14.11 **Section** 4C Volume F5 – Electric Powered Motor Gliders

Category F5 – Electric Powered Motor Gliders

a) 5.5.1. General Rules **Switzerland**

Modify 5.5.1.7 'Competitor and Helper', as shown below:

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.~~

Each competitor is permitted 1 (one) helper. In competitions where there is a team/nation ranking, a team manager (or another team member, if the pilot is also team manager) will be allowed as second helper. A person that launches the plane (launcher) and leaves base A after launch is not counted as a helper. The helper can be exchanged during the flight (for example different helpers for distance and duration task).

Reason: The flight line gets sometimes too crowded (up to 4 persons on the field plus official timekeeper) and the pilot gets rather distracted by irrelevant communications. With only one helper the pilot has to take more responsibility in the flight tactics. Less conflicts for starting orders (team protection). Team manager (as an additional helper) not needed in competitions without team ranking.

b) 5.5.2 Contest Rules **Bulgaria**

Delete sub-paragraph a) in 5.5.2.1 'Definition of an Official Flight', and replace it with the text shown below:

5.5.2.1 Definition of an Official Flight

~~a) During a two (2) minute starting period, the competitor is allowed an unrestricted number of attempts, hand launches or starts from the ground (except F5B, para 5.5.4.4 d). An attempt starts when the model aircraft is released by the competitor or his helper(s). After the first attempt, it is no longer allowed to take another model aircraft. The timekeeper will start the timing device at each attempt. After two minutes, no further launching or take off is allowed and the flight is being considered as official, the model aircraft being airborne or not. The pilot may repeat a second two-minute starting period only if:~~

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.

Reason: F5D was moved to F3 Pylon SC and present rule is not useful anymore.

Technical Secretary Comment: The final sentence: 'The pilot may repeat a second two-minute starting period only if:' relates to b) and c) sub-paragraphs which follow and should not be deleted.

Annex 5E – Rules for Electric Flight World Cup Events

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

F5 Subcommittee & Bulgaria

Amend paragraph 5E.2.1 as follows:

5E. 2.1 The Electric Flight World Cup will be organised in classes F5B (**Multi Task** Gliders) ~~F5D (Pylon Racing Aeroplanes)~~ and F5J (Thermal Duration Gliders) ~~during the years in which there are no World Championships.~~ **every year.**

Reason: F5 FAI World Cup events becomes more and more events and competitors (F5 Subcommittee). World Cups are very popular events (Bulgaria).

d) 5E.2.4 Procedure for Nomination of World Cup Contests F5 Subcommittee

Amend the paragraph 5E.2.4 as follows:

5E. 2.4 The ~~Subcommittee Chairman~~ **World Cup Coordinators** collects results of each competition, produces and distributes the World Cup positions.

Reason: World Cup Coordinators are necessary in booming classes.

Technical Secretary Comment: Please confirm if one or more World Cup Coordinators are intended. As the proposal stands, the grammar is incorrect.

e) 5E.3. Classification Bulgaria

Delete the paragraph 5E.3.1and replace it with the text shown below:

5E. 3.1 ~~During a year, a maximum of three (3) contests will be counted. If a competitor flies in more than three contests, his three (3) best results will be allocated.~~

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 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.

Reason: In last few years, F5J World cups are well over 25 and best 3 results are not fair enough to give good presentation for overall result.

Technical Secretary Comment: This proposal has been amended to correct the English grammar.

f) 5E.3. Classification Bulgaria

Add a sentence to paragraph 5E.3.2 as follows:

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.**

Reason: This will be fairer for pilots living in big countries.

g) 5E.3. Classification Bulgaria

Replace paragraph 5E.3.3 with a table of points.

5E. 3.3. Points awarded at a World Cup Contest

~~1st place = 100 points,~~
~~2nd place = 75 points~~
~~3rd place = 60 points~~
~~4th place = 50 points~~
~~5th place = 49 points~~
~~6th place = 48 points, etc.~~
~~54 points - R = World Cup points (R = individual ranking)~~

	Number of competitors (with valid results)					Number of competitors (with valid results)					Number of competitors (with valid results)		
Position	70 and more	40 - 69	39 and less		Position	70 and more	40 - 69	39 and less		Position	70 and more	40 - 69	39 and less
1.	100	90	80		31.	50	39	9		61.	20	9	
2.	90	80	70		32.	49	38	8		62.	19	8	
3.	85	75	65		33.	48	37	7		63.	18	7	
4.	80	70	60		34.	47	36	6		64.	17	6	
5.	77	67	55		35.	46	35	5		65.	16	5	
6.	75	65	50		36.	45	34	4		66.	15	4	
7.	74	63	45		37.	44	33	3		67.	14	3	
8.	73	62	42		38.	43	32	2		68.	13	2	
9.	72	61	39		39.	42	31	1		69.	12	1	
10.	71	60	36		40.	41	30			70.	11		
11.	70	59	34		41.	40	29			71.	10		
12.	69	58	32		42.	39	28			72.	9		
13.	68	57	30		43.	38	27			73.	8		
14.	67	56	28		44.	37	26			74.	7		

15.	66	55	26		45.	36	25			75.	6		
16.	65	54	24		46.	35	24			76.	5		
17.	64	53	23		47.	34	23			77.	4		
18.	63	52	22		48.	33	22			78.	3		
19.	62	51	21		49.	32	21			79.	2		
20.	61	50	20		50.	31	20			80.	1		
21.	60	49	19		51.	30	19			**81 - last**	1		
22.	59	48	18		52.	29	18						
23.	58	47	17		53.	28	17						
24.	57	46	16		54.	27	16						
25.	56	45	15		55.	26	15						
26.	55	44	14		56.	25	14						
27.	54	43	13		57.	24	13						
28.	53	42	12		58.	23	12						
29.	52	41	11		59.	22	11						
30.	51	40	10		60.	21	10						

Reason: This will be fairer for pilots competing in bigger contests. All participants will take World Cup points depending on ranking. Less advance for top ranking than the present rule.

h) 5E.3. Classification **Bulgaria**

Add a new paragraph 5E.3.4 as follows. Please consider the suggested amendment to the wording of this proposal below:

5E. 3.4. In case of more than 10 juniors or women participants in World Cup overall results. FAI medals must be awarded for Junior and Woman World cup ranking.

Technical Secretary Comment: Suggested modification to this proposal in line with the CGR Volume 2020 follows:

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.

Reason: As in some other FAI classes already done it will encourage junior and woman participation in World cup events.

F5B – RC Electric Powered Multi Task Gliders

i) 5.5.4.1 Definition **F5 Subcommittee**

Delete a section from sub-paragraphs b), and replace it with the text shown below:

b) Model Aircraft specifications:
Minimum weight without battery 1000 g

Minimum surface area 26.66 dm^2

Type of battery Any type of rechargeable batteries

Maximum number of equivalent cells in series. At any point in the flight, the maximum voltage of the flight battery must not exceed 42 volts.

Minimum weight of battery pack 400 g

~~The maximum amount of energy to be used in one flight is 1750 W*min. Anything over this will result in a deduction of 1 point per 3 W*min over 1750 W*min.~~

The maximum allowed amount of energy to be used in one flight is 1750 watt-minutes. If this limit is exceeded a penalty of 1 point for every 3 watt-minutes will be applied to the score. In the case where less than 1750 watt-minutes is used there will be a bonus of 10 points for every 3 watt-minute less than the 1750 limit applied to the score.

The amount of energy in one flight must be stored by a logger.

Reason: Makes the malus-bonus system more interesting.

j) 5.5.4.1 Definition Switzerland

Delete sections from sub-paragraphs b), g) and h) as follows. Rename h) as g):

b) Model Aircraft specifications:

Minimum weight without battery 1000 g

Minimum surface area 26.66 dm^2

Type of battery Any type of rechargeable batteries

Maximum number of equivalent cells in series. At any point in the flight, the maximum voltage of the flight battery must not exceed 42 volts.

Minimum weight of battery pack 400 g

~~The maximum amount of energy to be used in one flight is 1750 W*min. Anything over this will result in a deduction of 1 point per 3 W*min over 1750 W*min.~~

The amount of energy in one flight must be stored by a logger.

~~g) With the logger, 1 (one) point is deducted for every 3 (three) watt-min used over the limit.~~

~~h)~~ **g)** Starting order for World and Continental Championships: the starting order for the first round will be established by random draw. For the next rounds the starting order will follow the reversed ranking list. ~~Frequency will not follow frequency and t~~ **T**eam member will not follow team members.

Reason: Replaced by energy bonus/penalty. See item p).

k) 5.5.4.1 Definition Switzerland

Add a sentence to sub-paragraph h) or g) (if renumbered) as follows:

~~h)~~ **g)** Starting order for World and Continental Championships: the starting order for the first round will be established by random draw. For the next rounds the starting order will follow the reversed ranking list. ~~Frequency will not follow frequency and t~~ **T**eam member will not follow team members.

In competitions with more than 4 foreseen rounds, the starting order of the last round should be the reversed ranking. Team members that follow each other in the ranking should not be separated by more than 2 other competitors.

Reason: Starting order: in big international championships the last round will be more interesting for spectators as they will easily know when the "good ones" are flying.

l) 5.5.4.4 Launching **Switzerland**

Modify 5.5.4.4 with the following deletions and additions:

~~a) Before launching, the competitor has to show to his timekeeper how he controls his motor(s) on his transmitter (on, off, reversing);~~

~~b)~~ **a)**The launch will occur behind the safety ~~line~~ **plane** within 10 m from Base A.

~~c)~~ **b)** The model aircraft is released into flight directly from the hands of the competitor or his helper, without assistance. The model aircraft shall not be launched from a height greater than the flier's normal reach above the ground.

~~d)~~ **c)** After the aircraft is hand-launched and the timing device is started, no further launching is allowed. The flight is considered official, whether the model aircraft is airborne or not.

d) The competitor is given a 90 second preparation time.

Reasons:

a) Control receiver takes care of monitoring motor on/off. a) is obsolete, therefore deleted.

b) Safety line in not mentioned in course layout, correct: safety plane.

d) Stop the tactical waiting for "good" conditions… this will speed up the rounds.

m) 5.5.4.5 Distance Task **Switzerland**

Modify sub-paragraph a) as follows:

a) This task begins when the model aircraft is hand-launched and ends after 200 seconds. ~~Time of release is to be taken by one timekeeper.~~ **Time is started when motor on is detected by control receiver during the launch.**

Reason: Starting of the task time by electronic device is more precise than a button pressed by an official. If the model leaves the hand of the helper and the motor does not switch on when full throttle is given the time will start. No restart or switching to model B is allowed as mentioned in 5.5.4.4.

n) 5.5.4.5 Distance Task **Switzerland**

Add a sub-paragraph h) to paragraph 5.5.4.5 as follows:

a) – g) unchanged

h) After reaching 1500Wmin. the on-board limiter/logger/telemetry device must stop the motor and not allow it to start again until 200sec. after first motor start (start of duration task).

Reason: Limiting energy during distance task reduces the risk of excessive power consumption and gambling with weather conditions. Reduces also the motivation for a short “rocket climb” at the end of the distance task.

It adds new element for tactics: Power/energy saving during distance task can help to save energy for duration task if energy bonus is introduced (additional proposal, see item p)).

o) 5.5.4.6 Duration and Landing Task **F5 Subcommittee**

Delete a section from 5.5.4.6 d) as follows:

d) Duration time is cumulative. ~~and one point will be awarded for each full second the model aircraft is flying. 3 points will be deducted for each 1 second of motor running time.~~

Reason: The consideration of the energy consumption makes the deductions of motor running time unnecessary.

p) 5.5.4.6 Duration and Landing Task **Switzerland**

Delete sections of sub-paragraph c) and d) and replace with new sub-paragraph i) as follows:

a) This task must be completed within 600 seconds from the moment the audio signal is given.

b) The competitor has to decide how much and how often he will switch on the motor.

c) The duration task score-keeping device keeps track of ~~the motor run time as well as~~ the glide time. Duration task scoring ends when the model aircraft comes to rest after landing.

d) Duration time is cumulative and one point will be awarded for each full second the model aircraft is flying. ~~3 points will be deducted for each 1~~

~~second of motor running time.~~

e) – h) remain unchanged.

i) **The consumed energy for the whole flight will be read out after landing. An energy bonus/penalty will be awarded according to the following scheme:**

Total energy:

a) <1700Wmin: bonus of 1 point per 10Wmin

b) 1700 - 1800 Wmin: energy penalty: -1 point per 10Wmin over 1700Wmin, until 1800Wmin

c) >1800 Wmin: energy penalty: -1 point per 3 Wmin over 1800Wmin in addition to b)

Reason: Motor runtime will be replaced by energy management bonus/malus system. Within a range of 1700-1800Wmin flights as we see them now will be possible. Energy penalty is similar to motor runtime penalty. It will favour more efficient (slower) climbs and prevent single rocket-like climbs.

A bonus can encourage lower power setups that are not competitive right now. High risk (high energy) tactics will be “punished” stronger than now.

q) 5.5.4.6 Duration and Landing Task **Switzerland**

Modify sub-paragraph f) in 5.5.4.6 with deletions and additions as follows:

f) Additional points will be awarded for landing; when the model aircraft comes to rest in the 30 m circle, ~~10 points will be given while coming to rest in the 20 m circle gives 20 points, and when coming to rest in the 10 m circle 30 points will be given~~. **A maximum of 30 points is given when the nose of the plane comes to a rest within 2.5m of the centre (5m circle). 5 points less will be given for each additional 2.5m.** The distances are measured from the centre of the circle to the nose of the model aircraft. **If possible the 5m/10m/20m and 30m landing circles are marked on the ground. Distances will always be measured with a band attached to the centre point.**

g) No additional points will be awarded if the landing occurs more than 630 seconds after beginning of this task (as per 5.5.4.6.a)).

Reason: Refining the landing points will add a little more weight on the duration and landing task.

F5J – RC Electric Powered Thermal Duration Gliders

r) 5.5.11.10. Launching **Bulgaria**

Add text to sub-paragraph 5.5.11.10. e) as follows:

e) The launches must be straight forward **for at least three (3)**

seconds, with the motor running. Any other type of launch is not allowed. A penalty of 100 points will be applied for any breach of this rule.

Reason: **Safety** – This rule was successfully used as local rule at F5J ECh 2018 and F5J WCh 2019. Prevent dangerous manoeuvres close of over access corridor at launch.

Technical Secretary Note: Because this is an urgent safety proposal a request will be made for early implementation under CGR A.11.1. A Technical Notice will be placed on the CIAM website. Note that the rule A.11.1 b) states that: 'Any amended or new safety rule(s) shall appear in the Organiser Bulletins of the appropriate championship(s) being held that year.'

F5K (old class was deleted in 2019) – Thermal Duration Gliders For Multiple Task Competition With Electric Motor And Altimeter/Motor Run Timer (AMRT)

s) F5K **Netherlands**

*Insert a new set of rules for F5K. Refer to **Annex 7e** for the rules and **Annex 7f** for a description of the F5K class.*

Technical Secretary Comment: If accepted, the numbering for this class could be 5.5.10 to slot between F5G and F5J in the volume or 5.5.12 to follow F5J in the volume (before the World Cup Annex 5E). The numbering in the Annex has been left as proposed.

Reason: Many pilots fly F5J, but also like the dynamic tasks of F3K, they are unable to participate due to physical problems (injury). Launch height in the current F3K competition is very important. To be competitive, you must launch at least 60 meters plus. Some of the younger pilots launch the plane up to 80 meters or even more. That is why we decided to start a new competition that still revolves around thermal soaring, but where everyone can participate in this "F3K Multi Task Competition". We call it F5K.

5.7. CLASS F5K - THERMAL DURATION GLIDERS FOR MULTIPLE TASK COMPETITION WITH ELECTRIC MOTOR AND ALTIMETER/MOTOR RUN TIMER (AMRT)

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).

5.7.1. General

This event is a multi task contest where the RC gliders must start and land in a specific Launch- and Landing area and perform specific tasks.

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.
Official timekeepers may position themselves anywhere inside or outside the start and landing field in order to observe the flight. They must at all times ensure that they do not impede any competitor or model.

5.7.1.2. Helper

i. Each competitor may have one helper for launching the model glider and/or for retrieving the model glider, if it has landed outside the flying field or landings area. The helper is the only person allowed to help the competitor during his working time. 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, then the score for the round will be 0 points.

5.7.2. Definition of the model glider

5.7.2.1. Specifications

- Maximum wingspan 1500 mm
- Minimum loading 12 g/dm2
- Maximum flying weight 600 gram
- LIPO batteries with nominal cell voltage of 3.7 V only
- Maximum voltage at full charge 3*4.2 = 12.6 V (3s)
- Radius of the nose must be a minimum of 5 mm in all orientations.
- Any number of control functions is permitted.
- All ballast must be carried internally and fastened securely within the airframe.
- Each model must be fitted with an approved AMRT in accordance with the Technical Specification published in F5K Altimeter/Motor Run Timer Technical Documentation.
- Installation of the AMRT in a competitor's model shall be in accordance with the requirements as detailed in the Technical Guidance Documentation.
- Proper operation of the AMRT including any associated display and its compatibility with other control equipment installed in the model is the responsibility of the individual competitor.
- Each competitor is allowed to use three model gliders during a round. It is permissible to change parts between these three model gliders. The competitor may change his model gliders at any time as long as they conform to the specifications. The organizer has to mark the model gliders and all interchangeable parts of each of the three model gliders before the start of the competition. All spare model gliders must stay outside the flying field and only one model is permissible on the flying field to score a valid flight time. The previous model must be removed from the flying field before a replacement model may be launched.
- Only in order to ensure safe flying, receiver voltage and/or flight battery voltage and/or remote control link quality measurements may be used to asses the condition of the model glider.
- Use during the flight of any other measurements on the model glider is not allowed.
- The use of any automatic flight control or stabilisation is not allowed.
- Any construction materials are permitted

5.7.2.2. Losing a part of the model glider

If the model glider loses any part during the flight, then the flight shall be scored zero. If the model glider loses a part as a result of a mid-air collision or during the landing; that means after the first contact of the model glider with the ground, any object or person, then the flight is valid.

5.7.2.3. Radio frequencies

Only 2,4 GHz (Spread Spectrum Technology Transmitters) are permitted.

5.7.2.4. Ballast

Para B3.1 of Section 4b (builder of the model glider) is not applicable to class F5K. 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 Launch and Landing area:

- The Launch- and Landing area's are defined using a 30 meter tape pinned around the center making a hexagon with an outer enclosing circle with a diameter of 10 meters, called the individual "Pilot Area".
- The distance between two Pilot Areas is 15 meter from center to center perpendicular to the wind direction, and 50 meters from center to center in the wind direction
- The boundary of the rectangular flying field will nowhere be closer than 15 meters from the center of any Pilot Area.

ii.

5.7.3.3 Launch rules:

- The Contest Director will announce the direction of launch. All competitors must launch and land in that direction. If the competitor hits a person other than their self or their timer, the competitor will score zero for the task.
- Any launch starts with the model glider being on the ground in the "Pilot Area" during preparation time.
- 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
- The maximum launch altitude and maximum motor run time is according the "Nominal Launch Height" specifications. See Nominal Launch Height table in 5.7.11.1.
- The motor must not be run before the start signal is given. A penalty of 100 points will be applied for any breach of this rule.
- The person who launches the model glider must stand still while throwing the model glider. The motor needs to be running before releasing the model glider.
- A helper may launch the model glider for the competitor
- The Nominal Launch Height settings are set in the AMRT. The AMRT display shows the NLH F5K settings. Any deviation in motor time and or launch height (NLH) setting will result in a zero score for the flight
- Motor restarts within a flight after the initial climb are prohibited, and will result in a zero score
- Any launch after the maximum number of flights is already achieved, results in a penalty of 100 points.

5.7.3.4 Landing rules:

- It is <u>not permitted</u> 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. If a competitor or his helper touches the model glider, the flight is assumed to continue until the model glider has landed on the ground and has come to a complete stop, and a penalty of 100 points is given.
- Each competitor-helper team will have one specific Pilot Area that he or she can move around in, but not go out of <u>during the flight, unless the line of site cannot be maintained due to obstructions or other competitors. Not following this rule will result in a penalty of 100 points.</u>

- During the landing it is permitted for the competitor to stand outside the Pilot Area. The competitors need to go back in the Pilot Area in case the model glider catches a thermal during the landing and the model glider thermals her way up.
- At the end of each task the model glider must land within the Pilot Area boundary.
- Landing outside the Pilot Area but within the flying field results in a 10 points penalty per landing.
- Landing outside the flying field will result in a zero score.
- If any part of the model glider is inside a boundary, it is considered to have landed inside the boundary.
- If the model glider has landed outside the Pilot Area assigned to the competitor, and needs to be picked up, the competitor or helper may only leave the Pilot Area after the aircraft has landed. Not doing so will result in a penalty of 100 points.
- All penalties are cumulative.

5.7.3.5. Retrieving of model glider

- While retrieving the model, it is not permissible to fly it back to the Pilot Area. It will be considered as a new launch, outside of the Pilot Area, and will result in a zero score.
  The competitor must retrieve the model glider in safe way, without obstructing other competitors that are starting or landing. A penalty of 100 points is given if the Contest Director or official timekeeper is of the opinion these rules are not respected
  If the model glider has landed outside the flying field, and needs to be picked up, the competitor or helper may only leave the landing area after the aircraft has landed. Not doing so will result in a penalty of 100 points

5.7.4. Safety

5.7.4.1.
Contact with a person
In order to guarantee the highest level of safety, any contact between a model glider being launched or a flying model glider and any other person (except the competitor) either in or outside the start and landing field has to be avoided. This includes contact that happens while the glider is flying or while the glider is being handled by the competitor between landing and launching.
If such contact happens on the start and landing field during the working time or landing window, the competitor will receive a penalty according to paragraph 5.7.4.3.

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

5.7.4.3.
Safety area
The organiser may define safety areas outside of the start and landing field, for protecting people and objects. The organiser must ensure that the safety areas are well defined, clearly marked and permanently monitored.

Contact of the model glider:
i) with an object, including the ground, within the defined safety area will be penalised by deduction of 100 points from the competitor's final score.
ii) while airborne with a person within the defined safety area will be penalised by deduction of 300 points from the competitor's final score.
iii) while airborne with a person anywhere outside the defined safety area will be penalised by deduction of 100 points from the competitor's final score.
Each flight attempt may only incur a single penalty. If multiple safety infractions happened during the same flight attempt only the highest penalty will be applied. For example, if during the same flight attempt a competitor's model contacted a person and an object inside the safety area, the 300 points penalty will be applied.
In all of the above cases, if the infractions occurred as a result of a mid-air collision, no penalties will be levied, according to 5.7.4.2.
Penalties shall be listed on the score sheet of the round in which the infringement(s) occurred.

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 notification 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 not following this way the flight shall be scored zero.
For major events the declaration of forbidden airspace should only be used as a last resort if a field cannot be found that will allow the contest site to be set out free of such constraints.

5.7.5. Weather conditions / Interruptions
The maximum wind speed for F5K contests is eight (8) m/sec. The start of the contest must be delayed or the contest has to be interrupted by the contest director if the wind speed exceeds eight (8) m/sec measured three (3) times for at least twenty (20) sec in a time interval of five (5) minutes at two (2) meters above the ground at the start and landing field. In the case of rain, the contest director can interrupt the contest. When the rain stops, the contest starts again with the group that was flying, which receives a re-flight.

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 the model glider comes to a rest anywhere.
5.7.6.2. Validity of the landing
A landing is valid if the model glider landed inside the flying field, and before the end of the landing window.

5.7.7. Flight time
The flight time is measured from the moment the model glider leaves the hands of the competitor until a landing of the model glider as defined in 5.7.6. or the working time expires.
The flight time is measured in full seconds. Rounding up is not allowed.
The flight time is official if the launch happened from inside the Pilot Area assigned to the competitor 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 model glider 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. The sum of all flight times per task must not be greater than the working time minus the number of scored flights in seconds.

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 and round scores
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.

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, as well as the landing window

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. For all Tasks a 15 seconds landing window will begin at the end of the working time. Any model gliders still airborne must land before the end of the landing window. If a model glider lands later, then that flight will score zero.

For Task C (All up), the landing window for each flight attempt will begin at 0:03 and end at 4:33 after the start of the acoustic signal indicating the 3 second launch window. If a model glider lands after the end of the landing window, then that flight will score zero. The organiser should announce the last ten seconds of the landing window by counting down.

5.7.9.4. Preparation time
For each round, the competitors receive at least 5 minutes of preparation time. At the beginning of the preparation time, the organisers must call the names and/or starting numbers of the competitors flying in the next group.

5.7.9.5. Re-Flights
The competitor is entitled to a new working time if his attempt could not be performed correctly due to a fault by the organisers.
The new working time is to be granted to the competitor according to the following order of priorities:
a) in a following group;
b) if this is not achievable, then in a new group of a minimum of 4 re-flyers. The new group of re-flyers can be completed by other competitors selected by random draw. If the team membership of the drawn competitor does not fit or the competitor will not fly, the
draw is repeated;
c) if this also is not achievable, then with his original group at the end of the ongoing round.
In b) and c) above the better of the two results of the original flight and the re-flight will be the official score, except for the competitors (re-flyers) 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 a fault of the organisers.

5.7.10. Scoring
A minimum of five (5) rounds each with different tasks must be flown for the competition to be valid.

The scores 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 and truncated down to the whole seconds according to 5.7.7.
Launch height bonus or penalties are expressed in seconds, as is the penalty for extra starts or landing outside the Pilot Area, and part of the task result.
The normalised scores within a group are calculated by using the following formula: normalised score (points) = competitor’s result (seconds) / best competitor’s result (seconds) x 1000.
The normalised scores are rounded to whole numbers (points).

5.7.10.1. Final score
The final score is the sum of the normalised scores of all rounds minus penalty points.
If five (5) or more rounds are flown then the lowest score is dropped.
The penalty 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.
The penalty points are retained even if the score of the round in which the offence occurred is dropped.

5.7.10.2. 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.

5.7.10.3. 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 then 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 flyoff. A separate junior fly-off is not mandatory.
If a fly-off is flown, the points (including penalties) of the previous rounds are not considered for the

final score

5.7.10.4. 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.

5.7.11. Definitions of tasks
Detailed specifications including the tasks and Nominal Launch Height (NLH) 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.

5.7.12. Nominal Launch Height (NLH)
The motor stop is arranged by two parameters: the "Nominal Launch Height" and the "Motor time". Both parameters can be set in an altitude device such as the AMRT (for instance an Altis Nano from Aerobtec). Both height and motor time are announced by the Contest Director.

Settings AMRT for Nominal Launch Height (NLH) and Motor time:

Wind Forecast	Between [m/s]		Nominal Launch Height (NLH) in AMRT	Motor time [sec] in AMRT
Light breeze	0	3	60	7
Moderate wind	4	6	70	8
Strong wind	7	9	80	9

The wind forecast site from Windfinder will be used to define the expected average wind speed during the contest day. All details can be found on their website https://www.windfinder.com

One (1) day before the beginning of the contest the Contest Director will announce the nominal launch height for the contest day. For this he will take the average windspeed between 11h and 17h. Some examples:

Windspeed 11h: 4 m/s
Windspeed 14h: 2 m/s
Windspeed 17h: 2 m/s
Average speed: 2,7 m/s

Nominal launch height: 60 mtr.

Windspeed 11h: 7 m/s
Windspeed 14h: 8 m/s
Windspeed 17h: 6 m/s
Average speed: 7 m/s

Nominal launch height: 80 mtr.

The Contest Director may decide to change the nominal launch height in the event that the actual wind speed is very different compared to the expected wind speed.

Penalty and bonus rules during launch:

As described before the Nominal Launch Height and motor time settings are saved in the AMRT before the contest. During launch a penalty or bonus rule applies. No penalty applies in the event the zoom after motor stop is equal or less than 2 meter related to the Nominal Launch Height.

In the event the zoom is more than 2 meter and less than 6 meter a penalty of 1 second per meter will be applied. If the zoom is more than 6 meter a penalty of 2 seconds per meter will be applied. All counted from the nominal launch height.

In the event the height is less than the Nominal Launch Height a launch bonus is applied. In the event the launch height is less than 2 meter and less than 6 meter a bonus of 1 second per meter will be

applied. If the launch is less than 6 meter a bonus of 2 seconds per meter will be applied. All counted from the nominal launch height. You can find all details below.

Penalty examples with different launch heights:

The Contest Director announced a nominal launch height of 60 meter, PENALTY rules:
No launch penalty for heights : 61 (0 seconds) and 62 (0 seconds)
1 second per meter penalty : 63 (-3 seconds), 64 (-4 seconds), 65 (-5 seconds), 66 (-6 seconds)
2 seconds per meter penalty : 67 (-14 seconds), 68 (-16 seconds), 69 (-18 seconds), etc.

The Contest Director announced a nominal launch height of 60 meter, BONUS rules:

No bonus for heights : 59 (0 seconds) and 58 (0 seconds)
1 second per meter bonus : 57 (3 seconds), 56 (4 seconds), 55 (5 seconds), 54 (6 seconds)
2 seconds per meter bonus : 53 (14 seconds), 52 (16 seconds), 51 (18 seconds), etc.
For the NLH 70 and 80 meter the same penalty range / bonus is applicable

The launch altitude is recorded and captured in the AMRT After the task, the different launch altitudes are shown on the display. The pilot only has to put his launch scores on the score card. The Competition software counts the penalty or bonus seconds in the task result.

Be aware the launch height is measured during the 10 seconds after you have switched off the motor. The highest altitude is captured. In this example 66 meter. This altitude was at the end of the zoom phase. The launch penalty for this example is -6 seconds.

5.7.13 Tasks

5.7.13.1 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
- Time flown will be entered into the scoring, with a maximum of the target time per flight
- Before starting the next flight it is not necessary to achieve the current target time
- Minimum time between landing and start is considered 5 seconds
  Maximum total flight time used for scoring: 9.45 min

Example Task A, NLH = 60 meter

First Flight	:	
	Start height 55 meter	: 5 seconds launch penalty
	Time	: 59 seconds
	General penalty	: no penalty
	Subtotal first flight	: 59 + 5 = 64 seconds
Second flight	:	
	Start height 70 meter	: 20 seconds launch penalty
	Time	: 2 minutes and 45 seconds = 165 seconds
	General penalty	: no penalty
	Subtotal second flight	: 165 - 20 = 145 seconds
Third flight	:	
	Start height 50 meter	: 20 seconds launch bonus
	Time	: 1 minutes and 50 seconds = 110 seconds
	General penalty	: Landing out of Pilot Area = 10 points penalty
	Subtotal third flight	: 110 + 20 – 10 = 120 seconds
Fourth flight	:	
	Start height 65 meter	: 5 seconds launch penalty
	Time	: 3 minutes and 30 seconds = 210 seconds
	General penalty	: no penalty
	Subtotal fourth flight	: 210 - 5 = 205 seconds

End result Task A: 64 + 145 + 120 + 205 = 534 seconds. Maximum scored in this group 560 seconds, so after normalising the score for this competitor in this task is 534/560*1000 = 954 points.

5.7.13.2 Task B: Last Flight

- Last flight counts
- Max flight is limited to 5 minutes
- All competitors of a group must launch their model gliders simultaneously, within 3 seconds of the acoustic signal. Launching a model glider before or more than 3 seconds after the start of the acoustic signal will result in a zero score for the flight
- Three Launches maximum within a 7 minute window
- There will be a start penalty in case a competitor needs more than 1 start

iii. First start : zero points (no penalty)
iv. Second start : start penalty is 10 seconds
v. Third start : start penalty is 20 seconds

Example Task B, NLH = 60 mtr

First Flight : Start height 41 meter : 38 seconds launch bonus
Start Penalty : 0 seconds
Time : 1 minutes and 5 seconds = 65 seconds
General penalty : no penalty
Subtotal first flight : 65 + 0 + 38 = 103 seconds

Second flight : Start height 58 meter : 0,seconds launch penalty
Start Penalty : 10 seconds
Time : 3 minutes and 30 seconds = 210 seconds
General penalty : Landing out of Pilot Area = 10 seconds penalty
Subtotal second flight : 210 – 0 – 10 – 10 = 190 seconds

Third flight : Start height 60 meter: 0 seconds launch penalty
Start Penalty : 20 seconds
Time : 2 minutes and 25 seconds = 145 seconds
General penalty : Landing out of Pilot Area = 10 seconds penalty
Subtotal third flight : 145 – 20 – 10 = 115 seconds

End result Task B, Last Flight counts: 115 seconds. If the maximum result in this group is 310 seconds, after normalising, the score for this competitor in this task is 115/310*1000 = 371 points.

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

- 3 flights will be flown in total in this task.
- No working time is necessary.
- All competitors of a group must launch their model gliders simultaneously, within 3 seconds of the acoustic signal. The maximum measured flight time is 240 seconds.
- Launching a model glider before or more than 3 seconds after the start of the acoustic signal will result in a zero score for the flight.
- After 4 minutes the competitor will have 15 seconds to land. Landing after these 15 seconds will render the flight invalid.
- The flight time starts at launch, meaning the moment the model glider is released from the helper or competitors hands, not at the start of the acoustic signal.
- The flight time stops at landing or at the acoustic signal, even if the competitor is still flying.
- The preparation time for the next task after the 15 second landing window is 15 seconds.
- The score is the accumulation of the flight times of the three flights, adjusted for penalties and bonuses for launch height and landing in the Pilot Area.
- A helper may launch the model glider for the competitor

vi.

Example Task C, NLH = 60 mtr

First Flight :

Start height 55 meter : 5 seconds launch bonus
Time : 2 minutes and 50 seconds = 170 seconds
General penalty : no penalty
Subtotal first flight : 170 + 5 = 175 seconds

Second flight :
Start height 50 meter : 20 seconds launch bonus
Time : 4 minutes and 0 seconds = 240 seconds
General penalty : Landing out of Pilot Area = 10 seconds penalty
Subtotal second flight : 240 + 20 – 10 = 250 seconds

Third flight :
Start height 65 meter : 5 seconds launch penalty
Time : 3 minutes and 45 seconds = 225 seconds
General penalty : Landing out of Pilot Area = 10 seconds penalty
Subtotal third flight : 225 - 5 - 10 = 210 seconds

End result Task C: 175 + 250 + 210 = 635 seconds. If the maximum result in this group is 660 seconds, after normalising, the score for this competitor in this task is 635/660*1000 = 962 points.

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

- Three Launches maximum within a 10 minute window
- 3, 3 and 4 minutes maximum flights in any order within four launches within a 10 minute window
- Time flown will be entered into the scoring, with a maximum of the target time per flight
- Before starting the next flight it is not necessary to achieve the current target time
- Minimum time between landing and start is considered 5 seconds
  Maximum total flight time used for scoring: 9.45 min

Example Task D, NLH = 60 meter

First Flight :
Start height 56 meter : 4 seconds launch bonus
Time : 2 minutes and 25 seconds = 145 seconds
General penalty : no penalty
Subtotal first flight : 145 + 4 = 149 seconds

Second flight :
Start height 70 meter : 20 seconds launch penalty
Time : 2 minutes and 40 seconds = 160 seconds
General penalty : Landing out of Pilot Area = 10 seconds penalty
Subtotal second flight : 160 – 20 - 10 = 130 seconds

Third flight :
Start height 63 meter : 3 seconds launch penalty
Time : 3 minutes and 25 seconds = 205 seconds
General penalty : Landing out of Pilot Area = 10 seconds penalty
Subtotal third flight : 205 - 3 – 10 = 192 seconds

End result Task D: 149 + 130 + 192 = 471 seconds. If the maximum result in this group is 560 seconds, after normalising, the score for this competitor in this task is 471/560*1000 = 841 points.

5.7.13.5 Task E: Poker

- Each competitor has a maximum of three of flights to achieve or exceed up to three target times.
- Working time is 10 minutes.
- All competitors of a group must launch their model gliders simultaneously, within 3 seconds of the acoustic signal. Launching a model glider before or more than 3

seconds after the start of the acoustic signal will result in a zero score for the flight

- Before the first launch of a new target, each competitor announces a target time to the official timekeeper.
- He can then launch to try and reach or exceed this target time, if his total number of flights up till then is lower than three.
- 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 cannot be changed.
- The competitor may try to reach the announced target flight time until the end of the working time, or he has reached his total of three flights within the task.
- For the competitors last flight he may announce “end of working time”. For this specific call, the competitor has ONLY one attempt.
- The target time must be announced clearly in the official contest language or alternatively shown to the timekeeper in written numbers (e g 2:38) by the competitor’s helper immediately after the launch.
- If the competitor calls “end of working time” the competitor’s helper writes the letter “W”.
- The competitor can call “all in” for his first flight, target and maximum result is 9.59 minute.
- The target(s) (1 - 3) with achieved target times are scored, adjusted for penalties and bonuses for launch height and landing in the pilot area.
- The maximum flight time is 9.50 minutes, in case the competitor launches 3 times There will be a start penalty in case a competitor needs more than 1 start

vii. First start : zero seconds (no penalty)
viii. Second start : start penalty is 10 seconds
ix. Third start : start penalty is 20 seconds

Example Task E, NLH = 60 meter

First Flight	:
Start height 41 meter	: 38 seconds launch bonus
Start Penalty	: 0 seconds
Time	: 1 minutes and 5 seconds = 65 seconds
General penalty	: no penalty
Subtotal first flight	: 65 + 0 + 38 = 103 seconds [assume: target time reached]

Second flight	:
Start height 65 meter	: 5 seconds launch penalty
Start Penalty	: 10 seconds
Time	: 3 minutes and 30 seconds = 210 seconds
General penalty	: Landing out of Pilot Area = 10 seconds penalty
Subtotal second flight	: 210 – 5 – 10 – 10 = 185 seconds [assume: target time reached]

Third flight	:
Start height 58 meter	: 0 seconds launch penalty
Start Penalty	: 20 seconds
Time	: 3 minutes and 45 seconds = 225 seconds
General penalty	: Landing out of Pilot Area = 10 points penalty
Subtotal third flight	: 225 – 20 – 10 = 195 seconds [assume: target time reached]

End result Task E: 103 + 185 + 195 = 483 seconds. If the maximum result in this group is 560 seconds, after normalising, the score for this competitor in this task is 483/560*1000 = 863 points.