

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

- a) Model aircraft in which the propulsion energy is provided by an electric motor(s) and in which lift is obtained by aerodynamic forces acting on surfaces which remain fixed in flight, except for control surfaces.
- b) 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.

- a) The pilot circle: radius 2 metres.
- b) 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. During active combat periods the pilot and his mechanic(s), officials, team managers and others within the boundary of the designated combat flying area must wear a safety helmet, with a fastened chinstrap, strong enough to withstand the impact of a flying combat model aircraft.

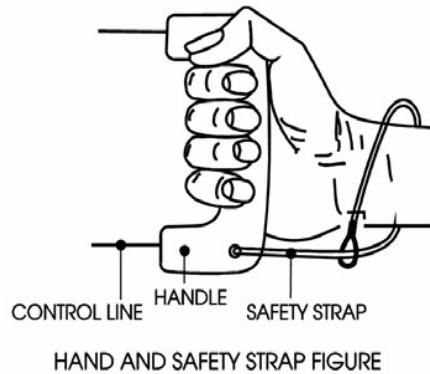
4.4.4. Competitor

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.

4.4.5. Characteristics

- a) Maximum loading: 100 g/dm²
- b) Line length: 15,92 +/- 0,04 m
- c) 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.
- d) The models must be driven by an electric powered motor.
- e) The electric motor should have a maximum weight of 150 g. As electric motor are considered all parts which are needed to get a complete running unit including electrical wires or connectors, reduction gear and the prop drive with its screws or nuts.
- f) Maximum rotational speed of the propeller should not exceed 20000 rpm (measured at full throttle on ground with the same setup as in flight)
- g) Maximum voltage of the electric power supply is 42 Volt off load.
- h) Maximum weight of the model airplane ready to fly is 625 g.
- i) Minimum weight of the empty model airplane (ready to fly without battery) is 400 g.
- j) 2,4 GHz RC gear is allowed for throttle control. During Combat the throttle must be constant.
- k) The motor(s) must shut down in case of a fly away
- l) 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.



- m) 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(s), control lines and model aircraft. The pull test shall be equal to 200 N.
- b) The safety strap(s) may also be pull tested with a load equal to 200 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 6 model aircraft for each competition.
- c) Each competitor shall be permitted a maximum number of model aircrafts according to the choosed mode (A, B or C) in each combat heat. The model aircraft is fitted with one handle, one pair of lines and the mounted motor(s).
- d) Models, motors, control lines and handles may not be replaced or interchanged during the combat period.

4.4.8 Streamer

See F2D rule 4.4.8

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/mechanic 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 the time according to the choosed mode (A, B or C).
- 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 flight circle.
- j) The Circle Marshal 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) The time according to the choosed mode (A, B or C) 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

See F2D rule 4.4.10

4.4.11. Reflights

See F2D rule 4.4.11

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

See F2D rule 4.4.11

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.

4.4.15 Judges and Timekeepers

See F2D rule 4.4.15

4.4.16 Appendix

Mode A

Duration of the fight: 3 minutes
 Number of Models per fight: 1
 Mechanics: 1

Mode B

Duration of the fight: 2x2 minutes, one model per period (1 min break)
 Number of Models per fight: 1 with new streamer (if damaged) per 2 minutes, no battery change during one period
 Mechanics: 1

Mode C (F2D-like)

Duration of the fight: 4 minutes
 Number of Models per fight: 2
 Mechanics: 1