

VOLUME F5

PART FIVE – TECHNICAL REGULATIONS FOR RADIO CONTROLLED CONTESTS

5.5. CATEGORY F5 – ELECTRIC POWERED MOTOR GLIDERS

5.5.1 GENERAL RULES

5.5.1.1 Definition of Electric Powered Motor Gliders

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

5.5.1.2 Builder of the Model Aircraft

There is no requirement for the competitor to be the builder of the model in F5. Refer C.5.1.2. in *CIAM General Rules*.

5.5.1.3 General Characteristics of RC Electric Powered Motor Gliders F5

Maximum total area 150 dm²

Maximum weight 5 kg

Loading 12 to 75 g/dm²

- a) The power source shall consist of any kind of rechargeable batteries (or secondary cells), the maximum no load voltage must not exceed 42 volts. In case the voltage is measured, this shall be done at the moment the preparation time for the pilot starts. After the measurement has been taken, the pilot is allowed 5 minutes preparation time as per 5.5.2.4.
- b) Battery specifications in F5B and F5J are written in the special rules of these classes.
- c) Mechanical or chemical modification of the individual cells, e.g. to reduce their weight, is not allowed except that insulation sleeves of individual cells may be changed.
- d) Electronic systems allowed are:
 - Augmented stability systems.
 - Systems that limit the energy used during climbs.
- e) Electronic systems that are prohibited are:
 - Autonomous or pre-programmed flight.
 - GPS or similar positioning systems or waypoint navigation.

Further exceptions are written in the specific class rules.

5.5.1.4 Energy Limiter/Logger

The energy limiter/logger is located in the electric circuit between the battery and the motor. In the case of a limiter, the interruption must persist for a defined period of time. Logger data must be retrieved immediately after the flight. The contest organiser may supply a "real time radio telemetry logger" that transmits logged data to the ground. The energy data and motor-run data shall be made available to the pilots.

5.5.1.5 Procedure for Limiter and Logger Checking

The limiters and loggers must be approved by the EDIC (ELECTRONIC DEVICES IN COMPETITIONS WORKING GROUP).

- a) The general procedure of limiter and logger checking follows Section C.12, Model Processing, in *CIAM General Rules*.
- b) The organiser will check if the limiter/logger is correctly connected to RX, LiPo pack and ESC. There must not be any type of "jumper" present in the RX cable or on the current sensor.

c) Malfunction of limiter/logger:

- limiter/logger given by the organiser, the competitor will have a reflight.
- limiter/logger of the competitor, a penalty in F5B/F of 100 p must be given.

Only one of these two systems can be used at a contest. The organiser must decide which of these two systems he will use and indicate clearly in the invitation.

5.5.1.6 Number of Model Aircraft

The competitor may use two model aircraft and three in F5J. The competitor may combine the parts of the model aircraft during the contest, provided the resulting model aircraft conforms to the rules and that the parts have been checked before the start of the contest.

5.5.1.7 Competitor and Helper

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

5.5.2 CONTEST RULES

5.5.2.1 Definition of an Official Flight

- a) During a two (2) minute starting period, the competitor is allowed an attempt which starts when the model aircraft is released by the competitor or his helper. After two minutes, no further launching or take off is allowed and the flight is scored with 0 points. The pilot may repeat a second two minute starting period only if:
 - b) The competitor cannot perform a flight due to outside interference verified by the organiser.
 - c) No scoring was made for reasons outside the control of the competitor. In such cases, the flight may be repeated at any other time decided by the Contest Director.

5.5.2.2 Cancelling of a Flight and Disqualification

The flight is annulled:

- a) If the pilot uses a model aircraft that does not conform to the FAI rules. In the case of intentional or flagrant violation of the rules, in the judgement of the Contest Director, the competitor may be disqualified.
- b) If the model aircraft loses any part during the flight time. The losing of a part during landing (ie. contact with the ground or another obstacle) during the flight due to a collision with another model is not taken into account;
- c) If the model aircraft was already used by another competitor at the same contest;
- d) If the pilot uses more than two helpers;
- e) If any part of the model aircraft does not come to rest and remain at rest within 100 metres from the landing spot. For powered gliders, this rule applies only after the duration and landing task has started.
- f) If for powered gliders the duration and landing task has not been started and also the landing does not occur on the designated flying side of the security line and within 100 m from the intersection of that line with Base A or B.
- g) If in contrast with the declaration of the competitor the model aircraft carried more than the allowed number of cells as power source for the motor or the voltage exceeds 42 volts.
- h) The competitor is disqualified if the model aircraft is controlled by anyone other than the competitor.
- i) If the model aircraft touches either the competitor or his helper during landing manoeuvres, no landing points will be given.
- j) If an infringement of energy limitation rules occurs the result of that round is discarded.

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5.5.2.3 Organisation of the Contest

For transmitter and frequency control see C.16.2 in CIAM General Rules.

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

5.5.2.4 Organisation of Starts

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

5.5.2.5 Processing of Energy Limiters

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

5.5.2.6 Judging

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

Note: These General Rules and Contest Rules are applicable to the F5 Class: Multi Task Gliders (5.5.4.)

5.5.10 F5K – RC THERMAL DURATION GLIDERS FOR MULTIPLE TASK COMPETITION WITH ELECTRIC MOTOR AND ALTIMETER/MOTOR RUN TIMER (AMRT) – (PROVISIONAL)

5.5.10.1 F5K Introduction

The F5K event is a multi-task contest where the RC gliders must start and land in a specific “Pilot Area” and perform specific tasks.

Each launch is scored with points made up of:

- flight time in seconds (may be zero)
- altitude bonus or penalty points
- penalties (if applicable)

If the total of all points is negative, the score is zero (0). The score is the accumulation of the flight times, adjusted for penalties and bonuses for launch altitude and any other penalties (if applicable).

5.5.10.2 Task Overview:

Task A: 1, 2, 3, 4 minute flights in any order

- Four launches maximum within a 10 minute window
- 1, 2, 3 and 4 minutes target times, flown in any order within a 10 minute window
- Each flight counts even if the target time is not achieved
- Maximum total flight time used for scoring: 9.59 min.
- After 10 minutes the competitor will have 15 seconds to land. If he lands after these 15 seconds, the flight penalty is 100 points

Task B: Last flight, 5 out of 7 minutes

- Three launches maximum within a 7 minute window
 - All competitors of a group must launch their model gliders simultaneously
 - Only the last flight counts
 - Maximum measured flight time is 5 minutes. It is allowed to overfly the 5 minutes target time
 - There will be a launch penalty in case a competitor uses more than 1 launch
 - First launch : no launch penalty – zero penalty points
 - Second launch : launch penalty is 10 points
 - Third launch : additional launch penalty of 10 points (20 points total penalty)
- The number of flights is registered on the scorecard
- After 7 minutes the competitor will have 15 seconds to land. If he lands after these 15 seconds, the flight penalty is 100 points

Task C: All up, 4 minutes maximum (3x)

- Three (3) flights of 4 minutes maximum
- The maximum measured flight time is 4 minutes during each all up task
- After 4 minutes the competitor will have 15 seconds to land. If he lands after these 15 seconds, the flight penalty is 100 points
- After the 15 second landing window, the preparation time for the next All-up flight is 15 seconds

Task D: 3, 3, 4 minute flights in any order

- Three launches maximum within a 10 minute window
- 3, 3 and 4 minutes target times, flown in any order within a 10 minute window
- Each flight counts even if the target time is not achieved
- Maximum total flight time used for scoring: 9.59 min.

- After 10 minutes the competitor will have 15 seconds to land. If he lands after these 15 seconds, the flight penalty is 100 points

Task E: Poker

- Working time is 10 minutes
- Each competitor has a maximum of three launches to achieve up to three self-nominated target times within the working time
- The target and maximum allowable flight time is 9 minutes and 59 seconds
- The pilot can announce “**all in**” for his first launch. Only *one launch* is then allowed.
- **Before the first launch of any new target, each competitor announces a target time to the timekeeper.** The timekeeper records the nominated target time on the score card
- The pilot can any use remaining launches to try to reach his target time up until the end of working time
- If the target is reached (or exceeded) the timekeeper will mark the flight with “Y” (time achieved). The pilot is credited with the target time. **Any time over the target time is not counted**
- The launch bonus or penalty applies where the target time is achieved. If the pilot has unused launches, before launch he must announce the next target time (less, more or “end of working time”) to the timekeeper
- The timekeeper writes this against the next flight number on the scorecard and the pilot takes his new launch
- Only one attempt is allowed if the pilot announces “*end of working time*”
- **If the target time is not reached**, the timekeeper will mark the flight with “N” (not achieved). The launch bonus or penalty does not apply where the target time is not achieved. While the pilot has unused launches, the target time remains the same for the next launch. The timekeeper writes this target time against the next flight number and the pilot takes his new launch
- Flights with achieved target times are scored, adjusted for height, bonus or penalty, landing out of the pilot area and any flight penalties
- Launch penalty applies whenever a launch is made. **The penalty applies even if the flight fails to achieve the target time**
 - First launch : no launch penalty – zero penalty points
 - Second launch : launch penalty is 10 points
 - Third launch : additional launch penalty of 20 points (30 points total penalty)

The number of flights is registered on the scorecard
- After 10 minutes the competitor will have 15 seconds to land. If he lands after these 15 seconds, the flight penalty is 100 points

5.5.10.3 Nominal Launch Height (NLH)

One (1) day before the start of the competition, the Contest Director will announce the nominal launch height for the competition day. For this he will take the average windspeed between 11h and 17h.

Wind Forecast	Between [m/s]		Nominal Launch Height (NLH)	Motor time [sec] in AMRT
Light breeze	0	3	60	7 sec
Moderate wind	4	6	70	
Strong wind	over 6 m/s		80	

* The maximum wind speed for F5K contests is eight (8) m/sec

The motor stop is controlled by two parameters: the "Nominal launch height" or the "Motor time". Both parameters are set in an altitude device (AMRT, for example an Altis Nano from Aerobotec).

However, the pilot can stop the engine earlier or at a lower altitude to gain additional launch bonus points.

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5.5.10.4 Penalty and Bonus Rules During Launch:

Penalty or bonus points apply to launches that are over or under the NLH. The launch height is the highest altitude reached from launch until 10 seconds after the motor is stopped.

- For each metre under the NLH, 0.5 points per metre bonus applies.
- For each metre from 1 to 10 metre over the NLH, 1.0 points per metre penalty applies.
- For each metre from 11 metre over the NLH, 3.0 points per metre applies.

The bonus or penalty is always calculated with reference to the announced NLH.

5.5.10.5 Launch and Start Flight Time:

- a) The Contest Director will announce the direction of launch. All competitors must launch and land in that direction.
- b) The AMRT is activated before the start of the working time with the model glider still on the ground to set the zero meter offset correct.
- c) The flight time starts at launch, meaning the moment the model glider is released from the helper's or competitor's hands, not at the start of the acoustic signal. Starting the motor without launching the plane does not count as start flight time.
- d) A helper may launch the model glider for the competitor.

5.5.10.6 Land and End Flight Time:

- a) The flight timing ends when the model comes to rest on the ground or at the acoustic signal, even if the competitor is still flying.
- b) It is not permitted to catch a model glider for a landing, all flights must conclude with a ground landing. This includes the landings between flights as well as the final landing of the last flight of the task.
- c) At the end of each task the model glider must land within the Pilot Area boundary.
- d) Landing outside the Pilot Area but within the flying field results in a 10 points penalty per landing.
- e) Landing outside the flying field will result in a zero score for the round.
- f) If any part of the model glider is inside a boundary, it is considered to have landed inside the boundary.
- g) No points are deducted for flying over the maximum flight time or past the end of the working time.
- h) For all Tasks a 15 seconds landing window will begin at the end of the working time.

5.5.10.7 Launch Altitude – Altimeter / Motor Run Timer (AMRT):

- a) Each model must be fitted with an approved AMRT in accordance with the Technical Specification published in F5K Altimeter/Motor Run Timer Technical Documentation.
- b) The launch altitude is recorded in the AMRT. After the task, the launch altitudes for each flight are shown on the display. The pilot only has to record his launch altitude on the scorecard. The competition software converts the launch altitude into any bonuses or penalties.

Note: Refer to the Sporting Code volume EDIC – Electronic Devices in Competition, Section 1 "Technical Specifications & Guidance" for the documentation regarding specifications and guidance for the altimeter/motor run timer (AMRT).

5.5.10.8 Helper / Timekeepers:

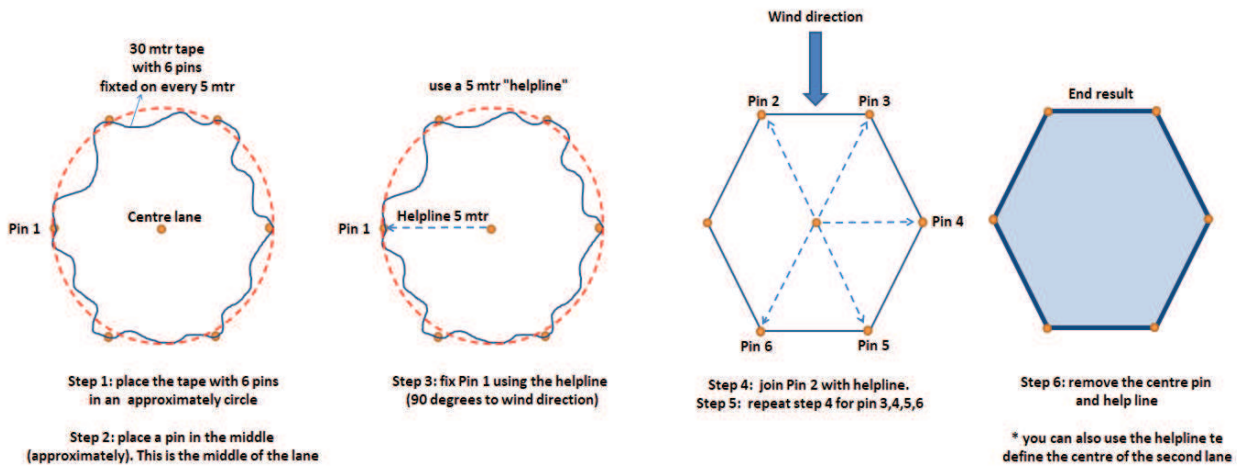
- a) The helper / timekeeper may coach the pilot during flight.
- b) The helper / timekeeper may help to retrieve the model glider, if it has landed outside the flying field or Pilot Area.

5.5.10.9 Definition of the Model Glider

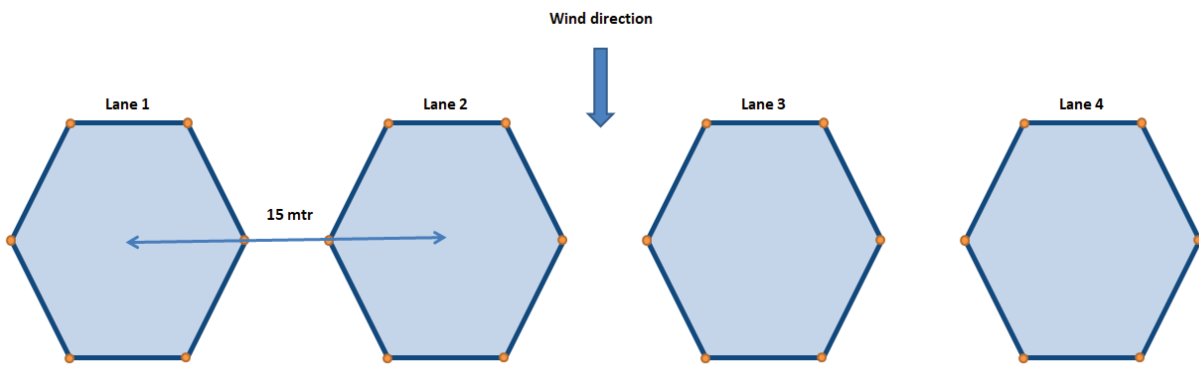
- a) Maximum wingspan - 1500 mm
- b) Minimum loading - 12 g/dm²
- c) Maximum flying weight - 600 gram
- d) Maximum 3 cell (3S) batteries are allowed
- e) The use of any automatic flight control or stabilization is not allowed

f) Any construction materials are permitted

5.5.10.10 Launch and Landing area (Pilots Area):



a) The Launch and Landing area is defined using a 30 metre tape pinned around the centre making a hexagon with an outer enclosing circle with a diameter of 10 metres, called the individual “Pilot Area”.



- b) The distance between two Pilot Areas is 15 metres from centre to centre, perpendicular to the wind direction.
- c) The boundary of the rectangular flying field will nowhere be closer than 15 meters from the centre of any Pilot Area.

5.5.10.11 Flight and Round Penalties:

5.5.10.11.1 Flight Penalty:

- a) Flying in a no fly zone will result in a 300 point penalty for the flight score.
- b) Overfly landing window will result in a 100 point penalty for the flight score.

5.5.10.11.2 Round Penalty:

- a) Hitting some else in another Pilot area will result is a zero (0) for the round.
- b) Motor restart during flight will result in a zero (0) for the round.
- c) Landing outside the flying field (as defined by the CD) will result in a zero (0) for the round.

In case of a mid-air collisions of two or more model gliders the competitors will not be granted reflights nor will penalties be applied.

5.5.10.12 Preparation time

For each round, the competitors receive at least 5 minutes of preparation time.

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5.5.10.13 Scoring

- a) The scores are normalized 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 points and truncated down to the whole points.
- b) The normalized scores within a group are calculated by using the following formula:
normalized score (points) = competitor's result (points) / best competitor's result (points) x 1000.
- c) The normalized scores are rounded to whole numbers (points).

5.5.10.14 Final Score

The final score is the sum of the normalized scores of all rounds. If eight (8) or more rounds are flown then the lowest score is dropped.

5.5.10.15 Resolution of a Tie

In the case of a tie, the best dropped score defines the ranking. If the tie still exists, a separate fly-off for the relevant competitors will be flown to achieve a ranking. In this case the contest director will define one task that will be flown for the tie-break fly-off.

5.5.10.16 Fly-off

The organiser may announce a fly-off prior to the beginning of the event. For World and Continental Championships, the fly-off is mandatory for seniors. The fly-off should consist of at least three (3) rounds with a maximum of six (6) rounds. If less than three (3) fly-off rounds can be completed, the result of the preliminary rounds determine the final ranking. 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 for the final score.

5.5.10.17 Team Classification

To establish the ranking for international team classification, the final individual scores of the three best members of the team are added together. Teams are ranked according to the highest numerical score to lowest. In the case of a national team tie, the team with the lower sum of the place numbers, given in order from the top, wins. If still equal, the best individual placing decides.

5.5.10.18 Contest Director and Jury:

The above rules are taken as a starting point. The CD makes the best decision to the best of his knowledge. The CD can install a jury. The total of the CD and the jury must be an unequal number. If an incident occurs, the CD and the jury can force a decision by voting.

ANNEX of F5K Thermal Duration Gliders for Multiple Task Competition Rule**Local rules, The Netherlands 2021:**

FAI rule	Local rule	Explanation
Minimum loading 12 g/dm ²	<12 g/dm ²	Planes with lower loading are also allowed (e-dlg planes)
Motor restart	100 point penalty	Only if the motor accidentally restarts during landing. The penalty applies to the flight.

ANNEX 5E

RULES FOR ELECTRIC FLIGHT (F5B, F5J) WORLD CUP EVENTS

5E.1. General Rules

- 5E.1.1. The General Rules for FAI World Cup with all the principle points concerning the responsibility and the organisation of World Cup are written in the FAI Sporting Code, Volume *CIAM General Rules C.2*.
- 5E.1.2. The Open International Contests that could be nominated by the F5 Subcommittee as a World Cup contest are described in the FAI Sporting Code, Volume *CIAM General Rules Section C.2.2*.

5E. 2. Procedure for Nomination of World Cup Contests

- 5E. 2.1 The Electric Flight World Cup will be organised in classes F5B (Multi-Task Gliders) and F5J (Thermal Duration Gliders) every year.
- 5E. 2.2. Requests for open international contests that are planned as World Cup contests must be checked by the Subcommittee Chairman before they will be published in the FAI International Sporting Calendar.
- 5E. 2.3. Contests that are not published in the Sporting Calendar could not be World Cup contests.
- 5E. 2.4. The World Cup Coordinator collects results of each competition, produces and distributes the World Cup positions.
- 5E. 2.5. World Cups will be awarded at the CIAM Plenary meeting to winners or delegates of their NACs.

5E. 3. Classification

- 5E. 3.1. In the case of twenty (20) or fewer World Cup contests during a year, a maximum of three (3) contests will be counted. In the case of more than twenty (20) World Cup contests during a year, a maximum of four (4) contests will be counted. If a competitor flies in more than three (or four contests), his best three (or four results) will be allocated.
- 5E. 3.2. Not more than one (1) contest could be counted in the same country. In case of counties with more than 2 time zones, two (2) contests could be counted.
- 5E. 3.3. Points awarded at a World Cup Contest
- NOTE: See the table on the following page.**
- 5E.3.4. Juniors and Women
- There will be a separate classification for juniors and women, provided that more than 10 such competitors are listed in the World Cup ranking. Medals and diplomas shall be awarded in accordance with CGR C.2.2.3.