SAMAA

R/C SCALE RULE BOOK

SAFETY RULES

SERIES SCALE

SPORT SCALE

F4H (STAND OFF SCALE)

F4C

VALID: 1 MARCH 2022

1. INTRODUCTION

The following is a full update of the Radio Control Scale Rules for all Scale Classes and Competitions for use in South Africa from 1 June 2019. As presented these include all relevant (other than grammar and some numbering) amendments **in RED** since the last edition of the Rule Book. The F4H Static Score Sheet and the 'Universal' Flight Score Sheet have also been updated without red bits.

The Rule Book consists of the following:

1. Introduction

2. Safety Rules

3. Series Scale National Series: Rules and Objectives as well as amendments to the Current SAMAA Sport Scale and Stand Off Scale Rules as applicable to the Series.

4. SAMAA Sport Scale Rules
   - 4.1 SAMAA Sport Scale Rule Book: Section 1
   - 4.2 SAMAA Sport Scale Rule Book: Section 2

5. INTERNATIONAL RULES FOR CLASS F4H (Stand-Off-Scale)

   - 5.1 Class F4H: Section 1.
   - 5.2 ANNEX 1A: Judges Guide (Static Section)
   - 5.3 ANNEX 1B: Organizers Guide.

6. INTERNATIONAL RULES FOR CLASS F4C

   - 6.1 General Rules
   - 6.3 Class F4C
   - Annex 6A: Judges Guide for Static Judging
   - Annex 6C: Judges Guide for Flying

7. STATIC- AND FLYING SCORE SHEET MASTERS AND COMPETITORS DECLARATION FORM.

The **Complete Sport Scale Rule Book** consists of Paragraph 4 plus Section 5.3 plus Annex 6C under Paragraph 6.

The **Complete F4H Rule Book** consists of Paragraph 5.1, 5.2 and 5.3 plus parts of Annex 6A and Annex 6C under Paragraph 6 as stated in Paragraph 5.

The **Complete F4C Rule Book** consists of the complete Paragraph 6 as listed above.

Johan Ehlers
NASA Rules and Judging Coordinator
July 2019

2. SAFETY RULES

The safe operation of Scale Model Aircraft is subject to the SAMAA Manual of Procedures and the SAMAA Safety Procedures and Guidelines for the operation of Radio Controlled Aircraft.

Furthermore, where applicable, the LSAA and SAMJA Safety Procedures and Guidelines for Large Scale Aerobatic Aircraft and Model Jet Aircraft apply.

References to Safety are also found under **Sport Scale** par. 2.6, 2.7 and 2.11 on pages 11, 12 and 13; **F4H** par. 2.11 on p 24 as well as par. 1B8 and 1B9 on page 28; and **F4C** par 6.3.11 on page 42.

For all Scale Classes where it is not specifically mentioned in the specific sections, the contest should be interrupted or the start delayed by the contest director in the event that the wind is continuously stronger than 9 m/s measured at two (2) meters above the ground at the flight line, for at least one minute.

3. SERIES SCALE NATIONAL SERIES

Rules and Objectives of Series Scale as well as
Amendments to the Current SAMAA Scale Rules as applicable to the Series

1. General:

1.1 Series Scale is a series of competitions, with the primary emphasis on flying, for scale radio controlled model aircraft, and acts as a qualification for entry and invitation to the South African Scale Masters which form part of the South African F4C and /or F4H Team Trials.

1.2 The series will be flown simultaneously in various centers around the country, the scores being coordinated and collated at a central location.

1.3 There will be two rounds, commencing in July, of which the two best rounds will count for qualification purposes. The further round will be flown October of each year.

1.4 The series will form the qualification for the SOUTH AFRICAN SCALE MASTERS, which will be flown the following March at a central venue. All pilots scoring an average in excess of 1800 points in their best two Series Scale rounds will be eligible for entry and invitation to the Masters. The annual Masters will form part of the Team Trials for the F4C and F4H Teams to the World Championships as specified in the Team Selection Procedure for each World Championships.

1.5 Series Scale is open to all scale flyers, provided that they are SAMAA-members. In order to qualify for team selection, uninterrupted SAMAA-membership during the whole run up to the last team selection event of a cycle is mandatory.

1.6 Although there are no restrictions on model weight and engine size for Series Scale other than the SAMAA Large Aircraft regulations, for an aircraft to be eligible for F4C or F4H team selection, it must meet the current limitations as stated in the current FAI Rule Book.

2. Rules:

Series Scale will be contested under the current SAMAA Sport Scale Rules with the following exceptions:

2.1 There is no restriction to the number of models a contestant may enter in the series, but a separate entry fee is payable for each model at the discretion of the local organizers.

2.2 The Builder of the Model Rules (F4H and F4C Rule Books) is waived for Series Scale since all flying is done according to the Sport Scale Rules, but not for the Masters or any other SAMAA-sanctioned F4H and F4C competition. This implies that a modeler may use a model which does not comply with the BOM rule during the series in order to qualify for the Masters. It does not mean that a number of contestants may share the same model during Series Scale rounds.

2.4 Attempts. In order to encourage newcomers, a contestant may have two attempts to complete an official flight. The attempt must be called before the expiry of the seven minutes time to get airborne, or before the model has been airborne for more than 60 seconds. This only applies to the series and not to the Masters or other SAMAA sanctioned contests.

2.5 Number of flights to count. Ideally a series round consists of three rounds of flying with the average of the best two flights to constitute the flight score. If only two rounds of flying can be completed, the best flight will constitute the flight score. If only one round of flying can be completed, that flight will constitute the flight score.

2.6 Provided that judges experienced at Nationals level are used, the number of judges may be reduced to two (2) for Series Scale events.

3.0 There will be an entry fee to cover the costs of hosting each round, the amount to be decided by the local organizer, payable per aircraft entered, for participation per flying day.

4. SAMAA SPORT SCALE RULE BOOK

SECTION 1

Introduction: Sport Scale is a flying-only class to provide an introduction to Radio Controlled Scale Competition.

GENERAL RULES AND STANDARDS

1.1 Definition of a Scale Model:

A scale model shall be a reproduction of a heavier-than air, fixed-wing, man-carrying aircraft, which has been airborne.

NB: To indicate the subject full-size aircraft being scale modeled, the word 'prototype' is always used.

1.2 Judges:

The organizers of Local or National competitions shall appoint a panel of at least three competent flight judges.

1.3 Coefficient:

Where a K-factor (K) is noted, scoring shall be from zero to 10 inclusive. The score shall then be multiplied by the K-factor (K). Half points may be used.

1.4 Remarks:

a] All models shall become airborne under their own power in the manner of the prototype. Hand-launching will be permitted at the sacrifice of the total take off points.

b] Models of seaplanes of all classes are permitted to use wheeled dollies for take-off in the absence of suitable water surface conditions.

c] Metal-bladed flying propellers are forbidden.

d] The release or dropping of a dolly immediately after take-off shall not be considered as jettisoning.

e] The use of silencers is mandatory.

f] Explosives may not be dropped.

g] If the pilot of the prototype is visible from the front or from the side during flight, a dummy pilot of scale size and shape shall be equally visible during flight in the model. If such a pilot is not fitted, the total flight score shall be reduced by 10%.

j] No maiden flight of a model will be allowed at a contest.

k] When jettisoning of any part of the model occurs (except if nominated under 2.5.2 to 2.5.9) the scoring shall cease from that point onwards, including the figure in which it occurred.

I] The model may not be handled in any manner after commencement of the first manoeuvre, except as outlined under 2.4 (b).

m] Any manoeuvre which is done out of sequence scores zero.

n] Any manoeuvre which is not completed scores zero.

o] Any infringement will result in disqualification.

1.5 Number of models:

Each contestant may compete with one model only. The application of this rule is at the discretion of the contest organizer for competitions other than the Masters and National Championships, where this rule shall apply.

1.6 Helpers:

A contestant may have one helper during an official flight. An additional helper may assist with starting and pre-flight preparations. All but one helper must retire clear from the flying area before the flight is called. No helper may touch the transmitter during an official flight.

The time keeper is responsible for observing that helpers do not touch the transmitter once the first manoeuvre has been called. If a helper touches the transmitter, the flight is scored zero.

1.7 Builder/flier:

Although there is no Builder of the Model Rule for Sport Scale, the person entering the model must also pilot it and a model may not be shared among competitors.

1.8 Proof of scale:

1.8.1 Proof of scale is the responsibility of the contestant.

1.8.2 Name of Entry:

Exact name and model designation of the subject aircraft shall be indicated in the space provided on the flight score sheet

1.8.3 The scale to which the model is built is optional, but must be stated in the space provided on the flight score sheet.

1.8.4 The model must be a clearly recognizable rendition and not a caricature of a full size fixed wing aircraft. ARF Scale Models are eligible. For example an 'Ugly Stick' does not fulfill the criterion that it represents a Fokker Monoplane, neither does a 2 x

2 'Caprise' represent a CAP 232 etc. The decision of the flight judges in this regard will be final. Any scale model with any colour scheme is acceptable, provided that the model fulfills this criterion.

1.8.5 Bonus: To compensate models with scale colour schemes and markings as opposed to models with non-scale colour schemes and markings, models with scale colour schemes and markings will receive a bonus added to their flight score. A model that has been re-finished in an authentic colour scheme shall receive a 10% bonus, whereas a model with a representative colour scheme 'out of the box', shall receive a 5% bonus. Proof of colour and markings can be a colour photograph, a printed and published description, an artist's impression or plastic model box top art. It is the responsibility of the contestant to submit the proof of colour and markings to the chief flying judge when handing his score sheets to the judges for his first round flight.

SECTION 2

MODEL CHARACTERISTICS, FLIGHT TIMING, FLIGHT SCHEDULE, ORGANISATION AND SCORING

2.1 Model Characteristics:

a) For local and national competitions the FAI upper weight limit for model aircraft of 25 kg with fuel shall apply.

b) Jet reaction motors:

Rocket or pulse jet may not be used.
Turbines are allowed.

2.1.2 Radio Control Equipment

Permitted:

a) Radio control equipment shall be of the open loop type; i.e. no electronic feedback from the model aircraft to the ground except for telemetry systems that monitor batteries, engines and fuel.

b) The use of any electronic stability device on three primary flight controls.

Not Permitted:

a) The use of GPS devices/data or any other satellite based system
b) The use of any navigational positioning sensors which provide altitude or heading hold positioning.
c) Pre-programmable devices for flight manoeuvres

IMPORTANT NOTE: Apart from the Transmitter, any device which can be used for programming, e g laptop, tablet and any dedicated input device is not permitted at the flight line at any time.

2.2 Official Flights:

a) Each contestant will be called to fly three times and must execute an official flight within the required time limit (see 2.3) on each occasion to be eligible for flight points for that flight.

b) If a contestant is unable to start or complete a flight and, in the opinion of the CD, the cause is outside the control of the contestant, the CD may, at his discretion, award the contestant a re-flight. The CD shall decide when the re-flight shall take place.

c) An official flight commences at the earliest of the following:

1. in the case of a piston engine, when the contestant or his helper begins to crank the engine in order to start it, or
2. in the case of an electric motor, when the contestant or his helper announces the commencement of the first manoeuvre, or
3. three minutes after the contestant is instructed to start his flight. (See 2.3 (b)).
4. An official flight is terminated when the model lands and stops, except during the option 2.6 l. (Touch and Go).

d) For the purpose of 2.8, an official flight shall be considered to have been completed when the model has been airborne for 60 seconds.

2.3 Flight Timing:

a) The contestant will be advised that he will be required to start his flight not less than 5 minutes before the instruction to start.

b) The contestant will then be instructed to start his flight.

c) Timing of the flight will commence when the official flight commences. (See 2.2 (c))

d) The contestant will be allowed 17 minutes to complete his flight.

e) In the case of a piston-engine powered model of a multi-engine prototype, the time allowed in d), above, will be increased by one minute for each additional engine.

f) No points will be awarded for any manoeuvre which is not completed at the end of the time allowed.

2.4 Starting Time

a) If the model is not airborne within seven minutes, plus one additional minute for each engine, after the official flight and timing commence, the official flight will end and no points will be awarded for the flight.

b) If the engine stops after take-off has commenced, but before the model is airborne the engine may be restarted, but no points will be awarded for take-off. There is only one attempt allowed to repeat the take-off.

Note: In this case, rule 2.4 a. still applies.

2.5 Flight:

2.5.1 Take off .....K = 11
2.5.2 Option 1 ..... K = 7
2.5.3 Option 2 ..... K = 7
2.5.4 Option 3..... K = 7
2.5.5 Option 4..... K = 7
2.5.6 Option 5..... K = 7
2.5.7 Option 6..... K = 7
2.5.8 Option 7..... K = 7
2.5.9 Option 8..... K = 7

2.5.10 Approach and Landing.....K=11
2.5.11 Realism in flight

a) Engine sound (realistic tone & tuning)..... K = 4
b) Speed of model.....K = 9
c) Smoothness of Flight.....K = 9

Total K Factor .....K = 100

Notes:

1) The flight schedule must include the two manoeuvres "Overhead Figure Eight" and "Descending 360° Circle" to be accepted as complete.
2) The scale of the model and the cruising speed or maximum speed of the prototype must be stated on the score sheet.
3) Only one attempt is permitted for each manoeuvre, the only exception is the procedure of getting the model airborne, as defined in 6.3.5.b.

2.6 Optional Demonstrations:

The manoeuvres "Overhead Figure Eight" and "Descending 360° Circle" are mandatory manoeuvres to be included in each flight and positioned in the flight sequence at the competitor's discretion. The contestant shall be prepared, if required by the judges, to give evidence that the options selected are typical and within the normal capabilities of the aircraft subject type modelled. Only one 'mechanical' option may be included in the selection of options. Selected options must be given to the judges in writing before commencement of the flight. The options may be selected in any order. (Options A, Q, U, V, W, AC and AD are intended for subjects with little or no aerobatic capability). These are aircraft designed with limited manoeuvrabilty where the original prototypes were restricted by the manufacturer or the licensing government agency. A contestant may not select option B if option C has been selected and *vice versa*.

Examples are: Pioneer and early aircraft (pre 1915), purpose designed reconnaissance and bomber aircraft (this does not include fighter aircraft later adapted for reconnaissance duties or fighter-bombers where the designer intended an aerobatic capability), touring aircraft, passenger and cargo aircraft and military transports.

If these non-aerobatic manoeuvres are flown by models NOT certified as non-aerobatic, then they shall be marked zero.

The order in which all manoeuvres are to be flown must be indicated on the score sheet before the flight and any manoeuvre flown out of sequence shall be marked zero.

Competitors may demonstrate up to two different flight functions of their own choice,

but must be prepared to supply evidence that each function was performed by the prototype modelled. Competitors must indicate to the Flight Judges the nature of the demonstration(s) before going to the flight line).

A	Chandelle ……	K=7
B	Retract and extend landing gear ……..…	K=7
C	Retract and extend flaps ……..	K=7
D	Dropping of bombs or fuel tanks ……..……..	K=7
E	Stall turn ……..……..…..	K=7
F	Immelman turn ……..…...	K=7
G	One loop ……..……..……..	K=7
H	Cuban eight ……..……K=7	
I	Reverse Cuban Eight …… …..….	K=7
J	Half Cuban Eight ……...…….	K=7
K	Half Reverse Cuban Eight ……..……..	K=7
L	Split S (Reversal) ……..…….	K=7
M	Normal spin (three turns) ……	K=7
N	Roll ……...……..	K=7
O	Parachute drop ……..……..	K=7
P	Touch and go ……..…….…...	K=7
Q	Overshoot ……..……..	K=7
R	Side slip to left or right ……..….	K=7
S	1st Flight function by subject aircraft ……..	K=7
T	2nd Flight function by subject aircraft ……	K=7
	Competitors may demonstrate up to two different flight functions of their own choice, but must supply evidence that each function was performed by the prototype modelled. Competitors must indicate on the Declaration Form and to the Chief Flight Judge the nature of the demonstration(s) before going to the flight line.	
U	Flight in triangular circuit ……..……	K=7
V	Flight in rectangular circuit ……..……..……	K=7
W	Flight in a straight line at constant height ……..……..….. *(maximum height 6 meters)*	K=7
X	Flight in a straight line with one engine throttled …….....…… *(for multi-engined model aircraft only)*	K=7
Y	Lazy Eight ……..	K=7
Z	Wingover ……	K=7
AA	Inverted flight ……	K=7
AB	Derry Turn …….	K=7
AC	Procedure Turn ……..……..……..	K=7
AD	Straight flight at low speed ……	K=7

Notes:

In the case of uncertainty as to the aerobatic/non-aerobatic status of a particular subject, the contestant shall be prepared to, if required by the judges, supply published evidence to support his choice.

The pilot should at all times be allowed to choose at least the direction of the Take-off, Landing and Touch and Go, provided they do not over-fly a designated safety area behind the judges line laid out for the protection of spectators, officials, other contestants and helpers. All flying manoeuvres start by a trajectory parallel to the judges' line, except 2.6 P and Q, which start with a trajectory perpendicular to the judges' line.

2.7 Marking (Flight points):

Each manoeuvre may be awarded from zero to 10 inclusive using increments of half a mark by each of the judges during the flight. These marks are multiplied by the K-factor listed for each manoeuvre. The manoeuvres must be performed in a plane and at a height which will allow them to be seen clearly by the judges. The non-observance of this rule will be penalised by loss of points. If and when the model passes behind the judges before a manoeuvre is completed, no points shall be given for this manoeuvre. If in the opinion of the Contest/ Flight Line Director or Judges the model is unsafe or being flown in an unsafe manner, they may instruct the pilot to land.

After each flight the Flight Judges will record any non-standard event that caused downgrading or loss of flight points. If for any reason the mark awarded is changed, the change must be initialled by the judge. The Chief Flight Judge will review all flight score sheets for completeness and fairness and justification of any zero scores e.g. missed manoeuvres, manoeuvres flown out of order, out of flight time, flying behind the judges line or crash landing. The Chief Flight judge must then sign the score sheets before they are sent for processing.

2.8 Flight Score

All flight scores will be recorded on the score sheet. It is the responsibility of the competitor to ensure that his personal details, the details of his model and the chosen options are correctly entered on the score sheet and that a sufficient number of copies are presented to the judges before each official flight commences.

The flight score shall be the aggregate sum of the points awarded by all three judges in 2.7.

Normalisation:
The total flight score of each competitor for each round will be normalised to 1000 points as follows:

$$\text{Flight Points}_x = F_x/F_w \times 1000$$

Where:

Flight Points_x = Normalised Flight Score for competitor x
F_x = Flight Score for competitor x and
F_w = Highest Flight Score

2.9 Organisation of Radio Control Flying Scale Events

All non-2,4GHz transmitters likely to be used during the contest must be checked and placed in an impound which is kept under supervision. During the contest, a steward must be in control of the transmitter impound and will issue the transmitter to the competitor only when his name is called for him to stand by to make his flight. As soon as the flight has ended, the competitor must immediately return his transmitter to the steward at the transmitter impound.

All unauthorised transmissions during the contest will result in automatic disqualification of the offender from the entire contest, and render him liable for further penalties.

The timekeeper will notify the pilot when his model is flying outside the prescribed area.

The order of starting of the various competitors will be established by means of a draw before the start of the contest. The flight order of the competitors will not be changed.

Competitors must be called at least five (5) minutes before they are required to occupy the starting area.

2.10 Final Scoring

Three rounds are to be flown. The lowest normalized flight score is to be deleted and the average of the remaining normalized flight scores is to constitute the final flight score. In the event that for reasons beyond the control of the organizer only two rounds of flying can be completed in the time available for the contest, the average of the two normalized flight scores will constitute the final flight score. If only one round can be completed, the normalised flight score will constitute the final flight score. The final flight score will be used to rank the contestants in order of merit.

2.11 Safety

a) All manoeuvres must be performed parallel with the judges' line such that if any part of the manoeuvre is performed behind the judges' line it will score ZERO.

b) Exceptions from this rule are manoeuvres 2.5.1 Take-off, 2.5.10 Landing and 2.6.P Touch and Go. The pilot has the right to perform these manoeuvres into wind as long as they do not overfly a designated area behind the judges line laid out for the protection of spectators, officials and other competitors or helpers.

c) If a model aircraft is in the opinion of the Chief Judge or Flight Line Director unsafe, or being flown in an unsafe manner, he may instruct the pilot to land.

5.

CLASS F4H STAND-OFF-SCALE RULEBOOK

JUNE 2019

SECTION 1

GENERAL RULES AND STANDARDS FOR STATIC JUDGING

1.1 Definition of a Scale Model:

A scale model shall be a reproduction of a heavier-than air, fixed-wing, man-carrying aircraft, which has been airborne.

NB To indicate the subject full-size aircraft being scale modeled, the word 'prototype' is always used.

1.2 Judges:

The organizers of local or National competitions shall appoint three competent Static Judges who shall determine the degree of fidelity to scale and craftsmanship, and a panel of at least three competent flight judges. For International Judging Panel requirements, see par. 6.1.4 on page 29.

1.3 Coefficient:

Where a K-factor (K) is noted, scoring shall be from zero to 10 inclusive. The score shall then be multiplied by the K-factor (K).

1.4 Remarks:

a] All models shall become airborne under their own power in the manner of the prototype. Hand-launching will be permitted at the sacrifice of the total take off points.

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

c] No parts of a model, except propeller and spinner, may be removed between scale judging and flying, nor may anything except a dummy pilot and antenna be added externally to the model. Bombs, drop tanks, etc. must be presented for static judging but may be replaced before flying by simpler and repairable examples of the same shape, colour, size and weight. Additional air entries are permitted, provided they are covered by movable hatches for static judging; these hatches may be moved or opened manually prior to flight, or in flight by means of radio control. The appearance of the model in flight must not be affected.

d] A flying propeller of any form or diameter may be substituted for a scale propeller. The size, shape and colour of the spinner may not be changed.

Note: Substitution of the scale propeller relates only to powered propellers that were intended to propel the subject aircraft. If a model of a multi-engine aircraft uses non-powered (wind-milling) propellers, these may not be changed between static and flying. Features such for example the small generator propeller on the nose of an aircraft such as the Me163, may likewise not be changed for flying propellers.

e] Metal-bladed flying propellers are forbidden.

f] The release or dropping of a dolly immediately after take-off shall not be considered as jettisoning.

g] The use of silencers is mandatory. Effective concealment of a silencer within the scale outline of the model may be considered for craftsmanship points.

h] Explosives may not be dropped.

i] If the pilot of the prototype is visible from the front or from the side during flight, a dummy pilot of scale size and shape shall be equally visible during flight in the model. If such a pilot is not fitted, the total flight score shall be reduced by 10%. The dummy pilot may be present during scale judging but will not be taken into account.

j] No maiden flight of a model will be allowed at a contest.

k] When jettisoning of any part of the model occurs (except if nominated under 2.5.5 to 2.5.9) the scoring shall cease from that point onwards, including the figure in which it occurred.

I] The model may not be handled in any manner after commencement of the first manoeuvre.

m] Any manoeuvre which is done out of sequence scores zero.

n] Any manoeuvre which is not completed scores zero.

o] Any infringement will result in disqualification.

1.5 Number of models:

Each contestant may compete with one model only. The application of this rule is at the discretion of the contest organizer for competitions other than the Masters and National Championships, where the rule shall apply.

1.6 Assistants:

A contestant is permitted one helper during an official flight. An additional helper is permitted to assist with engine starting and pre-flight preparation if so required by the competitor. All but one helper must retire clear from the flying area, before the flight is called. No helper may touch the transmitter during an official flight.

The time keeper is responsible for observing that helpers do not touch the transmitter once the first manoeuvre has been called. If the helper touches the transmitter the flight is scored zero.

1.7 Builder/Flier

The requirement for the competitor to have constructed his own model (rule 6.1.9.4.e in F4C) is not applicable to F4H; however this fact must be declared in the Contestant Declaration Form where applicable and the surface finish (Colour and Markings) on the model must have been applied by the competitor in order to obtain significant marks under par 1.8.7.

1.8 Proof of scale:

1.8.1 Proof of scale is the responsibility of the contestant.

1.8.2 Name of Entry:

Exact name and model designation of the subject aircraft shall be indicated on entry blank and in "Proof of Scale" presentation.

1.8.3 The scale to which the model is built is optional, but must be stated in the "Proof of Scale" presentation.

1.8.4 Documentation:

To prove that the model resembles a particular prototype, documentation is required. The documentation can be submitted in bound form, as a montage no larger than A2 or on separate sheets. A published book with page markers is not acceptable. The contestant's name and designation of his model must appear as a heading or on the cover of the documentation. The documentation shall include proof of cruising speed or maximum speed of the prototype.

The documentation shall consist of a published three-view drawing or silhouette together with a minimum of one (1) photograph or printed reproductions and a maximum of five (5) photographs, one or more showing the actual subject aircraft being modeled. Ideally these must show the entire aircraft and show the three aspects: side view, front view and top plan view (the underneath plan view will not be judged). There is no requirement for close-up detail photographs, but additional photographs, (within the maximum number of 5) can be used to support the three aspects if the outline needs clarification.

The three view drawings will be used as the basis for judging outlines. These drawings must conform to the requirements of rule 6.1.9.4(b). Photographs take precedence when discrepancies exist between the drawings and the chosen subject.

Proof of colour and markings may be in the form of colour chips, original paint samples, colour photographs (which may be the same photos supplied for outline) or colour illustrations published in books, magazines or in kit boxes. Published descriptions are also acceptable when accompanied by examples of similar colours used on other aircraft types. Authenticated colour chips will not be a requirement for proof of colour.

1.9 Declaration

The competitor must complete and sign the Declaration Form (Annex 6 E.1) certifying that he has applied the surface finish (Colour and Markings) to the model. The declaration also includes a questionnaire which is used by the

Static Judges to assess how much the competitor has contributed to the Scale Accuracy of the model. If an incorrect declaration is subsequently revealed, the competitor may be disqualified from the contest. The competitor may use photographs and/or sample material in support of the declaration.

Note: The declaration must be co-signed by the Competitors NAC to be valid. The NAC signature is only required for international competitions.

1.10 Static Judging:

Static judging shall be done at a distance of 5 meters from the model. This is measured from the center line of the model to the judges seating position. The final static score will be the sum of the three individual judge's marks.

A prototype with a retractable undercarriage shall be presented for static judging with the undercarriage in the extended position.

Each of the following items will be awarded a mark out of 10 by each judge in increments of a tenth of a mark.

Scale Accuracy:

This is an assessment of the outline accuracy of the model compared with the prototype as seen from the three aspects (side, front and top plan), judged by comparison of the documentation presented.

a) Originality of Model

This is an assessment of the extent to which the scale accuracy of the model is due to the effort of the competitor. Maximum marks will be awarded to a model which is built, covered and painted in its entirety by the competitor (own design, from drawings or a traditional kit). A model which is covered and painted might score a little less. An ARTF model will score close to zero (unless evidence is presented of extensive modification by the competitor).

b) Colour Accuracy and Complexity

Colour Accuracy is an assessment of the accuracy of the colours of both the colour scheme and the markings of the model in comparison with documentation presented.

Colour complexity relates to the number of colours, the distribution of the colours and the boundary between colours,

c) Markings Accuracy and Complexity

Markings accuracy is an assessment of the position, orientation and size of the markings including the colour- or camouflage scheme in comparison with the documentation.

Markings complexity relates the number and extent of the markings and how they are distributed on the model.

Realism:

This is a subjective assessment of how well the model captures the character of the prototype as illustrated by the documentation; taking into account the surface finish, weathering and any detail that is noticeable from 5m.

1.10.1 Static Scoring:

Item	K-factor
Scale Accuracy:	
Side view	K= 14
Front view	K= 14
Top view	K= 14
Colour:	
Accuracy	K= 8
Complexity	K= 4
Markings:	
Accuracy	K= 14
Complexity	K= 6
Realism	K= 14
Originality of Model	K= 12
Total	K= 100

Normalisation:
The total of the competitors' static scores will be normalised to 500 points as follows:

$$\text{Static Points}_x = S_x/S_w \times 500$$

Where:
Static Points_x = Normalised Static Score for competitor *x*
S_x = Static Score for competitor *x* and
S_w = Highest Static Score

1.10.2 Scoring:

The final static score shall be the aggregate sum of points awarded by the three judges normalized as described above. These points can be used for final classification only when the model completes an official flight.

SECTION 2

MODEL CHARACTERISTICS, FLIGHT TIMING, FLIGHT SCHEDULE, ORGANISATION AND SCORING

2.1 General characteristics:

Maximum weight of the complete model aircraft without fuel in flying condition including any dummy pilot: 15 kg (≈150 Newton)

Model aircraft using electric motors as a power source shall be weighed without batteries used for those motors.

Motive Power: Rocket or pulse jet engines are not permitted.
Note: For all other scale model aircraft specifications see Volume; CIAM General Rules Section B, Paragraph B.1.3 General Characteristics of Model Aircraft.

The 15 kg weight limit is only applicable for team selection purposes. For local and national competitions the FAI upper weight limit for model aircraft of 25 kg with fuel shall apply.

If a model appears to be noisy in flight, the Judges or Contest / Flight Line Director can demand a noise test. The transmitter and the model will then be impounded by the flight line official immediately following the flight. No modification or adjustment to the model shall be permitted other than re-fuelling. If the model features variable pitch propeller(s), the noise test will cover the total variation of pitch. The model shall be tested by a noise steward and in the event the model failing the noise test will be retested by a second noise steward, using a second noise meter. If the model fails the retest, the score for the preceding flight shall be zero. The sound meter must be of good quality with a test system (reference noise).

The maximum noise level will be 96 dB(A) measured at 3 meters from the center line of the model with the model placed on the ground, over concrete or macadam, at the flying site. With the motor running at full power, measurement will be taken 90 degrees to the flight path on the side chosen by the competitor and downwind from the model. The microphone will be placed on a stand 30 cm above the ground in line with the motor(s). No noise reflecting objects shall be nearer than 3 meters to the model or the microphone. If a concrete or macadam surface is not available then the measurement may be taken over bare earth or very short grass, in which case the maximum noise level will be 94 dB(A). In the case of multi-engine models, the noise measurement will be taken at 3 meters from the closest engine to the noise meter and the maximum noise level will be the same as for single engine models.

2.1.1. Radio Equipment:

Permitted:
a) Radio control equipment shall be of the open loop type; i.e. no electronic feedback from the model aircraft to the ground except for telemetry systems that monitor batteries, engines and fuel.
b) The use of any electronic stability device on three primary flight controls.

Not Permitted:
a) The use of GPS devices/data or any other satellite based system b) The use of any navigational positioning sensors which provide altitude or heading hold positioning.
b) The use of any navigational positioning sensors which provide altitude or heading hold positioning.
c) Pre-programmable devices for flight manoeuvres.

IMPORTANT NOTE: Apart from the Transmitter, any device which can be used for programming, e.g laptop, tablet and any dedicated input device is not

permitted at the flight line at any time.

2.1.2. Eligibility

Any model which has previously been placed in the top five (5) in a Continental or World Championship F4C competition during the last 6 years, including repaints and rebuilds, will NOT be permitted in F4H. The requirement for the competitor to have constructed his own model (rule 6.1.9.4.e) is not applicable to Stand-Off Scale. See par 1.7

2.2 Official Flights:

a) Each contestant will be called to fly three times and must execute an official flight within the required time limit (see 2.3) on each occasion to be eligible for flight points for that flight.

b) If a contestant is unable to start or complete a flight and, in the opinion of the Contest Director (CD), the cause is outside the control of the contestant, the CD may, at his discretion, award the contestant a re-flight. The CD shall decide when the re-flight shall take place.

c) An official flight commences at the earliest of the following:

1. in the case of a piston engine or turbine, when the contestant or his helper begins to crank the engine in order to start it, or

2. in the case of an electric motor, when the contestant or his helper announces the commencement of the first manoeuvre, or

3. three minutes after the contestant is instructed to start his flight. (See 2.3 (b)).

4. An official flight is terminated when the model lands and stops, except during the option 2.6 1. (Touch and Go).

d) For the purpose of 2.8, an official flight shall be considered to have been completed when the model has been airborne for 60 seconds.

2.3 Flight Timing:

a) A contestant will be advised that he will be required to start his flight not less than 5 minutes before the instruction to start.

b) The contestant will then be instructed to start his flight.

c) Timing of the flight will commence when the official flight commences. (See 2.2 (c))

d) The contestant will be allowed 17 minutes to complete his flight.

e) In the case of a piston-engine or turbine powered model of a multi-engine prototype, the time allowed in d), above, will be increased by one minute for each additional engine.

f) No points will be awarded for any manoeuvre which is not completed at the end of the time allowed.

2.4 Starting Time:

a) If the model is not airborne within seven minutes, plus one additional minute for each additional engine, after the official flight and timing commence, the official flight will end and no points will be awarded for the flight.

b) If, in the case of a piston engine or turbine, the engine stops after the take-off has commenced, but before the model is airborne the engine may be restarted, but no points will be awarded for take-off.

Note: In this case, rule 2.4 a. still applies.

2.5 Flight:

2.5.1 Take off ..... .K = 11
2.5.2 Option 1 ..... K = 7
2.5.3 Option 2 ..... K = 7
2.5.4 Option 3..... K = 7
2.5.5 Option 4..... K = 7
2.5.6 Option 5..... K = 7
2.5.7 Option 6..... K = 7
2.5.8 Option 7..... K = 7
2.5.9 Option 8..... K = 7
2.5.10 Approach and Landing.....K=11
2.5.11 Realism in flight

a) Engine noise (realistic tone and tuning) K=4
b) Speed of model …….. K=9
c) Smoothness of flight …….. K=9

Total K Factor ..... K = 100

Notes:
1) The flight schedule must include the two manoeuvres "Overhead Figure Eight" and "Descending 360° Circle" to be accepted as complete.
2) The scale of the model and the cruising speed or maximum speed of the prototype must be stated on the score sheet.
3) Only one attempt is permitted for each manoeuvre, the only exception is the procedure of getting the model airborne, as defined in 2.4(b).

2.6 Optional Demonstrations:

The manoeuvres "Overhead Figure Eight" and "Descending 360° Circle" are mandatory manoeuvres to be included in each flight and positioned in the flight sequence at the competitor's discretion. The contestant shall be prepared, if required by the judges, to give evidence that the options selected are typical and within the normal capabilities of the aircraft subject type modelled. Only one 'mechanical' option may be included in the selection of options. Selected options must be given to the judges in writing before commencement of the flight. The options may be selected in any order. (Options A, Q, U, V, W, AC and AD are intended for subjects with little or no aerobatic capability). These are aircraft designed with

limited manoeuvrabilty where the original prototypes were restricted by the manufacturer or the licensing government agency. A contestant may not select option B if option C has been selected and *vice versa*.

Examples are: Pioneer and early aircraft (pre 1915), purpose designed reconnaissance and bomber aircraft (this does not include fighter aircraft later adapted for reconnaissance duties or fighter-bombers where the designer intended an aerobatic capability), touring aircraft, passenger and cargo aircraft and military transports.

The order in which all manoeuvres are to be flown must be indicated on the score sheet before the flight and any manoeuvre flown out of sequence shall be marked zero.

A Chandelle ……..…….……K=7
B Retract and extend landing gear……..……K=7
C Retract and extend flaps ……..…….…..K=7
D Dropping of bombs or fuel tanks..……..……..... K=7
E Stall turn ..…….. K=7
F Immelman turn ..…….…….….. K=7
G One loop ..……..…….…….….. K=7
H Cuban eight ……..…….…… K=7
I Reverse Cuban eight …..…… ……..…. K=7
J Half Cuban eight …..…… K=7
K Half Reverse Cuban eight …..……..…….. K=7
L Split S (Reversal) ..……..…….……. K=7
M Normal spin (three turns)…… K=7
N Roll ..……..…… K=7
O Parachute drop ……..….. K=7
P Touch and go ……..……... K=7
Q Overshoot ……..……..…….. K=7
R Side slip to left or right ……..…. K=7
S 1st Flight function by subject aircraft ……. K=7
T 2nd Flight function by subject aircraft ……..……. K=7
Competitors may demonstrate up to two different flight functions of their own choice, but must supply evidence that each function was performed by the prototype modelled. Competitors must indicate on the Declaration Form and to the Chief Flight Judge the nature of the demonstration(s) before going to the flight line.
U Flight in triangular circuit …….……...…… K=7
V Flight in rectangular circuit …… K=7
W Flight in a straight line at constant height …….. K=7
(maximum height 6 meters)
X Flight in a straight line with one engine throttled ……K=7
(for multi-engined model aircraft only)
Y Lazy Eight ……..……..….…….. K=7
Z Wingover ……..…… K=7
AA Inverted flight ……..…. K=7
AB Derry Turn ……... K=7
AC Procedure Turn ……..…….….. K=7
AD Straight flight at low speed..……..… K=7

Notes:

Contestants must be prepared, if required by the judges, to provide evidence that the options selected are typical and within the normal capabilities of the subject aircraft modeled.

Only one mechanical option may be included in the contestant's choice of options.

The pilot should at all times (except when conflicting with safety) be allowed to choose at least the direction of take-off and landing. All flying manoeuvres start by a trajectory parallel to the judges' line, except 2.6 P and Q, which start with a trajectory perpendicular to the judges' line.

The order in which the optional manoeuvres are to be flown must be marked on the score sheet. Any manoeuvre flown out of order will be marked zero.

2.7 Marking (Flight points):

Each manoeuvre may be awarded marks from zero to 10 inclusive using increments of half a mark by each of the judges during the flight. These marks are multiplied by the K-factor listed for each manoeuvre. The manoeuvres must be performed in a plane and at a height, which will allow them to be seen clearly by the judges. The non-observance of this rule will be penalised by loss of points. If and when the model passes behind the judges before a manoeuvre is completed, no points shall be given for this manoeuvre. If the model is in the opinion of the judges unsafe or being flown in an unsafe manner, the judges may instruct the pilot to land.

In the case of doubt regarding the zeroing of a manoeuvre, the other judges will abide by the decision of the Chief Judge.

2.8 Flight Score

The flight score shall be the aggregate sum of the points awarded by all three judges in 2.7.

Normalisation:

The total flight score of each competitor for each round will be normalised to 1000 points as follows:

$$\text{Flight Points}_x = F_x/F_w \times 1000$$

Where:
Flight Points_x = Normalised Flight Score for competitor x
F_x = Flight Score for competitor x and
F_w = Highest Flight Score

All flight scores will be recorded on the score sheets. It is the competitor's responsibility to ensure that his personal details, the details of the model and the chosen options are correctly entered on the score sheet and that a sufficient number of copies are presented to the judges before each official flight commences.

After each flight the Flight Judges will record any non-standard event that caused downgrading or loss of flight points. If for any reason the mark awarded is changed, the change must be initialled by the judge. The Chief Flight Judge will review all flight score sheets for completeness and fairness and justification of any zero scores e.g. missed manoeuvres, manoeuvres flown out of order, out of flight time, flying behind the judges line or crash landing. The Chief Flight judge must then sign the score sheets before they are

sent for processing.

2.9 Organisation of Radio Control Flying Scale Events

All transmitters, other than those operating on the 2,4 GHz band, likely to be used during the contest must be checked and placed in an impound which is kept under supervision. During the contest, a steward must be in control of the transmitter impound and will issue the transmitter to the competitor only when his name is called for him to stand by to make his flight. As soon as the flight has ended, the competitor must immediately return his transmitter to the steward at the transmitter impound.

All unauthorised transmissions during the contest will result in automatic disqualification of the offender from the entire contest, and render him liable for further penalties.

The timekeeper will notify the pilot when his model is flying outside the prescribed area.

The order of starting of the various competitors will be established by means of a draw before the start of the contest. The flight order of the competitors will not be changed unless the organizers need to do so to avoid frequency clashes.

The second round will start one third the way down the flying order. The final round will start two thirds down the flying order.

Competitors must be called at least five (5) minutes before they are required to occupy the starting area.

2.10 Final Scoring

Three rounds are to be flown. The lowest normalized flight score is to be deleted and the average of the remaining normalized flight scores is to constitute the final flight score. In the event that for reasons beyond the control of the organizer only two rounds of flying can be completed in the time available for the contest, the average of the two normalized flight scores will constitute the final flight score. If only one round can be completed, the single normalized flight score will constitute the final flight score. The scores of an official round can only be recorded if all the competitors had an equal opportunity for a flight in that round.

The final normalized flight score is to be added to the normalized static score for the final result.

2.11 Safety:

a) All manoeuvres must be performed parallel with the judges' line such that if any part of the manoeuvre is performed behind the judges' line it will score ZERO.

b) Exceptions from this rule are manoeuvres 6.3.1. Take-off, 6.3.6.10 Landing and 6.3.7.P Touch and Go. The pilot has the right to perform these manoeuvres into wind as long as they do not overfly a designated area behind the judges line laid out for the protection of spectators, officials and other competitors or helpers.

c) If a model aircraft is in the opinion of the Chief Judge or Flight Line Director unsafe, or being flown in an unsafe manner, he may instruct the pilot to land.

ANNEX 1A.

JUDGES GUIDE (Static Section)

1 General

a) As with other scale classes, before individual judging commences, all the models entered should be reviewed in order to superficially grade the models in relation to each other. It is particularly important during this initial evaluation, that because all static judging is carried out at 5 meters, judges should avoid any close up evaluation of the models.

b) The documentation requirements for F4H have been reduced to the minimum which is considered necessary to make a fair assessment of the judging aspects required. It is important that judges do not waste time seeking to assess any aspect which is not adequately supported by the documentation.

c) The penalty marks as stated in ANNEX 6A paragraph 6A.1.9 will apply.

d) Generally 15 minutes (approximately) is considered sufficient judging time for each model.

e) When all the models have been individually judged, the spread of marks awarded, particularly the 'Complexity marks' for all the models should be reviewed by the panel of judges. The panel of judges have the right to alter the marks retrospectively if they subsequently believe them to be unfair. The relative mark of one model compared with the others is important and only when the Chief Judge agrees that this has been achieved should the scores be released for publication.

2 Scale Accuracy (Outline)

The three view drawings together with the photographs are to be used to assess scale accuracy. Paragraph 6A.1.10.1 provides further advice on assessing scale accuracy.

3 Originality of Model

The judges must examine the Competitors Declaration including any supporting evidence presented by the competitor and if necessary question the competitor, in order to evaluate the extent to which the competitor has contributed to the model. A maximum of 10 marks should only be awarded to a model which is entirely built by the competitor. The score must be reduced according to the effort the competitor as contributed to the model. A prebuilt model should score a zero.
b) The following should be used as a guide:

i) Competitor built (own construction, from plan or kit) covered and painted 10 points
ii) Covered and painted the model - 8 points
iii) Painted the model - 6 points
iv) Modified markings on ARF - 4 points
v) Any unmodified ARF - 2 points
vi) Not any achievement on the model (pre-built & pre-painted) - 0 points

Depending on the declaration regarding self-made and modified parts, intermediate points may be awarded at the discretion of the static judges.

4 Colour Accuracy and Complexity

Colour Accuracy is an assessment of the accuracy of the colours of both the colour scheme and the markings of the model in comparison with documentation presented.

Colour complexity relates to the number of colours, the distribution of the colours and the boundary between colours. For example: Camouflage colour schemes should show the correct pattern and the correct degree of merging of the shades.

5 Markings Accuracy and Complexity

Markings accuracy is an assessment of the position, orientation and size of the markings including the colour- or camouflage scheme in comparison with the documentation. Judges should not make assumptions that markings are the same on each side of the prototype and should only award high marks when all the markings are fully supported by the documentation.

Markings complexity relates the number and extent of the markings and how they are distributed on the model.

It is important to ensure that the marks awarded are a fair comparison with the spread of marks awarded across the range of models entered.

6 Realism

Judges should consider how well the model captures the character of the full size aircraft as portrayed in the photographic documentation. If the subject aircraft is ‘factory fresh’ or an unblemished museum example, then the model should be in a similar pristine condition. Alternatively if the photograph of the subject aircraft shows worn or stained surfaces and weathered paintwork, then this should be reflected in the model. Judges should be careful to avoid penalising the omission of details which are not clearly visible at 5 meters.

ANNEX 1B.
ORGANIZERS' GUIDE

1B.1 **ContestDirector:**
The organizer shall appoint a Contest Director who will have overall control over the proceedings.

1B.2 **Judges:**
The organizer of a local or national competition shall appoint three competent judges who shall determine the degree of fidelity to scale and craftsmanship, and a panel of at least three competent flight judges.

1B.3 **Equipment:**
Judges shall be provided with the following:
Shade, clip boards, prepared score sheets, table for static judges and table or tables for model base and chairs.

1B.4 **Location:**
For static judging, a secluded area shall be provided, access to which is exclusive to the Judges, Contest Director, and the entrant concerned with each model.

1B.5 **Preparation**:
If time permits, judges shall be provided with a scale model which is not entered in the contest, and this will be used as a practice subject for static judging. The results obtained will be discussed before the entered models are judged.

1B.6 **Personnel:**
The following will be provided:
Flight line director
Timekeepers
Score sheet runners
Scorers equipped with suitable machines
Scoreboard officials

1B.7 **Score Sheets:**
These should be in duplicate so that a copy can be given to the contestant at the completion of all static judging and after each flight.

1B.8 **Flying Site:**
The flying area should be of sufficient size, and the ground layout should be sufficiently flexible to allow scale models to take off into wind without obstruction, or overflying the spectator area. The judges should be a minimum of 15 metres back from the centre of the take- off strip, or the portion of the take-off area most likely to be used by contestants.

1B.9 **Interruption of the Contest:**
The contest should be interrupted or the start delayed by the contest director in the event that the wind is continuously stronger than 9 m/s measured at two (2) meters above the ground at the flight line, for at least one minute.

CHAMPIONSHIP LOGO and FAI emblem

COMPETITOR'S **DECLARATION FORM F4H** (ANNEX 6E 1.2)

This form must be completed and signed by the competitor. The competitor is to tick off the proper box according to his model's specifications .

Competitor's Name	National ID	Prototype Name & Designation:	**Class F4H**

AIRCRAFT CRUSING AND/OR MAXIMUM SPEED attach proof on a separate sheet.

_____

ORIGINALITY OF THE MODEL (mark/tick the column)

1) Competitor built—(own construction, or built from plan or kit) ..... ☐
2) Covered and painted the model ..... ☐
3) Painted the model ..... ☐
4) Modified outline and markings on the ARF ..... ☐
5) Modified markings on ARF ..... ☐
6) Unmodified ARF (Prebuilt and prepainted) ..... ☐

Comments and/or explanations on the backside:

If your flight schedule is to include Optional Demonstrations 6.3.7. S or T -
Flight functions by subject aircraft:
Provide full details of your manoeuvre(s) on the backside of this declaration.

COMPETITOR'S DECLRATION:

I certify that the answers given above by me are correct.

Name: .....(block letters) Signature: .....

6.

CLASS F4C

INTERNATIONAL RADIO CONTROL

SCALE RULE BOOK

June 2019

PART SIX

6.1 GENERAL RULES AND STANDARDS FOR STATIC JUDGING OF SCALE MODEL AIRCRAFT

A scale model aircraft shall be a reproduction of a heavier than air, man-carrying aircraft. The classes F4C and H are fixed-wing classes.

The aim of scale contests is to recreate the accurate appearance and realism of the full-size aircraft as best appropriate to each model aircraft class. This shall apply equally to static judging and flight performance.

Note: To indicate the subject full-size aircraft being scale modelled, the word "prototype" may be used.

6.1.2. System of Rules

Rules are numbered as follows:

6.1. General rules and standards for judging Fidelity to Scale

6.3. Radio Controlled Flying Scale Model aircraft

6.1.3. Competition Programme:

A competition programme for a particular event shall consist of part 6.1 plus the regulations for the specific event. Rules for the R/C events, shall be 6.1. plus 6.3.

The R/C event may commence with flying on the first day of competition, with static judging commencing after the first model aircraft has been flown, or with Static Judging with flying commencing after sufficient models have been static judged as not to hold up the flight line. No competitor will be required to fly more than one flight before being static judged.

If there are more than 45 competitors by the official closing date for entries in a World or Continental Championship, the organizer may use two separate panels for static judging. Each panel shall consist of two judges. The first panel will judge Scale Accuracy (6.1.10.1 – Side View, End View and Plan View). On completion of this, the second panel will judge the remaining aspects (6.1.10.2. – 6.). Under these circumstances the R/C event will commence with static judging. Flight judging will commence once the first 10 models have been statically assessed. In this case all competitors shall have their static judging done before the first flight.

6.1.4. Judges

The organizer of Scale R/C World or Continental Championship (F4C) shall appoint three (or four for two panels) judges to do static judging, plus a separate panel of three judges to judge the flying. If there are more than 45 competitors at a World

Championship, then the organizers may use two static panels of two judges each as well as two flight lines with three judges on each flight line.
For Championships with less than 45 competitors in a class, the organizer is allowed to use two sets of two static judges instead of one set of three judges to speed up static judging.

Within each class (F4C and F4H) all the judges (static and flying) must be of a different nationality and selected from a list submitted by the NACs for guidance and approved by the CIAM Bureau.

In the case of World and Continental Championships, the flight and static judges' panels shall contain at least one member of the Scale CIAM Sub-committee. The CIAM Bureau must approve the two panels of judges prior to the World or Continental Championships.

Within each panel of Judges (Static and Flying), there must be a common language. The organizer is allowed to use two judges of the same nationality, one in each class, F4C and F4H.

For World Championships the Panel of Judges should be composed of judges from at least three continents.

For local competitions, including National Championships, two panels of three judges each (one for static and one for flying) or one panel of three judges for both static and flying may be used.

6.1.5. Scoring

Where a K-factor (K) is noted, marks shall be awarded from 0 to 10 inclusive using increments of half a mark for Flight Judging and a tenth of a mark for Static Judging. The score shall then be calculated by multiplying the marks awarded by the K-factor (K).

6.1.6. Remarks

a) All model aircraft shall become airborne in the manner of their prototype.

b) In the absence of suitable water surface conditions, model aircraft of seaplanes are permitted to use wheels or wheeled dollies for take-off. The release or dropping of a dolly immediately after take-off will not therefore be penalised. Deviation from Scale because of the inclusion of permanently attached wheels, skids or similar non-prototype devices in the model aircraft structures will not be taken into consideration in the scoring of Fidelity to Scale and Craftsmanship.

c) No parts of a model aircraft, except propeller and spinner may be removed, nor may anything except a dummy pilot and antenna be added externally to the model aircraft, between scale judging and flying. Bombs, drop-tanks, etc must be presented for static judging, but may be replaced before flying by simpler and repairable examples of the same shape, colour, size and weight. Any infringement will result in disqualification. Additional non-prototype air inlets entries are permitted provided they are covered by movable hatches for static judging; these hatches may be moved or opened manually prior to flight, or if in flight by means of radio control. Necessary repairs due to flight

damage are permitted, but the maximum weight limit still applies. The appearance of the model aircraft in flight must not be unduly affected.

d) A flying propeller of any form or diameter may be substituted for a scale propeller. The size, shape and colour of the spinner may not be changed.
Note: Substitution for a scale propeller relates only to powered propellers that were intended to propel the subject aircraft. If a model aircraft of a multi-engined aircraft uses non-powered (windmilling) propellers, these may not be changed between static and flying. Features such as for example, the small generator propeller on the nose of an aircraft such as a Me163, may likewise not be changed for flying propellers.

e) Metal-bladed flying propellers are forbidden.

f) Explosives may not be dropped.

g) If the pilot of the prototype is visible from the front or from the side during flight, a dummy pilot of scale size and shape must be equally visible during flight in the model aircraft. If such a pilot is not fitted, the total flight score shall be reduced by 10%. The dummy pilot may be present during static judging but will not be taken into account.

h) A measurement of weight must be undertaken immediately after the first flight of each Model aircraft. No modification of the model aircraft except exhausting of fuel and cleaning of the model aircraft is allowed. If found to be overweight, then zero points will be awarded for that flight and the model aircraft must be re-weighed after each subsequent flight. The officials responsible for weighing the model aircraft and the device to be used shall be available to all competitors for weighing prior to the first flight of the contest. The tolerance of the weighting equipment to be added to the maximum weight (i.e. C/L model aircraft max weight 6 kg, weight tolerance 15 grams gives total allowed weight of 6,015 Kg as maximum).

i) Any model aircraft that, in the opinion of the Chief Judge or the Flight Line Director, appears to be noisy in flight will have to submit to a noise check after that flight. Turbine powered model aircraft are exempt from such noise checks. For details see section 6.3.2 (F4C). The organizer must provide all competitors with the possibility to conduct noise checks prior to the competition if competitors so request.

j) The contest should be interrupted or the start delayed by the contest director in the event that the wind is continuously stronger than 9 m/s measured at two (2) meters above the ground at the flight line, for at least one minute.

6.1.7. Number of Model Aircraft

Each competitor may compete only with one model aircraft in any one category, F4H or F4C.

6.1.8. Helpers

Each competitor is permitted one (1) helper during a flight. An additional helper may assist with engine starting and pre-flight preparation, should the competitor require this. All but one helper must retire clear of the flying area before the take-off is announced. For radio control events no helper may touch the transmitter during an official flight. The timekeeper is responsible for watching that helpers do not touch the transmitter once the first manoeuvre has been called. If a helper touches the transmitter the flight is scored zero.

6.1.9. Documentation (Proof of Scale)

6.1.9.1. Proof of scale is the responsibility of the competitor.

6.1.9.2. The exact name and model designation of the prototype shall be indicated on the entry form, on the score sheet, and also in the "Proof of Scale" presentation. The documentation submitted by the competitor must state if the original prototype is non-aerobatic. The judges will discuss this information before the first flight commences in F4C. The Chief Judge shall make the final decision before any flight is made and this might affect the marks awarded under 6.3.6.11.d. (Choice of options).

6.1.9.3. The scale to which the model aircraft is built is optional, but it must be stated in the "Proof of Scale" presentation.

6.1.9.4. To be eligible for Fidelity to Scale (Static) points the following is the minimum documentation that must be submitted to the judges

(See Annex A - 6A.1.9. for recommended presentation of documentation)

a) Photographic evidence:
At least three photographs or printed reproductions of the prototype, including at least one of the actual subject aircraft being modelled are required. Each of these photographs or printed reproductions must show the complete aircraft, preferably from different aspects and must not be smaller than A5. These main photos must be submitted in triplicate, the second and third copies may be photocopies. Photographs of the model are not permitted unless the model is posed alongside the full size prototype and the photo used as proof of colour. The use of photographs based on digital files which show evidence of being enhanced or manipulated shall result in disqualification. The photographic evidence is the prime means of judging scale accuracy against the prototype.

b) Scale Drawings:
Accurate scale drawing of the full-size aircraft that show at least the 3 main aspects of Side View, Upper Plan View and Front End View. These drawings must be to a common scale giving a minimum span of 250 mm, and a maximum span of 500 mm or if the fuselage is longer than the wingspan, these measurements will be made on the fuselage. The drawings must be submitted in triplicate. Unpublished drawings by the competitor or other draftsman are not acceptable unless certified accurate in advance of the contest by an authoritative source such as the respective National Scale Committee or equivalent, the builder of the original aircraft, or other competent authority.

c) Proof of Colour:
Correct colour may be established from colour photographs, from published descriptions if accompanied by colour chips certified by a competent authority, from samples of original paint, or from published colour drawings, eg "Profile" type publications.

d) Aircraft speed:
The cruising speed of the subject aircraft must be stated on the Competitors Declaration Form and also be included in the documentation, and repeated on all flight score sheets before each official flight starts. In the case of early aircraft, where only maximum speeds are likely to be listed, the maximum speed alone may be quoted in the documentation. The competitor must be prepared to substantiate this information if

required.

e) Competitor's declaration:

The competitor must include in his documentation a signed declaration that his model conforms to the requirements and rules appropriate to the class of model. The Competitor's Declaration also contains a questionnaire which is used by the Judges to determine the origin of the model design and its construction and the extent of use of commercially available components. The NAC signature is only required for international competitions.

The declaration form is at ANNEX 6E.1

6.1.10. Judging for Fidelity to Scale and Craftsmanship

		K - Factor
1.	Scale Accuracy	
a.	Side view	13
b.	End view	13
c.	Plan view	13
2.	Colour	
a.	Accuracy	3
b.	Complexity	2
3.	Markings	
a.	Accuracy	8
b.	Complexity	3
4.	Surface texture and scale realism	
a.	Surface Texture	7
b	Realism	7
5.	Craftsmanship	
a.	Quality	12
b.	Complexity	5
6.	Scale detail	
a.	Accuracy	9
b.	Complexity	5
Total K Factor		K = 100

Items under 1. to be judged at a minimum distance of 5 m in F4C, from the center of the model aircraft. Judges must not touch the model aircraft.

6.1.11. Static Scoring

For Flying Scale Contests the combined Fidelity to Scale and Craftsmanship points shall be the aggregate sum of points awarded by the three static judges. These static points shall be used for final scores classification only when the model aircraft has completed an official flight.

Normalisation:
The total of the competitors' static scores will be normalised to 1000 points as follows:

$$\text{Static Points}_x = S_x/S_w \times 1000$$

Where:
Static Points_x = Normalised Static Score for competitor *x*
S_x = Static Score for competitor *x*
S_w = Highest Static Score

6.1.12 Organisation of Scale Events

All transmitters, other than those operating on the 2,4 GHz band, likely to be used during the contest must be checked and placed in an impound which is kept under supervision. During the contest, a steward must be in control of the transmitter impound and will issue the transmitter to the competitor only when his name is called for him to stand by to make his flight. As soon as the flight has ended, the competitor must immediately return his transmitter to the steward at the transmitter impound.

The flying and static order of the various countries and competitors will be established by means of a draw before the start of the contest. Team Managers shall nominate their individual team members' order as first, second or third.

The flight order of the competitors will not be changed unless, in the case of R/C events, the organizers need to do so to avoid frequency clashes. Sufficient flexibility in frequency sequencing must be provided to allow a competitor to make use of his transmitter, at the latest, by the time he enters the N^{o} 1 ready box. There shall be no substitution of one team member's slot for another team member's slot.

The second flight round will start one-third the way down the flying order. The final round will be flown in ascending order with regard to the preliminary placing after two flight rounds and static.

Competitors must be called at least five minutes for F4C before they are required to occupy the starting area.

6.1.13 Builder of the Model

Scale models must be constructed and finished solely by the competitor. The only exceptions to this rule are for models entered in Class F4H.

Note: The use of the word "constructed" in this context means that the competitor is the person who has done all the work on the model.

The Competitor must also prepare the model for flight, although helpers are permitted (see paragraph 6.1.8).

Commercially available components, machined parts, die or laser cut parts and prefabricated or moulded airframe components which are manufactured by a third party, whether specifically for the model or supplied as part of a kit, may be used in the construction of scale models.

Details of these items (excluding fixings, i.e. screws, nuts a bolts etc) must however, be entered on the Competitors Declaration Form and if they affect the visible scale accuracy or craftsmanship of the model they will result in a reduction of the marks awarded during static judging.

If any commercially available parts have been modified by the competitor to improve scale accuracy then the evidence of this work must be supplied (attached to the declaration) in order for the Judges to assess the craftsmanship. If found in violation of this rule the competitor may be disqualified from the contest.

Copies of the Declaration Forms of all contestants shall be made available for examination by all contestants. If a contestant or number of contestants disagree with what has been claimed by a contestant, he/they may lodge an official protest by the normal procedure together with clear proof of their claim within twenty four hours of the publication of the forms. The protest is then handled by the jury as per normal procedure and they decide on the validity of the protest and a suitable sanction.

6.1.14 Demonstration of Functional Scale Detail during Static Judging

The model should be presented for static judging supported only by its undercarriage or normal aids to take-off and landing. If applicable, folding wings may then be unfolded and locked for flight in the manner of the full size aircraft. With the exception of undercarriage retraction, a demonstration of functional detail of any part of the model is permitted providing such functionality is normally only operable by the pilot or aircrew of the full size aircraft, from their crew position.

6.3. CLASS F4C - RADIO CONTROLLED FLYING SCALE MODEL AIRCRAFT

6.3.1. General Characteristics

Maximum weight of the complete model aircraft without fuel in flying condition including any dummy pilot: 15 kg (≈150 Newton)

Model aircraft using electric motors as a power source shall be weighed without batteries used for those motors.

Motive Power: Rocket or pulse jet engines are not permitted.

Note: For all other scale model aircraft specifications see Volume; CIAM General Rules Section B, Paragraph B.1.3 General Characteristics of Model Aircraft.

6.3.1.1. Radio Control Equipment

Permitted:
a) Radio control equipment shall be of the open loop type; i.e. no electronic feedback from the model aircraft to the ground except for telemetry systems that monitor batteries, engines and fuel.

b) The use of any electronic stability device on three primary flight controls.

Not Permitted:
a) The use of GPS devices/data or any other satellite based system.

b) The use of any navigational positioning sensors which provide altitude or heading hold positioning.
c) Pre-programmable devices for flight manoeuvres.

IMPORTANT NOTE: Apart from the Transmitter, any device which can be used for programming, e.g laptop, tablet and any dedicated input device is not permitted at the flight line at any time.

6.3.2. Noise

If a model aircraft appears to be noisy in flight, **only** the Chief Judge or Flight Line Director can demand a noise test. The transmitter and the model aircraft will then be impounded by the flight line official immediately following the flight. No modification or adjustment to the model aircraft shall be permitted other than refuelling. If the model aircraft features variable pitch propeller(s), the noise test will cover the total variation of pitch. The model aircraft shall be tested by a noise steward and in the event the model aircraft failing the noise test it will be re-tested by a second noise steward, using a second noise meter. If the model aircraft also fails the re-test, the score for the preceding flight shall be zero. This is a final decision. The sound meters must be of good quality with a test system (reference noise).

The maximum noise level will be 96 dB(A) measured at 3 meters from the center line of the model aircraft with the model aircraft placed on the ground, over concrete or macadam, at the flying site. With the engine running at full power, measurement will be taken 90 degrees to the flight path on the side chosen by the competitor and downwind from the model aircraft. The microphone will be placed on a stand 30 cm above the ground in line with the engine(s). No noise reflecting objects shall be nearer than 3 meters to the model aircraft or the microphone. If a concrete or macadam surface is not available then the measurement may be taken over bare earth or very short grass, in which case the maximum noise level will be 94 dB(A). In the case of multi-engine model aircraft, the noise measurement will be taken at 3 meters from the closest engine to the noise meter and the maximum noise level will be the same as for single engine model aircraft.

Turbine engines will not be subject to noise measurement.

6.3.3. Official Flights

a) Each competitor will be called to fly three rounds, and must execute an official flight within the required time limit (see 6.3.4.) on each occasion to be eligible for flight points for that flight.
In the case of two flightlines (see 6.1.4) each competitor will fly four rounds, two in front of each panel of judges and two on each flight line and the lower score from each panel will be deleted.

b) If a competitor is unable to start or complete a flight and, in the opinion of the Contest/Flightline Director, the cause is outside the control of the competitor, the Contest/Flightline Director may, at his discretion, award the competitor a reflight. The Contest Director shall decide when the reflight shall take place.

c) An official flight commences at the earliest of the following:

i) The competitor signals to the timekeeper that he is commencing to start his engine(s).

ii) Two minutes after the competitor is instructed to start his flight.

iii) An official flight is terminated when the model aircraft lands and stops, except during the option 6.3.7.M. (Touch and Go).

6.3.4. Flying Time

a) A competitor will be advised that he will be required to start his flight not less than 5 minutes before the instruction to start.

b) The competitor will then be instructed to start his flight.

c) Timing of the flight will commence when the official flight commences (see 6.3.3.c.).

d) The competitor will be allowed 17 minutes to complete his flight.

e) In the case of a multi-engined model aircraft, the time allowed in (d) above will be increased by one minute for each additional engine.

f) No points will be awarded for any manoeuvre that is not completed at the end of the time allowed.

6.3.5. Starting Time

a) If the model aircraft is not airborne within 7 minutes, plus one additional minute for each extra engine, after the official flight and timing commence, the official flight will end and no points will be awarded for the flight.

b) If the engine(s) stops after the take-off has commenced, but before the model aircraft is airborne, the engine(s) may be restarted. There is only one attempt allowed to repeat the whole procedure. In the case of a repeated attempt, no points will be assigned for the interrupted manoeuvre.

Note: In this case rule 6.3.5(a) still applies.

6.3.6. Flight

6.3.6.1.	Take-off	K =	11
6.3.6.2.	Option 1	K =	7
6.3.6.3.	Option 2	K =	7
6.3.6.4.	Option 3	K =	7
6.3.6.5.	Option 4	K =	7
6.3.6.6.	Option 5	K =	7
6.3.6.7.	Option 6	K =	7
6.3.6.8.	Option 7	K =	7
6.3.6.9.	Option 8	K =	7
6.3.6.10.	Approach and Landing	K =	11
6.3.6.11.	Realism in flight		
	a) Model Sound	K =	4
	b) Speed of the model aircraft	K =	9
	c) Smoothness of flight	K =	9
Total K Factor		K =	100

Notes: The flight schedule must include the two manoeuvres “Figure Eight” and “Descending 360° Circle” to be accepted as complete.

The scale of the model aircraft and the cruising or maximum speed of the prototype must be stated on the Flight Score Sheet (Annex 6E.2.)

Only one attempt is permitted for each manoeuvre, the only exception is the procedure of getting a model aircraft airborne, as defined in 6.3.5.b.

6.3.7. Optional Demonstrations

The manoeuvres “Figure Eight” and “Descending 360° Circle” are mandatory manoeuvres to be included in each flight and positioned in the flight schedule at the competitor’s discretion.

Competitors must be prepared, if required by the judges, to give evidence that the options selected are typical and within the normal capabilities of the aircraft subject type modelled. Only one manoeuvre involving the demonstration of a mechanical function may be included in a competitor’s choice of options. These include (options D (Bombs/Fuel Tank Drop), O (Parachute Drop), and, if applicable, S or T (Flight Functions by subject aircraft).

The options may be flown in any order but the order must be indicated on the score sheet and be given to judges before commencing the flight.

A competitor may not select option C (Retract and extend flaps) if option B (Retract and extend landing gear) has also been selected.

The order in which all manoeuvres are to be flown must be marked on the score sheet and any manoeuvre flown out of order will be marked zero.

A	Chandelle	K=7
B	Retract and extend landing gear	K=7
C	Retract and extend flaps	K=7
D	Dropping of bombs or fuel tanks	K=7
E	Stall turn	K=7
F	Immelman turn	K=7
G	One loop	K=7
H	Cuban eight	K=7
I	Reverse Cuban eight	K=7
J	Half Cuban eight	K=7
K	Half Reverse Cuban eight	K=7
L	Split S (Reversal)	K=7
M	Normal spin (three turns)	K=7
N	Roll	K=7
O	Parachute drop	K=7
P	Touch and go	K=7
Q	Overshoot	K=7
R	Side slip to left or right	K=7
S	1st Flight function by subject aircraft	K=7
T	2nd Flight function by subject aircraft	K=7

Competitors may demonstrate up to two different flight functions of their own choice, but must supply evidence that each function was performed by the prototype modeled.

Competitors must indicate on the Declaration Form and to the Chief Flight Judge the nature of the demonstration(s) before going to the flight line.

U Flight in triangular circuit …… K=7
V Flight in rectangular circuit ……..…… K=7
W Flight in a straight line at constant height ……..…….. K=7
(maximum height 6 meters)
X Flight in a straight line with one engine throttled …….....…… K=7
(for multi-engined model aircraft only)
Y Lazy Eight …….. K=7
Z Wingover …… K=7
AA Inverted flight ……. K=7
AB Derry Turn ……..……. K=7
AC Procedure Turn ……..…….. K=7
AD Straight flight at low speed ……..… K=7

Notes:

Contestants must be prepared, if required by the judges, to provide evidence that the options selected are typical and within the normal capabilities of the subject aircraft modeled.

Only one mechanical option may be included in the contestant's choice of options.

The pilot should at all times (except when conflicting with safety) be allowed to choose at least the direction of take-off and landing. All flying manoeuvres start by a trajectory parallel to the judges' line, except 2.6 P and Q, which start with a trajectory perpendicular to the judges' line.

6.3.8. Marking (flight points)

Each manoeuvre will be awarded marks from 0 to 10, using increments of half a mark, by each of the judges during the flight. These marks are multiplied by the appropriate K - factor in each case.
The manoeuvres must be performed in a plane and at a height that will allow them to be seen clearly by the judges. The non-observance of this rule will be penalised by loss of points.

6.3.9. Flight Score

All flight scores will be recorded on the score sheet. It is the competitor's responsibility to ensure that his personal details, the details of the model and the chosen options are correctly entered on the score sheet and that a sufficient number of copies are presented to the judges before each official flight commences.

The scores of all three judges will count towards the final score.

The flight score shall be the sum of the points awarded by all three judges in 6.3.6.

Normalisation:

The total flight score of each competitor for each round will be normalised to 1000 points as follows:

$$\text{Flight Points}_x = F_x/F_w \times 1000$$

Where:

Flight Points$_x$ = Normalised Flight Score for competitor *x*
F_x = Flight Score for competitor *x* and
F_w = Highest Flight Score

6.3.10. Final Scoring:

For each competitor, add the normalised static score earned in 6.1.10. to the average of the normalised scores of the two best flights under 6.3.9. If the competitor has achieved only one flight, the normalised score awarded for that flight will be divided by two.

If, for any cause beyond the control of the organizers, (eg. B.11.1.) less than three official rounds can be flown, the scoring shall be completed as follows:

a) If two rounds are flown, the average of the normalised scores of the two flights as in 6.3.9. will be used.

b) If only one round is flown, the single normalised flight score of that one round will be recorded.

c) The scores in an official round can be recorded only if all competitors had equal opportunity for a flight in that round.

The national team classification for World or Continental Championships is established after the completion of the championship by adding the scores of the three members of the team together unless there is a fourth member of the team (who must always be a junior) in which case it will be the three best scoring members.

In the case of a national team tie, the team with the lower sum of place numbers, given in order from the top, wins. If still equal, the best individual placing decides.

6.3.11. Safety:

a) All manoeuvres must be performed parallel with the judges' line such that if any part of the manoeuvre is performed behind the judges' line it will score ZERO.

b) Exceptions from this rule are manoeuvres 6.3.1. Take-off, 6.3.6.10 Landing and 6.3.7.P Touch and Go. The pilot has the right to perform these manoeuvres into wind as long as they do not overfly a designated area behind the judges line laid out for the protection of spectators, officials and other competitors or helpers.

c) If a model aircraft is in the opinion of the Chief Judge or Flight Line Director unsafe, or being flown in an unsafe manner, he may instruct the pilot to land.

ANNEX 6A
TECHNICAL RULES FOR FLYING SCALE MODEL CONTESTS
CLASS F4

JUDGES GUIDE FOR STATIC JUDGING

6A.1 General

a) Before Static Judging commences the judges should review the whole entry at a distance not closer than 3 meters in order that a standard is established for grading of points to be awarded. The entries should be studied in relationship to each other from a superficial aspect before detailed examination commences. The Chief Static Judge should take this opportunity to ensure that all judges are of similar mind as to what is involved, particularly with respect to complexity aspects where these are applicable.

b) A trial assessment using one or more non-competition models should be done prior to the start of the competition to establish a uniform standard.

c) A Chief Judge shall be appointed as a spokesman for the static judges, and if two panels of static judges are to be used, the second panel will have a Deputy Chief Judge appointed to assist the Chief Judge in his work. The Chief / Deputy Chief Judge should discuss the merits and criticisms of each item in his area of responsibility with the other judges in his team, making suggestions for the scores.

d) The static evaluation is broken down into six items as listed in 6.1.10. Judges must discuss each item as a team and attempt to arrive at a unanimously agreed score for each item, although each will retain the right to differ. Any degree of difference should however be minimal.

e) The Chief Judge should discuss the merits and criticisms of each item with the other judges, making suggestions for the scores to be awarded as a basis for further discussion. The use of half points (see 6.1.5.) is important when judging top-class models. There may be instances where, for example, a 9 would be too low and a 10 too high, and a suitable score might be, say, 9,5.

f) Regardless of the actual marks awarded, it is imperative that an accurate and fair comparison is attained across the whole range of models entered. The relative mark of one model compared to another is the most important standard to be achieved. Judges are encouraged to make use of analysis sheets and electronic or other archive devices to achieve this comparison.

g) Upon completion of the static judging of each model, the Chief Judge must check all score sheets for completeness before submitting them for processing. The panel of Static Judges has the right to alter scores retrospectively that they subsequently feel to be wrong (e.g. first model deviations, details not proven by documentation, overlooked commercial items etc).Sufficient time must be allocated by the organizers for this review to be done. Only when the Chief Judge agrees that this has been achieved, should the scores be released for publication.

h) If models are flown before being static judged (see 6.1.3.), any damage sustained during flight shall be ignored by the static judges provided the model is intact and it is practical to do so.

6A.1.9. Documentation for Proof of Scale

The minimum documentation as stated in 6.1.9.4 must be provided. Failure to comply shall result in penalty marks as follows :

Less than 3 full photos of prototype:	Zero Points for Scale Accuracy (6.1.10.1) Likely down marking of Realism (6.1.10.4) Likely down marking of Craftsmanship (6.1.10.5)

	Likely down marking of Scale Detail (6.1.10.6)
Missing or unauthorized drawings:	Zero Points for Scale Accuracy (6.1.10.1)
No photo of Subject Aircraft:	Zero Points for Markings (6.1.10.2) Likely down marking for Realism (6.1.10.4)
Incomplete Colour Documentation:	Zero Points for Colour 6.1.10.3)

The documentation stated above is the absolute minimum required for participation. In reality more comprehensive evidence is needed to assess the model relative to the prototype. As the full size aircraft cannot be presented, it follows that the photographic documentation provided should be as comprehensive as possible if a high score is to be achieved.

All documentation should relate to the subject aircraft whenever possible; variations from this must be clearly marked if not otherwise obvious. All relevant notes and corrections to the documentation should be in English.

The static judges have a difficult task to do in a short period of time. Documentation should therefore be presented in a format that can be quickly and accurately assessed. Superfluous and/or contradictory evidence should be avoided. The documentation should ideally be presented as a top hinged bound volume in landscape format (calendar format) with a maximum size of A3. However, a stiff A2 size sheet is considered to be the largest that may be comfortably handled by the judges. It will assist the judges if the documentation is presented in a format that reflects the sequence of the judging aspects, eg: Side view, End view, Plan view, Markings, Colour, etc. If a specific photograph is required to document more than one of the judging aspects, it must be repeated on the relevant page to avoid that the judges have to continually turn pages back and forth to cross reference.

6A.1.10. Static Judging

Items 6.1.10.1. must be judged at a minimum distance of 5 meters in F4C from the nearest part of the model. A handler should be prepared to position the model as directed by the judges. No measurements are to be taken and the models must not be handled by the judges.

The model must be judged against the documentation presented and the judges should award marks solely on this evidence. The quality of the documentation/evidence provided by the competitor will normally be reflected in the score that the judges award. Accurate and clear evidence deserves good marks if the model matches it. Judges should ensure that a competitor does not benefit by default by submitting poor or incomplete documentation.

Judges must assess both accuracy and complexity of those aspects where indicated.

6A.1.10.1. Scale Accuracy

The photographs are the prime means of determining the accuracy and realism relative to the full size aircraft and must always take precedence over drawings if there is any doubt concerning an item of scale accuracy. Caution should however be exercised when determining rigging angles using photographs taken at an oblique angle, as these might give the wrong impression. In this particular case the drawing may be a more appropriate reference for checking dihedral and incidence angles.

The model should first be positioned in a pose similar to that in the best photograph and checked for obvious discrepancies. This procedure is then repeated with any other suitable photographs.

Then, using photographs and drawings check:

a) Side View, this may be either left or right depending on the most suitable photograph. A check should be made of the fuselage outline, cabin or canopy shape, cockpit aperture shape, engine cowling and spinner shape, outline of fin and rudder, wing and tailplane sections. Also the shape, angle and position of landing gear legs and tail wheel or skid, the size of wheels and tyres. On multi-wing aircraft a check should be made of wing stagger, wing gap and the shape and arrangement of struts and incidence wires.

b) Front End View, for dihedral, wing thickness and taper, wing struts, bracing and gap on multi wing aircraft. Also the thickness of fin, rudder and tailplane, cross-sections of fuselage and engine cowling, cowling shape and cut-outs, propeller size and shape, shape of cockpit canopy or windshields, size, shape, position and angle of landing gear, wheel track and tyre thickness.

c) Upper Plan View, for wing outline and fairings, aileron size, flaps, tailplane size and outline, elevator size, shape and cut outs, trim tabs, fuselage shape and taper, cockpit or canopy shape, engine cowling shape.

6A.1.10.2. Colour

Colour Accuracy:

Correct colour may be established from colour photographs, from accepted published descriptions if accompanied by colour chips certified by competent authority, from samples of original paint, or from accepted published colour drawings. Also check colours of national markings, lettering and insignia. Camouflage colour schemes should show the correct degree of merging of the shades.

Colour Complexity:

Consideration should be given to the greater effort involved in reproducing multi-coloured finishes compared to models which feature only one or two basic colours. The system for awarding colour complexity points should be agreed upon before starting competitive judging. Up to two complexity points may be given for each main colour that covers a significant part of the airframe. A maximum of a single point may be given for each minor colour, such as those for the insignia, struts, guns, bombs etc. Basic colours such as black and white should receive a fraction of a complexity point. It is essential that if high marks are to be awarded, a comprehensive standard of colour documentation must be presented.

6A.1.10.3. Markings

If a single panel of 3 judges is involved, much of the Markings aspect can be assessed whilst checking Scale Accuracy. The relative positioning and shape of the markings on the model are often a good indication of Scale Accuracy as they highlight errors in shape and outline. The opportunity to check markings on the underside of the model can also be taken whilst checking the plan view.

Markings Accuracy:

Check the position and size of all markings and lettering. Particular emphasis should be made to the relative positioning of markings to other markings and key features on the airframe. Check that the style and thickness of all letters and figures are correct. Check that any trim strips are of the correct dimensions and are correctly positioned. Check camouflage patterns.

Markings Complexity:

The system for awarding marks for Markings Complexity should be agreed upon before starting competitive judging. A high mark for complexity is not solely dependent upon the number of markings, but the difficulty in achieving the required effect. Complex lettering, particularly when spread over a large area or relating to key positions on the airframe, should attract a higher complexity mark than sparsely positioned markings of more simple design. Curved lines are usually more complex than straight lines. Camouflage patterns should be considered carefully, with the more complex styles involving irregular patterns and indistinct edges being rewarded accordingly. For high marks to be given in this section it is important that documentation covering all the markings to be assessed is presented.

6A.1.10.4. Surface Texture and Scale Realism

Realism is a question of how well the model captures the character of the full size aircraft. The judges should ask themselves if they are looking at the subject aircraft in miniature, or just a model airplane.

The texture and appearance of the surface of the model should be a good reproduction of that of the prototype. Fabric covered types should be covered in the correct material, and the outline of stringers and wing ribs should be visible. Ply covered or wooden monocoque types should be correctly simulated and any sag between the ribs and formers should be apparent if this is present on the prototype. Metal stressed skin types should show simulation of panels and rivets. In all instances, the appropriate gloss, eggshell or matt finish should be correctly reproduced.

If the subject aircraft is an unblemished museum example, then the model should be in similar pristine condition. If the subject aircraft is an operational aircraft, then a degree of weathering and signs of regular use should be evident if appropriate to the full size machine.

The documentation should show these aspects and the judges should mark accordingly.

6A.1.10.5. Craftsmanship

This section deals with the skill, ingenuity, general finess and complexity involved in the construction of the model.

Craftsmanship Quality:

Model should be checked for quality of workmanship, with particular reference to clean, sharp edges, especially trailing edges of wings and tail surfaces; correct gaps at hinge line of control surfaces; close fit where non scale joints are used for dismantling the models or access hatches used for model operation.

Non-scale items such as switches, needle valves, silencers, control horns etc. should not be visible.

Craftsmanship Complexity:

Judges should consider the overall complexity of the design, awarding higher marks for more intricate shapes and structure. Special items of ingenuity may also be rewarded under this section.

In assessing both the above aspects the judges should consult the competitors declaration and check for any components that have not been made by the competitor (see 6.1.9.4e) and adjust the marks awarded accordingly.

The points that are awarded must again reflect the standard of documentation presented.

6A.1.10.6. Scale Detail

Check that items such as those listed are present on the model where applicable, and that they are accurately reproduced and correctly positioned.

Hatches	Brake pipes
Handles	Landing gear springing
Footsteps	Tyre treads
Doors	Wing slots
Armament	Navigation and landing lights
Bomb racks	Pitot head
Control cables	Walkways
Control horns	Tanks
Fairings	Radiators
Bracing	Filler caps
Turnbuckles	Louvres
Struts	Cooling gills
Lacing or stitching	Mass balances
Aerials	Instrument panel
Venturis	Cockpit or cabin interior detail

The marks awarded should reflect both the accuracy and the quantity of the scale detail present.

Scale Detail Accuracy:

The documentation presented should clearly show the features that are being assessed. Higher marks should be awarded to those competitors who accurately reproduce these items.

Scale Detail Complexity:

A well-documented highly detailed model should score proportionately higher than a model with little detail, even though the full-size prototype of the latter is itself sparsely detailed. Judges should ensure when marking this aspect that they are relating to the complexity of detail actually on the model, and not award marks for what is shown in the documentation.

ANNEX 6C
JUDGES' GUIDE
R/C SCALE FLYING TECHNICAL RULES FOR FLYING SCALE MODEL CONTESTS
FLIGHT SCHEDULE, CLASS F4C

6C.1 General

All flying manoeuvres must be judged bearing in mind the performance of the full size prototype. The aim of the scale flight schedule is to recreate the flight characteristics and realism of the full-size aircraft. Judges must not therefore confuse scale contests with aerobatic contests.

The errors mentioned under each manoeuvre cannot be an exhaustive list of all possible faults. They are intended to show the sort of mistakes that are likely during that manoeuvre. These errors examine each manoeuvre from three aspects:

1. The shape, size and technical requirements of the intended manoeuvre.
2. The positioning of the manoeuvre relative to the judges position or other datum.
3. The scale realism achieved relative to the subject aircraft.

It remains the responsibility of the judges to decide upon the importance of each error and deduct marks accordingly, always taking into account the characteristics of the full size aircraft.

Each manoeuvre must be announced prior to commencement and called on commencement by the word "NOW'. All flying manoeuvres must be announced upon completion by the word "FINISHED/ COMPLETE".

The flying judges will be seated alongside the landing area in a line parallel with the wind direction. This axis will be referred to as the "judges' line". The Contest/Flight Line Director will be responsible for the measuring of wind direction. If, in the opinion of the Contest/Flight Line Director, the wind direction continually deviates more than 30° from the judges' line, the Judges' line will be adjusted accordingly.

Unless there is a conflict with safety, the pilot should at all times be permitted to choose the direction of take-off and landing to allow for unexpected changes in wind direction. This provision will also apply to manoeuvre 6.3.7.P (Touch-and-Go) since this consists of both a landing and take-off.

Apart from the manoeuvres mentioned above, all manoeuvres must be performed parallel with the judges' line such that if any part of the manoeuvre is performed behind the judges' line it will score ZERO.

In the interests of safety, any manoeuvres overflying a designated area behind the judges line, laid out for the protection of spectators, officials and other competitors or helpers will score ZERO.

The height and positioning of individual manoeuvres should be proportional to that expected in a full size display typical to each prototype. Unless specified otherwise, manoeuvres that are carried out in a horizontal plane (e.g. Straight Flight, Figure Eight, Triangular Circuit) should commence on a flight path that is about 60° elevation to the judges. Manoeuvres such as the Descending Circle and Spin should start at a higher elevation. Judges should down mark manoeuvres as too high, too low, too far away, or too close if they consider the positioning to be so.

The item 6.3.6.11. "Realism in Flight", should be discussed by all judges after completion of the flight and they should attempt to arrive at an agreed score for this item.

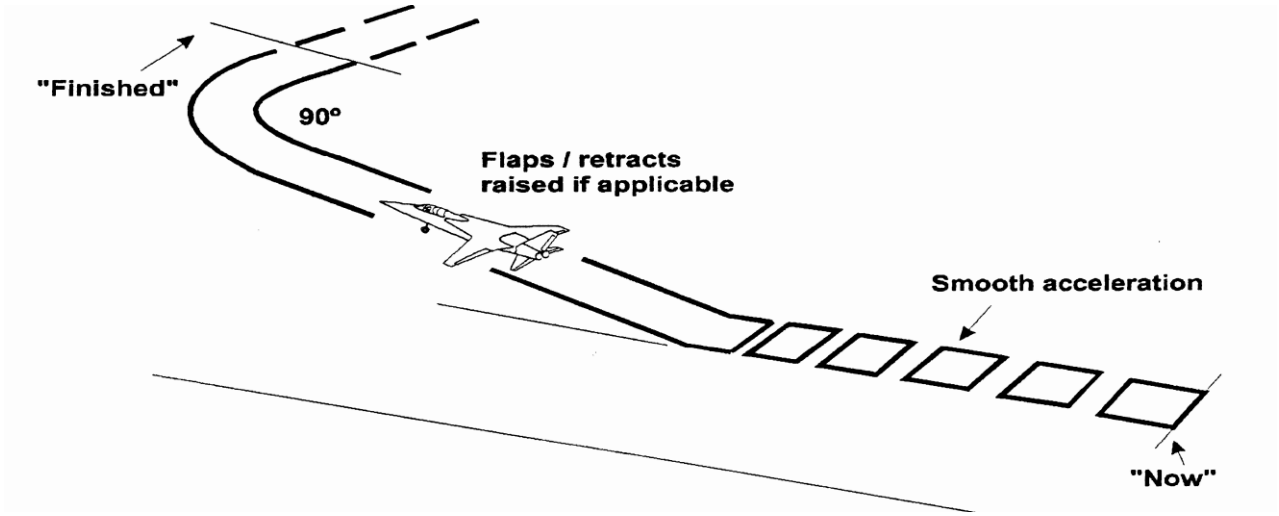
After each flight the Flight Judges will record any non-standard event that caused downgrading or loss of flight points. If for any reason the mark awarded is changed, the change must be initialled by

the judge. The Chief Flight Judge will review all flight score sheets for completeness and fairness and justification of any zero scores e.g. missed manoeuvres, manoeuvres flown out of order, out of flight time, flying behind the judges line or crash landing. The Chief Flight judge must then sign the score sheets before they are sent for processing.

6C.3.6.1. Take-Off:

The model should stand still on the ground with the motor running without being held by the pilot or mechanic and then take-off into wind, or as required by the competitor to make best use of the take-off distance available (jet subjects). If the model is touched after the competitor calls "Now" the take-off will score zero. The take-off should be straight and the model should smoothly accelerate to a realistic speed, and then lift gently from the ground and climb at an angle consistent with that of the prototype. The take-off is completed after the model has turned 90 degrees.

If the prototype used flaps for take-off, then the model should also, but this may be subject to the competitor's judgment taking into account the wind strength. Any flapless take-off due to wind must be nominated to the judges before take-off. Flaps should be raised during the climb-out after take-off. If applicable, the landing gear should be retracted during the climb-out.



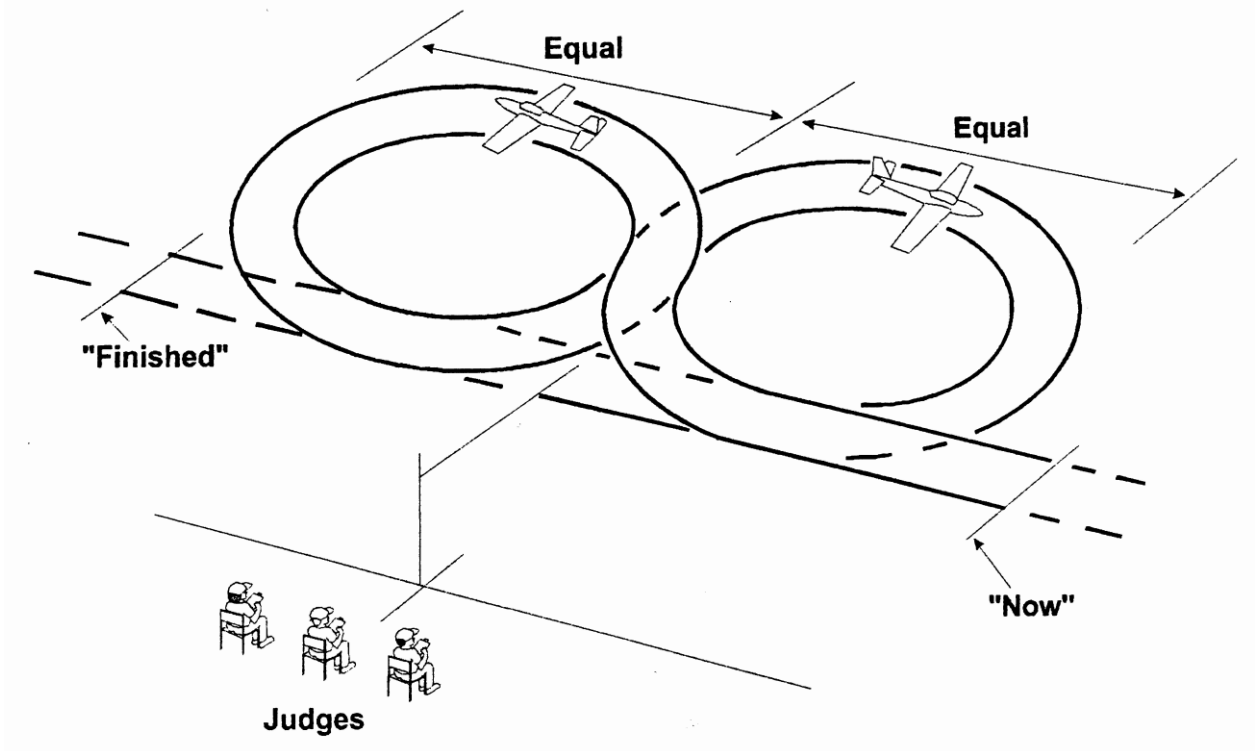
Errors:

1. Model touched after calling "Now" (zero marks).
2. Swings on Take-off (a slight swing with other than a tricycle undercarriage is acceptable as the aircraft tail is raised).
3. Take-off run too long or too short.
4. Unrealistic speed / too rapid acceleration.
5. Inappropriate attitude at lift-off for undercarriage configuration.
6. Not a smooth lift-off.
7. Climb rate wrong (too steep or too shallow).
8. Nose attitude wrong during climb (nose too high or too low).
9. Flaps not used if applicable.
10. Wheels not raised if applicable.
11. Significant wing drop.
12. Climb-out track not same as take-off run.
13. Unrealistic rate of turn onto crosswind leg.
14. Crosswind track not 90° to climb out track.

6C.3.6.2. Overhead Figure Eight:

The model approaches in straight and level flight on a line parallel with the judges' line, and then a one-quarter circle turn is made in a direction away from the judges' line. This is followed by a 360-degree turn in the opposite direction, followed by a 270-degree turn in the first direction, completing the manoeuvre on the original approach line.

The intersection (mid- point) of the manoeuvre shall be on a line that is at right angles to the direction of entry and passes through the center of the judges' line.

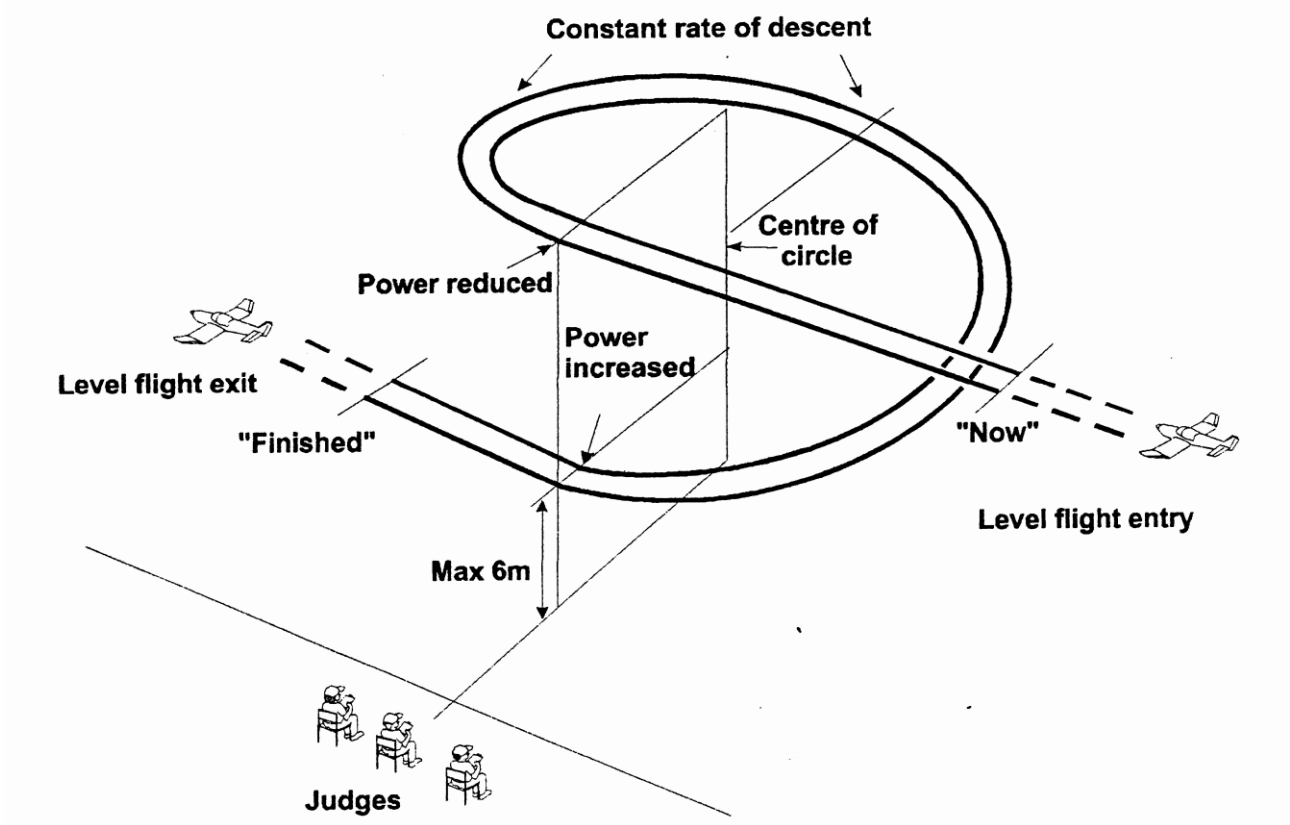


Errors:

1. Entry into first circle not at right angles to original flight path.
2. Circles unequal size.
3. Circles misshapen.
4. Constant height not maintained.
5. Intersection not centered on judges' position.
6. Entry and exit paths not on same line.
7. Entry and exit paths not parallel with judges' line.
8. Overall size of manoeuvre not realistic for prototype.
9. Model flight path not smooth and steady.
10. Too far away, too close, too high, too low.

6C.3.6.3. 360° Descending Circle at Constant Low Throttle Setting:

Commencing from straight and level flight, the model performs a gentle 360° descending circle over the landing area, in a direction away from the judges, at a constant low throttle setting. The manoeuvre terminates at a maximum height of 6 meters, resuming straight and level flight on the same path.



Errors:

1. Rate of descent not constant.
2. Descent too steep.
3. Throttle setting not constant or low enough.
4. Circle misshapen.
5. No significant loss of height.
6. Model does not descend to 6 meters or below.
7. Circle not centered on judges' position.
8. Entry and exit paths not parallel with the judges' line.
9. Start and finish not called in straight and level flight.
10. Too far away, too close.

6C.3.7. Optional Demonstrations:

The selection of optional manoeuvres is dependent upon the capabilities of the aircraft subject type modelled. There are two categories, namely Aerobatic and Non-aerobatic, which are defined as follows:

- Aerobatic - Aircraft designed for aerobatic flight, examples of which are military fighters and fighter-bombers, training aircraft, purpose built aerobatic aircraft and some racing aircraft.

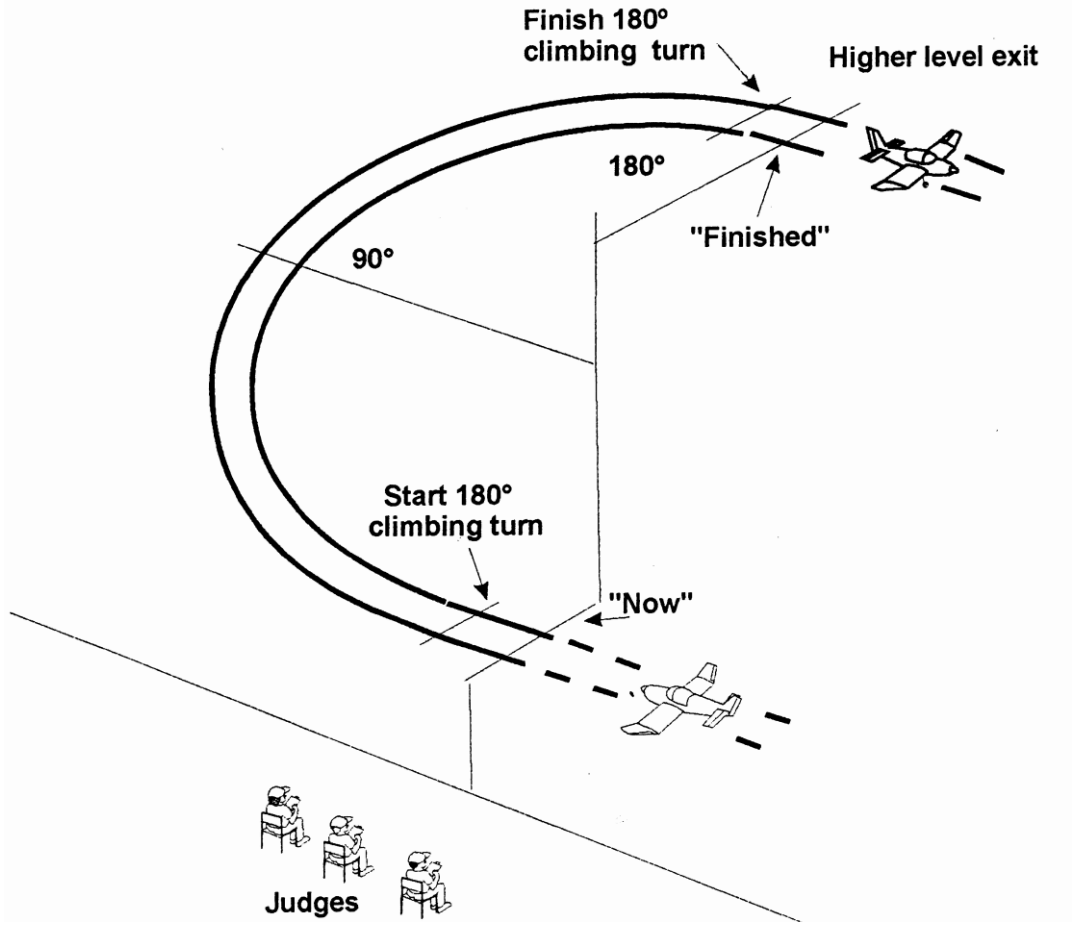
- Non-acrobatic — Aircraft designed with limited manoeuvrability where the original prototypes of which were restricted by the manufacturer or licensing government agency. Examples are touring aircraft, passenger and cargo aircraft and heavy military transports and bombers.

The selection of manoeuvres and the order in which they are to be flown must be shown on the score sheet and given to the judges before each flight. This order must adhered to and any manoeuvre flown out of sequence will score ZERO.

The competitor must be prepared, if required by the judges, to give evidence that the options selected are within the normal capabilities of the aircraft subject type modelled.

A Chandelle

From a straight and level flight the model passes the judges and then performs a 180° climbing turn in a direction away from the judges, resuming straight and level flight on the opposite heading. The rate of climb should be commensurate with that of the prototype. This manoeuvre is for non-aerobatic prototypes only.

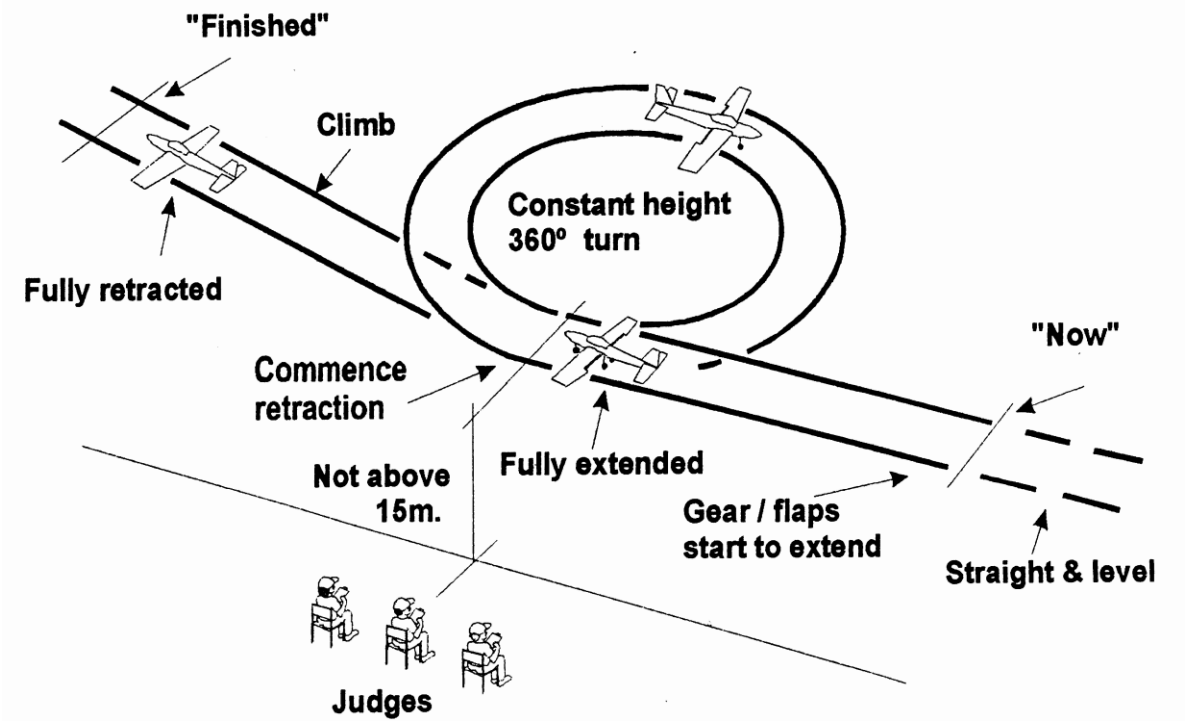


Errors:

1. Turn not smooth and continuous.
2. Climb not smooth and continuous.
3. Half height gain not at 90° position.
4. Excessive/unrealistic engine power used to achieve the climb.
5. Insignificant height gain.
6. Start & finish not centered on judges' position.
7. Entry and exit paths not parallel with the judges' line.
8. Final track not 180° opposite to entry.
9. Entry and exit not in straight and level flight.
10. Too far away or too high.

A. Extend and Retract Landing Gear:
B. Extend and Refract Flaps: (Diagram and errors applicable to both manoeuvres unless stated)

Model approaches the landing area in straight and level flight at a height not exceeding 15 meters and in full view of the judges, extends the landing gear / flaps. Model then executes a 360° turn in a direction away from the judges, and when again directly in front of the judges retracts the landing gear / flaps and climbs away in straight flight.



Errors:

1. Model speed too high for landing gear / flap lowering.
2. Gear / flaps not extended in full view of judges.
3. Speed and sequence of extension and retraction not realistic.
4. Flaps demo only: a) Instability when flaps lowered.
   b) No change in attitude with flaps.
5. Misshapen circle, height not constant.
6. Circle height exceeds 15 meters.
7. Circle not centered on judges' position.
8. Retraction not commenced in front of judges.
9. Entry and exit paths not parallel with the judges' line.
10. Entry and exit tracks not the same.
11. Non-scale-like climb out.
12. Too far away or too close.

C. Dropping of Bombs or Fuel Tanks:

If bombs are carried internally, bomb-bay doors must be open and be closed after the drop.

If bombs or fuel tanks are carried externally, they must be fitted in the correct positions and in the correct manner. Dropping should be in the manner of the prototype.

Dropping should be within clear view of the judges and centerd on the judges' position.

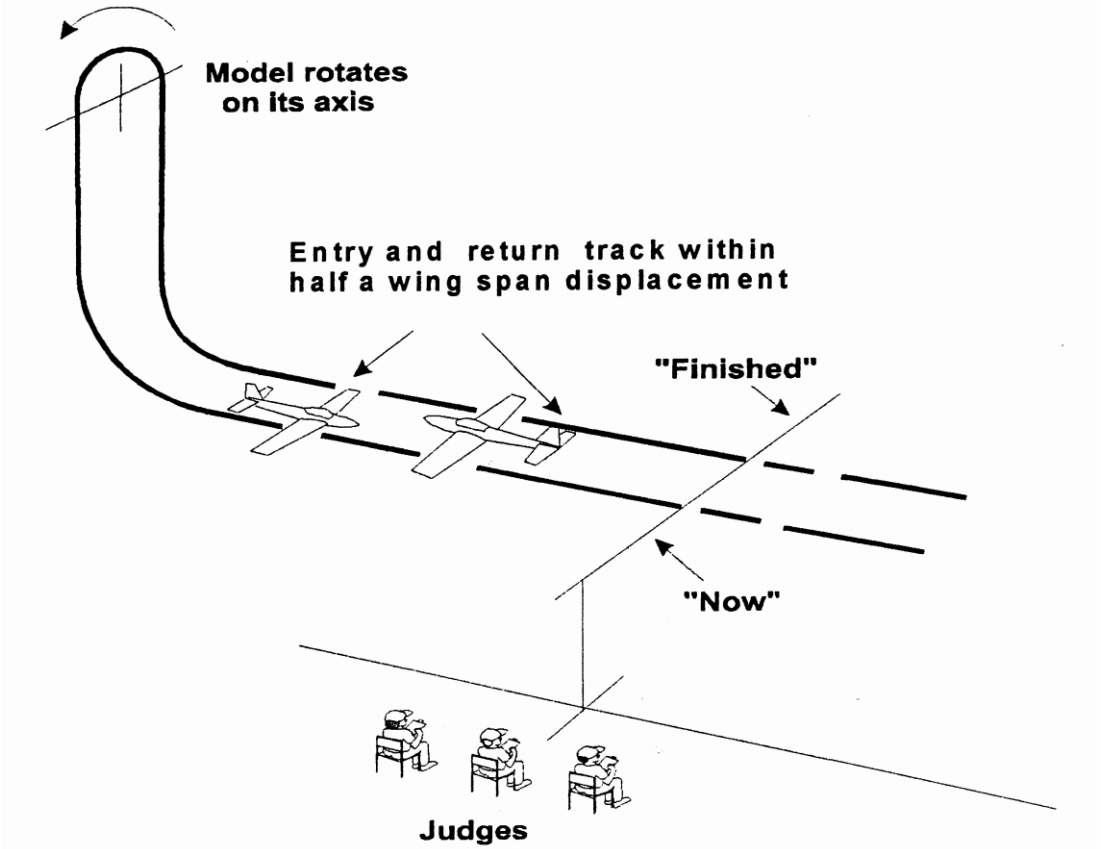
Any special features of the manoeuvre should be declared to the judges beforehand.

Errors:

1. Bombs or tanks do not detach and fall in a realistic manner.
2. Drop is not in front of judges.
3. Overall dropping manoeuvre not presented in a realistic way.
4. Too far away / too close / too high / too low.

D. Stall Turn:

The model starts in level flight, noses up to a vertical flight path until it comes to a stop. At which point the model yaws through 180°, then dives and finally recovers straight and level on a flight path in the opposite direction to the entry. Entry and exit should be at the same height. The competitor should specify whether the turn shall be to the left or right. Low powered aircraft types would be expected to execute a shallow dive at full throttle in order to pick up the necessary speed before commencing the manoeuvre.

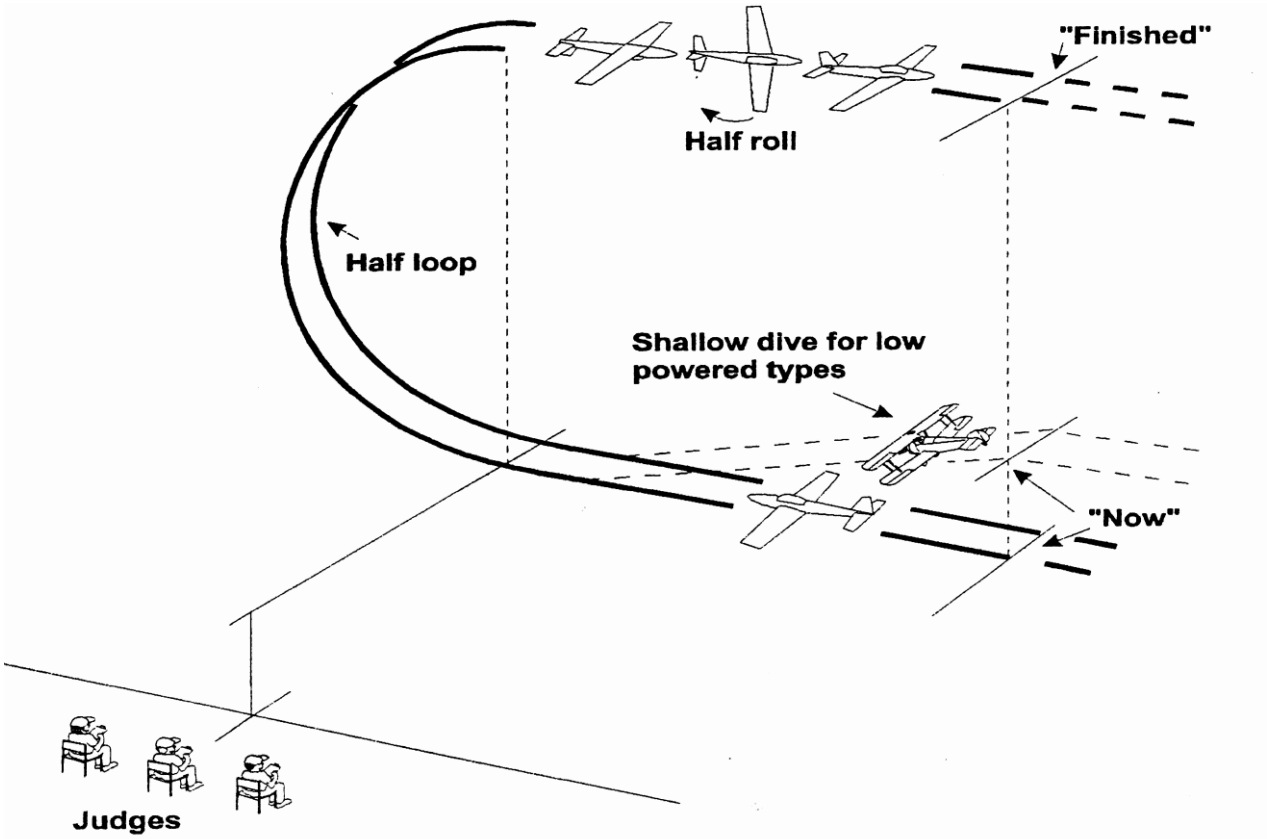


Errors:

1. Start & finish not parallel with judges' line.
2. Pull up not positioned to give best view to judges.
3. Climb and descent not near vertical.
4. Insufficient height gain.
5. Model does not stop.
6. Model does not turn within half its wingspan and around its axis.
7. Competitor does not specify or achieve nominated left / right turn.
8. Entry and exit paths are not at same height.
9. Model does not exit within half span displacement of entry track.
10. Entry and exit paths not parallel with the judges' line.
11. Too far away / too close / too high / too low.

E. lmmelmann Turn:

From a straight and level flight the model pulls up into the first half of a circular loop (commensurate with the performance of the subject type), and when inverted, performs a half roll before resuming straight and level flight on the opposite track. Low powered aircraft types would be expected to commence the manoeuvre by executing a shallow dive at full throttle in order to pick up the necessary speed.



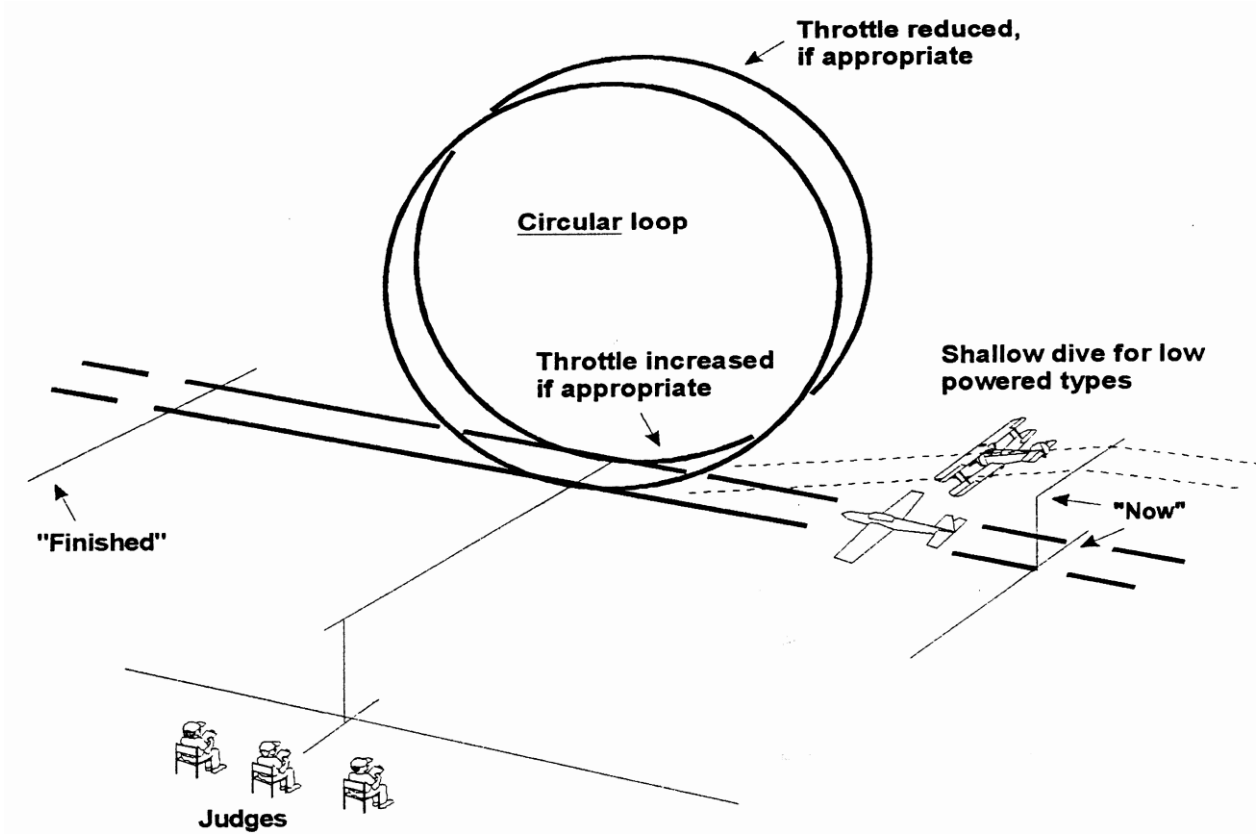
Errors:

1. Track of the half loop not vertical.
2. Half loop not centered on judges' position.
3. Half loop is not sufficiently semicircular.
4. Roll starts too early or too late.
5. Excessive height loss in the roll.
6. Track veers during the roll.
7. Does not resume straight and level flight on the opposite track to entry.
8. Manoeuvre not flown parallel with judges' line.
9. Size of manoeuvre and speed not in manner of the prototype.
10. Too far away / too close / too high / too low.

F. Loop:

From straight flight, the model pulls up into a circular loop and resumes straight and level flight on the same heading as the entry. The throttle may be reduced at the top of the loop as appropriate to type, and opened if necessary when normal flight is resumed. Low powered aircraft types would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the loop.

Note: Whilst the loop is intended to be a circular manoeuvre, the ability of a low powered aircraft to achieve a perfect circle will be significantly less than that of a jet or high powered aerobatic machine. A slightly elongated loop by the former would therefore expect to score as well as a perfect circle achieved by the latter, but a grossly misshapen circle would be significantly down marked. This also applies to other options involving looping manoeuvres.

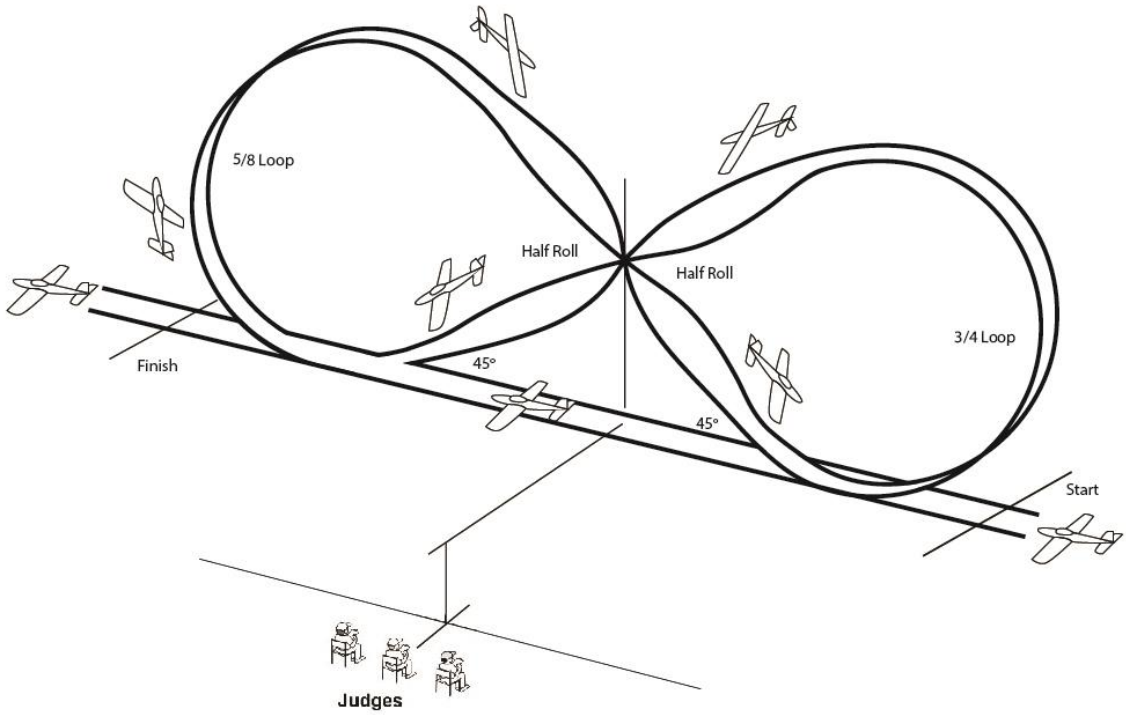


Errors:

1. Track of loop not vertical
2. Loop not sufficiently circular, commensurate with the subject type.
3. Inappropriate use of throttle.
4. Size and speed of Loop not in manner of prototype.
5. Not centered on judges' position.
6. Does not resume straight and level flight on same track and height as entry.
7. Manoeuvre not flown parallel with judges' line.
8. Too far away / too close / too high / too low.

H. Cuban Eight

The model approaches in straight and level flight on a track parallel to the judges line. After passing the judges center line the model aircraft pulls up into a 5/8 inside loop to reach a 45° nose down attitude and then performs a half roll on the judges center line. The 45° down line is held until 3/4 inside loop is flown to repeat the manoeuvre in the opposite direction for a straight and level recovery at the same height and track as the original entry. The throttle may be closed at the top of each loop, as appropriate to the subject type, and reopened during each descent. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

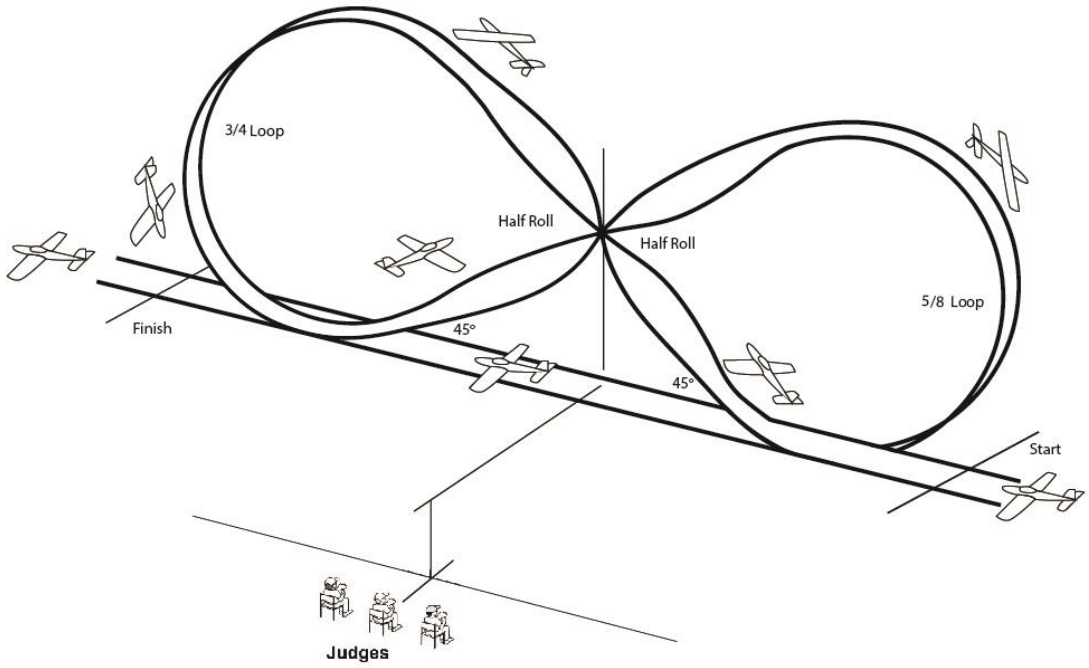


Errors:

1. Manoeuvre not performed in a constant vertical plane that is parallel with the judges' line.
2. Loops are not circular.
3. Loops are not the same size.
4. Half rolls are not centered on the judges' position.
5. 45° descent paths not achieved.
6. Model does not exit manoeuvre at same height as entry.
7. Model does not resume straight and level flight on same track as entry.
8. Inappropriate use of throttle.
9. Size and speed of manoeuvre not in manner of prototype.
10. Too far away / too close / too high / too low.

I. Reverse Cuban Eight:

The model approaches in straight and level flight, parallel to the runway and pulls through a 1/8 loop to a 45 degree up line before reaching the judges center line and then performs a half roll in front of the judges. It then pulls through a ¾ inside loop into a 45 degree up line and performs a half roll in front of the judges and then pulls through a 5/8 inside loop to resume straight and level flight to exit the manoeuvre at the same altitude and track as the entry. The throttle may be closed at the top of each loop, as appropriate to the subject type, and reopened during each descent. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

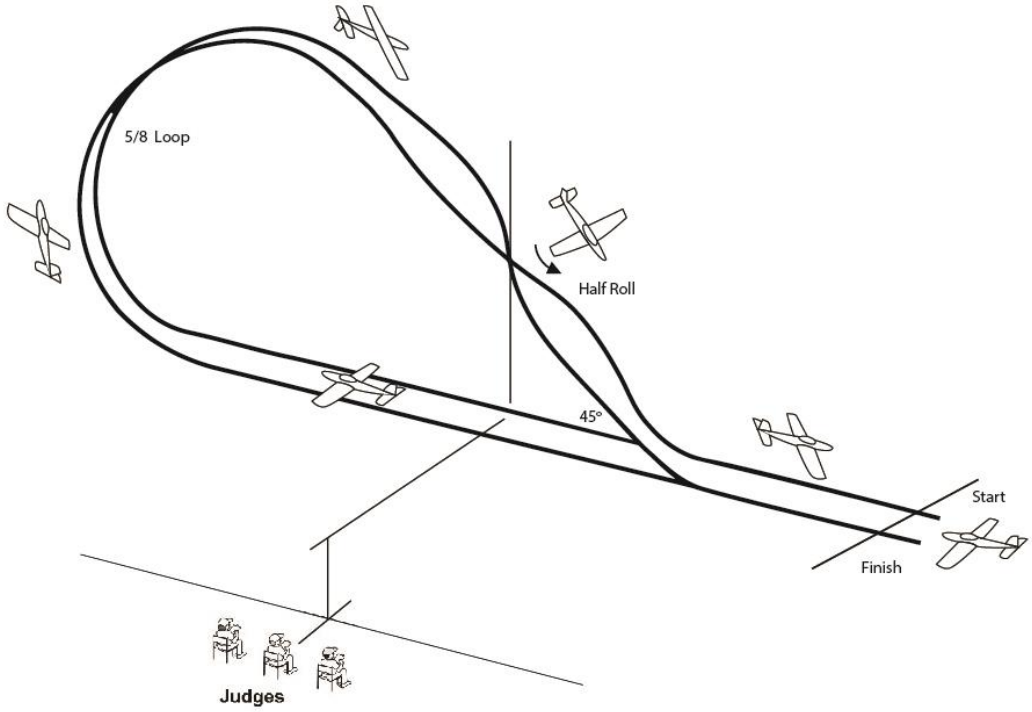


Errors:

1. Manoeuvre not performed in a constant vertical plane that is parallel with the judges' line.
2. Loops are not circular.
3. Loops are not the same size.
4. Half rolls are not centered on the judges' position.
5. 45º ascent paths not achieved.
6. Model aircraft does not exit manoeuvre at same height as entry.
7. Model aircraft does not resume straight and level flight on same track as entry.
8. Inappropriate use of throttle.
9. Size and speed of manoeuvre not in manner of prototype.
10. Too far away/too close/too high/too low.

J. <u>Half Cuban Eight:</u>

The model approaches in straight and level flight on a track parallel to the judges line. After passing the judges center line the model aircraft pulls up into a 5/8 inside loop until a 45° nose down attitude is reached. The 45° inverted flight is held until a half roll is performed on the judges center line. The 45° down line is then held until a 1/8th inside loop is performed for a straight and level exit is achieved at the same height and on the same track as the entry. The throttle may be closed at the top of the loop, as appropriate to the subject type, and reopened during the descent. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

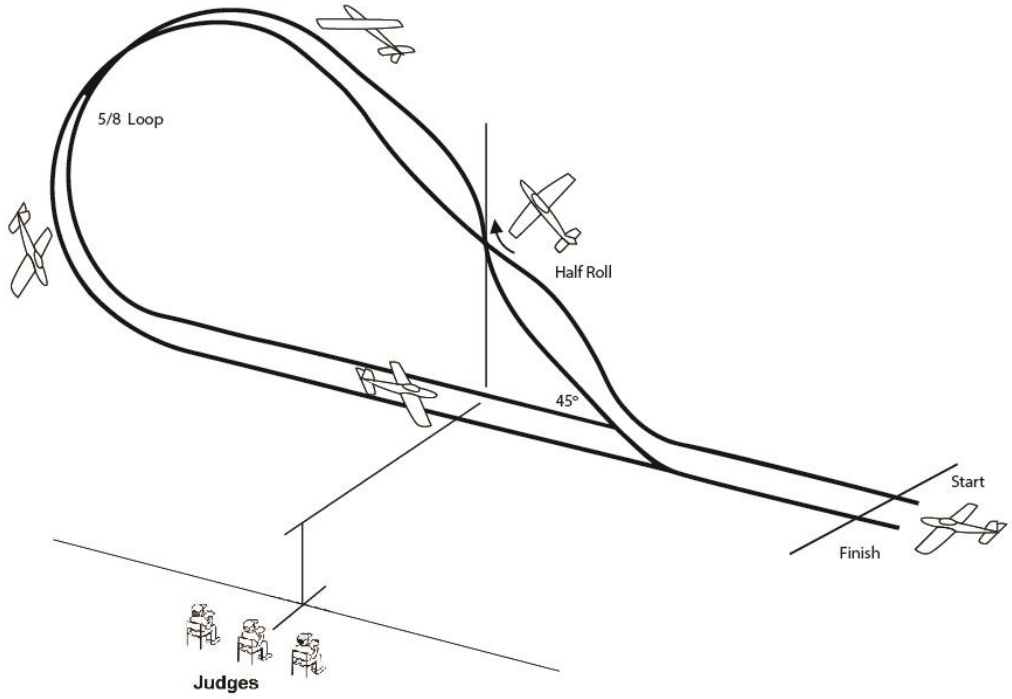


Errors:

1. Manoeuvre not performed in a constant vertical plane that is parallel with the judges' line.
2. Loop not circular.
3. Half roll not centered on the judges' position.
4. The 45º descent path not achieved.
5. Model aircraft does not exit manoeuvre at same height as entry.
6. Model aircraft does not resume straight and level flight on same track as entry.
7. Inappropriate use of throttle.
8. Size and speed of manoeuvre not in manner of prototype.
9. Too far away/too close/too high/too low.

K. Half Reverse Cuban Eight:

The model approaches straight and level, parallel to the runway and pulls through a 1/8 loop into a 45 degree up line before reaching the judges center line and performs a half roll in front of the judges. It then pulls through a 5/8 inside loop to resume straight and level flight to exit the manoeuvre at the same altitude and opposite track as the entry. The throttle may be closed at the top of the loop, as appropriate to the subject type, and reopened during each descent. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

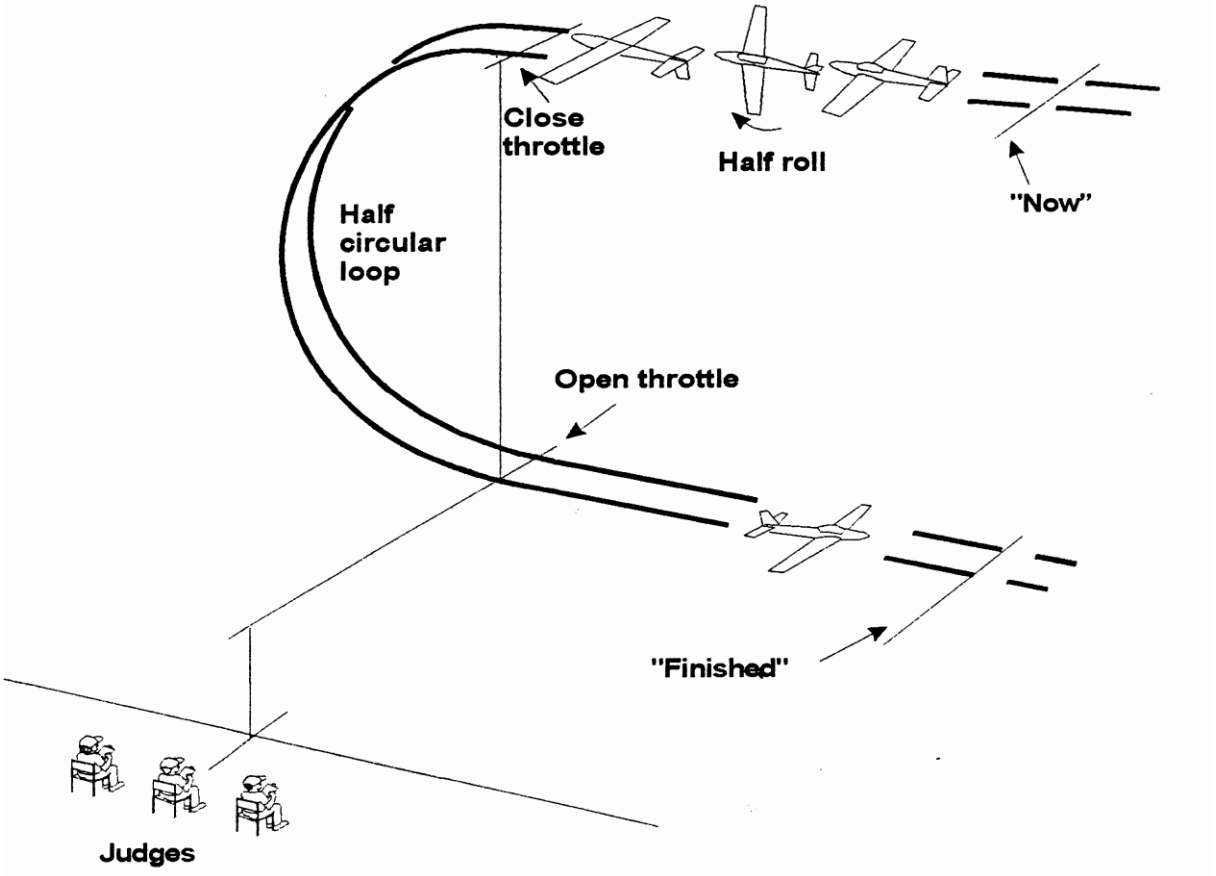


Errors:

1. Manoeuvre not performed in a constant vertical plane that is parallel with the judges' line.
2. Loop not circular.
3. Half roll not centered on the judges' position.
4. The 45º ascent path not achieved.
5. Model aircraft does not exit manoeuvre at same height as entry.
6. Model aircraft does not resume straight and level flight on same track as entry.
7. Inappropriate use of throttle.
8. Size and speed of manoeuvre not in manner of prototype.
9. Too far away/too close/too high/too low.

L. Split S (Reversal):

From straight flight, the model performs a half roll and when inverted performs half of a circular inside loop (commensurate with the performance of subject type), and resumes straight and level flight on a flight path opposite to that of the entry. The throttle should be closed at the inverted position, as appropriate to type, and opened when normal flight is resumed.

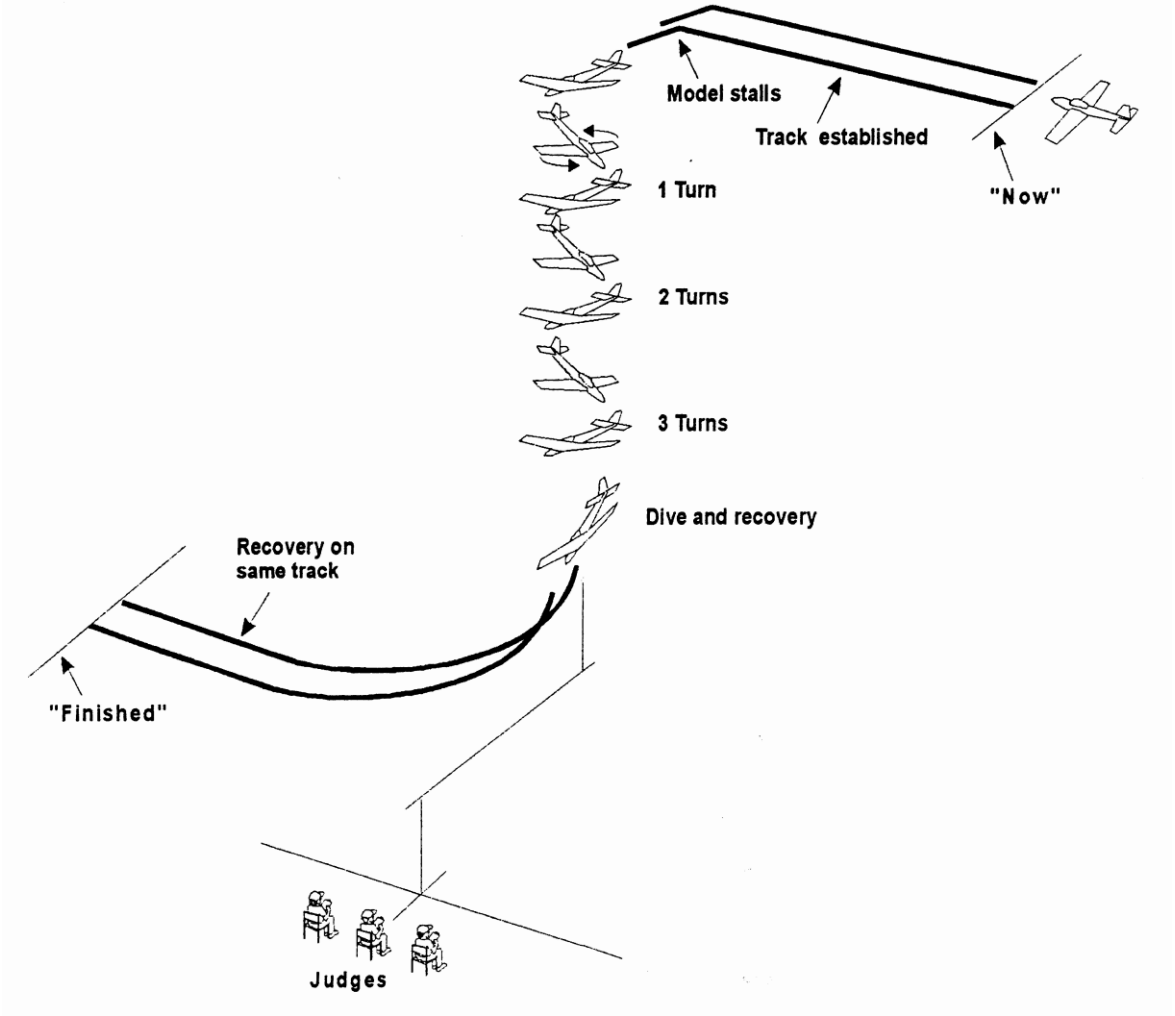


Errors:

1. Model changes track during half roll.
2. Model inverted too long or too short.
3. Inappropriate use of throttle.
4. Track of half loop not on line or vertical.
5. Half loop is not sufficiently semicircular.
6. Too fast or too tight a half loop.
7. Does not resume straight and level flight on opposite track to entry.
8. Half loop not centered on judges' position.
9. Manoeuvre not flown parallel with the judges' line.
10. Too far away / too close / too high / too low.

M. Spin Three Turns:

From straight and level flight, the model decelerates into a stall and commences the spin through three turns and recovers to level flight on the same track as the initial flight direction. During descent the model may drift with the wind.

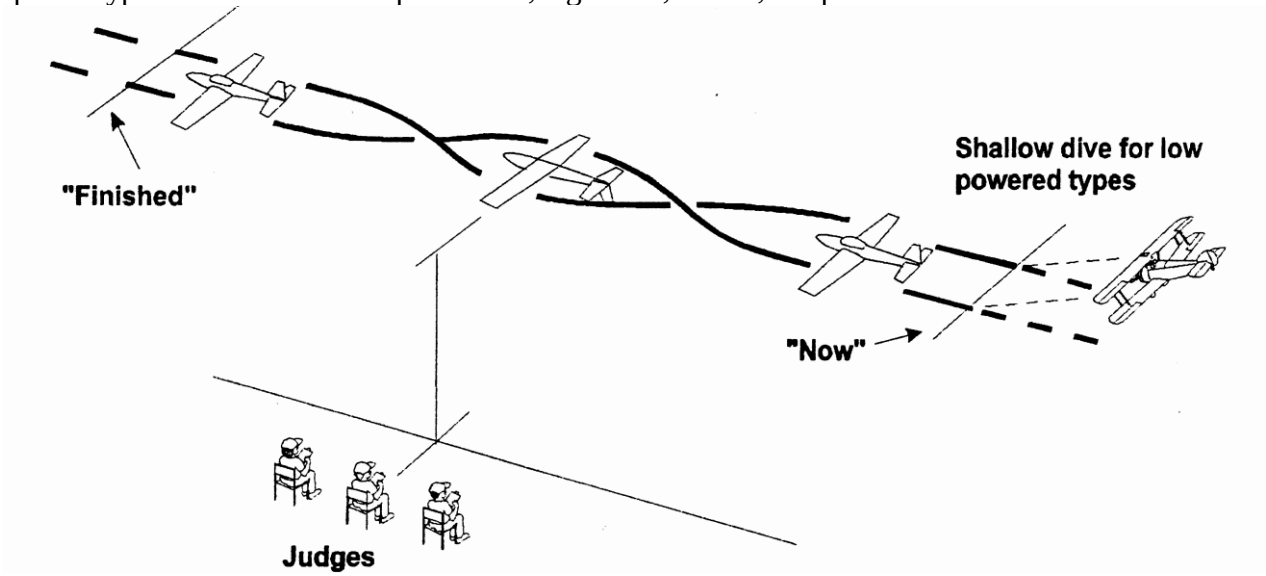


Errors:

1. Engine not throttled back at point of stall.
2. Entry into spin not clean and positive.
3. Not a true spin but merely a spiral dive (which should score zero).
   Note: In a true spin descent path will be close to C of G of model. A spiral dive is a tight vertical barrel roll.
4. Not three complete turns.
5. Start of spin not centered on judges' position.
6. Model does not resume straight and level flight on same track as entry.
7. Entry and exit paths not parallel with judges' line.
8. Entry and exit not in level flight
9. Too far away / too close / too high / too low.

N. Roll:

From straight and level flight, the model rolls at a constant rate through one complete rotation and resumes straight and level flight on the same track. Low powered aircraft would be expected to execute a shallow dive at full throttle before the manoeuvre. Competitors should nominate any special type of roll that will be performed, e.g. Slow, Barrel, Snap.



Errors:

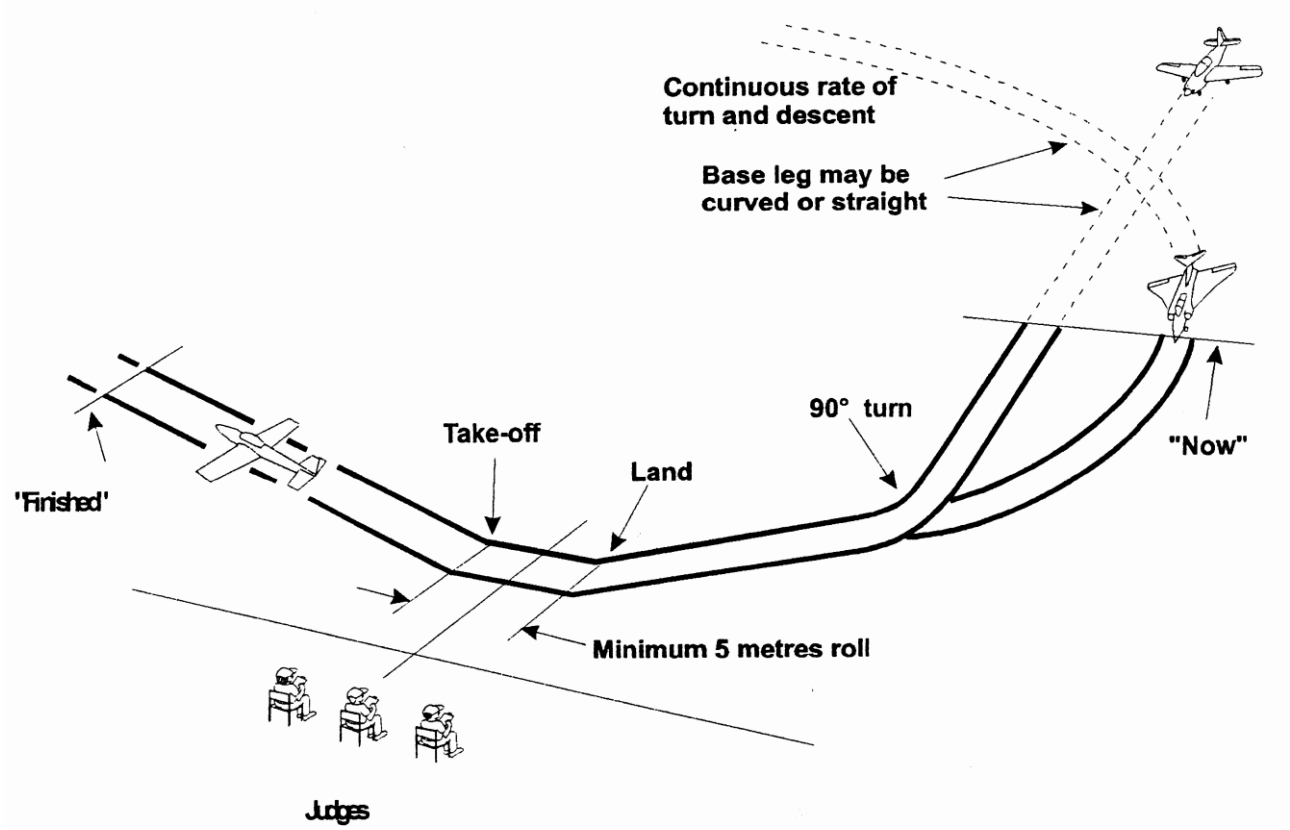
1. Rate of roll is not constant.
2. Style of roll not typical to prototype.
3. Roll not centered on judges' position.
4. Entry and exit at different heights.
5. Entry and exit at different speeds.
6. Entry and exit tracks and line of roll not parallel with judges' line.
7. Does not resume straight and level flight on same track as entry.
8. Style of roll not as nominated.
9. Inappropriate use of throttle.
10. Too far away / too close / too high / too low.

O. Parachute:

The drop should be in the manner of the prototype. For example, cargo should be dropped from a hatch or bomb bays. Man via doors, hatch or by inverting the aircraft. The model should reduce speed before commencing drop, possibly by using flaps and lowering the landing gear. If the prototype used a braking parachute in landing, the competitor may demonstrate this.

P. Touch and Go

The model commences by descending from base leg, which may be either curved or straight as required by the pilot. The turn is continued through 90° onto final approach. The model then lands and takes off again into wind without coming to a halt. The main wheels must roll on the ground for a minimum of five meters. Flaps must be used if applicable.

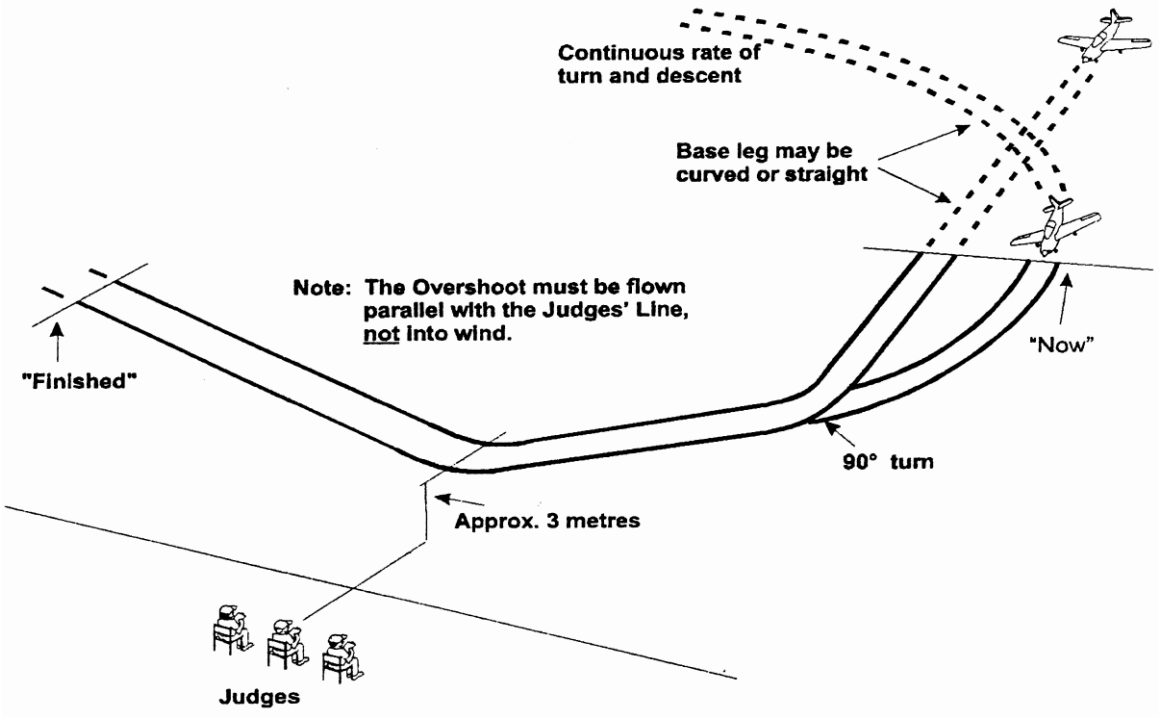


Errors:

1. Manoeuvre does not commence on base leg.
2. Turn onto final approach too tight or not 90°.
3. Descent from base leg not smooth and continuous.
4. Model does not achieve correct landing approach prior to touchdown.
5. Model does not achieve a minimum ground roll of 5 meters
   Note: if prototype has two main wheels then both wheels must roll on ground for minimum 5 meters.
6. Model bounces on landing.
7. Inappropriate use of flaps.
8. Climb out not smooth or realistic.
9. Approach and climb out tracks not the same.
10. Does not make best use of landing space available for wind direction.

Q. Overshoot

The model commences by descending from base leg, which may be either curved or straight as required by the pilot. The turn is continued through 90° onto a higher than normal landing approach on low throttle, using flaps if applicable. On reaching the center of the landing area at a height of approximately 3 meters, power is applied to check the descent. After normal flying speed and attitude are attained the model climbs straight ahead. The aim of the manoeuvre is to simulate an aborted landing due to a higher than normal landing approach. This option may only be nominated for non-aerobatic aircraft.

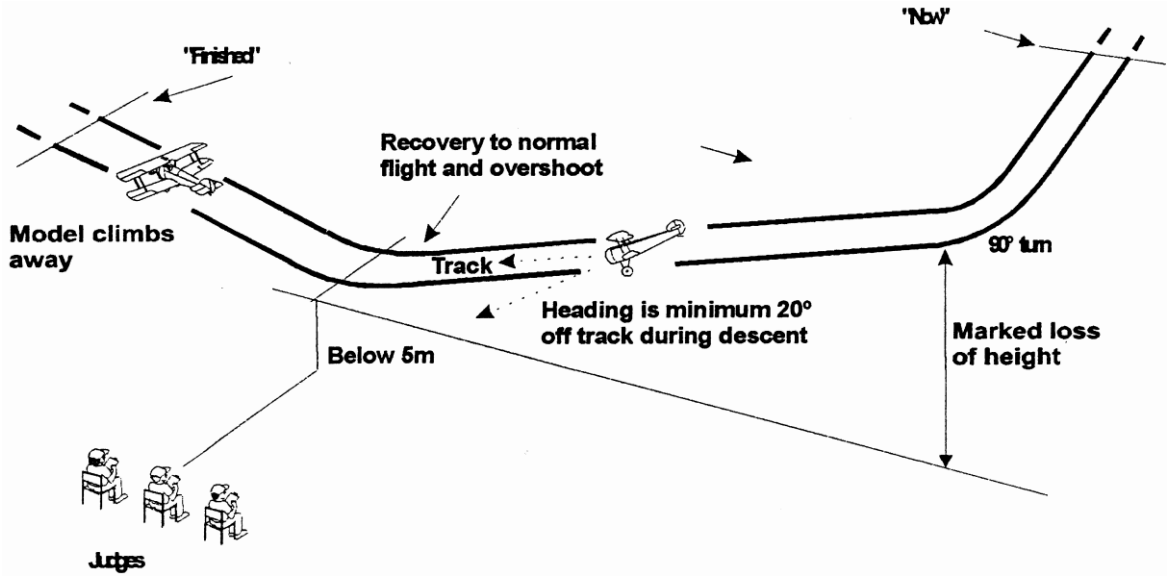


Errors:

1. Manoeuvre does not commence on base leg.
2. Turn onto final approach not smooth and continuous or not 90°.
3. Model does not achieve correct high landing approach.
4. Model does not achieve correct landing speed or attitude.
5. Not continually descending until power applied.
6. Model descends to significantly above or below 3 meters.
7. Lowest point of manoeuvre not achieved in front of judges.
8. Not smooth transition of speed & attitude from approach, through descent check to climb-out.
9. Inappropriate use of flap and/or gear.
10. Model could have landed from approach.
11. Model does not climb away smoothly.
12. Approach and climb out tracks not the same.
13. Too close or too far away.

R. Side Slip:

The model commences the manoeuvre in level flight by reducing power on base leg, and then turns onto a higher than normal final approach that is parallel with the judges' line. As the model enters the turn it starts a Sideslip by the application of opposite rudder to the direction of turn, achieving a yaw of at least 20° off track. A marked loss of height must be apparent whilst maintaining final approach speed. The aim of the Sideslip, if continued, would be to effect a landing in front of the judges. Before reaching the judges' position however, the Sideslip is corrected, normal flight is resumed and the model carries out an overshoot from below 5 meters before climbing away. The purpose of this manoeuvre is to demonstrate a marked loss of height on final approach without an excessive build up of speed or the use of flap. This manoeuvre may be nominated by all types of models.



Errors:

1. Model does not smoothly enter Sideslip upon turning final approach.
2. Model is not yawed at least 20° off track during Sideslip.
3. Rate of Sideslip and descent are not constant.
4. There is insufficient height loss.
5. Excessive speed is built up during descent.
6. Approach track not maintained or not flown parallel with judges' line.
7. The Sideslip is not corrected before passing the judges.
8. Overshoot is not below 5 meters.
9. Not a smooth transition during return to normal flight and climb-out.
10. Too far away / too close / too high / too low.

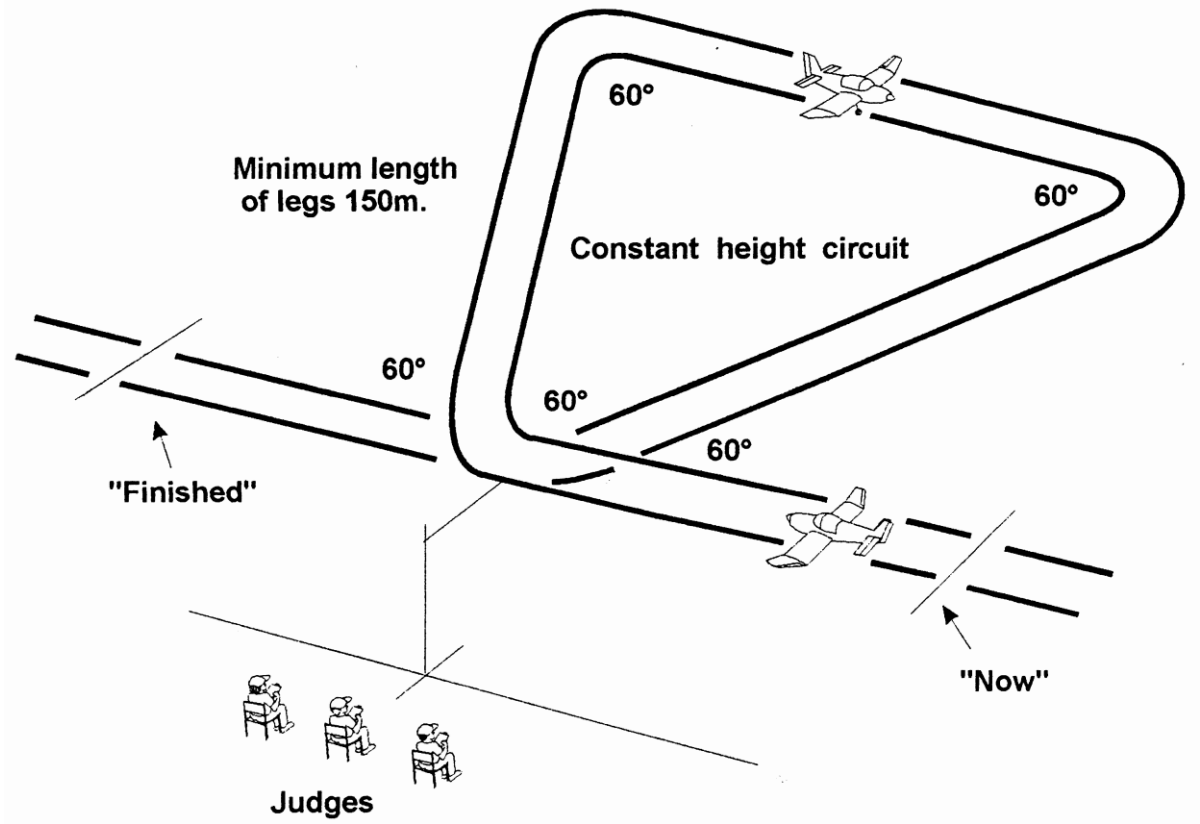
S and T. Flight Function(s) Performed by Prototype Aircraft:

A competitor may demonstrate up to two different flight functions of his own choice but must indicate to the flight judges the nature of the demonstration(s) before going to the flight line. The competitor must be prepared to supply evidence that the subject type aircraft performed this function e.g. crop spraying, outside loop etc.

Procedural flying manoeuvres such as climbing turn, descending turn, etc. are not acceptable. Mechanical options which could be performed on the ground equally well (e.g. switching on and off lights), are also not allowed.

U. Flight in Triangular Circuit:

The model approaches in a straight and level flight to a point directly in front of the judges. It then turns to track 60° away from the judges' line. It then flies straight and level for a minimum of 150 meters, turns to track parallel with the judges' line, flies a further minimum of 150 meters, then turns to track towards the judges and flies a further minimum of 150 meters to a position above the center of the landing area, which completes an equilateral triangle (i.e. a triangle with sides of equal length and angles of 60°), before making a final turn to intercept the original entry track. This option may only be nominated for non-aerobatic aircraft.

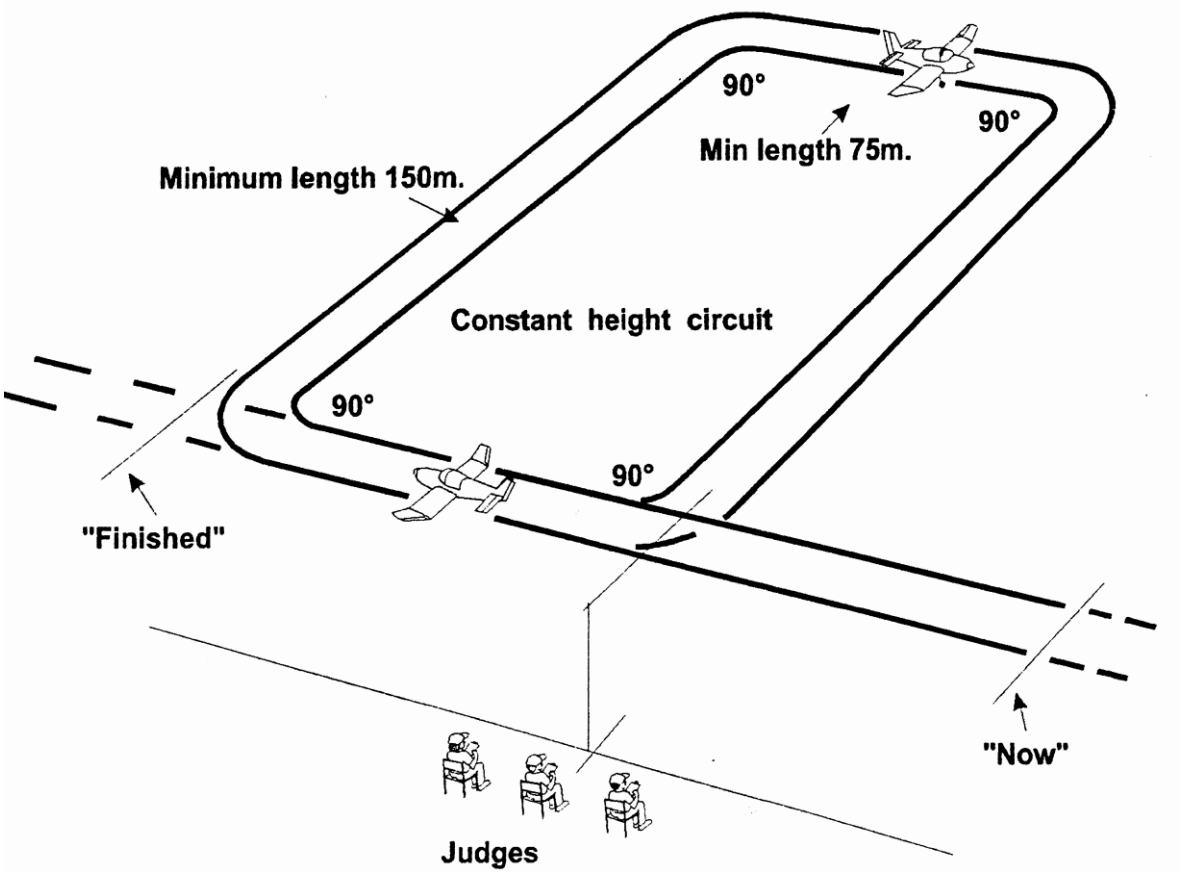


Errors:

1. Not commenced and finished at points equidistant from the judges.
2. Model changes height.
3. Rate of turn at corners not constant or inside corners of triangle not 60°.
4. Sides of the triangle are not straight.
5. Sides of triangle are not equal lengths.
6. Sides of the triangle are too long or too short.
7. Apex of triangle not centered on judges' position.
8. Correction for drift not properly made.
9. Start and finish tracks not the same.
10. Start and finish tracks not parallel with judges' line.
11. Too far away / too close / too high / too low.

V. Flight in Rectangular Circuit:

The model approaches in straight level flight to a point directly in front of the judges. It then continues for a minimum of 75 meters before it turns away to track 90° from the judges' line and flies straight and level for a minimum of 150 meters before turning to track parallel with the judges' line for a further minimum of 75 meters. It then turns to track directly towards the judges for a minimum of 150 meters, to a point in front of the judges, before completing a final turn to intercept the original entry track. This manoeuvre describes a rectangle over the ground. This option may only be nominated for non-aerobatic aircraft.

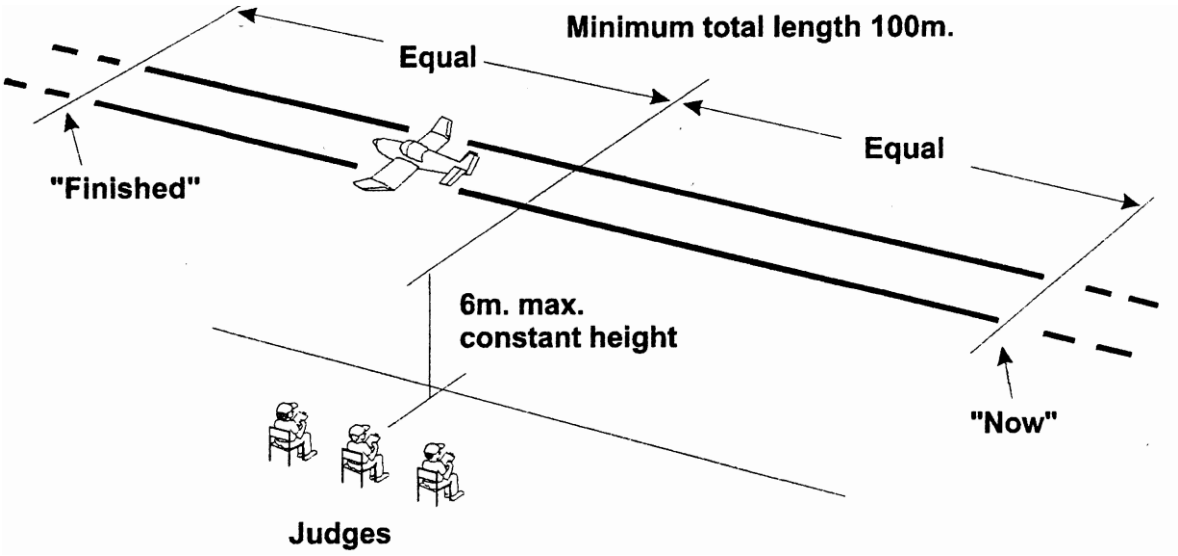


Errors:

1. Not commenced and finished at points equidistant from the judges.
2. Model changes height.
3. Rate of turn at corners not constant or corners not 90°.
4. Legs are not straight.
5. Legs too long or too short.
6. Opposite sides of rectangle are not of equal length
7. Correction for drift not properly made.
8. Final leg of rectangle not centered on judges' position.
9. Start and finish tracks not the same.
10. Start and finish tracks not parallel with judges' line.
11. Too far away / too close / too high / too low.

W. Flight in a Straight Line at Constant Height:

Model approaches in straight flight at a constant height not exceeding 6 meters for a minimum distance of 100 meters, then climbs away. This is in effect a low fly past and may only be nominated for non-aerobatic prototypes.

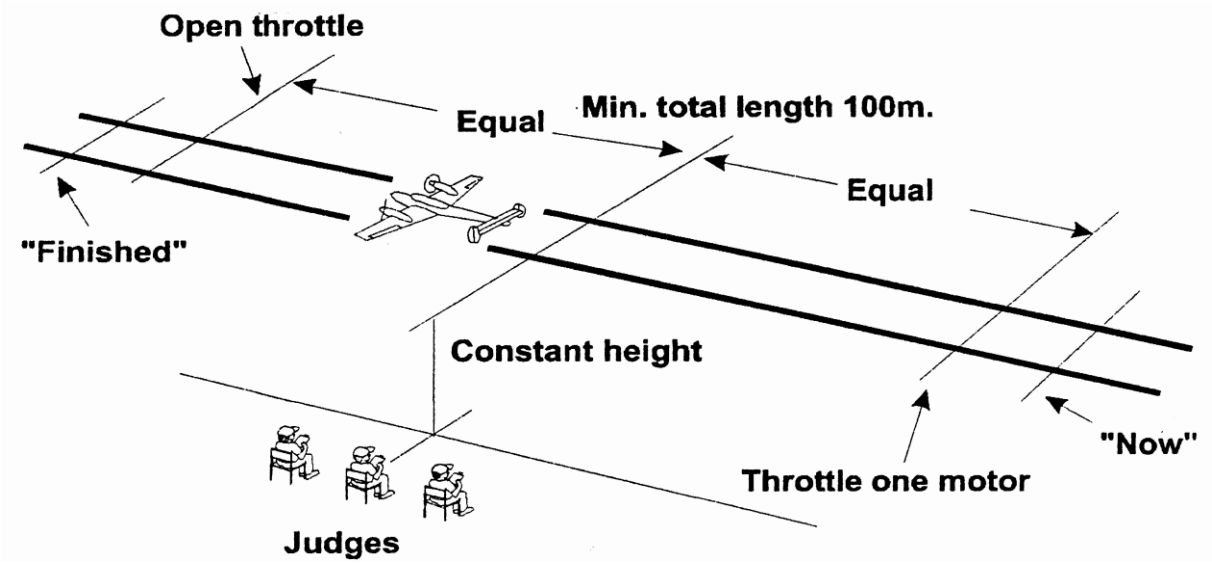


Errors:

1. Not a straight course (slight corrections acceptable with light aircraft).
2. Not constant height.
3. Not 6 meters or below.
4. Not pass over the landing area.
5. Not centered on judges' position.
6. Not parallel with the judges' line.
7. Too short distance (too long is not an error).
8. Model flight path not steady.
9. Too far away I too close I too high / too low.

X. Flight in a Straight Line With One Motor Throttled (*Only Multi Engined Aircraft*):

Model approaches in straight flight at a constant height with one motor throttled, for a minimum of 100 meters, after which the motor is opened up and the model resumes normal flight. (This option is only for multi-engined subjects.)



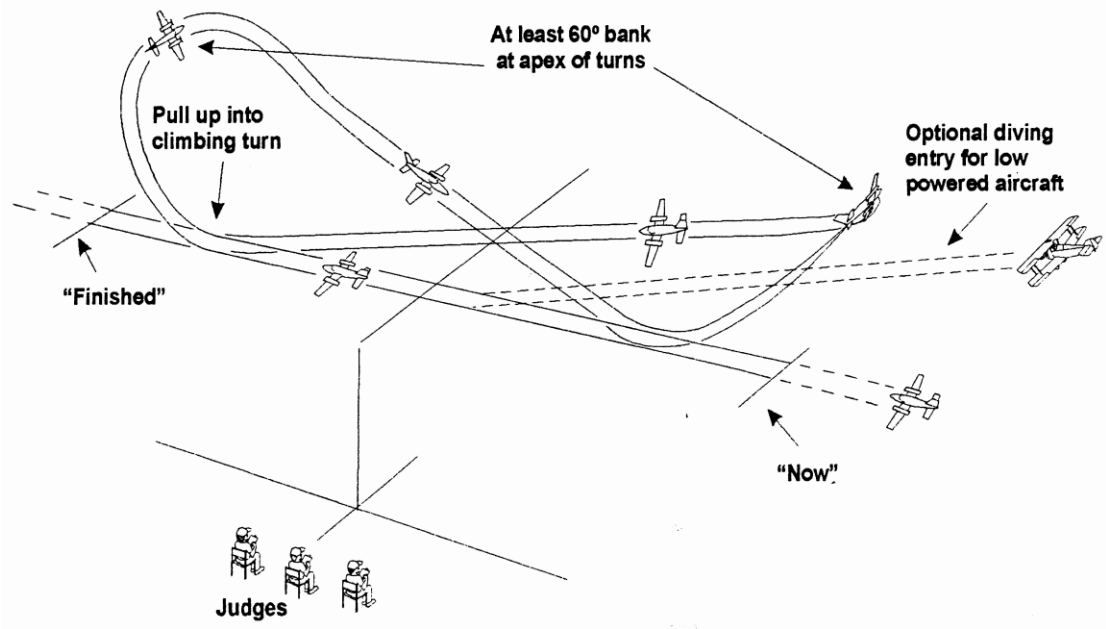
Errors:

1. Flight not straight.
2. Model is unstable.
3. Undue loss of height.
4. Engine not opened up after demo.
5. Engine not throttled back sufficiently.
6. Insufficient duration.
7. Not centered in front of judges' position.
8. Not flown parallel with the judges' line
9. Too far away / too close / too high / too low.

Y. Lazy Eight:

The model approaches in straight and level flight on a line parallel with the Judges' line. After passing the judges' position a smooth climbing turn is commenced away from the judges. At the apex of the turn the bank should be at least 60°. The nose of the model then lowers and the bank comes off at the same rate as it went on. The turn is continued beyond 180° to cross in front of the judges with wings level before intercepting and turning on to the reciprocal of the original approach track. This completes half of the figure, which is then repeated in the opposite sense to give the full manoeuvre, Intercepting the original approach track parallel with the judge's line completes the Lazy Eight. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre. The figure should be symmetrical each side of the judges' position.

This manoeuvre is essentially two Wingovers in opposite directions, and should be capable of being flown by most aircraft.



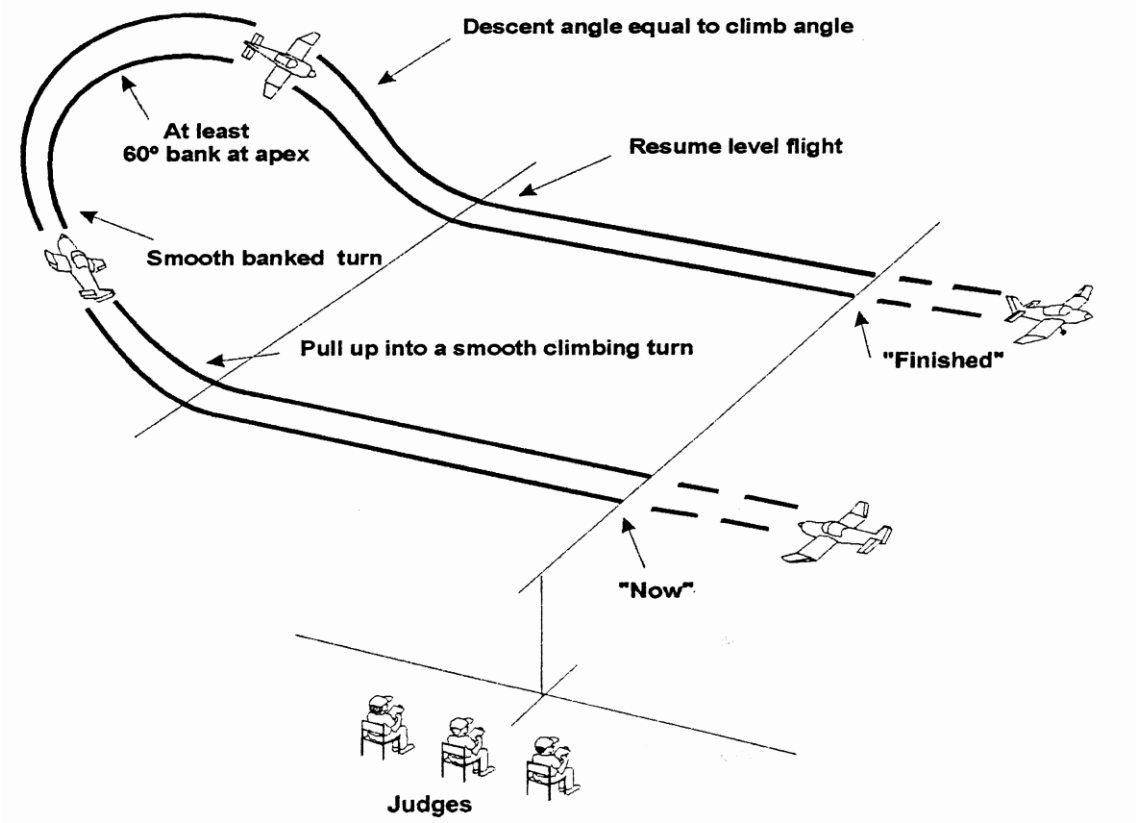
Errors:

1. Entry and exit paths not parallel with judges' line.
2. Insufficient climb achieved.
3. Insufficient bank achieved.
4. Climb and descent angles not equal throughout manoeuvre.
5. Manoeuvre not symmetrical about judges' position.
6. Arcs misshapen.
7. Start and finish positions not as indicated.
8. Overall size of manoeuvre not realistic for prototype.
9. Model flight path not smooth and steady.
10. Too far away / too close / too high / too low.

Z. Wingover:

The model aircraft approaches in straight and level flight on a line parallel with the Judges' line. After passing the judges' position a smooth climbing turn is commenced away from the judges. At the apex of the turn, the model should track 90° to the entry track and the bank angle should be appropriate to the capability of the prototype, but usually no more than 60º for a non-aerobatic aircraft and at least 60° for an aerobatic aircraft. The height gain should be appropriate to the capability of the prototype. The model then continues on a mirror image of the entry flight path and recovers to straight and level flight at the same height but on the opposite heading to the entry and on a line displaced away from the judges.

A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

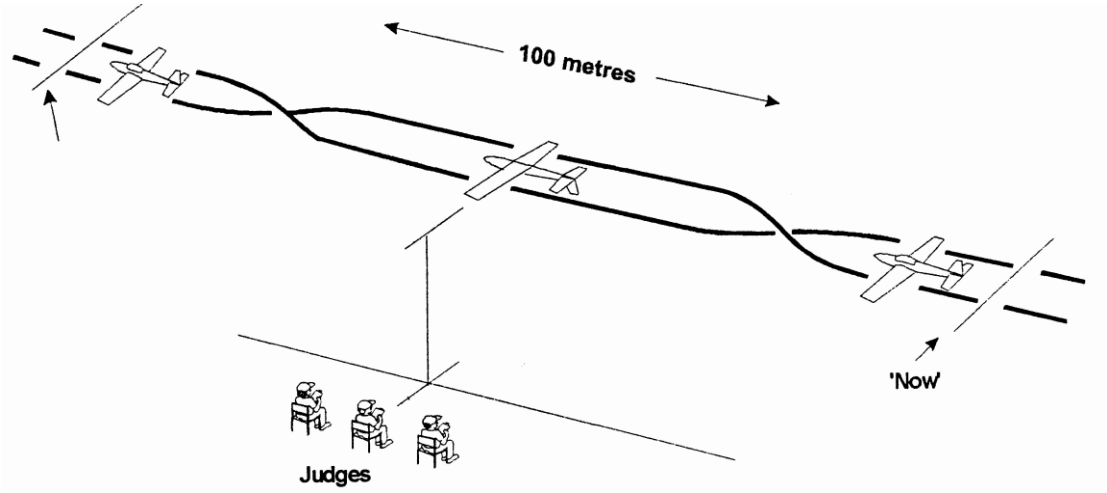


Errors:

1. Start and finish positions not as indicated.
2. Insufficient climb achieved.
3. Insufficient bank achieved
4. Climb and descent angles not equal throughout manoeuvre.
5. Model does not fly a smooth and symmetrical arc.
6. Entry and exit paths not parallel with judges' line.
7. Overall size of manoeuvre not realistic for prototype.
8. Model flight path not smooth and steady.
9. Too far away / too close / too high / too low.

AA. Inverted Flight:

Model half rolls into inverted attitude and makes a straight inverted flight of 100 meters in length, and then half rolls out of inverted attitude and resumes normal straight flight. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

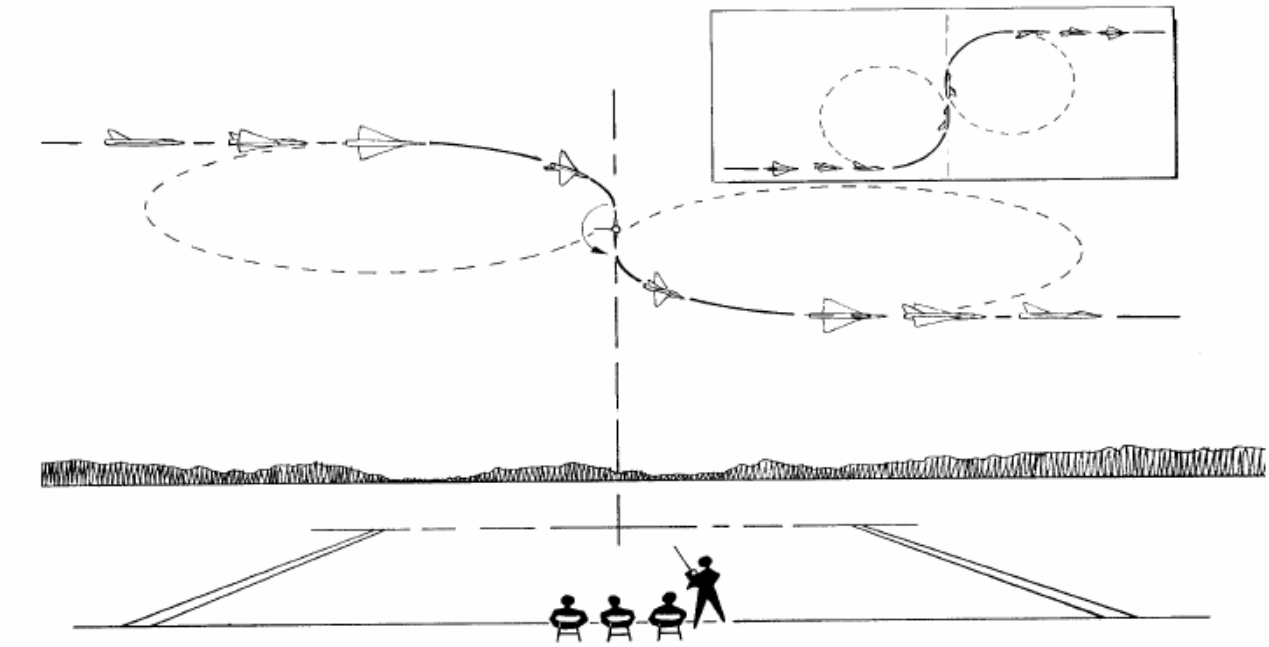


Errors:

1. Half rolls not performed on same track as inverted flight.
2. Model does not fly a straight course.
3. Model gains or loses height.
4. Model does not remain inverted for the prescribed duration.
5. Manoeuvre not centered on judges' position.
6. Manoeuvre not flown parallel with judges' line.
7. Too far away / too close / too high / too low.

AB. Derry Turn:

The model approaches at a high speed in straight and level flight on a line parallel with the judges line. The model then makes a steep (in excess of 60° bank) one quarter circle turn in a direction away from the judges, without losing height. When centerd in front of the judges the model makes a half roll in the same rolling direction as the entry, again directly followed by a steep one quarter circle turn in the opposite direction, and then flies off straight and level on a line parallel with that of the entry to the manoeuvre. The manoeuvre should be smooth and continuous.



Errors:

1) Entry not in parallel with the judges line.

2) The manoeuvre not centerd in front of the judges.

3) The rolling manoeuvre in front of the judges not axial .

4) The roll in center not in the same direction as the entry to the manoeuvre.

5) The roll not carried out on a line directly away from the judges.

6) Any hesitation between the end of the first quarter turn, the roll and/or the start of the second turn.

7) Exit not parallel with entry.

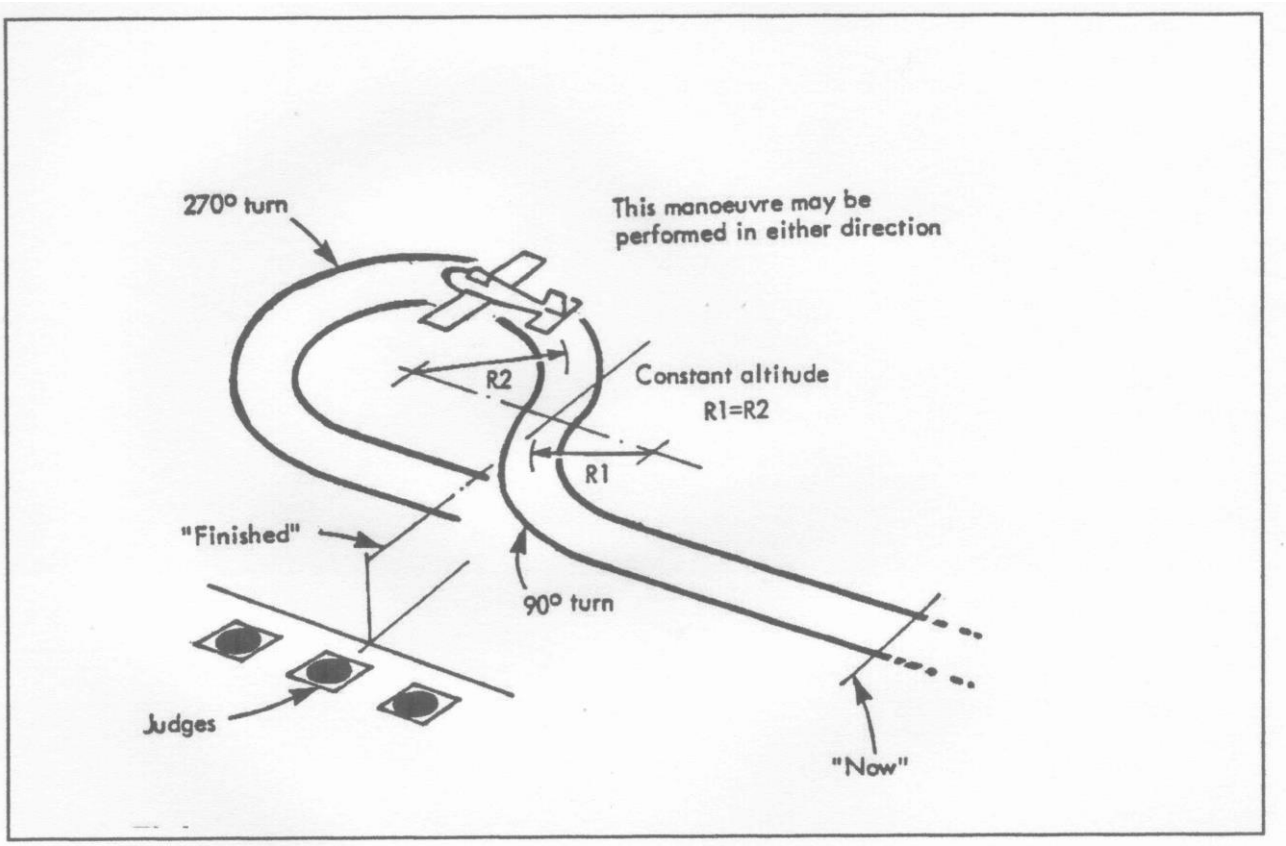
8) Significant height difference during the manoeuvre.

9) The manoeuvre misshapen as seen as part of a figure eight.

10) The manoeuvre is executed too low or too high to be easily judged.

AC. Procedure Turn:

Commencing from straight and level flight the model aircraft turns away through 90 degrees in a direction away from the judges and then turns through 270 degrees in the opposite direction resuming straight and level flight in the opposite heading to that of entry. The manoeuvre must be positioned in such a manner that the point where the model changes from the 90 degree turn to the 270 degree turn is on a line perpendicular to the judges line in front of the judges.



Errors:

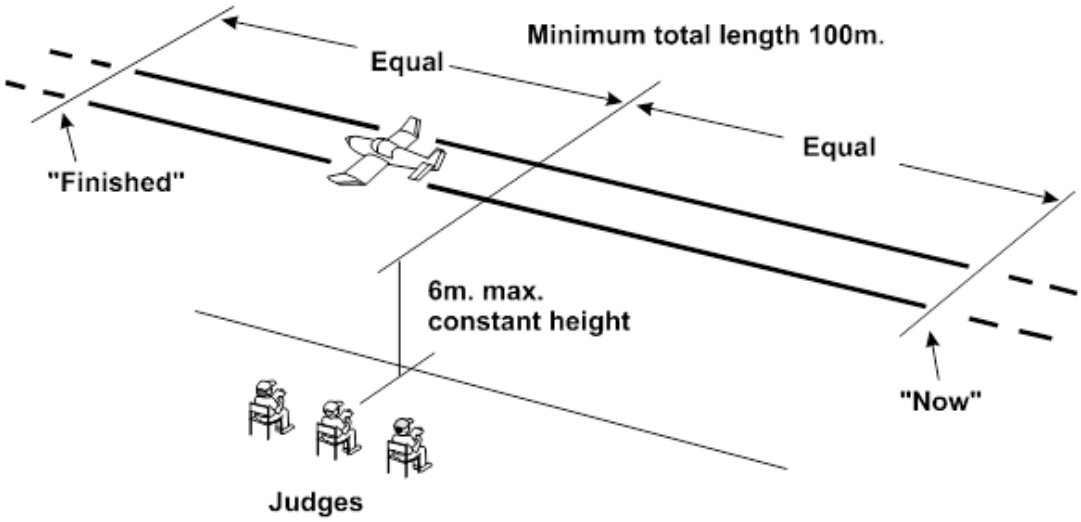
1. Rate of turn not constant.
2. Changes of altitude during the manoeuvre.
3. Incorrect exit heading
4. Change from 90 degree turn to 270 degree turn incorrectly positioned.
5. Manoeuvre too small or too large in relation to the scale of the model.
6. Manoeuvre too close or too far away to be observed properly.
7. Monoeuvre too high or too low to be observed properly.

AD. Straight Flight at Low Speed :

The model flies in a straight line, and parallel with the judges line, over the landing area for a minimum distance of 100 meters and centered on the judges position. The height must be constant and not exceed 6 meters and the model must fly at a speed which would represent the minimum safe flying speed for the prototype.

Prototypes fitted with retractable undercarriage must have the U/C extended.

If the prototype is fitted with any L/E or T/E flaps, slats, speed brakes, spoilers or other high drag/low speed/high lift devices then these must be deployed, unless the competitor can provide evidence that such devices were disabled or not routinely used.



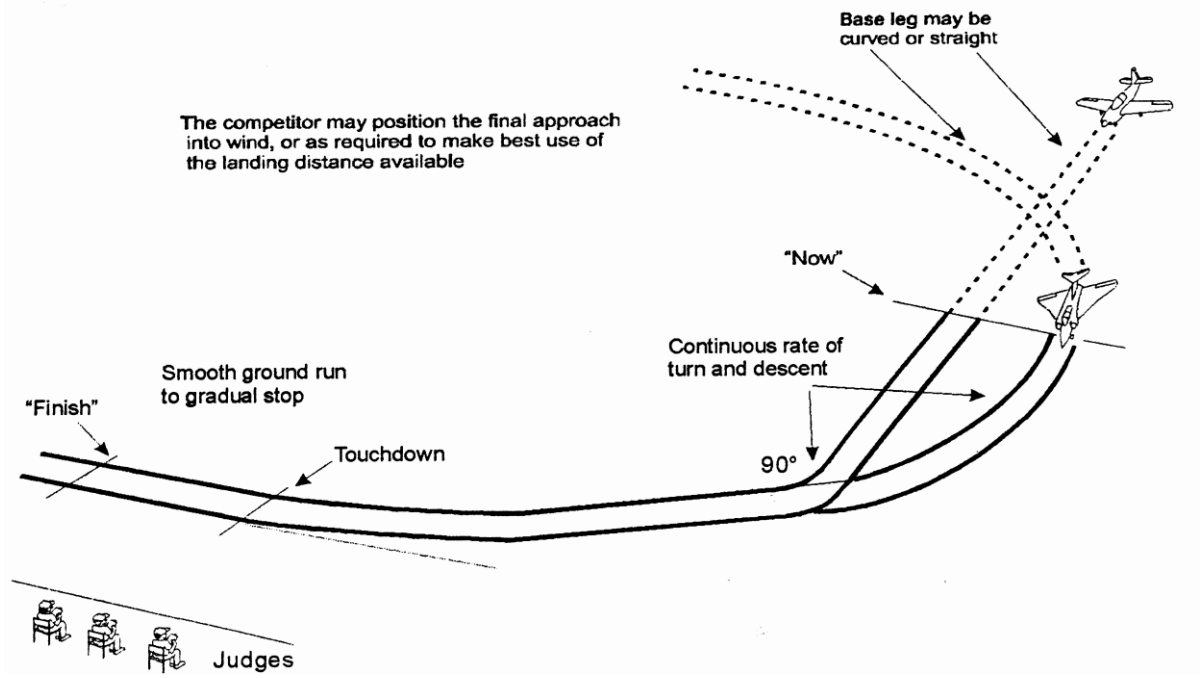
Errors:

1. Not a constant heading
2. Not a constant height.
3. Above 6 meters.
4. Model does not pass over the landing area.
6. Manoeuvre not centerd on judges' position.
7. Not parallel with the judges' line.
8. Too short distance (too long is not an error).
9. Failure to extend the undercarriage and/or deploy high drag/low speed/high lift devices.
10. Model flying too fast.

6C.3.6.10 Approach and Landing:

The manoeuvre commences by descending from base leg (in the same way as the Touch and Go). Prior to this point the model may complete any form of appropriate circuit to achieve a landing configuration. This may be a full rectangular or oval pattern, or a join directly onto the downwind or base legs. The Approach and Landing may be orientated into wind, or as required by the competitor to make best use of the landing distance available (e.g. jet subjects).

The base leg may be either straight or curved as required by the pilot. From the start position the model completes the turn through 90° onto final approach. The model should round out smoothly, adopting the attitude applicable to the specific type and touch down without bouncing before smoothly rolling to a stop. An aircraft with conventional landing gear will make a three-point landing or will land on the main wheels and then gently lower the tail, as appropriate to the prototype, the prevailing wind conditions, or the surface of the landing area. An aircraft with tricycle landing gear will land on the main wheels first and then gently lower the nose wheel.



Errors:

1. Manoeuvre does not commence on base leg.
2. Turn onto final approach not constant rate or not 90°.
3. Descent from base leg not smooth and continuous.
4. Model does not achieve correct landing approach prior to touchdown.
5. Model does not round out smoothly.
6. Model bounces.
7. Drops a wing during landing.
8. Touches wing tip on ground.
9. Does not come to a gradual and smooth stop after landing.
10. Does not adopt landing attitude appropriate to subject type.

11. Model runs erratically or turns after landing.

12. Model noses over (note 30% penalty if only nose-down - zero if it over-turns).

NOTE: A crash landing scores zero points, but if the model makes a good landing and then stops nose down towards the end of the landing run, then the landing marks that would have been otherwise awarded should be reduced by 2 points.

If the nose down situation is solely the result of the model running off the prepared area, because this is too short for the particular wind direction, the above down marking will not apply.

Models with retractable landing gears, landing with one or more gears retracted should have the landing points reduced by 30%.

All landings ending with the model on its back will be considered a crash landing.

6C.3.6.11.Realism in Flight

Realism in Flight covers the entire flight performance including the way in which the model aircraft flies between manoeuvres.

Judges will allot points for Realism within the following aspects, always keeping in mind the likely characteristics of the full size subject:

Flight Presentation: ..... K = 4

Most aircraft are somewhat aerobatic, while some are totally non-aerobatic and others are purpose designed for aerobatics. It is up to the competitor to select manoeuvres that would typically be flown by the prototype in an air show style performance. Any documentation to verify the selection of manoeuvres shall be attached to the Competitors Declaration form, of which a copy will be made available to the Chief Flight Judge by the organizers after Registration of Teams has been completed.

Aspects of the flight to be considered are:

1. The variety and combination of manoeuvres, including the turn-around manoeuvres in the presentation in order to give a flowing display.

2. Ideally, the turn-around manoeuvres should result in the model aircraft being properly positioned at the right altitude and track for the next manoeuvre in the sequence in order to minimise ‘dead’ fly pasts to get the model to the other side of the flight line.

3. The inclusion of more complicated and/or risky manoeuvres such as full Cuban Eights, Slow Rolls, Point Rolls, Snap Rolls, Overhead Triangles and Rectangles and Touch and Goes should be rewarded more, compared with sequences consisting of simple single element manoeuvres.

4. Power Management by the pilot. The management of the power settings of the model during the various flight phases is of importance as well as the transition between settings. The sound of the power plant is to be judged more as a generic sound relating to the type of power plant and aircraft, rather than whether it is representing a specific power plant.

Speed of the model aircraft ..... K = 9

This should be a subjective assessment of the scale speed of the model aircraft, based on the speed of the full size aircraft (as indicated on the score sheet and documentation) judged as if it were performing a public flying display. Model aircraft invariably fly faster than scale speed and marks should be deducted accordingly. For example, a model aircraft that appears to be flying at twice scale speed should score no more than half marks, a model aircraft flying at three times scale speed, or faster, should score zero.

Smoothness of flight ..... K = 9

The model aircraft should be well trimmed and show no signs of instability. Judges should assess the smoothness of control taking into account the prevailing weather conditions. They should also judge the attitude of the model aircraft in flight, i.e. any nose-up or nose-down tendency.

Realism in flight aspects shall be discussed by all flight judges after completion of the flight in consultation with any claim for non-aerobatic eligibility made on the Competitor's Declaration form (Annex 6C.1). The judges should attempt to arrive at an agreed score for this item.

Some original prototypes would have little or no aerobatic capability. These are aircraft designed with limited manoeuvrability where the original prototypes of which were restricted by the manufacturer or licensing government agency. Examples are touring aircraft, passenger and cargo aircraft and heavy military transports and bombers. The optional manoeuvres are included under 6.3.7. to cater for such subjects. These aircraft should still be considered for high marks in this section if the performance of the original prototype genuinely limits them to such manoeuvres. Conversely, if aircraft with greater manoeuvrability and performance choose these options when the original prototype would be capable of much more, then low marks should be awarded in this section.

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F4H International Scale
Static Score Sheet 2019-

Judge Initials:	Chief Judge Signature:

STATIC JUDGING QUALIFICATION	CLAIMED	AWARDED
3-view (minimum span 250mm Max span 500mm)		
Colour Documentation		
Five photos maximum		
Competitors Declaration Form		

PROTOTYPE NAME AND DESIGNATION:	CONTESTANT NUMBER:
	CONTESTANT(S) NAME(S):

STATIC SCORE (0-10 Decimals permitted)

No	ITEM	ASPECT	POINT	K	SCORE
1	SCALE ACCURACY:	Side view(s)		14	
2		End view(s)		14	
3		Plan view(s)		14	
4	COLOUR ACCURACY:			8	
5	COLOUR COMPLEXITY			4	
6	MARKINGS ACCURACY			14	
7	MARKINGS COMPLEXITY			6	
8	REALISM			14	
9	ORIGINALITY OF MODEL			12	
			TOTAL		

MAIN REASONS FOR LOSS OF POINTS: (Optional)

F4C International Scale

Static Score Sheet 2017-

STATIC JUDGING QUALIFICATION	CLAIMED	AWARDED
3-view (minimum span 250mm; maximum span 500mm)		
Colour Documentation		
Three photos minimum		
Proof of Cruising- or Maximum Speed		
Competitors Declaration Form		

PROTOTYPE NAME AND DESIGNATION:	CONTESTANT NUMBER:
	CONTESTANT NAME:

STATIC SCORE (0-10 Decimals permitted)

No	ITEM	ASPECT	POINT	K	SCORE
1	SCALE ACCURACY:	Side view(s)		13	
		End view(s)		13	
		Plan view(s)		13	
2	COLOUR:	Accuracy		3	
		Complexity		2	
3	MARKINGS:	Accuracy		8	
		Complexity		3	
4	SURFACE TEXTURE & SCALE REALISM	Surface Texture		7	
		Scale Realism		7	
5	CRAFTMANSHIP:	Quality		12	
		Complexity		5	
6	SCALE DETAIL	Accuracy		9	
		Complexity		5	
JUDGES INITIALS:			TOTAL		

MAIN REASONS FOR LOSS OF POINTS:

FLIGHT SCORE SHEET

F4C / F4H/ Sport Scale 2019-

Competitor number:		Round:		
Judge Number:		Competitor Name:		
Judge Signature:		Subject Aircraft:		
		Aircraft type: (X)	Aerobatic	Non-aerobatic
		Cruising / Maximum Speed		
		Scale of Model:		

No.	MANOEUVRES		POINTS	K-factor	SCORE
1	Take-off			11	
2	Option 1:			7	
3	Option 2:			7	
4	Option 3:			7	
5	Option 4:			7	
6	Option 5:			7	
7	Option 6:			7	
8	Option 7:			7	
9	Option 8:			7	
10	Approach and Landing			11	
		Flight Presentation		4	
		Speed of the model		9	
		Smoothness of flight		9	
			TOTAL		

Model qualifies for **5%** or **10%** colour and marking bonus (SPORT SCALE ONLY) **Judges Please circle the applicable %**	YES	NO

CHAMPIONSHIP LOGO and FAI emblem

COMPETITORS DECLARATION FORM (ANNEX 6E.1)

This form must be completed and signed by the competitor and endorsed by the competitor's NAC. Competitors are to indicate answers YES or NO by circling the appropriate boxes

Competitor's Name	National identification.	Model name & type	Class- F4C or F4G

If your flight schedule is to include Optional Demonstrations 6.3.7. S and T - Flight function by subject aircraft - provide full details of your manoeuvre(s) here or on a separate sheet.

AIRCRAFT CRUISING- OR MAXIMUM SPEED - Attach Proof on a Separate Sheet

STATIC JUDGING QUESTIONNAIRE		
Was the structure of this model researched and designed entirely by you?	YES	NO
Was this model built using a commercially available design or plan? If YES state the name of the person who has drawn the plan.	YES	NO
Was this model built from a kit? If YES, state kit manufacturer's name:	YES	NO

Indicate if any of the following items are supplied as part of a kit or not made by you. List any additional items (other than R/C equipment) in the empty spaces or on a separate sheet. (Refer to Rule 6.1.13)

Moulded or built up fuselage	YES	NO
Pre-formed or built up wing panels	YES	NO
Pre-formed or built up tail surfaces	YES	NO
Moulded canopy	YES	NO
Moulded or spun engine cowlings	YES	NO
Undercarriage assembly	YES	NO
Wheels	YES	NO
Tyres	YES	NO
Guns, bombs or other fittings	YES	NO
Spinners	YES	NO
Scale propellers	YES	NO
Instrument panel or cockpit interior	YES	NO
Printed or pre-cut markings or decals	YES	NO
Wire rigging or fittings	YES	NO
	YES	NO
	YES	NO

COMPETITOR'S CERTIFICATION

I certify that I am the builder of the model and that the answers given above are correct.

Name ……..(block letters) Signature……

ENDORSEMENT BY THE COMPETITOR'S NATIONAL AIRSPORTS CONTROL

I certify that the Competitors Certification is valid and the answers given above have been verified.

Name …… (block letters) Signature……

Position Held /Authority ……