the crossing of the plane by the nose of the glider. The judges announce to the competitor when his model crosses the plane, by use of an acoustic or optical signal. One plane has to be designated as the start and finish plane. The timekeepers shall stand near the start and finish plane.

All flying shall take place on one side of a plane, perpendicular to the two vertical turning planes, and materialised by a sighting device in the vicinity of Base A and a flag at Base B. The side which is to be flown is indicated by the organisers, and all personnel, competitors, helpers and public shall remain on the other side of this plane. The flight is annulled when the crossing of the safety plane by any part of the glider is signalled by the safety line marshal.

5.I.1.4. Characteristics of an Aero-Tow Glider: Model aircraft which is not provided with a propulsion device and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed, (i.e. not rotating or ornithopter type surfaces). Models with variable geometry or area must comply with the specification when the surfaces are in maximum and minimum extended mode. The models must be controlled by the competitor on the ground using radio control connection. Any variation of geometry or area must be actuated at distance by radio.

- a) Maximum flying weight 5 kg
Loading on the St (maximum) 75 g/dm²

The loading must be identical for the two tasks in each round (Example: a glider being 50 g/dm² loaded during the speed task has to be identically loaded for the duration task.).

Minimum wing-span 3.50 m

The gliders must have a semi-scale look:

- 1) The fuselage width, measured in centimetres at the maximum cross-section, excluding the fillets, shall be at least equal to 3.2% of the glider wingspan (example 400 cm x 3.2% = 12.8 cm). The fuselage height measured in cm at the maximum cross section, excluding the fillets, shall be at least equal to 4% of the glider wingspan (example 400 cm x 4% = 16 cm)
- 2) The fuselage shall include a transparent cockpit canopy, similar to the one used on full size gliders.
- 3) To facilitate take-off, the glider must possess a wheel with a minimum diameter of 4 cm, and giving a minimum fuselage-to-ground clearance of at least 1 cm.

On the ground, only the change of radio frequency as well as changes of wing and tail incidence angles is allowed. In flight, surface and incidences may be changed by remote control.

Any device for transmission of information from the model to the competitor or his helper, including gyroscopes, variometers and any visible device on the exterior of the glider (flashing lights) is prohibited.

Prefabrication of the models: models which are assembled by the builder from prefabricated parts and in which the builder installs the equipment, are allowed. In any configuration, the glider must constantly comply with the above characteristics

- b) The radio must be able to operate simultaneously with other equipment at 20 kHz spacing. When the radio does not meet this requirement, the working bandwidth (max. 50 kHz) shall be specified by the competitor.

5.1.1.5. Competitor and Helper: Each competitor must operate his radio equipment personally. He is permitted one helper to assist him during the launching and the flight.

5.1.2. Technical and Sporting Rules for the Contest

5.1.2.1. Number of Models: The competitor may use two models in the contest. Only one model can be used during a specific round.

5.1.2.2. Technical Control and Processing: Each competitor shall present a model specification certificate (see 2.3.5. and 2.3.6. Section 4c) for each model.

Models shall be processed in accordance with B.13 Section 4b.

Models shall be weighed before and after the speed and duration flights of each round.

5.1.2.3. Organisation of Starts: For the first speed task, the starting order shall be established with a draw. The starting order for the other speed tasks is then determined by a sequential rotation of the first starting order ($1/N$ where N is the number of rounds).

For the duration tasks, the competitors shall be combined in groups with a draw. For this purpose, each competitor must enter two different frequencies at least 20 kHz apart. The Organiser will be the only person able to determine the most suitable frequency so that the competitors can fly in groups of 4 competitors or 3 competitors minimum.

The tasks may be flown in any order during a round. No round may be started before the end of the preceding one.

The starting order is determined before the beginning of the flights.

When called by the Starter, the competitor has two minutes preparation time before taking off. At the end of the two minutes preparation time, if his model is not ready for take-off, the competitor is penalised one attempt. The same holds true if, for any reason, he abandons his takeoff.

For the duration task, the time between the release of the gliders of the first and the last competitors of one group must be less than ten minutes.

The time required for the towing-plane/glider between take-off and release must not exceed 1 min. 30 sec. Once the 1 min. 30 sec time has elapsed, the release is compulsory with no further attempt.

In all cases, a new attempt is repeated immediately (before the following competitor).

In the case of paragraph 5.1. 2.7., the Contest Director is the only person who can make the decision to allow a new attempt at the end of the task.

5.1.2.4. Launching

- a) All gliders shall be launched by aero-towing with radio controlled aircraft made available by the organisers and flown by a competitor designated by them.
- b) All launches shall start with the glider on the ground. The use of dollies/launching trolleys is not permitted.

- c) The tow plane shall conform to the General Characteristics of Model aircraft (see 1.2 Section 4c) except that the maximum flying weight shall be 12 kg and that the maximum swept volume of the motor shall be 50 cc.
- d) To facilitate aero-towing, the glider shall be fitted with a single tow-hook, working with a simple nylon bow, situated not more than 10 cm from the nose of the model.
- e) The glider shall be released at a maximum altitude of 200 metres above ground level. This altitude shall be determined by an automatic altimeter carried in the tow plane which action is to stop automatically the climb by throttling back the engine to idle.
- f) The towing plane competitor shall advise the competitor when his model approaches the release height. He shall order the release of the model (sounding a horn) when the model reaches an altitude of 200 m. The release must be executed within three seconds following the order to do so; if not, the competitor is penalised one attempt.
- g) For the speed task, the model shall cross the start plane within two minutes after release of the model.
- h) If the towing plane/glider crosses the start plane before the 200 m horn is sounded, the glider shall, after release, return behind the start plane to perform its speed flight.
- j) The tow rope is 25 m long with a fusible ring (nylon bow) at each end.
- k) The tow rope must be fitted with a red warning ribbon.

The glider can start its speed flight after release without waiting for the 200 m horn to sound.

Only the judge can indicate the position of the glider for the correct crossing of the start plane.

5.1.2.5. Definition of a Re-flight

The flight is not considered an attempt and may be re-flown if:

- a) the glider is not ready to take off after the two minutes preparation time;
- b) the towing has to be interrupted because of the competitor's fault;
- c) the release occurs above the allowed altitude;
- d) for the duration task, the group is entitled a new time slice (10 minutes or 7 minutes 30 seconds) if the models were not all released within the allocated time. The contest director may ask for immediate repetition of the flight or may postpone the re-flight to the end of the task.

5.1.2.6. Number of Attempts: For each task, if the first attempt is not conclusive, the competitor is entitled a second attempt.

The flight may be repeated if:

- a) the glider collides with another model. Should the flight continue in a normal manner, the competitor may demand:
 - 1) that the flight in progress be accepted as official;
 - 2) or to repeat his flight.
- b) the flight has not been judged by the timekeepers;
- c) the towing is interrupted through no fault of the competitor;
- d) for the duration task, if the gliders are not released within the allowed 10 minutes time, the group is entitled to a second (and unique) attempt.

If the contest director asks for the flight to be repeated because of a competitor's fault, the group will fly again and the better of the two results will be the official score for the other competitors of the group.

5.1.2.7. Penalty: If, for the duration task, the glider loses in flight any part, the flight time is penalised with a 200 points penalty. If, during the recorded time of the speed task, the glider loses any part, 200 points will be deducted from the partial score of the speed task.

5.1.2.8. Cancellation of Flight and Disqualification: The flight is annulled if:

- a) the competitor uses a glider not in accordance with the rules;
- b) the glider was not ready for take-off during the second attempt;
- c) the glider crosses the safety plane.

d) during the duration flight, the glider overflies at low altitudes the safety areas defined by the organiser of the competition.

A competitor is disqualified:

- a) in case of intentional or flagrant violation of the rules;
- b) if the model is controlled by anyone other than the competitor.

5.1.2.9. Timing: The launch-officer times the two minutes preparation time from the moment he calls the competitor for departure.

The timing of the flights must be ensured by two timekeepers provided with stopwatches. Timing can exceptionally be ensured by only one timekeeper, but in this case, he must use two stopwatches simultaneously.

5.1.2.10. Definition of the Landing Point: The landing point is the point on the ground vertically below the nose of the model when stopped.

5.1.2.11. Definition of the Landing Area: The landing area is defined by a rectangle, 20 metres wide and 40 metres long, defined on the ground with tight lines.

5.1.3. Scoring:

- a) **Speed task:** The time required for the glider to fly 1000 metres, four laps of the course, shall be recorded in seconds and tenths of seconds.
- b) **Duration task:** Each timekeeper records the whole duration of the flight, from the release of the model from the tow line until:
 - 1) the glider comes to a standstill on the ground; or
 - 2) the flight is stopped by an obstacle; or
 - 3) the glider disappears from the timekeeper's sight.

One point is awarded for each complete second of flight up to a maximum of 480 points (8 minutes).

One point is deducted for each full second flown in excess of 480 seconds.

Twenty additional points are awarded if the landing is performed inside the rectangle. The landing direction must be the same as the take-off direction imposed at the beginning of the task. A touch and go in the opposite direction is recorded zero.

No landing points shall be awarded if the glider:

- 1) hits the competitor or his helper, during the landing process; or
- 2) stops in an inverted position; or
- 3) executes a rotation of more than 90 degrees from the landing area axis (length of the rectangle).

If the model stops more than 100 m from the centre of the landing area (rectangle), the flight time is penalised 200 points.

- c) The final classification for each competitor is compiled from the partial scores of each round..

The partial score (P_S) for duration task for each competitor is:

$P_S = 1000 \times T_C/B_T$ where:

T_C = competitor's partial points = $(P_C + E_P) - P_P$;

B_T = partial points of the best competitor in the group = $(P_C + E_P) - P_P$;

P_C = points awarded to the competitor (5.1.3.b);

E_P = extra points for landing;

P_P = penalty points.

The partial score (P_S) for speed task for each competitor is:

$P_S = 1000 \times B_T/T_C$ where:

B_T = best speed time

T_C = time of the competitor

Final score: The final score of each competitor is compiled by adding the partial scores of each round. In order to establish the final score, the lowest round may be dropped if three rounds or more have been flown... If five rounds or more have been flown, two rounds may be dropped. If nine or more rounds have been flown, three rounds may be dropped.

In order to decide the winner when there is a tie among the three first competitors, a whole round will be flown for these competitors.