5.5. AUSTRALIAN RC THERMAL SOARING MODELS

5.5.1. General Rules

5.5.1.1. Definition of a Radio Controlled Glider

Aeromodel which is not provided with a propulsion device and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed, (i.e. not rotating or ornithopter type surfaces). Models with variable geometry or area must comply with the specification when the surfaces are in maximum and minimum extended mode. The models must be controlled by the pilot on the ground using radio control connection. Any variation of geometry or area must be actuated at distance by radio.

5.5.1.2. Prefabrication of the Models

Para B.3.1. of Section 4b (Builder of the Model) is not applicable to this class.

5.5.1.3. Characteristics of Radio Controlled Gliders

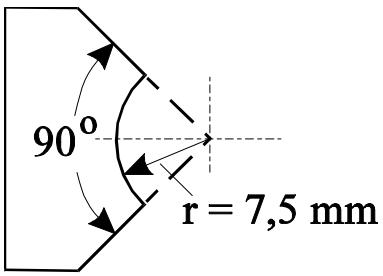
a) Common characteristics:

Maximum surface area (St).....150 dm^2

Maximum flying mass .....5 kg

Loading on the St .....between 12 and 75 g/dm^2

Minimum radius of fuselage nose ….....7,5 mm
(see template)



NOSE TEMPLATE

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

The underside of the model must not have any protuberance other than the towhook and surface control linkages. The towhook must not be larger than 5 mm in frontal width and 15 mm in frontal height.

Any device for transmission of information from the model to the pilot is prohibited.

The competitor may use three models in the contest.

The competitor may combine the parts of the models 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 5.5.2.1.

For the sake of randomness of the starting order among the successive rounds, each competitor must enter two different frequencies, distance of 20 kHz minimum. The competitor can be called to use any of these frequencies during the contest, so long as the call is made at least 15 minutes prior to the beginning of the respective heat. The radio control equipment used must comply with current MAAA regulations and operate at a maximum bandwidth spacing of 20 kHz.

5.5.1.4. **Competitors and Helpers**

The competitor (pilot) must operate his radio equipment personally. Each pilot is permitted four helpers.

5.5.1.5. **Definition of an Attempt and an Official Flight**

a) Attempts

aa) For each task (ref. 5.5.2.1.), during the working time allocated to him, the competitor is entitled to 2 attempts. An attempt starts when the model is released from the hands of the competitor or his helper(s) under the tension of the tow line. No change of model or parts of the model is allowed after starting the first attempt.

ab) 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:

- 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) or, with a launch cable during the process of launching. Should the flight continue in a normal manner, the competitor may demand that the flight in progress be accepted as official, even if the demand is made at the end of the original working time

- His model or launch cable in the process of launch collides with another model or launch cable also in the process of launch (released for flight by the competitor or his helper), or with another model in flight. Should the flight continue in a normal manner, the competitor may demand that the flight in progress be accepted as official, even if the demand is made at the end of the original working time
- His launch cable is crossed or fouled by that of another competitor at the point of launch of his model (released for flight by the competitor or his helper).

- The flight has not been judged by the fault of the judges or timekeepers**.** (If the timing person is supplied by the competitor and there has been a timing malfunction, this will not be grounds for a reflight unless it is brought to the attention of the competition director within 4 minutes of the start of working time and the competitor's flight is immediately abandoned.

- In the case of an unexpected event, not within the control of the competitor, the flight has been hindered or aborted.

  For all cases described above the competitor may demand that the flight in progress in which the event occurred will be accepted as official. Note is made that in the event the competitor continues to launch or does a relaunch after clearing of the hindering condition(s) he is deemed to waive his right to a new working time.

ac) When a competitor obtains a new working time period, and his model has been damaged beyond repair during the attempt where he obtained this new working time, he is entitled to continue flying the current round with his second model, and this notwithstanding rule 5.5.2.1.
This rule applies only when the damage inflicted to the model is directly linked to the incident that gave the right to the reflight.

b) Official Flight

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

c) Additional Attempt - Group Scoring

In case of additional attempts (reflights) during a round, the pilots entitled to that additional attempt must fly within a group that is not complete in number or in one or more groups newly formed. If not possible due to clash of frequencies, those entitled to another flight fly within their group once more. The better of the two results will be the official score except for pilots who are allowed another attempt. For those the result of the repetition is the official score.

5.5.1.6. **Cancellation of a Flight or 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, or conduct not in the spirit of the rules, aimed at affecting the results in a prejudicial manner, in the judgement of the Contest Director, the competitor may be disqualified.

b) The flight in progress is annulled if the model loses any part during the launch or the flight time. The losing of a part during landing (i.e. in contact with the ground) is not taken into account.

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

d) If the model touches either the pilot or his helpers during landing manoeuvres, no landing points will be given.

e) In case of hand or pulley towing the launching device (except the launching cable with or without any device of maximum 5 cm^3 or 5 grams) must not be thrown by the competitor or his helpers, under penalty of cancellation of flight.

f) In case of launching by an electrical powered winch, the upwind turnaround device must be fixed safely to the ground. The flight is cancelled and no further attempt is permitted if the pulley comes loose from its mounting support or the turn around device is torn out of the ground.

g) In the case of launching by an electrically powered winch, the ejection of any part of the winch (excluding parts of the line) during its operation leads to cancellation of the flight, and no further attempt is permitted.

5.5.1.7. Organisation of Starts

The competitors shall be combined in groups with a draw, in accordance with the radio frequencies used, to permit as many flights simultaneously as possible

The composition of the groups must be changed every round in order to have different combinations of competitors. There must be a minimum of four pilots in a group
The result of a group is annulled if only one competitor is not entitled to a new working time. In this case, the group will fly again and the result will be the official result.

A different starting order shall be used for each round.

The competitors are entitled to 5 minutes of preparation time before the starter gives the order to count off working time.

5.5.1.8. Organisation of Contests

For transmitter and frequency control see Section 4b, para B.8.

The official will issue the transmitter to the competitors only at the beginning of their preparation time, according to 5.5.1.7. (This rule may be waived subject to local conditions)

At major, State or National events the CD may set a protest fee. Notice of the fee must appear in all preliminary notices pertaining to the event and may not be set on the day. The fee shall not exceed $20. This fee must be paid before any protest will be considered by the organizers. Protests must be lodged in writing with the protest fee. Protests relating to flying incidents or organizational issues must be lodged within 30 minutes of the incident. Protests with respect to results must be lodged within 72 hours of the results being posted. If the protest is upheld, the fee will be refunded.

5.5.1.9. Safety Rules

The organiser must clearly mark the boundary between the landing area and the area assigned for other business (safety area).

Except in the circumstances described in paragraph 5.5.1.5 a) ab) lines 1, 2, 3, and 5, after release of the model from the hand of the pilot or helper, the contact of the model with any object (earth, car, stick, plant, line, etc.) or a person within the safety area will be penalised. The number of contacts during one flight does not matter (maximum one penalty for one flight). The penalty will be a deduction of 100 points from the competitor's final score and shall be listed on the score sheet of the round in which the contact occurred.

All relevant MAAA and CASA safety directives must be observed. The organizers of major events should seek height clearance of at least 1000 ft.

5.5.2.1. **Definition**

This contest is a duration-task event for radio controlled gliders.
A minimum of four rounds must be flown for National Championships.

5.5.2.2. **Launching**

General

All launching shall take place in an area as designated by the organiser with provisions made for launching into the wind. Unless otherwise specified, all launches will be made with equipment approved by the organiser or Contest Director.

a) The launch of the glider may be one of the following means:

(1) hand towing
(2) electrical powered winch
(3) hand operated pulleys.

b) The total length of the towlines must be as follows:

a(1) Hand towing: line length must not exceed 175 m when tested under a tension of 2 kgf. All of the FAI F3J rules relating to the specification and use of towing equipment for hand towing and the use of hand operated pulleys apply to these rules with the single exception that where reference is made to the distance 150 metres, the equivalent reference to 175 metres is substituted.

a(2) Electrical Powered Winch: line length must not exceed 400 metres. Upwind turn-around devices, which must be used, shall be no more than 200 m from the winch. The height of the axis of the turn-around pulley to the ground must not exceed 0.5 metre. Release of the model must occur within approximately 3 metres of the winch. An automatic means must be provided to prevent line reel from unwinding during launch.

The winch shall meet the following specifications:

a) The winch shall be fitted with a single production starter motor having an internal resistance of at least 15,0 milliohms at ambient temperature corrected to 20 ^{0}C using the formula:
$R(20\ ^0\ C) = R(T)/(1 + 0{,}003\ X\ (T - 20\ ^0\ C)$
where R = internal resistance and T = ambient temperature in degrees centigrade.

The measurement has to be made by a digital storage instrument no less than 150 milliseconds and no more than 200 milliseconds after the test voltage is applied and during which time the motor shall have stopped rotating.

The measurement should be made using the test equipment and procedure shown in Annex 5C of the FAI Sporting Code.

Battery voltage, current flow and voltage at the motor terminals (including any additional adjusting resistor), shall be instantaneously displayed and then recorded to enable calculation of motor internal resistance. The resistance may be attained by adding an external resistor, but the design must not allow any change of total resistance (e.g. by over bridging the resistor). Resistance of any control device does not count.

The rotor of the motor may be fitted at each end with ball or needle roller bearings. Any further change of the original motor will lead to immediate disqualification of the competitor who used it.

b) The drum must have a fixed diameter and the width between winch drum flanges shall be at least 75 mm.

c) The power source shall be a flat plate 12-volt lead/acid battery. The maximum sum of the length, breadth and height of the battery is 625mm (not including mounting or fixing mouldings). No modification to the battery casing is allowed.

The battery must supply the winch motor with current through a magnetically or mechanically actuated switch. The use of any electronic device between the winch motor and the battery is forbidden.
The battery may not be charged on the launching line.

d) The motor must not be cooled, and the battery must not be heated.

e) The purpose of this rule is to prohibit the use of significant energy storage devices other than those mentioned. With the exceptions of the single winch battery, line stretch, and the small amount of energy in the rotating motor and winch drum, no energy storage devices shall be allowed. This includes, but is not limited to, flywheels, springs, weights, and hydraulic or pneumatic devices. The flywheel-like properties of the winch drum shall not be exploited.

c) The towline (which must be of non-metallic material except for linkages) must be equipped with a pennant having a minimum area of 5 dm^2. A parachute (5 dm^2 minimum area) may be substituted for the pennant provided it is not attached to the model and remains inactive until the release of the cable.

d) Launching operations:
(1) Hand towing: After release of the model from the towline the tow ring must be retrieved without delay to the hand reel.

(2) Electrical powered winch: After release of the model from the towline, the towline should be rewound without delay by operating the winch, until the parachute (or pennant) is approximately 10 metres above the ground level. Then, the parachute should be retrieved by hand to the winch. A powered winch must not be operated when the towline:
- is lying on the ground and across other towlines;
- strikes another towline during launching.

During complete rewinding of the line on the winch, the parachute, when used, must be removed and inactivated.

5.5.2.3. **Task**

a) This task must be completed within 12 minutes from the order of the starter, including the towing time. The start signal must be audible at all places along the winch base line.

b) One point will be awarded for each full second from the time the model is free flying to the time the model comes to rest, up to a maximum of 600 points (i.e. 10 minutes maximum), for each full second of flight within the working time; no points will be awarded for flight time in excess of working time. The free flying of the model commences when the model is released from the towline.

c) One point will be deducted for each full second flown in excess of 600 seconds (10 minutes).

d) Additional points will be awarded for landing, depending upon distance from the spot, marked by the organiser, according to the following tabulations:

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 when at rest to the spot (centre of the circle of 15 m radius).

No points will be awarded for the quality of landing.

No landing bonus will be awarded if the flight time exceeds 630 seconds (10 1/2 minutes).

The measured distance is rounded up to the nearest higher metre.

e) For models still in the air when the 12 minutes expire, the elapsed flight time only will be taken into consideration for scoring, without any additional points for the precision landing.

f) A classification based on decreasing number of points awarded will be compiled, called "Partial Score " - see 5.5.2.6.

5.5.2.6. **Partial Scores**

a) For each task the winner of each group receives 1000 points.

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

$$\text{Partial Score} = 1000 \times \frac{P_1}{P_W}$$

Where P_1 = points of the competitor obtained as 5.5.2.3.

P_W = points of the winner in the relating group.

5.5.2.8. **Classification**

If only five rounds are flown, the competitor's classification is determined by the sum of all Partial Scores for each round. If more than five rounds are flown, the lowest Partial Score is omitted. If more than 11 rounds are flown, then the 2 lowest partial scores will be omitted. To decide the winner when there is a tie, a new round will be flown by the tied competitors.

5.5.2.9. **Site**

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

FLYING FIELD LAYOUT
(left hand layout shown)