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

5.5.10.1   F5K introduction

The F5K event is a multitask contest where the RC gliders must start and land in a
specific "Pilot Area" and perform different flight tasks. The motor stop is controlled by the
Altimeter/Motor run timer device (AMRT: 60 meters, 7 seconds) or by the pilot. A
reference launch altitude is defined before the contest and depends on the wind strength.
Goal is to get fair launch altitude for all pilots. However, pilots can gain additional launch
bonus points for launching lower than the reference altitude. The reference altitude is
called the "Nominal Launch Height" and is 60 or 70 meters.

Each launch is scored with points made up of:
- flight time in seconds (may be zero)
- launch altitude bonus or penalty points
- other penalties (if applicable)

One point will be awarded for each full second of flight within the Working Time. 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

General: test flying is only allowed before the contest and during the break.

Task A: 1, 2, 3, 4 minute flights in any order
- All pilots must launch simultaneously at the start of the signal
- Four launches maximum
- 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 pilot will have 15 seconds to land

Task B: Last Flight 5 out of 7 minutes
- All pilots must launch simultaneously at the start of the signal
- Three launches maximum
- Working time is 7 minutes
- Only the last flight counts
- The maximum flight time is limited to 5 minutes. Any subsequent launch of the model
  glider annuls the previous time. It is allowed to overfly the 5 minutes target time
- There will be a launch penalty in case a pilot 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.

Task C: All up, 4 minutes maximum (3x)
- All pilots must launch simultaneously at the start of the signal
- Working time is 4:01 minutes, Maximum flying time is 4:00 minutes
- Three flights of 4 minutes maximum. The maximum measured flight time is 4 minutes
  during each All-Up task.
- After 4:01 minutes the competitor will have 15 seconds to land.
- 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
- All pilots must launch simultaneously at the start of the signal
- 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.

Task E: Poker
- All pilots must launch simultaneously at the start of the signal
- 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 altitude bonus or penalty only applies only 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 launch 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

5.5.10.3   Nominal Launch Height (NLH)
The Nominal Launch Height is the reference launch altitude (NLH) in which there are no bonus or penalties applied and is set in a competitions software program (for example Gliderscore). The AMRT setting is fixed for all wind conditions: 60 mtr altitude and 7 seconds motor time. Pilots can gain bonus points and launch under the NLH or get launch penalty points by launching over the NLH. The NLH is related to the strength of the wind. For light breeze wind the NLH is 60 meters. For moderate wind speed the NLH is 70 meters. One 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 wind strength between 11h and 17h. The Nominal Launch Height will be announced during the briefing before the contest.

Wind Forecast	Between (m/s)		Nominal Launch Height (NLH - meter)
Light breeze	0	5	60
Moderate wind	6	8	70

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

5.5.10.4   Launch points related to the NLH
The launch altitude is the highest altitude reached from launch until 10 seconds after the motor is stopped. There will be no bonus points for flights shorter than 30 seconds, penalty points still apply. Penalty or bonus points only apply to valid flights.

Bonus and penalty table:
For each meter *under* the NLH: 0.5 points per meter bonus applies.
For each meter from 1 to 10 meter *over* the NLH: 1.0 points per meter penalty applies.
For each meter from 11 meter *over* the NLH: 3.0 points per meter applies.

The bonus or penalty points are always calculated with reference to the announced NLH. Launch altitudes are shown on the AMRT (fe Altis nano - Gliderkeeper). The NLH bonus and penalty table are set in the competition software (fe Gliderscore), which translates the launch altitude to bonus or penalties points.

5.5.10.5   Launch and Start flight time:
a) The Contest Director will announce the preferred direction of launch. Pilots always need to launch against the wind direction, even if this is not the preferred announced launch direction. However, it is not allowed to launch over the pilot area of other pilots. Therefor launches are in the preferred launch direction or 180 degrees other than the preferred launch 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.
The AMRT records and displays the maximum altitude attained (Launch Height), above a ground level reference between the instant of motor start and 10 seconds after the motor is stopped. It restricts the operation of the motor by the competitor to a single continuous run not exceeding 7 seconds. It resets the start height displayed to "---" if the motor is restarted at any time during the flight. Each model must be fitted with an approved AMRT in accordance with the Technical Specification published in F5J/F5K Altimeter/Motor Run Timer Technical Documentation
c) The flight time starts at launch, meaning the moment the model glider is released with motor running from the helper or competitor's hands, not at the start of the acoustic signal. The motor must not be run before the start signal is given
d) A helper may launch the model glider for the competitor

5.5.10.6   Land and End flight time:
a) The attempt must be timed from moment of release from the hand of the competitor or his helper to either:
b) the model aircraft first touches the ground
c) or the model aircraft first touches any object in contact with the ground. The flight time stops when the model touches an object outside the Pilot Area. The location where the model lands determines whether the plane has landed inside or outside the Pilot Area (in case of touch and land)
d) or completion of the Group's Working Time
e) 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
f) Only whole seconds count. Tenths of seconds are not rounded
g) At the end of each task the model glider must land within the Pilot Area boundary
h) Landing outside the Pilot Area but within the flying field results in a 10 points penalty per landing

i) No points are deducted for flying over the maximum flight time or past the end of the working time
j) Overfly the landing window will result in a 100 point penalty for the flight score
k) If any part of the model glider is inside a boundary, it is considered to have landed inside the boundary.
l) For all tasks a 15 second 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 F5J/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 retrieving the model glider, if it has landed outside the flying field or Pilot area.

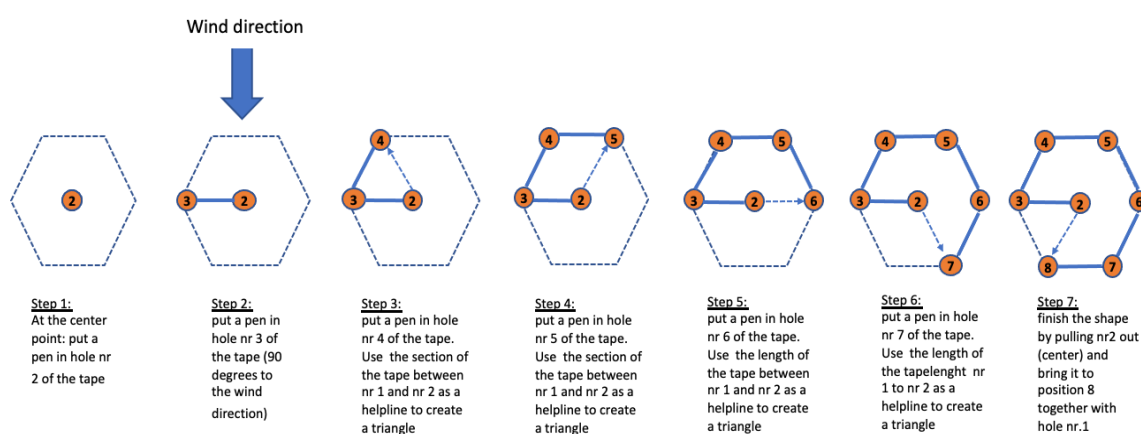**5.5.10.9   Definition of the model glider**
a) Maximum wingspan 1500 mm
b) Minimum loading 12 g/dm2
c) Maximum flying weight 600 gram
d) Maximum 3 cell (3S) batteries are allowed
e) The use of any automatic flight control or stabilization is not allowed
f) Any construction materials are permitted

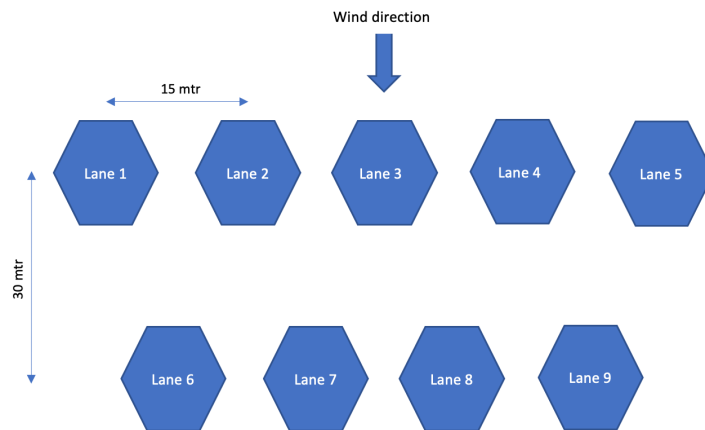**5.5.10.10   Number of Model Aircraft**
The competitor may use three model aircraft. The competitor may combine the parts of the model aircraft during the contest, provided the resulting model aircraft conforms to the rules and that the parts have been checked before the start of the contest.

5.5.10.11   Launch and Landing area (Pilots Area)

Find more help about how to build the pilot area on YouTube:
https://youtu.be/FGNql6JcFvM

Wind direction

Step 1:
At the center point: put a pen in hole nr 2 of the tape

Step 2:
put a pen in hole nr 3 of the tape (90 degrees to the wind direction)

Step 3:
put a pen in hole nr 4 of the tape. Use the section of the tape between nr 1 and nr 2 as a helpline to create a triangle

Step 4:
put a pen in hole nr 5 of the tape. Use the section of the tape between nr 1 and nr 2 as a helpline to create a triangle

Step 5:
put a pen in hole nr 6 of the tape. Use the length of the tape between nr 1 and nr 2 as a helpline to create a triangle

Step 6:
put a pen in hole nr 7 of the tape. Use the length of the tapelenght nr 1 to nr 2 as a helpline to create a triangle

Step 7:
finish the shape by pulling nr2 out (center) and bring it to position 8 together with hole nr.1
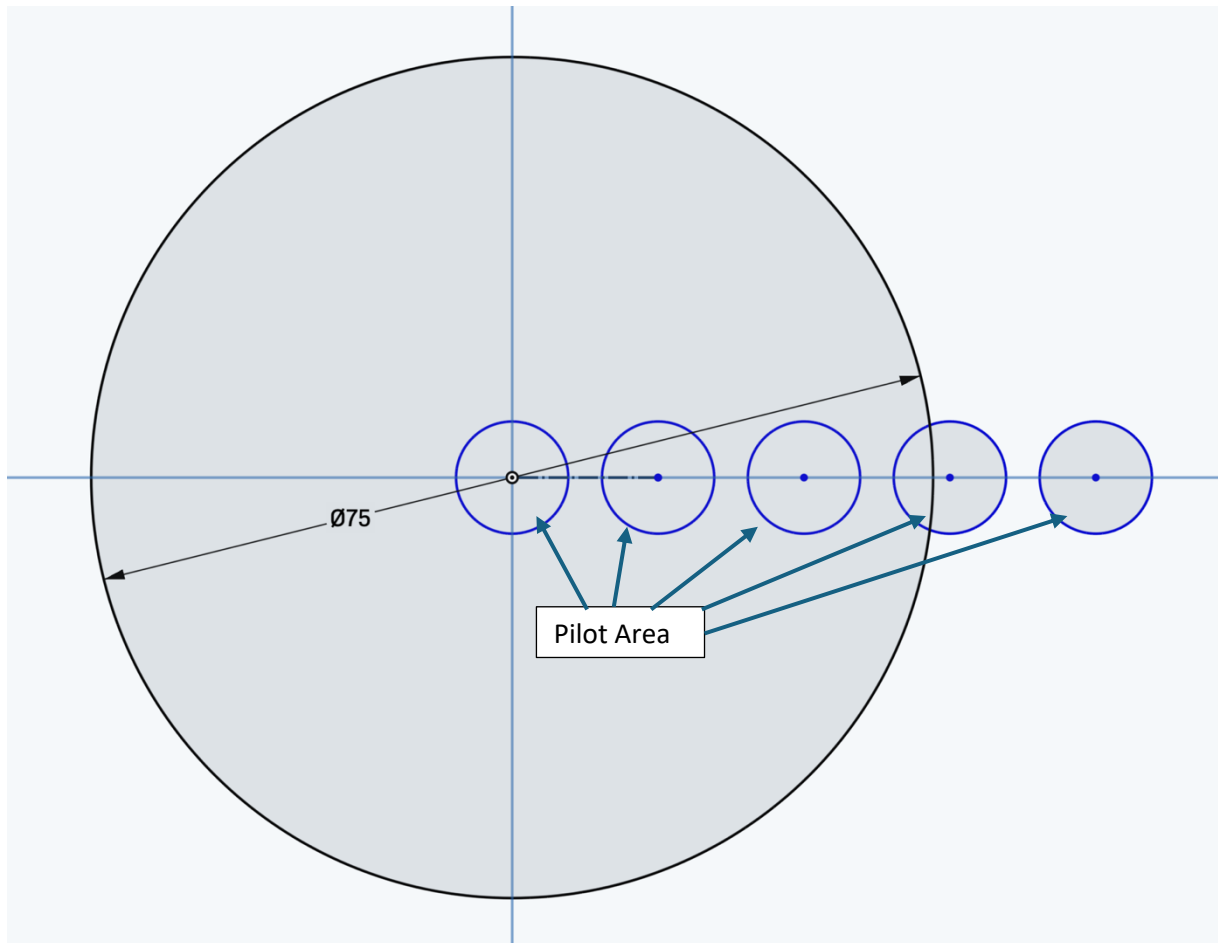
- The Pilot area is defined using a 30-meter tape pinned around the center making a hexagon with an outer enclosing circle with a diameter of 10 meters, called the individual "Pilot Area"
- Pilots launch and land their plane in the Pilot Area. Pilot and Timer remain in this area during flight.
- Pilots launch and land their plane in the Pilot Area. Pilot and Timer remain in this area during flight. Only during landing is it allowed to step outside this area for the landing of the plane.
- There should be a safe distance between two Pilot Areas (fe 15 meter from center to center perpendicular to the wind direction). A second lane can be created if more lanes are needed. In this case, a second lane could be created. The second row Pilot Area should also be at a safe distance from the first row Pilot Area and shifted at least ½ the distance of the distance between the Pilot's area (fe 30 meters downwind and 7,5 meters shifted to the right (see picture)

- The boundary of the flying field will nowhere be closer than 15 meters from the center of any Pilot Area.

The flight will be cancelled and recorded as a zero score if during landing no part of the model aircraft comes to rest within 75 meters of the center of the Pilot Area. The competition director may decide to define other borders in case the environment warrants it.

5.5.10.12   Penalty overview
Flight penalty:
a) Overfly landing window will result in a 100 points penalty for the flight score
b) Landing outside the flying field will result in "zero" points for that flight only
c) Motor restart during flight will result in a zero for that flight
d) Landing outside the pilot area will result in a 10 points penalty for the flight score

Safety penalty – zero for the round:
a) Hitting some else than yourself or your timer will result is a zero (0) for the round
b) Flying in a no fly or other safety zone will result in a 300 points penalty. The penalty is deducted from the final score

5.5.10.13   Reflight
In case of a mid-air collisions of two or more model gliders the competitors <u>will not be granted</u> refights nor will penalties be applied.

The competitor is entitled to a re-flight if:
i) if his attempt could not be performed correctly due to organizers fault. 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 frequency or 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 an organizer's fault

ii) the launch altitude was not recorded in the AMRT and / or the associated external AMRT software could not determine the launch altitude

iii) the attempt has not been judged by the timekeeper, provided that the helper or the pilot has informed the timekeeper about the position of the model a reasonable time before landing; if this is not done, the competitor is not entitled to a re-flight if his attempt has not been judged by the timekeeper.

5.5.10.14 Preparation time

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

5.5.10.15 Scoring

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. 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. The normalized scores are rounded to whole numbers (points).

5.5.10.16 Final score

The final score is the sum of the normalized scores of all rounds. If six (6) seven (7) or more rounds are flown then the lowest score is dropped. Basepoint to determine the final results are the scorecards signed by pilot and timer. Rectification of the final result is only possible if the organization has incorrectly processed the approved score cards (flight time, launch altitude and other bonuses and/or penalties). Other data than signed scorecards will not be accepted to determine the score result.

5.5.10.17 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.

5.5.10.18 Fly-off

The organizer 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

5.5.10.19 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.