

NZMAA FLYING RULES

Section 5: Soaring

Updates and Alterations

Date	Paragraph	Change
Feb 2006	Preface F3B	F3B Notes changed.
Feb 2006	2.6 & 3.10	Thermal R.E.S. no longer provisional
Feb 2007	Annex A, 3.3	Allowing use of alternate matrixes
Feb 2007	3.8.3	Hand-launch tasks
Feb 2007	Class E2	Thermal Electric Precision Deleted
Feb 2007	3.5.3.4 EPD	Clarification for NDC
Feb 2007	FAI F3F	Clarification for NDC
July 2008	Preface F3J	Add clause c)
July 2008	Preface F3F	Further clarification for NDC
July 2008	2.7 FAI Classes	Add F3K Hand Launch Glider
July 2008	3.8.1	Edit a & d, Add e thru n
July 2008	3.8.3	Upgrade the NDC format. Rewrite b, c & d
Jan 2009	F3B Preface	Clarification for F3B winch line length
Jan 2009	F3B Preface	Deletion rule b) be as only 150m line should be used for F3J
Jan 2009	2.3.2 Timing	Change of rule to complete timing
Jan 2009	2.3.4 Timing	Add new rule for safety and clarification
Jan 2009	3.5.3 Class E2	Rule change to incorporate new battery chemistry
Jan 2009	3.5.4 Speed 400	Rule change to incorporate new battery chemistry
Jan 2009	3.11 Class L	Add NZ Class L; Dynamic soaring
Jan 2009	2.2.4	Move pulley tow rules into launching rules
Jan 2009	2.2.2 d (i)	Change to F3J rules
Jan 2009	2.2.2 d (ii)	Addition to rule noting single towman
Mar 2010	2.4.4	Precision Landing points changed to FAI F3J table
Mar 2010	2.4.5	Precision Landing points exception for NDC
Jan 2013	2.2.2 c (i) & (ii)	Line length reduced to 300m except RES & 2m
Jan 2013	2.4.4	Remove NDC exception & add "for Gliding"
Jan 2013	2.4.5	Deleted Table for NDC Landing. Add Landing Table for Electric events
Jan 2013	2.6	Add Electric Classes M, N & O
Jan 2013	3.2.3 d, e & f	Clarify requirement of NDC fly-off
Jan 2013	3.13 Class M	Add NZ Electric Class M; ALES 200
Jan 2013	3.12 Class N	Add NZ Electric Class N; ALES 123
Jan 2013	3.14 Class O	Add NZ Electric Class O; X5J
Feb 2013	PREFACE	Added F3K NDC format - Provisional
Feb 2013	3.13.7	Added NDC format - Provisional
Feb 2013 ^{12th}	2.8	Added 2.8 Altitude Limiters - Provisional
Feb 2013 ^{12th}	3.13.6	Added reference to 2.8 - Provisional
April 2014		Removed Provisional status F3K NDC, 3.12.7 NDC format, 2.8 & 3.12.6
April 2014	3.15 Class P	Add NZ Electric Class P: Radian

NZMAA FLYING RULES

Section 5: Soaring

PREFACE

This Section details all New Zealand designed Soaring competitions. Refer to the Section 1 (General Competition Rules) for general contest and flying rules.

For international contest classes refer to the FAI Sporting Code. New Zealand variations of the international rules are detailed below.

F3J

- a) All references to national teams, team managers etc. do not apply.
- b) Winches may be used. The turnaround to winch distance should be 150m. Consideration must be given to the field so that winch lanes can be formed. The use of winches should be advertised prior to the event taking place. Winches must conform to the specifications as detailed in the New Zealand general soaring rulebook, section 5.2.2

F3B

- a) All references to national teams, team managers etc. do not apply.
- b) Launch equipment used by competitors for F3B contests held within New Zealand is to meet the specifications as detailed in the New Zealand general soaring rulebook; section 5.2.2 with the exception the Line length must not exceed 400metres. Upwind turn around devices, which must be used, shall be no more than 200m from the winch.

F5B

From 1 Dec 03, this event will be flown to FAI rules.

F3F

For NDC Competitions at least 3 rounds should be flown with the best 3 to count towards the final score.

F3K

- a) All references to national teams, team managers etc. do not apply.
- b) For NDC Competitions, Fly tasks B, D, G & H only. Total is sum of raw scores.
- c) Tasks are from the FAI Sporting Code Section 4 Aeromodelling Volume F3 Radio control Soaring Model Aircraft NOT NZ Class I.

1 GENERAL DEFINITIONS

1.1 DEFINITIONS

Glider / Sailplane: An aeromodel which is not provided with a propulsion device and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed, (ie. not rotating or ornithopter surfaces). Models with variable geometry or area must comply with the specifications when the surfaces are in the maximum and minimum extended mode. The pilot on the ground using radio control must control the model. Any variation of geometry or area must be actuated at distance by radio control.

1.2 CHARACTERISTICS

Maximum surface area	150 dm ²
Maximum flying weight	5 kg
Maximum wing loading	75 g/ dm ²
Minimum wing loading	12 g / dm ² (3.932oz/ft ²)
Minimum radius of fuselage nose	7.5 mm

(See Rule 3.8.1 for characteristics applying only to HL Gliders)

1.3 RADIO CONTROL TRANSMITTER.

The radio equipment must be operated on an NZMAA approved frequency and be an approved telecontrol device. No device for transmitting information from the sailplane to the pilot is permitted.

1.4 NUMBER OF MODELS, OWNERSHIP AND OPERATION.

- 1.4.1 Unless otherwise specified in class rules, the competitor may use a maximum of two models in a contest and may combine any parts of the models provided the resultant complies with the required characteristics of 1.2.
- 1.4.2 The competitor must own the model(s) flown, but is not required to have built them.
- 1.4.3 A model may be flown in a contest by only one competitor.

1.5 BALLASTING

Ballast may be removed or fitted between flights provided that the model complies with the required characteristics and provided also that the ballast is fitted internally.

1.6 OFFICIAL FLIGHT

There is an official flight when the model has left the hands of the competitor or his helper under the pull of the launching apparatus. Unless otherwise specified there will only be one official flight per round in contests flown to rounds.

- 1.6.1 Repeat Attempt. *(Applies to all NZ tow launched classes except Premier Duration.)*
A flight may be repeated only if:

- (a) The model being launched or its launching cable collides with another model in flight, with another person at launch, strikes another launching cable, or is affected by proven radio interference. In these circumstances, should the model continue its flight, the competitor may take the flight as official even if the decision is made at the end of the attempt.
- (b) The flight was not judged correctly by the timekeeper.
- (c) The launching system malfunctions (including line break). (A repeat attempt is not permitted for early disengagement from the launching cable).
- (d) A model lands without becoming detached from the launching system.

Note 1. A repeat attempt is not allowed in a case where the timekeeper makes an error in counting down the time to assist the pilot; there is no obligation for the timekeeper to provide such a service.

Note 2. A repeat attempt is not allowed where the pilot has not asked the timekeeper(s) to verify the stopwatch(es) have been started when the parachute/pennant is seen to drop from the sailplane.

Note 3. Repeat attempts are permitted no more than once for each official flight, except (and only for) the circumstances detailed in 1.6.1 (a). Should a 1.6.1 (a) occurrence take place during a repeat attempt then the repeat attempt may be taken again.

Note 4. In contests flown to rounds, the repeat attempt must take place in the same round as the original attempt.

1.7 FLIGHT ANNULMENT

A flight will be annulled and no repeat attempt permitted if:

- (a) A competitor's model does not conform to the rules.
- (b) A model loses any part during launch or flight (the losing of a part on landing is permissible).
- (c) A flight is made when the competitor is not adhering to the frequency control system in use for the contest.

1.8 TRANSMITTER CONTROL

- 1.8.1 Transmitters must not be operated without adherence to the frequency control system being used. Transmitter pounds must be available for storage of transmitters where there is more than one person on the frequency. All transmitters at the contest site must be kept in a pound when not in use. The onus is on the competitor to return the transmitter to the pound. Where there is no frequency conflict, the transmitter and peg may be retained for the contest and the requirement to use the pound may be waived by the CD. A personal peg must be inserted in the space from which the frequency peg has been removed.

2 SOARING (All Classes)

2.1 THERMAL SOARING

Thermal soaring is flight over reasonably level terrain with a low probability of slope or wave lift. For thermal sites with adjacent hills, structures, or objects from which updraft can be generated, the CD may impose flight restrictions to preclude the use of lift off such features. Such restrictions must be announced at the contestants meeting.

2.2 LAUNCHING

(See individual classes for launch types permitted.)

2.2.1 General.

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

- (a) Hand towing
- (b) Electrical powered winch
- (c) Hand operated pulleys
- (d) Bungee

2.2.2 Launch apparatus shall conform to the following specifications:

- (a) Towline: The towline (which must be of non-metallic material except for 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.
- (b) Hand towing:
 - (i) Line length must not exceed 175metres when tested under a tension of 2 kg.
 - (ii) The line must be attached to a device that allows immediate retrieval following release of the model
- (c) Electrical Powered Winch:
 - (i) Line length must not exceed 300 metres except with RES & 2m models flown in open competitions where line lengths must not exceed 400 metres.
 - (ii) Upwind turn around devices, which must be used, shall be no more than 150m from the winch except with RES & 2m models flown in open competitions where the turn around device shall be no more than 200m from the winch.
 - (iii) The height of the axis of the turn-around pulley to the ground must not exceed 0.5 metre.
 - (iv) Release of the model must occur within approximately 3 metres of the winch.
 - (v) An automatic means must be provided to prevent the line reel from unwinding during launch.

The winch shall meet the following specifications:

- (i) 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 degrees C using the formula:

$$R \text{ corrected} = \frac{R \text{ ohms} \times T}{1 + [0.003 \times (T - 20 \text{ deg C})]}$$

where: R = internal resistance and T = ambient temperature in degrees C.

- (ii) The resistance may be attained by adding an external resistor, but the design must not allow any change of the total resistance (eg. by overbridging the resistor). Resistance of any control device does not count.
- (iii) 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.
- (iv) The measurement is made using the test equipment and procedure shown in the STC winch testing operating manual. NZ test gear is held by the STC.
- (v) All winches used at National competitions (except NDC) must be tested and certified by an STC approved person.
- (vi) At national events the organisers may randomly test any winch at anytime to check compliance with the above standard.
- (vii) The drum must have a fixed diameter and the width between winch drum flanges shall be at least 75 mm.
- (viii) The power source shall be a single 12 volt lead/acid battery having linear dimensions so that the sum of the length, breadth, and height (excluding mounting lugs) does not exceed 750mm.
- (ix) 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.
- (x) The motor must not be cooled, and the battery must not be heated.
- (xi) 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, fly wheels, springs, weights, and hydraulic or pneumatic devices. The flywheel-like properties of the winch drum shall not be exploited. The purpose of this rule is to prohibit the use of significant energy storage devices other than those mentioned.
- (xii) The specifications for pegs to be used for securing winches and turnarounds are as follows -

a) Winches -

A minimum of 2 pegs manufactured from steel with a minimum 8mm diameter must be used to secure the winch to the ground. The pegs securing the winch to the ground must pass through part of the winches frame or legs and engage with the ground a minimum of 300mm.

b) Turnarounds -

A minimum of 2 pegs manufactured from steel with a minimum diameter of 10mm must be used to secure the turnaround to the ground. The pegs securing the turnaround must be engaged with the ground a minimum of 400mm. It is suggested that more or longer pegs may be necessary if the ground is particularly soft. The point of attachment for the turnaround guide ropes/chains etc to the pegs is to be no more than 50mm above ground level.

Pegs that meet this rule are generally available from most camping/tenting shops at minimal cost. Should you have difficulty finding a source in your local area, contact the STC for assistance.

Contest Director's/Clubs are directed to enforce that winches/turnarounds not secured in accordance with this rule are not permitted to be used for sport flying or competition.

(d) Hand Operated Pulleys:

(i) Two man Pulley tow is permitted in accordance with current F3J rules.

(ii) Reflex pulley tow.

Line length shall not exceed 350 metres when tested under a tension of 2kg. One end of the line will be staked to the ground, the line will then run no more than 175 metres into wind to a fixed turn-around and then back to the parachute/pennant and towman standing next to the staked end of the winch line. The towman may use a single pulley. Note only one Tow person is allowed.

(iii) Lines may be required to be recovered as directed by the contest director.

(e) Bungee:

30 metres maximum of rubber, 120 metres maximum of line, plus a parachute or pennant and 30cm maximum of leader line. Maximum pull on the bungee before release not to exceed 5kgs.

A minimum of 2 pegs manufactured from steel with a minimum diameter of 10mm must be used to secure the bungee to the ground. The pegs securing the bungee must be engaged with the ground a minimum of 400mm. It is suggested that more or longer pegs may be necessary if the ground is particularly soft.

2.2.3. Launching Operations.

(a) Hand towing:

After release of the model from the towline, the towline must be retrieved without delay and wound in to the handreel.

- (b) 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 10metres above the ground level. The parachute should be retrieved by hand to the winch. A powered winch must not be operated when the towline :
 - (i) is lying on the ground and is across other towlines;
 - (ii) strikes another towline during launching.
- (c) The penalty for not winding down the winch line as above will be 100 points deducted from the score for that round (after normalising if normalised scoring is being used). The C.D. may exempt a competitor from the penalty if he is satisfied that compliance was prevented by winch malfunction or another competitor(or his helper or equipment.) During complete rewinding of the line on the winch, the parachute, when used, must be removed or de-activated. The line must be suitably marked (e.g. electrical tape) to facilitate winding the line down.

2.2.4. Pulley Tow

- (a) In thermal soaring events flown under NZMAA Rules, and when launching is by pulley or by reflex pulley tow, the towline shall be anchored to the ground by a method following:

Either 1)
A steel peg at least 10mm in diameter and at least 305mm long is driven into the ground through the centre link of a steel chain 610mm long. A steel peg of the same specifications as that securing the centre link secures each of the splayed ends of the chain at an angle of approximately 120° to the line of load. The end of the towline is to be securely attached to one of the links adjacent to the centre link;

Or 2)
Any method of demonstrably equal or greater security formally approved by the Soaring Technical Committee.
- (b) In events such as F3B and F3J, FAI rules rules for towline anchoring shall apply.

2.3 TIMING

- 2.3.1 Timing of the flight commences when the parachute/pennant is seen to drop from the sailplane.
- 2.3.2 Timing of the flight shall finish when the sailplane first touches the ground or a ground based object.
- 2.3.3 Models already in the air and being timed at the completion of the round, may complete that flight and landing.
- 2.3.4 If the sailplane comes into contact with a person during the flight and before the model comes to rest during landing then NO landing points will be awarded.

2.4 LANDING

- 2.4.1 An in-flight sailplane has right of way over a launching sailplane.
- 2.4.2 In contests requiring precision (spot) landings, the pilot and timekeeper must stand upwind of the landing spot, moving to this point as soon as practical after launch.
- 2.4.3 Models are to be scored and retrieved by the pilot / timekeeper with haste and caution so as not to impede the landing approach of other sailplanes. (See clause 2.4.4.).
- 2.4.4 Precision Landings for Gliding events
The following applies to classes that call for precision landings. Bonus points are awarded depending on the distance from the model nose at rest to the centre of a 15m radius circle. The measured distance is according to the following table.

Precision Landing Scoring:

Distance from centre (metres)*	Bonus	Distance from centre (metres)*	Bonus
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 15	Nil

2.4.5 Precision Landings for Electric Events

The following applies to Electric soaring classes that call for precision landings. Bonus points are awarded depending on the distance from the model nose at rest to the centre of a 10m radius circle. The measured distance is rounded to the next full metre according to the following table.

Precision Landing Scoring:

Distance from centre (metres)*	Bonus	
1	50	
2	45	
3	40	
4	35	
5	30	
6	25	
7	20	
8	15	
9	10	
10	5	
Over 10	0	

* Next full metre distance.

2.5 CONTESTS

2.5.1 Contestants Meeting.

At every contest the Contest Director will hold a contestants meeting no later than 15 minutes before the beginning of round 1. The purpose of the meeting will be to advise contestants of any matters pertaining to the contest.

2.5.2 Round Identification.

In contests using a 'rounds' format, the Contest Director shall ensure that the start and finish of rounds are clearly identified for competitors, preferably by use of a loud audible alarm. It is also recommended that a visible display be used, eg. a flag in a prominent position. Competitors are to be informed at the contestants meeting what round identification method is to be used.

2.6 NZ CLASSES

		Para
Class A	6 minute Thermal Duration	3.1
Class B	10 minute Thermal Duration	3.2
Class C	Premier Thermal Duration	3.3
Class D	Thermal Formula 500	3.4
Class E	Thermal Electric 7 x 7	3.5.1
Class EPD	Thermal Electric Precision Duration	3.5.3
Class E400P	Speed 400 Pylon Racing (Provisional)	3.5.4
Class F	Slope Soaring Closed Circuit Distance	3.6.1
Class G1	Slope Soaring Pylon Racing, Open	3.6.2
Class G2	Slope Soaring Pylon Racing, 60inch	3.6.2
Class G3	Slope Soaring Combat	3.6.3
Class H	2 Metre Thermal	3.7
Class I	Hand Launch Glider	3.8
Class J	Thermal 2,4,6,8,10	3.9
Class K	Thermal RES	3.10
Class L	Dynamic Soaring Speed	3.11
Class M	ALES 200	3.12
Class N	ALES 123	3.13
Class O	X5J Unlimited	3.14
Class P	ALES RADIANT	3.15

2.7 FAI CLASSES (see Section 5A)

Class F3B	FAI Thermal Multi-task
Class F3J	FAI Thermal Duration
Class F5B	FAI Electric Aerobatics
Class F5B	FAI Electric Multi-task (including handicap)
Class F5B/600	FAI 10 Cell Electric Multi-task
Class F5D	FAI Pylon
Class F3K	FAI Hand Launch Glider

2.8 Altitude Limiters – Provisional

NOTE: Clause 2.8 overrides clause 3.13.6

- 2.8.1 All ALES models must be fitted with an Altitude Limiter Switch (ALS) that will shut off the motor when it reaches the designated altitude above the ground. Any brand or make is permitted. This device must also shut off the motor at the time defined in the event rules during launch if the designated altitude has not yet been reached.
- 2.8.2. The ALS must not be enclosed in any material other than that recommended by the manufacturer. It may not be positioned in any part of the model which could result in distortion of actual air pressure variations (e.g. – near forward facing air scoops or venting ports).
- 2.8.3. Models must include sufficient static venting to ensure that outside pressure is duplicated inside the model at the ALS location. In the event of a launch exceeding 10% of the designated launch altitude due to insufficient venting, the Contest Director may assign a score of zero to the violator for that round.
- 2.8.4. The Electronic Speed Control must always operate via its series connection to the ALS and not with direct connection to the receiver.
- 2.8.5. The connectors linking the ALS to the receiver shall be readily accessible so that an ALS reader can be installed on demand by the Contest Director. The ALS reader is the responsibility of the contestant and will serve to verify Motor off Height and time programmed in the ALS device while retaining the normal operation of the competitor's own installation.
- 2.8.6. 'Zooming' is defined as using kinetic energy (speed) stored in the plane during the launch to exceed the designated launch height by more than 10%. Unless the ALS device has an anti-zoom feature activated, contestant must transition to level flight immediately after the motor cuts. Zooming will be considered in violation of the intent of the altitude limiter rule and the Contest Director may assign a score of zero to the violator for that round.
- 2.8.7. Any attempt to subvert the intent of this Altitude Limiter rule set is grounds for disqualification from the event as unsportsmanlike conduct.

3. NEW ZEALAND CLASS RULES

3.1 CLASS A : 6 MINUTE THERMAL DURATION

A four round, 6 minute duration and landing contest with best 3 flights counting.

3.1.1 Launching

The launch of the model may be by one of the following means:

- hand tow
- electrical powered winch
- hand operated pulleys

3.1.2 Scoring

- (a) One point will be awarded for each full second from the time the model is free flying until it comes to rest (as defined in Rule 2.3.2) up to a maximum of 360 points.
- (b) One point will be deducted for each full second flown in excess of six minutes.
- (c) Landing points scored as per rule 2.4.4 added to flight score.

3.1.3 Number of Flights

- (a) Unless otherwise specified by the Contest Director, contests will be run in rounds of one hour duration.
- (b) Four rounds will be flown with the total of the best three determining placings.

3.1.4 Flights at end of round.

As long as the parachute/pennant drops from a launching glider before the end of a round is signalled, a full 6 minute flight and spot landing can be attempted even if the round ends during the flight.

3.2 CLASS B: 10 MINUTE THERMAL DURATION

A three round duration contest plus fly-off, with 10 minute max. plus landing points.

3.2.1 Launching: The launch of the model may be by one of the following means:

- Hand tow
- Electrical powered winch
- Hand operated pulleys

3.2.2 Scoring

- (a) Five points will be awarded for each completed half minute of free flying (as defined in rule 2.3) up to a maximum of 100 points.
- (b) No points will be deducted for flights in excess of 10 minutes but if other contestants are waiting to fly on the pilots frequency, he is obliged to land as soon as practical after achieving the 10 minute maximum.
- (c) A landing bonus is scored as per rule 2.4.4.
- (d) Flight and landing scores are totalled and any points scored in excess of 120 are not counted.

3.2.3 Number of Flights

- (a) Unless otherwise specified by the Contest Director, contests will be run in rounds of one hour duration.
- (b) Three rounds will be flown, all counting.
- (c) In the event that more than one competitor scores three maximum flights, a single round fly-off to a 200 point maximum (100 flying points plus 100 landing points), will be held with competitors flying simultaneously if frequencies permit. The maximum flight time is again 10 minutes.
- (d) In the event of a fly-off tie, another fly-off is permitted.
- (e) In a National Decentralised Contest, only the first fly-off flight is scored.
- (f) In a National Decentralised Contest, any competitor that scores three maximum flights must also score a single fly-off flight.

3.3 CLASS C: PREMIER THERMAL DURATION.

A 10 minute flight during an 12 minute working time. This class offers thermal duration flying in a group using a common working time. This enables the scoring to be done on a 'group scoring' basis.

Note: this whole section has been revised and rewritten by the Soaring TC- effective 1 Dec 2003

3.3.1 Launching: The launch of the model may be by one of the following means:

- Hand tow
- Electrical powered winch
- Hand operated pulleys

3.3.2 Organisation of Starts

(a) The organisers will use Annex A and a list of competitors when making out the draw, and each competitor will be allocated an identification number. This number will be prefixed with a letter, this letter indicating the column a competitor has been placed into, in the draw. For National contests or other large competitions, the organisers have the right to request that a competitor supplies details of two frequencies he may fly on, the organizers shall be the sole judge of which frequency is used for the contest.

Note: Those on the same frequency will have to be placed in the same column in the draw, (their Identification number will be prefixed with the same letter).

This means they will not be called to fly in the same group. The CD may request R/C frequency changes to accommodate matrix requirements.

(Competitors who wish to assist each other with launching are not permitted to enter on the same frequency to avoid flying against each other).

(b) The organizers should have the matrix displayed where it is readily visible to all competitors.

(c) Competitors are entitled to a 5-minute preparation time before the starter gives the order to start the working time.

(d) The first flight will be those competitors in group 1 to be followed by group 2 and this numerical order of group flights will continue until the round has been completed. A minimum of one minute gap will be allowed between the working times of consecutive groups. The Contest Director will announce the actual gap at the contestant's meeting. For large entries at least a two minute gap is preferable.

(e) The working time is 12 minutes, and will be commenced and terminated with a readily audible signal plus an optional visual indicator.

(f) The organizers shall endeavour to provide a landing spot for each pilot that participates in each group. If this can be done, then general rule 2.4.2 becomes void for the contest. If this is not possible then the mark and remove method must be used as referred to in general rule 2.4.3

3.3.3 Scoring

- (a) One point will be awarded for each full second from the time the towline is released until the model until it comes to rest (as defined in Rule 2.3.2) up to a maximum of 360 points.
- (b) One point will be deducted for each full second flown in excess of 600 seconds.
- (c) For models still in the air when the 12-minute working time expires, timing will stop when the audible signal is operated. The elapsed flight time only will be taken into consideration for scoring, without any additional points for precision landing.

3.3.4 Definition of an Attempt and Official Flight.

a) Attempts

i) For each round, during the working time allocated, the competitor is entitled an unlimited number of attempts. An attempt starts when the model aircraft is released from the hands of the competitor or his helper(s) under the tension of the towline. No change of model aircraft or parts of the model aircraft is allowed after starting the first attempt in each round.

ii) 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 aircraft in flight collides with another model aircraft in flight, or another model aircraft 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 aircraft or launch cable in the process of launch collides with another model aircraft or launch cable also in the process of launch (released for flight by the competitor or his helper), or with another model aircraft 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 aircraft (released for flight by the competitor or his helper);
- in the case of an unexpected event, outside the competitor's control, 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.

When a competitor obtains a new working time period, and his model aircraft has been damaged beyond repair during the attempt where he obtained the new working time, he is entitled to continue flying the current round with a different model aircraft.

This rule applies only when the damage inflicted to the model aircraft 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 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.

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.

Note: A new working time period will not be granted for Timekeeper errors. (It is up to the competitor to ensure that the timekeepers are doing their job)

3.3.5 Number of Rounds.

The contest will be void unless a minimum of three rounds is completed. There is no limit on the maximum number of rounds.

3.3.6 Partial Scores

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

(b) For other competitors in the same group the partial score is determined as follows:

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

Where P1 = points for the competitor obtained as for 3.3.3

Where Pw = points for the winner in the relating group.

(

c) Total Score

The total score is compiled by adding the Partial Scores from all rounds for each competitor, with the winner recording the highest total score.

3.3.7. Cancellation of a Flight 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.

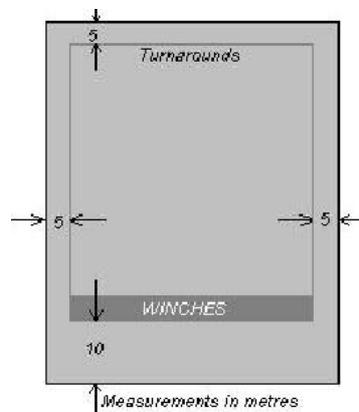
- b) The flight in progress is annulled if the model aircraft loses any part during the launch or the flight-time. Further attempts may be made after reattaching of the lost part. The losing of a part during landing (i.e. in contact with the ground) is not taken into account.
- c) The competitor is disqualified from the current round if the model aircraft is controlled by anyone other than the competitor.
- d) If the model aircraft touches either the pilot or his helper during landing before the model comes to rest, 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 the 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.

3.3.8. Safety Rules

A safety area encompassing the winches, winch lines and turnarounds and extending 5 metres in all directions except behind the winches, which shall be 10 metres, will be marked by the organizers.

The organizer must clearly mark or define verbally at the contestants meeting, any other area's not to be overflowed during the contest for safety reasons.

After release of the model aircraft from the hand of the pilot or helper, the contact of the model aircraft with any object (earth, car, stick, plant, line, etc.) or a person within the safety area(s) will be penalised. The number of contacts during one flight does not matter (maximum of 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.



Light grey is the safety area

ANNEX A TO 3.3 CLASS C : PREMIER THERMAL DURATION RULES

1. The organisers will use a list of competitors when making out the draw, and each competitor will be allocated an identification number. This number will be prefixed with a letter, this letter indicating the column a competitor has been placed into, in the draw.

Examples of lists for the allocation of identification numbers:

For 9 competitors or less:

A	B	C
1	1	1
2	2	2
3	3	3

For 16 competitors or less :

A	B	C	D
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4

For 25 competitors or less:

A	B	C	D	E
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5

F or 36 competitors or less:

A	B	C	D	E	F
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6

For 49 competitors or less:

A	B	C	D	E	F	G
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7

Note: Those on the same frequency will have to be placed in the same column in the draw, (their identification number will be prefixed with the same letter). This means that they will not be called to fly in the same group. The CD may request R/C frequency changes by competitors to accommodate matrix requirements. (Competitors who wish to assist each other with launching are not permitted to enter on the same frequency to avoid flying against each other).

2. The following is the matrix to be used for 9 fliers or less, to determine which group each flier will fly in for each round, up to a maximum of 3 rounds. (3x3 matrix).

	<i>Round 1</i>	<i>Round 2</i>	<i>Round 3</i>
Grp.1	A1 B1 C1	A1 B2 C3	A1 B3 C2
Grp.2	A2 B2 C2	A2 B3 C1	A2 B1 C3
Grp.3	A3 B3 C3	A3 B1 C2	A3 B2 C1

3. The following is the matrix to be used for 16 fliers or less, to determine which group each flier will fly in for each round, up to a maximum of 4 rounds. (4x4 matrix.)

	<i>Round 1</i>	<i>Round 2</i>	<i>Round 3</i>	<i>Round 4</i>
Grp.1	A1 B1 C1 D1	A1 B2 C3 D4	A1 B3 C4 D2	A1 B4 C2 D3
Grp.2	A2 B2 C2 D2	A2 B3 C4 D1	A2 B4 C1 D3	A2 B1 C3 D4
Grp.3	A3 B3 C3 D3	A3 B4 C1 D2	A3 B1 C2 D4	A3 B2 C4 D1
Grp.4	A4 B4 C4 D4	A4 B1 C2 D3	A4 B2 C3 D1	A4 B3 C1 D2

4. The following is the matrix to be used for 25 fliers or less, to determine which group each flier will fly in for each round, up to a maximum of 5 rounds. (5x5 matrix.)

	<i>Round One</i>	<i>Round Two</i>
Grp.1	A1 B1 C1 D1 E1	A1 B2 C3 D4 E5
Grp.2	A2 B2 C2 D2 E2	A2 B3 C4 D5 E1
Grp.3	A3 B3 C3 D3 E3	A3 B4 C5 D1 E2
Grp.4	A4 B4 C4 D4 E4	A4 B5 C1 D2 E3
Grp.5	A5 B5 C5 D5 E5	A5 B1 C2 D3 E4

	<i>Round Three</i>	<i>Round Four</i>	<i>Round Five</i>
A1	B3 C5 D2 E4	A1 B4 C2 D5 E3	A1 B5 C4 D3 E2
A2	B4 C1 D3 E5	A2 B5 C3 D1 E4	A2 B1 C5 D4 E3
A3	B5 C2 D4 E1	A3 B1 C4 D2 E5	A3 B2 C1 D5 E4
A4	B1 C3 D5 E2	A4 B2 C5 D3 E1	A4 B3 C2 D1 E5
A5	B2 C4 D1 E3	A5 B3 C1 D4 E2	A5 B4 C3 D2 E1

5. The following is the matrix to be used for 36 fliers or less, to determine which group each flier will fly in for each round, up to a maximum of 6 rounds. (6x6 matrix.)

	<i>Round One</i>	<i>Round Two</i>	<i>Round Three</i>
Grp.1	A1 B1 C1 D1 E1 F1	A1 B2 C3 D4 E5 F6	A1 B3 C4 D5 E6 F2
Grp.2	A2 B2 C2 D2 E2 F2	A2 B3 C4 D5 E6 F1	A2 B4 C5 D6 E1 F3
Grp.3	A3 B3 C3 D3 E3 F3	A3 B4 C5 D6 E1 F2	A3 B5 C6 D1 E2 F4
Grp.4	A4 B4 C4 D4 E4 F4	A4 B5 C6 D1 E2 F3	A4 B6 C1 D2 E3 F5
Grp.5	A5 B5 C5 D5 E5 F5	A5 B6 C1 D2 E3 F4	A5 B1 C2 D3 E4 F6
Grp.6	A6 B6 C6 D6 E6 F6	A6 B1 C2 D3 E4 F5	A6 B2 C3 D4 E5 F1

	<i>Round Four</i>	<i>Round Five</i>	<i>Round Six</i>
Grp.1	A1 B4 C5 D6 E2 F3	A1 B5 C6 D2 E3 F4	A1 B6 C2 D3 E4 F5
Grp.2	A2 B5 C6 D1 E3 F4	A2 B6 C1 D3 E4 F5	A2 B1 C3 D4 E5 F6
Grp.3	A3 B6 C1 D2 E4 F5	A3 B1 C2 D4 E5 F6	A3 B2 C4 D5 E6 F1
Grp.4	A4 B1 C2 D3 E5 F6	A4 B2 C3 D5 E6 F1	A4 B3 C5 D6 E1 F2
Grp.5	A5 B2 C3 D4 E6 F1	A5 B3 C4 D6 E1 F2	A5 B4 C6 D1 E2 F3
Grp.6	A6 B3 C4 D5 E1 F2	A6 B4 C5 D1 E2 F3	A6 B5 C1 D2 E3 F4

6. The following is the matrix to be used for 49 fliers or less, to determine which group each flier will fly in for each round, up to a maximum of 7 rounds. (7x7 matrix.)

Round One

Grp.1 A1 B1 C1 D1 E1 F1 G1
 Grp.2 A2 B2 C2 D2 E2 F2 G2
 Grp.3 A3 B3 C3 D3 E3 F3 G3
 Grp.4 A4 B4 C4 D4 E4 F4 G4
 Grp.5 A5 B5 C5 D5 E5 F5 G5
 Grp.6 A6 B6 C6 D6 E6 F6 G6
 Grp.7 A7 B7 C7 D7 E7 F7 G7

Round Two

A1 B2 C3 D4 E5 F6 G7
 A2 B3 C4 D5 E6 F7 G1
 A3 B4 C5 D6 E7 F1 G2
 A4 B5 C6 D7 E1 F2 G3
 A5 B6 C7 D1 E2 F3 G4
 A6 B7 C1 D2 E3 F4 G5
 A7 B1 C2 D3 E4 F5 G6

Round 3

A1 B3 C5 D7 E2 F4 G6
 A2 B4 C6 D1 E3 F5 G7
 A3 B5 C7 D2 E4 F6 G1
 A4 B6 C1 D3 E5 F7 G2
 A5 B7 C2 D4 E6 F1 G3
 A6 B1 C3 D5 E7 F2 G4
 A7 B2 C4 D6 E1 F3 G5

Round 4

A1 B4 C7 D3 E6 F2 G5
 A2 B5 C1 D4 E7 F3 G6
 A3 B6 C2 D5 E1 F4 G7
 A4 B7 C3 D6 E2 F5 G1
 A5 B1 C4 D7 E3 F6 G2
 A6 B2 C5 D1 E4 F7 G3
 A7 B3 C6 D2 E5 F1 G4

Round 5

A1 B5 C2 D6 E3 F7 G4
 A2 B6 C3 D7 E4 F1 G5
 A3 B7 C4 D1 E5 F2 G6
 A4 B1 C5 D2 E6 F3 G7
 A5 B2 C6 D3 E7 F4 G1
 A6 B3 C7 D4 E1 F5 G2
 A7 B4 C1 D5 E2 F6 G3

Round 6

A1 B6 C4 D2 E7 F5 G3
 A2 B7 C5 D3 E1 F6 G4
 A3 B1 C6 D4 E2 F7 G5
 A4 B2 C7 D5 E3 F1 G6
 A5 B3 C1 D6 E4 F2 G7
 A6 B4 C2 D7 E5 F3 G1
 A7 B5 C3 D1 E6 F4 G2

Round 7

A1 B7 C6 D5 E4 F3 G2
 A2 B1 C7 D6 E5 F4 G3
 A3 B2 C1 D7 E6 F5 G4
 A4 B3 C2 D1 E7 F6 G5
 A5 B4 C3 D2 E1 F7 G6
 A6 B5 C4 D3 E2 F1 G7
 A7 B6 C5 D4 E3 F2 G1

7. The organizers should have the matrix displayed where it is readily visible to all competitors, or supply each competitor with a score sheet with their round/group marked on it.

8. Should the organisers require to fly more rounds than specified for a given matrix size (e.g. 10 rounds from a 6x6 matrix) ,start repeating in sequence from Round One until the required number of rounds have been flown.

9. Matrixes other than that above may be used in competitions provided a copy is available for viewing, or given to all competitors prior to the start of the contest.

3.4 CLASS D : THERMAL FORMULA 500

This event combines an 8 minute duration task and a 2 minute precision flight and landing task into one contest.

3.4.1 Launching: The launch of the model may be by one of the following means:

- hand tow
- electrical powered winch
- hand operated pulleys

3.4.2. Only one model is permitted for all tasks. If a model becomes unflyable it may be replaced at the CD's discretion.

3.4.3 Duration Task

One point will be awarded for each full second of free flying (as defined in Rule 2.3) up to a maximum of 480 points (8 minutes), one point will be deducted for each full second flown in excess of eight minutes. A landing bonus of 20 points will be awarded if the nose of the model rests within 15 metres of a defined spot.

3.4.4 Precision Task

Points will be awarded for flight time in accordance with the table below up to a maximum of 400 points. A landing bonus will be awarded as per rule 2.4.4 up to a maximum of 100 points.

Flight	Score	Flight	Score	Flight	Score	Flight	Score
1:59 2:00	400	1:39 2:20	300	1:19 2:40	200	0:59 3:00	100
1:58 2:01	395	1:38 2:21	295	1:18 2:41	195	0:58 3:01	95
1:57 2:02	390	1:37 2:22	290	1:17 2:42	190	0:57 3:02	90
1:56 2:03	385	1:36 2:23	285	1:16 2:43	185	0:56 3:03	85
1:55 2:04	380	1:35 2:24	280	1:15 2:44	180	0:55 3:04	80
1:54 2:05	375	1:34 2:25	275	1:14 2:45	175	0:54 3:05	75
1:53 2:06	370	1:33 2:26	270	1:13 2:46	170	0:53 3:06	70
1:52 2:07	365	1:32 2:27	265	1:12 2:47	165	0:52 3:07	65
1:51 2:08	360	1:31 2:28	260	1:11 2:48	160	0:51 3:08	60
1:50 2:09	355	1:30 2:29	255	1:10 2:49	155	0:50 3:09	55
1:49 2:10	350	1:29 2:30	250	1:09 2:50	150	0:49 3:10	50
1:48 2:11	345	1:28 2:31	245	1:08 2:51	145	0:48 3:11	45
1:47 2:12	340	1:27 2:32	240	1:07 2:52	140	0:47 3:12	40
1:46 2:13	335	1:26 2:33	235	1:06 2:53	135	0:46 3:13	35
1:45 2:14	330	1:25 2:34	230	1:05 2:54	130	0:45 3:14	30
1:44 2:15	325	1:24 2:35	225	1:04 2:55	125	0:44 3:15	25
1:43 2:16	320	1:23 2:36	220	1:03 2:56	120	0:43 3:16	20
1:42 2:17	315	1:22 2:37	215	1:02 2:57	115	0:42 3:17	15
1:41 2:18	310	1:21 2:38	210	1:01 2:58	110	0:41 3:18	10
1:40 2:19	305	1:20 2:39	205	1:00 2:59	105	0:40 3:19	5

3.4.5 Contest Format

- (a) A contest will comprise two flights of the duration task and two flights of the precision task with the best three flights scoring.
- (b) The flights may be made in any order, but the contestant must nominate to which task the previous flight will be recorded before any further flights are attempted.

3.5. CLASS E : THERMAL ELECTRIC 7X7

The object is to fly three 7 minutes flights over 3 rounds on a single charge, with a bonus for landing in the marked circle.

- 3.5.1 There are no restrictions on motor, plane, motor control or cell size. No more than 7 x nicad or nickel metal hidride cells are permitted. *(No lithium or other chemistry)*
- 3.5.2 The battery SHALL NOT BE RE-CHARGED between flights and the same battery must be used for all three flights.
- 3.5.3 Flights will be scored one point for each second flown up to 7 minutes (i.e. 420 points) then one point lost for each second flown over this time.
- 3.5.4 A landing bonus of 50 points will be awarded if the whole of the model stops inside a 15 metre diameter circle; 25 points if any part of the model stops inside a 30 metre diameter circle; zero points if outside the circle.
- 3.5.5 Timing of flight is to commence at the end of the motor run. There is no limit to the length of motor run. Time keeping starts when the timekeeper sees the transmitter operated to stop the motor.
- 3.5.6 The motor may not be restarted during the flight. Should the motor be restarted for any reason, the timekeeper will stop the watch immediately and landing points will be lost.
No re-flights are permitted.
- 3.5.7 Contestants are advised to have a backup watch (or timekeeper)
- 3.5.8 Each round counts. The final score is the total of all points over three rounds.
- 3.5.9 The duration of each round will be decided by the CD taking into account the number of competitors, the weather conditions, and any other pertinent factors.

3.5.3 CLASS E2 : THERMAL ELECTRIC PRECISION DURATION

EPD is an electric thermal competition that brings planes of different shapes and sizes on to a more even playing field. EPD consists of 3 classes of aircraft and limited motor runs associated with those aircraft.

3.5.3.1 Classes

Class 1: Ferrite or cobalt motor.

Motor is limited to a brushed type electric motor. The maximum motor run time for this class is 60 sec per flight. Battery Chemistry is unlimited. The battery pack shall have no more than a nominal 26 volts total.

Class 2: Brushless 7 cell

Any motor is permitted. The battery pack must consist of no more than 7 cells total. Battery Chemistry is limited to NiCad or NiMh only. The motor run time is limited up to a maximum of 40 secs per flight.

Class 3: Unlimited.

Any motor is permitted. The battery pack shall have no more than a nominal 26 volts total. The motor run is limited to a maximum of 20 sec per flight. Battery Chemistry is unrestricted.

3.5.3.2

- (a) The aircraft is unlimited in design and wing span, but must not weigh more than 3.5 kg.
- (b) Only Nicads or NiMH cells may be used
- (c) There is no recharging or changing of battery between flights in each round. Recharging or battery change between rounds is permitted.
- (d) The quantity of cells can be altered between rounds only within the class limits. There is no changing class between rounds.
- (e) There is no changing of motor or airframe between rounds.

3.5.3.3 Contestant Flights

- a) Each round will consist of a 20 min working window.
- b) Each plane must not exceed its Limited motor run time as described in the aircraft characteristics described 3 classes.
- c) In the working window each pilot must complete 3 flights, 1x 2 min flight 1 x 5 min flight and 1 x 10 min flight in any order.
- d) Landing must occur at the time frame, each second over the time frame will be deducted from the flight time. (each second under is time unachieved)
- e) Each pilot must specify to which time frame the flight is allocated upon landing.
- f) No flight time can be flown more than once per round.
- g) The timing of the flight begins when the motor is turned off. The motor cannot be turned on again until after the plane has landed. If the motor is turned on again the timing is stopped and they pilot is penalised 50 points and landing points are unattainable
- h) Once the 20-Min working window runs out, the timing of the flight stops and landing points are unattainable.
- i) All landings must be within the specified field area. Any flights landed outside of that area score zero.

- j) 15 Landing points will be awarded for each flight for any part of the aircraft landing within a 15m radius marked by a competition landing tape. Landing points and timing stop will be from when the plane has come to a complete stop.
- k) There must be a max of 2 pilots per landing tape for safety reasons.
- l) The plane must be launched from the windward end outside the specified landing circle. You cannot change landing circles once you have started using one.
- m) All rounds will be normalised to 1000 points.
- n) Pilots will be rotated in order to make sure all pilots fly against each other.

3.5.3.4 For NDC Competitions at least 3 rounds should be flown with the best three to count towards the final score.

3.5.4 Provisional rules for Speed 400 Pylon Racing.

These are as flown by the NSMAC

3.5.4.1 Aircraft/ Motor

- (a) 1 motor per model
- (b) Motor Mabuchi 380 or equivalent i.e. Speed 400 can motor.
- (c) The motor may not be changed between rounds. i.e. the motor must last all the rounds in the event.
- (d) Unrestricted battery chemistry.
- (e) Wing loading may not exceed the FAI limit
- (f) Organisers reserve the right to examine and test any competitor's motor and compare the results of measured KV, no load amps and RPM with Ecalc and Mcalc [the programmes] calculations. If the results are on average 10% above the average of "the programmes" calculations- the motor will be deemed illegal.

3.5.4.2 Event

- (a) The course will be a 2 base course similar to that flown in F3B and F5B/F5F
- (b) The distance between the pylons will be 100 meters.
- (c) All pilot, callers and flaggers will be required to wear protective helmets.
- (d) Each pilot in a round will require a flagger and a timer.
- (e) A caller may assist a pilot.
- (f) Up to 4 aircraft may be flown in a round.
- (g) The aircraft will be **HAND LAUNCHED** at 1 second intervals.
- (h) The pilot is not required to launch his own aircraft.
- (j) The timekeeper will start the stopwatch as soon as the aircraft is called to launch.
- (k) The timekeeper will stop the watch and record the time when the aircraft completes 10 laps of the course.
- (l) A shorter course or a conventional triangular course can be laid out at the discretion of the Event Director. If a non-standard course is used then any published results should describe the course used. No times recorded on a non-standard course qualify for record claims

3.5.4.3 Penalties

- (a) Launching before called - disqualified
- (b) 1 cut 10% penalty added to recorded time.
- (c) 2 cuts disqualified.
- (d) Use of illegal motor, changing motor, more than 7 cells or cells other than NiCads or NiMh disqualified

3.6 NZ SLOPE SOARING CLASSES

Definition: Slope soaring is flight on or near rising ground or obstructions which cause deflection of passing air to an extent sufficient to sustain model flight.

For contest purposes, a slope soaring site is unsuitable if:

- (a) The wind velocity measured at 2 metres above ground level is less than 3m/s or, more than 20 m/s.
- (b) The direction of the wind is incessantly deviating more than 45 degree from a direction perpendicular to the slope; or
- (c) In the Contest Director's opinion conditions are contrary to safe operation (ie. storms, rain, fog, radio interference etc).

Note: Should a contest be terminated part way through due to any of the above conditions, the contest will be scored on the basis of completed rounds to that time.

3.6.1 CLASS F : SLOPE SOARING - CLOSED CIRCUIT DISTANCE

- (a) The object is to make as many passes up and down the slope between two markers placed 100 metres apart in 4 minutes (1 lap = 2 passes - 200 metres flown).
- (b) Scoring. Each 100 metre pass scores 25 points. Only completed 100 metres passes within 4 minutes from the instant of launch shall be scored. Each contestant has three flights, the best two to score.

3.6.2 CLASSES G1 and G2 : SLOPE SOARING - PYLON RACING

Class G1 has no size limit; G2 is limited to 60inch maximum wingspan

- (a) The course is marked by flagmen 100 metres apart along the slope. The object is to start at the main flagman /timekeeper position and fly up to the other flagman and back 5 times (10 passes for a distance of 1000 metres) in the shortest possible time.
- (b) Up to 4 models may be flown at one time.
- (c) Four races per competitor will comprise a contest with the best three races per competitor scoring.
- (d) Models may land and be re-launched during a race.
- (e) Models must clear the course and land as soon as possible after the completion of each race.
- (f) Race Procedure
 - (i) The Contest Director gives a 1 minute warning, at which point models

may be launched and 'mill' aloft.

(ii) A 10 seconds to zero countdown is then given with the models making a flying start from behind the start finish line at count 'zero'. If a model crosses the start/finish line before 'zero' it must return to the start and cross the line again.

(iii) Timing starts at the count 'zero' (not when models crosses line).

(iv) All turns are to be made into wind (away from the slope) and the timekeepers count laps, stopping their stopwatches at the end of the 5th lap (10th pass). In the event a model turns before the flagman indicates, it must return and cross the line or be penalised by adding 1/5 of its flight time for each cut. Final time then scored as per 3.6.2 (g)

(v) Each contestant may have a caller to assist him in judging turns.

(g) Scoring

(i) The time in seconds for each racer is deducted from 200. The resultant is the score for that round.

(ii) Placings are determined by ranking each flier's total points in order, with the highest number of points winning.

3.6.3. CLASS G3 -SLOPE SOARING COMBAT.

The object of the contest is to score points by knocking the other aircraft to the ground.

General

(a) Consideration for safety for spectators, property, contest personnel and contestants is to be given the utmost importance.

(b) The C.D. will be the judge of model suitability and construction for combat.

(c) The C.D. may disqualify any model or person on the grounds of safety.

(d) **The model**

(i) The model must be an all foam combat glider.

(ii) There is no limit on wingspan or number of servos used.

(iii) Wings shall have a plastic foam leading edge at least 25mm wide measured chordwise at any point on the wing. The wing LE may be covered with film covering material, vinyl tape, fibre reinforced vinyl tape or any combination of the three. Wood, metal, solid plastic, carbon fibre, kevlar or any resin impregnated fibre material on or in the wing LE will not be permitted.

- (iv) Wing spars of any non-metallic material are permitted provided they do not violate the provisions of (iii) above. Must be more than 25 mm away from the LE at any point. Maximum total cross section area for spars shall not exceed 3/4 sq. in. (484mm²).
- (v) The fuselage reinforcement to finish at least 25mm from the nose and the total cross section area not to exceed 1 sq. in. (625mm²). The fuselage may be covered with film covering material, vinyl tape, fibre reinforced fibre tape or any combination of the three. Wood metal, solid plastic, carbon fibre, kevlar, or any resin-impregnated fibre covering material on the fuselage will not be permitted.
- (vi) A maximum flying weight of 1 kg will be permitted.
- (d) **The Contest:** A group of 4 to 6 aircraft will fly in each round.
- (e) **Scoring.**
 - (i) No points for touches. Two points are scored for each knock-down.
 - (ii) After a knockdown, the victorious model must perform a full loop or roll before points are awarded. This manoeuvre must be performed before entering into the next engagement.
 - (iii) The "killed" model may re-enter the round but must launch from the designated launch area.
 - (iv) In the case of multiple hits, e.g. 3 aircraft, the following scoring shall apply: If one aircraft recovers and two are "killed", then the recovered aircraft shall be awarded 4 points on completion of a roll or loop.(Two points per model). If two aircraft recover and one is "killed", then both recovered aircraft will be awarded 2 points upon completion of a roll or loop.
 - (v) If whilst manoeuvring in a round, a model ceased to fly due to contact with the ground or a ground based object, the model then loses one point. This rule does not apply to "killed" models.
 - (vi) A suggested round duration is 15 to 20 mins, the actual time being decided by the C.D.
 - (vii) All rounds will start with a simultaneous launch from the designated launch area.
 - (viii) A contest will consist of at least 3 rounds for each competitor using a matrix system to mix up the competitors in each round.

Note. Team Combat rules are withdrawn at present pending further experiment with the scoring system.

3.7 CLASS H : NEW ZEALAND THERMAL 2 METRE RULES

A straight forward contest in which basic models can be used

3.7.1 The model

Maximum (projected) wingspan of the model is not to exceed 2 Metres. The maximum number of operating servos is three. Two servos can be used according to the pilot's wishes. The optional third servo must be for spoiler control only. Spoiler control must not utilise trailing edge flaps.

3.7.2 Launching

3.7.2 Launching

Models may be launched by Hand Tow or Hand Operated Pulley Tow. At the Contest Director's discretion, Bungees may be used. Winches may not be used. Refer to Rule 2.2.2 for launching definitions

3.7.3 Flying

(a) The contest director may determine a maximum contest time suitable for the weather conditions and the number of competitors. It is suggested that 3 hours is a suitable contest time.

(b) During the contest time pilots will be required to complete flights of 3,4,5,6 & 7 minutes *in any order but the contestant must nominate to which task the previous flight will be recorded before attempting the next flight.* When to launch is up to the individual.

However when the allotted contest time expires only flights already completed or models in flight that have already been released from the tow or bungee and are being timed will be counted.

(c) One point is awarded for each second of flight up to the target time.

(d) One point is deducted for each second in excess of the target time.

(e) More than 60 secs in excess of the target time will result in all the points for that flight being forfeited.

3.7.4 Landing

50 points will be awarded for landing within the 15 metre radius of a spot measured to the nose of the model. All flight and landing points will be forfeited if the model lands outside the appointed flying field.

3.7.5 Scoring

All flight and landing scores will count towards the individuals total. The competitor with the highest accumulated score wins.

3.8 CLASS 1: HAND LAUNCH GLIDER

3.8.1 General

- a. Variations to Rule 1.2 (Soaring - General Definitions - Model Characteristics) that apply only to RC HLGs are as follows: Maximum wingspan: 1500mm Maximum weight: 600gm, Minimum nose radius: 5mm
- b. All flights will be conducted without the assistance of launching devices, slope, ridge or obstacle lift as identified by the CD at the contestants' meeting.
- c. Each contestant must hand launch his/her own glider, or another person may launch the pilot's model provided the pilot either touches the plane before launch or touches the thrower after the previous flight is complete.
- d. All launching and landing must be within a designated area as specified by the CD, in order for flight time to count. A plane is inside if the nose of the plane is within the landing area boundaries. A typical launching area should be 100m x 50m orientated so that the longer side is perpendicular to the wind direction. Final size is at the CD's discretion.
- e. Each pilot is limited to one person as a spotter/timer on the field at any time.
- f. The flight score will be truncated. For example, a time of 27.99 seconds is scored as 27 seconds.
- g. Flight time commences when a model leaves the hand, and ends when the model comes in contact with any land based object, including people, or at the end of the working time – Time will be truncated. No rounding.
- h. All planes must be on the ground within 60 seconds after the final working time. Infraction of this rule will result in a zero score for the round.
- i. All heats will be flown "man on man" and scores will be normalized to 1000 points for each group. If required – Groups will be announced in advance. Any pilot, who does not fly in his assigned group. Will automatically receive a zero score for that round.
- j. There is no restriction on the number of planes a pilot may fly during a round or the contest, provided all planes are on the assigned frequency. Pilot may have only one plane in the launch area at any one time. Backup planes must be stored outside launch area boundaries. If a pilot decides to change planes during a heat, for any reason, the pilot must remove that plane from inside the launch area boundaries before retrieving new plane.
- k. Mid-air collisions will receive no re-flight consideration. Pilots should observe "Blue Sky" rules.
- l. There will be no transmitter pound. All pilots are responsible for obtaining the frequency peg before turning on the transmitter.
- m. Each pilot is responsible for the accuracy of his/her own score cards.

- n. warm up and test flights may only be taken during the three-minute ready time before the upcoming heat and only by the pilots assigned to that heat.

3.8.2 Centralised Contest Format

- a. A national contest will comprise a minimum of 4 rounds.
- b. The tasks for each round may be defined by the contest director, provided they are published and/or distributed to all competitors prior to the contest. Task definitions should be along the lines of those specified in the FAI F3K Rules.
- c. If it is not possible for all competitors to fly at the same time, then in each round the competitors will be divided into the minimum of flight groups required. These groups will then fly sequentially and be scored independently.
- d. Scoring within each flight group shall be normalised with the winner receiving 1000 points. The other fliers in the group shall receive a proportionally lesser number of points based on their flight score relative to the group winner.

3.8.3 National Decentralised Contest Format

- a. An NDC contest will comprise 4 rounds, each of 10 minutes.
- b. Contest rules as per 3.8.1 except scoring as per 3.8.3 below
- c. For NDC only, scoring will be the sum of the four rounds Raw Scores.
- d. Four rounds as follows:
 - i. R1 – 10 Min working time. Total time – 3 minute max per flight . Ten second penalty per throw after the first four throws.
 - ii. R2 – 10 Min working time. Five longest flights – 2 minute max time per flight
 - iii. R3 – 10 Min working time. Total time – 2 minute max time per flight Ten second penalty for each throw after four throws.
 - iv. R4 – 10 Min working time. Three longest flights – 3 minute max time per flight. Ten second penalty for each throw after four throws.

3.8.4 The tasks for the centralized contest format (other than the NZMAA Nationals) may be selected from the 10 listed below. Other tasks may be used provided they are given to contestants in writing prior to the start of the contest.

3.8.5 For the NZMAA Nationals, the tasks to be flown must be published in The Fliers World prior to the start of the Nationals.

Task A - In a 10 minute working time. Unlimited launches. Flights of 15, 30, 45, 60, 75, 90, 105, 120 seconds in that order. Flight must meet or exceed target time before moving on to next flight. Score 1 point per completed flight.

Task B - In a 10 minute working time. Unlimited launches. Flights of 1, 2, 3, and 4 minutes in any order. Score 1 point per second up to the nominated flight time, no penalty for going overtime.

- Task C - In a 10 minute working time. 6 launches only. Total flight time from 5 best flights, 2 minute maximum per flight. Score 1 point per second up to 2 minutes max per flight, no penalty for going over time.
- Task D - In a 10 minute working time. 6 launches only. Flights of 1, 2 and 3 minutes in that order. Score 1 point per second of flight time up to the max, no penalty for going over time.
- Task E - In a 10 minute working time. Unlimited launches. Total flight time from 3 longest flights. 3 minute max per flight. Score 1 point per second, no penalty for going over time.
- Task F - In a 10 minute working time. Unlimited launches. Flights of 90, 80, 70, 60, 50, 40, 30, 20 and 10 seconds in that order. Flight must meet or exceed target time before moving on to next flight. Score one point per completed flight.
- Task G - In a 10 minute working time. Unlimited launches. Flights of 15, 15, 30, 30, 45, 45, 60, 60, 120, 120 seconds in any order. Must meet or exceed time to complete flight. Score 1 point per completed flight.
- Task H - In a 10 minute working time. Unlimited launches. First flight to be a minimum of 30 seconds, to count each subsequent flight must exceed the previous flight by one whole second. 3 flight minimum. Score total flight time from all counting flights. Score 0 if minimum of 3 flights not met.
- Task I - In a 10 minute working time. Unlimited launches. Two 2 minute max flights, two 3 minute max flights. Score total flight time of counting flights, no penalty for going over time.
- Task J - In a 10 minute working time. Unlimited launches. Flights of 1 minute max. Best 10 flights count, no penalty for going over time.

3.9 CLASS J : THERMAL 2,4,6,8,10

A thermal contest requiring flights of 2,4,6,8, & 10 minutes in any order, plus landing points, with all flights counting.

3.9.1 Launching

The launch of the model may be by one of the following means:

- hand tow
- electrical powered winch
- hand operated pulleys

3.9.2 Scoring

(a) A point is awarded for each complete second up to the target time. A point is deducted for each complete second in excess of the target time.

(b) Any landing points scored as per rule 2.4.4. are added to each flight score.

(c) Flights may be made in any order but the contestant must nominate to which task the score will be recorded before attempting the next flight.

3.9.3 Contest time

All flights are completed at any time during the period allocated for the contest. The duration of the contest is to be nominated by the CD at the contestants meeting.

3.10 CLASS K Thermal : R.E.S. (Rudder, Elevator, Spoiler)

Flown to Class A Thermal Rules for models incorporating Rudder, Elevator and Spoiler functions only.

3.10.1 Flown to Class A Thermal Flying Rules

3.10.2 The model may be any size within the general rules

3.10.3 There are no restrictions on building materials

3.10.4 Basic flight control is by rudder and elevator or moving tail only

3.10.5 Spoiler control must not utilise Trailing edge flaps, except in the case of a flying wing, where the trailing edge may only move in the same direction, i.e. up or down together

3.10.6 There is no restriction on the number of servos

3.10.7 It is not necessary to have a spoiler.

3.11 CLASS L: Dynamic Soaring Speed– Provisional Rules

- 3.11.1 Speed recording – For the purpose of setting and recording NZ Dynamic Soaring Speed Records, the speed of the glider flying the speed run must be recorded on a calibrated radar gun. A printed photo of the recorded speed should accompany any claim.
- 3.11.2 At all times the Safety of the pilot, speed recorder and the public is paramount and any attempts at the speed record should be planned with safety in mind. If the action of the pilot claiming the record was deemed to be dangerous or inappropriate then the claim could be declined.

3.12 CLASS M: ALES 200 (Altitude Limited Electric Soaring)

Objective - To provide a Man-On-Man (Group scored), electric launched, thermal duration soaring event with a consistent launch altitude for all competitors

3.12.1 Event Rules

- (a) Any electric powered sailplane meeting the definition of an electric powered glider is permitted to fly in this event,
- (b) Launches will be accomplished by the competitor's on-board electric power system and will begin within a starting launch window,
- (c) The launching motor run will be limited by a 30 second timer or 200 metre launch altitude, whichever comes first. (A list of acceptable altimeter/timer switches is in 3.13.6).
- (d) The launch must be followed by pure gliding flight with no further motor assistance.
- (e) Landing points will be added to the normalized flight score to determine the overall score Thermal Duration Task
- (f) The task consists of a target time announced by the Contest Director (CD). 10 minutes is recommended.
- (g) The CD may choose to change the target time based on local conditions,
- (h) The flight is initiated with a 10 second launch buzzer. All pilots must launch their planes within the 10 second launch buzzer. A plane launched before or after the launch buzzer will receive 0 points for the round,
- (i) Time will start when the model aircraft has left the hands of the competitor or helper. The model aircraft must leave the hands of the competitor or helper under the pull of the electric drive motor. The CD may allow a power-off launch for reasons of safety.
- (j) No wing tip launches are allowed (discus, side-arm, etc.).
- (k) At the end of the motor run (30 seconds or 200 meters whichever comes first), no other activation of the motor is permitted for the remainder of the flight,
- (l) Time will end when the model touches the ground or any ground-based object,
- (m) The flight will be scored at 1 point/second for each second up to and including the target time,
- (n) For each second beyond the target time the score will be decreased by 1 point/second

3.12.2 Landing

- (a) The landing circle will consist of a 10 meter tape marked in 1 meter increments.
- (b) Landing points apply per Electric Precision Landing of 50 point maximum, 10 meter landing tape as per clause 2.4.5 and measured to the nose of the model.
- (c) Landing points will be measured from the centre of the landing circle to the nose of the aircraft,
- (d) No landing points will be given if the plane sustains significant damage during the landing and, in the opinion of the contest director or his designate, is not safely flyable
- (e) No landing points will be given if the model aircraft touches either the pilot or his helper during the landing.

3.12.3 Scoring

- (a) Time will be recorded by the timekeeper/helper and will be truncated for scoring purposes,
- (b) Points are earned at the rate of +1 point/sec up to and including the target time and are reduced by -1 point/second beyond the target time (e.g. 600 possible points for a 10 minute target).
- (c) The flight scores will be normalized by taking the ratio of the contestants score to that of the highest score for that flight group and multiplying by 1000.
- (d) The contestant's final score will be the sum of the pilot's normalized flight score and the landing score.

3.12.4 General Requirements

- (a) Field boundaries will be established by the CD consistent with local terrain and good safety practices. An aircraft landing beyond the field boundaries will receive 0 points for the round. Any part of the aircraft touching the field boundaries will be considered in-bounds except that parts shed from the aircraft and landing within the field boundaries will not qualify as in-bounds.
- (b) The competitor may use up to three model aircraft in the contest. The competitor may combine the parts of the model aircraft during the contest, provided the resulting model aircraft conforms to the rules and the parts have been checked before the start of the contest.
- (c) Each pilot is allowed one timer/helper who may communicate with the pilot during the round. The timer/helper's responsibilities are to assure the safety of the flight and to record the time of flight and the landing bonus. The timer/helper may assist the pilot with launching, plane retrieval and advice (including time progression) that the pilot may request during the event.
- (d) Any device for the transmission of information from the model aircraft to the pilot or timer/helper which would assist the pilot in finding, locating or centering on thermal or slope lift is prohibited.
- (e) Any use of telecommunication devices in the field to communicate with competitors, their helpers or team managers while performing the competition task is prohibited.

3.12.5 Definition of Electric Powered Model Glider:

- (a) A model aircraft in which lift is generated by aerodynamic forces acting on surfaces remaining fixed in flight, except control surfaces, which performs manoeuvres controlled by the pilot on the ground, using radio control.
- (b) Model aircraft with variable geometry or area must comply with the specification when the surfaces are in maximum and minimum extended mode.
- (c) Maximum surface area - 150dm² (2325in²)
- (d) Maximum flying weight - 5Kg (11.023lbs)
- (e) Maximum surface loading - 75g/dm² (24.51oz/sqft)
- (f) The power source shall consist of any kind of rechargeable batteries (or secondary cells).
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.
- (g) Any type of electric motor, with or without a gearbox, may be used.
- (h) Any device, fixed or retractable, intended to arrest the model aircraft on the ground during landing is prohibited.
- (i) All ballast must be carried internally and fastened securely within the airframe.
- (j) Batteries may be charged or changed at any time during the competition.
- (k) Any device, other than the approved timer/altimeter, which is carried in or on the model and which enables total or partial independent control over the model, is prohibited.
- (l) The competitor is entitled to a re-flight (or a new attempt) if he was hindered or aborted by an unexpected event not within his control.
- (j) The CD may enforce a possible violation of the launch height by requiring that a contestant re-launch his plane with a self-contained altimeter to verify compliance with the launch target.

3.12.6 Approved Timer/Altimeters

Refer to rule 2.8 – Altitude Limiters

3.12.7 National Decentralised Contest Format (NDC)

- (a) An NDC contest will comprise 4 rounds, each of 10 minutes.
- (b) Contest rules as per 3.13.1 except scoring as per 3.13.7.c below
- (c) For NDC only, scoring will be the sum of the four rounds Raw Scores.
 - (i) Flight time max is 10min (600 points) plus landing max of 50. Max round score of 650.
 - (ii) Max NDC score is 2600 points

3.13 CLASS N: ALES 123 OPEN (Altitude Limited Electric Soaring)

The object is to fly three 6 minutes flights over 3 rounds with a bonus for landing. Launch height is limited to 123m (400ft) and motor run time to 20 seconds.

3.13.1 Contest rules

- (a) There are no restrictions on motor, plane or battery chemistry.
- (b) You can recharge or swap batteries between flights
- (c) Flights will be scored one point for each second flown up to 6 minutes (i.e. 360 points) then one point lost for each second flown over this time.
- (d) Launch height is limited to 123m (400ft). Height will be controlled by an Altimeter switch placed in line with the throttle channel. See 2.8.
- (e) A landing bonus of 50 points will be awarded if the whole of the model stops inside a 7 metre diameter circle; 25 points if any part of the model stops inside a 15 metre diameter circle; zero points if outside the circle.
- (f) Timing of flight is to commence at launch of the model, from the moment it leaves the launchers hand. Maximum motor run time is 20 seconds, to be controlled by the onboard switch. Flight timing stops as soon as the model touches the ground.
- (g) The motor may not be restarted during the flight. Should the motor be restarted for any reason, the timekeeper will stop the watch immediately and landing points will be lost.
- (h) No re-flights are permitted.
- (i) Each flight counts. The final score is the total of all points over three flights.
- (j) If the model is still airborne at the end of the round the flight time stops at that point as well as no landing points awarded.
- (k) The duration of each round will be decided by the CD taking into account the number of competitors, weather conditions and any other pertinent factors.

3.14 CLASS O: X5J UNLIMITED

The object is to fly four flights with 10 minute working time per flight with a bonus landing using an unlimited electric motor powered sailplane.

3.14.1 General Rules

- (a) This class allows any electric model to be used with in general FAI and NZ limits for R/C models.
- (b) Any combination of battery and motor combination may be used.
- (c) More than one model per competitor may be used in a contest.
- (d) Battery changing and recharging is allowed between flights.
- (e) Definitions apply per Section one of the Soaring rules
- (f) No two Pilots can fly the same model.

3.14.2 Contest Rules

- (a) A Contest consists of 4 flights, all count. These 4 flights are summed to get the contest score.
- (b) Each flight will be flown within a 10 minute working time.
- (c) Motor must be running at launch. Motor run time is included in the working time. The Pilot must tell the Timer when he stops the motor at which time the Timer will start the glide time watch.
- (d) One point is awarded for each second flown on the glide (does not include motor run time) up to the end of the 10 minute working time. Landing points are added to get the flight total score.
- (c) Landing points apply per Electric Precision Landing of 50 point maximum, 10 meter landing tape as per clause 2.4.5 and measured to the nose of the model.
- (d) If the aircraft is airborne after the end of the working time the flight watch is stopped at the finish of working time and no landing points are awarded.
- (e) If the motor has to be restarted during the flight, the subsequent run times are deducted from the glide score at 1 point per second and no landing points are awarded.

3.14.3. Note

Maximum possible score per flight depends on the engine run time but could be 600 seconds, less run time, plus 50 landing points. Typically this would be 635 if the motor run was 15 seconds and if the Pilot landed on the spot at exactly the end of the working time.

3.15 CLASS P: ALES RADIAN (or similar 2m All Foam Electric Glider)
(ALES = Altitude Limited Electric Soaring)

The intent of this competition is to provide a simple set of rules for a fun event. Open to Radian electric gliders or equivalent 2m all foam models. Major modifications to the aircraft may lead to condemnation by your fellow pilots.

The object is to fly three 7 minutes flights over 3 rounds with a bonus for landing. Launch height is limited to 200m and motor run time to 30 seconds.

A Contest Director may decide to mass launch groups of pilots to add to the fun of the event. The CD may use group scoring in this instance but points will not be eligible for any record claims or NDC.

3.15.1 Contest rules

- (a) There are no restrictions on motor, plane or battery chemistry.
- (b) You can recharge or swap batteries between flights
- (c) Flights will be scored one point for each second flown up to 7 minutes (i.e. 420 points) then one point lost for each second flown over this time.
- (d) Launch height is limited to 200m. Height will be controlled by an Altimeter switch placed in line with the throttle channel. Refer section 2.8.
- (e) A landing bonus of 50 points will be awarded if the whole of the model stops inside a 7 metre diameter circle; 25 points if any part of the model stops inside a 15 metre diameter circle; zero points if outside the 15m circle.
- (f) Timing of flight is to commence at launch of the model, from the moment it leaves the launchers hand. Maximum motor run time is 30 seconds, to be controlled by the onboard switch. Flight timing stops as soon as the model touches the ground.
- (g) The motor may not be restarted during the flight. Should the motor be restarted for any reason, the timekeeper will stop the watch immediately and landing points will be lost.
- (h) No re-flights are permitted.
- (i) Each flight counts. The final score is the total of all points over three flights.
- (j) The model must be airborne at the end of the round the flight time for the flight & landing to count.
- (k) The duration of each round will be decided by the CD taking into account the number of competitors, weather conditions etc. For example each round could be 1 hour.

3.15.2 NDC rules

- (a) Group scored contest results are not eligible for NDC contests.