NZMAA FLYING RULES
Section 7A: Radio Control Scale : Flying Rules,1998

1.a. INTENT

The intent of this competition is to foster interest in *SCALE MODEL AIRCRAFT*, by encouraging realistic, prototypical flight plans, and accurate Scale Model Aircraft.

1.a.1 The following classes are considered:

i. **OPEN SCALE** is for all flying models of full size aircraft capable of carrying a living pilot. The contestant must be the builder and pilot of the model.

ii. **LIMITED SCALE** is for all flying models of full size aircraft capable of carrying a living pilot with weight and dimensional limits as for FAI Class F4C. The contestant must be the builder and pilot of the model.

iii **TEAM SCALE** is for all flying models of full size aircraft capable of carrying a living pilot. The Team consists of two or more, one of whom must be the builder and one the pilot, both of these should be on the field.

iv. **FLY ONLY SCALE** is for all flying models of full size aircraft capable of carrying a living pilot. Models entered in this class are not subject to Static Judging, the builder of the Model rule does not apply, the contestant is considered to be the pilot.

1.a.2. Any Model may be entered in one class at any competition.

1.a.3. Each Contestant may compete only with one model in any one class.

1.a.4. A Contestant may have one assistant during an official flight, but if the model is of a multi-engined prototype, the contestant may have two helpers. No helpers may touch the transmitter during an official flight.

1.b.1 Models must comply with NZMAA standards of maximum weight, wing loading and engine capacity.

1.b.2. All models of a size to be required by the NZMAA to have a Large Model Certificate must have the Certificate available for inspection by the C.D.

2.a.1. Where a K Factor is noted, scoring shall be from 0 to 10 inclusive. The Score shall then be multiplied by the K Factor (K).
Fractions of a point may be used in determining Flight Scores.

2.a.2. Proof of Scale is the responsibility of the contestant.

2.a.3. Complexity Bonus. To compensate for different aircraft characteristics, and to reward complex models, complexity bonus points will be applied to flight scores as follows:

a.	Undercarriage,	Tail Dragger	K = 5%
		Retract Main Gear	K = 5%
b.	Biplane		K = 5%
c.	Undercambered Wing Section		K = 5%
	(Does not apply to modern reflex curved sections)		
d.	Multiple Engines(Includes Ducted Fans)		K = 5%
e.	Prototypical Wing Warping		K = 5%

Notes; To qualify for (d), the power ratio of the engines must be prototypical, and all engines must be running at Take Off.

Judges shall decide on applicable bonus points to be applied to the flight score of each model during the static scoring procedure. Complexity bonus Points will be applied only if the model includes the items listed.

Only one bonus may be claimed under each heading.

Maximum bonus to be applied may not exceed 20% in total.

2.b.1. All models shall become airborne in prototypical fashion. Hand launching will be permitted at a total sacrifice of take off points.

2.b.2. Models of seaplanes of all classes may be permitted to use wheels or wheeled dollies for take-off in the absence of suitable water surface conditions. Deviation from scale through permanently attached wheels, skids or similar non-prototype devices shall not be taken into consideration in the scoring of fidelity to scale and craftsmanship.

2.b.3. No parts of a model, except propeller and spinner may be removed, nor anything visible except a dummy pilot and antenna be added to a model, between static judging and flying. Bombs, droptanks etc must be presented in static but may be replaced before flying by similar and repairable examples of the same shape, colour and size. Penalty is disqualification. Additional air entries are permitted, provided they are covered by removable hatches for static judging; these hatches may be moved or opened manually prior to flight, or if in flight, by means of radio control. The appearance of the model may not be affected.

2.b.4. A flying propeller of any form or diameter may be substituted for a scale propeller. The size and shape of the spinner may not be changed.

2.b.5. Metal bladed propellers are prohibited.

2.b.6. The release or dropping of a dolly immediately after take-off shall not be considered as jettisoning.

2.b.7. Explosives may not be dropped.

2.b.8. If the pilot of the prototype is visible from the front or side during flight, a dummy pilot of scale size and shape shall be equally visible during fight of the model. Penalty is the K-factor for Realism; Style shall be reduced to three (3). Presence of a dummy pilot is not mandatory for static judging.

2.b.9. When jettisoning of any part of the model occurs, the scoring of the flight shall cease from that point onwards, including the figure in which it occurred.

3.a. RADIO EQUIPMENT. There shall be no limitations on the radio or mechanical equipment used by the contestant. Gyros are permitted only in helicopters and multi-engined fixed wing models.

4.a. OFFICIAL FLIGHTS

4.a.1. A competition will consist of up to five (5) flights for each contestant who must execute an official flight within the required time limit (see 4.b.) on each occasion to be eligible for flight points for that flight.

4.a.2. If a contestant is unable to start or complete a flight and, in the opinion of the Contest Director, the cause is outside the control of the contestant, the Contest Director may, at his/her discretion, award the contestant a reflight. The Contest Director will determine when the reflight will take place.

4.a.3. An official flight commences at the earliest of the following:

- i The contestant signals to the timekeeper that he/she is commencing to start the engine(s).
- ii Two minutes after the contestant is instructed to start the flight (See 4.b.2.)

4.b. FLYING TIME

4.b.1. A contestant will be given not less than five minutes notice of an instruction to start. At this time, contestant, helper, model and starting equipment should move up to the ready box.

4.b.2. The contestant will then be instructed to start.

4.b.3. Timing of the flight will commence when the official flight commences. (See 4.a.3. above.)

4.b.4. The contestant will be allowed 14 minutes in the case of an aerobatic prototype, or 17 minutes in the case of a non-aerobatic prototype, to complete the flight.

4.b.5. In the case of a piston engined model of a multi engined prototype the time allowed in (4.b.4.) above will be increased by one minute per additional motor.

4.b.6. No points will be awarded for any manoeuvre not completed at the end of the time allowed.

4.c. STARTING TIME.

4.c.1. If the model is not airborne within 7 minutes (plus one minute for each additional motor) after the official flight and timing commence, the official flight will end and no points will be awarded for the flight.

4.c.2. If, in the case of a piston motor, the motor stops after the first manoeuvre has commenced but before the model is airborne, the motor may be restarted, but no points will be awarded for the figure which has commenced.

Note: rule (4.c.1.) still applies.

5.a. FLIGHT.

The emphasis in flight requirements is on realism and flying in a prototypical manner.

5.a.1. Figures shall be performed to the Flight Judges Guide (Appendix #1) and accepted by NZMAA. However, a contestant who can provide documentary evidence of prototypical variance from these should do so, and will then be judged against this specification.
Contestant must provide evidence in written or diagrammatic form to the Chief Flight Judge before the flight commences.

5.a.2. **Manoeuvres:** Mandatory

Take - off	K = 10
Approach	K = 5
Landing	K = 10

5.a.3. **Approach**
Contestant may elect, but must call and document, a prototypical approach. Eg. Buzz and Break for fighters, Land off reversal for aerobatic types, etc.

5.a.4. **Landing**
Contestant may elect, but must call and document, a prototypical landing.
Eg. arrestor hook, three point, wheeled on, etc.

5.a.5. **Emergency Landing**
At any time after the flight commences but before entering the final approach, contestant may call an Emergency Landing due to a malfunction in the model. Provided that the model lands on, or adjacent to, the landing circle, the pilot will receive a score for landing, with the same considerations as for a normal landing as regards tip over etc. In the case of a wheels up landing, consideration will be given as to apparent crew survivability.

5.b.1. **Optional Manoeuvres.**
Manoeuvres may be chosen from the following lists, but alternative figures may be specified if approved by the Contest Director who shall decide K factors for such manoeuvres. Upon establishment of a figure's value, it shall be added to the list as such.
In the following options, those which are italicised (eg. **Chandelle**) are available for aircraft designed as non-aerobatic aircraft:
Definition: *Non-aerobatic aircraft are those restricted to level flight by the manufacturer or licensing government agency and those aircraft intended only for carrying passengers, cargo or heavy loads such as bombs.*
Aircraft designed for aerobatic flight, such as military fighters and trainers and those having no restriction against aerobatics may not select these italicised manoeuvres.

5.b.2. Selected figures must be appropriate to the capabilities and licensing of the type. The flight schedule must be developed so as to display the model within the performance limits of the type and to emphasise prototypical character. In the event of the judges questioning the suitability of manoeuve(s) of the type, the pilot has the responsibility of providing documentary evidence of the manoeuvre(s) suitability.

5.b.3. **Manoeuvres. K = 2**

Straight Flight
Strafing Run
Extend and Retract Landing Gear
Extend and Retract Flaps

5.b.4. **Manoeuvres. K = 3**

Taxi
Procedure Turn
Chandelle
One Loop
Axial Roll
Half Cuban Eight
Half Reserve Cuban Eight
Reversal or Split - S
Immelmann Turn
Overshoot
Stall Turn
Low Pass (under 6 meters)
Inverted Pass
Military Roll
Snap Roll (positive)
Release Parachute(s)
Drop Bombs or Tanks

5.b.5. **Manoeuvres. K = 4**

Descending Circle
Derry Turn
Humpty Bump
Cuban Eight
Reverse Cuban Eight
Double Stall Turn
Avalanche
Normal Spin (3 turn)
Slow Roll
Two Rolls, opposite direction
Cobra Roll
Vertical Eight
Continuous 3 Rolls
Touch and Go
Agricultural Spreading or Spraying
Dirty Pass
Horizontal Eight
Inverted Low Pass
Square Loop
Vertical Rolls (4)
Barrel Roll
Stall Turn (any roll)
Snap Roll (negative)

5.b.6. **Manoeuvres. K = 5**

******Triangular Circuit**
Rectangular Circuit
Rolling Circle
Rolling Loop
Dive Bomb Attack
Hesitation Roll (4 point)
Figure M with 1/2 Rolls
Lazy Eight
Two Hesitation (2 point) Rolls, Opposite Directions
Inverted Spin (3 turn)

5.b.7. The contestant may choose any combination of manoeuvres which gives a total K = 30, up to a maximum of 10 manoeuvres.
Note: Should the total K Factor exceed 30, the contestant must nominate a manoeuvre to be down graded, to achieve the correct total, eg. reduce a K = 4 to K = 2 . Increasing a K Factor value to reach K Factor = 30 is not allowed.

5.c. REALISM OF FLIGHT

5.c.1. **Style. *K=3*** That the style and appearance of the entire flight was prototypically appropriate.

5.c.2. **Speed. *K=3*** That the model speed appeared prototypically appropriate.

5.d.1 The sequence of figures may begin upwind or downwind, but thereafter a manoeuvre must be attempted on each pass, once the first manoeuvre is called. Penalty is 20% reduction of flight score. One free pass, to position for starting purposes, and one free pass for setting up of landing circuit is permitted.

6.a MARKING (Read in Conjunction with Rule 5.b.2)

6.a.1. Each figure may be awarded marks from 0 to 10 inclusive by each of the judges during the flight. These marks are totalled (in the case of three flight judges) and multiplied by the appropriate K value.
The figures must be performed in a plane and at a height which will enable them to be seen clearly by the judges. Non compliance with this rule will result in downgraded points. Any manoeuvre which passes behind a minimum judging line will be given a zero by the chief Flightline Judge.
If, in the opinion of the CD a model is unsafe or is being flown in an unsafe manner, the pilot may be instructed to land.

6.a.2. Marking shall be done by considering each individually and starting at a maximum value of 10, deduct 0.5 point for each error, arriving at a net point score for the manoeuvre.

6.a.3. **Flight Score.** Flight Score shall be given thus:
For five judges, the highest and the lowest scores are scratched, then, as for three judges, the remaining three marks are totalled, multiplied by the appropriate K value and entered.

6.a.4 Realism of Flight
These items are to be discussed by all the Judges after the completion of the flight, who shall then arrive at a unanimous score, which will then be multiplied by the number of the Judges present. The Chief Judge shall then record the score on his/her score card.

7.a. ORGANISATION
The field shall be laid out giving a flying strip of no less than 100 meters length (into expected wind direction) by 10 meters width short mown grass, rolled smooth

if necessary. Where possible, a circle of 100 meters diameter should be mown. Bordering this, if there is thick grass, there should be a run out zone of 3 – 5 meters width topped to 50 - 70 mm height. A pit lane of short mown grass should be mown at a safe distance from the flying strip.
Between them there should be a taxi way, wide enough for a Ready Box to be accommodated.
Flight Judges should be seated approx. 5 - 7 meters from the flying strip. Pilots should stand immediately in front of them, with a caller close to hand.
Flight orders may be changed at the discretion of the Contest Director.

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