

4.4. CLASS F2D-E – ELECTRIC POWERED COMBAT MODEL AIRCRAFT

4.4.1. Definition of a Combat Event

A combat event is a contest during which eliminating heats are followed by a final in which two competitors with their model aircraft fly in the same circle at the same moment for a predetermined time, the object being to cut a streamer attached on the longitudinal centre line of the opponent's model aircraft, points being awarded for each cut taken.

4.4.2. Definition of a Combat Model Aircraft

- Model aircraft in which the propulsion is done by propeller(s) and in which lift is obtained by aerodynamic forces acting on surfaces which remain fixed in flight, except for control surfaces.
- The longitudinal centre line shall be defined as the axis of the propeller and the axis of symmetry in the case of multi-propeller model aircraft.

4.4.3. Combat Site

A combat site must consist of two concentric circles which shall be marked on the ground.

- The pilot circle: radius 2 metres.
- The flight circle: radius 20 metres

The flight circle must be laid out on grass. The pilot circle may be laid out on grass or any other material having a maximum diameter of 4 metres.

During active combat periods the pilot and his mechanic(s), officials, team managers and others within the boundary of the flying site must wear a safety helmet, with a fastened chinstrap, strong enough to withstand the impact of a flying combat model aircraft.

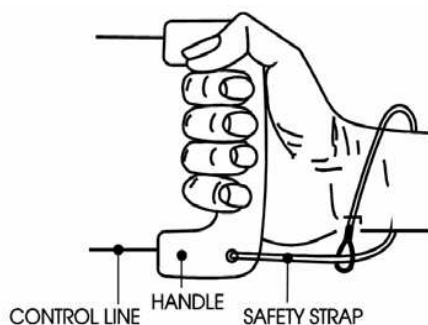
4.4.4. Competitor

The pilot, is the entrant and known as the competitor. (In exceptional circumstances of wet or extremely windy weather, an additional helper may be used as a streamer holder and must perform no other function for the duration of that combat period).

To avoid the catching of the opponent's lines the protruding parts of the helmet must be covered. No communication using electronic devices is allowed between the pilot and mechanics/persons outside the flying circle.

4.4.5. Characteristics

- Maximum loading: 100 g/dm²
- Line length: 15,92 +/- 0,04 m
- Minimum line diameter: 0,385 mm (no minus tolerance)
Two multi-strand control lines must be used. No free ends capable of entangling an opponent's lines, and no line splices, are permitted.
- The models must be driven by an electric powered motor.
- The magnetic active volume of the electric motor should have a maximum diameter of 35 mm (no plus tolerance) and a maximum length of 15 mm + 0.5 mm.
- The maximum weight of the electric power pack is 155 g.
- The maximum voltage of the electric power pack is 42 Volt.
- The electric power pack must be rechargeable.
- A safety strap connecting the competitor's wrist to the control handle must be provided by the competitor and worn at all times while his model aircraft is flying. The strap should be as shown in the sketch i.e. it should be attached to the wrist with a loop and sliding knot so that if the handle is released it tighten itself securely around the wrist. The point of attachment at the handle is up to the discretion of the pilot.



HAND AND SAFETY STRAP FIGURE

- j) The model aircraft shall not carry any artificial aid intended to assist the cutting of the streamers.

4.4.6. Technical Verification

To be tested before each heat:

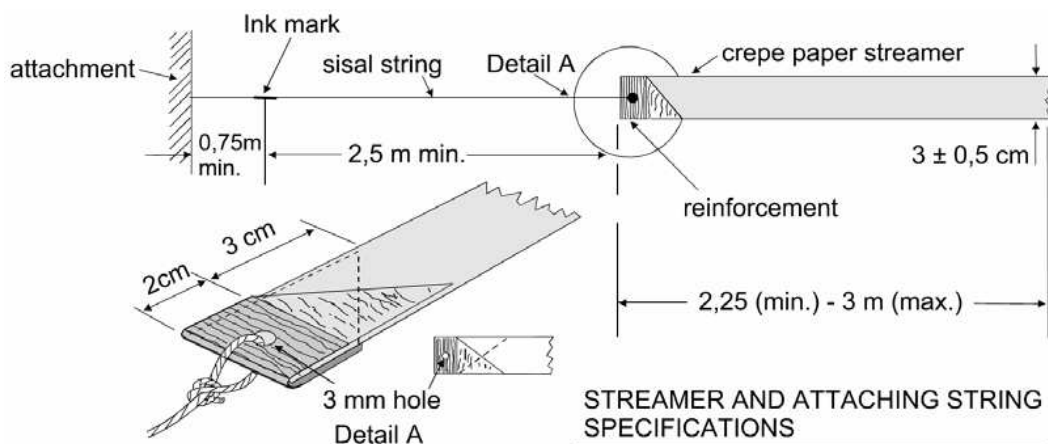
- a) Each set of lines must be checked for length and diameter.
The line length is measured from the inboard face of the grip of control handle to the longitudinal centre line of the model aircraft.
A pull test shall be applied to the assembled handle, control lines and model aircraft. The pull test shall be equal to 150 N.
- b) The safety strap(s) and safety wire(s) may also be pull tested with a load equal to 150 N.

4.4.7. Number of Model Aircraft

- a) Only one model aircraft specification certificate is required for each design of model aircraft presented by each competitor.
- b) Each competitor shall be permitted a maximum of three model aircraft for each competition.
- c) Each competitor shall be permitted a maximum of one model aircraft, one handle, one pair of lines and one motor in each combat heat.
- d) Models, motors, control lines and handles may not be replaced or interchanged during the combat period.

4.4.8 Streamer

The streamer shall consist of double weight crepe paper (80 g/m²) or any replacement of equivalent strength, not less than 2,25 m or more than 3 m long and 3 ± 0,5 cm wide, fixed to a sisal (or any replacement of equivalent strength) string of 3,25 m minimum length. All streamers must be of the same length. There shall be a clearly visible ink mark 2,5 m from the junction of the string and streamer. The streamer shall be attached to the model aircraft in such a way that the ink mark is level with, or behind, the rearmost portion of the model aircraft (see sketch). The attachment part of the string shall have a minimum length of 0,75 m. The attachment end of the streamer shall be reinforced on either side by tape approximately 2 cm wide affixed diagonally to the length of the streamer with one at right angles to the other and extending for a maximum of 5 cm. An additional fibre/fabric reinforced tape 2 cm wide is affixed across the streamer (see detail below).



The colour of the streamer must be different for the two competitors in the heat. Each pilot/pit crew shall be issued with a streamer at the start of the heat by the judge assigned to that competitor. A second streamer will be available from the judges when needed.

4.4.9. The Heat from start to finish

- a) All signals shall be both acoustic and visual.
- b) During the starting period the launching positions must be separated by at least a quarter of a lap.
The first named competitor in the draw shall have the choice of streamer colour and the other the choice of starting position.
- c) It is the responsibility of the pilot/helper to make sure the streamer is unrolled before take-off.
- d) A signal, given by the Official Timer, shall signify the beginning of the combat period on or after which the model aircraft may be launched.
- e) From the moment the Official Timer has given the signal to launch the combat heat lasts for 5 minutes.
- f) When the Circle Marshal is satisfied that each model aircraft has completed one level lap, anti-clockwise, separated by approximately half a lap, he will give a signal that combat may begin.

- g) Combat may begin after a restart signal from the Circle Marshal following an interruption when one or both model aircraft have been grounded. This signal shall be given as soon as the Circle Marshal is satisfied that there is approximately half a lap separation between the two model aircraft.
- h) If, after a mid-air collision, no streamer can be found and the streamer retaining device is missing or bent, then, with the permission of the judges, it is acceptable to continue the heat without replacing the streamer.
- i) When moving around the circle the mechanics/pilots must be on the outside of the pflight circle.
- j) The Circle Marshall will monitor the conduct of both pilots, and shall issue a yellow card warning to any pilot who uses a rough or unsafe flying style, causes line tangles or displays unsportsmanlike behaviour. Each yellow card issued (a maximum of three for each pilot per competition) shall be officially recorded and retained for the remainder of the competition. If the first yellow card incident is considered severe, the pilot shall also be disqualified for this offence.
- k) The Circle Marshal shall give an acoustic signal to terminate the combat heat:
 - i) 5 minutes after the signal to launch (10 seconds countdown).
 - ii) when both streamer strings have been cut and the pilots have been asked to fly level and anti-clockwise and cease combat.
 - iii) If one pilot has only the string remaining and he request the Circle Marshal to instruct both pilots to fly level and anti-clockwise and to cease combat.
 - iv) if the heat has to be terminated due to disqualification of one or both competitors or for any other reason.

4.4.10. Scoring

- a) Scoring shall start at the signal to launch and continue during the heat (maximum 5 minutes).
- b) 100 points shall be awarded for each distinct cut off the opponent's streamer. There is a cut each time the model aircraft, propeller or lines fly through the opponent's streamer resulting in particle(s) becoming detached from the streamer. A cut that contains string only does not count.
- c) Two points shall be awarded for each second that a model aircraft is airborne during the heat. In the case of a model aircraft fly-away the watches should be stopped from the moment of the fly-away.
- d) Each penalty point given (See 4.4.12) shall be added to the competitors score.
- e) In the event of a tie score in any heat, that heat shall be re-flown. A heat is considered a tie if the score difference is 10 points or less.

4.4.11. Reflights

A reflight may be granted:

- a) in the event of a line tangle resulting in the control line(s) breaking and only one model aircraft being grounded, making it impossible to clear the line tangle.
- b) if, as a result of combat, a model aircraft cuts its own streamer/string or the streamer/string becomes wrapped around the model aircraft and/or the lines (unless only string remains).
- c) at the discretion of the Judges/Circle Marshal if an unfair situation occurs and none of the pilots/mechanics can be blamed.

4.4.12. Penalties and disqualifications

A. A competitor will receive a penalty of -40 points:

- a) if he steps outside the centre circle with one foot while his model aircraft is airborne.
- b) if the pilot do not immediately, or after a clearing a line tangle, withdraw a grounded model aircraft to the pitting area prior to servicing it. It is not allowed to service the model or remove the streamer until any line tangle is cleared.
- c) if the model aircraft is launched prior to the starting signal.
- d) when he recieves his first yellow card (Subject to 4.4.9.n).

B. A competitor will receive a penalty of -100 points if:

- a) if the pilot damages the streamer, or the model aircraft cut its own streamer, whilst the model aircraft is on the ground and the model is launched without replacing the streamer.
- b) if the string becomes detached from the model aircraft while airborne prior to the signal to start combat.

In all these cases the pilot must immediately on a signal from the Circle Marshal land and replace the streamer. The watches should be stopped from the moment of such a signal.

C. A competitor will be disqualified from the heat if:

- a) if he flies with a model that do not confirm to 4.4.5.
- b) if he attempts to fly a model aircraft which at the time of launch does not have a:
 - i. strong effective control mechanism
 - ii. secure engine attachment

- c) if he deliberately attacks the streamer of his opponent's model aircraft prior to the Circle Marshals signal to start combat.
- d) if he interferes with his opponent, or forces his opponent to leave the centre circle.
- e) if, while his model is not airborne and his opponent is flying or ready to fly, he leaves any parts of his model or lines in the centre circle without an immediate attempt to clear them.
- f) if he attacks his opponent's streamer without his own, or the remaining parts, is attached to his model aircraft (Except for 4.4.9.j).
- g) if he is not present at his allotted flight time, unless he has the express permission of the Event Director.
- h) if he leaves the centre circle, intentionally while his model aircraft is flying.
- i) if he flies in such a manner as to inhibit his opponent, from clearing any line tangle.
- j) if he flies other than level in an anticlockwise direction when only his model aircraft is airborne and there is no line tangle. Sudden or rough manoeuvres are not allowed.
- k) if he releases the handle and the safety strap separates from handle or wrist or removes the safety strap, for any reason, while the model aircraft is flying.
- l) if he interferes to cause a ground hit of, or collides with his opponent's model aircraft that clearly has no streamer left and flies level in anticlockwise direction without any manoeuvres to chase and attack.
- m) if the streamer becomes detached from the streamer retaining device during combat, but not as a result of a mid-air collision.
- n) if the model aircraft lands with no streamer string and the streamer retaining device is missing or bent, but not as a result of a mid-air collision.
- o) when he receives his second or third yellow card (Subject to 4.4.9.n).
- p) for any other flagrant breach of the rules.

4.4.13 Video camera

The Organiser/Judges may use a video recording equipment to monitor the pilots and the pilot circle. At the discretion of the Judges/Circle Marshal the recorded video can be used as a judging tool.

4.4.14 Individual and Team Classification

- a) The contest shall be run as a knockout tournament.
- b) The competitor who obtains the highest score in points shall be the winner of each heat.
- c) A competitor shall be eliminated from the competition when he has lost two heats.
- d) Each round shall be randomly drawn (subject to 4.4.14.e)) from the competitors remaining in the competition.
- e) Previous opponents and competitors of the same nationality shall be drawn apart if possible with competitors of the same nationality to fly against each other only if there are no remaining opponents. Defending champions, not members of their national team, are considered as individuals not possessing any specific nationality.
- f) In a round with an odd number of competitors the non-flying competitor will fly twice in the following round, in the first heat and in the last heat (if the number of competitors permit it and he still is in the contest).
- g) Each competitor shall be ranked according to his number of wins, not counting fly-off heats, with the fly-off heats being used to establish second and third place as necessary.
- h) In the event of a tie for second or third place fly them off allowing only one loss during the fly-off. In the event of a tie for third place after a fly-off for second place do a new fly-off.
- i) A specific junior final tournament will be organised if juniors are at the same placing (tie) in the general tournament, in order to define who is first, second and third for the specific individual placing and will have no influence on the general individual placing (no change in the team classification).
- j) The competitors "win" scores, not counting fly-offs, shall be added for the participants of each nation.
- k) The team classification is established by taking the total scores, obtained in 4.4.14.g) above, of the three best scoring members of the team together. In the case of a team tie, the team with the lower sum of place numbers, given in order from the top, wins. If still equal, the best individual placing decides. Complete three-competitor teams are ranked ahead of two competitor teams which, in turn, are ranked ahead of single competitor entries.