



**BRITISH MODEL FLYING ASSOCIATION
CONTEST RULES**

SECTION 6

SCALE

**FREE FLIGHT - CONTROL LINE
RADIO CONTROL – INDOOR - HELICOPTERS**

To be read in conjunction with the General Rules, Sections 1 and 2
which are available free of charge from the BMFA

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SECTION 6

SCALE RULE BOOK 2013

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IMPORTANT NOTES CONCERNING THIS ISSUE

Rule Changes are marked with a side bar. Typographical, grammatical and syntactical corrections are unmarked.

The major changes are summarised below:

6.1.1.1 - The use of the word 'prototype' to refer to the subject full size aircraft has been discontinued and replaced with "full size aircraft"; "subject aircraft"; or "subject full size aircraft" depending on context. N.B these changes are NOT marked with a sidebar.

6.1.1.2 - Addition of explanation regarding differences between BMFA and FAI rules.

6.1.1.13 - Exclusion of helicopters from noise checks.

6.1.1.17 - Addition of rules for substitution of scale helicopter rotor blades and the use of metal rotor blades.

6.1.1.20 – Revision of statement on 'gyros' to include helicopters.

6.1.1.21 – Statement on allowed telemetry.

6.1.2.2 - Clarification of the rule defining the minimum size of photographs used for proof of outline.

6.2.1.2 - C/L Scale – addition of the use of 2.4GHz radio for secondary control.

6.2.1.3 - Transfer of some C/L flight rules from the Judges Guide.

6.3.1.2/6.3.1.2.1 – Insertion of paragraph defining the CD's responsibility and added emphasis regarding the Judges line.

6.3.1.10 – Additional safety rules

6.3.3.3 – Indoor R/C Scale – Addition of rule for pilot position.

6.3.4 - Full integration of the Rules for Scale R/C Helicopters, including a major review of the rules and removal of the judges guide.

6.3.5 - Revision of section to include Helicopter variations and Helicopter specific manoeuvres.

6.3.5.4.13 - Change to the 'Sideslip' to allow sideslip to port or starboard.

6.4.8.1 – Kit Scale - moving the rear motor peg for rubber powered models.

GENDER

Words of masculine gender should be taken as including the feminine gender unless the context indicates otherwise.

WORD DEFINITIONS

The use of "shall", "must", "is" and "are to" indicates that the aspect concerned is mandatory.

The use of "should" implies a non-mandatory recommendation.

The use of "may" implies what is permitted or what might happen and is non-mandatory.

The use of "will" indicates a future happening which may not be mandatory.

FORMS AND DOWNLOADS

The Competitors Declaration forms, score sheets and Judges Guides can be downloaded from the Scale Website - www.scalebmfa.co.uk or are available in hard copy on request from the Scale Tech Committee Secretary or the relevant Contest Director.

6.1 GENERAL

6.1.1 GENERAL SCALE RULES

These rules apply to all scale classes unless stated otherwise in the class rules

6.1.1.1 Definition of Scale Models

A scale model aircraft shall be a reduced scale reproduction of a full size aircraft. The full size aircraft which has been modelled must have flown and models of pilotless aircraft or drones are not permitted.

N. B. Throughout these rules the word “subject” is used to refer to the specific full size aircraft that has been modelled.

The aim of scale contests is to accurately recreate the appearance and realism of the full-size aircraft both on the ground and in flight.

6.1.1.2 System of Rules

All rules in this rule book are Contest Rules as defined in the BMFA Contest Rule Books Part 2, General Section 2.3 - Class Rules.

Any infringement of these rules may result in disqualification from the competition.

Most BMFA Scale Class rules are similar to the FAI Class rules, but for various reasons differences do occur. These differences are closely monitored by the BMFA Scale Tech Committee to ensure that the rules reflect the special needs of UK competition. It must be remembered that whilst the STC can make changes to BMFA rules in a matter of months; it can often take up to three years to change FAI rules. Changes are sometimes made to FAI rules which the STC may decide are inappropriate for the UK. The STC may make changes to UK rules which are subsequently rejected or amended by the FAI. The STC may also decide to incorporate changes to the BMFA rules in advance of proposing a similar change to FAI rules. There are also many FAI rules, particularly for non-championship classes which are considered to be out of date, however Team Trials will always be run to the FAI rules that will be in force in the year of the international competition for which the selection is taking place.

6.1.1.3 Builder of the Model Rule

Scale models must be constructed and finished solely by the competitor, team entries are not permitted. The Competitor must also prepare the model for flight.

Commercially available components, machined parts, components manufactured using a computer aided process, die or laser cut parts and prefabricated airframe components 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. However details of these items must be entered on the Competitors Declaration and will be taken into account during static judging.

The only exceptions to this rule are for models entered in R/C Stand-Off and all Flying-Only competitions.

6.1.1.4 Number of Models, Qualification and Eligibility

Each competitor may compete with one model only in each class. Additional restrictions may apply to some classes; see qualification and/or eligibility rules where appropriate.

6.1.1.5 Name and Scale of Model

The exact name and variant or mark number of the subject aircraft shall be written on the entry form, score sheets, the Competitors Declaration and in the 'proof of scale' documentation. The scale to which the model is built is optional, but must also be stated on both static and flight score sheets.

6.1.1.6 Competitor's Declaration:

The Competitor must complete and sign a declaration that his model conforms to the current requirements and rules appropriate to the class of model. Because rules may be subject to change on an annual basis the declaration must be made on the current proforma. Declaration forms for C/L, R/C, Free Flight and Helicopter classes are available from the Scale Competition Secretary, the Contest Director or the forms can be downloaded from the Scale Technical Committee website at www.scalebmfa.co.uk.

Any components (with the exception of engines, electrical/electronic equipment and fixings e.g. nuts, bolts, screws etc.) not manufactured by the competitor must be listed on the appropriate Competitors Declaration. This includes components manufactured using a computer aided process.

For the C/L Scale, R/C Scale, R/C Stand-Off Scale, Scale Helicopters and Scale R/C Indoor classes, Competitors must also complete a questionnaire on the Declaration. This is used by the Static Judges to assess how much the competitor has contributed to the scale accuracy, which components to discount when judging craftsmanship and the origin of the model design and its construction (Stand-off classes).

6.1.1.7 Speed of the model

The maximum and cruising speeds of the subject aircraft must be stated 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.

6.1.1.8 Judges

The organiser shall appoint at least two flight judges (three for the Team Trial) and where appropriate at least two static judges (three for the Team Trial). All judges for Team Trials require prior approval from the STC.

Flight Judges should have a good general knowledge of the typical performance limitations of different categories of full size aeroplanes. Clearly judges cannot be expected to possess detailed knowledge of the performance and limitations of all aeroplanes likely to be modelled but judges should be aware of their generic differences.

Static Judges must discount any prior or special knowledge of the subject aircraft and the scale accuracy of the model must be assessed solely on the documentation submitted by the competitor.

As soon as practicable after each flight or static judging (as applicable) the judges' marks should be made available to the competitor. Competitors are not permitted to question their marks with judges or officials, unless submitting a formal protest.

After the results have been announced and subject to the agreement of the judge or judges in question, competitors are free to discuss any aspect of their model and their flight performance.

6.1.1.9 Protests and Appeals

Any competitor wishing to make a formal protest is advised to first discuss the matter at the event with the Contest Director.

If not satisfied with the CD's decision the competitor must, at the event, hand him the protest in writing, together with a fee of double the standard contest entry fee. The CD will then immediately empanel a jury of three persons to deal with the protest.

The jury's decision is final, subject to the right of the competitor to appeal to the BMFA Council.

Notification that an appeal is pending must be sent by the competitor to the BMFA Competition Secretary at BMFA HQ, to arrive not later than two weeks from the date of the event.

The appeal itself, together with any supporting evidence, must be sent to the BMFA Competition Secretary to arrive not later than two months from the date of the event.

If the written protest or the appeal is upheld, the protest fee will be returned.

6.1.1.10 Scoring System

The order of merit for scale competitions is decided on a final score which is normally made up from flying and static elements in equal proportions. This is achieved by ensuring that the number of Flight judges is equal to the number of Static Judges, but in the event that this is not possible the CD is responsible to ensure that the scores are suitable factored.

Exceptions to this rule are detailed in the appropriate class rules and certain events identified as 'flying only' do not have a static element in the final score.

The scoring system used at the Team Trial will be dependent upon the FAI rules currently in force. (Annex 6a refers)

All scoring is to be on the prescribed score sheets which are available from the Scale Technical Committee Secretary, or the Contest Director. Score sheets can also be downloaded from the Scale Technical Committee website at www.scalebmfa.co.uk

Static and Flight judges shall award **marks** from 0 to 10 inclusive for each item or manoeuvre using increments of 0.1 of a mark

Where a coefficient (K-factor) is noted, the **score** for each item is then calculated by multiplying the marks awarded by the K-factor.

Static Score

The static score shall be the sum of the scores awarded by all judges.

The Static Score can only be used in the calculation for the final competition result when the model aircraft has completed an official flight.

Flight Score

The flight score shall be the sum of the scores awarded by all the Flight Judges.

The scores in an official round can only be used in the final competition result if all competitors had an equal opportunity for a flight in that round.

Final Scoring/Competition Results

Unless otherwise stated in the class rules, the final score shall be the sum of the static score and the average of the two best flight scores.

If only one round is flown, the single flight score will count .

6.1.1.11 Flying Only Events

Selected events may be designated Flying Only competitions. No static judging will take place, the result being settled entirely on the flying score of the model.

Models used must be clearly recognisable as bona fide scale models of full size aircraft. The Contest Director may disallow any entries that he considers not to fit this specification.

The requirement for the entrant to have constructed his own model (6.1.1.3) is waived for such Flying Only contests.

Entry to R/ C Scale Flying Only at the UK Nationals will be subject to qualification based upon the competitor's score achieved during the last one or two years of competition.

6.1.1.12 Interruption of the Competition

The competition may be interrupted or the start delayed by the Contest Director if:

- (a) The wind is continuously stronger than 9 m/s (20 mph) measured at two metres above the ground at the flight line for at least one minute, (20 seconds for Free Flight), unless specified otherwise in class rules.
- (b) The visibility prohibits proper observation of the models or due to atmospheric conditions it would be dangerous to continue the competition.
- (c) It is necessary to reposition the Judges line, the flight line or any spectator control measures.
- (d) The prevailing conditions are such that they may lead to unacceptable sporting results.

In the event of an interruption during a flight round, the remainder of the round may be completed as soon as conditions allow.

6.1.1.13 Noise

Where appropriate, I/C engines of all scale models must be effectively silenced. For C/L and R/C fixed wing classes the following noise limits shall apply to models powered by I/C piston engines.

Helicopters and turbine powered models are exempt from noise checks.

The decision to measure noise level at a contest rests with the Contest Director.

To measure the noise level the model aircraft must be placed on a concrete or macadam surface or if these surfaces are not available then the measurement may be taken over bare earth or very short grass.

The microphone will be placed on a stand 30 cm above the ground in line with the engine(s) or the rearmost engine if they are not in line. For single engine models, noise measurement will be taken at a point which is 3 meters from the centre line of the model on the side chosen by the competitor; or in the case of a multi-engine model 3 meters from the closest engine to the noise meter. There shall be no noise reflecting objects closer than 3 meters to the model aircraft or the microphone.

The model must be securely restrained and with the engine or engines running at full power, the maximum noise level over concrete or macadam must not be greater than 96 dB(A) or, if over bare earth or grass not greater than 94 dB(A). If the model aircraft features variable pitch propeller(s), the noise test must be carried out over the full range of propeller pitch with the engine at full power, or maximum rpm for the propulsion system if more limiting.

6.1.1.14 Helpers

Each competitor is permitted one helper during a flight. An additional helper may assist with engine starting and pre-flight preparation should the competitor require this. In the case of multi-engine models, one additional helper is permitted to assist in the starting of engines. All but one helper must retire clear of the flying area before the take-off commences.

For radio control events no helper may touch the transmitter except for assisting in starting engine(s). The timekeeper is responsible for watching that helpers do not touch the transmitter during flight. If this occurs the flight is scored zero.

6.1.1.15 Preparation for Flight

Between scale judging and flying, no parts of a model are to be removed, nor may anything other than a dummy pilot and an antenna be added externally to the model; propellers and droppable ordnance may be substituted (see below).

Additional air entries/exits are permitted provided they are covered by movable hatches for static judging; these hatches may be opened manually prior to flight, automatically in flight or by means of radio control.

Necessary repairs due to flight damage are permitted, but the maximum weight limit still applies and the appearance of the model in flight must not be unduly affected.

6.1.1.16 Dummy Pilot

If the pilot of the subject aircraft is visible from the front or from the side during flight, a dummy pilot of scale size and shape should

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 static judging but shall not be taken into account.

6.1.1.17 Propellers and Helicopter Rotor Blades

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

Note: This relates only to powered propellers that were intended to propel the subject aircraft. If a model of a multi-engine aircraft uses non-powered (windmilling) propellers, these must 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, must likewise not be changed for flying propellers.

For rubber powered aircraft the removable nose block with thrust bearing may be considered as part of the flying propeller. The flight nose block must be similar in appearance to the static nose block and should be presented with the model for static judging

Metal-bladed flying propellers are forbidden.

Helicopter rotors of a different diameter and with a different cross section may be substituted for scale rotors. If the number of blades is changed a penalty may be incurred.

The use of metal rotor blades is subject to a CAA dispensation as defined in the BMFA Members Handbook page 40 and amended by addendum issue 1 dated December 2011.

6.1.1.18 Droppable Stores or Ordnance

Stores that are to be released from the model in flight must be presented for static judging but may be replaced before flying by simpler examples of the same size and colour.

Explosives or incendiary devices must not be carried or released from the model.

6.1.1.19 Take-off aids

All models shall become airborne in the manner of the subject full size aircraft.

Models of seaplanes, in all classes, may use wheels or 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 scale devices in the model structures shall, in this case, be disregarded during static judging.

Free flight models may be hand launched, in which case the take-off shall score zero.

6.1.1.20 Electronic motion stabilising devices or Gyros

On fixed wing scale models, the use of all types of electronic motion stabilising devices is forbidden with the exception of fixed wing R/C Indoor models where a penalty is applied to the flight score.

Scale Helicopters are permitted to use devices which provide auto-stabilisation. Devices which provide altitude, heading or speed hold and GPS devices are not permitted.

N.B. The FAI Scale R/C classes no longer ban the use of these devices, therefore in order not to disadvantage our international team, the FAI rules will apply to the Scale R/C Team Trials.

6.1.1.21 R/C Telemetry

The transmission of information from the model aircraft to the competitor is restricted to Propulsion and Receiver system health monitoring. Any other data stream or telemetry is prohibited.

6.1.2 STATIC JUDGING RULES

These rules apply to all scale classes unless stated otherwise in the class rules

6.1.2.1 Proof of Scale

Proof of scale is the responsibility of the competitor.

The documentation provided should be as comprehensive as possible if a high static score is to be achieved. Any feature of the model which is not supported by documented evidence will not be marked.

6.1.2.2 Documentation

The following is the minimum requirement:

(a) Proof of Scale Accuracy (outline)

This must be in the form of photographs or printed reproductions and drawings.

(i) Photographic evidence:

At least three different photographs or printed reproductions of a full size aircraft which must be the same type and mark number as the actual subject aircraft being modelled. Each of these photographs or printed reproductions, which need not be originals, must show the complete aircraft, preferably from different aspects and with a minimum aeroplane image size of 150mm. At least one photograph or printed reproduction must show the actual subject aircraft modelled.

Photographs of the model are not permitted unless the model is posed alongside the subject aircraft and the photo used as proof of colour.

Additional photographs used as evidence of scale detail or markings may be of any size.

Photographs based on digital files may be resized or cropped, but the use of photographs which show evidence of being enhanced or manipulated shall result in disqualification.

(ii) Scale Drawings:

Accurate scale drawing(s) 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 wing span of 250 mm (150 mm minimum for Indoor and Free Flight classes), and a maximum wing span of 500 mm. If the fuselage is longer than the wingspan, these measurements will be made on the fuselage. 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 BMFA Scale Technical Committee, the builder of the original aircraft, or other competent authority.

(b) Proof of Colour:

Correct colour may be established from colour photographs, from published descriptions, from samples of original paint, or from published colour drawings. For the F4 classes written descriptions must be accompanied by colour chips certified by a competent authority.

(c) Proof of Markings

This may be in the form of colour photographs (which may be the same as those supplied for outline), or published colour illustrations from books or magazines. Black and white photos or illustrations are acceptable if accompanied by suitable colour

samples. Published descriptions are also acceptable when accompanied by examples of markings used on similar types. Evidence of all the markings including their position on the subject aircraft must be provided to avoid loss of marks.

6.1.2.3 Presentation of Documentation

Failure to provide the minimum proof of scale documentation will result in penalty marks as follows:

- (a) Fewer than 3 full photos of prototype:
 - ZERO points for Scale Accuracy (6.1.2.4.1)
 - Likely downmarking of Realism (6.1.2.4.4)
 - Likely downmarking of Craftsmanship (6.1.2.4.5)
 - Likely downmarking of Scale Detail (6.1.2.4.6)
- (b) Missing or unauthorised drawings:
 - ZERO points for Scale Accuracy (6.1.2.4.1)
- (c) No photo of subject aircraft:
 - ZERO points for markings (6.1.2.4.2)
 - Likely downmarking for Realism (6.1.2.4.4)
- (d) Incomplete colour documentation:
 - ZERO points for Colour (6.1.2.4.3)

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 and superfluous or contradictory evidence should be avoided.

The documentation should be presented on separate sheets to avoid the requirement for judges to continually turn pages for cross-references. Sheets or boards should not be smaller than A4 and not larger than A2. It will assist the judges if the documentation is presented in a format that reflects the sequence of the judging aspects, e.g. Side view, End view, Plan view, Markings, Colour, Surface Texture Scale details etc.

All documentation should relate to the subject aircraft whenever possible; variations from this must be clearly marked if not otherwise obvious.

6.1.2.4 Judging for Fidelity to Scale and Craftsmanship

Each of the following will be awarded a mark out of 10 in increments of 0.1 of a mark by each Judge: -

1. (a) Scale Accuracy - side view K = 13
- (b) Scale Accuracy - end view K = 13
- (c) Scale Accuracy - plan view K = 13
2. Markings
 - Accuracy K = 8
 - Complexity K = 3
3. Colour
 - Accuracy K = 3
 - Complexity K = 2

4. Surface Texture and Scale Realism
 Surface TextureK=7
 Scale RealismK=7
5. Craftsmanship
 QualityK = 12
 ComplexityK = 5
6. Scale Detail
 AccuracyK = 9
 ComplexityK = 5
- Total K = 100

6.1.2.5 Static Judging Distance

These measurements are taken from the centreline of the model to the judges' chair.

SCALE CLASS	ITEMS 1 to 3 inc	ITEMS 4 to 6 inc	REMARKS
Control Line	3 metres	No Restriction	
R/C (F4C modified)	5 metres	No Restriction	
R/C Stand-Off (F4H modified)	n/a	n/a	All at 5 metres
R/C Indoor	1.5 metres	0.5 metres	
R/C Helicopter	5 Metres	No Restriction	
R/C Stand-Off Helicopter	n/a	n/a	All at 5 metres
Outdoor FF (I/C power)	2 metres	0.5 metres	
Outdoor FF (Rubber)	2 metres	0.5 metres	
Outdoor FF (CO ₂ or Electric)	2 metres	0.5 metres	
Indoor FF (Rubber)	1.5 metres	0.5 metres	
Indoor FF (CO ₂ or Electric)	1.5 metres	0.5 metres	
Peanut	n/a	n/a	No restriction
Pistachio	n/a	n/a	No restriction
Indoor Kit Scale	n/a	n/a	No restriction

6.2 CONTROL LINE

6.2.1 SCALE CONTROL LINE

6.2.1.1 General Model Characteristics

Maximum weight of the complete model in flying condition without fuel but including any dummy pilot shall be 6kg except that a model of a multi-engine subject shall be 7 kg.

Models using electric motors for motive power shall be weighed without the batteries used for those motors.

Motive power:

- (a) I/C piston engines
- (b) Gas Turbine – maximum thrust of 10kg
- (c) Electric motors - maximum voltage of power source to be 72 volts

The use of Rocket or pulse jet engines is forbidden.

6.2.1.2 Control Mechanism

All Control Line Flying Scale Model Aircraft must be permanently attached to two or more non-extensible wires or cables during flight.

Primary Flight Control Function: The model aircraft's flight path may only be controlled by manually activated and mechanically linked flight control elements. This must be by a hand-held control handle manipulated by the pilot located on the ground at the centre of the model aircraft's flight circle. No automatic control of the Primary Control Function shall be permitted.

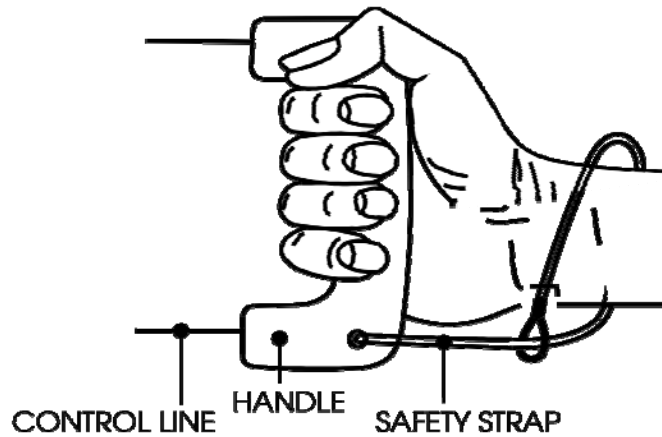
Secondary Control Functions: These may include (but are not limited to) control of engine/s, landing gear, landing flaps. Secondary Control Functions may be controlled by the pilot via wires/cables, or may function completely automatically. The frequency of any electro-magnetic pulses sent through wires/cables shall not exceed 30 kHz.

Secondary Control Functions may also be controlled using 2.4GHz radio control equipment. The radio control equipment must conform to BMFA General Regulations and Contest Rules Section 1 paragraph 1.2.5(5). There can be no electrical or mechanical link between the radio control equipment and the Primary Control Function and the Transmitter must be under the sole control of the pilot in the centre of the circle during the flight.

Before each flight the entire mechanism including control lines and their attachments to the model aircraft and the control handle, shall be subject to a pull test equal to 5 times the weight of the model aircraft, as recorded at Processing, with a maximum of 25 kg.

Control line length (central point of handgrip to vertical centre line of model aircraft) shall be not less than 15 metres or more than 21.5 metres.

The safety strap connecting the competitor's wrist to the control handle must be attached for the whole flight. The circle marshal shall ensure that this requirement is met and any attempt to take off in breach of this will result in disqualification of that flight.



HAND AND SAFETY STRAP FIGURE

6.2.1.3 Official Flight

Each competitor may be called to fly up to three times, and must execute an official flight within the required time limit (see 6.2.1.4) on each occasion to be eligible for flight points for that flight.

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

An official flight commences at the earliest of the following:

- (a) The competitor signals to the timekeeper that he is commencing to start his motor(s).
- (b) Two minutes after the competitor is instructed to start his flight (see 6.2.1.4).

An official flight is terminated when the model lands and stops, except during the option 6.2.1.8.(j) Touch and Go and 6.2.1.8.(o) (Taxi Demonstration).

Each manoeuvre must be announced prior to commencement and called on commencement by the word "NOW". Completion of each manoeuvre must also be announced by the word "FINISHED". Failing to do so, loud and clear, will result in loss of marks for that manoeuvre.

The judges will be seated outside the circumference of the contest circle in a position agreed with the Contest Director. When the wind direction, in the opinion of the CD, continually deviates more than 30° from the first decided direction, the judges position will be adjusted accordingly.

The pilot is permitted to choose the spots where he wishes to commence his take off run and terminate the roll out after landing. He is also free to choose where he wishes to position each manoeuvre, but must bear in mind that manoeuvres need to be positioned in full view of the judges to achieve a good score.

In the interest of safety, any manoeuvre that is carried out when the pilot steps outside a circle of 3 metres diameter will score ZERO.

If any non-listed manoeuvre or flight function is nominated as option M (para. 6.2.1.8 below), competitors must indicate to the Flight Judges the exact nature of the demonstration before going to the flight line. The competitor must be prepared to supply evidence that the manoeuvre was performed by the subject aircraft modelled.

6.2.1.4 Flying Time

Each competitor shall have 9 minutes to complete a flight, plus one minute for each additional motor. Timing will start when the competitor begins to crank the motor or two minutes after entering the starting area, whichever is first. Scoring finishes after expiration of the time limit.

6.2.1.5 Starting Time

Competitors must be called at least 7 minutes before they are required to occupy the starting area.

The model must become airborne within the first 5 minutes (plus one minute for each additional motor in excess of one). If the model is not airborne within the 5 minutes, plus one minute for each additional motor, the competitor must immediately make room for the next competitor.

If the motor(s) stops after the take-off has begun, but before the model is airborne it may be restarted within the 5 minutes starting period.

Within these time limits, only one attempt is allowed to repeat the take off. In the case of a repeated attempt, the take-off will be marked Zero.

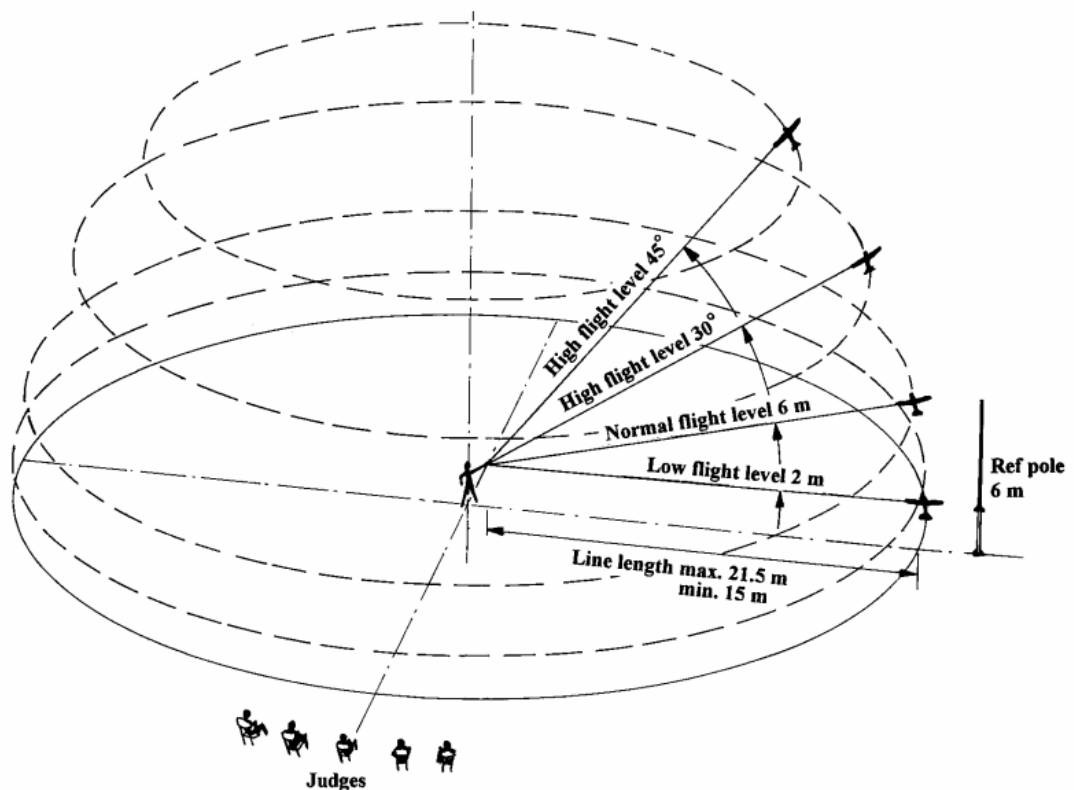
6.2.1.6 Flight Level Definitions:

Three basic levels of flight are defined:

Low Flight Level at approximately 2 m height.

Normal Flight Level at approximately 6 m height.

High Flight Level between 30° and 45° line elevation.



6.2.1.7 Flight Schedule

The manoeuvres must be executed in the order listed below. Between the end of one manoeuvre and the start of the subsequent one, the competitor must fly the model a minimum of two laps.

- (1) Take-off K = 14
- (2) 5 laps of straight level flight K = 8
- (3) Optional demonstration K = 12
- (4) Optional demonstration K = 12
- (5) Optional demonstration K = 12
- (6) Optional demonstration K = 12
- (7) Landing..... K = 14
- (8) Realism in flight
 - (a) Model Sound..... K = 4
 - (b) Speed of the Model..... K = 6
 - (c) Smoothness of flight K = 6

Total K = 100

6.2.1.8 Optional Demonstrations

The competitor 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.

The selected options must be given to the judges in writing before take-off. The options may be flown in any order but the order must be marked on the score sheet and any manoeuvre flown out of order will be marked ZERO.

Any demonstration of cargo doors or bomb doors must be done in conjunction with a cargo or bomb drop, if no cargo or ordnance is dropped, the manoeuvre will score ZERO.

Not more than one drop option may be nominated.

Only one attempt is permitted for each manoeuvre, the only exception is the take-off as described in 6.2.2.2.

FOUR optional demonstrations must be selected from the following list:

- A Multiengine option – in order to qualify for full multi-engine points, all engines must run for the complete flight. Should any engine cut prematurely, then the marks will be reduced accordingly.

Note: The K-Factor of 12 applies to any multiengine subject. No points are awarded for each individual engine.

- B Retract and extend landing gear.
- C Retract and extend flaps.
- D Droppable ordnance.
- E High flight over 30° line angle.
- F One inside loop.
- G Three inverted laps.
- H Wingover.

- I Figure eight.
- J Touch and go.
- K Lazy Eight
- L Parachute drop.
- M Non-listed manoeuvre or Flight function.
- N Taxi demonstration.
- O Overshoot/go around.

6.2.1.9 Realism of Flight:

Realism of Flight covers the entire flight performance including the way the model flies between the manoeuvres. The following aspects are marked always keeping in mind the likely characteristics of the subject aircraft.

If the model lands (or crashes) before the flight schedule is complete, all the realism marks should be reduced from what would have been awarded if the schedule had been completed. The amount of reduction should be in proportion to the percentage of the schedule not flown.

Model sound K = 4

This is an assessment of how the model replicates the characteristic sound of the subject aircraft. Special consideration will be given where the model demonstrates any particular characteristic sounds of the full size aeroplane. Competitors are encouraged to advise judges if such characteristic sounds can be reproduced and where they will occur in the flight. E.g. Excessive propeller noise at high power setting or noise produced by the airframe during high 'g' manoeuvres.

Speed of the model K = 6

This is a subjective assessment of the scale speed of the model.

Smoothness of flight K = 6

This is an assessment of the smoothness of control taking into account the prevailing weather conditions. The model should be well trimmed and show no signs of instability. The attitude of the model in flight, i.e. any nose-up or nose-down tendency will also be assessed.

Note:

A model, which flies with wheels down, whereas the subject aircraft actually featured retractable landing gear, shall have the total flight score reduced by 25%.

6.2.2 SCALE CONTROL LINE FLIGHT MANOEUVRES

6.2.2.1 Description of Manoeuvres

The following descriptions and diagrams are largely theoretical and indicate the optimum shape of the manoeuvres.

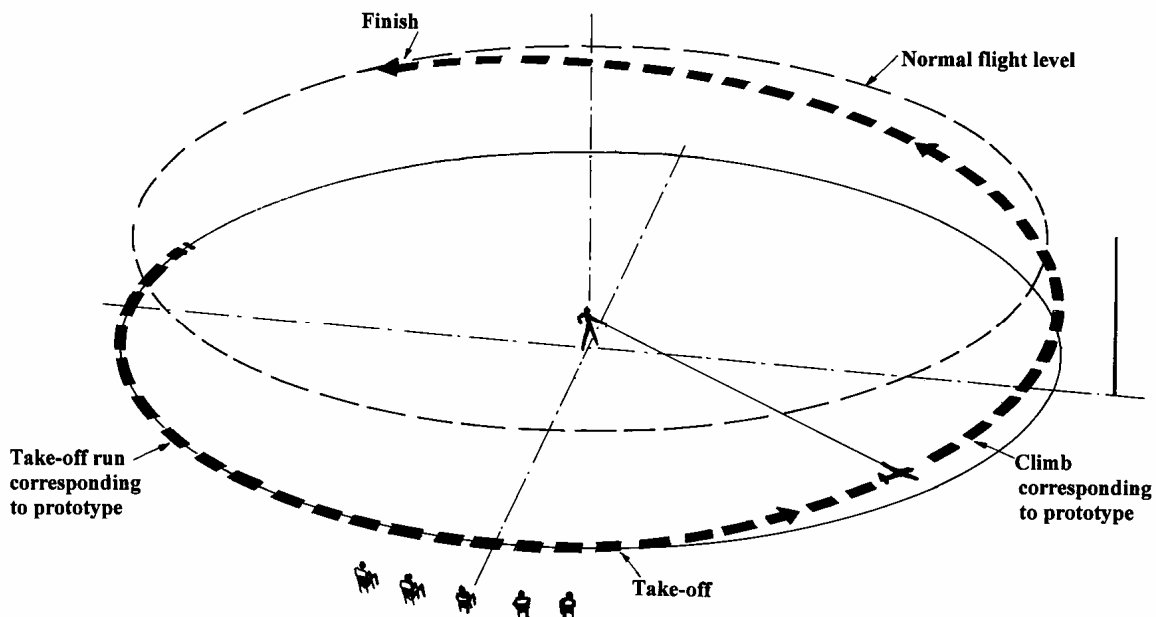
The errors mentioned under each manoeuvre cannot be an exhaustive list of all possible faults. They are intended to show the sort of mistakes that are likely during that manoeuvre.

Flight Judges will assess each manoeuvres with regard to the following 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.

6.2.2.2 Takeoff

The model should stand still on the ground with the engine(s) running without being held. If the model is touched after the word "NOW" has been called the manoeuvre will score zero. The model should accelerate to a realistic speed and lift smoothly from the ground, climb at an angle consistent with the subject aircraft and level off at Normal Flight Level. The manoeuvre may, depending of the subject aircraft, take more than one lap to complete.

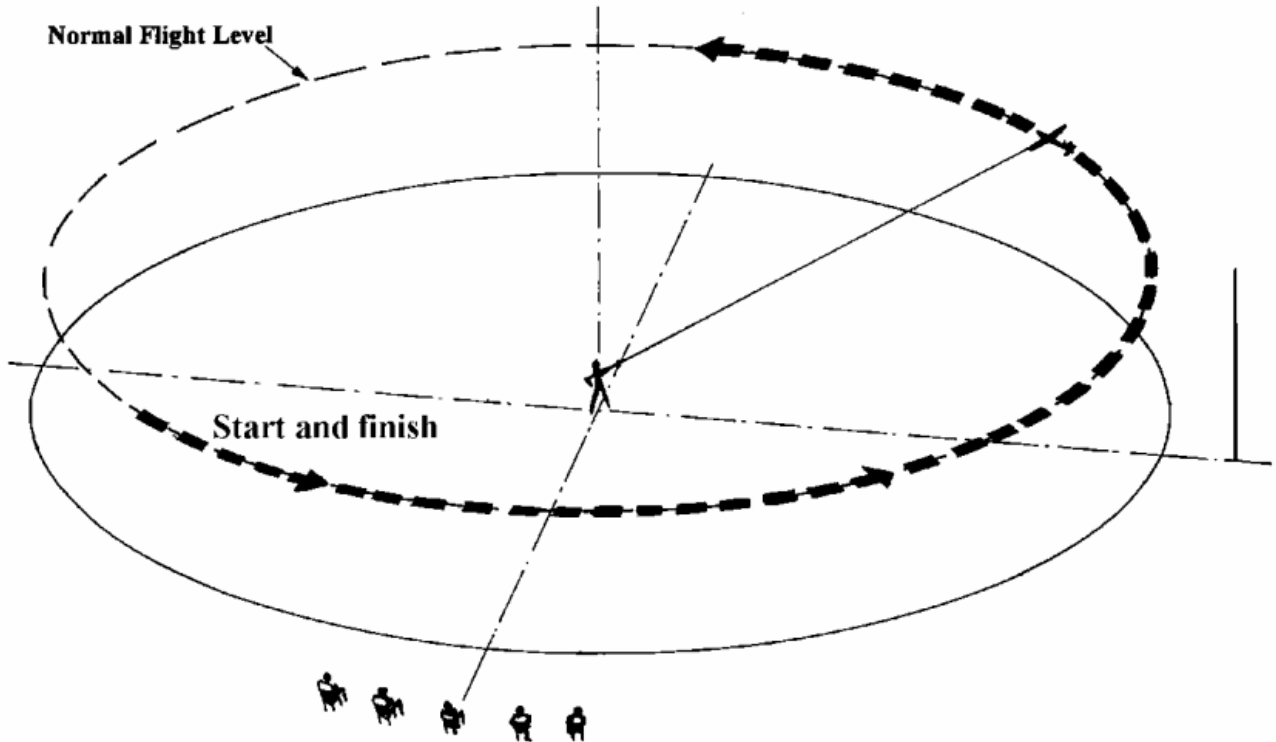


Errors:

- (1) Model touched after calling "NOW" (zero marks).
- (2) Climb erratic.
- (3) Rate of Climb not consistent with subject aircraft.
- (4) Level off not smooth.
- (5) Level off not at Normal Flight Level.

6.2.2.3 Five laps at Normal Flight Level:

This manoeuvre should demonstrate the basic flying qualities of the model. Five smooth and stable laps should be flown at Normal Flight Level. Height should remain almost constant for full marks.



Errors:

- (1) Not five laps (zero marks). More than five laps is not an error.
- (2) Flight above or below Normal Flight Level (approx. 6 m) will downgrade the score proportionately.
- (3) Model flight path not smooth and steady.

6.2.2.4 OPTIONAL MANOEUVRES

A Multi-engines:

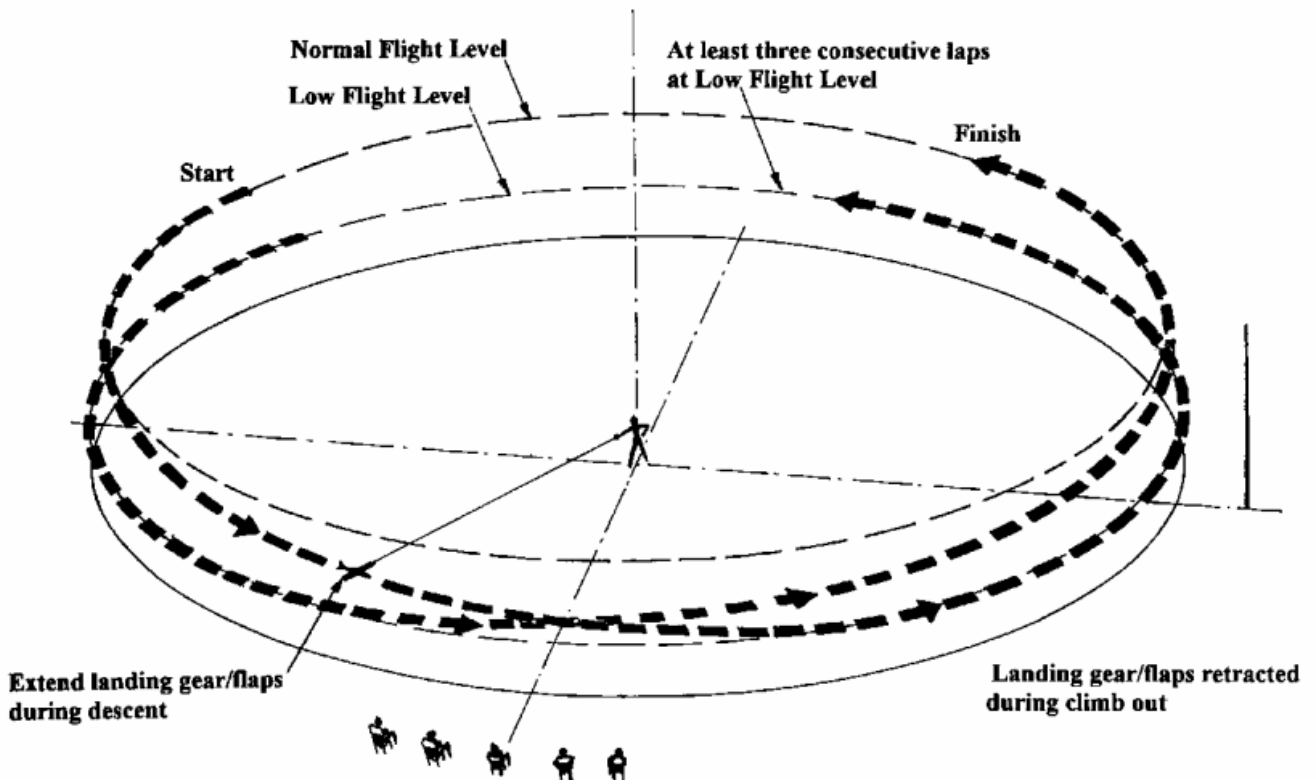
In order to qualify for full multi-engine points, all engines must run for the complete flight. Should any engine cut prematurely, then the mark will be reduced accordingly.

B Retract and Extend Landing Gear:

C Extend and Retract Flaps:

(Diagram and errors applicable to both manoeuvres unless stated)

The manoeuvre should commence from Normal Flight Level and be flown with the gear/flaps fully extended at Low Flight Level (approx. 2m) for at least three consecutive laps. The gear/flaps will then be retracted during a climb out to Normal Flight Level where the manoeuvre is finished.

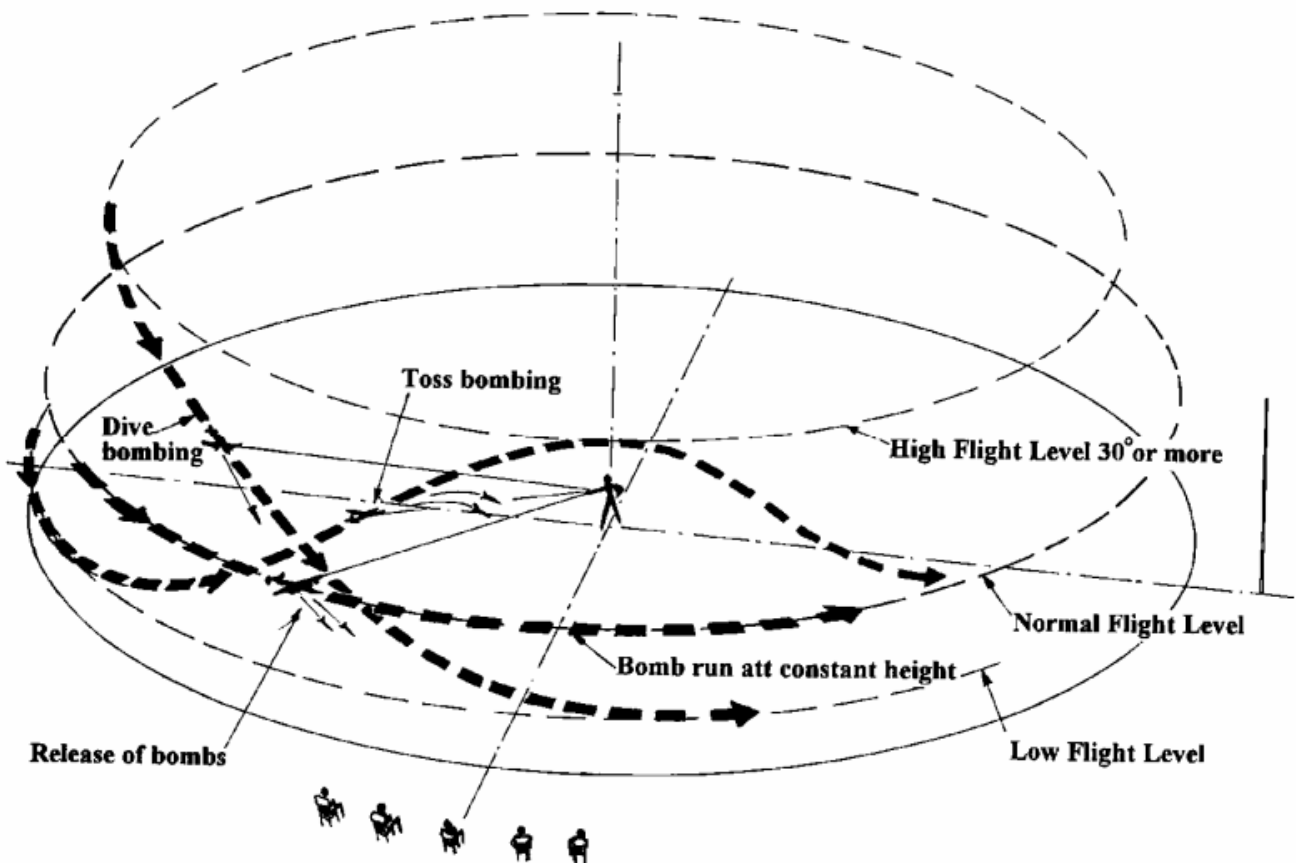


Errors:

- (1) Not commenced from Normal Flight Level.
- (2) Extension and or retraction not in full view of the judges.
- (3) Model speed too high for landing gear/flap lowering.
- (4) Model not flown at Low Flight Level for three consecutive laps with gear/flaps extended.
- (5) Speed and or sequence of extension and retraction not realistic.
- (6) No change in attitude with flaps lowered.
- (7) Manoeuvre not finished at Normal Flight Level.

D 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 position and in the correct manner. Dropping should be in the manner of the subject aircraft. Dropping should be within clear view of the Judges and centred on the Judges position. Any special features of the manoeuvre should be declared to the Judges beforehand



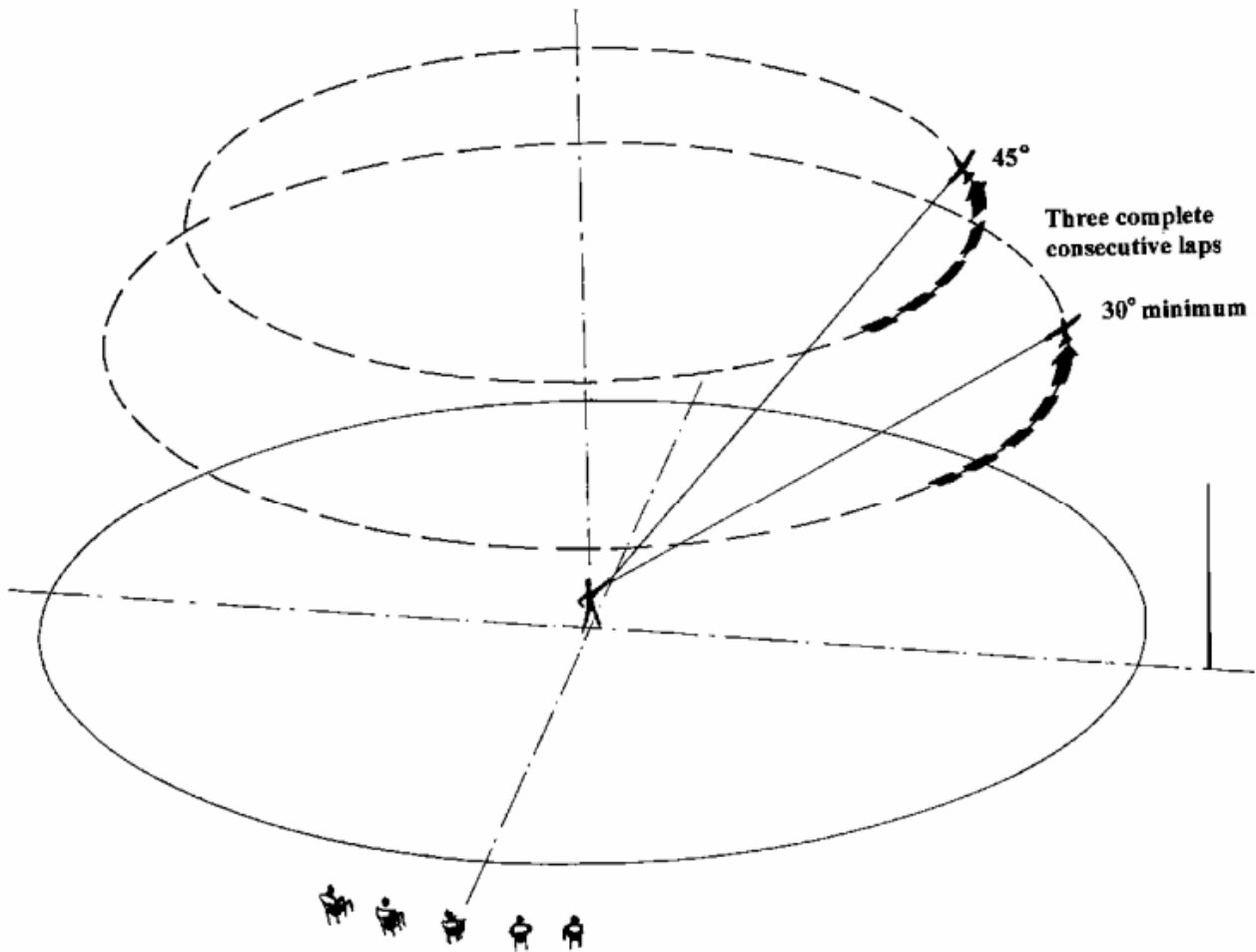
Errors:

- (1) Not a realistic way of releasing the bomb load.
- (2) Bomb bay doors did not operate in a realistic way.
- (3) Bombs do not behave as such on falling to their target zone
- (4) Bombs not falling on the intended and agreed area.
- (5) Drop tanks not behaving as drop tanks in the air.

E High Flight At Over 30° Line Angle:

During three complete and consecutive laps the lines must be at a minimum angle of 30° to the ground. The centre of the circles, which the model describes, must be directly over the flier's head.

Optimum marks will be awarded if the lines do not come below 45° and the flight level remains almost constant. Lower marks will be awarded to models which fly below 45° but above 30°, or if the flight level changes considerably during the three laps. Zero marks shall be given if the model flies below 30° line-angle at any moment during the three laps.

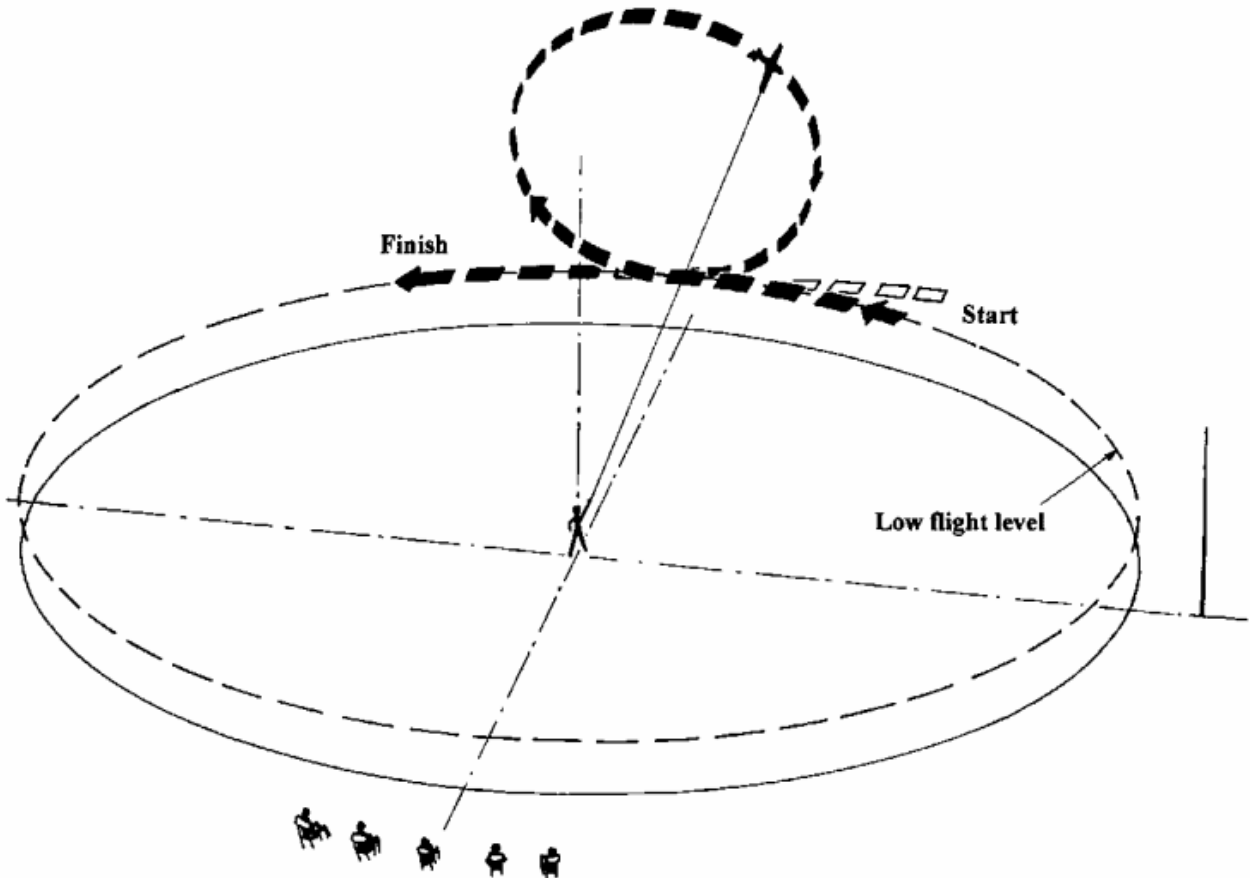


Errors:

- (1) Not three consecutive laps.
- (2) Great variations of height during the flight..
- (3) Centring varies during the flight.
- (4) Line-angle below 30°, at any moment - zero marks.

F**One Inside Loop:**

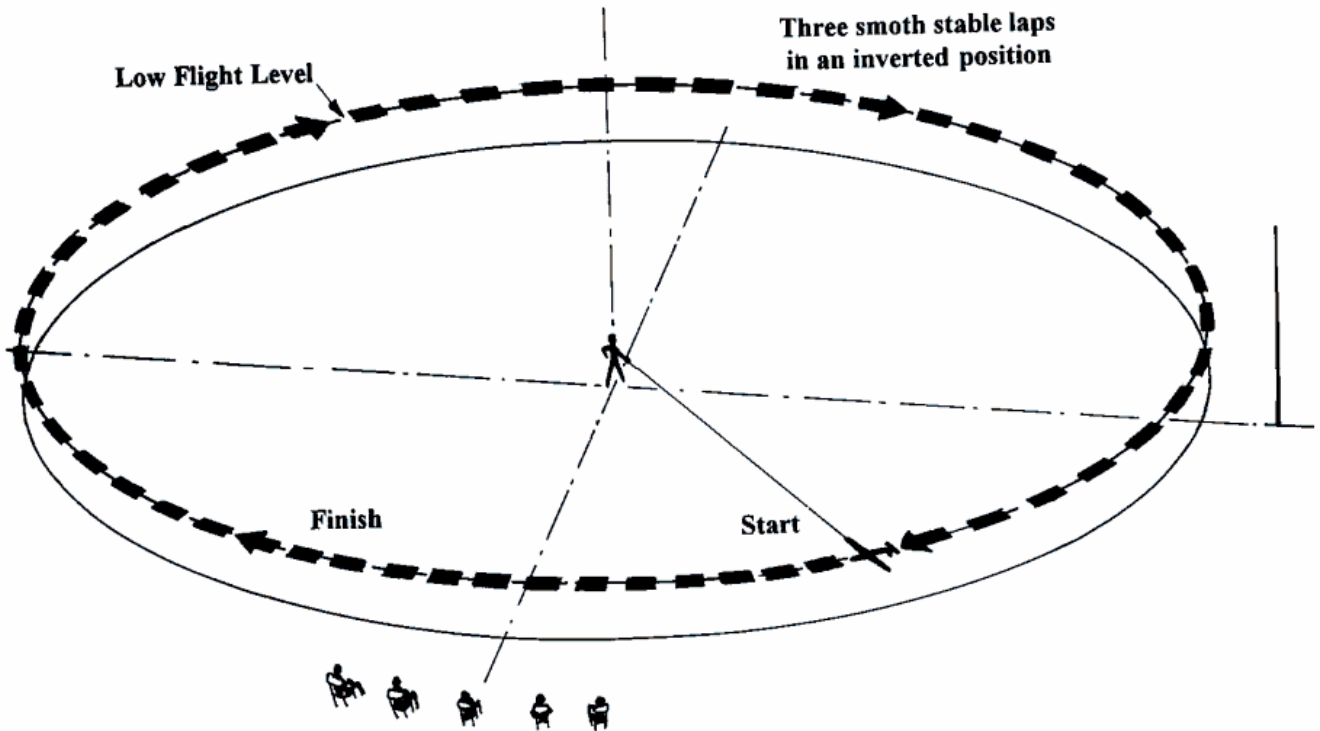
From Low Flight Level, the model pulls up into a circular loop and resumes level flight at the same height as the entry. The throttle may be reduced at the top of the loop, as the subject aircraft would be operated. Low powered aircraft types would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the loop.

**Errors:**

- (1) Loop not commenced at Low Level Flight.
- (2) Track of loop not vertical.
- (3) Loop not in the manner of the subject aircraft.
- (4) Inappropriate use of throttle.
- (5) Loop not finished at Low Flight Level.

G**Three Inverted Laps:**

The model should make three smooth and stable consecutive laps in an inverted position at Low Flight Level. Height should remain constant for optimum marks.

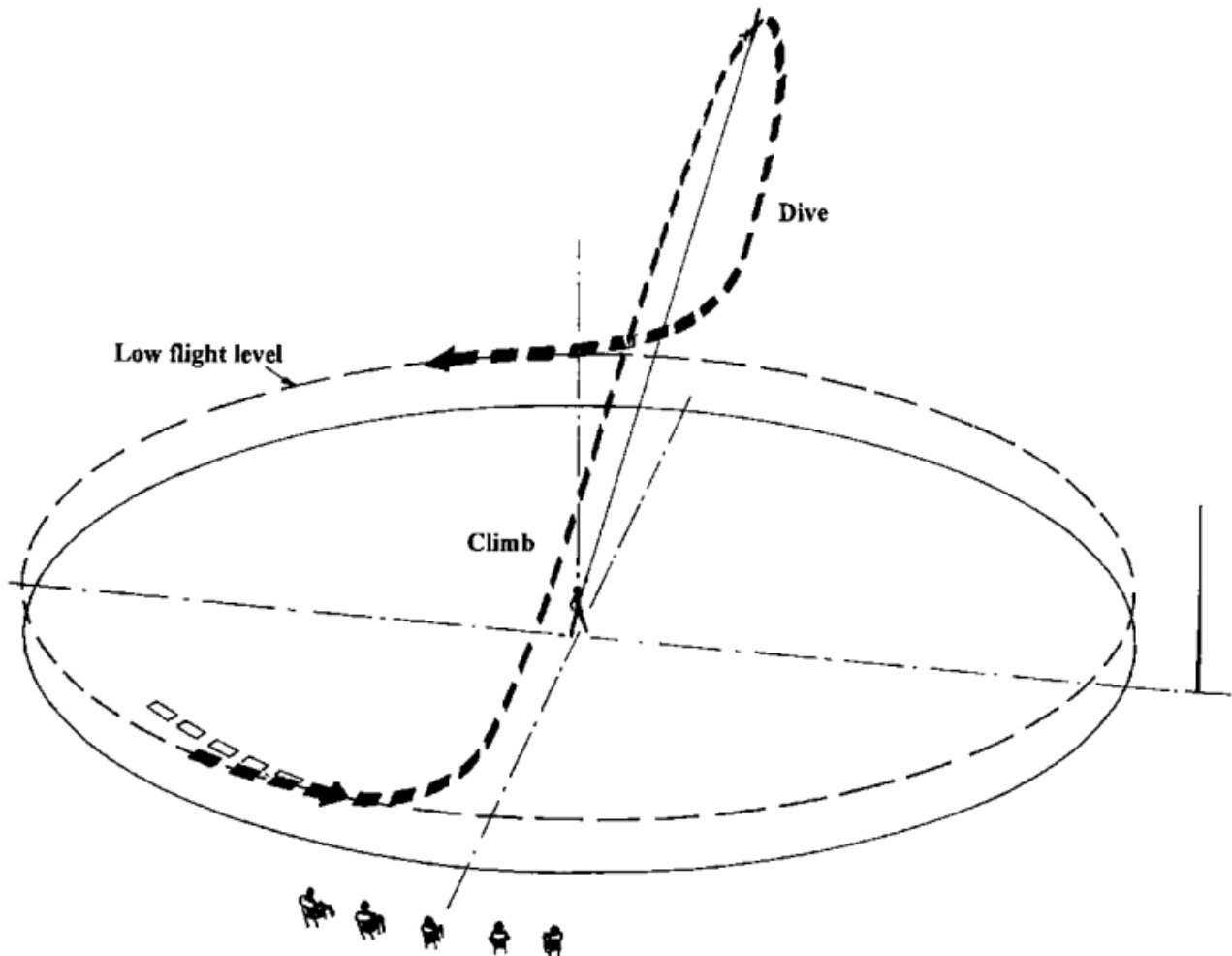
**Errors:**

- (1) Less then three laps, zero marks.
- (2) The height not at Low Flight Level.
- (3) Not smooth and stable.
- (4) Variations in height.

H

Wingover:

From Low Level Flight the model should make a near vertical climb, then perform an equally near vertical dive and finally level out at Low Level Flight. The radii in the pull-up and the pull-out should be of equal size for full marks. Low powered aircraft types would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.



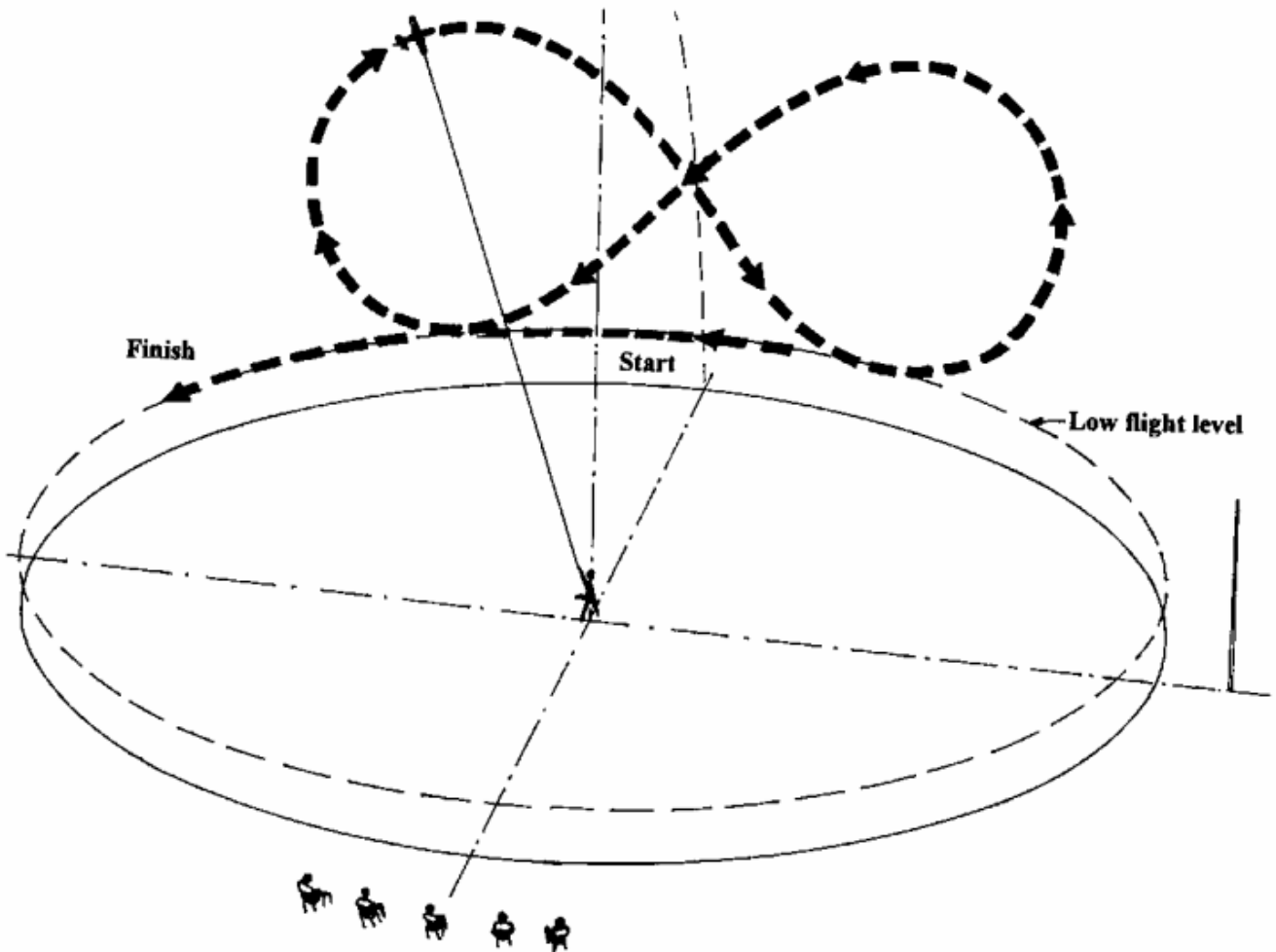
Errors:

- (1) Not commenced from Low Level Flight.
- (2) Not sufficiently steep climb. (Less than 60° will score zero).
- (3) Not sufficiently vertical dive. (Less than 60° will score zero).
- (4) Not equal shape in the pull-up and the pull-out.
- (5) The manoeuvre is not finished at Low Level Flight.

I

Figure Eight:

From Low Level Flight, the model pulls up into a near circular loop until 45° nose down. The 45-degree inverted is then held until the entry height is reached when another near circular loop is executed inverted. The manoeuvre is completed with a second 45° nose down and a pullout at Low Level Flight. The 45-degree intersection shall divide the manoeuvre in two equal parts for top marks.



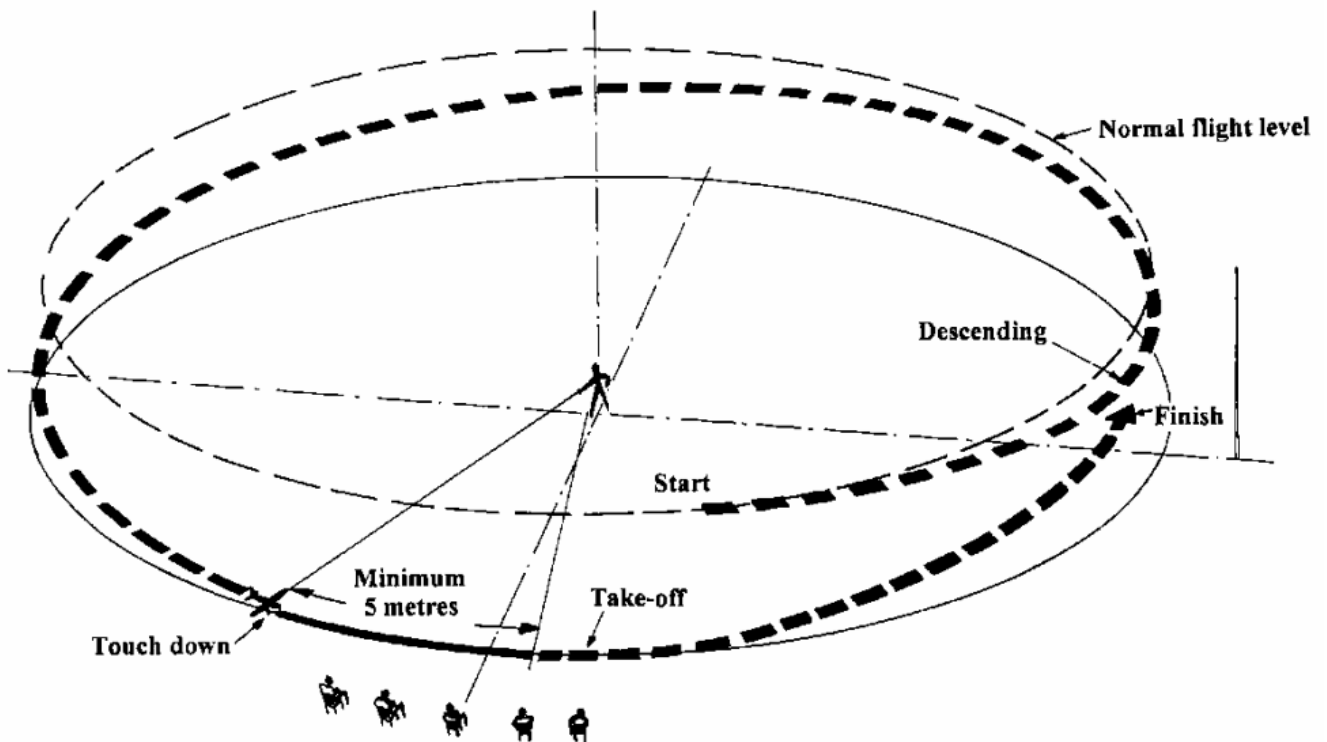
Errors:

- (1) Manoeuvre not commenced from Low Flight Level.
- (2) Loops not near circular.
- (3) Not a 45-degree intersection.
- (4) Loops are not the same size.
- (5) The manoeuvre not finished at Low Flight Level.

J

Touch and Go:

From Normal Flight Level, the model reduces speed and extends landing gear and flaps, as applicable to the subject aircraft, touches down and rolls along the ground without coming to a halt. The main wheels must roll along the ground for a minimum of five lengths of the actual model. The model then makes a normal take-off and completes the manoeuvre at Normal Flight Level. The descent, prior to touch down, may take more than one lap to complete.



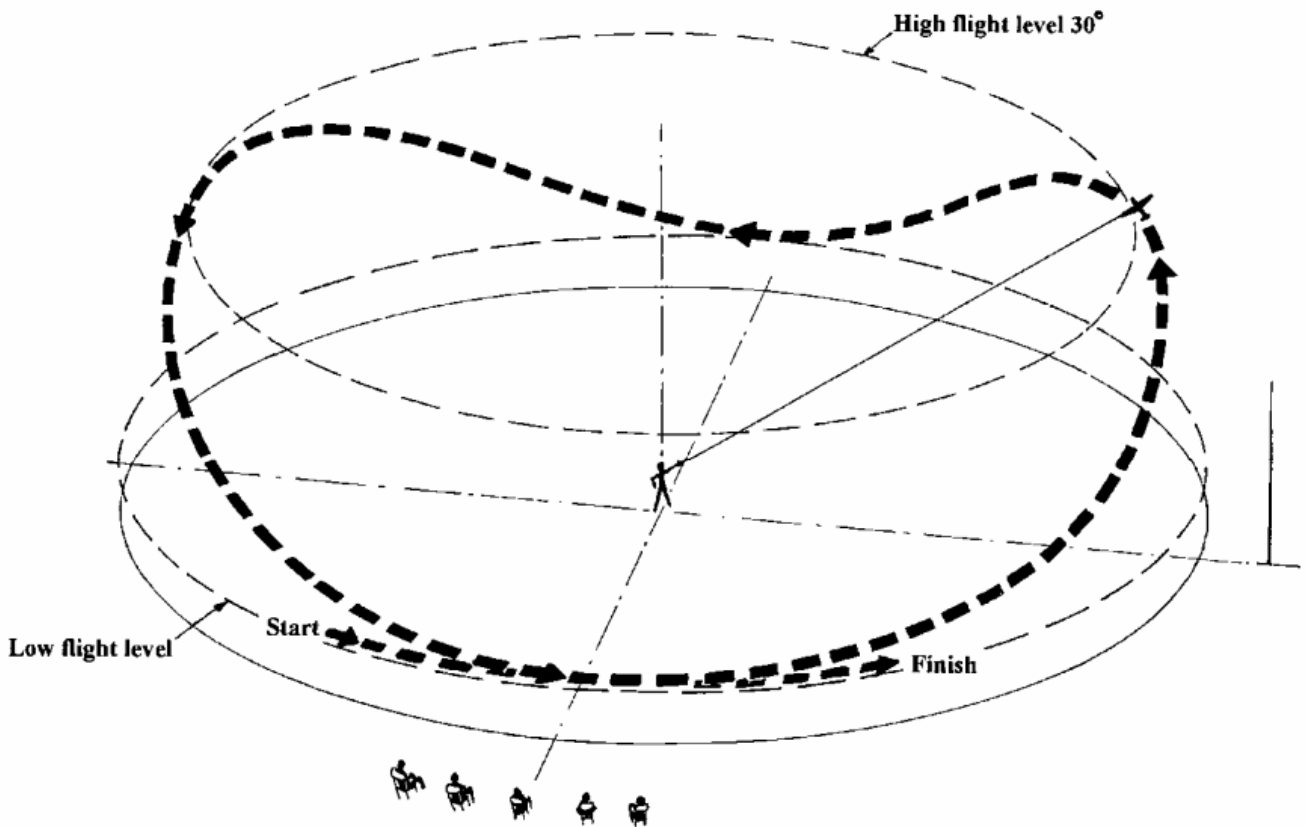
Errors:

- (1) Descent not commenced from Normal Flight Level.
- (2) Throttle, gear and flaps not operated smoothly during the descent.
- (3) The model bounces on touch down and the continuing roll on the ground.
- (4) The roll on the ground is less than five lengths of the model.
- (5) Not a normal take off and climb out to Normal Flight Level.

K

Lazy Eight

From Low Flight Level in front of the judges the model describes a climbing turn to High Flight Level and down again opposite the judges. The climbing turn is then immediately repeated in the other half of the circle and finished in front of the judges at Low Flight Level. This manoeuvre is for all types of aircraft.

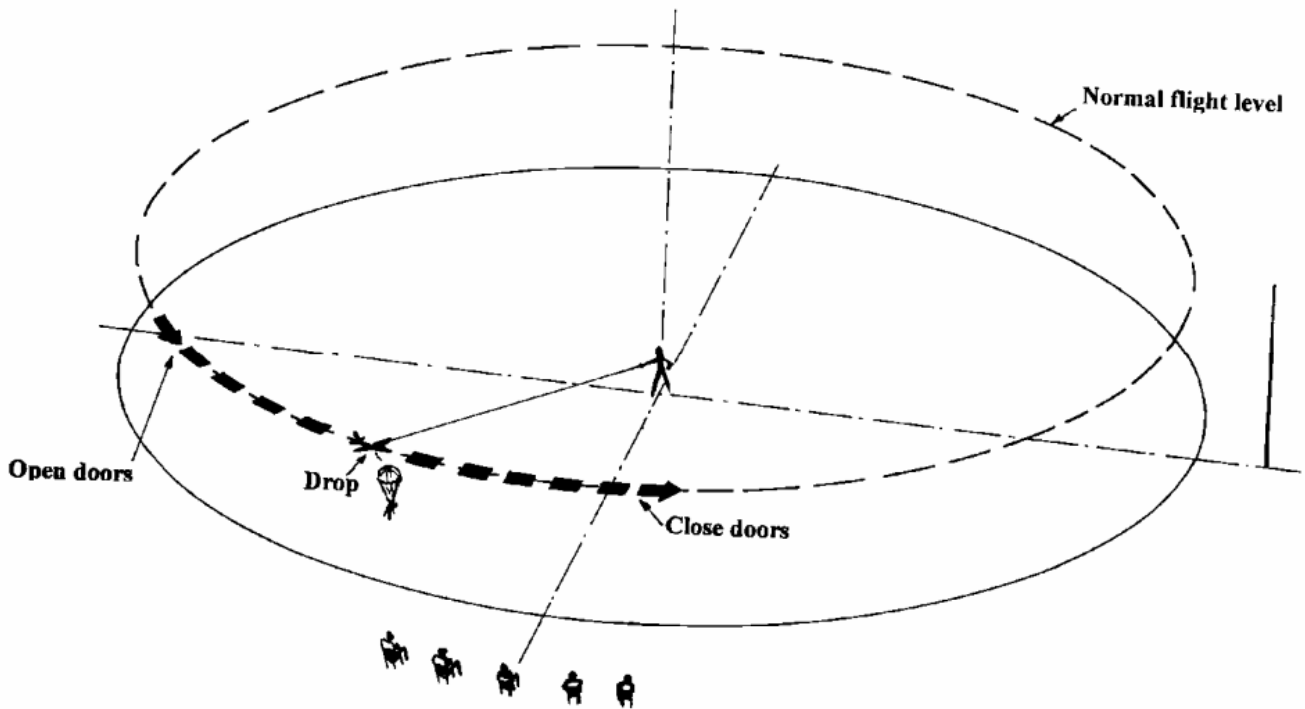


Errors:

- (1) The manoeuvre not executed from Low Level Flight
- (2) The climbing turn not to High Flight Level
- (3) The second climbing turn not a copy of the first
- (4) The manoeuvre not finished at Low Flight Level
- (5) The manoeuvre not centred in front of the judges

L**Parachute drop:**

The drop or ejection should be in the manner of the subject aircraft. Cargo should be dropped from a hatch or from bomb bays. A man should be dropped via doors, a hatch or by inverting the aircraft. If the subject aircraft used a braking parachute when landing, the competitor may demonstrate this aspect for this manoeuvre.

**Errors:**

- (1) Not a realistic way of dropping or ejecting the parachute.
- (2) The parachute not dropped at the agreed spot or area.

M**Flight Function by the subject aircraft:**

In each flying round, the competitor may demonstrate one flight function of his own choice which is appropriate for the subject aircraft. The precise nature of the demonstration must be understood and agreed by the judges prior to the commencement of the flight program.

Note:

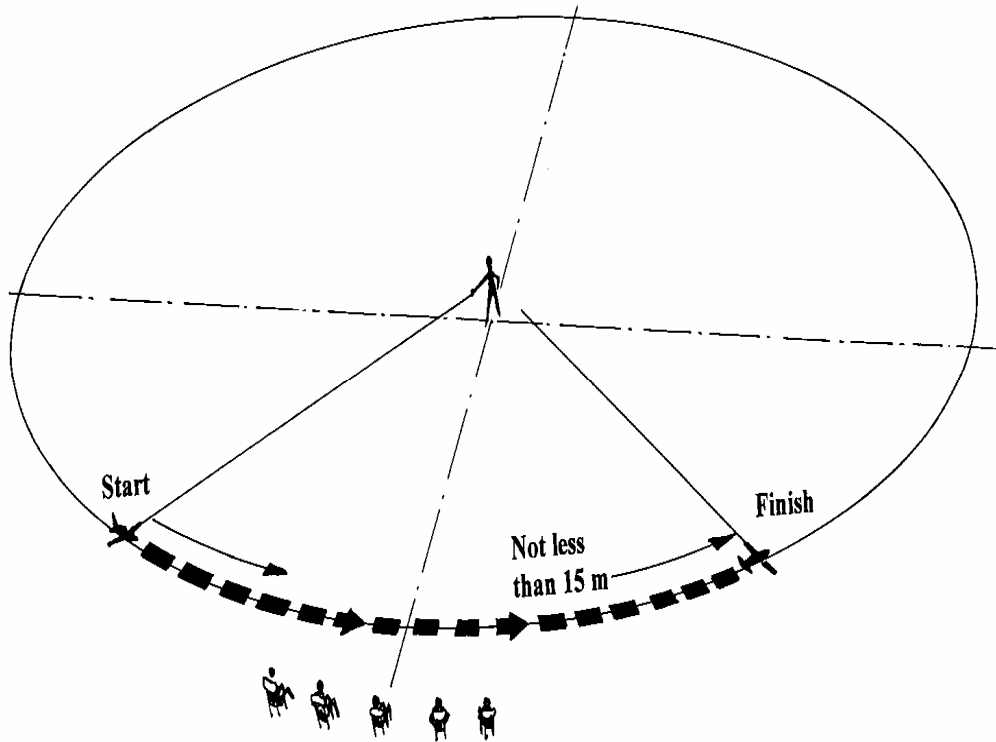
Not more than one drop option may be nominated.

Pure mechanical options, which could equally be performed on the ground, are not allowed.

N

Taxi Demonstration

The model should stand still on the ground with the engine(s) running without being held. The model should then taxi a minimum distance of 15 metres in a manner of the subject aircraft and finally come to a full stop. All engines must be operating for full marks. This manoeuvre may be executed before or after the flight.

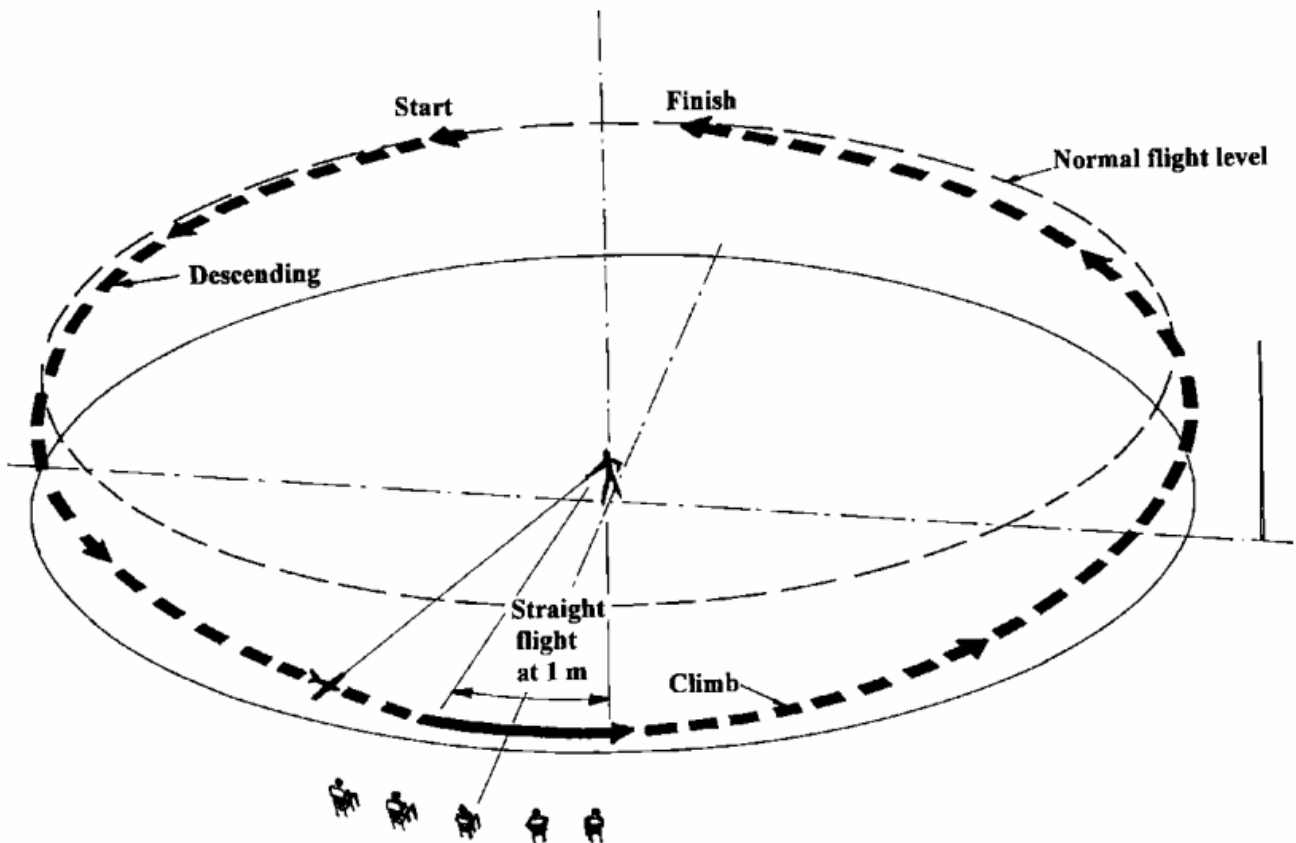


Errors:

- (1) Taxi distance less than 15 metres.
- (2) Not a realistic taxi for the subject aircraft.
- (3) Not all engines operating.
- (4) If held or touched during the manoeuvre, the score is zero.

O **Overshoot/Go-around:**

From Normal Flight Level, the model reduces speed and extends landing gear and flaps, as applicable to the subject aircraft. When the model reaches not more than one metre height it picks up speed before it then makes a normal climb out and completes the manoeuvre at Normal Flight Level. The descent to approximately one metre may take more than one lap to complete.



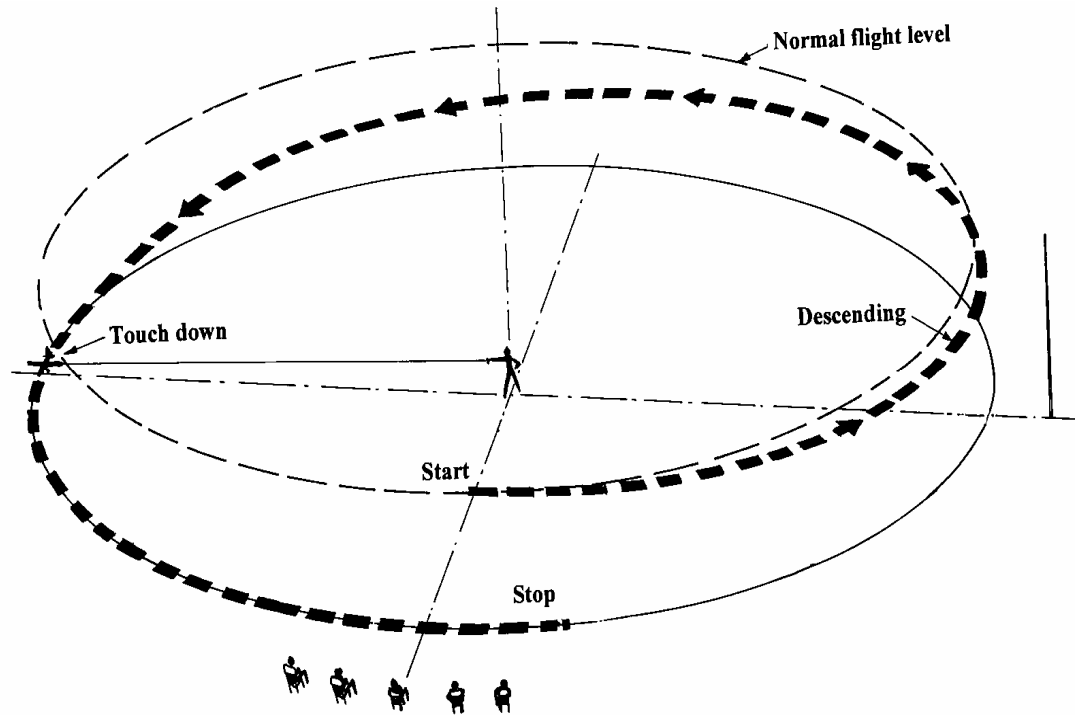
Errors:

- (1) Descent not commenced from Normal Flight Level
- (2) Throttle, gear and flaps not operated smoothly during descent.
- (3) The model not allowed to accelerate smoothly before climbing out.
- (4) The manoeuvre not finished at Normal Flight Level.

6.2.2.5

Landing:

From Normal Flight Level, the model smoothly descends while throttling back and begins the approach with flaps and gear down, when applicable, the model then continues to round out, adopting the attitude applicable to the subject aircraft and touches down with no bouncing and rolls to a stop. The landing may take more than one lap to finish.



Errors:

- (1) Landing manoeuvre not commenced from Normal Flight Level.
- (2) Not a smooth descent down to the touchdown point.
- (3) Gear/flaps not lowered in correct positions.
- (4) Excessive use of throttle on finals.
- (5) Model too fast, not correct approach configuration.
- (6) Model bounces on touchdown.
- (7) Model does not come to a gradual and smooth stop after landing.
- (8) Model noses over (30 % penalty when nose-down, zero if it overturns).
- (9) Engine(s) stops before the landing manoeuvre is finished.

6.3

RADIO CONTROL

6.3.1 SCALE RADIO CONTROLLED MODELS (Based on FAI Class F4C)

6.3.1.1 General Model Characteristics

Maximum weight of the complete model in flying condition without fuel but including any dummy pilot shall be 15kg

Models using electric motors for motive power shall be weighed without the batteries used for those motors.

Motive power:

- (a) I/C piston engines
- (b) Gas Turbine
- (c) Electric motors - Maximum voltage of power source to be 72 volts

The use of Rocket or pulse jet engines is forbidden

6.3.1.2 Organisation of Scale Radio Control Flying Events

The Contest/Flight Line Director is responsible for setting up the flight line i.a.w BMFA guidelines and for defining any no-fly areas. N.B. At the UK Nationals there are additional considerations regarding airspace.

The flying order of the competitors will be established by means of a draw before the start of the contest.

The competitor is responsible to ensure that he is aware of his position in the flying order and his model is prepared for flight in the event that the competitor before him in the flying order fails to start. Each competitor will be given a minimum of five minutes' notice to commence his flight.

Each competitor may be called to fly up to three times and must execute an official flight within the required time limit (see 6.3.1.4) on each occasion to be eligible for flight points for that flight.

6.3.1.2.1 The Judges' Line

The Flight judges will be seated alongside the take-off and landing area on a line which is approximately parallel with the wind direction. This axis will be referred to as the judges' line. The Contest/Flight Line Director will be responsible for monitoring the direction of the wind and if it continually deviates more than 30° from the judges' line and it is practical to do so, the judges' line will be adjusted accordingly.

6.3.1.3 Transmitter Control

All transmitters likely to be used during the contest must be checked and non-2.4GHz transmitters placed in a compound under observation.

During the contest, a steward must be in control of the transmitter compound and will issue the transmitter to the competitor only when his name is called for him to stand by to make his flight.

Non-2.4GHz transmitters must be returned to the steward at the transmitter compound, as soon as the flight or attempted flight has ended. All unauthorised transmission during the contest will result in automatic disqualification of the offender from the entire contest, and render him liable to further penalties.

6.3.1.4 Flight Timing

An official flight is a flight completed within 17 minutes. If the model has more than one engine, the flight time allowed will be increased by one minute for each additional engine.

Judging stops at the end of the time allowed and any manoeuvre that is not completed will be marked zero.

When instructed to start his flight, the official flight time will commence after two minutes or when the competitor signals to the timekeeper that he is commencing to start his engine(s), whichever is first.

If the model is not airborne within 7 minutes from when flight timing commences, plus one additional minute for each extra engine, the official flight will be terminated and the total flight score will be zero.

If the engine(s) stops after the take-off has commenced, but before the model is airborne, the engine(s) may be restarted, but the take-off will be marked zero.

Only one attempt is allowed to restart an engine and complete the take-off and if the model does not become airborne, the official flight will end and the flight score will be zero.

If the model lands and stops after the take-off has been completed, with the exception of a model which stops during a touch and go manoeuvre, the official flight is terminated.

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

6.3.1.5 Flight Program

The flight program, which must be completed within the official time, consists of the take-off, eight manoeuvres and the landing. Two of the manoeuvres are mandatory and six are optional.

Descriptions of manoeuvres are shown under section 6.3.5

In the event that there is a large entry or only limited time available, the Competition Director may decide to reduce the number of optional manoeuvres.

Only one attempt is permitted for each manoeuvre, the only exception is the procedure of getting a model airborne, as defined in 6.3.1.4.

6.3.1.6 Flight Judging

Flight Judges will examine each manoeuvre with regard to the following aspects:

- (a) The shape, size and technical requirements of the intended manoeuvre.
- (b) The positioning of the manoeuvre relative to the judges position or other datum.
- (c) The scale realism achieved relative to the subject aircraft.

6.3.1.6.1 Flight Realism

At the end of the flight the judges will confer to assess Realism of Flight, which covers the entire flight performance including the way in which the model flies between manoeuvres. If the flight is terminated before the flight program has been completed, all the realism marks will be reduced in proportion to the part of the program not flown.

The following aspects are assessed, always keeping in mind the likely characteristics of the full size subject:

(a) Model sound - This is an assessment of how the model replicates the characteristic sound of the subject aircraft. Special consideration will be given where the model demonstrates any particular characteristic sounds of the full size aeroplane. Competitors are encouraged to advise judges if such characteristic sounds can be reproduced and where they will occur in the flight. E.g. distinctive propeller noise at high power setting or noise produced by the airframe during high 'g' manoeuvres.

(b) Speed of the model - This is a subjective assessment of the scale speed of the model.

(c) Smoothness of flight – This is an assessment of the smoothness of control taking into account the prevailing weather conditions. The model should be well trimmed and show no signs of instability. The attitude of the model in flight, i.e. any nose-up or nose-down tendency will also be assessed.

6.3.1.7 K-Factors

The following K-factors apply:-

- (1) Takeoff K = 11
- (2) Mandatory Manoeuvre K = 7
- (3) Mandatory Manoeuvre K = 7
- (4) Optional Manoeuvre K = 7
- (5) Optional Manoeuvre K = 7
- (6) Optional Manoeuvre K = 7
- (7) Optional Manoeuvre K = 7
- (8) Optional Manoeuvre K = 7
- (9) Optional Manoeuvre K = 7
- (10) Approach and Landing K = 11
- (11) Realism of flight:
 - (a) Model sound K = 4
 - (b) Speed of the model K = 9
 - (c) Smoothness of flight K = 9

6.3.1.8 Flight Schedule

The aim of the flight schedule is to recreate the flight characteristics and realism of the full-size aircraft

All the manoeuvres must be identified on the score sheet which must be given to the judges before timing of the flight commences.

Manoeuvres (2) to (9) may be flown in any order but the order must be marked on the score sheet and any manoeuvre flown out of order will be marked zero.

(a) Mandatory Manoeuvres

The "Figure Eight" and "Descending 360 degree Circle" are mandatory manoeuvres to be included in each flight, to be positioned within the flight schedule at the competitor's discretion.

(b) Optional Manoeuvres

The competitor must select six optional manoeuvres which should demonstrate an appropriate range of capabilities of the subject aircraft and may be selected from the list below.

The selection of manoeuvres may also include up to two non-listed manoeuvres or flight functions which the competitor feels are appropriate. If a competitor wishes to demonstrate any non-listed manoeuvre or flight function he must provide written details preferably with a diagram to the flight judges and seek their agreement regarding the exact nature of the proposed manoeuvre before the flying part of the competition commences. There can be no discussion with the judges on this matter at the flightline.

Competitors may also submit a description of the prototype's flight characteristics (originated by a competent authority), which should be used to judge the flight. This should be given to the Flight Judges before the flying part of the competition commences.

Only one manoeuvre involving dropping something or the demonstration of a mechanical function may be included in a competitor's choice of options.

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

List of optional manoeuvres (see section 6.3.5 for descriptions) -

- One loop
- Roll (including variations)
- Roll off the Top (Immelmann turn)
- Split-S or Reversal
- Stall turn
- Normal spin (three turns)
- Cuban eight (including half cuban, reverse cuban and reverse half cuban)
- Lazy eight
- Derry turn
- Inverted flight
- Wingover
- Chandelle
- Side slip
- Flight in triangular circuit
- Flight in rectangular circuit
- Extend and retract Landing gear or Flaps
- Overshoot or Go-around
- Procedure Turn
- Touch and go
- Straight flight with one engine throttled (multi-engined models only)
- Straight Flight at Low Speed
- Drop bombs or fuel tanks
- Parachute Demonstration

6.3.1.9 Presentation of Manoeuvres

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".

All manoeuvres must be performed parallel with the judges' line (para. 6.3.1.2.1 refers) and may be flown in either direction i.e. from the left or the right, but if any part of the manoeuvre is performed behind the judges' line it will be marked ZERO.

Exceptions from this rule are the Take-off, Landing, Touch and Go and the Sideslip. These manoeuvres may be performed into wind and the model may fly behind the judges' line as long as it does not overfly any designated area laid out for the protection of spectators, officials and other competitors or helpers.

The height and positioning of individual manoeuvres should be proportional to that expected in a full size display typical to the subject aircraft. Unless specified otherwise, manoeuvres that are carried out in a horizontal plane (e.g. Figure Eight, Triangular Circuit) should commence on a flight path that is between 30° and 60° elevation to the judges. Manoeuvres such as the Descending Circle and Spin should start at a higher elevation.

Any model which flies with the main undercarriage down when the full size aircraft was equipped with retractable landing gear shall have the total flight score reduced by 10%. Flying with just the tail wheel down when the full size had a retractable tail wheel, will incur a 3% penalty.

6.3.1.10 Flight Safety

If the model flies over any designated no-go area or an area laid out for the protection of spectators, officials and other competitors, or flies behind a specified safety line during any manoeuvre, the competitor will be advised and the manoeuvre will be marked zero.

If in the opinion of the Flight Judges or the Flightline Director, a model aircraft is considered unsafe, or being operated or flown in an unsafe manner, or repeatedly infringes a 'no go' area, the pilot shall be instructed to land immediately and the flight score will be zero.

At the UK Nationals, the airspace for R/C scale flying is restricted and control is exercised by the use of flags. A stationary flag will be used to advise the competitor that the model is at or near the airspace boundary and no penalties will be incurred regardless of the number of times the flag is shown. A waved flag is an indication to the judges that the competitor has encroached into adjacent airspace in which case the competitor will be warned and in the event of a second infringement, flight scoring will stop and the competitor will be requested to land.

Pre-flight testing of failsafe systems is recommended (CAP 658 and The BMFA Members Handbook pages 28/29 refer). The Contest Director may at his discretion request a pre-flight demonstration of a competitor's failsafe settings. Pre-flight checks of failsafe settings will be carried out at the UK Nationals

6.3.2 SCALE RADIO CONTROL STAND-OFF

6.3.2.1 Contest Rules

The General Characteristics of the model and the Flying Schedule shall be the same as Scale R/C - (6.3.1 refers).

Scoring, Eligibility, Declaration requirements, Documentation requirements and the Static Judging rules are as shown below:

6.3.2.2 Scoring

Greater emphasis is placed on the flying performance and the ratio of Flight Score to Static Score is 2:1.

Normally two rounds will be flown and the final score will be the sum of the two flight scores and the static score. If one round is flown the flight score will be doubled, if three rounds are flown the best two flight scores will be used.

6.3.2.3 Eligibility

In addition to rule 6.1.1.4 no model which has previously been placed in the top three in a BMFA Scale R/C competition, including repaints and rebuilds, will be permitted in R/C Scale Stand-Off.

The minimum requirement is that the surface finish (colour and markings) on the model must have been applied by the competitor. The requirement for the competitor to have constructed his own model (Builder of the Model rule 6.1.1.3) is not applicable to Scale Stand-Off.

6.3.2.4 Declaration

The competitor must complete and sign the Competitors Declaration Form 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 contributed to the Scale Accuracy. The competitor may also use photographs or sample material in support of the declaration.

If an incorrect declaration is subsequently revealed, the competitor may be disqualified from the contest.

6.3.2.5 Documentation

The documentation for Stand-Off scale is the minimum necessary to fully assess the outline from 3 aspects (side view, front view and top plan view); the colour; the markings; the realism and the subject aircraft design complexity.

As with all scale model static judging, good photographs are the prime means of judging scale accuracy. Photographs and reproductions should be of a reasonable size, (aircraft image size 150 mm minimum) and presented on separate sheets or as a montage no larger than A2. A book with page markers is not acceptable.

There are no prescribed penalties for missing or inadequate documentation, but judges can only award marks on the basis of the documentation available. Poor documentation will be reflected in reduced scores and any aspect of static judging for which there is no documentation will result in a Zero score for that aspect.

(a) Proof of Scale Accuracy (Outline)

This may be in the form of photographs, printed reproductions or drawings. At least three photographs or printed reproductions of the full size aircraft, one or more of which must show the actual subject aircraft being modelled. Ideally these must show the entire

aeroplane 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 or detail photographs, but additional photographs can be used to support the three aspects if the outline needs clarification. Drawings are only required and indeed will only be used by the judge if the photographic evidence for any of the outline views is inadequate. If used, drawings must conform to the requirements of rule 6.1.2.2(b). (Cautionary note - if the competitor is in any doubt on this subject, then drawings should be supplied)

(b) Proof of colour:

This may be in the form of colour chips or original paint samples, colour photographs (which may be the same photos supplied for outline), or colour illustrations published in books, magazines or on kit boxes. Published descriptions are also acceptable when accompanied by examples of similar colours used on other aircraft types.

(c) Proof of markings:

This may be in the form of colour photographs (which may be the same as those supplied for outline), or published colour illustrations from books or magazines. Black and white photos or illustrations are acceptable if accompanied by suitable colour samples. Published descriptions are also acceptable when accompanied by examples of markings used on similar types.

6.3.2.6 Static Judging

All static judging is carried out at a distance of 5 metres. This is measured from the centre line of the model to the judges seating position.

(a) Scale Accuracy.

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

(b) Originality of Model Design & Construction

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 designed and constructed in its entirety by the competitor. A model which is built from a kit will score less, dependent upon the extent of prefabrication and an ARTF model will score zero (unless evidence is presented of extensive modification by the competitor).

(c) Colour and Markings Accuracy

This is an assessment of the accuracy of the colour and markings of the model by comparison with the documentation presented.

(d) Colour and Markings complexity

This is a subjective assessment of the difficulty in reproducing and applying the finish and markings to the model.

(e) Realism

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

(f) Subject Aircraft Design Complexity

This is a subjective assessment of the difficulty in reproducing the shape, and intricacy of the subject aircraft.

6.3.2.7

K - Factors

Scale Accuracy –

Side View	K = 15
Front View	K = 15
Upper Plan View.....	K = 15
Originality of model Design & Construction	K = 15
Colour and Markings Accuracy.....	K = 10
Colour and Markings Complexity.....	K = 5
Realism	K = 20
Subject Design Complexity.....	K = 5

Total K = 100

6.3.3 SCALE RADIO CONTROL INDOOR

6.3.3.1 Contest Rules

The General Rules (Section 6.1.1) will apply where appropriate with the exception of rule 6.1.1.20 concerning electronic motion stabilising devices, see 6.3.3.6 below.

The Static Judging rules are as stated in 6.1.2

The Flying rules are the same as Scale R/C (FAI Class F4C) (Section 6.3.1) with the exception of the following concerning General Model Characteristics, Event Organisation and the Flight Program:

6.3.3.2 General Model Characteristics

Maximum weight of the complete model in flying condition including all power packs is 200gm.

The maximum wing loading of the complete model in flying condition including all power packs is 15 gm/sq dm

The following motive power is approved:

- (a) Electric motors
- (b) CO₂ Motors
- (c) Rubber motors

The use of any other power system is forbidden.

Use of electronic and/or gyro stabilisation devices is approved for scale indoor RC models, but they must be declared and the flight score will be penalised (See Para. 6.3.3.6 below).

6.3.3.3 Organisation of Scale Indoor Radio Control Flying Events

The flying order of the competitors will be established by the contest director before the start of the contest.

The competitor is responsible to ensure that he is aware of his position in the flying order and his model is prepared for flight in the event that the competitor before him in the flying order fails to start. Each competitor will be given a minimum of five minutes' notice to commence his flight.

Each competitor may be called to fly up to three times and must execute an official flight within five minutes on each occasion to be eligible for flight points for that flight.

The Flight Judges will be seated alongside the take-off and landing area on a line which is parallel with the required flight direction. This axis will be referred to as the "judges' line".

Competitors must stay behind the judges line during the flight. Failure to do so will result in zero score for that flight.

Transmitter control will be in accordance with paragraph 6.3.1.3

6.3.3.4 Flight Timing

An official flight is a flight completed within 5 minutes.

Any manoeuvre that is not completed within the official flight time will be marked zero.

When instructed to start his flight, the official flight time will commence after two minutes or when the competitor signals to the timekeeper that he is commencing to start his engine(s), whichever is first.

If the model is not airborne within 3 minutes from when flight timing commences the official flight will be terminated and the total flight score will be zero.

If the model lands and stops after the take-off has been completed, with the exception of a model which stops during a touch and go manoeuvre, the official flight is terminated.

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

6.3.3.5 Flight Programme

The flight programme, which must be completed within the official time, consists of five manoeuvres. The descriptions of these manoeuvres are shown under section 6.3.4

Apart from the Take-off and Landing, the Manoeuvres may be flown in any order.

Only one attempt is permitted for each manoeuvre.

The following K-factors apply:

(1) Takeoff	K = 16
(2) Figure Eight.....	K = 13
(3) 360 Deg Descending Circle.....	K = 13
(4) Touch and Go.....	K = 13
(5) Approach and Landing	K = 16
(6) Flight Performance	K = 29
	Total K = 100

6.3.3.6 Flight Performance

Flight Performance is a subjective assessment of all aspects of the flight not covered by the specific manoeuvres 1 to 5. This includes the overall flight presentation, all the flying between manoeuvres and Flight Realism. (Realism will be assessed in terms of model sound, speed, stability, smoothness of control and flight attitude).

Models with electronic and/or gyro stabilisation devices will have their Takeoff, Touch & go and Landing scores reduced by 30%.

6.3.3.7 Presentation of Manoeuvres

All manoeuvres must be flown in the manner 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".

All manoeuvres must be performed parallel with the judges' line, if any part of the manoeuvre is performed behind the judges' line it will be marked ZERO.

The height and positioning of individual manoeuvres should be proportional to that expected in a full size display. Provided that the ceiling height allows, the figure eight manoeuvre should commence on a flight path that is between 30° and 60° elevation to the judges. The Descending Circle should start at a higher elevation.

All manoeuvres should be orientated with respect to the Judges line, but the direction of the manoeuvre is at the discretion of the contestant.

Any model which flies with wheels down whereas the prototype actually featured retractable landing gear shall have the total flight score reduced by 10%.

6.3.4 SCALE RADIO CONTROL HELICOPTER

6.3.4.1 Contest Rules

Scale helicopters contests are where possible governed by the same rules as contests for Radio Controlled fixed wing scale models and are divided into similar classes i.e. R/C Scale Helicopter; Stand-Off Scale Helicopter and Flying Only.

The General Rules (Section 6.1.1) will apply where appropriate

6.3.4.2 General Model Characteristics – as 6.3.1.1

6.3.4.3 Static Judging including Declaration and Documentation Requirements

Section 6.1.2 will apply to the R/C Scale Helicopter class and Section 6.3.2 will apply to the Stand-Off Scale Helicopter class

6.3.4.4 Organisation of Events – as 6.3.1.2 with the addition of the following:

A helipad will be marked out 20 meters in front of the judges and at 90° to the judges line. This will normally be in the form of a circle of 2 meters in diameter.

For Indoor Scale Helicopters the helipad will be 50cm in diameter and positioned an appropriate distance in front of the judges.

6.3.4.5 Transmitter Control – as 6.3.1.3

6.3.4.6 Flight Timing - As 6.3.1.4

6.3.4.7 Flight Programme – As 6.3.1.5

6.3.4.8 Flight Judging

Flight Judges will examine each manoeuvre with regard to the following aspects:

- (a) The shape, size and technical requirements of the intended manoeuvre.
- (b) The positioning of the manoeuvre relative to the judges' position or other datum.
- (c) The scale realism achieved relative to the subject aircraft, taking into account the following:
 - (i) Model sound - This is an assessment of how the model replicates the characteristic sound of the subject helicopter. Special consideration will be given where the model demonstrates any particular characteristic sounds of the full size helicopter. Competitors are encouraged to advise judges if such characteristic sounds can be reproduced and where they will occur in the flight. E.g. distinctive rotor noise at high speed or noise produced during high 'g' manoeuvres.
 - (ii) Speed of the model - This is a subjective assessment of the scale speed of the model.
 - (iii) Smoothness of flight – This is an assessment of the smoothness of control taking into account the prevailing weather conditions. The model should be well trimmed and show no signs of instability.

6.3.4.9 Flight Impression

At the end of the flight the judges will confer to decide the marks for Flight Impression, which is a subjective assessment of all aspects of the flight not covered by the specific manoeuvres 1 to 10. This includes the realism of all the flying between scheduled manoeuvres; the appropriateness or otherwise of the scheduled manoeuvres in an air display or an operational scenario and the overall flight presentation including the sequence of manoeuvres.

If the flight is terminated before the flight program has been completed, the Flight Impression marks will be reduced in proportion to the part of the program not flown.

6.3.4.10 K- Factors

(1) Take-off	K = 10
(2) Mandatory Manoeuvre.....	K = 8
(3) Mandatory Manoeuvre.....	K = 8
(4) Optional Manoeuvre.....	K = 8
(5) Optional Manoeuvre.....	K = 8
(6) Optional Manoeuvre.....	K = 8
(7) Optional Manoeuvre.....	K = 8
(8) Optional Manoeuvre.....	K = 8
(9) Optional Manoeuvre.....	K = 8
(10) Approach & Landing.....	K = 10
(11) Flight Impression.....	K = 16
	Total K = 100

6.3.4.11 Flight Schedule

The aim of the flight schedule is to recreate the flight characteristics and realism of the subject full-size helicopter, from when the rotors start to turn until the rotors are stopped.

All the manoeuvres must be identified on the score sheet which must be given to the judges before timing of the flight commences.

Manoeuvres (2) to (9) may be flown in any order but the sequence must be marked on the score sheet and any manoeuvre flown out of sequence will be marked zero.

(a) Mandatory Manoeuvres

The “Figure Eight” and “Descending 360 degree Circle” are mandatory manoeuvres to be included in each flight, to be positioned within the flight schedule at the competitor’s discretion. Descriptions of these manoeuvres are shown under section 6.3.5.

(b) Optional Manoeuvres

The competitor must select optional manoeuvres which should demonstrate an appropriate range of capabilities of the subject helicopter and may be selected from the list below. Descriptions of all listed manoeuvres are shown under section 6.3.5. The selection of manoeuvres may also include up to two non-listed manoeuvres or flight functions which the competitor feels are appropriate. If a competitor wishes to demonstrate any non-listed manoeuvre or flight function he must provide written details preferably with a diagram to the flight judges and seek their agreement regarding the exact nature of the proposed manoeuvre before the flying part of the competition commences. There can be no discussion with the judges on this matter at the flightline.

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. (Evidence of validity for any manoeuvre or aircraft performance can be any published document or statement of performance, flight test report, pilots notes, aircraft sales brochure or similar).

Only one manoeuvre involving dropping something or the demonstration of a mechanical function may be included in a competitor's choice of options. Mechanical functions which could be equally demonstrated on the ground, (e.g. switching on and off lights or opening & closing doors), are not acceptable as optional manoeuvres.

To assist the judges, competitors may submit a description of the full size subject helicopter's flight characteristics and performance, (originated by the manufacturer, licensing authority or established publisher). This should be given to the Flight Judges before the flying part of the competition commences.

List of optional manoeuvres -

- Loop
- Roll
- Roll of the Top
- Stall turn
- Lazy eight
- Wingover
- Chandelle
- Flight in triangular circuit
- Flight in rectangular circuit
- Extend and retract Undercarriage
- Procedure Turn
- Fixed Heading square
- Quick Stop
- Autorotation
- Confined area take-off

6.3.4.12 Presentation of Manoeuvres

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".

All manoeuvres must be performed parallel with the judges' line (para. 6.3.1.2 refers) and may be flown in either direction i.e. from the left or the right, but if any part of the manoeuvre is performed behind the judges' line it will be marked ZERO.

The height and positioning of individual manoeuvres should be proportional to that expected in a full size display appropriate to the subject helicopter. Unless specified otherwise, manoeuvres that are carried out in a horizontal plane (e.g. Figure Eight, Triangular Circuit) should commence on a flight path that is between 30° and 60° elevation to the judges. Manoeuvres such as the Descending Circle should start at a higher elevation.

Any model which flies with wheels down whereas the full size actually featured retractable landing gear shall have the total flight score reduced by 10%.

Any model which flies without the correct number of main rotor blades shall have the total flight score reduced by 10%

6.3.4.13 Flight Safety

The rotor blades of a model helicopter must not be driven unless the Helicopter is in an area designated as safe for helicopter flight. This would normally be in front of the Judges line.

If the model flies over any designated no-go area or an area laid out for the protection of spectators, officials and other competitors, or flies behind a specified safety line during any manoeuvre, the competitor will be advised and the manoeuvre will be marked zero.

If in the opinion of the Flight Judges or the Flightline Director, a model helicopter is considered unsafe, or being operated or flown in an unsafe manner, or repeatedly infringes a 'no go' area, the pilot shall be instructed to land immediately and the flight score will be zero.

6.3.5 SCALE RADIO CONTROL FLIGHT MANOEUVRES

6.3.5.1 Description of Manoeuvres

The following descriptions and diagrams are largely theoretical and indicate the optimum shape of the manoeuvres.

Scale flying is not simply an exercise in precision flying and although it is important to position each manoeuvre correctly it is equally important that the manoeuvre is flown in a manner which replicates how the manoeuvre would be flown by the full size aeroplane.

The errors listed 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.

NOTES:

Manoeuvres that are fixed wing or rotary wing specific are suffixed 'FW' or 'HELI' as appropriate.

Manoeuvres which may be oriented into the wind and which may cross the judges' line without penalty are additionally identified.

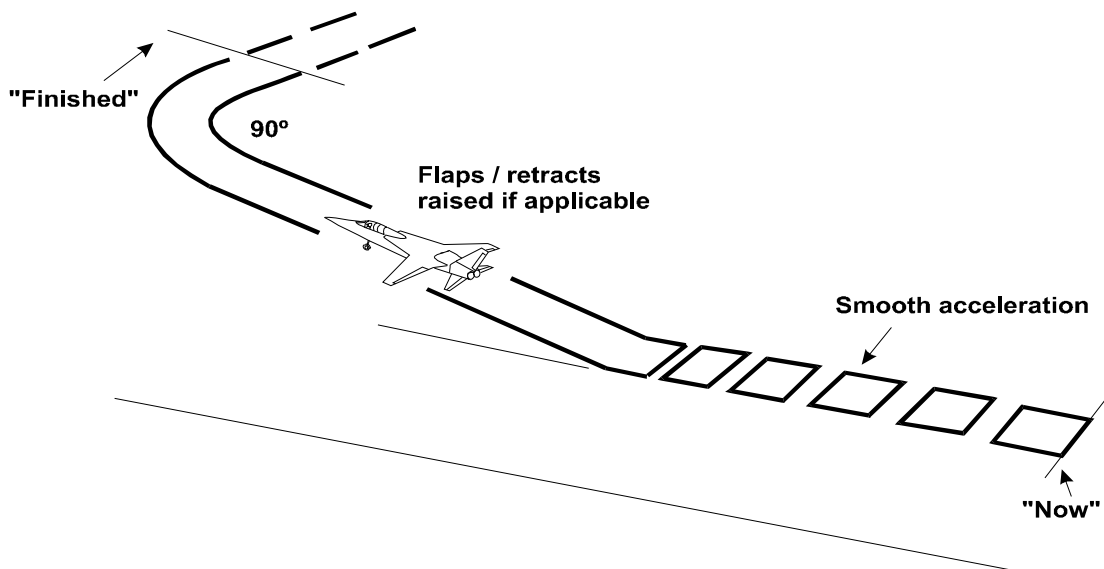
6.3.5.2. TAKE-OFF

6.3.5.2.1 TAKE-OFF – FW

This manoeuvre may be flown into the wind and the model may cross the judges' line without penalty

The model should stand still on the ground with the motor/s 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, (indoor models powered by rubber or CO₂ may be released after the competitor calls "Now"). 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 subject aircraft. The take-off is completed after the model has turned 90 degrees.

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



Errors:

- (1) Model touched after calling "Now" (zero marks). (Not applicable to rubber or CO₂ powered indoor models).
- (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) Rate of climb inappropriate for subject aircraft
- (8) Inappropriate attitude during climb (nose too high or too low).
- (9) Flaps not used if applicable.
- (10) Undercarriage 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.

6.3.5.2.2 TAKE-OFF - HELI

The model helicopter should stand still on the helipad on a heading parallel with the judge's line and with the rotor/s stationary. The rotor/s are then run up to speed and the model lifted off vertically to hover above the helipad at an altitude of 0.5 to 2 metres. The hover is sustained for 5 seconds followed by a 90° observance turn in a direction appropriate to the full size (i.e. opposite to the full size pilot's seating position – not required if pilot is seated on centre-line). After returning to the original heading, the model should then smoothly accelerate forwards and climb away at a speed and rate of climb appropriate to the full size. The take-off is completed after the model has turned 90° away from the judges line.

Diagram TBA

Errors:

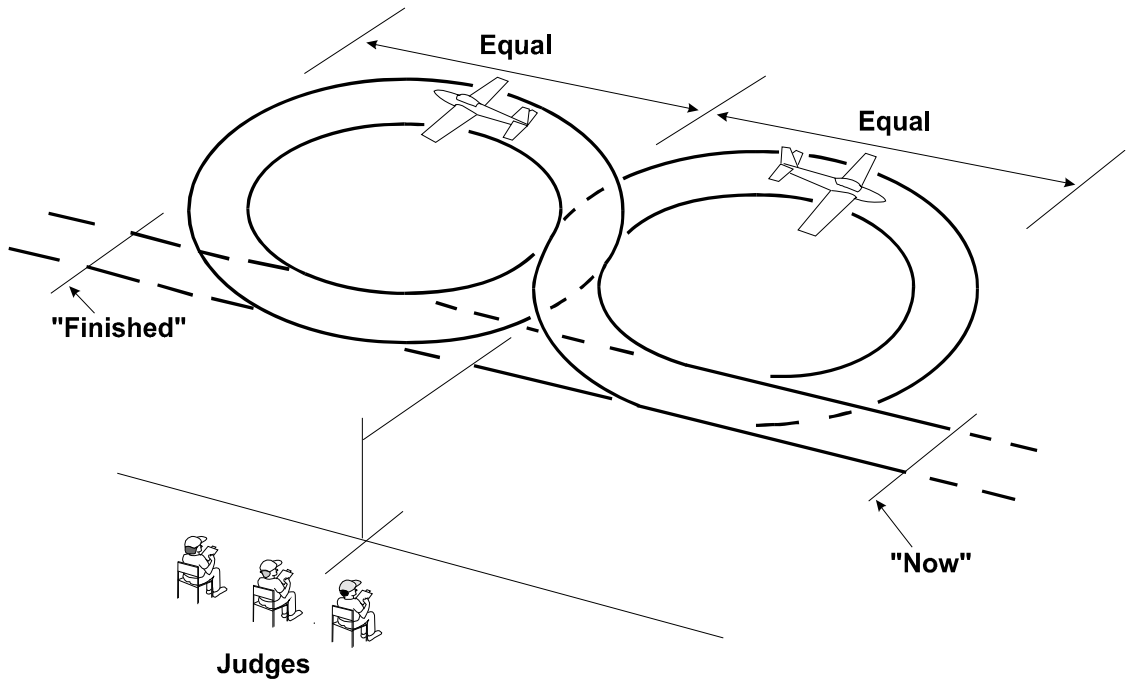
- (1) Model touched after calling "Now" (zero marks)
- (2) Yaws excessively on lift off
- (3) Hover not sustained for 5 sec.
- (4) Observance turn inappropriate/ not 90° .
- (5) Unrealistic speed / too rapid acceleration
- (6) Rate of climb inappropriate for subject aircraft
- (7) Undercarriage not raised if applicable.
- (8) Change of heading during climb
- (9) Unrealistic rate of turn onto crosswind leg
- (10) Model does not turn through 90° after climb out.

6.3.5.3 MANDATORY MANOEUVRES

6.3.5.3.1 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 centre of the judges' line. The manoeuvre is flown at a constant height

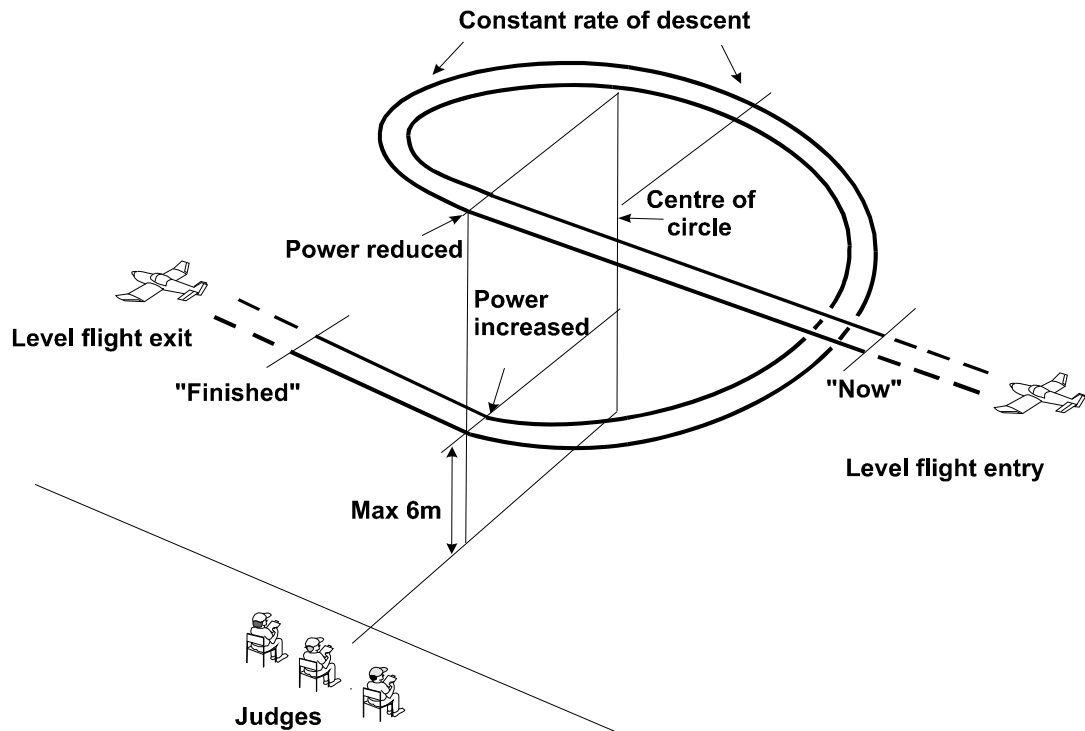


Errors

- (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 centred 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.

6.3.5.3.2 360° DESCENDING CIRCLE

Commencing from straight and level flight, above the landing area the model performs a gentle 360° descending circle in a direction away from the judges, at a low throttle setting and finishing over the landing area,. The descent and the turn is arrested at a maximum height of 6 metres (2 metres for indoor models) and the model resumes straight and level flight on the same heading as the entry.



Errors

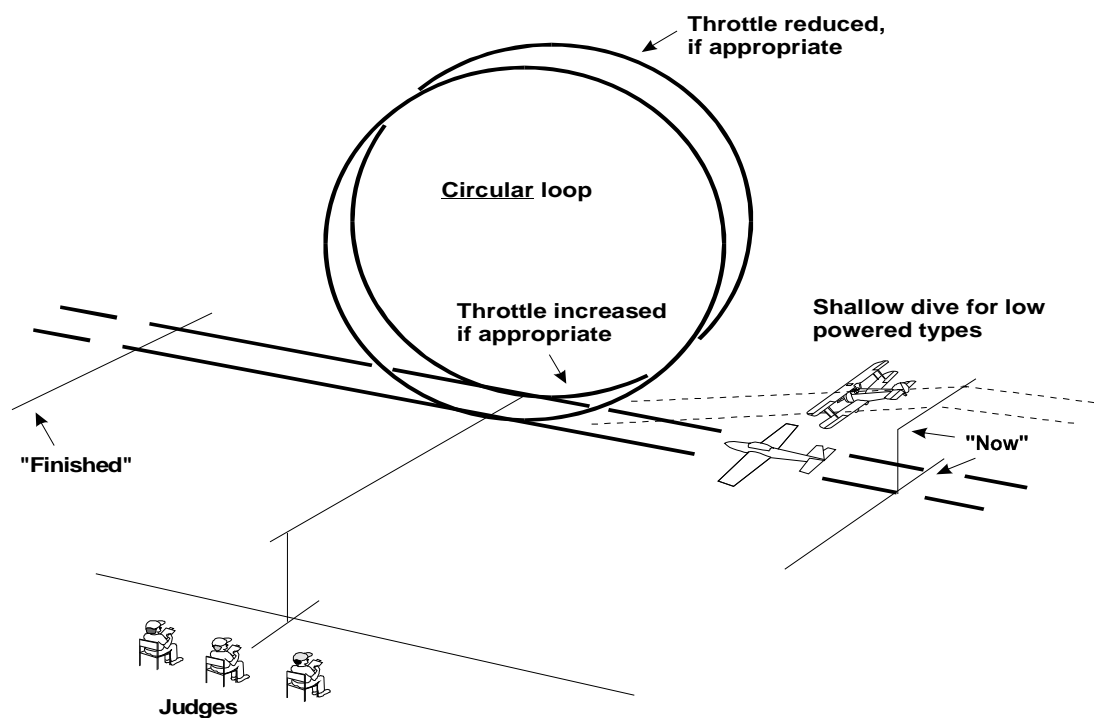
- (1) Rate of descent not constant.
- (2) Descent too steep.
- (3) Throttle setting not low enough.
- (4) Circle misshapen.
- (5) No significant loss of height.
- (6) Model does not descend to 6 metres or below (2 metres for indoor models).
- (7) Circle not centred on judges' position.
- (8) Entry and exit paths not parallel with the judges' line.
- (9) Start and finish not called in straight and level flight.
- (10) Start and completion of turn not over landing area

6.3.5.4 OPTIONAL MANOEUVRES

6.3.5.4.1 INSIDE 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.

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.

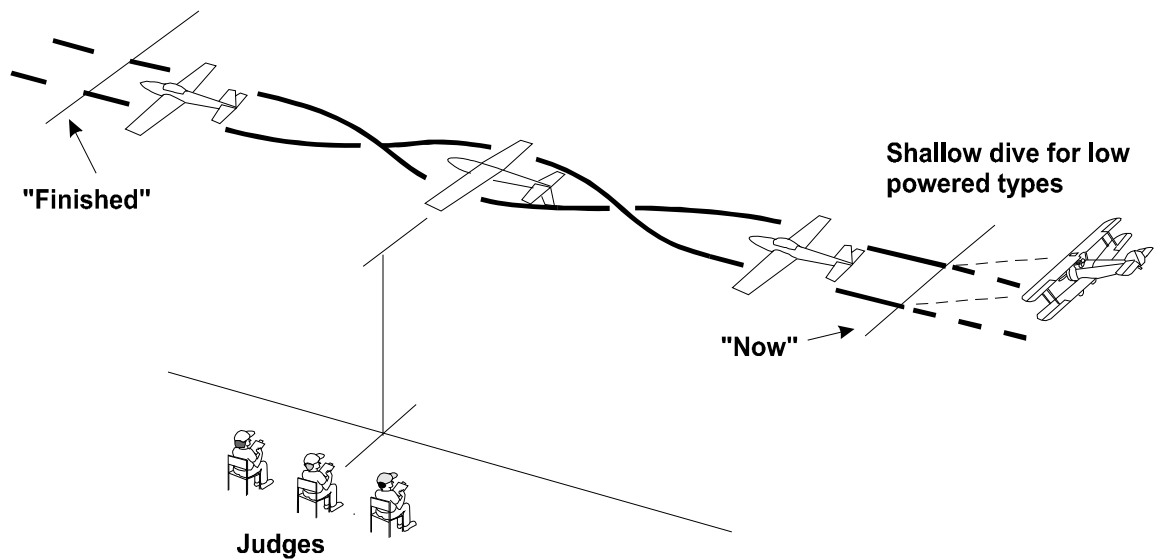


Errors

- (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 subject aircraft.
- (5) Not centred 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.

6.3.5.4.2 ROLL

This manoeuvre has two variations (a) Continuous Roll, where the model rolls at a constant rate through one complete rotation, and (b) Roll with a break or a hesitation Roll. Each of these variations have sub-variations ; e.g. Slow, Barrel, Snap 2-point ,4-point, climbing etc. Competitors may select a maximum of two sub-variations which must be specified on the score sheet before the flight is commenced. All variations will commence from straight and level flight, and after one complete rotation, resume straight and level flight on the same track and at the same altitude. The one exception to this is a climbing roll where the angle of climb must also be specified before flight. Low powered aircraft would be expected to execute a shallow dive at full throttle before commencing the manoeuvre.

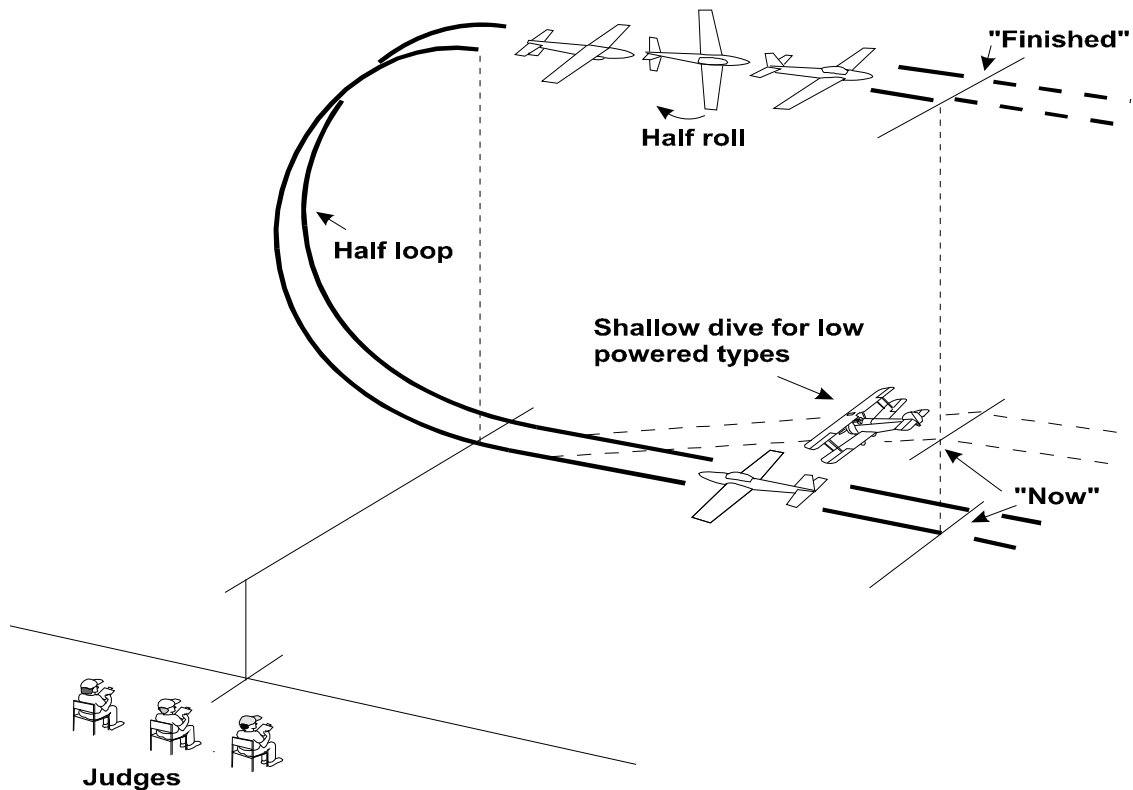


Errors

- (1) Rate of roll is not constant (continuous roll).
- (2) Style of roll not typical for subject aircraft.
- (3) Roll not centred on judges' position.
- (4) Entry and exit at different heights.(not climbing roll)
- (5) Entry and exit at different speeds.(not climbing roll)
- (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) Variation of roll not as nominated.
- (9) Inappropriate use of throttle.
- (10) Too far away / too close / too high / too low.
- (11) Hesitation roll segments not equal
- (12) Climbing roll not at specified angle

6.3.5.4.3 ROLL OFF THE TOP / IMMELMAN TURN

From 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. Low powered aircraft types would also be expected to lose some height in the half roll.

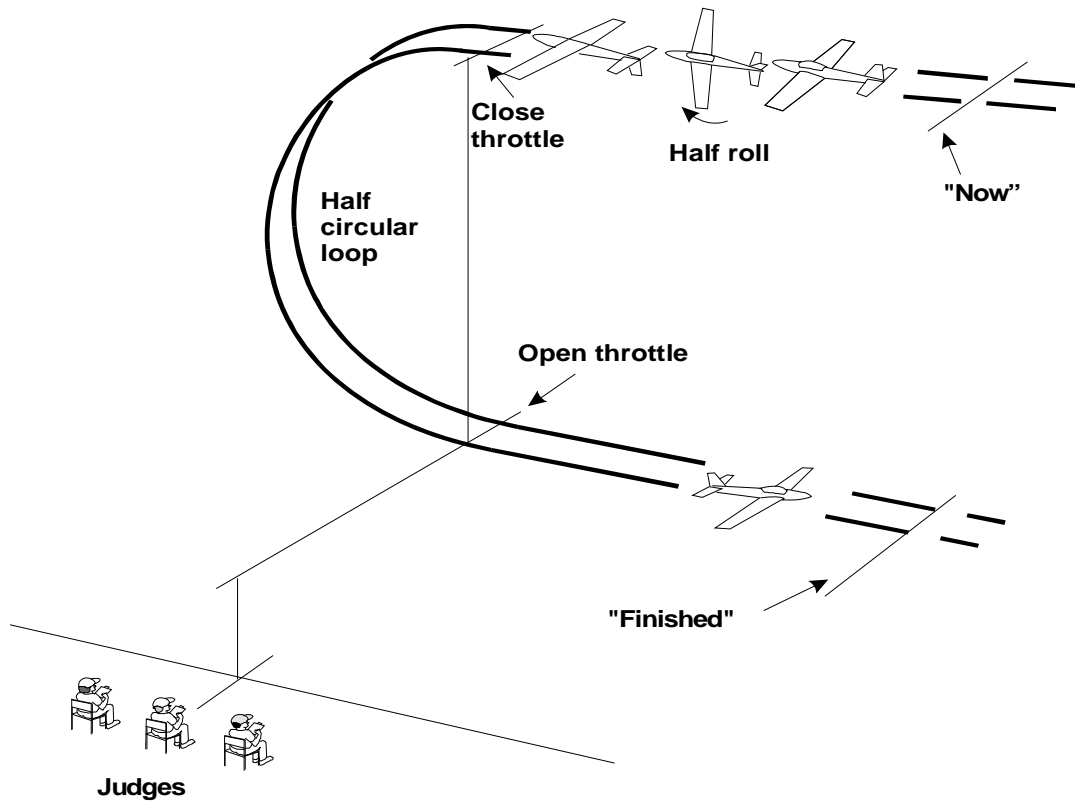


Errors

- (1) Track of the half loop not vertical.
- (2) Half loop not centred 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 subject aircraft.
- (10) Too far away / too close / too high / too low.

6.3.5.4.4 SPLIT - S or REVERSAL - FW

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.

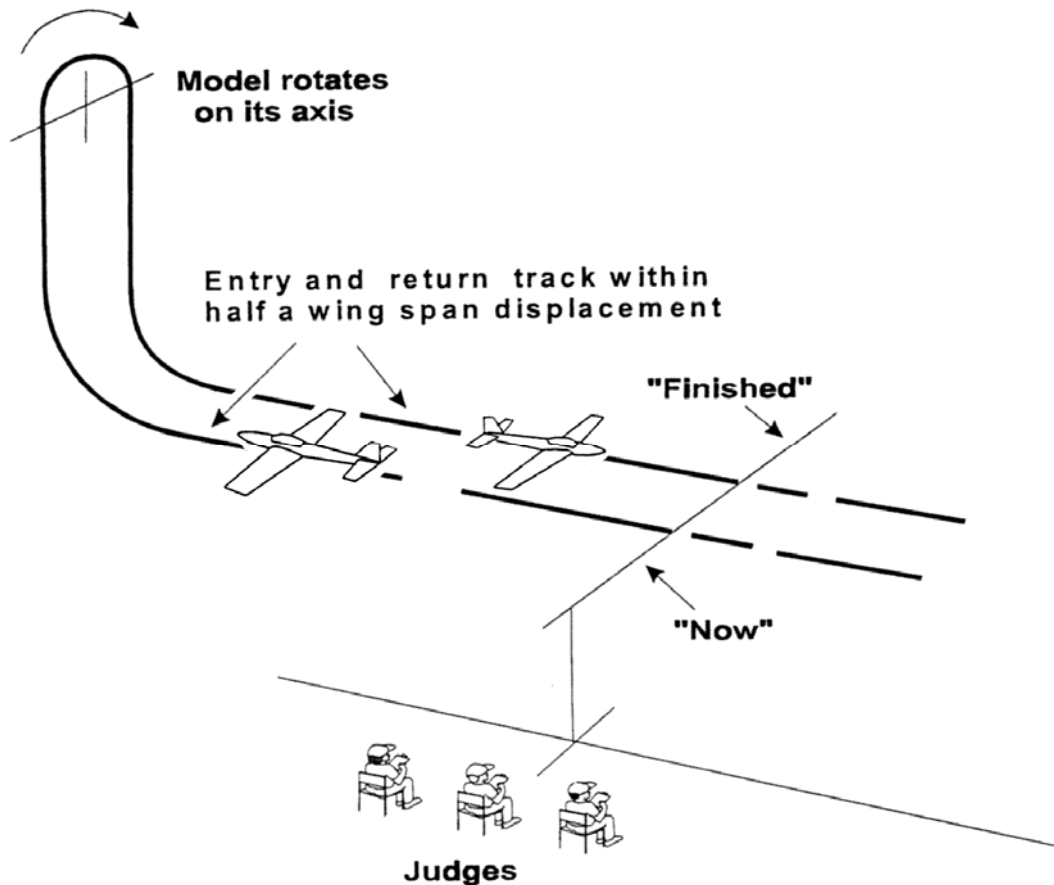


Errors

- (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) half loop is too fast or too 'tight'.
- (7) Half loop not centred on judges' position.
- (8) Model does not resume straight and level flight on opposite track to entry.
- (9) Manoeuvre not flown parallel with the judges' line.
- (10) Too far away / too close / too high / too low.

6.3.5.4.5 STALL TURN

The model aircraft starts in level flight, noses up to a vertical flight path until it comes to a stop. At which point the model aircraft yaws through 180 degrees in a direction away from the judges, 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. 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.

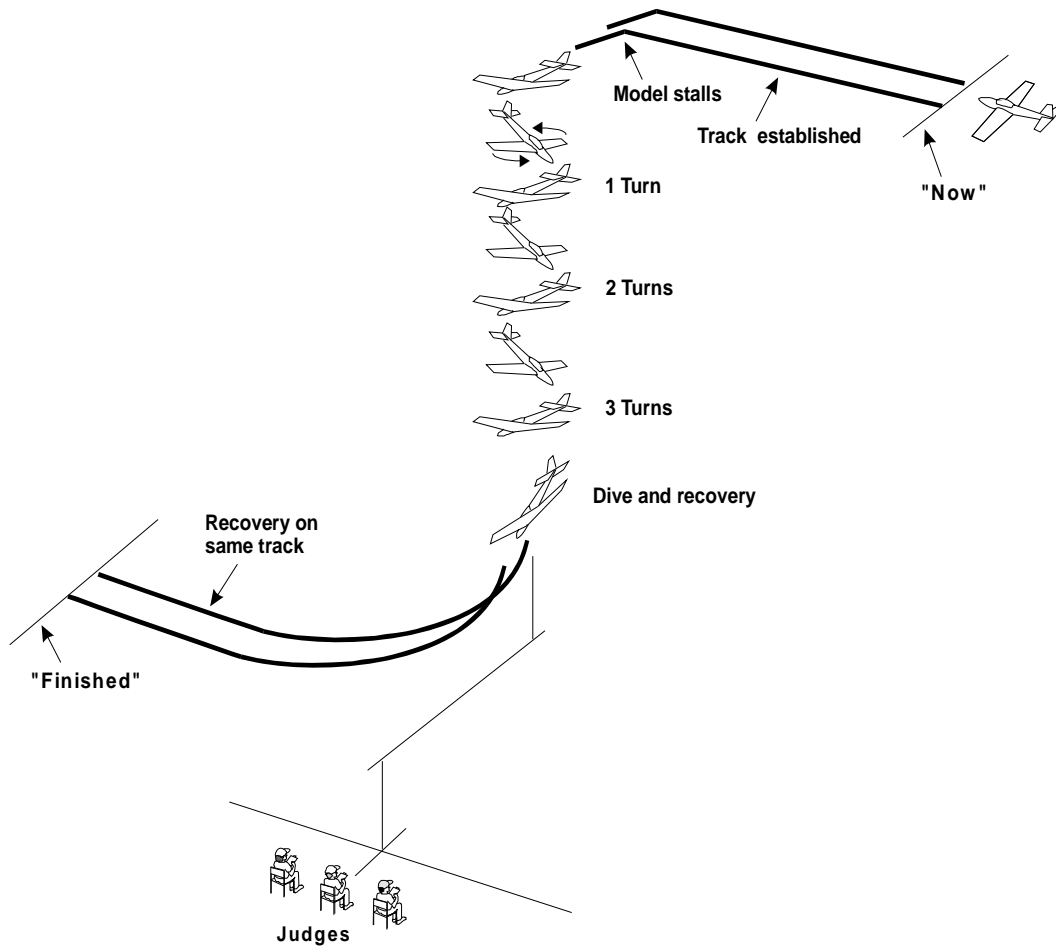


Errors

- (1) Start and 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 or stall before rotation.
- (6) Model does not turn within half its wingspan and around its vertical axis.
- (7) Model turns towards the judges.
- (8) Entry and exit paths are not at same height.
- (9) Model aircraft 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.

6.3.5.4.6 SPIN – THREE TURNS - FW

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) Incorrect use of the throttle at point of stall.
- (2) Entry into spin not clean and positive.
- (3) Not a true spin but merely a spiral dive which is a tight vertical barrel roll and which should be marked zero. In a true spin the descent path will be close to the C of G of the model.
- (4) Not three complete turns.
- (5) Start of spin not centred 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.

6.3.5.4.7 CUBAN EIGHT - FW

This option has four variations as detailed below. Competitors may select a maximum of two variations which must be specified on the score sheet before the flight is commenced.

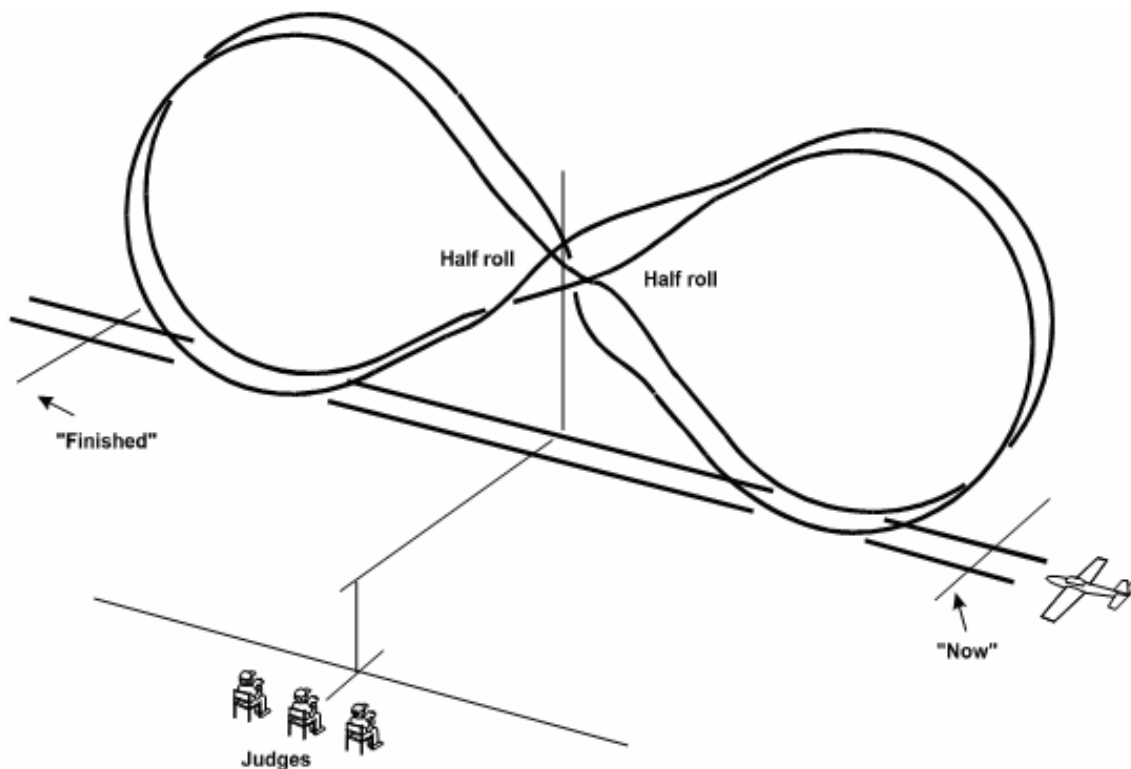
Normal Cuban Eight – Model pulls up into a circular inside loop until 45° nose down. The 45° inverted flight is held until a half roll when abeam the judges, the model then commences a similar circular inside loop with the bottom of this loop at the original entry height, followed by a half roll to repeat the manoeuvre in the opposite direction. Straight and level recovery is to be at the same height as the original entry.

Reversed Cuban Eight - The model starts with a 45° climb with half roll when abeam the judges. It then enters a downward loop with the bottom at the original entry height followed by a 45° climb with half roll, before entering the second downward loop, pulling out level at the entry height.

Half Cuban Eight - After the first 45 degree dive, with half roll, the model pulls out level at the entry height.

Reversed Half Cuban Eight - Start with the 45° climb and half roll then downward loop to finish level with entry.

Throttle may be closed at the top of each loop, as appropriate to 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.



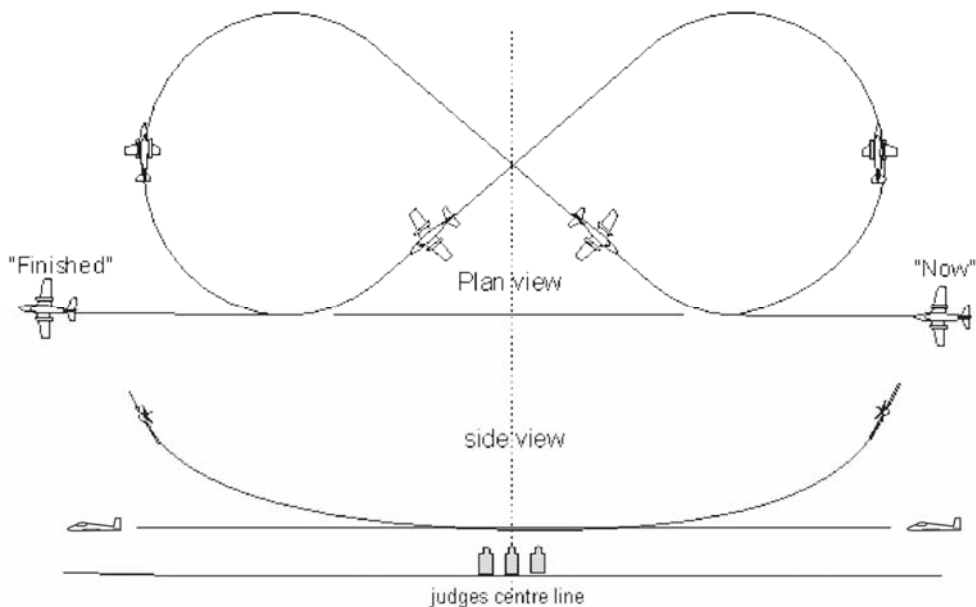
Errors

- (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 centred 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 loops not in manner of subject aircraft.
- (10) Too far away / too close / too high / too low.

6.3.5.4.8 LAZY EIGHT

The model approaches in straight and level flight on a line parallel with the Judges' line. When the model is in line with the judges (the centre) a smooth curving climb is commenced which progresses to a smooth climbing turn of constant radius away from the judges. At the apex of the turn the bank should be at least 60 degree and the model shall be on a heading of 90 degrees to the judges' line. The nose of the model then lowers and the bank comes off at the same rate as it went on. The turn is then continued beyond 180 degree to intercept the centre with the wings level and at the same height as the entry height into the manoeuvre. At the centre another smooth climbing turn is immediately commenced away from the judges, the shape of which should be the same as the first turn. The second turn is then continued beyond 180 degree to cross the centre with wings level and at the same height as the entry height into the manoeuvre. The Lazy Eight is completed by maintaining this height and heading with wings level before turning to intercept the original approach track to exit the manoeuvre parallel to the judges' line in straight and level 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. The figure should be symmetrical each side of the judges' position.

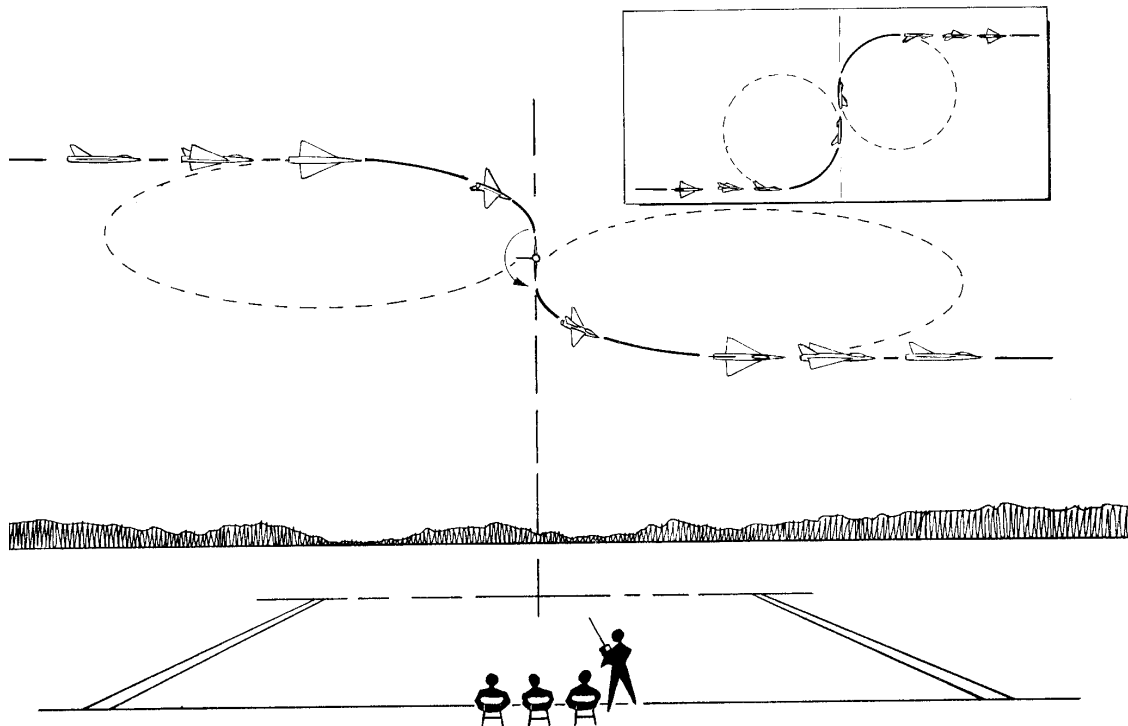


Errors:

- (1) Entry and exit paths not parallel with judges' line.
- (2) Insufficient climb achieved.
- (3) Insufficient bank achieved.
- (4) Climb and descent curves 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 subject aircraft.
- (9) Model flight path not smooth and steady.
- (10) Too far away / too close / too high / too low.
- (11) Apexes of turns not coincident with a model heading of 90 degrees.
- (12) Wings not level at the crossover.

6.3.5.4.9 DERRY TURN - FW

The model approaches at a high speed in straight and level flight on a line parallel with the judge's 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 centred 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.



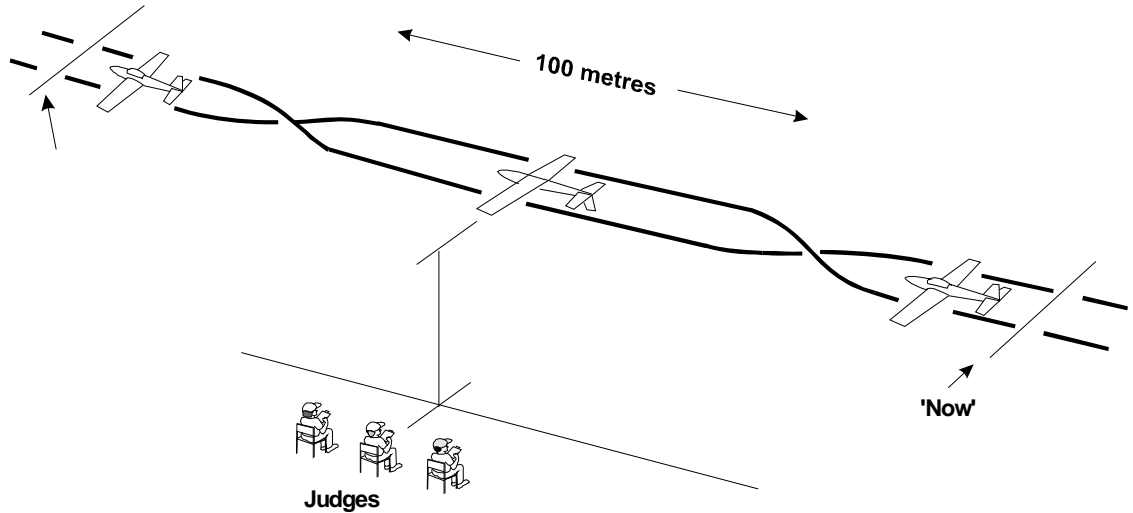
Errors

- (1) Entry not in parallel with the judge's line.
- (2) The manoeuvre not centred in front of the judges.
- (3) The rolling manoeuvre in front of the judges not axial .
- (4) The roll in centre 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.

6.3.5.4.10 INVERTED FLIGHT - FW

Model half rolls into inverted attitude and makes a straight inverted flight at constant speed, track and altitude for a minimum of 100 metres centred on the judges position, 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.

N.B. Competitors must be prepared to provide evidence that the subject aircraft was capable of sustained inverted flight.

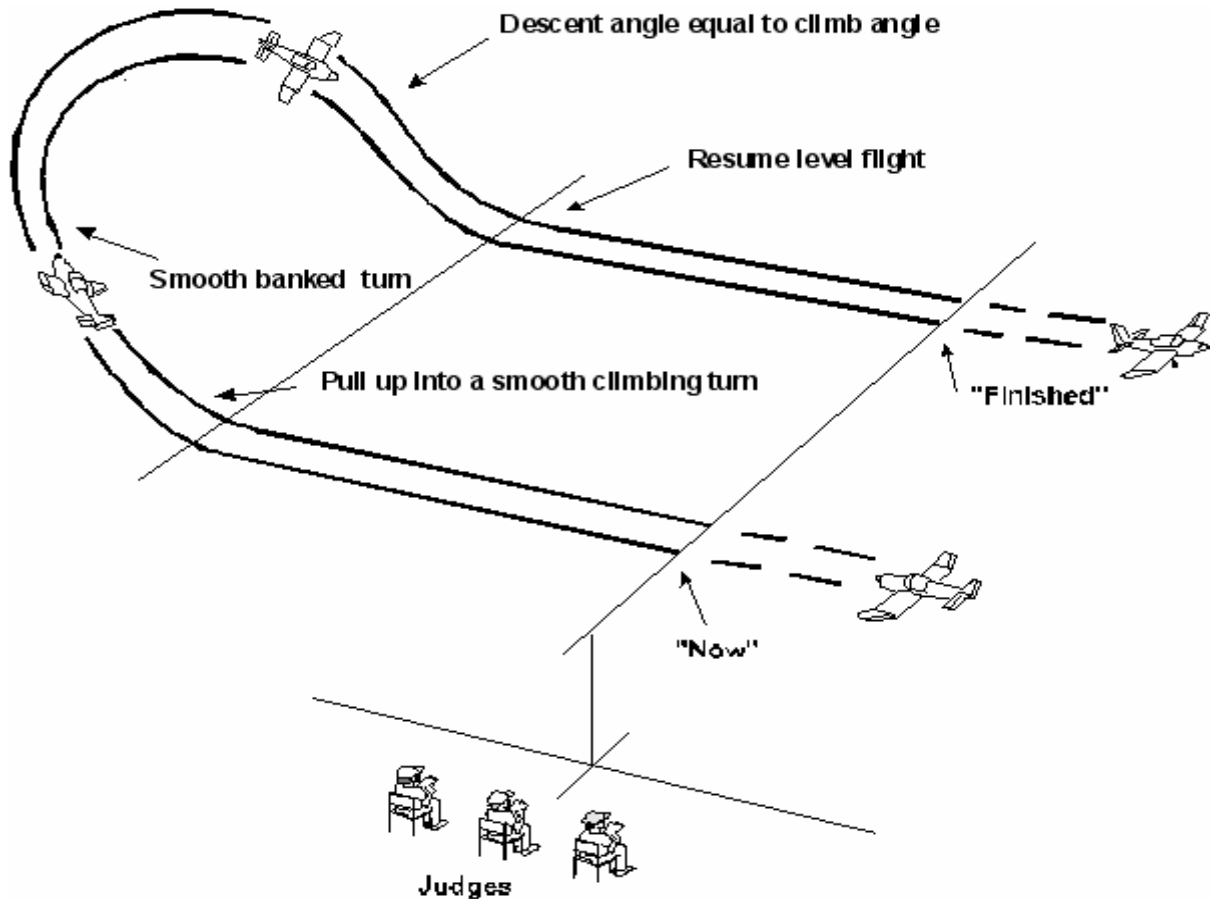


Errors

- (1) Half rolls not performed on same track as inverted flight.
- (2) Model does not fly a straight course.
- (3) Altitude not constant throughout
- (4) Model does not remain inverted for 100 metres.
- (5) Manoeuvre not centred on judges' position.
- (6) Manoeuvre not flown parallel with judges' line.
- (7) Too far away / too close / too high / too low.

6.3.5.4.11 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 deg to the entry track and the bank angle should be appropriate for the subject aircraft. The height gain should be appropriate to the capability of the subject aircraft. 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.

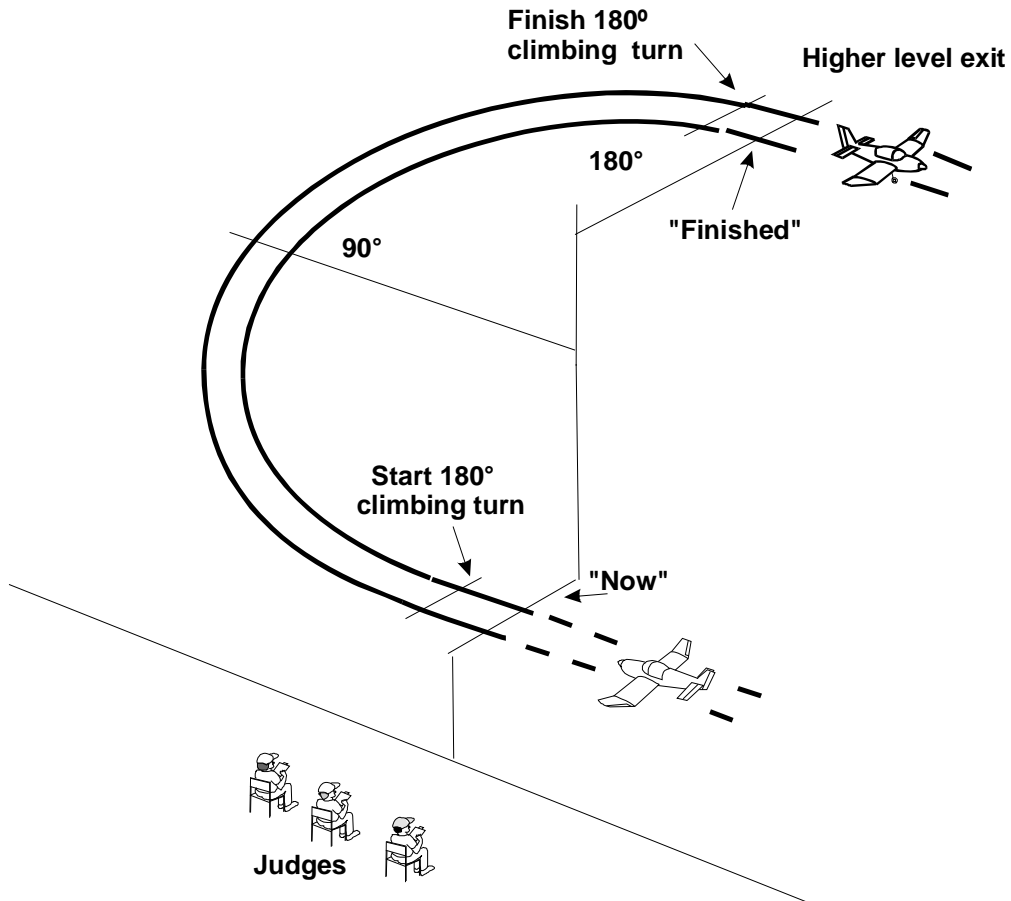


Errors:

- (1) Start and finish positions not as indicated.
- (2) Insufficient climb achieved.
- (3) Bank angle not appropriate for subject aircraft
- (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.

6.3.5.4.12 CHANDELLE

From a straight and level flight the model passes the judges and then performs a 180° constant rate climbing turn in a direction away from the judges, resuming straight and level flight on the opposite heading. The rate of climb should be the maximum which is appropriate for the subject aircraft.



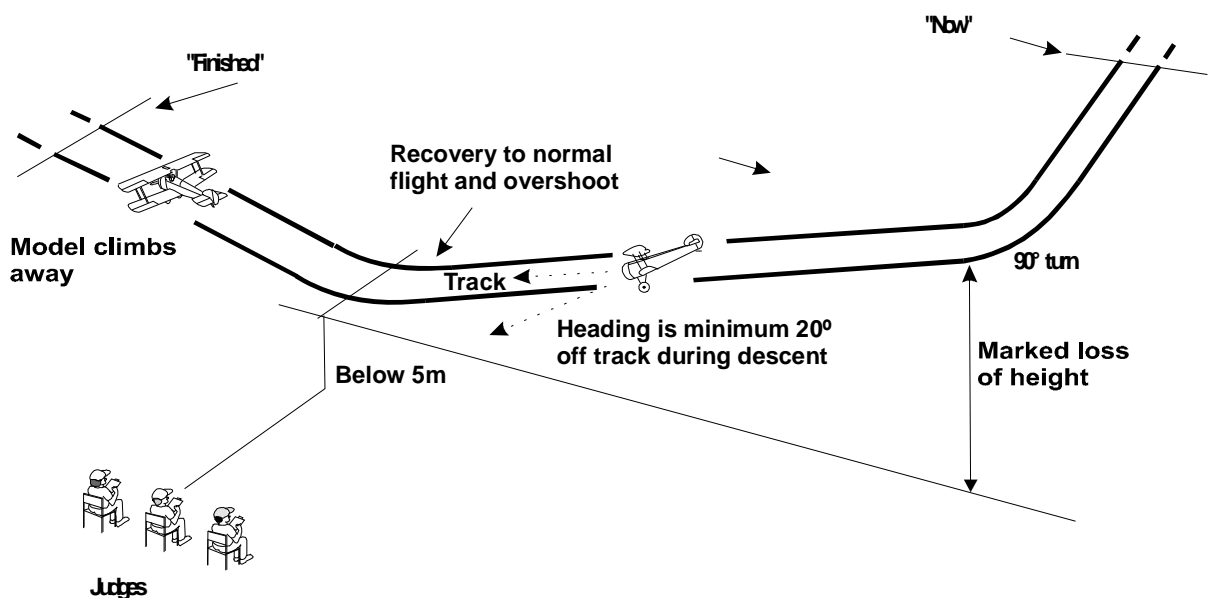
Errors

- (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/inappropriate rate of climb.
- (6) Start & finish not centred on judges' position.
- (7) Entry and exit paths not parallel with the judges' line.
- (8) Final track not 180 degrees opposite to entry.
- (9) Entry and exit not in straight and level flight.
- (10) Too far away or too high.

6.3.5.4.13 SIDESLIP - FW

This manoeuvre may be flown into the wind and the model may cross the judges line without penalty

The model commences the manoeuvre in level flight by reducing power on base leg, and then turns through 90° onto a higher than normal final approach which may be orientated into wind. After the model has completed the turn it starts a sideslip to the left or the right achieving a yaw of at least 20° off track. 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 metres 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 and to maintain the final approach track.

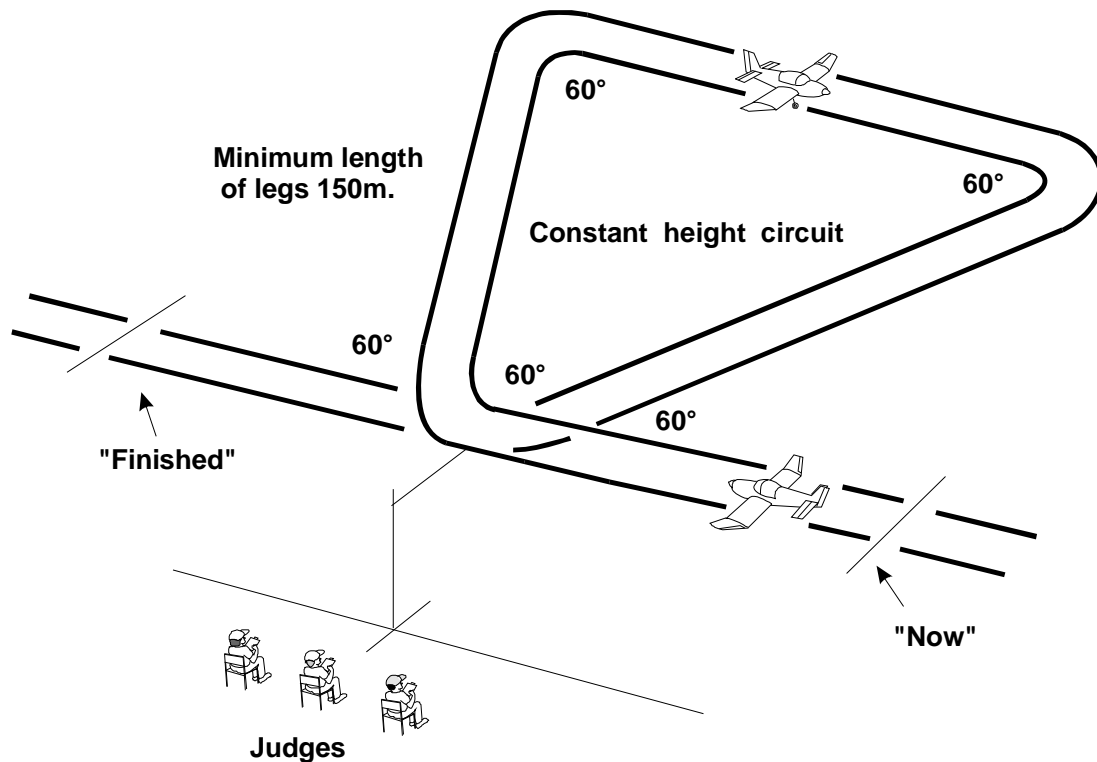


Errors:

- (1) Model does not smoothly enter sideslip after turning onto 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
- (7) The sideslip is not corrected before passing the judges.
- (8) Overshoot is not below 5 metres.
- (9) Not a smooth transition during return to normal flight and climbout.
- (10) Too far away / too close / too high / too low.

6.3.5.4.14 TRIANGULAR CIRCUIT

The model approaches in a straight and level flight to a point directly in front of the judges and then turns away to track 60° away from the judges' line. It then flies straight and level for a minimum of 150 metres, turns through 120° to track parallel with the judges' line, flies a further minimum of 150 metres, then turns through 120° to track towards the judges and flies a further minimum of 150 metres to a position above the centre of the landing area, which completes an equilateral triangle (i.e. a triangle with sides of equal length and included angles of 60°), before making a final turn to intercept the original entry track.

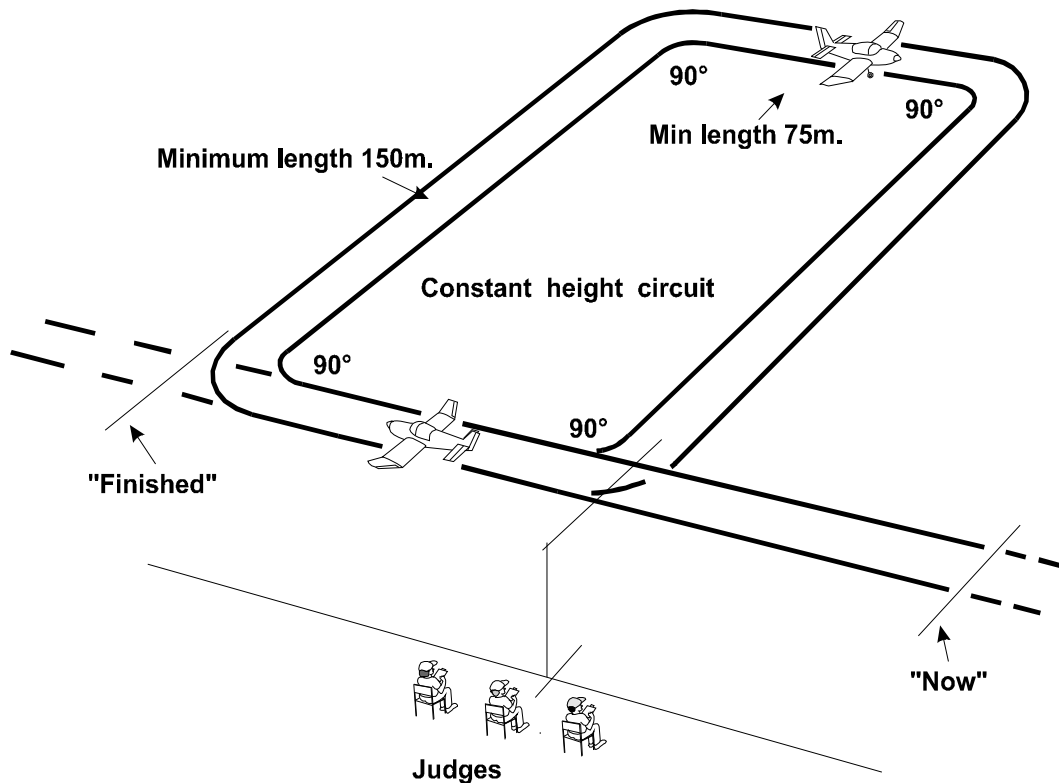


Errors

- (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 centred 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.

6.3.5.4.15 RECTANGULAR CIRCUIT

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



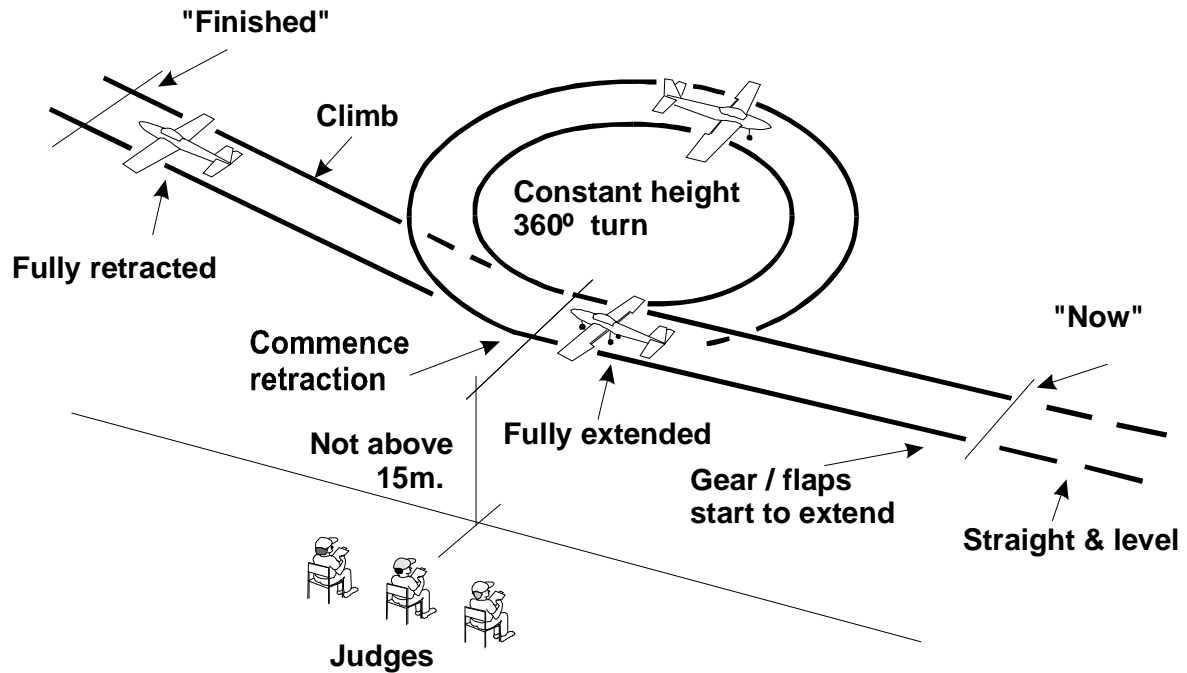
Errors

- (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 centred 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.

6.3.5.4.16 EXTEND AND RETRACT LANDING GEAR OR FLAPS – FLAPS FW

(Diagram and errors applicable to both manoeuvres unless stated)

The model approaches the landing area in straight and level flight at a height not exceeding 15m. and in full view of the judges, extends the landing gear or flaps. When in front of the judges the model then executes a 360° turn in a direction away from the judges and with a bank angle not exceeding 30°. After the turn and when again directly in front of the judges, retraction of the landing gear or flaps commences and the model climbs away in straight flight.

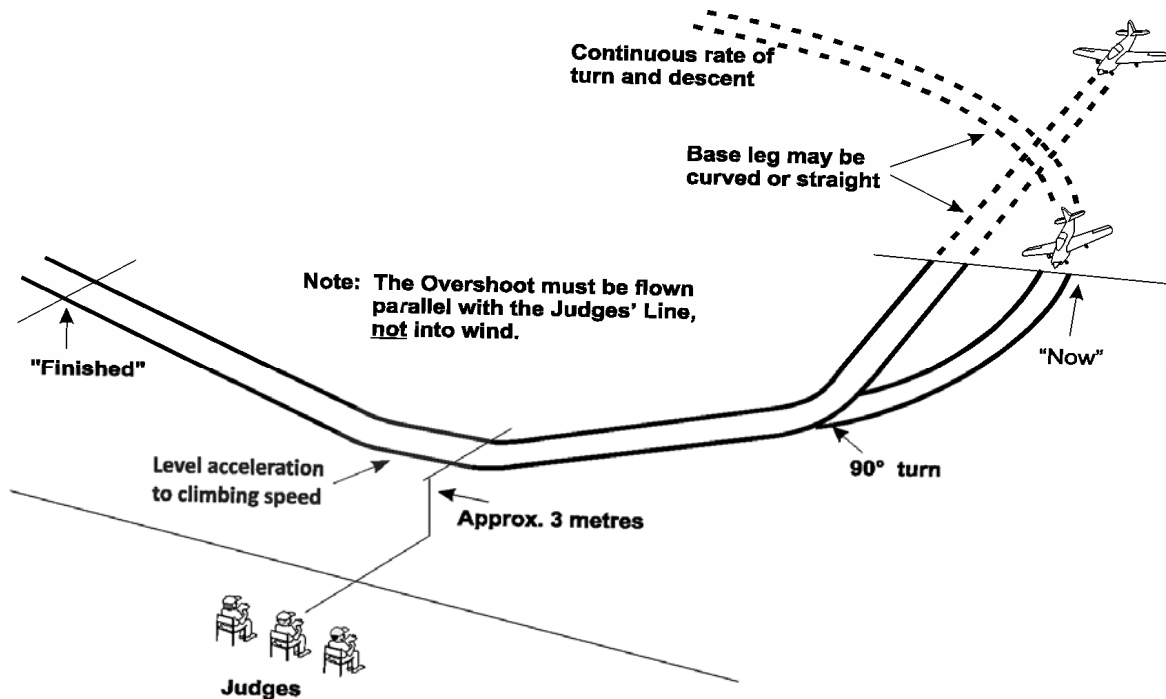


Errors

- (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) Instability with flaps lowered.
- (5) No change in attitude with flaps down.
- (5) Misshapen circle or not constant height.
- (6) Circle height exceeds 15 metres.
- (7) Inappropriate rate of turn / excessive bank angle
- (8) Circle not centred on judges' position.
- (9) Retraction not commenced abeam judges.
- (10) Entry and exit paths not parallel with the judges' line.
- (11) Entry and exit tracks not the same.
- (12) Too far away or too close.

6.3.5.4.17 OVERSHOOT or GO AROUND - FW

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 centre of the landing area at a height of approximately 3 metres, 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.

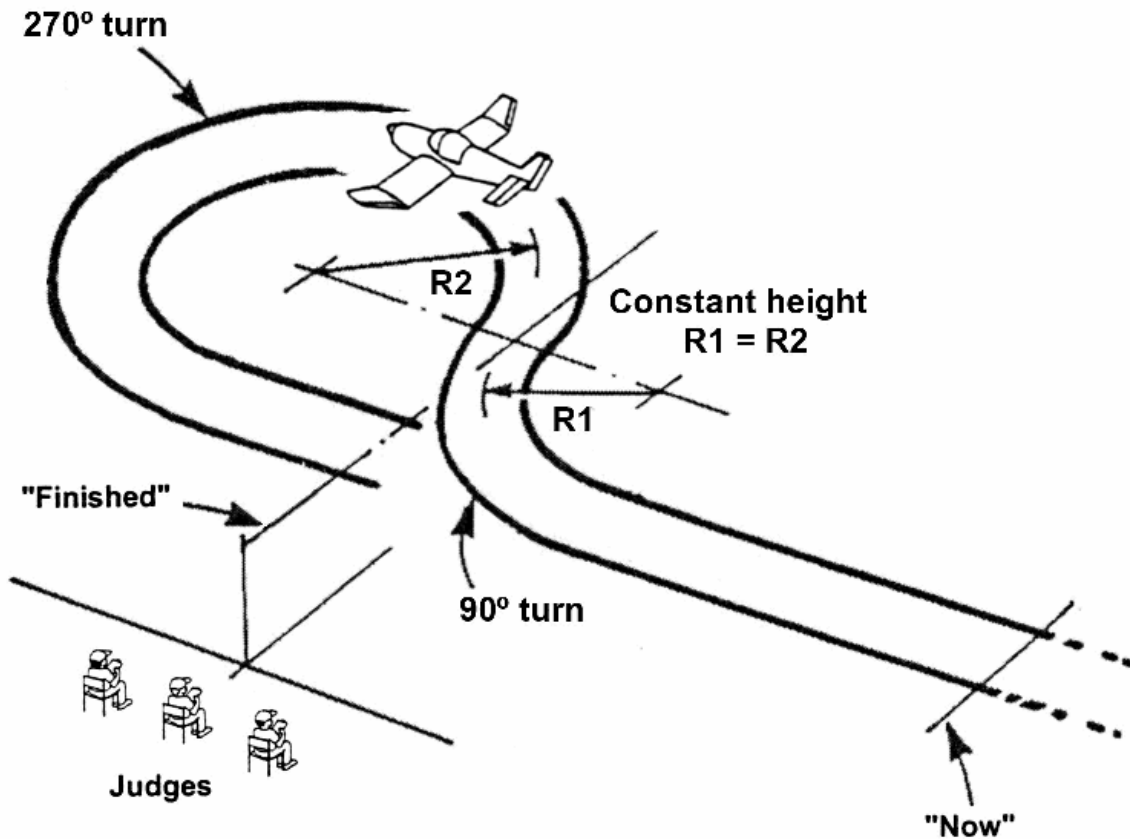


Errors:

- (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 metres.
- (7) Lowest point of manoeuvre not achieved in front of judges.
- (8) Not smooth transition of speed and 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.
- (14) Model gains height before accelerating

6.3.5.4.18 PROCEDURE TURN

The model approaches in straight and level flight on a line parallel with the Judges' line, and then makes a 90° turn in a direction away from the Judges' line. This is followed by a 270° turn in the opposite direction, completing the manoeuvre on the reciprocal heading on the original approach line. The manoeuvre must be commenced so as to place the point where the model changes from the 90° turn to the 270° on a line which is at a right angle to the direction of entry and passes through the centre of the Judges' line.



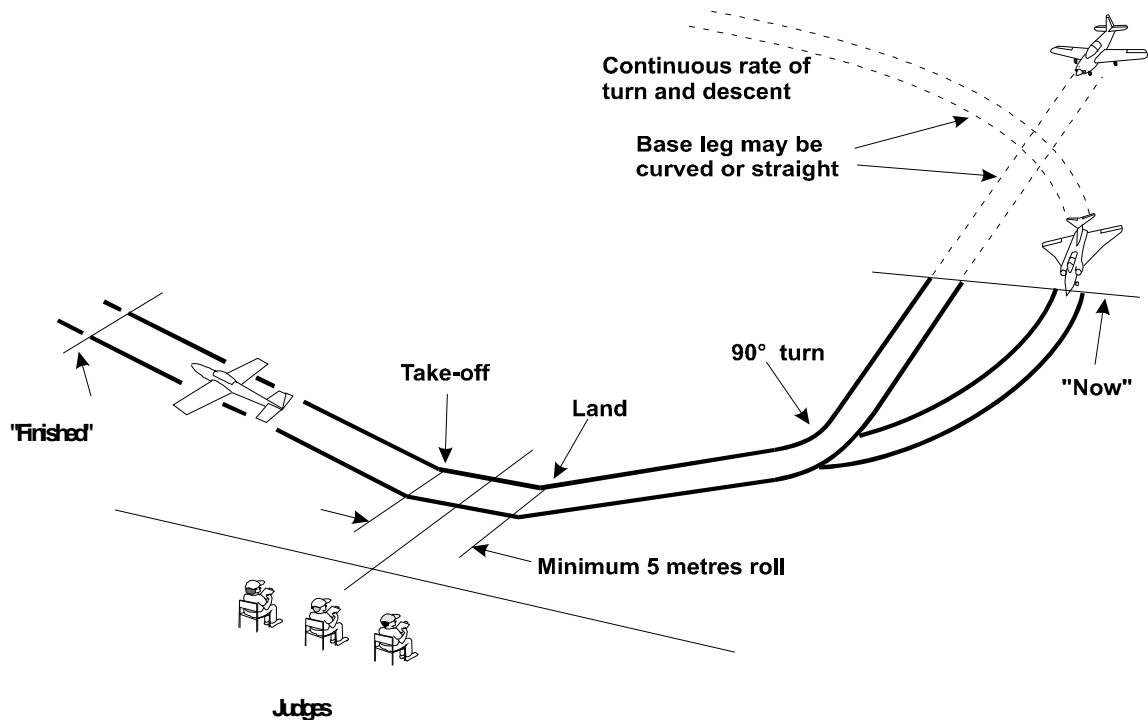
Errors

- (1) Rate of turn is not constant.
- (2) Radius of turn is not constant.
- (3) Constant height not maintained.
- (4) Entry and exit paths not on same line
- (5) Entry and exit paths not parallel with Judges' line.
- (6) Change from 90° to 270° turn not at right angles to original flight path.
- (7) Change from 90° to 270° turn not centred on Judges' position.
- (8) Overall size of manoeuvre not realistic for subject aircraft.
- (9) Model flight path not smooth and steady.
- (10) Too far away / too close / too high / too low.

6.3.5.4.19 TOUCH AND GO - FW

This manoeuvre may be flown into the wind and the model may cross the judges line without penalty

The model commences the manoeuvre 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 metres. (For Scale R/C Indoor only – ‘tail draggers’ will be expected to land on 3 points and the ground roll shall be 2 metres). Flaps will be used if applicable.

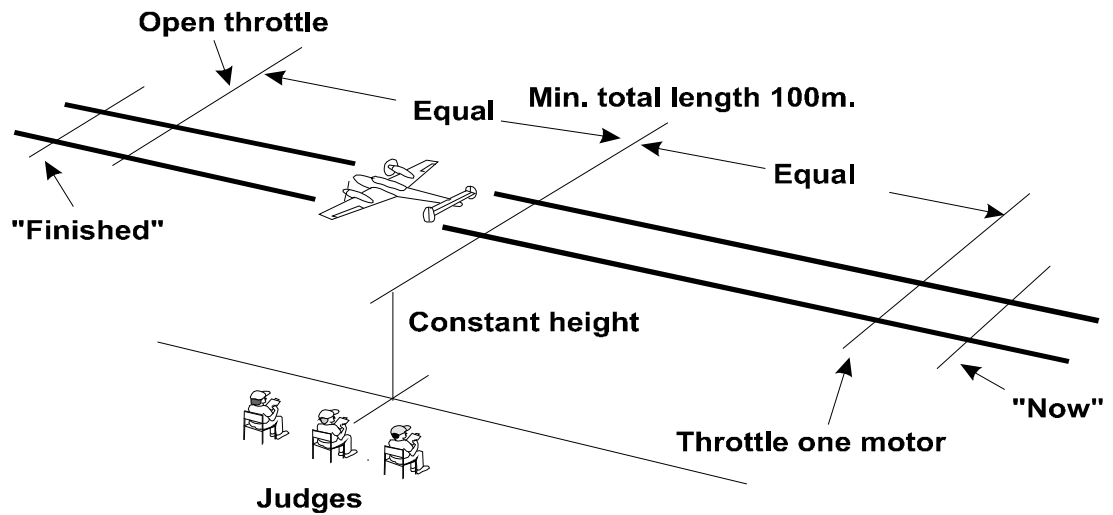


Errors

- (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 metres or 2 metres for indoor models. (Note: if prototype has two main wheels then both wheels must roll on ground for a minimum of 5 metres or 2 metre for indoor models).
- (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.

6.3.5.4.20 STRAIGHT FLIGHT WITH ONE MOTOR THROTTLED - FW

The model approaches in straight and level flight at a constant height and then one throttle is closed. The model then continues with one motor throttled, for a minimum of 100 metres, 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 centred in front of judges' position.
- (8) Not flown parallel with the judges' line
- (9) Too far away / too close / too high / too low.

6.3.5.4.21 STRAIGHT FLIGHT AT LOW SPEED - FW

The model flies in a straight line 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 exceeding 6 metres and the model must fly at a speed which would represent the minimum safe flying speed for the subject aircraft.

If the subject aircraft is fitted with retractable undercarriage then the U/C must be extended.

If the subject aircraft 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.
- (5) Manoeuvre not centered on judges' position.
- (6) Not parallel with the judges' line.
- (7) Too short distance (too long is not an error).
- (8) Failure to extend U/C or deploy high drag/low speed/high lift devices.
- (9) Model flying too fast.

6.3.5.4.22 DROPPING BOMBS OR FUEL TANKS

If bombs are carried internally, bomb-bay doors must be opened before the drop and closed after the drop, in the manner of the subject aircraft.

If bombs or fuel tanks are carried externally, they must be carried in the correct positions and released in the manner of the subject aircraft.

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

Any special features of the manoeuvre should be declared to the judges before the flight commences.

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.

6.3.5.4.23 PARACHUTE DROP

The drop should be in the manner of the full size aircraft. For example, cargo should be dropped from a hatch, bomb bay or rear ramp. A dummy man should exit from the cockpit, an escape hatch or door; fall from an inverted aircraft or be ejected in the manner of the full size. If appropriate the model should reduce speed before commencing the drop, possibly by using flaps and lowering the landing gear.

6.3.5.4.24 FIXED HEADING SQUARE - HELI

The manoeuvre is commenced with the model in a hover over the helipad on a reciprocal heading to the judges (i.e. facing the judges) and at an altitude of between 3 and 5 metres. The model then flies sideways to starboard for a minimum of 15 metres, then pauses for a maximum of 3 seconds before flying backwards for a minimum of 15 metres, pauses and flies sideways to port for a similar distance, pauses and then flies forward to hover over the helipad, where the manoeuvre is completed. The starting height and heading is maintained throughout the manoeuvre.

Diagram TBA

Errors:

- (1) Hovering height outside limits
- (2) Manoeuvre not a square
- (3) Heading not constant
- (4) Pauses at corners more than 3 seconds.
- (5) Sides of square too short, (too long is not an error)
- (6) Height not constant.
- (7) Start and finish not over helipad.

6.3.5.4.25 QUICK STOP - HELI

The model approaches the helipad on a heading parallel to the judges line, at an altitude which is not higher than 10 metres and at the maximum speed appropriate to the subject full size helicopter. Whilst maintaining altitude the model then commences a high alpha deceleration to stop in the hover over the helipad. The hover is maintained for a minimum of 5 seconds before the model flies away normally on the same heading.

Diagram TBA

Errors:

- (1) Heading not parallel with judges line/not constant
- (2) Speed inappropriate
- (3) Helicopter balloons
- (4) Helicopter yaws
- (5) Deceleration not smooth and progressive
- (6) Model does not stop over helipad
- (7) Hover not steady

6.3.5.4.26 AUTOROTATION - HELI

This manoeuvre may be flown into the wind and the model may cross the judges line without penalty

The purpose of this manoeuvre is to demonstrate a full autorotational descent to a soft landing. It is not necessary to land on the helipad, but the pilot must make the best use of the landing area available. The manoeuvre is flown into the wind and the model commences the manoeuvre at cruising speed and at a minimum height of 30 metres. The throttle is then closed and the model commences an autorotational descent at a minimum angle of 30°. At an appropriate height the flare is commenced and a smooth landing made with minimal forward speed. The manoeuvre is complete when forward speed is reduced to zero. A normal take off will follow to allow the competitor to complete the flight program.

Diagram TBA

Errors:

- (1) Insufficient altitude at start
- (2) Significant yaw or change of heading
- (3) Erratic descent
- (4) Unrealistic attitude during flare
- (5) landing not smooth
- (6) Excessive forward speed at touchdown

6.3.5.4.27 **CONFINED AREA TAKE-OFF - HELI**

The helicopter lifts off from the helipad and climbs vertically for a minimum of 5 metres. Forward speed is then progressively increased whilst the climb is sustained with an altitude gain similar to the vertical lift. A 180° climbing turn is then commenced with a similar altitude gain to the vertical lift. The manoeuvre is completed when the model has passed the line of the helipad in level flight at a minimum altitude of 15 metres and on a reciprocal heading to the start. The altitude gain in each of the three stages of the manoeuvre must be equal.

Diagram TBA

Errors:

- (1) Initial climb not vertical
- (2) Transition to forward flight too low
- (3) Transition not smooth
- (4) Helicopter yaws during lift and forward climb.
- (5) Climbing turn initiated at too low an altitude
- (6) Climbing turn not 180°.
- (7) Level flight not achieved at completion of turn.
- (8) Manoeuvre not smooth and progressive
- (9) Height gain during the three stages of manoeuvre not the same.

6.3.5.5 NON-LISTED MANOEUVRES OR FLIGHT FUNCTIONS PERFORMED BY THE SUBJECT AIRCRAFT.

A competitor may demonstrate up to two manoeuvres or flight functions of his own choice. Full details of the proposed manoeuvre preferably with a diagram must be presented to the flight judges and agreement reached as to the precise nature of the intended manoeuvre/s before going to the flight line. The competitor must be prepared to supply evidence that this function was performed by the aircraft subject type modelled, e.g. crop spraying, outside loop etc.

Procedural flying manoeuvres such as climbing turn, descending turn, etc. are not acceptable.

Mechanical functions which could be equally demonstrated on the ground (e.g. switching on and off lights), are not acceptable as flight options.

6.3.5.6 APPROACH AND LANDING

6.3.5.6.1 APPROACH AND LANDING – FW

This manoeuvre may be flown into the wind and the model may cross the judges line without penalty

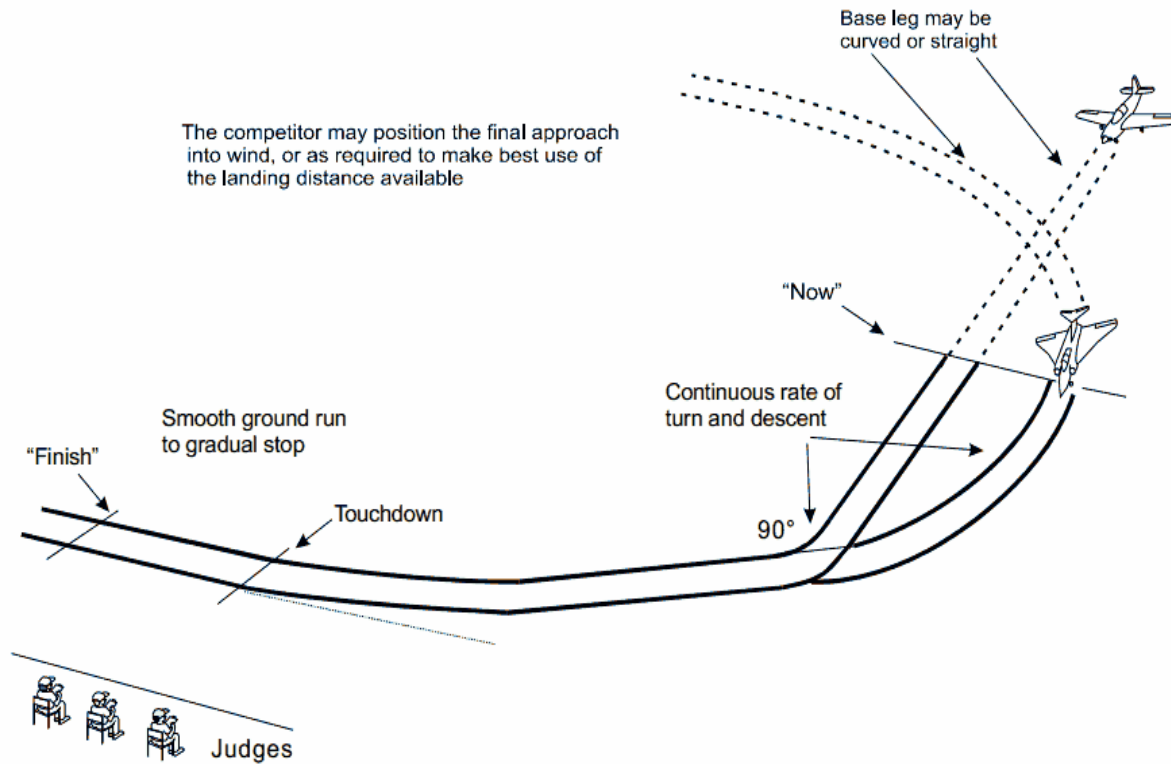
The manoeuvre commences by descending from base leg (in the same way as the Touch and Go). Prior to this point the model may complete any form of appropriate circuit to achieve a landing configuration. This may be a full rectangular or oval pattern, or join directly onto the downwind or base legs. The 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 degrees onto final approach. The model should round out smoothly, adopting the attitude applicable to the subject aircraft 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 full size and dependent upon 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 nosewheel.

If the subject aircraft used flaps and/or speed brakes for landing, then the model should also, but this may be subject to the competitor's judgement taking into account the wind strength. Flaps and/or speed brakes should be deployed at the appropriate point in the landing circuit up to and including the final approach. Any flapless landing due to the wind must be nominated at the time the landing manoeuvre is announced.

If the subject aircraft used a drogue parachute during landing the competitor may demonstrate this. The drogue must be deployed at the correct point in the landing and released when the model has come to a stop.



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 (2 mark penalty if only nose-down - zero if it over-turns).
- (13) Flaps and/or speed brakes not used if applicable.

Note:

A crash landing will be marked zero but if the model makes a good landing and then stops nose down towards the end of the landing run, then the landing marks which would have been otherwise awarded will be reduced by 2 marks. 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.

6.3.5.6.2 APPROACH AND LANDING – HELI

The model may complete any form of appropriate circuit to achieve a landing configuration. The circuit may be rectangular or oval, but after “start” is called, the model must make a final turn of at least 90° onto final approach. The model then approaches the helipad with a rate of descent and at an attitude appropriate to the full size, to transition into a hover over the helipad at an altitude of 0.5 to 2 metres. After a 3 second hover, the model then descends to touchdown and the landing is complete when the rotor/s have stopped turning.

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

Diagram TBA

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) Descent and deceleration rate not appropriate.
- (5) Model does not transition into hover over helipad.
- (6) Model does not hover for 3 seconds.
- (7) Hover not steady.
- (8) Descent to touchdown not smooth
- (9) Model not stationary during rotor rundown.

6.4

FREE FLIGHT

6.4.1 SCALE OUTDOOR FREE FLIGHT (I/C Piston Engine Powered)

6.4.1.1 General Characteristics

Maximum surface area 150 dm²
Maximum weight of complete model without fuel 2 kg
Maximum loading 50 g / dm²
Motive Power I/C Piston engine(s), individual 2.5cm³ max or for multi-engine models total 5cm³ max.

6.4.1.2 Definition of an Official Flight

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight. The model must remain airborne for at least 30 seconds for the flight to be judged and a flight score returned, when the wind velocity exceeds 4 m/s, the qualifying time shall be reduced to 20 seconds.

6.4.1.3 Number of Flights

Each competitor should have the opportunity to make a minimum of four flights.

6.4.1.4 Flying Time

Competitors must be called at least five minutes before they are required to occupy the starting area. Each competitor shall have a flying time of five minutes (plus one minute for each additional engine of multi-engined models) to complete each flight programme, the flying time commencing when the competitor begins to start the engine(s) or two minutes after entering the starting area, whichever is first. No points may be scored after the end of the flying time.

6.4.1.5 Flight

- (a) Take-off K = 20
- (b) Initial Climb..... K = 15
- (c) Realism in flight..... K = 35
- (d) Transition to descent..... K = 10
- (e) Descent and landing approach..... K = 20

Total K = 100

6.4.1.6 Complexity Bonus

The flight score shall be subject to a complexity bonus as listed in the following schedule. All bonuses are additive.

Engines (on different thrust lines)..... Bonus
Single 0
Two or more engines..... 10%

N.B. To qualify for the multi engine bonus each propeller must be driven by a separate engine unless this was not the case with the subject aircraft modelled. The engines must deliver similar levels of power.

Undercarriage

Fixed (any configuration).....	0
Retracts in flight.....	5%
Lowers in flight	5%

6.4.1.7 Marking and Scoring

Each flight judge awards marks out of 10 for each part of the flight, as defined in 6.4.1.5. These marks are then multiplied by the appropriate K factor and aggregated before the bonuses are applied as described in 6.4.1.6. The aggregate sum of the individual judges scores including the bonuses is the Total Flight Score.

The Final score is the sum of the Total Static Score and the best Total Flight Score.

6.4.2 SCALE OUTDOOR FREE FLIGHT (Rubber Powered)

6.4.2.1 General Characteristics

Maximum surface area.....	150 dm ²
Maximum weight of complete model	2 kg
Maximum loading	50 g / dm ²
Minimum wing span.....	60 cm

6.4.2.2 Definition of an Official Flight

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight. The model must remain airborne for at least 20 seconds for the flight to be judged and a flight score returned

6.4.2.3 Number of Flights

Each competitor should have the opportunity to make a minimum of four flights.

6.4.2.4 Flying Time

Competitors must be called at least five minutes before they are required to occupy the starting area. Each competitor shall have five minutes to complete each flight programme. This time shall commence two minutes after entering the starting area. The competitor may wind, or commence to wind, the motor(s) at any time beforehand. No points may be scored after the end of the time limit.

6.4.2.5 Flight

(a) Initial Climb.....	K = 20
(b) Realism in flight.....	K = 40
(c) Transition to descent.....	K = 15
(d) Descent and landing approach.....	K = 25

Total K = 100

6.4.2.6 Complexity Bonus

The flight score shall be subject to a complexity bonus as listed in the following schedule. All bonuses are additive.

Engines (on different thrust lines).....	Bonus
Single	0
Two or more engines.....	10%
N.B. To qualify for the multi engine bonus each propeller must be driven by a separate engine unless this was not the case with the subject aircraft modelled. The engines must deliver similar levels of power.	
Undercarriage	
Fixed (any configuration).....	0
Retracts in flight.....	5%
Lowers in flight	5%

6.4.2.7 Marking and Scoring

Each flight judge awards marks out of 10 for each part of the flight, as defined in 6.4.2.5. These marks are then multiplied by the appropriate K factor and aggregated before the bonuses are applied as described in 6.4.2.6. The aggregate sum of the individual judges scores including the bonuses is the Total Flight Score.

The Final score is the sum of the Total Static Score and the best Total Flight Score.

6.4.3 SCALE OUTDOOR FREE FLIGHT (CO₂ or Electric Powered)

6.4.3.1 General Characteristics

Maximum surface area	150 dm ²
Maximum weight (no fuel but including cells or tanks)	2 kg
Maximum wing loading	50 g / dm ²

Motive Power:

- (a) CO₂ motors
- (b) Electric motors (battery to be carried in the model)

Models above 200gms fitted with electric motor(s) driving external propeller(s) must have a safety device(s) which cuts the power when the propeller(s) meet an obstruction, or the model decelerates sharply. The device must also prevent the motor(s) being restarted if the model is picked up by a third party. The competitor may be required to demonstrate the effectiveness of the safety device by the competition director.

6.4.3.2 Definition of an Official Flight

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight. The model must remain airborne for at least 20 seconds for the flight to be judged and a flight score returned

6.4.3.3 Number of Flights

Each competitor should have the opportunity to make a minimum of four flights.

6.4.3.4 Flying Time

Competitor must be called at least five minutes before they are required to occupy the starting area. Each competitor shall have a flying time of 5 minutes to complete each flight programme, the flying time commencing two minutes after entering the starting area. No points may be scored after the expiration of the flying time.

6.4.3.5 Flight

- (a) Takeoff K = 20
- (b) Initial Climb..... K = 15
- (c) Realism in flight..... K = 35
- (d) Transition to descent..... K = 10
- (e) Landing approach..... K = 20

Total K = 100

6.4.3.6 Complexity Bonus

The flight score shall be subject to a complexity bonus as listed in the following schedule. All bonuses are additive.

- Engines (on different thrust lines)..... Bonus
- Single 0
- Two or more engines..... 10%

N.B. To qualify for the multi engine bonus each propeller must be driven by a separate engine unless this was not the case with the subject aircraft modelled. The engines must deliver similar levels of power.

- Undercarriage
- Fixed (any configuration)..... 0
- Retracts in flight..... 5%
- Lowers in flight 5%

6.4.3.7 Marking and Scoring

Each flight judge awards marks out of 10 for each part of the flight, as defined in 6.4.3.5. These marks are then multiplied by the appropriate K factor and aggregated before the bonuses are applied as described in 6.4.3.6. The aggregate sum of the individual judges scores including the bonuses is the Total Flight Score.

The Final score is the sum of the Total Static Score and the best Total Flight Score.

6.4.4 SCALE INDOOR FREE FLIGHT (Rubber Powered)

6.4.4.1 General Characteristics

- Maximum weight..... 200g (including motor)
- Maximum wing loading..... 15 g / dm²
- Motive Power..... extensible motors (rubber) only

6.4.4.2 Definition of an Official Flight

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight. The model must remain airborne for at least 15 seconds for the flight to be judged and a flight score returned.

6.4.4.3 Number of Flights

Each competitor should have the opportunity to make a minimum of four flights.

6.4.4.4. Flying Time

A minimum period of 15 minutes shall be allocated for trimming before the competition begins and the competitor must be called five minutes before he/she is required to occupy the starting area. Failure to comply will result in the loss of the flight. The model will be released, after notifying the flight judges, within a period of 3 minutes, plus one minute for each additional motor. Only one release is permitted during the allocated time.

6.4.4.5 Flight

- (a) Takeoff K = 15
- (b) Initial Climb..... K = 12
- (c) Descent and landing approach..... K = 19
- (d) Quality of landing..... K = 17
- (e) Realism in flight..... K = 37

Total K = 100

6.4.4.6 Complexity Bonus

The flight score shall be subject to a complexity bonus as listed in the following schedule. All bonuses are additive.

- Engines (on different thrust lines)..... Bonus
 - Single 0
 - Two or more engines..... 10%
- Note To qualify for the multiengine bonus each propeller must be driven by a separate engine unless this was not the case with the subject aircraft modelled. The engines must deliver similar levels of power.
- Undercarriage
 - Fixed (any configuration)..... 0
 - Retracts in flight..... 10%
 - Lowers in flight 10%

6.4.4.7 Marking and Scoring

Each flight judge awards marks out of 10 for each part of the flight, as defined in 6.4.5.5. These marks are then multiplied by the appropriate K factor and aggregated before the bonuses are applied as described in 6.4.5.6. The aggregate sum of the individual judges scores including the bonuses is the Total Flight Score.

The Final score is the sum of the Total Static Score and the best Total Flight Score.

6.4.5 SCALE INDOOR FREE FLIGHT (CO₂ or Electric Powered)

6.4.5.1 General Characteristics

Maximum weight (no fuel but including cells or tanks) 200g

Maximum wing loading 15 g / dm²

Motive Power:

- (a) CO₂ motors
- (b) Electric motors (battery to be carried in model)

6.4.5.2 Definition of an Official Flight

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight. The model must remain airborne for at least 15 seconds for the flight to be judged and a flight score returned.

6.4.5.3 Number of Flights

Each competitor should have the opportunity to make a minimum of four flights.

6.4.5.4 Flying Time

A minimum period of 15 minutes shall be allocated for trimming before the competition begins and the competitor must be called five minutes before he/she is required to occupy the starting area. Failure to comply will result in the loss of the flight. The model will be released, after notifying the flight judges, within a period of 3 minutes, plus one minute for each additional motor. Only one release is permitted during the allocated time.

6.4.5.5 Flight

- (a) Takeoff K = 15
- (b) Initial Climb..... K = 12
- (c) Descent and landing approach..... K = 19
- (d) Quality of landing..... K = 17
- (e) Realism in flight..... K = 37

Total K = 100

6.4.5.6 Complexity Bonus

The flight score shall be subject to a complexity bonus as listed in the following schedule. All bonuses are additive.

Engines (on different thrust lines) Bonus

Single 0

Two or more engines..... 10%

Note To qualify for the multiengine bonus each propeller must be driven by a separate engine unless this was not the case with the subject aircraft modelled. The engines must deliver similar levels of power.

Undercarriage

Fixed (any configuration)..... 0

Retracts in flight..... 10%

Lowers in flight 10%

6.4.5.7 **Marking and Scoring**

Each flight judge awards marks out of 10 for each part of the flight, as defined in 6.4.6.5. These marks are then multiplied by the appropriate K factor and aggregated before the bonuses are applied as described in 6.4.6.6. The aggregate sum of the individual judges scores including the bonuses is the Total Flight Score.

The Final score is the sum of the Total Static Score and the best Total Flight Score.

6.4.6 **SCALE PEANUT**

6.4.6.1 **Qualification**

Open to any scale free flight rubber powered model of either not more than 13" span or not more than 9" overall length excluding propeller.

6.4.6.2 **Documentation**

The minimum documentation is to be one of the following:

- (a) A general arrangement drawing of at least 2 inches wing span, plus one photograph or printed reproduction of the full sized aircraft. If the photograph or printed reproduction is not in colour, then an authentic written colour description must be included.
- (b) A coloured 3-view (e.g. 'Profile' publication) to a minimum of 1/144 scale.

The competitor must also state in the documentation, the type of covering material used on the model.

6.4.6.3 **Flying Section**

Each competitor is allowed up to 9 official flights. An official flight is counted each time the model is released for a declared flight. The times of the longest 2 flights (each rounded down to the nearest second) will be aggregated to form the competitor's flight score. Flights may be hand launched or from Take-off. If Take-off is successfully achieved, without pushing or similar assistance, then 10 seconds will be added to the flight time recorded.

6.4.6.4 **Static Judging/Appearance**

The General Static Judging rules (section 6.1.2) do not apply to Scale Peanut

Models will be judged visually, in comparison with the documentation provided, by one or more judges. No scale measurements will be taken and there is no restriction to static judging distance. Marks will be awarded as follows:

	Points
(a) Workmanship, marked on merit	0 - 15
(b) Complexity and accuracy of colour and markings.....	0 - 10
(c) Authentic details	0 - 5
(d) Flying surfaces	
All double surface	4
Double surface wing but single surface tail.....	2
Single surface	0
Note: If however the prototype itself was single surface, then the model should be likewise single surface and be awarded the full 4 points.	

(e)	Surface Finish	
	Authentic Colour	5 - 9
	Unpainted coloured tissue.....	4
	Unpainted condenser paper.....	3
	Clear film.....	0
(f)	Landing gear	
	Scale length	3
	Slightly enlarged	2
	Greatly enlarged or no documentation.....	1
	None or retracted	0
(g)	Dihedral	
	Scale	3
	Slightly exaggerated	1
	Grossly exaggerated or no documentation	0
(h)	Empennage	0 - 3
(i)	Bonus points for complexity	
	Low wing	9
	Biplane	9
	Triplane	15
	Autogyro.....	21
	Helicopter.....	27
	Flying boat or floatplane.....	9
	Scale number of wing ribs.....	2 per wing
	Scale number of tailplane ribs.....	1
	Scale number of rudder ribs.....	1/2
	Separate control surface	1/2 each
	Other than square fuselage	1
	Wheel pants or spats	1
	Three dimensional pilot.....	1
	Exposed engine	1
(j)	Negative points for deviation from scale to assist flying performance	
	Lengthening of nose or tail moment.....	2 each
	Moving wing back	2
	Simplifying fuselage cross-section or outline	2
	Enlarging rudder	2
	All other non-scale performance aids.....	2 each

6.4.6.5 Scoring

The order of marking in 6.4.7.3 and 6.4.7.4 will produce a 'place' in the Flying and Appearance sections respectively. Each contestants numerical 'places' in the two sections are added. The lowest overall totals then determine the final overall placings in the competition.

In the event of a tie, final overall places shall be determined by referring to the appearance score, followed if necessary by reference to the flight scores, comparing first flights, then second flights. If there is still a tie, the places will be decided by a duration fly off.

Models that do not record an official flight time will not qualify for a placing in the competition.

6.4.7 SCALE PISTACHIO

6.4.7.1 Qualification

Open to any scale free flight rubber powered model of either not more than 8" span or not more than 6" overall length excluding propeller.

6.4.7.2 Documentation

The minimum documentation is to be one of the following:

- (a) A general arrangement drawing of at least 2 inches wing span, plus one photograph or printed reproduction of the full sized aircraft. If the photograph or printed reproduction is not in colour, then an authentic written colour description must be included.
- (b) A coloured 3view (e.g. 'Profile' publication) to a minimum of 1/144 scale.

The competitor must also state in the documentation, the type of covering material used on the model."

6.4.7.3 Flying

Each competitor is allowed up to nine official flights. An official flight is counted each time the model is released for a declared flight.

There is no bonus for a successful RoG.

The times of the longest two flights (each rounded down to the nearest second) will be aggregated to form the competitor's flight score.

6.4.7.4 Static Judging/Appearance

The General Static Judging rules (section 6.1.2) do not apply to Scale Pistachio

Models will be judged visually, in comparison with the documentation provided, by one or more judges. No scale measurements will be taken and there is no restriction to static judging distance. Marks will be awarded as follows:

- (a) Workmanship 0-10
- (b) Complexity and authenticity of colour and markings 0 - 5
- (c) Authentic details 0 - 3
- (d) Scale dihedral..... 0 - 2
- (e) Scale empennage/foreplane 0 - 2
- (f) Surface finish (no penalty for single surface) 0 - 5
- (g) Complexity
 - low wing 4
 - biplane 4
 - triplane (or more) 7
 - more than one powered propeller 3
 - floats 2
 - helicopter/autogyro 5
 - for each flying surface with separate controls 1 each
 - fuselage crosssection 0 - 3
 - pilot 0 - 2
 - exposed engine..... 0 - 2
 - wheel spats/pants 1
 - rigging or flying wires 0 - 3

(h) Deviations to aid flying performance minus 2 each
Competitor's appearance score will be the sum of the marks awarded in 6.4.7.4(a) through to 6.4.7.4.(h).

6.4.7.5 Scoring

The order of marking in 6.4.8.3 and 6.4.8.4 will produce a 'place' in the Flying and Appearance sections respectively. Each contestant's numerical 'places' in the two sections are added. The lowest overall totals then determine the final overall placing in the competition.

In the event of a tie, final overall places shall be determined by referring to the appearance score, followed if necessary by reference to the flight scores, comparing first flights, then second flights. If there is still a tie, the places will be decided by a duration fly off.

Models that do not record an official flight time will not qualify for a placing in the competition.

6.4.8 SCALE INDOOR KIT SCALE

6.4.8.1 Qualification

This competition is open to any scale model built from a commercial kit that meets the following general characteristics:

Maximum weight..... 200g (including motor)

Maximum wing loading 15g/dm²

Motive Powerrubber, CO₂ or electric

Models of gliders are approved for this competition, they may be launched in any manor appropriate to the subject aircraft modelled. A single helper is permitted to assist with the launch.

No declaration as to compliance is required from the competitor but the judges reserve the right to weigh and exclude any model they suspect of being overweight.

Models may be built from kit parts or the builder's own wood but the kit plan must be provided as authentication.

The only modifications permitted from the original kit are those associated with fitting an alternative power source, a replacement propeller (including for rubber), wheels and moving the rear motor peg for rubber powered models.

6.4.8.2 Documentation

The minimum documentation required is the original (or photocopy) plan from which the model was built and one photograph, drawing or painting (e.g. box art) of either the aircraft modelled or a similar aircraft from the same era to authenticate the general colour scheme and markings.

6.4.8.3 Static Judging

The philosophy is different from other scale classes in that models are judged against authenticity and accuracy to the kit plan rather than absolute accuracy to photographs and 3 views.

Marks will be awarded up to the maximum of 100 to reflect the quality of workmanship and character of the models as follows:

- (a) Workmanship (finesse, accuracy to plan, warps, neatness of covering etc)... (60%)
- (b) Authenticity of Colour Scheme & Accuracy of Markings (if present) (20%)
- (c) Overall Character(20%)

It is expected that most models will have a coloured tissue finish with painted, printed, transfer or tissue markings. Fully painted models will not be excluded but will have 5 marks deducted from their static score. 5 marks will also be deducted for each significant deviation from the original design other than those permitted above. (Typical deductions include: increased dihedral, separate control surfaces where these are not shown on the plan etc)

6.4.8.4 Definition of an Official Flight

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight. The model must remain airborne for at least 10 seconds for the flight to be judged and a flight score returned.

6.4.8.5 Number of Flights

Each competitor should have the opportunity to make a minimum of 4 flights.

6.4.8.6 Flying Time

A minimum period of 15 minutes shall be allocated for trimming before the competition begins. Thereafter, each competitor shall be called five minutes before he/she is required to occupy the starting area. The model shall be released, after confirming that the flight judges are ready, within a period of 3 minutes, plus one minute for each additional motor. Failure to comply will result in the loss of the flight. Only one release is permitted during the allocated time.

6.4.8.7 Marking

Each phase of the flight will be awarded marks between 0 and 10 by each judge during the flight as follows:

- (a) Take-off K = 1
- (b) Initial Climb.....K = 1
- (c) Descent and Landing ApproachK = 1
- (d) Quality of LandingK = 1
- (e) Realism in Flight (speed, 'sit', stability and character)K = 2

6.4.8.8 Flight Score

The flight score will be the aggregate of the 2 highest scores awarded by each of 2 judges. If only one flight judge is available, the flight scores will be doubled.

6.4.8.9 Total Score

The total score will be the aggregate of the static mark and flight score (Maximum 340). In the event of a tie, the model with the higher flight score will take the higher place.

6.4.9 SCALE FREE FLIGHT – FLIGHT CHARACTERISTICS

Applicable to the following classes:

Scale Outdoor F/F I/C Piston Engine Powered Class - 6.4.1

Scale Outdoor F/F Rubber Class - 6.4.2

Scale Outdoor F/F CO2 / Electric Class - 6.4.3

Scale Indoor F/F Rubber Class - 6.4.5.

Scale Indoor F/F CO2 / Electric Class - 6.4.6

Scale Indoor Kit Scale Class - 6.4.9

6.4.9.1 Flight Phases

The flight of a Scale Free Flight model is broken down into several phases for judging purposes and the following descriptions apply to these phases. Not all these phases apply to all free flight classes and the individual class rules should be referred to as appropriate.

These descriptions are largely theoretical and indicate the typical performance of a Scale Free Flight model, however the model should at all times fly in the same manner as the subject aircraft.

The errors listed for each phase cannot be an exhaustive list of all possible faults, but they are intended to show the sort of errors that are likely during that phase of the flight.

6.4.9.2 Takeoff

The model should slowly accelerate from rest, leaving the ground after an appropriate ground run. The take-off run should be straight, and transition to flight should be smooth.

Errors:

- (1) Ground run too short, too long or assisted
- (2) Ground run curved. Note – Taildraggers may exhibit a slight swing as the tailwheel leaves the ground which should not be penalised.
- (3) Tail or nose wheel does not leave the ground before the main wheels,
- (4) One wing drops

6.4.9.3 Initial Climb

The model should smoothly rotate to a climbing attitude, and commence a gentle straight or curved climb. The rate of climb should be constant and appropriate to the prototype.

Errors:

- (1) Climb too steep or too shallow
- (2) Bank angle too high.
- (3) Wing drop or wing rock occurs
- (4) Pitch attitude too high or too low.

6.4.9.4 Realism in Flight

The model should mirror the flight characteristics of the subject aircraft

in speed, flight attitude, stability and balance. The model may fly in a straight line or turn in either or both directions. Turns should display an appropriate amount of bank. The flight should be smooth and continuous, especially the transitions between takeoff, climb, cruise, descent and landing approach. Due allowance must be made for the prevailing wind conditions.

Errors:

- (1) Model flies too slowly or too fast
- (2) Nose attitude is too high or too low

- (3) Model stalls, or shows fugoidal flight path
- (4) Model flies one wing low or is unstable laterally
- (5) Model pitches harshly when motor stops
- (6) Model is unstable and does not recover smoothly after hitting turbulence
- (7) Turns are flat or out of balance, e.g. left turn with right bank.

6.4.9.5 Transition to Descent

The model's flight path should smoothly change between cruise and descent. The change may be abrupt, after an abrupt motor stoppage, or prolonged if the power slowly reduces. The direction of flight may or may not change.

Errors:

- (1) Model stalls or an excessive pitch change is apparent as the motor stops
- (2) Model drops a wing or wing rock occurs

6.4.9.6 Descent and Landing Approach

The descent should be smooth, continuous and stable. It may be straight or curved. The rate of descent should be consistent with that of the prototype either engine on or engine off. As the model nears the ground it should adopt a landing attitude consistent with that of the prototype. Allowance must be made for prevailing wind conditions.

Errors:

- (1) Model stalls, drops or rocks the wings
- (2) Glide angle too steep a glide. Note: the glide angle may change significantly with engine on or off.
- (3) Model does not adopt a landing attitude

6.4.9.7 Quality of Landing (Indoor Only)

After adopting the landing attitude, the model should descend slowly to the floor, and touch down without bouncing. The ground run should be smooth and straight, with the model coming slowly to rest. Models with Tricycle u/c should touchdown on main wheels only; taildraggers should three-point.

Errors:

- (1) The model bounces
- (2) Ground run not straight
- (3) Model does not stop
- (4) Model ground loops
- (5) Model touches down too hard.
- (6) Model lands in a nose down attitude

ANNEX 6A

SCALE TEAM SELECTION PROCESS (F4C and F4H)

6.A.1 Rules to be Used

Team trials will be run to the FAI rules that will be in force in the year of the international competition for which the selection is taking place. The FAI F4C and F4H rules are available from either the BMFA Head Office or from the FAI/CIAM website: <http://www.fai.org/ciam-documents>.

It is the competitors' responsibility to ensure they are aware of the differences between the BMFA rules and the FAI rules.

Following the team trial the Scale Technical Committee will offer places to the top three from each class plus reserves in order of qualifying merit.

6.A.2 Minimum Standard of Qualification:

The Scale Technical Committee has, for a number of years, set a minimum qualification standard of 70% for Team selection. It is therefore expected that all successful participants shall achieve total scores (based on 2 judges) of at least 2800 points.

6.A.3 Static Qualification:

Separate arrangements will be made at the dedicated Team Trials for Static judging. This will normally require it to be a two-day event.

6.A.4 Flight Qualification

The flight aspect of team selection shall be based upon flying performance at the Team Trial, the UK Nationals and BMFA/STC Scale events throughout the season in the year preceding the international contest in question. These events (R/C Scale, Stand-Off Scale or Flying Only), shall be nominated at the start of each season and comprise at least 4 suitable venues including the Nationals. A qualifying flight score at the Nationals must be in the class for which you want to be considered for a team place, that is:

R/C Scale for F4C & F4H (see notes 1 to 4 below)

or Stand-Off Scale for F4H (see note 1 below)

The highest two flight scores achieved by each competitor at any two qualifying events throughout the season may count towards selection. These two scores shall be averaged and carried forward to comprise half the final qualifying flight score at the dedicated Team Trials event.

To achieve consistency across the various venues and conditions experienced during the season, the qualifying scores mentioned above will be normalised in terms of the highest scoring competitor at each event, e.g. the highest flight score will be 100% with the remainder expressed as a percentage of this.

The remaining half of the flight qualification will be the best flight score achieved at the actual Team Trials event. If weather precludes flying at the Trials, then the score achieved from the season's qualifying events will be adjusted to count as the sole flight element. Should there be a tie; the static scores shall be used to determine placings.

Participation in the team trial must be with the model(s) that you wish to have considered for a team place. It is accepted that any scale model complying with the current F4C/F4H weight limit may be used to attain qualifying flight scores during the season. The actual model intended for the international event must however be the one entered for static assessment and flown at the dedicated Team Trials event. Any further substitution of model prior to the international event shall be subject to individual approval by the Scale Technical Committee. This shall be based on evidence at BMFA Scale contests the following year, proving the new model to be equal to or better than the one used at the Trials.

Supporting Notes:

1. At the Nationals competitors are restricted to entering one class only. If you need a qualifying score from the Nats and are trying for a place on both teams you will be expected to enter F4C at the Nats, i.e. a score in F4C at the Nats can be considered as a qualifier for F4H (if needed) but not the other way round.
2. If you are trying for a place on both teams you will require two eligible models; one for each class. Competitors wanting to compete for selection for both classes **with different models** will be allowed to fly each at the Team Trials (time being the only constraint). (NB: At a World Championships the same model cannot be entered in both classes). The flight scores achieved during the season that constitute 50% of the team qualifier may be applied to both models (but see Note 1).
3. If you are trying for a place on both teams and are unsuccessful in F4C the 'F4C' model may be considered for the F4H team provided that it scores higher than the F4H model when judged to F4H rules.
4. If you are primarily trying for a place in the F4C Team and are not successful then you may be considered for the F4H Team with the same model; provided that model is eligible for F4H and you have it statically judged to both sets of rules. However, you will only have the opportunity to gain one flying score for each model entered at the team trial.

ANNEX 6B

ANNUAL SCALE TROPHIES

6.B.1 Official BMFA Trophies

These trophies are administered by the BMFA Records Officer and are awarded at the AGM Dinner.

6.B.2 BMFA National Championships

(a) Handley Page Trophy (122)

Awarded to the highest scoring multi-engined model competing in all classes at the Nationals. Scoring is based upon each model's percentage score of the maximum available for its class.

6.B.2.1 Scale R/C classes

(a) Radio Modeller Scale Trophy (57)

Winner of the F4C event.

(b) Radio Modeller II Trophy (65)

Winner of Scale R/C "Flying Only" class.

(c) Stand-Off Trophy (108)

Winner of Stand-Off Scale.

(d) Radio Modeller Trophy Number I (Number to be advised)

Awarded to the highest placed competitor in the "Flying Only" class who has not competed in a previous Scale R/C class at the National Championships. This trophy may be awarded at the AGM dinner but does not qualify for a free dinner ticket.

6.B.2.2 Scale C/L Classes

(a) Knokke No 2 Trophy (18)

Winner of the Scale C/L event.

6.B.2.3 Scale F/F (outdoor)

(a) Superscale Trophy (19)

Winner of Scale F/F Power event.

(b) Model Flier Trophy (97)

Winner of Scale F/F Rubber event.

(c) Knight & Pridham Trophy (104)

Winner of Scale F/F CO2/Elec event.

6.B.2.4 Scale Indoor Nationals

- (a) Hotham Trophy (58)**
Winner of Scale Open Rubber event.
- (b) Doug Sheppard Trophy (101)**
Winner of Scale CO2/Elec event.
- (c) Butch Hadland Memorial (75)**
Winner of Scale Peanut event.
- (d) Mike Goldby Memorial Trophy**
Winner of the Kit Scale event.

6.B.3 Official BMFA Trophies at Other Events

- (a) Ripmax Trophy (47)**
Winner of Scale R/C at an event nominated each year by the Scale Technical Committee
- (b) Eric Coates Memorial Trophy (131)**
Awarded each year across all Scale disciplines to the model that in the opinion of the Scale Technical Committee, best captures the spirit and endeavour of Scale modelling.

6.B.4 Scale Technical Committee Trophies

These trophies are administered by the BMFA Scale Technical Committee and are not eligible for AGM Dinner awards.

- (a) John David Jones Painting**
The original painting is awarded each year to the highest placed new model in the Scale R/C(F4C), Scale R/C Stand-off and F/F classes at the National Championships, based upon each model's percentage score of the maximum available for its class. The model may have been flown previously during that season but must not have flown at a previous National Championship.

In the opinion of the Scale Technical Committee, the model must be a genuinely new model and not modifications or a rebuild of an existing model. The CDs of FF and RC events will have the sole responsibility for nominating candidates for the Trophy.
- (b) Aeroplane Monthly Trophy**
The original painting is awarded at the BMFA Scale Indoor Nationals each year to the highest placed British civil light aircraft from the period 1919 to 1939.
- (c) Modellers Den Peanut Trophy**
Awarded to the winner of the Scale Peanut event at the BMFA's Autumn scale indoor event.
- (d) RC Model Flyer Trophy** - Donated by RC Model Flyer Magazine to be awarded to the best scratchbuilt Scale Indoor RC model at the Scale Indoor Nationals.

NOTES

NOTES

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