

## VOLUME F3 SOARING

### PART FIVE - TECHNICAL REGULATIONS FOR RADIO CONTROLLED CONTESTS

#### E 5.3. CLASS E F3B – MULTI-TASK GLIDERS WITH ELECTRIC MOTOR

##### E 5.3.1. General Rules

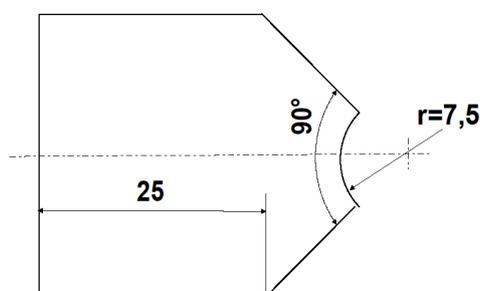
##### E 5.3.1.1. Definition of a Radio Controlled Glider with electric motor

Model which is provided with an electric motor. Model with variable geometry or area must comply with the specification when the surfaces are in maximum and minimum extended mode. The model must be controlled by the competitor on the ground using radio control. Any variation of geometry and / or area must be actuated at distance by radio control.

##### E 5.3.1.2. Characteristics data of Radio Controlled Gliders E F3B

|                                  |  |
|----------------------------------|--|
| Minimum wing-loading             | 35 g/dm <sup>2</sup>                             |
| Maximum wing-loading             | 75 g/dm <sup>2</sup>                             |
| Maximum flight mass              | 5 kg   |
| Minimum wingspan                 | 2,8 m  |
| Maximum "Average Input power" 1) | 800 W  |
| Maximum energy                   | 350 + 1 Wmin                                     |
| Maximum run-time of the motor    | 30 + 0,1 s                                       |
| Battery                          | Any type of rechargeable batteries (U ≤ 42 Volt) |
| Motor                            | Any type of motor                                |
| Minimum nose-/spinner radius 2)  | 7.5 mm (see template)                            |

- 1) During the total energy-consumption of 350 Wmin
- 2) If a spinner with an air-inlet (d ≥ 6 mm) for better cooling of the motor ("turbo spinner", "cool nose", etc.) is used, this rule is not valid.



TEMPLATE FOR NOSE-/SPINNER-RADIUS

### E 5.3.1.3 Technical equipment

a) Each model must be fitted with an approved Logger (LOG) in accordance with the Technical Specification published in E F3B LOG Technical Documentation.

b) The LOG must be approved by the EDIC (ELECTRONIC DEVICES IN COMPETITIONS WORKING GROUP).

c) The LOG is located in the electric circuit between the battery and the ESC (Electronic Speed Controller). The logger shall have for a random check the following connectors:

- “Plus battery” male connector four (4) mm diameter
- “ESC” female connector four (4) mm diameter
- “Minus battery male / female connector four (4) mm diameter

d) Installation of the LOG in the model shall be in accordance with the requirements as detailed in the Technical Guidance Documentation.

e) Proper operation of the LOG including any associated display and its compatibility with other control equipment installed in the model is the responsibility of the individual competitor.

f) To facilitate initial technical processing, the LOG must be easily removable for compliance checking.

The receiver command signal connection to the LOG must be easily accessible so that at any time during the competition the organisers have the option of installing a monitoring LOG via a branching Y lead.

g) To enable the timekeeper to record data required for scoring purposes there must be easy access to the display or the connector for a plug-in-display. It must not be necessary to disconnect the LOG from the receiver and / or the ESC or to remove it from the model.

h) The use of an additional extension cable is permitted for connecting the display. It is the responsibility of the competitor to ensure that any incorrect connection does not result in damage to the LOG or the display.

i) Any device other than an approved LOG which is carried in or on the model and which enables total or partial independent control over the model’s electric drive motor-operation, is prohibited. Receivers and ESC’s are not affected by this rule.

j) The functions of the LOG is to record “altitude”, “voltage” and “current” and to represent “altitude”, “average power”, “amount of energy” and the “run-time of the motor” at a display.

k) The motor can be stopped by the pilot or is stopped automatically after thirty point 0,1 (30.1) seconds or if the energy-limit of three hundred fifty plus one (350 + 1) Wmin is reached; afterwards the motor can’t be switched on again.

l) If the “average power” exceeds 800 W there is a penalty of two (2) point / one (1) Watt.

If the run-time of the motor exceeds 30,1 seconds or the energy-limit exceeds 351 Wmin the flight is penalised with 1000 points.

The number of infractions during one attempt does not matter (maximum one (1) penalty for one attempt).

The penalties 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.

l) LOG data must be shown to the official immediately after the flight.

#### **E 5.3.1.4. General requirements**

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

b) The use of any onboard-sensed data to automatically move the control surfaces or to modify the aircraft geometry is prohibited.

Any technological device used to aide in supplying data of the air's condition or direct feedback of the model's flight status is prohibited during the flight. These devices include any transmission or receiving devices not used to directly control the model aircraft (telephones, walkie-talkies, telemetry of airspeed and altitude etc.), temperature detecting devices (thermal imaging cameras, thermometers etc), optical aids (such as binoculars, telescopes etc.), and distance / altitude measuring devices (GPS, laser range finders etc.).

Telemetry of signal strength at the aircraft receiver and state of the receiver battery is permitted.

Use of corrective eyeglasses and sunglasses are permitted. If an infringement of this rule occurs, the pilot will be disqualified from the contest.

c) The competitor may use a maximum of three (3) models in the contest. All exchangeable parts (wing, fuselage, tail planes, canopy, joiner, maximal three (3) batteries / model) must be marked uniquely and in a way that does not allow replication of this mark on additional parts.

d) The competitor may combine the parts of the model during the contest; provided the resulting model used for flight conforms to the rules and that the parts have been checked before the start of the contest. See also E 5.3.2.1.

#### **E 5.3.1.5. Competitors and Helpers**

The competitor must operate his radio equipment personally. Each competitor is permitted up to three (3) helpers, including the team manager, who must not give any turning signals near base B during tasks B and C.

#### **E 5.3.1.6. Definition of an Attempt**

a) For each task (ref. E 5.3.2.1.), during the working time allocated, the competitor is entitled an unlimited number of attempts. An attempt starts when the motor of the model is switched on. No change of model or parts of the model (except a damaged propeller) is allowed after starting the first attempt.

b) The competitor is entitled to a new working time period if any of the following conditions occur and are duly witnessed by an official of the contest:

1) His model in flight collides with another model in flight, or another model in the process of launch (released for flight by the competitor or his helper).

2) His model in the process of launch collides with another model also in the process of launch (released for flight by the competitor or his helper), or with another model in flight.

To claim a re-fly in the cases 1) and 2) the competitor must land his model as soon as possible after the collision. If the competitor continues his flight, he has waived his right for a new working time.

3) The flight has not been judged by the fault of the judges or timekeepers.

4) In the case of an unexpected event, outside the competitor's control, the flight has been hindered or aborted.

c) The competitor has the right to change his model during a current round and this is not withstanding rule E 5.3.2.1. if:

1) His model collides with another model in flight; he has the right for a re-fly but his model is not reparable in time.

2) His model has landed (final or intermediate landing) and is damaged by a landing model of another competitor and the model is not reparable in time.

3) In the case of 1) or 2) above, once the competitor has exercised his right to change his damaged model, that model must not be used in any subsequent task(s) in the current round.

d) In case of additional attempts in task A (Duration) or task B (Distance) during a round the competitors must fly within a group that is not complete in number or in one or more groups newly formed.

#### **E 5.3.1.7. Definition of the Official Flight**

The official flight is the last flight performed during the working time.

#### **E 5.3.1.8. Cancellation of a Flight, Penalty and Disqualification**

a) Unless otherwise specified a flight in progress will be annulled for an infraction of any rule. In the case of intentional or flagrant violation of the rules, in the judgement of the Contest Director, the competitor may be disqualified.

b) The flight in progress will be penalised with 100 points if the model loses any part either during the launch or the flight. The loss of any part in a collision with another model or during landing (i.e. in contact with the ground) is not taken into account. The penalty of 100 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.

c) The competitor is disqualified if the model in flight is controlled by anyone other than the competitor.

d) If the model touches either the competitor or his helper during landing manoeuvres of task A, no landing points will be given.

#### **E 5.3.1.9. Organisation of Starts**

- a) The competitors shall be combined in groups with a draw, to permit as many flights simultaneously as possible. Incomplete teams may be to their request combined into a working team. The draw is organised in such a way that there are no competitors of the same working team in the same group. At World and Continental Championship the reigning champion, if participating outside the national team, may join his national team to form a working team.
- b) The composition of the groups must be changed every round in order to have different combinations of competitors. For task A-Duration there must be a minimum of five (5) competitors in a group. For task B-Distance there must be a minimum of three (3) competitors in a group. For task C- Speed a group may consist of eight (8) competitors or all competitors. It is preferable for the organiser to orientate the starting order for task C at the inverted ranking calculated out of the results of all tasks flown until that moment. For the first round the starting order for task C should always be identical with the starting order of task A. Alternatively the organiser may use the starting order for task A-Duration in subsequent task C-Speed rounds.
- c) The result of a group is annulled if only one (1) competitor has a valid result. In this case, the group will fly again and this result will be the official result.
- d) The flying order of different groups is established with the draw too. A different starting order shall be used for each round.
- e) The competitors are entitled to five (5) minutes of preparation time before the starter gives the order to count off the working time.

#### **E 5.3.1.10. Organisation of Contests**

- a) Transmitter pound see C.16.2.2
- b) Sighting apparatus or any device constituting an obstacle, should be placed on Base A and Base B, a minimum of five (5) metres from the safety plane for task C. Apparatus for judging the safety plane in task C shall be placed a minimum distance of five (5) metres from Base A or B outside the course.
- c) The contest director must inform without delay the competitor and / or his team manager about any decision taken, e.g. in the case of a re-fly, a penalty etc.

#### **E 5.3.1.11. Safety Rules**

- a) The organiser must clearly mark the boundary between the landing area and the safety area assigned for other activities. (See sketch "F3B/F3B-e flying field layout" page 11)
- b) After release of the model from the hand of the competitor or helper, any contact of the model with any object (earth, car, stick, plant, tow-line at combined F3B / F3B-e competitions, etc.) within the safety area will be penalised by 300 points, except in the circumstances described in paragraph E 5.3.1.6 b) items 1, 2, 3, and 4. Contact with a person within the safety area will be penalised by 1000 points. The number of contacts during one attempt does not matter (maximum one (1) penalty for one attempt). The penalty will be a deduction of 300 or 1000 points from the competitor's final score and shall be listed on the score sheet of the round in which the penalisation was applied.

#### **E 5.3.1.12. Weather Conditions/Interruptions**

a) The maximum wind speed for E F3B contests is twelve (12) m/sec. The contest has to be interrupted or the start delayed by the contest director if the wind speed exceeds twelve (12) m/sec measured three (3) times for at least twenty (20) seconds in a time interval of five (5) minutes two (2) metres above the ground at the start and landing area.

b) In the case of rain, the contest director can interrupt the contest during task A and task B. When the rain stops, the contest starts again with the last group that was flying; this group receives a re-fly.

c) In the case of rain, the contest director must interrupt the contest during task C. When the rain stops the contest starts again with the last pilot that was flying; he receives a re-fly. The whole group of task C must be divided in a meaningful number of equal groups depending on the total number of competitors before the task starts. If the weather is stable only one (1) group is evaluated; if the competition must be interrupted more than fifteen (15) minutes, then the interrupted group must start from the beginning and the results are evaluated for each group.

### **E 5.3.2. RULES FOR MULTI-TASK CONTESTS**

#### **E 5.3.2.1. Definition**

a) This contest is a multi-task event for radio controlled gliders with electric motor, which includes three tasks:

A) Duration

B) Distance

C) Speed

b) The combination of task A, B and C constitutes a round. A minimum of one (1) round and one (1) task must be flown that the competition is valid. The result of a World or Continental Championships is valid if five (5) complete rounds are flown; if more than five (5) complete rounds are flown, see paragraph E 5.3.2.8. Classification.

At the discretion of the organiser any task may be flown first in a scheduled round. In the case of unstable weather conditions, lack of time or technical issues it is possible fly task A or task B of the following round before task C of the current round. No other change of the schedule is allowed. The scheduled task must be completed. If the model is damaged during the pre-drawn task A or task B the competitor is entitled to change the model for task C of the previous round.

c) Any single round must be completed with the same model, without any change of parts, except the battery and a damaged spinner and / or propeller. Only the addition of ballast (which must be located internally the model) and with which the model must conform to rule E 5.3.1.2. and / or change of angles of setting are allowed.

#### **E 5.3.2.2. Launching / Relaunching**

a) All hand-launches and hand-relaunches (no start carriage and catapult) shall take place in an area as designated by the organiser with provisions made for launching into the wind (see "flying field layout" page 11)

b) The landing for a relaunch has to take place in an area designed by the contest director.

c) For safety reasons it is not allowed to catch the model.

d) The reset of the logger must be done manually; a reset via transmitter is forbidden.

### E 5.3.2.3. Task A-Duration

- a) This task must be completed within twelve (12) minutes from the order of the starter, including the rise time.
- b) The model shall be launched in the direction(s) determined by the contest director. The maximum run-time of the motor is limited to thirty point one (30,1) seconds. One (1) point will be awarded for each full second from the time the motor is switched on to the time the model comes to rest on the defined flying site, up to a maximum of 600 seconds, or each full second of flight within the working time; if the model does not land on the defined flying site the whole flight is zero. No points will be awarded for flight time in excess of working time.
- c) One point will be deducted for each full second flown in excess of 600 seconds.
- d) The "start altitude" is the altitude attained above a ground level reference between the motor is switched on and ten (10) seconds after the motor is stopped.
- 1) The "start altitude" shall be rounded down to the nearest metre.
  - 2) Each metre of the recorded "start altitude" results in a deduction of half (0,5) a second / metre up to 250 metres and three (3) seconds / metre above 250 metres.
  - 3) Where the score is negative (below zero), a zero score will be recorded.
- e) Additional points will be awarded for landing, depending upon distance from the spot marked by the organiser, according to the following table:

| Distance from spot (m) | Points | Distance from spot (m) | Points |
|------------------------|--------|------------------------|--------|
| 1                      | 100    | 9                      | 60     |
| 2                      | 95     | 10                     | 55     |
| 3                      | 90     | 11                     | 50     |
| 4                      | 85     | 12                     | 45     |
| 5                      | 80     | 13                     | 40     |
| 6                      | 75     | 14                     | 35     |
| 7                      | 70     | 15                     | 30     |
| 8                      | 65     | over 15                | 0      |

The distance is measured from the model nose (spinner) when at rest to the centre of the spot; the measured distance is rounded to the nearest higher metre.

No points will be awarded for the quality of landing and if the flight time exceeds 630 seconds.

- f) If a model has not come to rest when the twelve (12) minutes expire, the elapsed time only will be taken into consideration for scoring, without any additional points for the precision of landing.
- g) The motor can be stopped by the pilot or is stopped automatically after 30+0,1 seconds or if the energy-limit of 350+1 Wmin is reached; afterwards the motor can't be switched on again.
- h) Not allowed is to stop the motor automatically at a certain altitude boundary.
- i) A classification based on decreasing number of points awarded will be compiled, called "Partial Score A" - see E 5.3.2.6.

### E 5.3.2.4. Task B Distance

- a) The model shall be launched in the direction(s) determined by the contest director. The time between the motor is switched on and entering the course the first time at Base A in direction to Base B shall be equal or more than forty (40) seconds. The flight is penalised with 300 points if this time is less than forty (40) seconds. The penalty of 300 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. Crossing Base A in the direction to Base B with running motor is penalized with a zero result.
- b) This task must be completed within seven (7) minutes from the order of the starter, including the rise time. The trial begins only after the motor has stopped.
- c) When the model, in flight, first crosses Base A (imaginary vertical plane) in the direction to Base B, the actual flight time of four (4) minutes maximum starts, during which time the model must complete as many legs as possible from the starting Base A to Base B and conversely.
- d) A visual system or a combined audio-visual system announces to the competitor when his model crosses Base A or Base B (imaginary vertical planes). The absence of a signal will indicate that the model has failed to correctly cross the base. The instruments used to check the crossing of the vertical planes must assure the parallelism of such planes. Timing and signalling shall occur when any part of the intact model in flight crosses the base. If an audio-visual system is used, signalling is also valid when the audio system fails.
- e) The models will be identified by flags of different colours for each competitor in the group. When the competitor intends to start his helper waves the flag; when the model is identified by the associated helpers at base A and base B they wave the flag with the corresponding colour as well. At that moment the pilot or his helper can launch the model.

The competitor must stay within a distance of ten (10) metres either side of Base A during the timed flight.

- f) For a model which lands within four (4) minutes flight time only the full 150 metres legs will be counted. For model still in the air when the four (4) minutes flight time or seven (7) minutes expires, whichever comes first, only the completed legs at that moment will be taken into account.
- g) After having completed the task, the model must land on the defined flying-site outside the safety area(s) otherwise the flight is zero.
- h) A classification based on decreasing number of total flown legs during the flight time will be compiled, and points given as described in E 5.3.2.6., thus establishing the "Partial Score B".

#### **E 5.3.2.5. Task C – Speed**

- a) The model shall be launched in the direction(s) determined by the contest director. The time between the motor is switched on and entering the course the first time at Base A in direction to Base B shall be equal or more than forty (40) seconds. The flight is penalised with 300 points If this time is less than forty (40) seconds. The penalty of 300 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. Crossing Base A in the direction to Base B with running motor is penalized with a zero result.
- b) This task must be completed within four (4) minutes, from the order of the starter including the climb time. The trial begins only after the motor has stopped.

The model must start the task at Base A within ninety (90) seconds after the motor was switched on. If the ninety (90) seconds period expires before the model has crossed Base A for the first time, flying from Base A to Base B the flight is penalised with 300 points. The penalty of 300 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.

c) The task consists of flying the distance starting from Base A to Base B, and conversely, four (4) legs in the shortest possible time.

d) The flight time is recorded to at least 1/100 sec when the model in flight first crosses Base A at the predetermined side of the safety-plane and completes four (4) legs of the 150 metres course.

e) An audio system will inform the competitor when the model crosses the Base A or Base B (imaginary vertical planes). The absence of a signal will indicate that the model has failed to correctly cross the Base. The instruments used to check the crossing of the vertical planes must assure the parallelism of such planes. The signal is given when any part of the intact model in flight crosses the base. The source of the signal (horn, loudspeaker) must not be further than thirty (30) metres away from the intersection of base A and the safety plane.

f) During the timed flight the competitor must stay within a distance of ten (10) metres either side from Base A.

g) After having completed the task, the model must land on the defined flying-site outside the safety area(s) otherwise the flight is zero.

h) Model which comes to rest before having completed the task will score zero.

i) During task C the timed flight shall take place to one side of the safety plane, whilst all judges/time-keepers shall remain on the other side of the safety plane. The side which is to be flown shall be indicated by the organisers taking into account the direction of the sun, etc.

The flight will be penalised with 300 points, when sighted by means of an optical aid, the safety plane is crossed or multiple crossed by any part of the intact model. The instrument used to check the crossing of the vertical safety plane must also assure that the safety plane is orthogonal to Base A and Base B. The penalty of 300 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.

j) After the stop of the motor, when the model has crossed Base A flying in the direction to Base B, no further attempt is permitted unless the competitor signals his intention to re-launch before Base A is crossed.

k) A classification based on increasing times to complete the four 150 metres legs will be compiled, and points given as described in E 5.3.2.6., thus establishing "Partial Score C".

#### **E 5.3.2.6. Partial Scores**

a) Partial Score for Task A for each competitor is determined as follows:

$$\text{Partial Score A} = 1000 \times P1 / PW$$

$$P1 \leq 250 \text{ m} = \text{Flight [s]} - 0,5 \times \text{height-start altitude [m]} \text{ (E 5.3.2.3.)}$$

$$P1 > 250 \text{ m} = \text{Flight [s]} - ((250 \text{ [m]} \times 0,5) + (3 \times (\text{height-start altitude [m]} - 250 \text{ [m]}))) \text{ (E 5.3.2.3)}$$

PW = points of the winner in the related group.

b) Partial Score for Task B for each competitor is determined as follows

$$\text{Partial Score B} = 1000 \times D1/DW$$

Where D1 = distance covered by the competitor as for E 5.3.2.4.

DW = distance covered by the winner in the related group.

c) Partial Score for Task C for each competitor is determined as follows

$$\text{Partial Score C} = 1000 \times TW/T1$$

Where T1 = time of the competitor as for E 5.3.2.5.

TW = time of the winner in the related group.

#### **E 5.3.2.7. Total Score**

The competitor's Total Score for each round is compiled by adding the Partial Scores of all tasks.

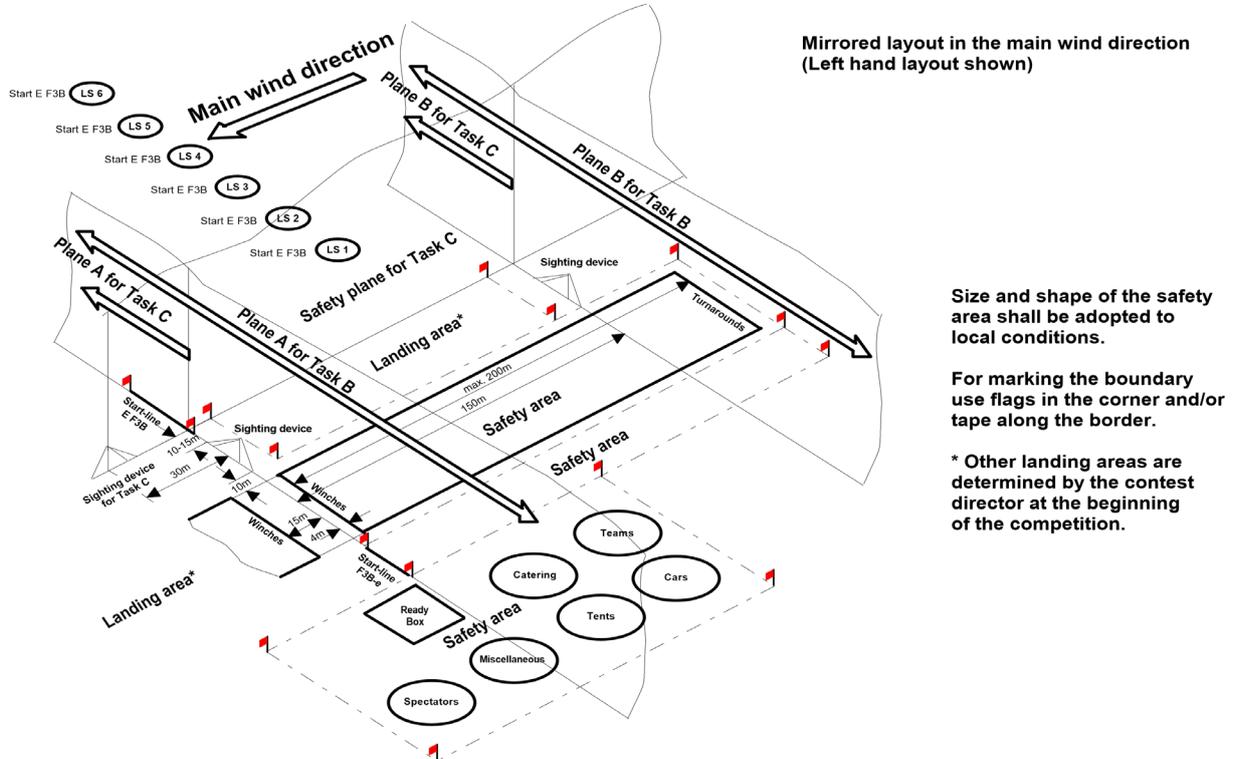
#### **E 5.3.2.8. Classification**

If only five (5) rounds are flown, the competitor's classification is determined by the sum of all Total Scores for each round. If more than five (5) complete rounds are flown the lowest partial score of each task with more than five (5) results is omitted from the sum of all partial scores. To decide the winner when there is a tie, the two (2) (or all who have the equal score) competitors will fly an additional round (duration, distance and speed).

**E 5.3.2.9. Site**

The competition must be held at a site having reasonably level terrain, with a reasonably low probability of slope or wave soaring.

# F3B / E F3B Flying Field Layout



For a combined F3B / E F3B competition the launch of the E F3B models takes place at the “start-line(s) E F3B”.

For an E F3B competition the launch takes place at the “start-line E F3B” (former F3B winch-line).