British Model Flying Association 2010 Rules for Electric class 7.12

7.12 eSoaring (Height Limited Rules) Class.

7.12.1 OBJECTIVE

To provide an electric powered model aircraft thermal soaring event, where the initial launch height is the same for all models and a single electric motor run is used to achieve the set launch height.

The launch must be followed by pure gliding flight with no further motor assistance.

Models will be allowed to compete in two classes, an "Open" class, (up to 4000 mm wingspan), using the model definition in 7.12.2 (a) below and a "Two Metre" class where the wingspan shall not exceed 2000 mm. No other restrictions, other than those of 7.12.2 (a) below, shall apply. In league competitions Open and 2M class models will always be run together in the same slots. The British Nationals may have events in each class.

The competitor shall elect to fly either "Open" or "2 Metre" before the start of the competition. Dual entry is not allowed.

7.12.2 GENERAL RULES

(a) Definition of Electric Powered Model Glider.

A model aircraft in which lift is generated by aerodynamic forces acting on surfaces remaining fixed in flight, except control surfaces, which performs maunoeuvres controlled by the pilot on the ground, using radio control.

Model aircraft with variable geometry or area must comply with the specification when the surfaces are in maximum and minimum extended mode.

(b) General Characteristics of RC Electric Powered Model Aircraft (FAI F5 class)

Maximum surface area - 150dm2 (2325in2)
Maximum flying weight - 5Kg (11.023lbs)
Maximum surface loading - 75g/dm2 (24.51oz/sqft)
Minimum surface loading - 12g/dm2 (3.95oz/sqft)

(c) The power source shall consist of any kind of rechargeable batteries (or secondary cells). 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) Batteries may be charged or changed at any time during the competition.

(e1) Any device for the transmission of information from the model aircraft to the pilot, either directly or indirectly, is prohibited. This includes any visual, electronic or any other sort of signal from the model. Any use of telecommunication devices (including transceivers and telephones) in the field to communicate with competitors, their helpers or team managers while doing the competition task is not allowed. The only exception to this rule is the use of devices that cannot in any way be used to enhance the pilots chances in the contest.

(e2) Any device in addition to an approved height limiter / motor run timer, which is carried in or on the model and which enables total or partial independent control over the model is prohibited.

(f) Any ballast used must be carried internally and fastened securely within the airframe.

(g) Any type of electric motor may be used.

(h) The competitor may use a maximum of three model aircraft in the contest. The competitor may combine the parts of the model aircraft during the contest, provided that the resulting model aircraft conforms to the rules and that where applicable, the parts have been checked for conformity before the contest.

7.12. 3 The Flying Site

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

(b) The launching line shall be arranged crosswind and shall include launch marks on the launch line at least 10 meters apart, one for each competitor of a group.

(c) The launch marks will also act as the centre of the landing circles; at which point a 10 meter graduated landing tape is fixed to the ground. The launch/landing markers should be laid out with reference to the wind direction, strength and site topography.

(d) Competitors & timekeepers must remain upwind of their respective landing circle centres at all times after launching of models.

Competitor and Helper

(j) Each competitor must operate the radio equipment personally.

Each competitor is permitted a maximum of 1 helper and 1 timekeeper. The helper may act as timekeeper where permitted and may also launch the competitors model.

7.12.4 CONTEST RULES

(a) Specific model characteristics – eSoaring.

Open class models must not exceed 4,000 mm projected wingspan. 2 Metre class models must not exceed 2,000 mm projected wingspan.

No fixed or retractable arresting device (i.e. bolt, saw tooth-like protuberance, etc.) is allowed to slow down the model aircraft on the ground during landing. Vertical tail

fins and/or rudders are excluded from this requirement so long as they are not expressly designed to arrest the movement of the model on landing.

The model must be fitted with an approved* type of height limiter switch. Wherever the height limiting switch is positioned in the model, it must not be located where there is any likelihood of a greater air pressure reading being generated than exists outside of the model at any time. (e.g. - close to any forward facing air scoop).

* See appendix for definition of approved height limiter switches

The height limiter/logger must not be enclosed in any material, or in any position or any part of the model, which could result in distortion of actual air pressure variations.

Models must include sufficient static venting to ensure that outside pressure is duplicated inside the model at the limit switch location.

(b) Model processing - initial

Before the start of the contest the CD (Contest Director), or their representative shall ensure that the model is fitted with an approved combined height limiting switch / motor run timer, which is set to cut all power to the electric drive motor so that the model aircraft completes its launch phase at an indicated pressure altitude above launch level of 200 meters, or after 30 seconds of motor run time, whichever occurs first.

To facilitate processing, all limiting switches must be easily removable and/or easily accessible for checking and/or log downloads where applicable.

The CD will record the serial number of each competitors switch for future reference. Should the limiting switch in use not have a permanently marked unique serial number, the CD will mark a unique number on the switch and record the number so marked.

(c) Model certification

Where a model has been previously subject to the above checks the CD may choose to allow that model to fly in the contest without further checking.

(d) Model processing – subsequent

The CD may at any time before, during or immediately after the contest, ask for any competitors logged data and limiter settings to be downloaded and analysed, to check for any non-compliance with the rules or to resolve any dispute. The CD may also ask for any Limit Switch to be checked for accuracy, either by direct in flight comparison with a master altimeter or with the use of approved altimeter checking equipment.

Following each event the first three placed models overall will have their height limiters checked and logs (where appropriate), downloaded.

Master altimeters or check meters will be calibrated in accordance with International Standard Atmosphere (ISA). The ISA to be used for FAI matters is given in ICAO Document 7488 tables 3 and 4. It assumes a temperature and pressure at sea level

of 15C and 760 mm of mercury (or 1013.25 mb/hPa). Above sea level, it assumes a constant temperature lapse rate from sea level of 6.5C per 1000 m (1.98C/3.56F per 1000 ft) rise in height, up to an altitude of 11,000 m (-56.5C).

(e) Entry, organisation of flying slots and timekeeping responsibilities

For the sake of randomness of the starting order among the successive rounds, each competitor must enter three different transmitter frequencies with 10 kHz minimum spacing. The competitor can be called to use any of these frequencies during the contest, so long as the call is made at least 1/2 hour prior to the beginning of a round in written form to the competitor, (or team manager when applicable). However CDs should make every effort to evolve a starting order, which reduces any need for frequency change to an absolute minimum, with preferably no change at all. Approved radio equipment operating on the 2.4GHz frequency band is also acceptable.

Pre-entry is advisable to enable the CD to arrange radio frequencies in advance so as to permit as many simultaneous flights as possible.

Any number of rounds may be scheduled but a minimum of 3 rounds must be completed to validate the contest and for the scores to count in the UK league. Unless otherwise specified in a league proposal for a given year, a minimum of four competitors are required to start in each class to validate the contest as a league event.

The flying order will be organised (i.e. by matrix) such that, as far as possible during the competition, each competitor will fly against as many other competitors as possible and not against the same competitor(s) in every slot. The only exception to this rule being in single slot per round contests.

The competitor is entitled to 5 minutes preparation time. Preparation time for the next slot in each round will start as soon as all the models from the previous slot have landed. The CD may announce an alternative (longer or shorter) preparation start time where appropriate.

It is the competitor's responsibility to provide a helper / timekeeper, with the possible exception of International Competitions, where timekeepers may be allocated by the organisers.

It is the timekeeper' responsibility to time the flight and deliver the score to the CD or his representative.

The CD must clearly indicate the start and end of the working time audibly and if possible visually.

Prior to the start of the competition, any data in each competitor's flight logger must be cleared.

7.12.5 Contest Rules

The working time for the contest is 11 minutes.

All models must be launched and landed within this time period.

Re-launching is allowed at any stage – a re-launch negates the previous flight score.

Models may be launched at any time during the 11 minute working time.

Launch is followed by a 10 minute target time flight, terminating in a spot landing.

In the event that a flight exceeds 10.00 minutes, the excess time in seconds will be deducted from the flight time score.

Any landing bonus is unaffected provided the landing is completed within the 11 minutes working time and also within 10 minutes and 30 seconds (a total of 630 seconds) of the start of flight time.

If the model lands either after the end of working time or after 10 minutes 30 seconds of flight time, a zero score will be allocated.

The motor must not be run after the first **30 seconds** of flight time. If the height limiter switch does not cut the motor before this 30 second period, the competitor **must** cut it manually. Following a motor cut by the height limiter, the pilot must then manually move the motor control to an off position within the next 10 seconds, to ensure no possibility of the motor re-starting.

The 10-minute target time **INCLUDES** the launch time and starts from the point at which the model leaves the launchers hand under the pull of the electric motor.

The timekeeper should assist the pilot by announcing the motor run time during the launch phase, advising elapsed time during flight and the approaching end of the 10-minute target time and/or the 11-minute working time.

The timekeeper must stop the watch when the model first touches ~~the ground~~ any object in contact with the ground including any pilot, helper, timekeeper or spectator.

7.12.6 Contest Flights - Launching

There is an official attempt when the model aircraft has left the hands of the competitor or helper under the pull of the electric drive motor. The CD may vary this rule for safety reason. (i.e. pusher propped models)

Power must not be applied to the altimeter switch until the model is on the flight line in preparation for the start of a contest flight. At this time, the competitor must ensure that the motor control and/or switch is set to zero. (i.e. the full stop position of the motor), before arming the altimeter switch.

All models must be launched into wind and within four meters of the competitors launch / landing marker. This rule applies for the initial launch **AND any subsequent re-launch**.

The motor run during the climb must be continuous, (uninterrupted) and at a constant throttle position.

Should there be any doubt about the legality of any launch, the CD may ask for the data log for the flight in question to be downloaded and/or the altimeter switch in use to be tested. Should the data log or tests show that a height advantage of more than 10% has been achieved, then that competitor's score for the slot in question will be cancelled.

7.12.7 Landing

Each competitor must have his own landing target.

The targets will be laid out with reference to the wind and site topography.

Competitors & timekeepers must remain upwind of the landing target centre at all times and all landings should be made into wind towards the landing marker in the same general direction as launch.

After landing, models may be retrieved only if doing so does not impede other competitors.

7.12.8 Re-flights

The competitor is entitled to a new working time **only if**:

1) The attempt was hindered or aborted by an unexpected event, not within the competitor's control.

Equipment or model failure do not qualify as grounds for a re-flight.

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

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

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

1) In an incomplete group in a different (later) round, or in a complete group on additional launching/landing spots.

2) In a new group of several (minimum 4) re-flyers. The new group of re-flyers can be completed by other competitors selected by random draw. If the frequency of the drawn competitor does not fit or the competitor cannot fly, the draw is repeated.
3) In the original group at the end of the ongoing round.

In priority 2 and 3 above, the flyer granted the re-flight shall have the score achieved returned to the original slot/round.

In priority 2 and 3 above, any person involved in the re-fly, other than the flyer granted the re-flight, will receive the better of their 2 scores.

7.12.9 Scoring

All flight times are to rounded DOWN to the nearest second.

One point per full second of flight time, to a maximum possible total of 600 points (10:00 minutes).

One point will be deducted for every second flown in excess of 600 seconds (10:00 minutes).

A zero score will be recorded for a flight where the motor run is more than 30 seconds.

A zero score will be recorded if the motor is re-started by the competitor at any time during the flight.

If the model aircraft loses any part either during the launch or in flight that flight will incur a 100 point penalty. The loss of any part in collision with another model aircraft or during landing, (i.e. in contact with the ground), is not taken into account.

Landing bonus will be awarded provided the model comes to rest within the arc of the landing tape. The measurement shall be taken from the nose of the model. No landing bonus is awarded if the model touches the competitor, his helper and/or timekeeper during landing.

Landing points will be awarded as below:

0+to 1m = 50pts 1+ to 2m = 45 pts 2+ to 3m = 40pts 3+ to 4m = 35pts
4+to 5m = 30pts 5+ to 6m = 25 pts 6+ to 7m = 20pts 7+ to 8m = 15pts
8+to 9m = 10pts 9+ to 10m = 5 pts Over 10 meters = 0pts

A landing more than 75 meters from the target receives zero flight score.

For each slot, the competitor with the highest score (flight + landing bonus) will receive 1000 points. Competitors with lower scores will be awarded a proportion of the winner's score i.e. score x 1000/winner's score.

7.12.10 Final Classification

Where more than 3 rounds are flown the lowest score will be discarded.
In the event of a tie the discarded score will decide places on the day but both competitors will receive equal League scores.

In the event that this does not produce a winner then a one round fly-off will be held using these same rules.

Appendix - Approved Height Limiter Switches

In order to gain approval, any height limiting switch must demonstrate that it will consistently enable an electric glider, when operated within the rules of the competition, to finish it's launch phase at an ISA 15C pressure indicated altitude of 200 meters plus or minus 8 meters. This requirement must be met whether or not the unit incorporates an "anti-zooming" feature.

As of January 2010 the following devices are approved.

Manufacturer RC Electronics
Part Number: RC Altimeter #2 BASIC (with firmware version 2.07 or higher)

Manufacturer RC Electronics
Part Number: RC Altimeter #2 PRO (with firmware version 2.07 or higher)

Manufacturer RC Electronics
Part Number: RC Altimeter #3 PRO (with firmware version 3.04 or higher)

Web address for RC Electronics is: www.rc-electronics.org

Note the difference between the three units is that the PRO versions can also provide a telemetry link. The functionality of the unit in terms of height data logging, altitude and time switching is exactly the same as the BASIC unit.

At least three alternative devices are known to be in development and, once they are commercially available and have gained approval, they too will be listed for use in these events.

Additional

7.9.4.3.3 Definition of a League Event Qualifying for a Final League result

(a) A minimum of 3 rounds will be completed.

7.9.4.3.4 Number of League Events Counting for Final League Score

(a) Best 6 scores from any number of events flown will count towards final National League placing.