

***MODEL AERONAUTICAL ASSOCIATION
of AUSTRALIA Inc.***



AUSTRALIAN OFFICIAL RULES

Section 6 - RC Glider Rules

LIST OF CONTENTS

R/C Glider Rules

5.5	Thermal Soaring	3
5.6	R/C Slope Soaring	11
5.7	Limited Electric Glider	14
5.8	Thermal Glider - Multi-Task	17

5.5. AUSTRALIAN RC THERMAL SOARING MODELS

Objective: To provide a man on man contest for competitors flying radio controlled thermal duration soaring gliders. Competitors are organized into groups to fly simultaneously. Each group’s score is normalized to give them meaningful scores irrespective of changing weather conditions during a round.

5.5.1. General Rules

5.5.1.1. Definition of a Radio Controlled Glider

A model aircraft which is not provided with a propulsion device and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed. Model aircraft with variable geometry or area must comply with the specifications in maximum and minimum extended mode. The model must be controlled by the competitor on the ground using radio control. Any variation of geometry or area must be actuated at distance by radio. The use of any onboard-sensed data to automatically move the control surfaces or to modify the aircraft geometry is prohibited.

5.5.1.2. Prefabrication of the Models

The builder of the model rule is not applicable to this class.

5.5.1.3. Characteristics of Radio Controlled Gliders

a) Common characteristics:

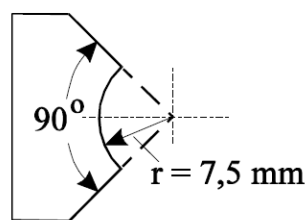
Maximum surface area150 dm²

Maximum flying mass5 kg

Wing Surface L.gbetween 12 and 75 g/dm²

Minimum radius of fuselage nose7,5 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 only exception to this rule is transmission of battery voltage and signal quality is allowed for safety reasons.

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. The parts may be checked by the contest organizer before the start of the contest, should the organizer make it clear this is going to occur.

b) Radio Control and Alternate Frequencies

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. This rule does not apply to pilots utilizing complying 2.4Ghz radio equipment.

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

An attempt begins upon release of the model from the hand of the pilot or helper under the tension of the winch line. There is no limit on the number of attempts during the allocated working time. The pilot is entitled to change models between attempts only after the initial model is safely stationary on the ground

b) Grounds for reflights and working time extension

The competitor is entitled to a reflight with a new working time if:

-his model in flight or in the process of being launched collides with another model in flight or in the process of being launched

-his model in flight or in the process of being launched collides with another competitor's towline

-the competitor's towline is hit by another model in flight or in the process of being launched

-where official timekeepers are in use, the attempt has not been judged by the official timekeeper. Where the timekeeper is a team member of the competitor, this is not grounds for a reflight, unless it is brought to the attention of the contest director immediately and within 4 minutes of the start of working time and the flight is immediately abandoned

-the attempt was hindered by an unexpected event, not within the competitor's control and not considered normal conditions. A crossed line during launch is not considered grounds for reflight.

-a towline from another pilot was not removed after launch and is blocking/covering his own. This specific situation may lead to an extension of working time so as to avoid reflights but still enable a fair attempt at the contest director's discretion.

Claiming a reflight should occur at the time of the incident, with the immediate cessation of the flight in progress once the contest director has ruled upon the claim. The Pilot can choose to accept the flight in progress, but waives the right to a reflight by continuing the flight in progress. A pilot commencing another attempt during the same working time has also waived the right to a reflight.

c) Official Flight

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

d) **Additional Attempt - Group Scoring**

In case of additional attempts (reflights), the pilots entitled to that additional attempt must fly within another group or in one or more groups of at least 4 pilots 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 for those pilots who were not entitled to a reflight but were required to fly again to create the group.

For those pilots claiming a reflight 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 judgment of the Contest Director, the competitor may be disqualified.

b) The flight in progress will be penalised with 100 points if the model aircraft loses any part either during the launch or the flight. The loss of any part in a collision with another model aircraft, tow line 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 penalty was applied.

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

d) If the model touches either the pilot or his helpers during landing maneuvers, 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 cm³ 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 electric 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 turnaround device is torn out of the ground. This will be also penalized by 1000 points

g) In the case of launching by an electric winch, the winch must be firmly fixed to the ground. The ejection of any part of the winch (excluding parts of the line) during its operation or the winch being torn from the ground (defined as pegs no longer being in the ground) leads to cancellation of the flight, and no further attempt is permitted. This will also be penalized by 1000 points.

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 preparation time before the starter gives the order to count off working time. The length of this time shall be at the contest director's discretion and may be timed using a device playing an audio file.

5.5.1.8. **Organisation of Contests**

Standard use of a frequency control board should be enforced. Unauthorized transmission may lead to disqualification

An official may 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**

a) Safety Area

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 b), after release of the model from the hand of the pilot or helper, contact of the model with any object (earth, vehicle, 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. An exception to the safety area rule is that a model landing in the winch lines as a result of a line break at or immediately after release from the hand upon launch shall not be penalized. Flying low over the safety area is to be discouraged by an initial warning by the contest director, and subsequent infringement may also be penalized by 100 points.

b) Safe Winch Launching

Winch part ejection or the winch being torn from the ground or turnaround pull-out is dealt with under 5.5.1.6 cancellation of flight or disqualification.

The winch line shall have no metallic parts. This specifically includes linkages to the parachute or pennant. Non-compliance will attract a 100 point penalty and require correction prior to further flying.

The winch line shall not be able to be pulled completely through the turnaround after launch. This can be achieved either by a restrictive opening in the turnaround or by fitting a non-metallic object to the winch line to prevent this. Pull through of the parachute after launch will be penalised 100 points.

There must be a quick release mechanism on the power lead to the battery in order to remove power from the motor in an emergency. (Connections to the battery must be removable without the need for tools). If slotted pole shoes are used then both of them have to be slotted.

When teams allowing more than 2 helpers per pilot are present, then each pilot shall have one helper present at the turnaround pulley prior to the first attempt of a working time, to prevent and clear any winch line issues which may arise. This is not required for subsequent attempts in the same working time. Failure to have a helper present should lead to delay of the first attempt, or a 100 point penalty. This requirement may be waived by the contest director prior to commencing the event.

2 way radios may be used to enable communication related to safe winch operation and other safety specific aspects. Radios may not be used to communicate flying strategy or conditions. If used for this purpose the flight will be disallowed.

c) General Safety

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

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.

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

- (1) hand towing
- (2) electric winch
- (3) hand operated pulleys.

Tow Line Length

The total length of the towlines must be as follows:

(a) Hand towing: line length must not exceed 150 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.

(b) Electric Winch: line length must not exceed 300 m. Upwind turn-around devices, which must be used, shall be no more than 150 m from the winch. The height of the axis of the turn-around pulley to the ground must not exceed 0.5 m. 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.

Winch Specification

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 deg. 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 at 300 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.

A sticker affixed to the winch indicating prior compliance will be accepted in most circumstances. When testing is to be conducted, the contest organizer shall make pre-event testing possible with equipment giving results within 0.5% of the official test device or devices.

It is allowed to fit the arbor of the rotor with ball or needle roller bearings at each end. The drum can be driven directly by the motor or by a gear with a constant transmission ratio. 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. The use of cylindrical packers, or half cylinder packers held on by bolts, to vary the diameter prior to launch is permitted.

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.

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.

Tow Line

The tow line (which must be of non-metallic material including linkages) must be equipped with a pennant having a minimum area of 5 dm². A parachute (5 dm² 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.

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) Electric winch: After release of the model from the towline, the towline should be rewound without delay at full speed, 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) The attempt will be timed from the moment of release from the line to when:
1. the model aircraft first touches the ground
 2. the model aircraft first touches any object in contact with the ground. Parts of launching devices (tow lines) extending from the ground shall not be interpreted as objects in contact with the ground
 3. The group working time concludes
 4. The timer loses sight of the model
- c) One point will be awarded for each full second the attempt lasts up to a maximum of 600 seconds. For each full second the attempt lasts over 600, one point will be deducted (i.e. 10 minutes maximum)
- d) 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
0.2.....	100	5.....	80
0.4.....	99	6.....	75
0.6.....	98	7.....	70
0.8.....	97	8.....	65
1.0.....	96	9.....	60
1.2.....	95	10.....	55
1.4.....	94	11.....	50
1.6.....	93	12.....	45
1.8.....	92	13.....	40
2.0.....	91	14.....	35
3.....	90	15.....	30
4.....	85	over 15m.....	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 ½ minutes).

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

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 of the landing.

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

5.5.2.4. **Partial Scores**

- a) The winner/s of each group receive/s 1000 points.
- b) Partial Score for each competitor is determined as follows:

$$\text{Partial Score} = 1000 \times (P1/Pw)$$

Where P1 = points of the competitor obtained as 5.5.2.3.

PW = points of the winner in the relating group.

5.5.2.5. **Classification**

The competitor's classification is determined by the sum of all Partial Scores for each round. To decide the winner when there is a tie, a new round will be flown by the tied competitors.



5.5.2.6. **Site**

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

5.6. **SLOPE SOARING MODELS**

5.6.1 **General Rules**

5.6.1.1 **Definition of a Radio Controlled Glider**

Aero model 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 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.

5.6.1.2. **Characteristics**

There are no restrictions on the model except that it must comply with the general FAI limits:

Maximum Surface Area (St)	150 dm ²
Maximum Flying Mass	5 kg
Loading on St	between 12 and 75 g/dm ²

A pilot may fly any number of models during a contest but may not exchange models during working time.

5.6.1.3. A pilot is permitted only one helper.

5.6.1.4. The model may be relaunched during both aerobatic and pylon racing tasks.

5.6.1.5. Flying will normally proceed when the wind velocity is between 8 and 80 km/hr(5 and 50 mph, 2.25 and 22.5 m/s). However, these limits may be varied by the Contest Director depending upon the site and conditions prevailing.

5.6.2. **Rules for Slope Soaring Contests**

5.6.2.1. The contest is a two task event for radio controlled gliders, specifically:

- 1) pylon racing, and
- 2) aerobatics.

Flying the two tasks constitutes a round. A minimum of two rounds must be flown.

5.6.2.2. **Task One - Pylon Racing**

- a) **Course.** The course is to be a nominal 100 metres with fifteen full laps to be flown.
- b) **Start.** A "sail boat" type start will be used with one minute to gain height and a countdown for the last ten seconds before racing and timing starts.

- c) There will be a working time of five minutes from the order to "race". Those models, whether air-borne or not, that have not completed the course at the end of the working time will be allocated a notional time of

$$5 \times \frac{15}{\text{No. of full laps flown}} \text{ minutes}$$

If no model completes the 15 laps within the working time, the heat will be reflowed.

- d) In the event of a mid air collision, the heat may be reflowed if a claimant signifies this intention immediately. The re-fly will take place as soon as possible but not before the start of the following round.

Note: Models may be replaced within a round only in the event of a mid air collision.

5.6.2.3. Task Two - Aerobatics

- a) Manoeuvres are to be flown in the order presented in these rules and only those completed within seven minutes of launch time will be scored. The pilot must announce the start of each manoeuvre. The Contest Director may modify or delete manoeuvres in adverse conditions. The optional manoeuvre (see list) must be nominated to the judges prior to the launching of the model.
- b) There will be at least two judges. If possible, two models will share the same time slot, alternating manoeuvres where practicable.

Note: It shall be left to the discretion of judges and Contest Director as to whether flying conditions are unsuitable for continuation of an aerobatic flight. A flight aborted under these circumstances may be continued when conditions improve. The time allowed for completion shall be the unexpired working time when the pilot receives the judges' decision plus one minute for gain of height.

5.6.2.3.1. Manoeuvres	K Factor
1. Two consecutive inside loops	1.0
2. Single axial or barrel roll	1.0
3. Inverted flight (5 seconds)	1.0
4. Three turn spin	1.0
5. Two stall turns (opposite directions)...	1.0
6. Optional manoeuvre (to be nominated from list below)	
- two outside loops	1.5
- four point roll	2.0
- three consecutive rolls	1.5
- inverted spin	2.5
- cuban eight	2.0
- inverted circle	1.5
7. Touch and Go	0.5
8. Rectangular pattern	0.5
9. Rectangular approach and landing	0.5

5.6.2.4. **Scoring**

- a) **Pylon.** Individual round scores will be calculated according to the following formula:

$$S = 500 \times \frac{(T_W + T_H)}{T_I}$$

where:-
 T_W = time achieved by overall winner of that round
 T_H = time achieved by overall winner of that heat
 T_I = time achieved by competitor in that heat

i.e. the overall round winner is awarded 1000 points.

- b) **Aerobatics.** All manoeuvres will be scored from 1 to 10 with multiplying K factors as shown. The flier with the highest total score is awarded 1000 points with other scores pro-rata from this.

- 5.6.2.5. **Classification.** The average of the competitors score for the pylon rounds is added to the average score for the Aerobatic rounds to provide an overall score.

5.7 LIMITED ELECTRIC GLIDER

5.7.1 Definition of Electric Powered Model Aircraft

Model aircraft in which lift is generated by aerodynamic forces acting on surfaces remaining fixed in flight except control surfaces and which performs manoeuvres controlled by the pilot on the ground, using radio control. The power pack for the electric motor may not have any fixed connection to the ground or another model aircraft in the air.

5.7.2 Builder of the Model Aircraft

Builder of the Model aircraft rule is not applicable to limited electric glider.

5.7.3 General Characteristics of RC Electric Powered Model aircraft

Maximum total area 150 dm²
Maximum weight 5 kg
Loading 12 to 75 g/dm²

5.7.4 Flight pack

The Flight Pack must consist of one of four chemistries with the following maxima:

- a. Up to seven (7) Nicad or NiMH cells
- b. LiPo cells up to 6600 cell-mAH max
- c. LiIon cells up to 10,000 cell-mAH max

Examples of permitted Flight Packs:

- 2S 3300, 2S 3200 mAH Lipo
- 3S 2200, 3S 2170 mAH Lipo
- 4S 1600, 4S 1500 mAH Lipo
- 5S 1200 mAH LiPo
- 4S 2300 mAH Li Ion (A123 cells)
- 7 * GP 3700, GP 2200, IB 4200 (or any other) NiMh
- 6 * any NiMH cells etc.

5.7.4.1 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.

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

5.7.6 Competitor and Helper

Each competitor must operate his radio equipment personally. Each competitor is permitted two helpers

5.7.7 Event definition:

The contest is for R/C Electric powered Motor Gliders.

It includes the following tasks:

- a] Duration, and
- b] Landing.

A minimum of two flights must be flown to constitute a contest.

5.7.8 Organization

5.7.8.1 The organisers shall provide five concentric circles of 3, 6, 9, 12 and 15 metre radius for the landing for each competitor in a heat. (the use of a “spot” and a measuring line to determine the distance the nose of the model is from the landing spot)

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

5.7.8.3 When a competition is in progress, only the pilots, their helpers and any officials should be on the flight line.

5.7.9 Scoring:

5.7.9.1 Where possible the organizers will use “man on man” or normalized scoring. The winner of each heat will receive 1000 points and each of the other competitors in that heat will receive a score calculated as shown:

$$\text{Normalized Score} = \frac{\text{Competitor's Flight score} \times 1000}{\text{Winner's flight score}}$$

where the Winner's flight score is the highest flight score achieved in the heat in which the competitor flew and the competitor's flight score is defined in 5.7.12

5.7.9.2 If normalized scoring is used then the organizers shall endeavour to organise the flight order (draw) so that over the event each competitor will fly against as many of the other competitors as is possible within the constraints of the frequencies used and the number of rounds being flown. (Organisers should note that the larger the number of competitors in each heat, the better this objective will be achieved.)

5.7.9.3 If more than two flights are flown, the lowest normalized score (*or flight score if normalized scoring is not used) of each competitor shall be discarded and the remaining normalized scores (*) added to obtain the final score, which will determine the competitor's position in the final classification.

5.7.9.4 In order to decide the winner when there is a tie, the discarded flight shall be taken into account.

5.7.10 Launching:

5.7.10.1 Before launching, the competitor shall show his timekeeper how the transmitter operates the motor control [on, off].

5.7.10.2 The model, with motor running, is released or thrown into flight directly from the hand(s) of the pilot or his helper without assistance.

5.7.10.3 The model shall not be launched from a height greater than the flier's normal reach above the ground.

5.7.11 Duration and Landing Task:

- 5.7.11.1 The objective of the duration task is to achieve a flight with a duration time of exactly 300 seconds.
- 5.7.11.2 The pilot has complete discretion over the motor's use subject to 5.7.10.2. The pilot must announce the switching on and switching off of his motor to the time keeper with the words "on" and "off"
- 5.7.11.3 The timekeeper recording the duration time shall:
 - a. Start the duration watch when the model is launched
 - b. Stop the watch when the model comes to rest.
- 5.7.11.4 The duration time is recorded as the minutes and completed seconds on the duration watch. (5.7.11.3)
- 5.7.11.5 The duration points are calculated by awarding one point for each full second the model is flying, up to 300 seconds and deducting one point for each full second flown in excess of 300 seconds. eg. A flight time of 5min 05sec or 305 seconds will receive 295 duration points.
- 5.7.11.6 The timekeeper recording the motor run (which may be the same person as in 5.7.11.3 above) will start their motor watch when the model is launched. They will stop their motor watch when the motor is switched off. The watch is started again each time the motor is started and stopped when the motor is turned off again.
- 5.7.11.7 Motor run time is cumulative. One point will be added for each full second that the motor is running.
- 5.7.11.8 Additional points will be awarded for the landing. The distance from the landing spot to the nose of the model is measured and points are awarded as follows:

Distance from the spot marker	Additional points awarded
Up to 3 metres	25 points
Over 3 and up to 6 metres	20 points
Over 6 and up to 9 metres	15 points
Over 9 and up to 12 metres	10 points
Over 12 and up to 15 metres	5 points

- 5.7.11.9 No landing points are awarded if the:
 - 5.7.11.9.1 Landing occurs more than 330 seconds after starting the task.
 - 5.7.11.9.2 The model aircraft touches either the competitor or his helper.
- 5.7.12 The Flight Score is calculated by subtracting the motor run points (5.7.11.7) from the duration points. (5.7.11.5) and then adding the landing points (5.7.11.8)
- 5.7.13 The flight is given zero points if:
 - 5.7.13.1 The pilot uses a model aircraft not conforming with the rules. In the case of intentional or flagrant violation of the rules, in the judgment of the Contest Director, the competitor may be disqualified.

- 5.7.13.2 The model aircraft loses any part during the duration time. However, the losing of a part during landing (i.e. after contact with the ground or an other obstacle) or during the flight due to a collision with another model is not taken into account
- 5.7.13.3 The model aircraft was previously used by another competitor at the same contest.
- 5.7.13.4 The pilot uses more than two helpers
- 5.7.13.5 Any part of the model aircraft does not come to rest and remain at rest within 100 metres from the landing spot.
- 5.7.13.6 The model aircraft used a power source that was not compliant with 5.7.4.1.
- 5.7.13.7 The model aircraft is controlled by anyone other than the competitor.

5.8. THERMAL SOARING MULTI-TASK
[Australian Rules]

5.8.1. GENERAL RULES

5.8.1.1. 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 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.

5.8.1.2. Prefabrication of the Models

Permitted: Models which are assembled by the builder from prefabricated parts, and in which the builder installs the equipment.

Not Permitted: Models which are completely fabricated and require only a few minutes of unskilled effort for their completion or complete ready to fly models which have been built by a person other than the pilot.

5.8.1.3. Characteristics of Radio Controlled Gliders

a) Common Characteristics

Maximum surface area (St) 150 dm²
Maximum flying mass 5 kg
Loading on the St .. between 15 and 75 g/dm²
Minimum radius of fuselage nose 7.5 mm

b) The radio shall be able to operate simultaneously with other equipment at 20 KHz spacing.

Any device for the retransmission of information from the model to the pilot is prohibited.
The competitor may use two 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.

5.8.1.4. **Competitors and Helpers**

The competitor (pilot) must operate his radio equipment personally. Each pilot is permitted four helpers who must not give any turn signals near Base B during the speed task.

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

a) **Attempts**

For each task [refer 5.8.2.1.] during the working time allocated to him, the competitor is entitled to an unlimited number of attempts. An attempt starts when the model is released from the hands of the competitor or his helper(s) under the tension of the towline. No change of model or parts of the model is allowed after the starting the first attempt.

b) **Official Flight**

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

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, or his model or launch cable during the process of launching, collides with another model in flight or with another model in process of launching (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 normal working time.
- His launch cable is crossed or fouled by that of another competitor prior to the launch of his model (release for flight by the competitor or his helper).
- the flight has not been judged by the fault of judges or time-keepers.
- in the case of an unexpected event, duly witnessed by the official judges or timekeepers, the flight has been hindered or aborted.

For all of these conditions, the competitor may demand that the flight in progress in which the event occurred be accepted as official. Note is made that, in the event that the competitor continues to launch (he relaunches after clearing the hindering conditions), he is deemed to have waived his right to a new working time.

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 5.8.2.1.. This rule applies only when the damage inflicted to the model is directly linked to the incident that gave the right to the reflight.

c) **Additional Attempts - Group Scoring**

In the case of additional attempts in the Duration task, the pilot(s) 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 this is not possible due to a clash of frequencies, those entitled to another flight must 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 them, the result of the repeat flight is the official score.

5.8.1.6. Cancellation of a Flight or Disqualification

- a) Unless otherwise specified, a flight will be annulled for any 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 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 the contact with the ground) is not taken into account.
- c) The flight in progress is annulled if the model is controlled by anyone other than the competitor.
- d) If the model touches either the pilot or his helper during the landing manoeuvres of the Duration tasks, no landing points will be given.
- e) In case of hand or pulley towing, the launching device must not be thrown by the competitor or his helpers under penalty of cancellation of the flight.
- f) In the 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 turnaround device is torn out of the ground.

5.8.1.7. Organisation of Starts - Duration Tasks

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

There must be a minimum of three pilots in a group and the composition of the groups must be changed in every round in order to have different combinations of contestants.

The flying order of the groups is also established with the draw. A different starting order shall be used for each round.

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

5.8.1.8. Organisation of Contests

For transmitter and frequency control, see 2.8. (Chapter 1).

5.8.2. Rules for Two Task Thermal Soaring Contest.

5.8.2.1. Definition.

This contest is a multi-task event for radio-controlled gliders, which includes two tasks: viz

- I] Duration, and
- II] Speed.

The combination of tasks I and II constitutes a round. A minimum of two rounds must be flown. At the discretion of the organiser, either task may be flown first in a scheduled round.

Any single round must be completed with the same model, without any change of parts. Only the addition of ballast (which must be located internally in the model and with

which the model must conform to 5.8.1.3.) and/or change of angles or settings are allowed.

Variation of geometry or area is allowed if actuated at distance by radio control.

5.8.2.2. **Launching.**

All launching shall take place in an area designated by the organiser with provision made for launching into the wind.

- a) The glider may be launched by one of the following means:
 - 1) hand towing;
 - 2) powered winch;
 - 3) hand operated pulleys.
- b) The total length of the towlines must be as follows:
 - a(1) Hand towing: must not exceed 175 metres when tested under tension of 2 kgf.
 - a(2) Electrical powered winch: line length must not exceed 400 metres. Upwind turnaround devices, which must be used, shall be no more than 200 metres from the winch. Release of the model must occur within approximately three metres of the winch. An automatic means must be provided to prevent the line reel from unwinding during the launch.

The winch shall meet the following specifications:

- a) the winch shall be fitted with a single motor having a body diameter not exceeding 140 mm and body length not exceeding 215 mm.
 - b) the width between the winch drum flanges shall not be less than 75 mm.
 - c) the power source shall be a single 12 volt lead/acid battery having linear dimensions such that the sum of length, width and height (excluding mounting lugs) does not exceed 750 mm.
- a(3) Hand operated pulleys: must not exceed 175 metres when tested under tension of 2 kgf. One end of the towline must be attached to the ground during the launch.
- c) Except for linkages, the towline must be of non-metallic material and must be equipped with a pennant or parachute having a minimum area of 5 dm².
 - d) **Launching Operations**
 - 1) Hand towing: After release of the model from the towline, the tow ring should 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 pennant or parachute is approximately ten metres above ground level.
A powered winch must not be operated when its towline
 - is lying on the ground or across other towlines;
 - strikes another towline, during launching.

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

5.8.2.3. **Task 1 - Duration**

- a) This task must be completed within 9 minutes from the order of the starter, including the towing time.
- 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 360 points (i.e. six 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 360 seconds (six minutes).
- d) Additional points will be awarded for landing, depending upon distance from the spot marked by the organiser, according to the following tabulation:

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 metre radius).

No points will be awarded for the quality of landing.

No landing bonus will be awarded if the flight time exceeds 390 seconds (6.5 minutes).

The measured distance is rounded up to the nearest metre.

- e) For models still in the air when the nine minutes expires, the elapsed flight time only will be taken into consideration for scoring, without any additional points for precision landing.
- f) A classification based on decreasing number of points awarded will be compiled, called "Partial Score 1". See 5.8.2.5.

5.8.2.4. **Task 2 - Speed**

- a) This task must be completed within four minutes from the order of the starter, including towing time.
- b) The task consists of flying the distance starting from Base A to Base B and returning to Base A in the shortest possible time. This represents a total distance of 300 metres.
- c) The flight time is taken in tenths of a second when, in gliding flight, the model first crosses Base A in the direction of Base B and completes two laps of the 150 metre course.
- d) A flagman or audio system announces to the pilot when the model crosses a Base (an imaginary vertical plane). The absence of a signal will indicate that the model has failed to cross the base correctly. Turning or flagging shall occur when the nose of the model crosses the Base.
- e) During the timed flight, the pilot must stay within a distance of 10 metres either side of Base A.
- f) After having completed the task, the model may land anywhere.
- g) Models which come to rest before having completed the task will receive zero score.
- h) During the Speed Task, the timed flight shall take place to one side of the safety line, whilst all of the judges/timekeepers shall remain on the other side of the safety line. The side on which the model is to be flown shall be indicated by the organisers who shall take into account the position of the sun Etc.
The flight is to be annulled if, when sighted by means of an optical aid, the safety line is crossed by any part of the model.
- i) After release of the tow hook, when the model has crossed Base A for the first time, flying in the direction from Base A to Base B, no further attempt is permitted, unless the competitor signals his intention to relaunch before Base A is crossed.
- j) A classification based on increasing times to complete the two 150 metre laps will be compiled and points given as described in 5.8.2.5., thus establishing "Partial Score 2".

5.8.2.5. **Partial Scores**

- a) For Task1 - Duration. The winner in each group receives 1000 points. For Task 2 - Speed. The winner receives 1000 points.
- b) **Partial Score 1 for each competitor is determined as follows:**

$$\text{Partial Score 1} = 1000 \times \frac{P_1}{P_w}$$

where P_1 = points of the individual competitor.

and P_w = points of the winner of related group.

Partial Score 2 for each competitor is determined as follows:

$$\text{Partial Score 2} = 1000 \times \frac{T_w}{T_1}$$

where T_1 = time of the individual competitor
and T_w = time of the winner of the Speed Task.

5.8.2.6. Total Score

For each round, the total score is compiled by adding Partial Scores 1 and 2 for each competitor.

If five rounds or more are flown, the lowest round score is cancelled.

To decide the winner when there is a tie, a whole round (two tasks) is repeated.

5.8.2.7. Sites

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