BRITISH MODEL FLYING ASSOCIATION

CONTEST RULES - SECTION 6

SCALE

FREE FLIGHT - CONTROL LINE
RADIO CONTROL - INDOOR

To be read in conjunction with the Contest Rules Sections 1 and 2 GENERAL REGULATIONS AND RULES which is available free of charge from the BMFA

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NOTES

Changes to this document other than consequential paragraph re-numbering, minor typographical, grammatical and syntactical changes, are listed in the synopsis on page 3 and 4 and marked by a vertical sidebar in the right-hand margin.

Gender

Words of masculine gender should be taken as including all genders.

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.

Scale Website and Downloads

The BMFA Scale Website is at https://scale.bmfa.org and contains details of the Scale Technical Committee, Scale newsletters and the contest calendar.

This Rule Book**,** the Scale Judges Guides, the CD’s guide, the Competitor’s Declaration and all the score sheets used at Scale Competitions can be downloaded from this website.

Synopsis of 2025 Changes

6.1.1.1 Clarification BMFA and FAI Rule equivalents.

6.1.1.3 (c) Control Line, Builder of the Model Rule clarification.

6.1.1.5 Number of Models allowable for free flight.

6.1.1.5 BMFA Achievement Scheme clarification.

6.1.1.6 Name and speed of model clarification.

6.1.1.11 Scoring System Change (this is repeated in each relevant class)

6.1.1.23 CAA Article 16 – OPERATOR I.D. number clarification for Control Line models.

6.1.2.1 Competitors Declaration clarification.

6.1.2.3 Documentation, Scale Drawings (ii) clarification.

6.1.2.7 Class CL1 Static Judging Distance change. CL1.

6.2.1 Class CL1 has now been amended and is based on FAI class F4B.

6.2.1.1 Class CL1 Control Line Model Characteristics changes.

6.2.1.2 Class CL1 Control Line Static Judging distance change.

6.2.1.9 Class CL1 Control Line Optional Demonstration Manoeuvre additions.

6.2.1.11 Class CL1 Control Line Final Scoring Clarification.

6.2.3.4 Class CL3 Flight Schedule (6) change.

6.2.4.4.2 CL Flight Manoeuvres, Asymmetric Flight.

6.3.2.3 Class RC2 Eligibility clarification.

6.3.2.4 Class RC2 Documentation update.

6.3.2.5 (g) Class RC2 Originality of the Model clarification.

6.3.3 New R/C RC3 Builder and ARF class.

6.3.4/5/6 RCX1/2/3 Indoor RC clarifications.

6.3.7.6 (14) RC Manoeuvre Error addition.

6.4.1.1 Free Flight Rules Judging Arrangements Double Entry clarification.

6.4.1.2 Safety Cut-Off weight change.

6.4.1.8 EMSDs (Gyro) clarification.

6.4.2 CLASS FF1 - SCALE FF OUTDOOR SUPERSCALE This class replaces the previous three Open classes FF1/2/3 for I/C, Rubber and Co2/Electric. All powers now combined in one class.

6.4.3 CLASS FF2– SCALE FF OUTDOOR. SCALE FREE FLIGHT, Modified Flying Only Class

Outdoor Scale Free Flight Intermediate Class has been discontinued.

6.4.5 CLASS FF4 - EDDIE RIDING COMPETITIONS. All now FF2 Contests.

6.4.6 New Class FF5 Scale Free Flight Outdoor Assisted Free Flight (provisional)

6.4.9.3 Class FFX3 Documentation clarification.

6.4.10.3 Class FFX4 Kit Scale Competitors Declaration update.

6.4.10.4 Class FFX4 Static Judging, Painted surfaces rule change.

6.4.11.4 and 6.4.12.4 Peanut and Pistachio, Scale Detail, added category.

6.4.14 New Class FFX8 Scale Free Flight Indoor Flying Only (Provisional)

ANNEX 6A BMFA SCALE TEAM SELECTION PROCESS changes.

ANNEX 6B ANNUAL SCALE TROPHIES. BMFA and STC Trophy designation changes.

6.1 GENERAL

6.1.1 GENERAL SCALE RULES and DEFINITIONS

These rules apply to all Scale classes and models unless stated otherwise in the class rules.

6.1.1.1 System of Rules

This document must be read in conjunction with the BMFA General Regulations and Rules.

All rules in this rule book are Contest Rules as defined in the BMFA General Regulations and Rules, **2.1 & 2.3**.

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

Note: Several BMFA Scale Classes equate to FAI Scale Classes and in most cases the rules are the same, however for various reasons and to ensure that the rules reflect the special needs of UK competition, differences do occur. These differences are closely monitored by the BMFA Scale Technical Committee (STC) to ensure that UK competitors are not disadvantaged when entering World Championships. Currently there are three BMFA scale classes (RC1, RC2 and CL1) which equate to FAI Championship classes (F4C, F4H and F4B)

It is important to understand that whilst the STC can make changes to BMFA rules in a matter of months, the FAI rule change process can take three years or more. Changes are sometimes made to FAI rules which the STC may decide are inappropriate for the UK and conversely the STC may make changes to UK rules which are subsequently rejected or amended by the FAI. Many FAI classes only have provisional rules and most non-championship FAI classes are out of date so the STC may decide to incorporate changes to the BMFA rules in advance of proposing a similar change to FAI rules.

6.1.1.2 Definition of Scale Models

A Scale model aircraft shall be a reduced size reproduction of a full-size aircraft, which is intended to accurately recreate the appearance and realism of the subject full-size aircraft both on the ground and in flight.

Published evidence must be available to verify that the full-size aircraft which has been modelled has successfully flown.

Scale models of pilotless aircraft, drones and non-airworthy replicas are not permitted.

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

6.1.1.3 Builder of the Model Rule

Scale models must be constructed and finished solely by the competitor, subject to the exceptions listed below. The competitor must also prepare the model for flight, although helpers are permitted (see **6.1.1.15**). Helpers seen working on a competitor’s model in the absence of the competitor will be considered as a breach of this rule and may result in disqualification.

Team entries are not permitted.

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 but must be declared (see **6.1.1.7**.).

The only exceptions to the Builder of the Model Rule are as follows:

a) Models in the R/C Stand-Off class RC2 (see **6.3.2**).

b) Models in the R/C Flying Only classes RC3 (see **6.3.3**) and RCX2. (see **6.3.5**).

c) Models in the C/L classes CL1, CL2 and CL3 (see **6.2.1**, **6.2.2 and 6.2.3**)

d) Models entered by Juniors, where parental assistance is permitted. Details must be entered on the Competitor's Declaration.

6.1.1.4 Definition of a Kit

Certain of the RC and FF classes specify the eligibility of models as built from a kit. For the purposes of these classes, which are identified in the individual class sections, the term kit is defined as a manufactured and marketed collection of materials and parts that are required to substantially complete the subject model including, where appropriate, such materials as wood, wire, celluloid, tissue, transfers and wheels. It does not include modern routed or laser cut part sets based on published magazine plans that have not previously been marketed as kits. The use of part sets based on original kit plans is however, welcomed as a means of attracting new competitors.

6.1.1.5 Number of Models, Qualification, Eligibility and Entry Fees

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

For outdoor R/C competitions when there is more than one class, competitors are normally permitted to enter only one class. Exceptionally, subject to the competition rules and/or at the CD's discretion, multiple class entries with different models may be permitted, but not in combination with the Flying Only class.

For Indoor and Outdoor Free Flight competitions competitors may be permitted to enter more than one class and with more than one model, subject to the competition rules and/or at the CD's discretion.

For RC Indoor Nationals entries are restricted to two out of the three classes per competitor with a completely different model for each class.

Entry fees are payable for all competitions, except for members of a club which is hosting an STC managed competition, who have free entry at that competition. The fees for all classes are reviewed each year by the STC and published on the STC website. In exceptional circumstances these fees may vary at the discretion of the STC.

Entry on the day conditions apply to all STC organised Scale competitions, except for the National Championships.

For National Championships, pre-entry is required on the published entry forms which are available from the STC website.

A BMFA achievement scheme "A" certificate is required as a minimum to fly in all outdoor National R/C Scale competitions.

Other scale flying events may require a "B" certificate by the organisers.

Competitors are required to provided evidence of their achievement scheme rating to the Contest Director.

6.1.1.6 Name and Scale and Speed of Model

The exact name and variant or mark number of the subject aircraft shall be written on the Competitor's Declaration and where applicable on the score sheets.

The model can be built to any scale and this must be stated on the documentation and the Declaration and any applicable score sheets.

The Competitor must enter the cruising speed of the subject aircraft on the Flight Score Sheets before the sheets are passed to the Flight Judges. In the case of early aircraft, where only maximum speeds are likely to be listed, the maximum speed alone may be quoted. The competitor must be prepared to substantiate this information if required.

6.1.1.7 Competitor's Declaration:

For all classes where there is a Static Judging element, the competitor must complete a questionnaire and sign a declaration that the competitor's model conforms to the appropriate class rules.

A Competitor's Declaration must be presented as part of the model's documentation

Because class rules may be subject to change on an annual basis the declaration must be made on the current proforma as specified in the individual class rules.

Declaration forms can be downloaded from the BMFA Scale website https://scale.bmfa.org/ or are available on request from the STC.

The questionnaire is used by the Static Judges to assess how much the competitor has contributed to the scale accuracy of the model and any third-party involvement in the construction of the airframe including dummy engines and detail parts. Any airframe components of the model including any moulds or plugs used to produce such components and including components produced using a computer aided process which are **NOT** entirely manufactured by the competitor, must be listed on the Competitor's Declaration. The only exceptions to this requirement are I/C Engines, Electric and Co2 motors, flight propellors, gear boxes, R/C equipment, electrical/electronic equipment and fixings e.g., nuts, bolts, screws etc which need not be declared.

Competitors must be prepared, if required by the judges, to answer any questions the judges feel are necessary regarding the information given on the Declaration.

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

6.1.1.8 Competition Scoring System & Score Sheets

The STC has for some time been examining the possibility of a fully electronic and paperless scoring system for scale competitions. in a need to reduce the amount of paper handling.

Dependent upon the Scale Class requirements, the paperwork necessary for recording the judges marking will be the responsibility of the Contest Director.

6.1.1.9 Judges and the BMFA Scale Judges Guide

The Contest Director shall (subject to availability) plan to appoint at least two Flight Judges and where appropriate at least two Static Judges.

Other than at the National Championships, if only one Flight Judge is available, the CD can at his discretion and subject to agreement by the Flight Judge present, substitute a local volunteer. If the volunteer is a competitor, then the flight score recorded for the substitute's flight will be calculated from the single judge's marks plus or minus the percentage difference between the judge's marks awarded for the other competitors' flights.
For scale contests, one Static Judge and one Flight Judge is permissible with the agreement of the C.D. If one judge is used for either, or both static and flight judging, the score will be doubled to maintain the score ratio between static and flying.

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 Judging of fidelity to scale/design is based solely on the information supplied by the competitor and Judges must not use any prior or special knowledge they may have of the subject aircraft. The scale accuracy of the model must be assessed solely on the proof of scale documentation submitted by the competitor.

As soon as practicable after each flight, the flight scores should be calculated and made available to the competitors. Static Judges will retain the static score sheets until all models have been static judged and only then will the scores be calculated and released to the competitors. Competitors are not permitted to question their marks with Judges or officials during the competition, 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.

The **BMFA SCALE JUDGES HANDBOOK** is published by the Scale Technical Committee and is revised as necessary dependent upon rule changes or revision of advice to judges. This document is essential reading for Scale Judges and is also recommended reading for competitors. The BMFA SCALE JUDGES HANDBOOK is available as a free download from the BMFA Website.

6.1.1.10 Protests and Appeals.

(a) It is the right of a competitor to protest any decision by a Contest Director (CD)**.** Any such protest, however, must be made officially to the CD, and must be made on the day. The protests and appeals procedure to be followed at the contest is also set out in the BMFA General Regulations and Rules, Section 2, and in the event of discrepancies they shall take precedence.

(b) If not satisfied with the CD's decision the competitor must, on the day, hand the CD the protest in writing, together with a fee of double the standard entry fee. The CD will then immediately empanel three appropriate persons to deal with the protest.

(c) The panel's decision is final, subject to the right of the competitor who submitted the protest to appeal to the BMFA Council.

(d) Appeals to Council about a decision made at a contest must be made as follows:

  (i) Notification that an appeal is pending must be sent to the BMFA Competition Secretary to arrive not later than two weeks from the date of the contest.

  (ii) 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 contest.

(e) Protests made to Council after the contest may only be made direct to the BMFA Competition Secretary who, after considering the details of the protest, may bring such protests to the attention of the BMFA Technical Council. Notification of an "after the contest" protest must be made to the Competition Secretary within 7 days of the contest and the protest and evidence submitted not later than two months from the date of the contest.

(f) Protests or appeals arising from a decision made by a Technical Committee on contest related matters may only be made directly to the Competition Secretary and must be accompanied by a £50 fee. The Competition Secretary will then convene a Panel comprising three Technical Committee Chairmen and not including the Chairman of the Technical Committee concerned. This Panel, plus the Competition Secretary, will study the appeal and examine the reasons for the Technical Committee's decision.

(g) If the protest or appeal is not upheld, then the appellant(s) must be informed of the reasons for the decision. This procedure does not preclude an appellant(s) taking a failed protest or appeal to the BMFA Full Council.

(h) If the written protest or appeal is upheld, the protest fee will be returned, however if

the protest or appeal is unsuccessful the fee will be allocated to the team travel fund of the relevant discipline.

6.1.1.11 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 if this is not possible the CD is responsible to ensure that the scores are suitably factored.

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

Static Judges shall award marks from 0 to 10 inclusive for each aspect / item of static judging using increments of 0.1 of a mark, except where alternative scoring regimes are specified in the class rules.

Flight Judges shall award marks from 0 to 10 inclusive for each flight manoeuvre using increments of 0.5 of a mark, except where alternative scoring regimes are specified in the class rules.

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 both Static 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.

For Free Flight classes a qualifying flight is required.

Flight Score

Unless otherwise stated in the class rules, the flight score shall be the sum of the scores awarded by both Flight Judges.

The Flight Score is subject to the bonuses and penalties as stated in the individual classes. These bonuses and penalties are cumulative and then applied to the Flight Score.

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 best flight score.

6.1.1.12 Weight, Wing loading and Weighing of Models

The individual class rules provide details of the maximum permitted weight and/or wing loading of the models.

Wing loading for fixed wing models is defined as the weight of the model divided by the total flying surface area. The total flying surface area includes the horizontal area of all flying surfaces on the model. The surface area includes the area of the flying surface included in or projected within the fuselage, nacelles etc. Wing loading is measured in grams per square decimetre.

Models may be weighed at any time during a competition at the discretion of the contest Director. Any model which does not conform to the specific weight or wing loading requirements applicable to the model class will be disqualified.

6.1.1.13 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.

6.1.1.14 Noise

Where appropriate, I/C engines of all Scale models must be effectively silenced. For C/L, R/C and FF classes the noise limits and noise test detailed below shall apply to models powered by I/C piston engines.

Advice on noise testing of Helicopters and turbine powered models is detailed in the BMFA Members Handbook.

The decision to carry out noise testing at a competition is the responsibility of 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 metres from the centre line of the model on the side chosen by the competitor, or in the case of a multi-engine model 3 metres from the closest engine to the noise meter. There shall be no noise reflecting objects closer than 3 metres 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.

6.1.1.15 Helpers

Each competitor is permitted one helper during a competition. An additional helper may assist with pre-flight preparation should the competitor require this. Helpers must not work on the model in the absence of the competitor. 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 flight line or launch point before the take-off commences and only one helper is permitted during the flight.

For Radio Control competitions helpers are not permitted to touch the transmitter except for assisting in starting engine(s), or in the event of a flight emergency, e.g., where the competitor is incapacitated. The timekeeper or other nominated official is responsible for watching that the helpers do not touch the transmitter during flight. If this occurs the flight is scored zero.

6.1.1.16 Preparation for Flight

Competitors are reminded that because test flying before a competition flight is not normally permitted because of time constraints, particularly at outdoor events, special attention must be paid to the assembly of the model and the preparation for flight. If the assembly process is complex and particularly in the case of large models, the use of an assembly checklist is recommended.

Between static judging and flying, the external appearance of the model must not be changed, except for propellers, spinners and droppable ordnance which may be substituted (see **6.1.1.18** and **6.1.1.19**). For Free Flight models intended to be hand launched, undercarriages arranged to be manually retracted into scale recesses prior to flight will be permitted.

Nothing may be added to the model other than a dummy pilot, external antenna, fuel or flight batteries and safety links for electric powered models.

Additional non-scale air entries/exits are permitted provided they are covered by movable hatches when the model is static judged. 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.

6.1.1.17 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. The absence of a dummy pilot during flight may reflect on the marks given for realism and may be subject to a penalty depending upon individual class rules.

6.1.1.18 Propellers and Rotor Blades

Models of propeller driven fixed wing aeroplanes may have the scale propeller/s replaced with a flight propeller/s of any shape and form.

Models of rotary wing aircraft e.g., helicopters and autogyros, may have the scale rotors replaced with flight rotors but if the number of blades is changed points may be lost if realism in flight is affected.

If the model is fitted with a spinner/s when static judged, the scale spinner/s may also be replaced with a flight spinner/s but this/these must be of the same size, shape and colour as the scale spinner/s. In this event these flight spinner/s must also be presented with the model for static judging.

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 or rotors are forbidden.

6.1.1.19 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.

6.1.1.20 Take-off Aids

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

Models of flying boats and floatplanes in all classes, may use wheels or wheeled dollies for take-off in the absence of suitable water surface conditions. A similar consideration also applies to models fitted with skis. Deviation from scale, through inclusion of permanently attached wheels, skids or similar non-scale devices in the model structure 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. For subject aircraft with retracting undercarriages, models built with the undercarriage retracted may be launched with the aid of dolly and/or catapult system.

6.1.1.21 Radio Control Equipment

The use of any Radio Control equipment in Scale models must be in accordance with CAP 722, the BMFA Members Handbook and the BMFA General Regulations and Rules, Section 1. Particular attention must be made to the following:

Failsafe Systems

Failsafe systems must comply with the requirements of the BMFA General Regulations and Rules **1.2.5**. It is the responsibility of the competitor to ensure he fully understands how to set the failsafe function of the equipment the competitor is using.

Pre-flight testing of failsafe systems is recommended, and the Contest Director may at his discretion request a pre-flight demonstration of a competitor's failsafe settings.

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.

Remote Cut-off for FF models

Use of RC systems to provide remote cut off for certain electric or IC power systems is permitted and detailed in the FF General Rules Section **6.4.1.2**.

6.1.1.22 Electronic Motion Stabilising Devices (EMSDs) or Gyros

Except for the indoor and some outdoor FF classes, Scale models are permitted to use devices which provide auto-stabilisation. Devices which provide altitude, heading or speed hold and active GPS devices are not permitted.

For some classes of fixed wing models the use of EMSDs will involve a penalty applied to the flight score. Details of how the penalty is applied will be found in the appropriate class rules.

Note: The rapid pace of development of devices which can provide autonomous flight is such that both the FAI and the BMFA rules regarding the use of these devices may require change at short notice.

6.1.1.23 CAA Article 16 – OPERATOR I.D. number

Article 16 requires "The Operator I.D. number must be clearly displayed on the aircraft or within a compartment that can be easily accessed without the use of a tool".

Outdoor Free Flight Models under 250gms and all Indoor Models and Control Line Models under 7.5 kilos with control lines of less than 25metres are exempt.

Display of the I.D. number in an unobtrusive position will not be penalised during static judging.

6.1.2 STATIC JUDGING or JUDGING FIDELITY TO SCALE

This section applies to all classes where the model is judged for scale accuracy (static judging). Exceptionally the R/C Stand-Off class (RC2) and some of the FF classes have a less stringent regime for static judging and the static judging criteria and documentation requirements are specified in the appropriate class rules.

6.1.2.1 Competitor's Declaration

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration. The Declaration can be downloaded from the Scale Technical Committee website, https://scale.bmfa.org/

6.1.2.2 Proof of Scale

Proof of scale is the responsibility of the competitor and with the exception of class RC2 and some of the FF classes, the minimum requirements for proof of scale evidence are specified in section **6.1.2.3**.(a) to (d) inclusive.

The documentation provided must relate to the same type and mark number as the actual subject aircraft being modelled and should be as comprehensive as possible if a high static score is to be achieved. In principle, any feature of the model which is not supported by documented evidence will not be marked.

6.1.2.3 Documentation

(a) Evidence of Scale Accuracy

This must be in the form of photographs or printed reproductions and drawings of the full-size aircraft which must be the same type and mark number as the actual subject aircraft being modelled. Both photographs and drawings are used for the static assessment.

(i) Photographs or printed Reproductions.

At least three different photographs or printed reproductions which need not be originals, but must show the complete aircraft, preferably from different aspects and with a minimum aeroplane image size of 150mm.

At least one of the photographs or printed reproductions 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 or evidence of realism.

Additional photographs may be used as evidence of scale detail, markings or surface texture and 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:

Published or certified scale drawing(s) of the full-size aircraft must show at least the 3 main aspects of Side View, Upper Plan View and Front-End View. The views must be to a common scale with a maximum wingspan of 500 mm unless the fuselage is longer than the wingspan, in which case measurements will be made on the fuselage drawing. For the Outdoor RC & C/L classes, drawings must have a minimum wingspan of 250 mm, and for Indoor and FF classes

drawings must have a minimum wingspan of 150 mm.

If the scale drawing is dissected for the individual views (side, front, plan) then a complete drawing must be presented with the documentation. In this case the complete drawing for outdoor RC and CL classes may be presented in a smaller scale. Minimum 150mm wing span or fuselage length, whichever is longer.

If not obvious a statement must appear on the scale drawings and any dissected scale drawings noting the publisher or STC validation

Unpublished drawings produced 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 classes CL1, RC1, RCX1, FF1, 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. Proof of all the markings including their position on the subject aircraft must be provided to avoid loss of marks.

Deliberate omission of markings or symbols either on the model or in the documentation is not acceptable unless the competitor provides evidence that such markings or symbols are the subject of a UK national ban.

(d) Proof of Texture

This may be in the form of detailed close-up photographs or a detailed description. This evidence must show all the different surface textures of the aircraft structure and in addition any unique features like stains, dirt, wear and tear etc. This may be the same evidence as that used for proof of detailed parts of the aircraft structure.

6.1.2.4 Penalties for inadequate documentation

Except in those classes subject to a less stringent level of documentation, failure to provide the minimum proof of scale documentation as specified in section **6.1.2.3** will result in a reduction of marks as follows:

(a) Fewer than three photos (as specified in the class rules) with a full image of the full-size aircraft type:

Or undersized image(s) in the photos of the subject modelled (6.1.2.3 (i):

ZERO points for Scale Accuracy	(6.1.2.6.1)
Downmarking of Realism	(6.1.2.6.7)
Downmarking of Craftsmanship	(6.1.2.6.8)
Downmarking of Scale Detail	(6.1.2.6.10)

(b) Missing, oversized/undersized, unpublished or unauthorised drawings:

ZERO points for Scale Accuracy	(6.1.2.6.1)

(c) No photo of subject aircraft:

ZERO points for markings (6.1.2.6.2)
Downmarking for Realism (6.1.2.6.7)

(d) Inadequate proof of colour:

ZERO points for Colour (6.1.2.6.4)

(e) Insufficient evidence of Texture:

Downmarking of Texture (6.1.2.6.6)

6.1.2.5 Presentation of Documentation

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.

A guide to the presentation of Documentation can be accessed via the STC website https://scale.bmfa.org/

6.1.2.6 Judging for Fidelity to Scale and Craftsmanship

Each of the following aspects will be awarded a mark out of 10 in increments of 0.1 of a mark by each Judge and the following K-factors apply (see **6.1.1.11**):

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
3. Markings Complexity.....K = 3
4. Colour Accuracy.....K = 3
5. Colour Complexity.....K = 2
6. Surface Texture .....K = 7

(Note: For Indoor RC and all Free Flight classes the Surface Texture and Scale Realism is not judged separately. See individual class rules for K- Factors)

7. Scale Realism .....K = 7
8. Craftsmanship Quality.....K=12
9. Craftsmanship Complexity .....K = 5
10. Scale Detail Accuracy .....K = 9
11. Scale Detail Complexity .....K = 5

Total K = 100

Note; For Class FF1 Scale FF Outdoor Superscale there is a simplified static judging format of the aspects above. (See **6.4.2.4)**

6.1.2.7 Static Judging Distance

For the classes listed below, the following measurements are taken from the centreline of the model to the Judge's chair.

For all other classes with a static judging element, it will be necessary for the Static Judges to handle the model.

SCALE CLASS	ASPECT ITEM 1	ASPECT ITEMS 2 to 11 Inc
CL1	----------All at 5 metres----------	
RC1	5 metres	no restriction
RC2	----------All at 5 metres----------	
FF1	2 metres	no restriction
Indoor RC Classes	no restriction	no restriction
Indoor FF Classes	no restriction	no restriction

6.1.2.8 Demonstration of Functional Scale Detail during Static Judging

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

6.2 CONTROL LINE CLASSES

6.2.1 Class CL1 - SCALE CONTROL LINE (Based on FAI class F4B)

6.2.1.1 Model Characteristics

Maximum weight of the complete model in flying condition without fuel but including any dummy pilot shall not exceed 7kg

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 6kg (or 60 Newton)

(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 Static Judging

Static Judging of models in this class will be carried out in accordance with **6.3.2**. (F4H) All aspects at 5 metres.

The Contest Director and Static Judges will be responsible for setting in place the facilities for static judging.

Competitors are responsible to ensure their model is prepared for safe static judging, i.e. fuel tanks drained or sealed to avoid fuel leakage, electric powered models must have flight batteries removed or electrically isolated, scale propellers fitted etc.

Electric powered models that need to demonstrate working functions when being static judged must have their propeller(s) removed or use independent batteries not connected to the motor.

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

6.2.1.3 **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, flaps, slats and other lift enhancing devices. 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.

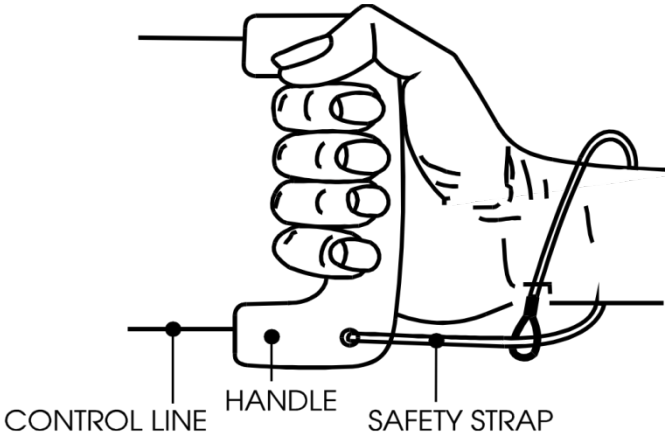
Secondary Control Functions may also be controlled using 2.4GHz radio control equipment. The radio control equipment must conform to BMFA General Regulations and Rules 1.2.5. and the Transmitter must be under the sole control of the pilot in the centre of the circle during the flight. There can be no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

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, 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.

Control handle and Safety Strap

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

6.2.1.4 **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 **6.2.1.5**) 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 **6.2.1.5**.).

An official flight is terminated when the model lands and stops, except during ground contact manoeuvres (Touch and Go Taxi).

Each manoeuvre must be announced prior to commencement and called on commencement by the words" NOW" or "START". Completion of each manoeuvre must also be announced by the words" FINISHED" or "COMPLETE". 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 30º 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.

6.2.1.5 **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.

6.2.1.6 **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.

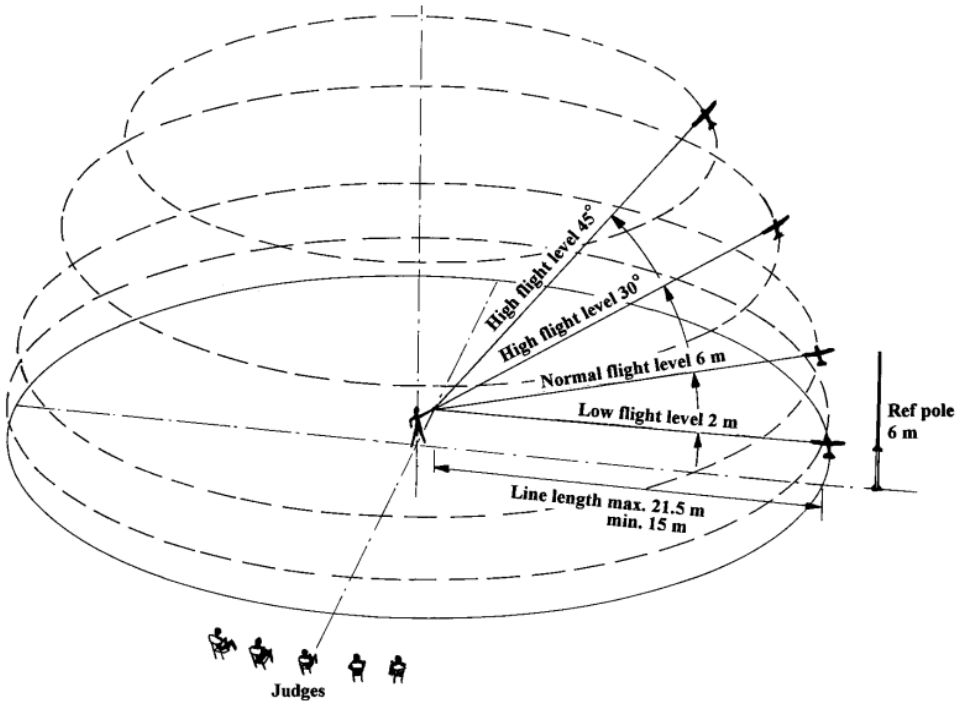
6.2.1.7 **Flight** Level Definitions:

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 30º and 45º line elevation.



6.2.1.8 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.

Each of the following aspects will be awarded a mark out of 10 in increments of 0.5 of a mark by each Judge and the following K-factors apply (see **6.1.1.11**):

(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

Note; The scale of the model aircraft and the cruising speed or maximum speed of the subject modelled must be stated on the flight scoring form.

6.2.1.9 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 whitethorn 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 **6.2.4.2**.

FOUR optional demonstrations must be selected from the following list (see **6.2.4** for full descriptions):

Multi-engine option – (See **6.2.4.4.1**)
Asymmetric flight demonstration
Retract and extend landing gear.
Retract and extend flaps.
Droppable ordnance.
High flight over 30° line-angle.
One inside loop.
Three inverted laps.
Wingover.
Figure eight.

Touch and go.

Lazy Eight

Parachute drop.

Non-listed manoeuvre or Flight function.

Taxi demonstration.

Overshoot/go around.

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

6.2.1.10 **Realism** in Flight

Realism in 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 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 considering 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.

Notes:

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

(b) 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 of the model. If such a pilot is not fitted, the total flight score shall be reduced by 10%

.

6.2.1.11 Final Scoring

Add the sum of the static judges scores to the scores of the two best flights.

If for any cause beyond the control of the organisers less than three official rounds can be flown, the scoring shall be completed as follows:

If two rounds are flown, the scores of the two flights will be used.

If only one round is flown, the single flight score of that one round will be doubled.

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

This will give a flight to static score ratio of 2 to 1.

6.2.2 CLASS CL2 - SCALE CONTROL LINE FLYING ONLY

6.2.2.1 Contest **Rules**

The General Characteristics of the model and the Flying Schedule shall be the same as Scale Control Line (see **6.2.1**).

No static judging will take place, Scoring and Eligibility requirements, are as shown below.

6.2.2.2 Scoring

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

6.2.2.3 Eligibility

Model rule **6.1.1.3**) is not applicable to Scale C/L Flying Only.

Models used in these competitions 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.

6.2.3 CLASS CL3 – SCALE CONTROL LINE PROFILE (Flying Only)

6.2.3.1 Eligibility

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 C/L Profile Flying Only.

The subject aircraft must be a full-size manned aircraft and recognisable as such. The wing shape, tail and side profile must match the subject to qualify.

Pictures of subject aircraft may be required to prove the subject is real if requested by the judges. This may be digital as long as the pictures have not been altered and to the C/D & judge's approval.

6.2.3.2 Model Characteristics

Fuselage width (as viewed from end / plan view) Max ¾ inch constant chord along most of the length. Some deviation allowed for strengthening doublers around the engine / motor.

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.

No complex Mechanics will be scored (e.g. retracts, ordnance dropping or flaps). If these are used, they will be disregarded from the flight.

No static judging will take place.

6.2.3.3 Handle and Lines

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.

A pull test of the control system (lines, handle & model connected) will be consistent with the other C/L scale classes (5x the mass of the aircraft, minus fuel / batteries). This will be performed any time the system is changed (e.g. taking off lines and putting them back on).

A self-tightening wrist strap must be attached between the handle and pilot's wrist for the entire flight.

6.2.3.4 Flight Schedule

The sequence of manoeuvres to be agreed with the judges before the flight commences. Between the end of one manoeuvre and the start of the subsequent one, the competitor must fly the model a minimum of two laps.

Points will be awarded out of 10 in intervals of 0.5 and multiplied by the K factor.

(1) Take-off (See note below)..... K = 20

(2) 5 laps of straight level flight..... K = 12

Two of the Optional Manoeuvres below will be flown

(3) Optional demonstration. 3 Laps High Flight..... K = 15

(4) Optional demonstration. Touch and Go..... K = 15

(5) Optional demonstration. Overshoot..... K = 15

(6) Optional demonstration. 1 Inside Loop..... K = 15

(8) Optional demonstration. 2 Laps Inverted..... K = 15

(10) Optional demonstration. Figure 8..... K = 15

(11) Landing ..... K = 20

(12) Realism in flight

(a) Scale Speed ..... K = 6

(b) Smoothness of Flight..... K = 6

(c) Scale Sound ..... K = 6

Total K = 100

Note. If the model is unthrottled the model may be released by a helper for take-off but the maximum points cannot exceed 7.0

Three rounds will be flown. One or Two rounds can be flown at CDs discretion.

6.2.3.5 Scoring

The final score will be the sum of the best two flight scores.

If one round is flown the flight score will be doubled.

6.2.4 SCALE CONTROL LINE FLIGHT MANOEUVRES

6.2.4.1 Description of 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, within the constraints imposed by the control lines, replicates how the manoeuvre would be flown by the full-size aeroplane.

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 manoeuvre regarding the following aspects:

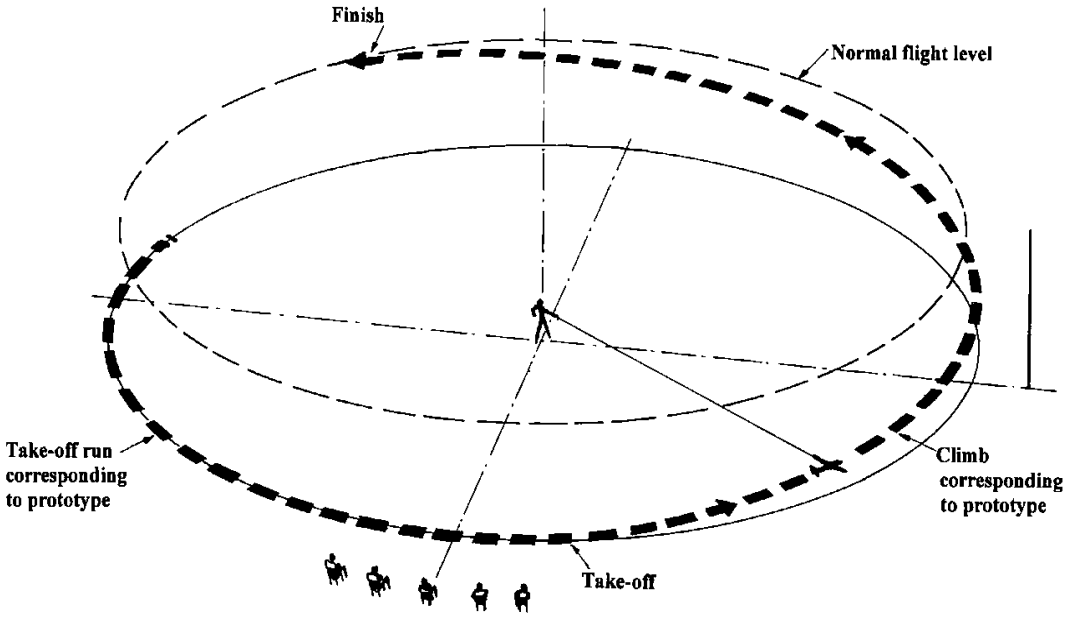
(1) The shape, size, and technical requirements of the intended manoeuvre.

(2) The positioning of the manoeuvre relative to the Judges' position or other datum.

(3) The scale realism of the manoeuvre achieved relative to the subject aircraft.

6.2.4.2 Take off

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 on the subject aircraft, take more than one lap to complete.



Errors:

(1) Model touched after calling "NOW" (zero marks).

(2) Climb erratic.

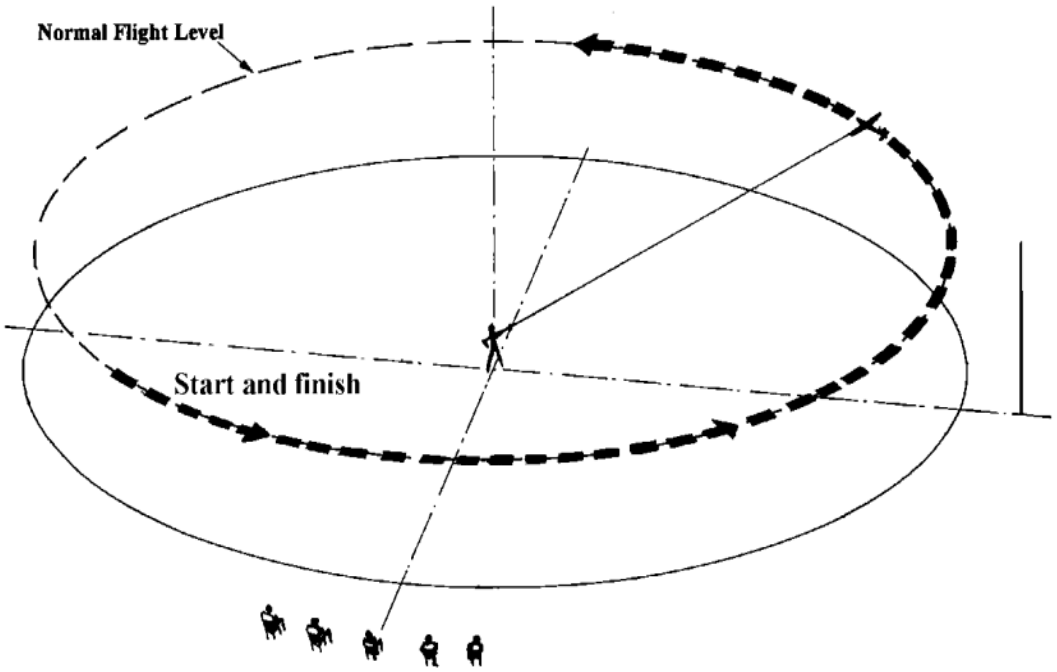
(3) Rate of Climb not consistent with subject aircraft.

(4) Level off not smooth.

(5) Level off not at Normal Flight Level.

6.2.4.3 Mandatory Manoeuvre - 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.

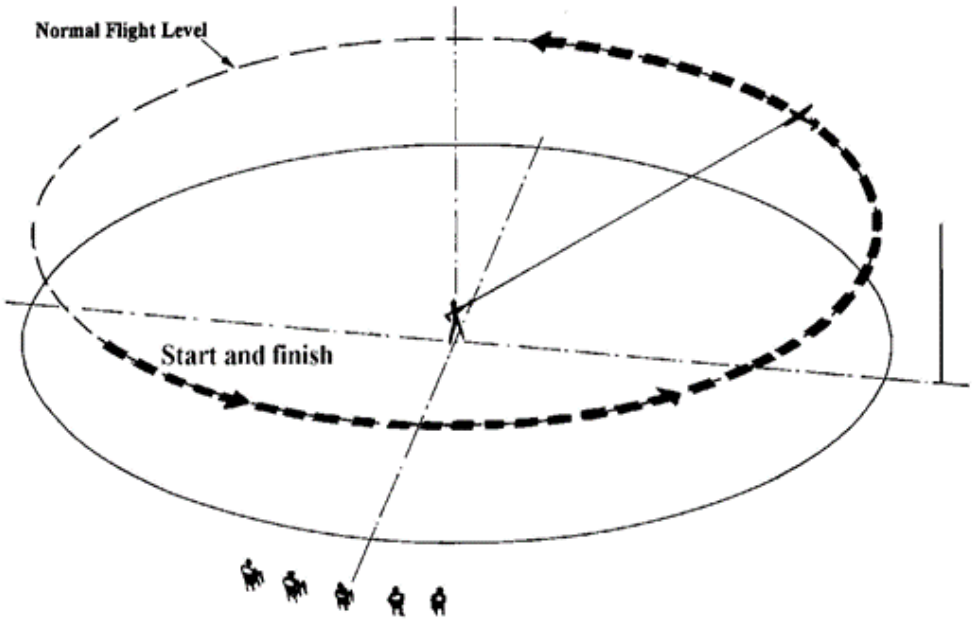
6.2.4.4 Optional Manoeuvres

6.2.4.4.1 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.

6.2.4.4.2 Asymmetric Flight

The model should make two smooth and stable consecutive laps with one engine noticeably throttled back. The laps should be at Normal Flight Level. Height should remain constant for optimum marks. When the second lap is complete the slower engine should be smoothly throttled up. The manoeuvre is complete after a final lap with both engines running smoothly at Normal Flight Level.



Errors:

(1) Les than two laps with reduced power – zero marks

(2) The height not at Normal Flight Level

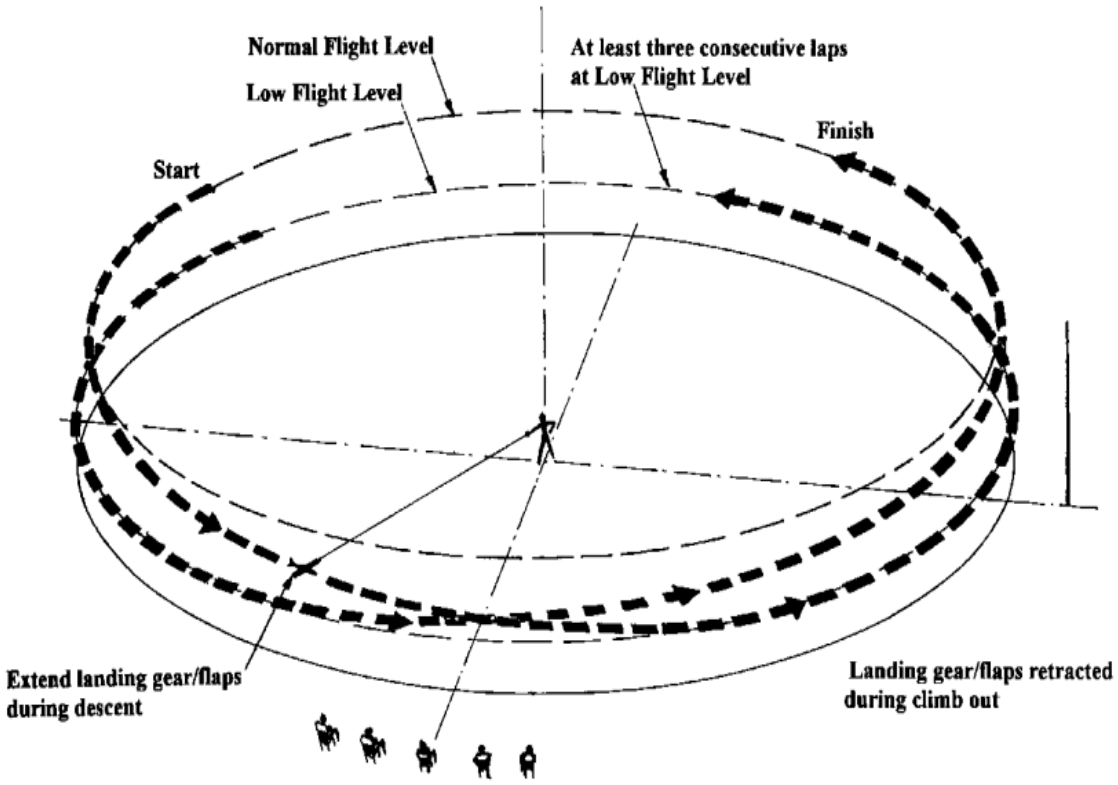
(3) Not smooth and stable

6.2.4.4.3 Retract and Extend Landing Gear

6.2.4.4.4 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.

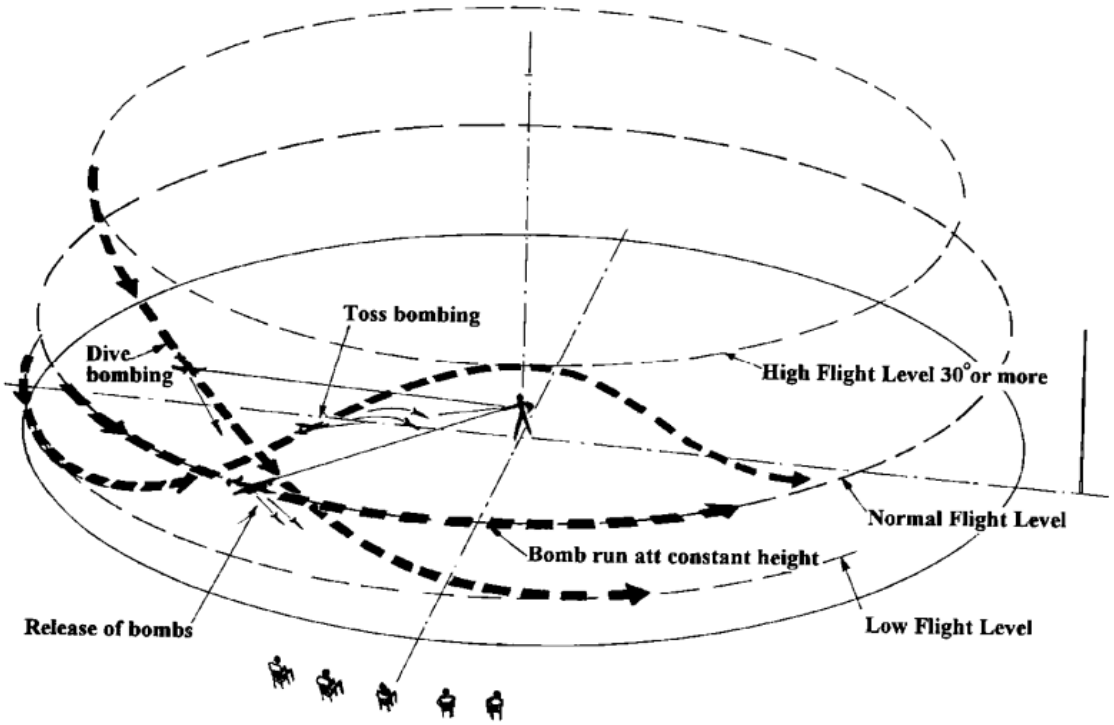
(5) Speed and or sequence of extension and retraction not realistic.

(6) No change in attitude with flaps lowered.

(7) Manoeuvre not finished at Normal Flight Level.

6.2.4.4.5 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

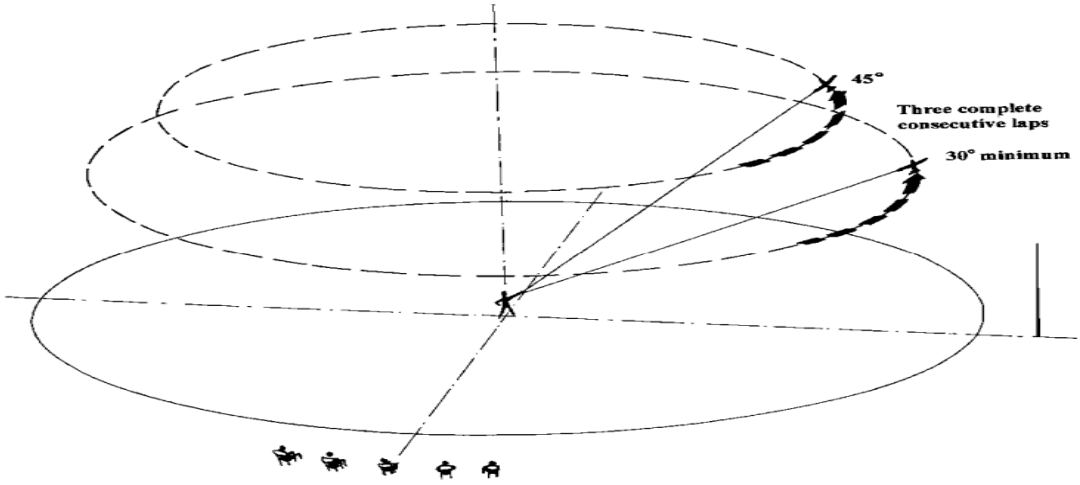
(4) Bombs not falling on the intended and agreed area.

(5) Drop tanks not behaving as drop tanks in the air.

6.2.4.4.6 High Flight at Over 30º Line Angle

During three complete and consecutive laps the lines must be at a minimum angle of 30º 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 45º and the flight level remains almost constant. Lower marks will be awarded to models which fly below 45º but above 30º, or if the flight level changes considerably during the three laps. Zero marks shall be given if the model flies below 30º line-angle at any moment during the three laps.



Errors:

(1) Not three consecutive laps.

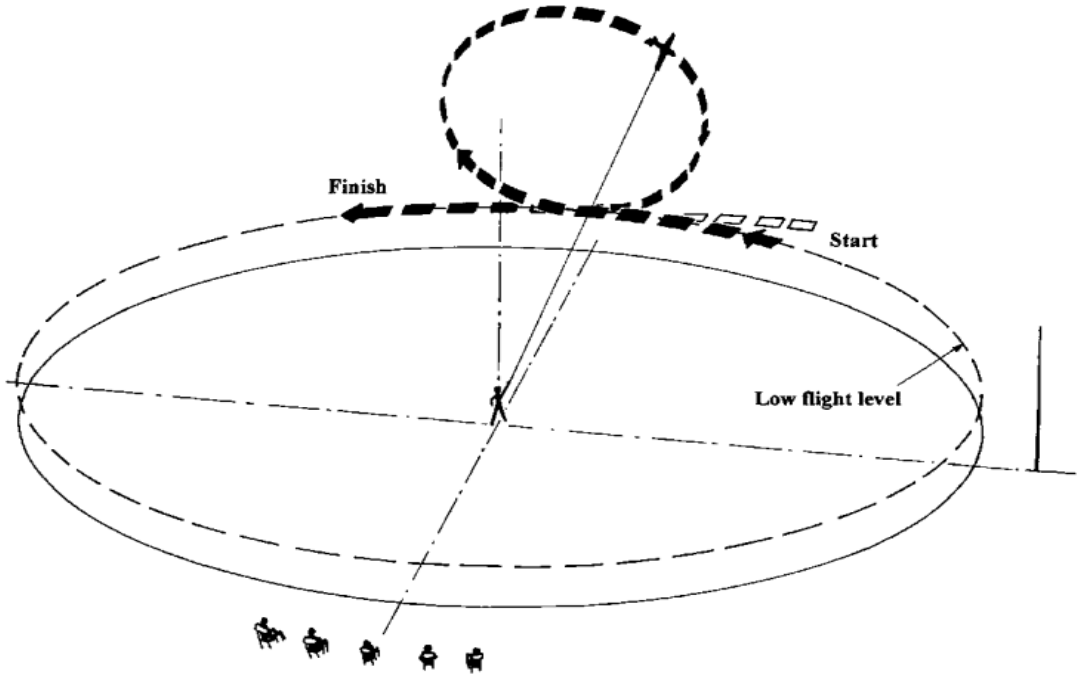
(2) Great variations of height during the flight.

(3) Centring varies during the flight.

(4) Line-angle below 30º, at any moment - zero marks.

6.2.4.4.7 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.

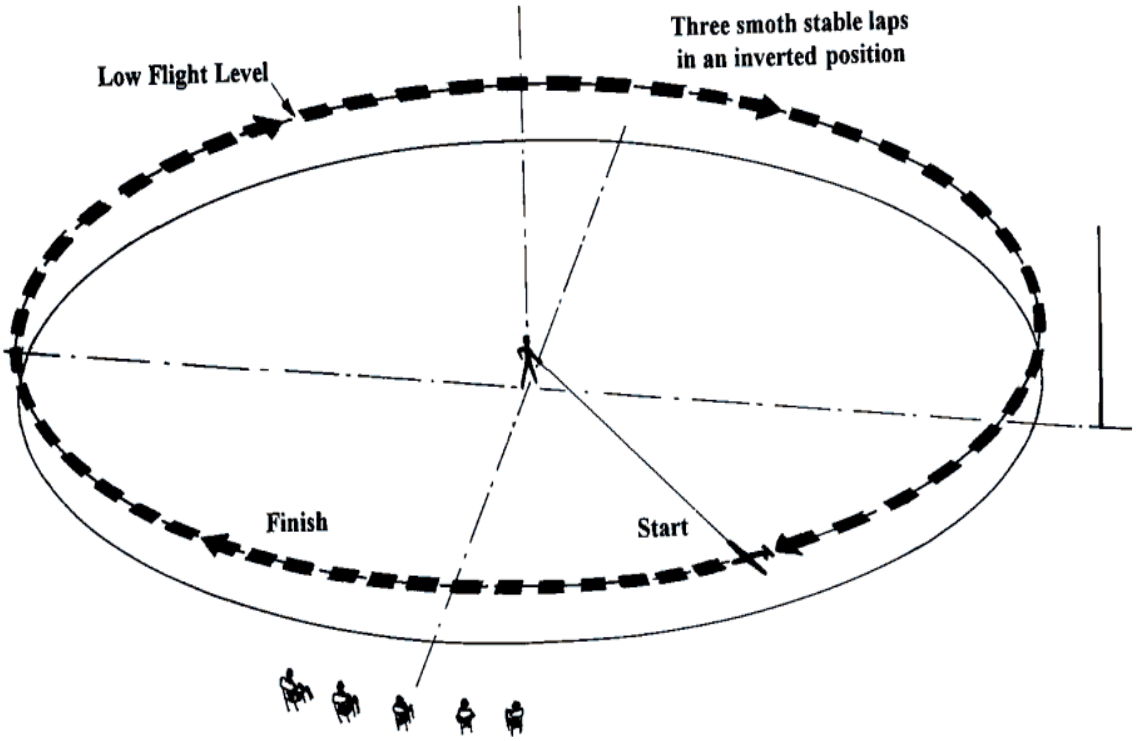
(3) Loop not in the manner of the subject aircraft.

(4) Inappropriate use of throttle.

(5) Loop not finished at Low Flight Level.

6.2.4.4.8 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 than three laps - zero marks.

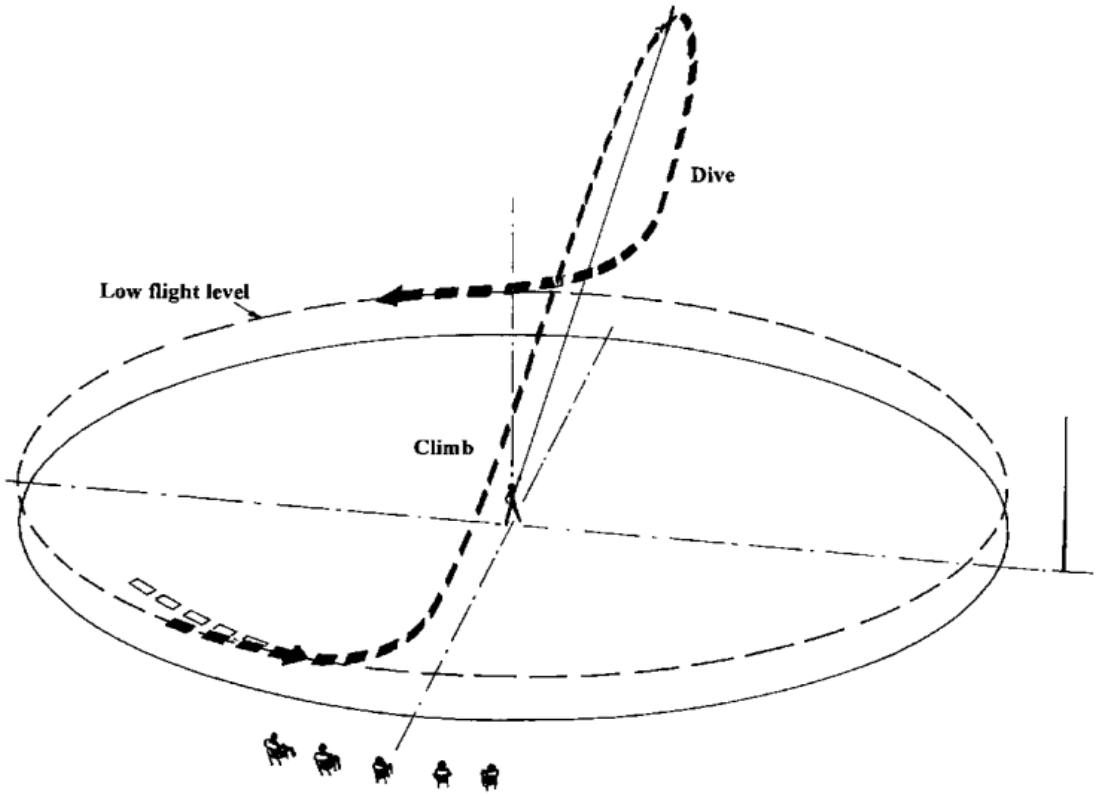
(2) The height not at Low Flight Level.

(3) Not smooth and stable.

(4) Variations in height.

6.2.4.4.9 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 to pick up speed before commencing the manoeuvre.



Errors:

(1) Not commenced from Low Level Flight.

(2) Not sufficiently steep climb. (Less than 60º will score zero).

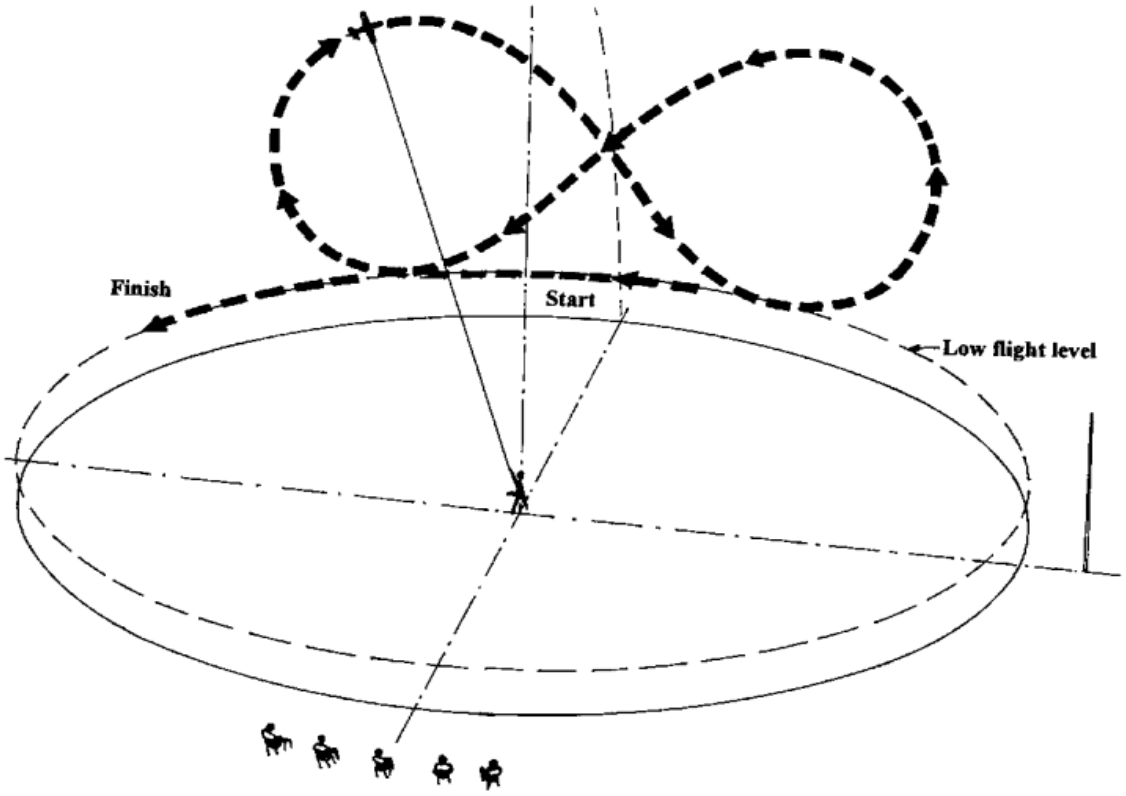
(3) Not sufficiently vertical dive. (Less than 60° will score zero).

(4) Not equal shape in the pull-up and the pull-out.

(5) The manoeuvre is not finished at Low Level Flight.

6.2.4.4.10 Figure Eight

From Low Level Flight, the model pulls up into a near circular loop until 45º 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 45º nose down and a pull-out 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.

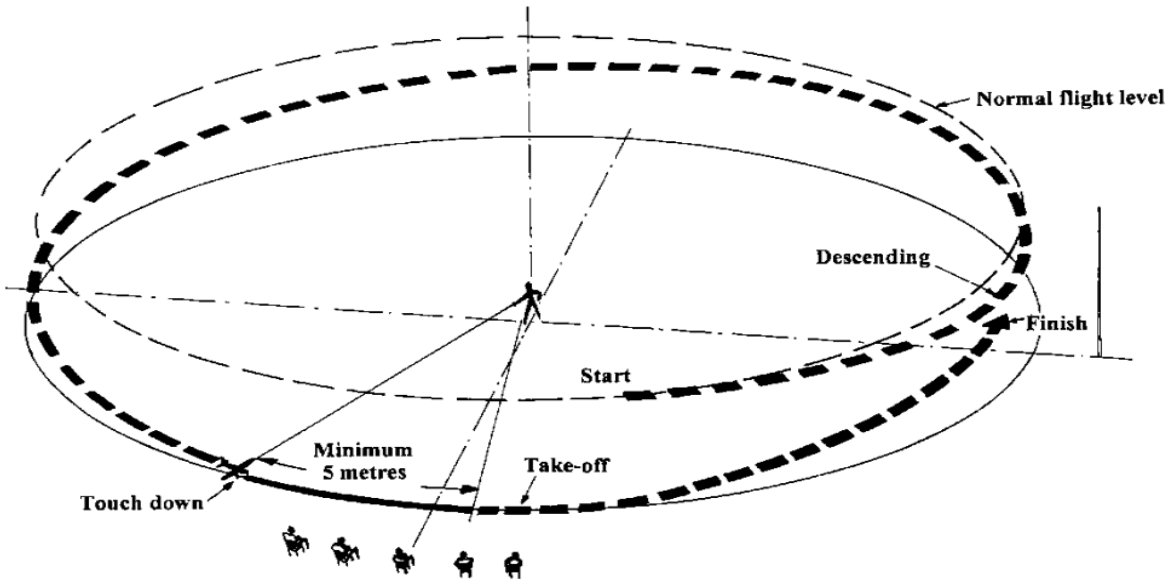
(3) Not a 45-degree intersection.

(4) Loops are not the same size.

(5) The manoeuvre not finished at Low Flight Level.

6.2.4.4.11 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.

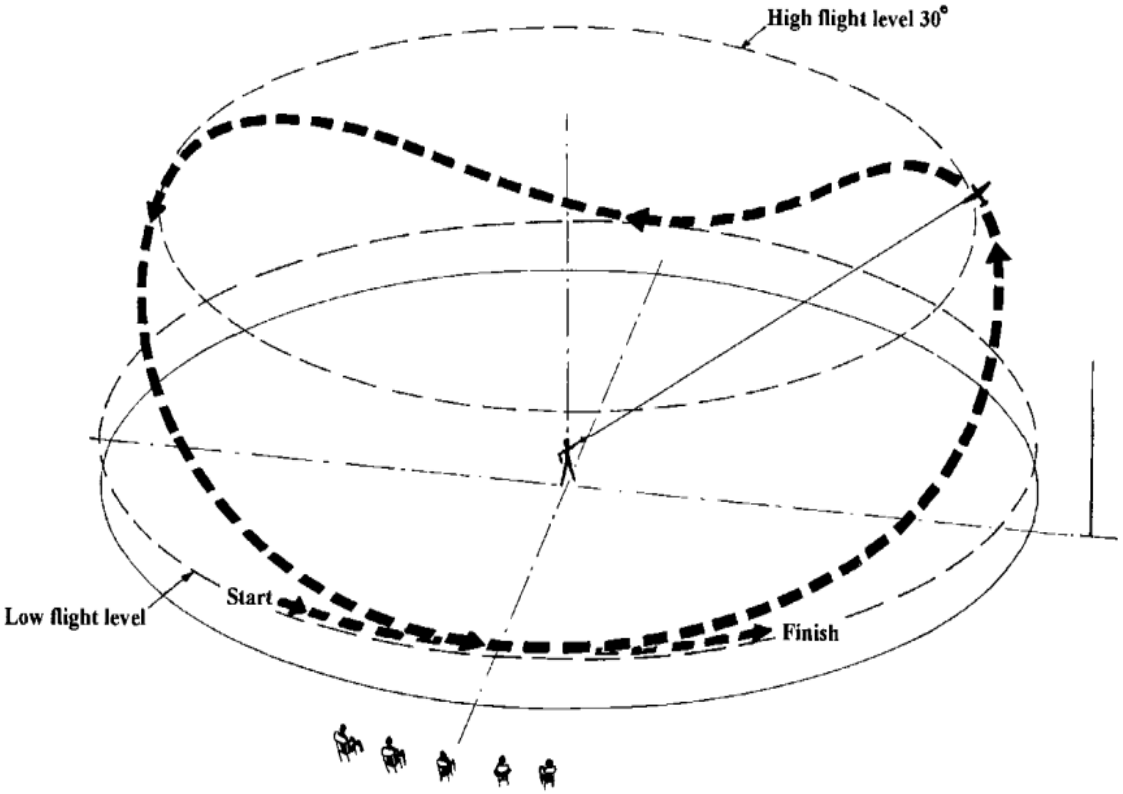
(3) The model bounces on touch down and the continuing roll on the ground.

(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.

6.2.4.4.12 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

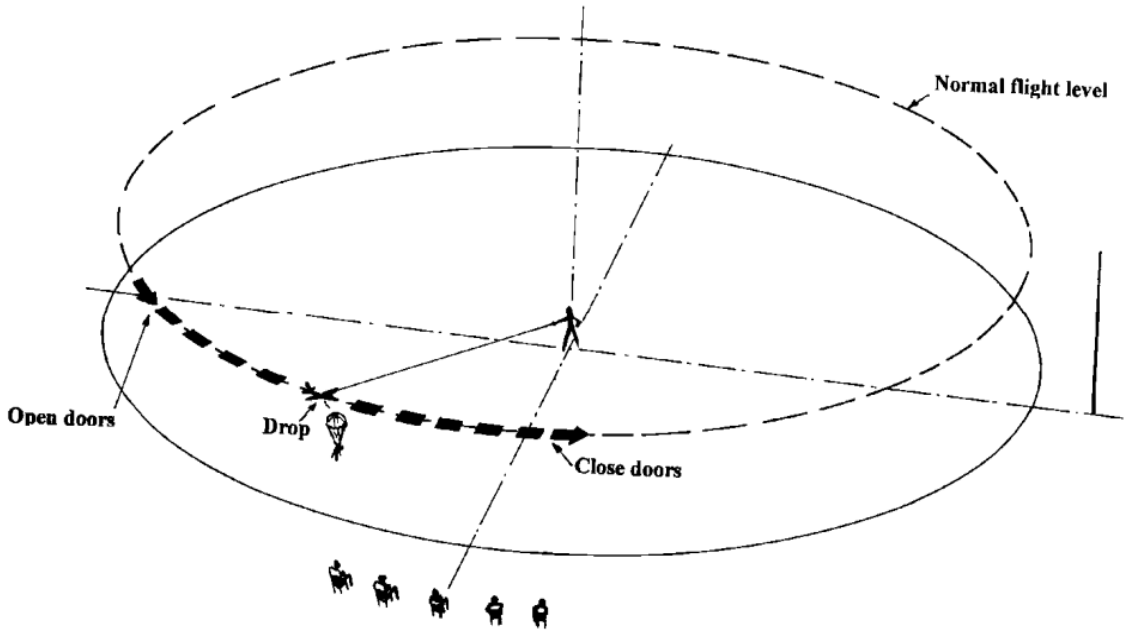
(3) The second climbing turn not a copy of the first

(4) The manoeuvre not finished at Low Flight Level

(5) The manoeuvre not centred in front of the Judges.

6.2.4.4.13 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.



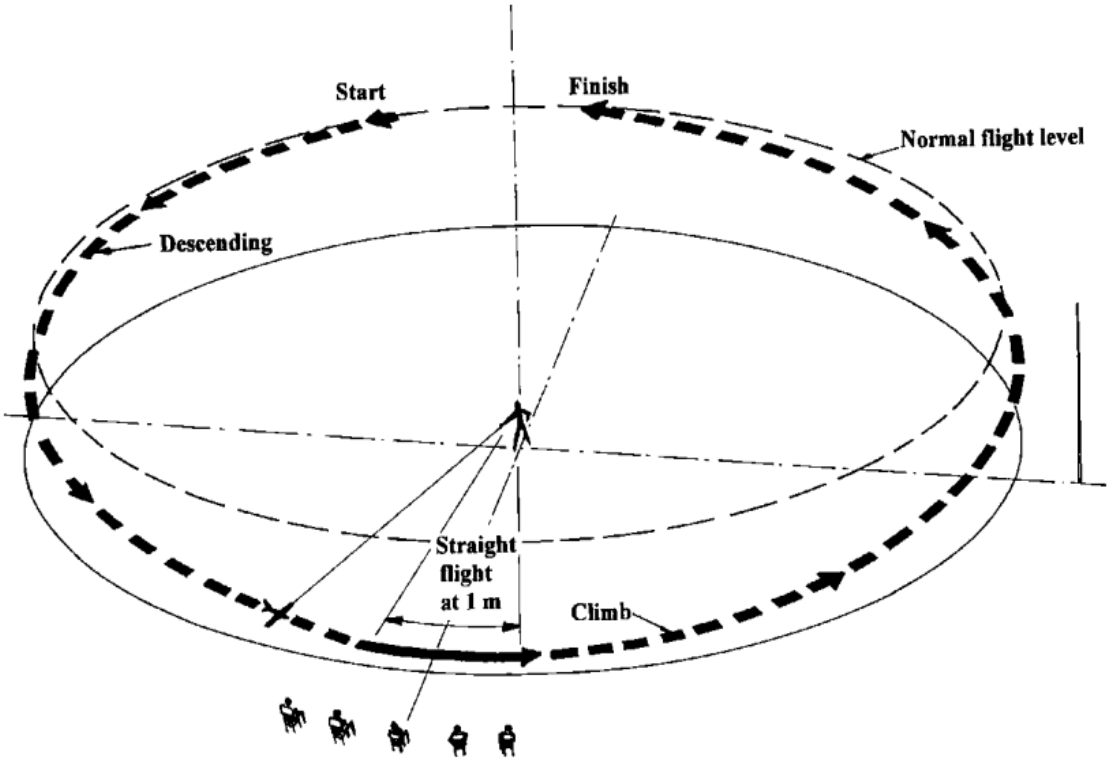
Errors:

(1) Not a realistic way of dropping or ejecting the parachute.

(2) The parachute not dropped at the agreed spot or area.

6.2.4.4.14 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 accelerating smoothly before climbing out.

(4) The manoeuvre not finished at Normal Flight Level.

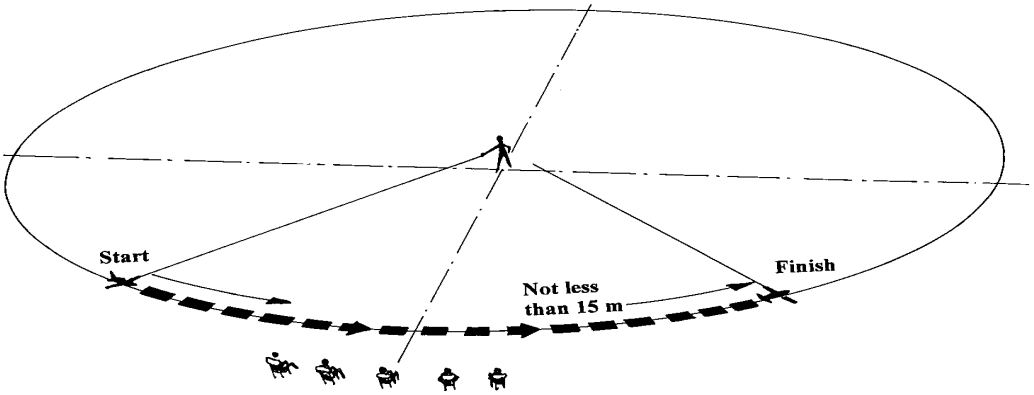
6.2.4.4.15 Non-listed manoeuvre or Flight Function by the subject aircraft

A competitor may include in his flight schedule one manoeuvres or flight function which is not described in this section e.g. crop spraying, outside loop etc. 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 before going to the flight line. The competitor must be prepared to supply evidence that any manoeuvre or function is/was within the performance capability of the aircraft subject type modelled,

Mechanical functions which could equally be performed on the ground and demonstration of functional scale detail, such as dropping auxiliary fuel tanks; sliding canopies and switching on and off lights, are not acceptable as optional flight manoeuvres, but may be included in the schedule to enhance realism.

6.2.4.4.16 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.

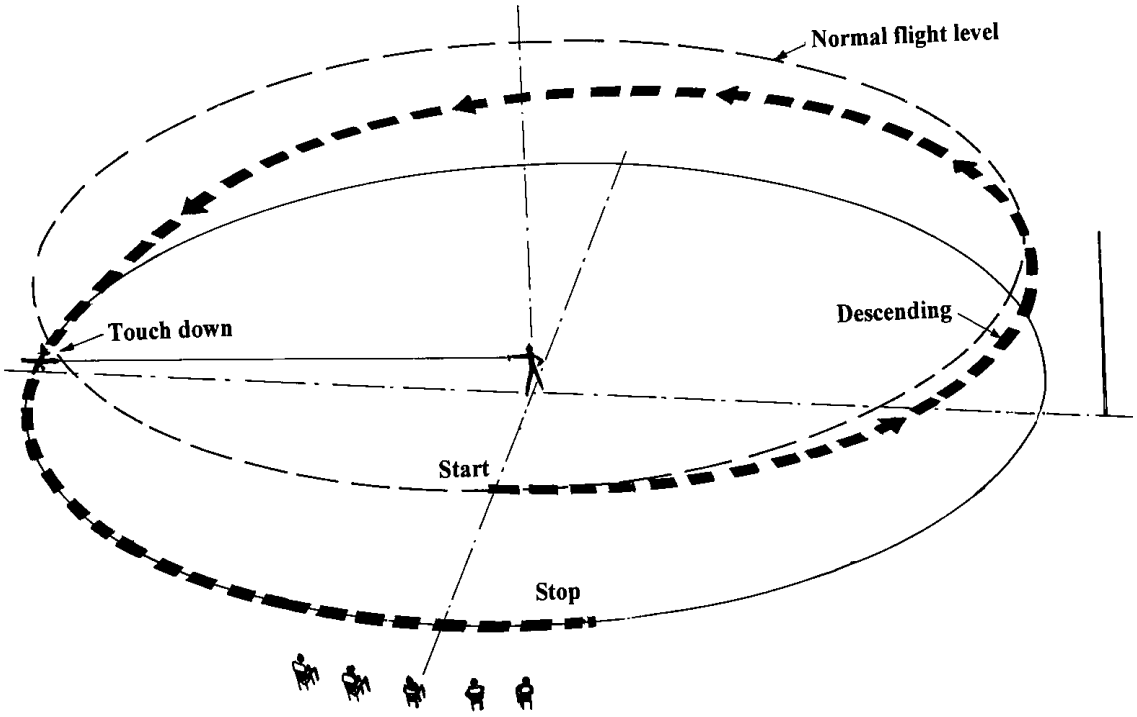
(2) Not a realistic taxi for the subject aircraft.

(3) Not all engines operating.

(4) If held or touched during the manoeuvre, the score is zero.

6.2.4.4.17 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 CLASSES

6.3.1 CLASS RC1 - SCALE R/C MODELS (Based on FAI Class F4C)

6.3.1.1 Model Characteristics

Maximum weight of the complete model in flying condition without fuel, or motor batteries if electric powered, but including any dummy pilot shall be 15 kg.

Motive power:

(a) I/C piston engines
(b) Gas Turbines
(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 Static Judging

Static Judging of models in this class will be carried out in accordance with **6.1.2**. The Contest Director and Static Judges will be responsible for setting in place the facilities for static judging which is normally carried out in the same order as the flying order after the model has completed its first flight in the competition.

Competitors are responsible to ensure their model is prepared for safe static judging, i.e. fuel tanks drained or sealed to avoid fuel leakage, electric powered models must have flight batteries removed or electrically isolated, scale propellers fitted etc. Electric powered models that need to demonstrate working functions when being static judged must have their propeller(s) removed or use independent batteries not connected to the motor.

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

6.3.1.3 **Organisation** of Scale Radio Control Flying Competitions

The Contest/Flight Line Director is responsible for setting up the flight line in accordance with BMFA guidelines and for defining any no-fly areas.

Note: At some competition venues and the UK Nationals there are additional considerations regarding airspace.

The CD is also responsible for producing the flying order, which is usually 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 that his flight schedule has been prepared (see **6.3.1.7**) using the current official flight score sheet. He must also ensure that his model is fuelled and prepared for flight if the competitor before him in the flying order fails to start.

Each competitor will normally be given a minimum of five minutes' notice to commence a flight and must execute an official flight within the required time limit (see **6.3.1.6**) to record a valid flight score for that flight.

A competition will normally consist of two flight rounds, but if there is a large entry or only limited time available, the Competition Director may decide to reduce the number of optional manoeuvres.

Note: The Outdoor UK National championships will normally consist of three rounds, depending on weather conditions.

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.

6.3.1.4 The Judges' Line and the Flight Judges' Position

The Flight Judges will be seated alongside the take-off and landing area on a line which, subject to any constraints imposed by the flying site will be approximately parallel with the wind direction. This line will be marked either by cones or flags or some existing man-made or natural feature and will be referred to as the Judges' line. The Contest/Flight Line Director will be responsible for monitoring the direction of the wind for the duration of the competition and if it continually deviates more than 30° from the Judges' line and it is practical to do so, after consultation with the Flight Judges the Judges' line will be changed to minimise the crosswind.

The Flight Judges' centre line is an imaginary line at 90° to the Judges' line extending from the centre of the Judges' position to the horizon. This centre line may be marked with a flag or suitable marker or aligned with an object on or near the horizon. It is the competitors' responsibility to ensure he understands the location of the marker and the centre line the Judges are using.

During a competition flight an unmarked exclusion zone of 10 metres radius of the Judges' position must be observed. Within this zone noise and speech is to be minimised to avoid any unwanted distraction for the pilot and Judges. The only persons allowed within this zone are the Judges including any Judges under training, the competitor and his helper/caller, the Flight Line Director, the Contest Director and Official photographers.

6.3.1.5 **Transmitter** Control

Transmitter control will be exercised in accordance with the guidelines laid down in the BMFA Members Handbook.

Competitors using 35 MHz Tx's must advise the CD who will ensure that suitable facilities for Tx control are in place and that the flying order is not compromised because of frequency clashes.

Separate rules apply at the UK National Championships where all Transmitters likely to be used during the contest may be subject to testing and/or registration. Non-2.4GHz transmitters will be subject to full Tx control during the competition. Non-2,4GHz transmitters will only be issued to the competitor when his name is called for him to stand by to make his flight and 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, in the event that an accident is caused, may render the competitor liable to further penalties.

6.3.1.6 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.

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.

Judging stops at the end of the time allowed and any manoeuvre that is not completed will be marked 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 if the model is touched during the restart process the take-off will be marked zero.

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

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

6.3.1.7 **Flight** Schedule

The aim of the flight schedule is to demonstrate the flight characteristics of the subject full-size aircraft in a realistic fashion.

Models of full-size flying replicas will be expected to conform to the performance limitations of the replica, unless the competitor can provide documentary evidence that the full-size replica is structurally similar to the original and has been flown in the same manner as the aircraft it replicates.

Models of historic aircraft and restored historic aircraft will be expected to conform to the flight envelope of the aeroplane as it was originally constructed and certified unless the competitor can provide documentary evidence to the contrary.

Before commencing his flight, the competitor must verify that the Flight Judges have been advised of his flight schedule and for 'entry on the day' competitions, the competitor can usually do this verbally before each flight. At the UK National Championships where entry is pre-paid, competitors will be requested to submit their flight schedule to the CD in advance of the competition. If the competitor wishes to change his schedule for his second or subsequent flight, he must ensure the Flight Judges are advised of the changes before calling take off.

The flight schedule must be adhered to and if during the flight any manoeuvre is omitted for any reason or missed out from the schedule it cannot be re-inserted. Missed manoeuvres and manoeuvres flown out of the sequence identified on the flight schedule will be marked zero.

Only one attempt is permitted for each manoeuvre, the only exception is the procedure of getting a model airborne, see **6.3.1.6**.

Competitors may submit a description of the subject aircraft's flight characteristics (originated by a competent authority), which may be used to provide advice to the Flight Judges. Any documentation in support of the flight schedule must be presented to the Flight Judges before the flying part of the competition commences.

The flight schedule consists of the take-off, eight manoeuvres and the landing. Two of the manoeuvres are mandatory and six are optional.

6.3.1.7.1 **Mandatory Manoeuvres**

The mandatory manoeuvres are the "Figure Eight" and the "Descending 360° Circle" and these two manoeuvres can be placed in any order and anywhere in the flight schedule.

6.3.1.7.2 **Optional Manoeuvres**

The competitor must select six additional manoeuvres from the list in paragraph **6.3.1.8** below. Competitors must be prepared, if required by the Judges, to give evidence that the manoeuvres selected are typical and within the normal capabilities of the full-size subject aircraft. If a manoeuvre is selected which in the opinion of the Judges is impossible for the full-size aircraft to achieve, the manoeuvre will be marked zero

The manoeuvres selected should reflect the purpose for which the full-size aircraft was designed. Many full-size aircraft are designed with limited manoeuvrability, or they may also have been restricted by the manufacturer or licensing government agency. Examples are touring aircraft, passenger and cargo aircraft and heavy military transports and bombers. If models of aircraft designed to be fully aerobatic fly a schedule consisting of low G manoeuvres, then low marks will be awarded.

The nominated manoeuvres may include up to two non-listed manoeuvres or flight functions (see **6.3.7.5**). The competitor must provide written details of any non-listed

manoeuvre 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 flight line.

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

6.3.1.8 List of Optional Manoeuvres

Theoretical descriptions of these manoeuvres are shown in section **6.3.7**

Loop

Roll - any two variations can be selected.

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) – any two variations can be selected.

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-engine models only)

Straight Flight at Low Speed

Drop bombs or Parachute Demonstration.

Non-listed Manoeuvres - maximum of two

6.3.1.9 Presentation of Manoeuvres

Manoeuvres must be flown in a manner which replicates the performance capability of the full-size aircraft.

Each manoeuvre in the schedule must be announced by the competitor or his helper prior to commencement. The start of each manoeuvre must then be 'called' by using the word "NOW" or "START". The completion of each manoeuvre must also be 'called' by using the word "FINISHED" or "COMPLETE". The start and finish points of each manoeuvre are shown in the Manoeuvre Description section **6.3.7**

All manoeuvres must be performed parallel with the Judges' line (see **6.3.1.4**) 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 cross the Judges' line without penalty providing 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 flown by the full-size aircraft at an air display. 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 30º and 45º elevation to the Judges. Manoeuvres such as the Descending Circle and Spin should start at a higher elevation. The positioning of manoeuvres with respect to the Judges is shown in **6.3.7**.

The manoeuvres should be combined with turn-around manoeuvres to achieve a continuous and flowing display. The turn-around manoeuvres should be selected such that the model aircraft is positioned at the correct altitude and track for the next manoeuvre in the schedule. Fly-bys and unnecessary circuits to get the model to the starting position of the next manoeuvre should be minimized.

Models must be flown at a realistic speed based on the speed of the full-size aircraft as if it were performing a public flying display and must also be well trimmed and show no signs of instability.

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.

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 of the model. If such a pilot is not fitted, the total flight score shall be reduced by 10%.

If the flight is terminated before the flight schedule has been completed, or a manoeuvre is omitted apart from a schedule reduction authorised by the CD (see **6.3.1.3**), the marks awarded for each aspect of Realism in Flight, items (11) to (15) will be reduced by 10% for each manoeuvre omitted.

6.3.1.10 K-Factors

The following K-factors apply.

Each of the following aspects will be awarded a mark out of 10 in increments of 0.5 of a mark by each Judge and the following K-factors apply (see **6.1.1.11**):

Flight Schedule

(1) Take-off ..... 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

Realism in Flight

(11) Manoeuvre Selection ..... K = 6

(12) Display Presentation ..... K = 4

(13) Power Management ..... K = 2

(14) Speed of the model aircraft ..... K = 6

(15) Smoothness of Flight ..... K = 4

Total ..... K = 100

6.3.1.11 Flight Judging

Flight Judges will examine each manoeuvre in the schedule (items (1) to (10) and award marks based on the shape, size, positioning, technical requirements and realism of the manoeuvre relative to the Judges' position or other datum.

After the model has completed the landing manoeuvre or the flight is terminated, the judges will confer to assess the entire flight for Realism in Flight, (items (11) to (15). During this assessment the judges should attempt to reach agreement on the marks to be awarded for each aspect. Each judge retains the right to his own opinion however, but any differences in the marking should be minimal.

6.3.1.12 Scoring

Normally two rounds will be flown, and the final score will be the sum of the best flight score and the static score.

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

If three rounds are flown, the average of the two best flight scores will count.

6.3.1.14 Flight Safety

Competitors are reminded of their legal obligations under the Air Navigation Order (ANO) as detailed in the BMFA Members Handbook Section 8.

If during a competition, the model is flown over any designated no-go area or an area laid out for the protection of spectators, officials, and other competitors, or is flown 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 Flight line Director/Contest 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.

If the airspace for R/C Scale flying is restricted, a 2-stage warning system may be put in place to advise competitors and Judges.

1. When the model is flown close to the boundary. Flying close to the boundary will not be penalised but should be taken as a warning.
2. When the boundary is infringed. An airspace boundary infringement during a manoeuvre will result in zero marks for that manoeuvre. Repeated infringements will result in zero marks for the flight and the competitor will be required to land.

Details of the warning system will be advised at a pilot briefing prior to commencement of flying.

6.3.2 CLASS RC2 - SCALE R/C STAND-OFF (Based on FAI Class F4H)

6.3.2.1 Contest Rules

The Model Characteristics, Organisation of the contest, the Flying Schedule and the Flight Judging rules shall be the same as class RC1 (see **6.3.1**).

Scoring, Eligibility, 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 **6.1.1.2** any model, including repaints and rebuilds, which has previously been placed in the top three in a BMFA Scale class RC1 competition, may be entered in a RC2 competition, but will not be eligible for a podium place or an award certificate until three years has lapsed.

The requirement for the competitor to have constructed his own model (Builder of the Model rule **6.1.1.3**) is not applicable to class RC2

6.3.2.4 Documentation

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

The documentation for class RC2 is the minimum necessary to fully assess the model from the following aspects: scale accuracy (outline), colour, markings and realism.

As with all Scale model static judging, good photographs and/or drawings are the means of judging scale accuracy.

A minimum of one and a maximum of 5 different photographs or printed reproductions can be submitted for this class. These should be of a reasonable size, (aircraft image size 150 mm minimum). Ideally these must show the entire aeroplane and show the three aspects; side view; front view and top plan view (underneath plan view will not be judged). There is no requirement for close up or detail photographs.

If necessary to aid document presentation, (e.g. proof of colour) one or more of the five photographs or illustrations may be duplicated providing duplicates are clearly marked.

The documentation should be 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 based on the documentation available. Poor documentation will be reflected in the marks awarded and any aspect of static judging for which there is no documentation will result in a zero mark for that aspect.

(a) Proof of Scale Accuracy (Outline)

This may be in the form of photographs, printed reproductions, or drawings. Photographs or printed reproductions of the full-size aircraft are restricted to a maximum of 5 and one or more must show the actual subject aircraft being modelled.

Drawings must conform to the requirements of rule **6.1.2.3 (a) (ii).**

(b) Proof of colour:

This may be in the form of colour chips or original paint samples, colour photographs (from the five photographs allowed or duplicated copies of 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 (from the five photographs allowed or duplicated copies of 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.

6.3.2.5 Static Judging

Competitors are responsible to ensure their model is prepared for safe static judging, i.e. fuel tanks drained or sealed to avoid fuel leakage, electric powered models must have flight batteries removed or electrically isolated, scale propellers fitted etc. Electric powered models that need to demonstrate working functions when being static judged must have their propeller(s) removed or use independent batteries not connected to the motor.

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

(a) Scale Accuracy.

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

(b) Colour Accuracy

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

(c) Colour Complexity

This is an assessment based on the variety of colours and the difficulty in reproducing the colour scheme to the model, by comparison with all the other models entered in the competition.

(d) Markings Accuracy

This is an assessment of the accuracy and positioning of the markings on the model.

(e) Markings Complexity

This is an assessment of the complexity of the markings on the model by comparison with all the other models entered in the competition.

(f) Realism

This is a subjective assessment of how well the model captures the character of the subject aircraft by direct comparison with the photograph or illustration of the subject aircraft. The assessment will also consider the surface finish, weathering and any detail that is noticeable at 5 m.

(g) Originality of the Model

This is an assessment of the extent to which the scale accuracy of the model is due to the effort of the competitor. Maximum marks will be awarded to a model which is constructed in its entirety by the competitor to their own design. Then on a sliding scale from a plan and a traditional kit to a model which is built from a modern kit which includes pre-formed components, which will score less, dependent upon the extent of

prefabrication and then to an ARTF model that will score zero (unless evidence is presented of extensive modification by the competitor).

6.3.2.6 K - Factors

Each of the following aspects will be awarded a mark out of 10 in increments of 0.1 of a mark by each Judge and the following K-factors apply (see **6.1.1.11**):

Scale Accuracy

- Side View ..... K = 14
- Front View ..... K = 14
- Upper Plan View ..... K = 14

Colour Accuracy ..... K = 8

Colour Complexity ..... K = 4

Markings Accuracy ..... K = 14

Markings Complexity ..... K = 6

Realism ..... K = 14

Originality of the model ..... K = 12

Total K = 100

6.3.3 CLASS RC3 - SCALE R/C BUILDER AND ARF CLASS (Provisional)

Class RC3 is the 2025 replacement for the old “Flying Only” Class. There are two model classes within RC3, both have a permitted maximum weight of the model, less fuel or batteries, if electric powered, of 15Kg.

The RC4 Class, Light Scale models (under 5kg A.U.W.) is now amalgamated into RC3. A certificate will be awarded to the highest scoring model under 5kgs (AUW)

Class RC3 – Builder Class - 15Kg Class RC3 – ARF Class - 15Kg

6.3.3.1 RC3 Model Classes - Definition

RC3 – Builder Class

Scratch built models – built by the pilot
Plan built models – built by the pilot
Kit built models of traditional construction – built by the pilot

RC3 – ARF Class

ARF models
Modified ARF models
Kit built with pre-made parts, i.e. composite, foam wings, 3D printed parts
Purchased, loaned or donated models

6.3.3.2 Contest Rules

Both model classes will be flown together as one Competition.

Certificates will be awarded in RC3 for both model classes. Gold for Winners, Silver for Runner Up and Bronze for Third Place. Light Scale Certificates will also be awarded in either/or class provided a minimum of 3 Light Scale Class models are flown in each class in the Competition.

No static judging will take place.

6.3.3.3 Scoring

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

6.3.3.4 Eligibility

The requirement for the competitor to have constructed his own model (Builder of the Model rule **6.1.1.3**) is not applicable to RC3 – ARF Class

Models entered in these classes 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.

6.3.3.5 Flying Schedule

Pilots will be required to fly 5 mandatory manoeuvres and 5 optional manoeuvres.

Mandatory manoeuvres:

(1) Take-off ..... K = 9

(2) Figure Eight ..... K = 7

(3) 360° Descending Circle ..... K = 7

(4) Straight Flight at Low-Speed ..... K = 7

(5) Approach and Landing ..... K = 9

Pilots will then choose 5 optional manoeuvres from the list below. This Manoeuvre list is specific to RC3 and is not the same list used in RC1 & RC2, (F4C & F4H).

The flying order draw will take place prior to the competition.

The Builders and ARF classes will not be segregated, and will be flown together.

6.3.3.6 **O**ptional Manoeuvres (RC3 only)

All optional manoeuvres will have a K factor of 5.

Inside Loop

Roll – (variation to be noted on score sheet)

Split-S/Reversal or Immelmann Turn - only 1 permitted per flight
(to be noted on score sheet)

Cuban Eight - only 1 variation per flight
(to be noted on score sheet)

Stall Turn

Chandelle

Wingover

Lazy Eight

Spin (3 turns)

Procedure Turn

Overshoot or Go-Around

Touch and Go

Sideslip

Inverted Flight

Derry Turn

Triangular Circuit

Rectangular Circuit

Extend and Retract Landing Gear and Flaps

Straight Flight with One Motor Throttled

Dropping Bomb or Ordnance

Parachute Drop

2 x Non-Listed Manoeuvres or Flight Functions performed by the Subject Aircraft

6.3.3.7 K Factors – Flying

Take Off and Approach and Landing……. K = 9

Mandatory Manoeuvres……K = 7

Optional Manoeuvre……...K = 5

6.3.3.8 K Factors – Scale Realism

Manoeuvre Selection……K = 10

Display Presentation (inc. Speed/Power/Smoothness) …….K = 12

Full Size Realism……..K = 12

6.3.3.9 Caller Duties – RC3 Class Only

The Caller is only permitted to relay to the pilot:

Upcoming manoeuvres, Wind speed, direction and trend.

Safety related information such as persons/vehicles on the flightpath or runway or incoming full-size aircraft or helicopters**.**

Pilots are responsible for the horizontal and vertical positioning of their models and the placement in front of the Judges, without caller assistance.

Callers assisting pilots new to scale competition flying may give agreed additional guidance at the Judges prior discretion.

6.3.3.10 Realism notes for RC3 Competitors

Competition Scale flying is a demonstration of how the flight of a scale model can replicate the flight of the full-size subject aircraft. It is not an exercise in precision flying or a display of aerobatics using a scale model.

The BMFA Scale Rule Book 2025 shows descriptions and diagrams that indicate the theoretical shape of the manoeuvres (**6.3.3.6**) to achieve realism in flight, it is important that the manoeuvres are flown in a manner that replicates how the manoeuvre would be flown by the full-size aircraft.

6.3.3.11 Judging

Competition flights will be judged by 2 Flight Judges and should be flown at a realistic speed based on the speed of the full-size aircraft as if it were performing a public flying display. It must also be well trimmed and show no signs of instability. Use of power/throttle and smoothness of flight will be taken into account. The choice of manoeuvres of the subject aircraft should be carefully researched to achieve a realistic scale flight.

6.3.4. CLASS RCX1 - SCALE RADIO CONTROL INDOOR OPEN

6.3.4.1 Eligible Models

The competition is open to any CO_2 or Electric powered scale model aircraft that complies with the BMFA General Regulations **1.2,** the Builder of the model Rule **6.1.1.3** and the class-specific Model Characteristics below.

6.3.4.2 Model Characteristics

Models must meet the following characteristics:

Maximum Flying Weight	300g
Maximum wing loading *	15g/dm^2
Motive Power	CO_2 or Electric Motors

*Surface Area and Wing Loading to be calculated in accordance with General Scale Rules **6.1.1.12**.

The use of auto stabilisation devices for class RCX1 is permitted but must be declared and the flight score will be subject to penalty (see **6.3.4.7**).

6.3.4.3 Static Judging and Proof of Scale Documentation

Static judging and Proof of Scale Documentation requirement for this class will be in accordance with **6.1.2** of the Scale Rules.

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

6.3.4.4 Flying Rules

Transmitter control will be in accordance with paragraph **6.3.1.5.**

The aim is for each competitor to have the opportunity to make 3 flights unless, at the Contest Director's discretion, entry levels/ time constraints require this to be reduced.

The flying order of the competitors will be established by the Contest Director before the start of the contest. The competitor is responsible for ensuring that he is aware of his position in the flying order and his model is prepared for flight if the competitor before him fails to make a flight.

Competitors will be called at least five minutes before they are required to occupy the starting area. If the competitor fails to present his model for flight during that time period, the flight will be considered void.

An official flight is a flight completed within 5 minutes and 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 ready to take-off, whichever is first.

If the model is not airborne within 1 minute 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, except for 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.

6.3.4.5 Flight Schedule

The flight schedule consists of the take-off, four manoeuvres and the landing. Two of the manoeuvres are mandatory and two are optional. The competitor must fly the two mandatory manoeuvrers (figure of eight and then descending circle) first and then the two optional manoeuvres. The competitor has the freedom to choose the order the optional manoeuvres are to be flown in. The flight schedule must be adhered to and if during the flight any manoeuvre is omitted for any reason or missed out from the schedule it cannot be re-inserted. Missed manoeuvres and manoeuvres flown not in the sequence identified on the flight schedule will be marked zero.

The Flight Schedule must be presented to the Flight Judges by the competitor and if he wishes to fly a different schedule for the second or subsequent flight then the Flight Judges must be advised.

For the manoeuvres see **6.3.1.8** and for detailed descriptions of how the manoeuvres are to be flown see **6.3.7**.

6.3.4.6 Presentation of Manoeuvres

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”.

All manoeuvres must be performed parallel with the Judges’ line, but the direction of the manoeuvre is at the discretion of the contestant. If any part of the manoeuvre is performed behind the Judges’ line it will be marked ZERO.

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

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 manoeuvres must be announced upon completion by the word "FINISHED".

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 30º and 60º elevation to the Judges. The Descending Circle should start at a higher elevation.

The size of manoeuvres should make the optimum use of the available space. However, if there are restrictions on the airspace and obstructions projecting from the walls or the ceiling, the size and positioning of manoeuvres may be subject to concession. Any such local rules’ will be advised before flying commences.

6.3.4.7 Flight Judging

Flight Judges will examine the entire flight regarding the following aspects:

(a) The shape, size and technical requirements of all the intended manoeuvres.

(b) The positioning of each of the manoeuvres relative to the Judges’ position or other datum.

(c) The scale realism of the flight

Note: If the flight is terminated before the flight schedule has been completed, or a manoeuvre is omitted (apart from a schedule reduction authorised by the CD (see **6.3.1.3**), the marks awarded for Realism in Flight item (8) below will be reduced by 10% for each manoeuvre omitted.

The following K-factors apply (see **6.1.1.11**): Each of the following aspects will be awarded a mark out of 10 in increments of 0.5 of a mark by each Judge and the following K-factors apply.

(1) Take-off ..... K = 15

(2) Figure Eight ..... K = 15

(3) 360° Descending Circle ..... K = 15

(4) Optional manoeuvre 1 ..... K = 10

(5) Optional manoeuvre 2 ..... K = 10

(6) Approach and Landing ..... K = 15

(7) Realism in Flight ..... K = 20

Total K = 100

Note: Realism in Flight is a subjective assessment of all aspects of the flight not covered by the manoeuvres (1) to (7). This includes how the model flies between manoeuvres, the relevance of the manoeuvres to the full-size aircraft, the management of power setting, model speed, stability, smoothness and flight attitude.

Models with electronic and/or gyro stabilisation devices will have their Take-off and Landing scores reduced by 40%.

If the full-size aircraft had retractable undercarriage and the model is built with the undercarriage in the raised position and uses a dolly assisted take-off, the take-off and landing points awarded will be subject to a 10% penalty. Models with operating retract/extend mechanisms will be awarded a bonus of 10% to the total flight score. Hand launch of models is not permitted.

If the pilot of the subject aircraft is visible 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%

6.3.4.8 Marking and Scoring

Each Flight Judge awards marks out of 10 for each manoeuvre. These marks are then multiplied by the appropriate K - Factor and aggregated before any bonus or penalties are applied to give the flight score for each judge.

The flight score for each of the two Judges in each round are added to give the Total Flight Score for that round.

The static score for each of the two Judges are added to give the Total Static Score.

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

In the event of a tie the highest discarded flight score will decide the result.

6.3.5 CLASS RCX2 - SCALE R/C INDOOR FLYING ONLY

6.3.5.1 Eligible Models

The competition is open to any CO_2 or Electric powered scale model aircraft that complies with the BMFA General Regulations **1.2** and the class-specific Model Characteristics below.

The Builder of the Model rule (**6.1.1.3**) does not apply to R/C Flying Only classes and eligible models can be scratch built, kit-built or a ready- built (ARTF) model.

6.3.5.2 Model Characteristics

Same as Class RCX1 see section **6.3.4**

6.3.5.3 Static Judging and Proof of Scale Documentation

Static judging is not carried out and no Proof of Scale documentation is required. However, the competitor must be prepared to provide proof that the model is a scale replica of a full-size aircraft, particularly if it is a model of an obscure subject unlikely to be recognised by the Flight Judges.

For this class a 2-dimensional pilot may be used.

6.3.5.4 Flying Rules

Organisation of the competition, the Flight Schedule, Presentation of manoeuvres and Flight Judging are all identical to the R/C Indoor open Class RCX1 see section **6.3.4.**

6.3.5.5 Marking and Scoring

Each Flight Judge awards marks out of 10 for each manoeuvre as defined in **6.3.4.7** These marks are then multiplied by the appropriate K - Factor and aggregated before any bonus or penalties are applied to give the flight score for each judge. The flight score for each of the two Judges are added to give the Total Flight Score.

The final flight score will be determined by the average of the best two total flight scores

In the event of a tie the highest discarded flight score will decide the result

6.3.6 CLASS RCX3 - SCALE R/C INDOOR KIT SCALE

6.3.6.1 Class Objectives

The RC Indoor Kit Scale class is a simple competition designed to encourage newcomers to the hobby and club flyers from all disciplines to build their own models and take part in R/C Indoor Scale competition.

6.3.6.2 Eligible Models

This class is open to any scale model built from a commercial kit or to a plan of a design that has been commercially kitted. (The term 'kit' is defined in section **6.1.1.4**)

Models may be built from kit parts or the builder's own wood. Alternative material to that provided in the kit may be used for covering and for the application of colour and markings. Clear film or Mylar coverings will be penalised unless the subject aircraft was similarly covered.

Modifications to the structure for the purposes of transportability, durability of landing gear, the fitting of a motor system, and accessing a radio control and battery system are permitted without penalty. Movable control surfaces should replicate the subject aircraft and, while the kit design rib spacing should be retained for all surfaces, additional structure required to achieve scale control surface outlines will not be penalised, nor will extra structure to support the R/C installation and pushrod exits.

All other modifications will be assessed under fidelity to the plan.

When models are based on commercial enlargements of an original kit, proof of that commercial enlargement can be the kit box of the enlarged version or a copy of an advert, web page or statement from the manufacturer. The onus is on the competitor to demonstrate that the enlargement is not a 'one-off' and was undertaken as part of a commercial marketed kit production run.

6.3.6.3 Model Characteristics

Models must meet the following characteristics:

Maximum Flying Weight .....300 g

Maximum wing loading ..... .15 g/dm^2

Motive Power ..... CO_2 or Electric Motors

The use of electronic auto stabilisation devices is approved for Scale Indoor RC models, but must be declared, and the flight score will be penalised (see **6.3.6.9**).

6.3.6.4 Documentation

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

The minimum documentation required is the original (or photocopy) plan from which the model was built and one photograph (min150mm subject image) to indicate a typical colour scheme and markings. In the absence of a colour photograph, an illustration or colour drawing or painting (e.g., box art) of either the subject modelled or an aircraft of the same type and nationality from the same era or a scheme based on plan information is acceptable to authenticate the general colour scheme and markings

Replication of the exact colour scheme and markings in the documentation is not a requirement and non-replication will not be penalised.

6.3.6.5 Static Judging

The static judging philosophy for this class is different from other Scale classes in that models are judged against authenticity and accuracy to the kit plan rather than absolute scale accuracy to photographs and 3 view drawings.

Marks will be awarded by each judge up to the maximum of 100 to reflect the character of the model and the build quality as follows:

a) Accuracy of Structure.
- Assessment of the fidelity of the model to the Kit plan 0-30 points

(b) Appropriateness of colour scheme and markings.
- Appropriateness of the colour scheme. 0-5 points
- Appropriateness of the markings. 0-5 points
- Complexity of the colour and markings. 0-5 points

(c) Build Quality.
- Fineness, straightness and sharpness of line. 0-10 points
- Accuracy of component fit and straightness of structure. 0-10 points
- Quality of surface preparation and application of covering. 0-10 points

(d) Overall Impression.
- Overall Impression of subject aircraft and spirit of kit 0-25 points

It is expected that models will have a conventional built-up structure with a coloured tissue finish and with painted, printed, transfer or tissue markings.

Kits with ready built parts or models built from pre-formed and decorated assembly packs will have a penalty of 10 marks deducted from their static score.

Models that have more than 50% of the surfaces painted and models having extensive computer generated or pre-decorated colour schemes and markings will have a penalty of 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 or specified on the plan. (Typical deductions include increased dihedral, increased moment arms, control surface areas etc)

For this class a 2-dimensional pilot may be used.

6.3.6.6 Flying Rules

The organisation of flying, the flight schedule, presentation of manoeuvres and flight judging arrangements will be the same as class RCX1 – (see **6.3.4**)

6.3.6.10 Marking and Scoring

Each Flight Judge awards marks out of 10 for each manoeuvre. These marks are then multiplied by the appropriate K - Factor and aggregated before any bonus or penalties are applied to give the flight score for each judge. The flight score for each of the two Judges are added to give the Total Flight Score.

The static score for each of the two judges are added together and multiplied by three to give the Total Static Score.

The Total Score will be the aggregate of the Static Score and the highest Flight Score.

The Total Score will have a flight to static ratio of approximately 3:1.

In the event of a tie the highest discarded flight score will decide the result.

6.3.7 SCALE RADIO CONTROL - FLIGHT MANOEUVRES

6.3.7.1 Description of Manoeuvres

Competition Scale flying is a demonstration of how the flight of a scale model can replicate the flight of the full-size subject aircraft. It is not an exercise in precision flying or a display of aerobatics using a scale model.

The following descriptions and diagrams indicate the theoretical shape of the manoeuvres but to achieve realism in flight, it is important that the manoeuvres are flown in a manner which replicates how the manoeuvre would be flown by the full-size aircraft.

The diagrams in this section also indicate where the start and finish of the manoeuvres should be called (see **6.3.1.9**) and the positioning of the manoeuvres in relation to the Judges and the judges centre line. Most manoeuvres are centred in front of the Judges position, but the Take-off, Touch-and-Go, Sideslip and the Landing may be performed into the wind and may cross the judge's line without penalty. However, they must still be positioned to make the best use of the available space and be clearly visible to the judges.

For Indoor competitions, manoeuvres should be flown in order to make optimal use of the available space, however where there are severe restrictions on the airspace and obstructions projecting from the walls or the ceiling, the size and positioning of manoeuvres may be subject to concession. Any such 'local rules' will be advised before flying commences.

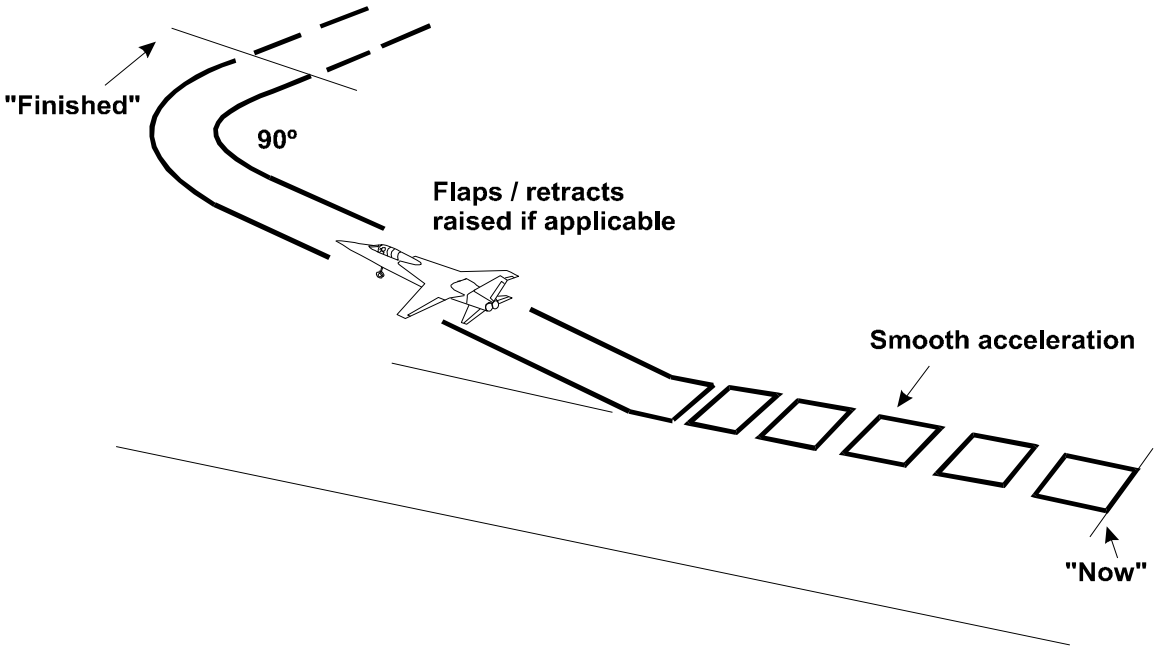
The errors listed under each manoeuvre are intended to support the manoeuvre description and show the sort of mistakes that are likely during that manoeuvre. They are not an exhaustive list of all possible faults.

6.3.7.2. Take-Off

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

The model should be positioned on the take-off area and stand still on the ground with the motor/s running without being held by the pilot or helper. After the take-off is 'called', the model then commences the take-off, either into wind, or as required by the competitor to make best use of the available take-off area. If the model is touched after the competitor or his helper calls "Now" the take-off will score zero. The model should smoothly accelerate to a realistic speed in a straight line 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 through 90 degrees at an appropriate altitude.

If the subject aircraft used flaps or other lift enhancing devices for take-off, then the model aircraft should also and these devices including the landing gear if applicable must be retracted in the correct sequence during the climb out after take-off. In the event of a strong or gusty wind, the competitor may choose to retract these devices before the take-off run commences, providing the Judges are advised. However, this may result in a reduction of the marks awarded.



Errors:

(1) Model touched after calling “Now” (zero marks). (Not applicable to rubber or CO_2 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/lift enhancing devices 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

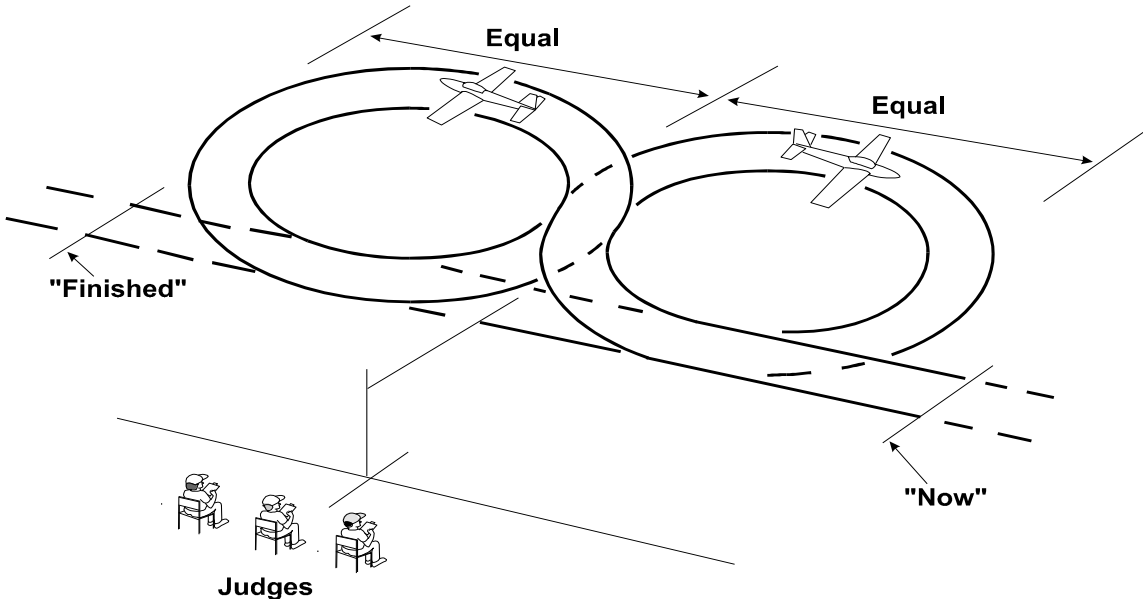
.

6.3.7.3 MANDATORY MANOEUVRES

6.3.7.3.1 Figure Eight

The model approaches in straight and level flight on a heading parallel with the Judges' line, and then a 90° 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 radius of the turns must be the same throughout the manoeuvre. The intersection (mid-point) of the manoeuvre shall be on a heading 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 and the left and right halves of the manoeuvre should be the same size.



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 heading.

(7) Entry and exit paths not parallel with Judges' line.

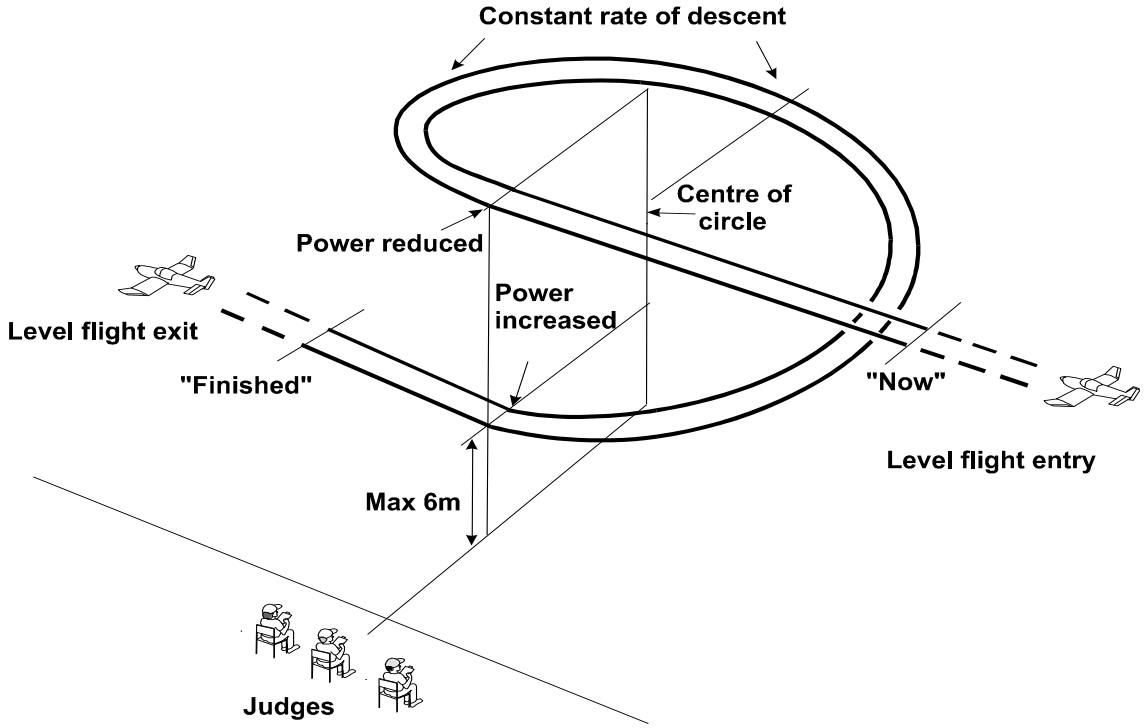
(8) Overall size of manoeuvre not realistic.

(9) Model flight path not smooth and steady.

(10) Too far away / too close / too high / too low.

6.3.7.3.2 360° Descending Circle

Commencing from straight and level flight on a track parallel with the Judges' line above the area in front of the Judges, the speed is noticeably reduced and the model turns away from the Judges and flies a gentle 360° descending circle at a constant rate of turn and at a constant rate of descent. The turn and the descent are arrested at a maximum height of 6 metres over the area in front of the Judges. (2 metres for indoor models) The speed is then increased and the manoeuvre is completed with the model resuming straight and level flight on the same track as the entry



Errors

(1) Insufficient reduction of speed.

(2) Rate of Descent too high or too low.

(3) Rate of descent not constant.

(4) Circle misshapen.

(5) Circle too big or too small.

(6) Circle not centred on Judges' position.

(7) Model does not descend to 6 metres or below, (2 metres for indoor).

(8) Start and completion of circle not over area in front of Judges.

(9) Entry and exit tracks not parallel with the Judges' line.

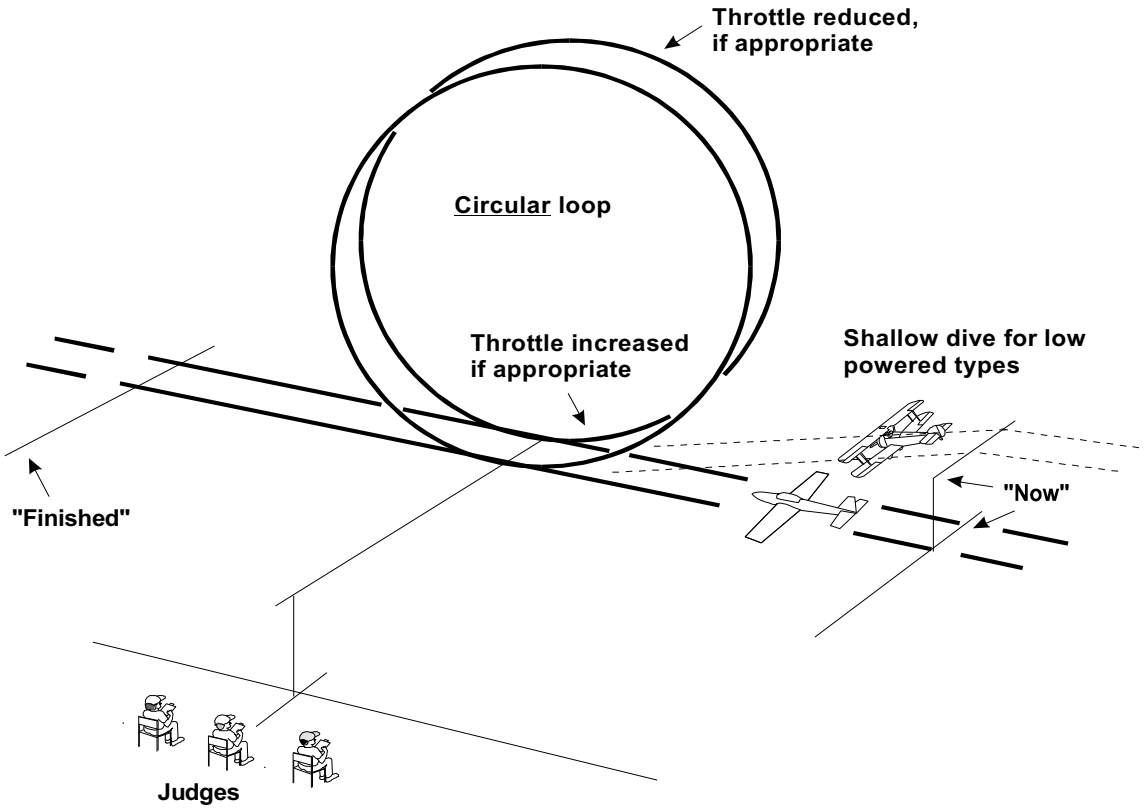
(10) Model not in straight and level flight when Start and Finish is called.

6.3.7.4 OPTIONAL MANOEUVRES

6.3.7.4.1 Inside Loop

From straight flight, the model pulls up into a 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, in which case the finish height will be the same as the height at pull-up.

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 vertically elongated loop by the former would therefore expect to be marked as well as a perfect circle achieved by the latter, but a grossly misshapen circle would be significantly down marked.



Errors

(1) Track of loop not vertical

(2) Loop not sufficiently circular or 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 the pull up.

(7) Manoeuvre not flown parallel with Judges' line.

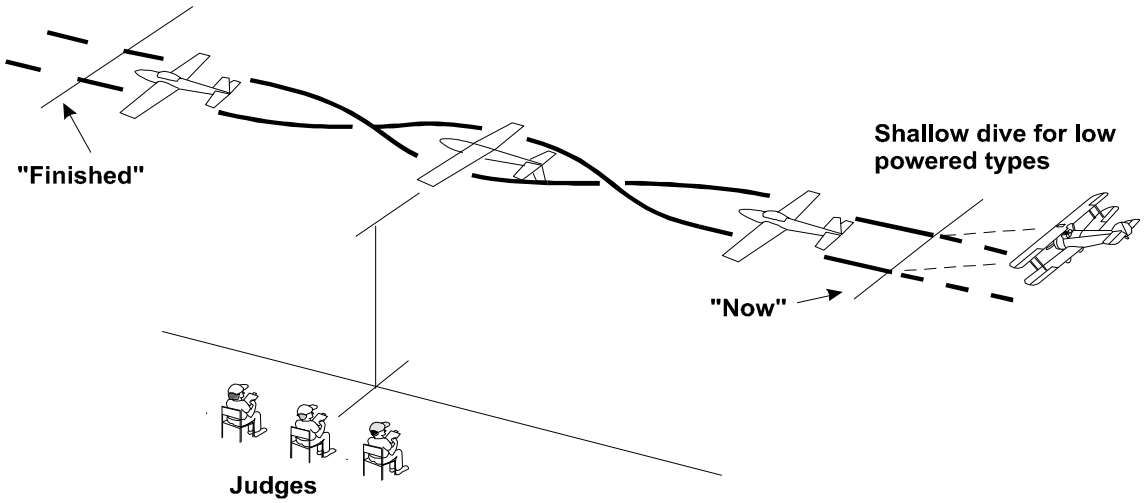
(8) Too far away / too close / too high / too low.

6.3.7.4.2 Roll

This manoeuvre has two variations:

Continuous Roll, where the model rolls at a constant rate through one complete rotation and **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 flight schedule 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.

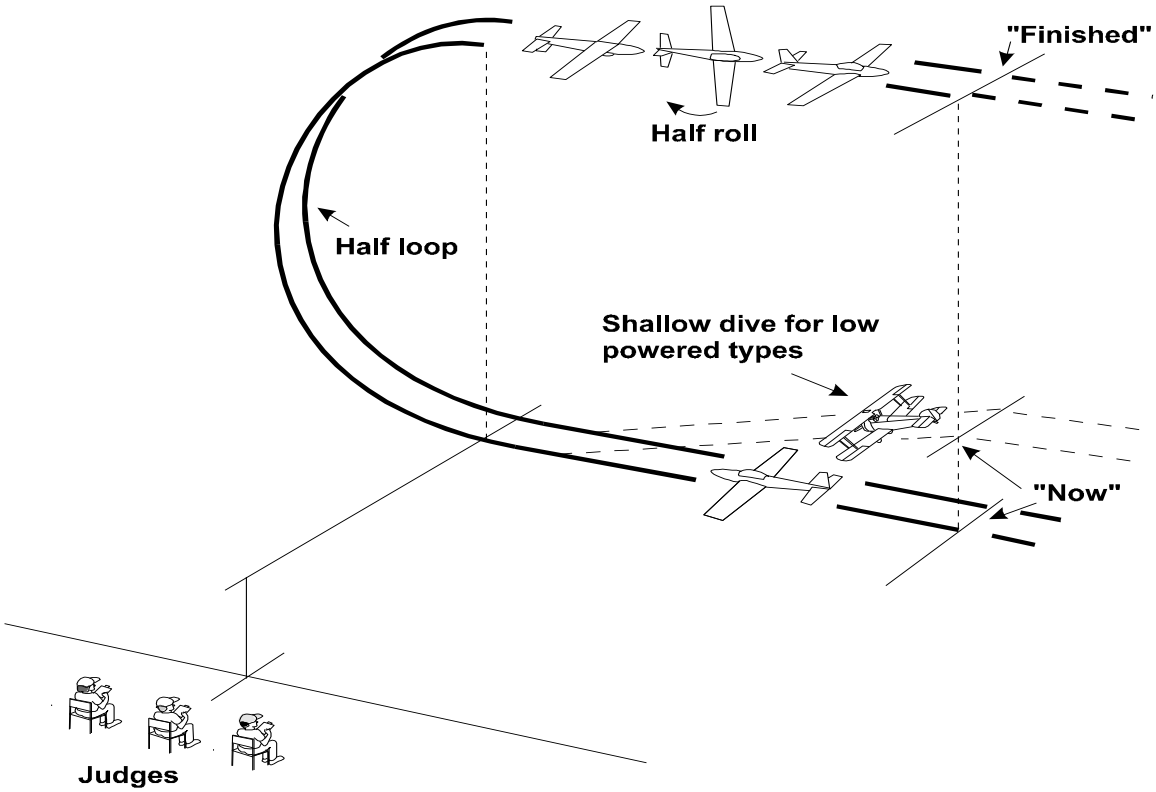
(10) Hesitation roll segments not equal

(11) Climbing roll not at specified angle

(12) Too far away / too close / too high / too low.

6.3.7.4.3 Roll Off The Top / Immelmann 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 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 semi-circular.

(4) Roll starts too early or too late.

(5) Excessive height loss in the roll.

(6) Track not sustained 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.

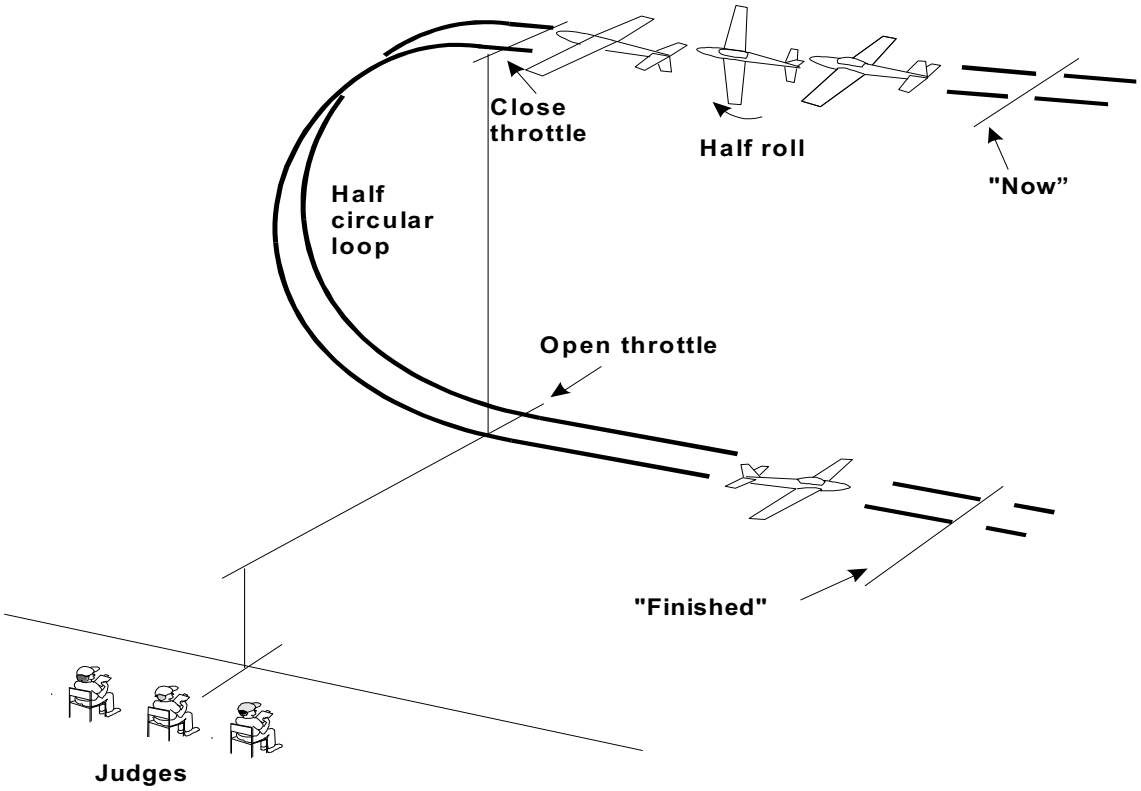
(9) Size of manoeuvre and speed not in manner of the subject aircraft.

(10) Rate of roll inappropriate.

(11) Too far away / too close / too high / too low.

6.3.7.4.4 Split - S or Reversal

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



Errors

(1) Model changes track during half roll.

(2) Model inverted too long or too short.

(3) Inappropriate use of throttle.

(4) Track of half loop not vertical.

(5) Half loop is not sufficiently semi-circular.

(6) half loop is too fast or too ‘tight’.

(7) Half loop not centred on Judges’ position.

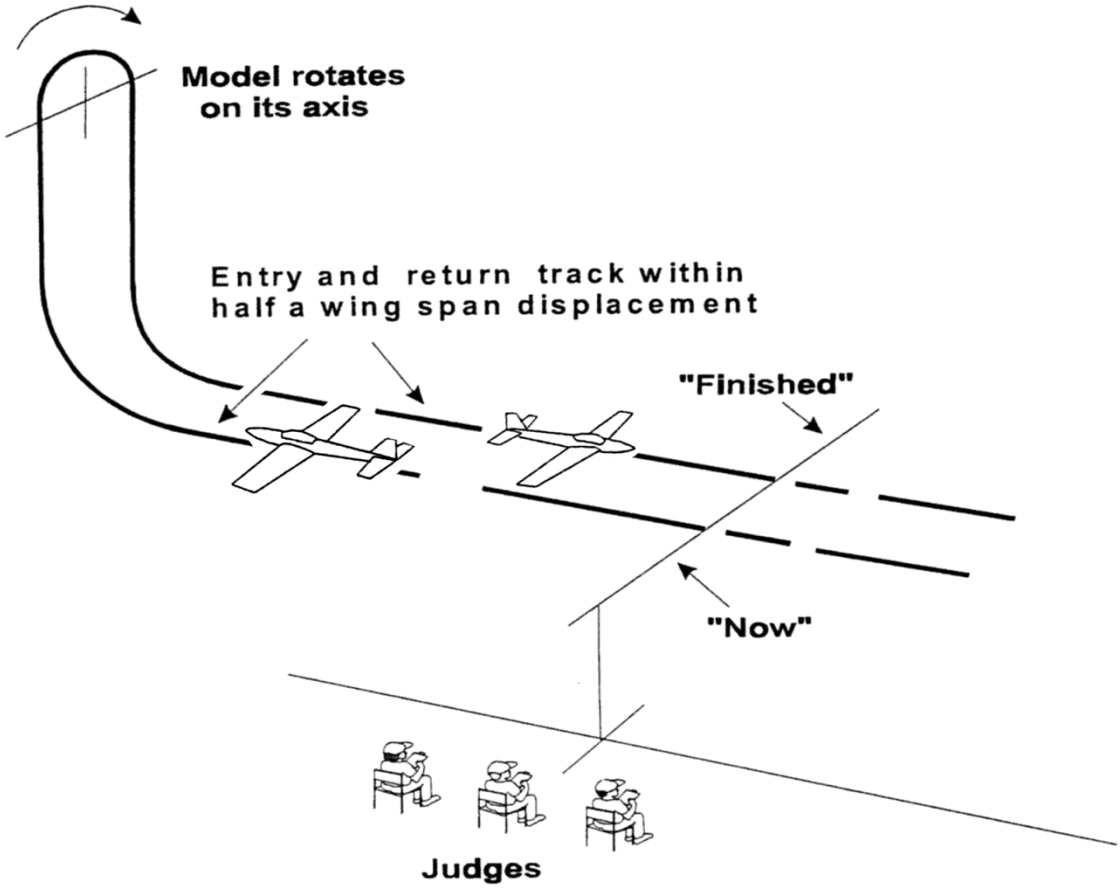
(8) Model does not resume straight and level flight on opposite track to entry.

(9) Manoeuvre not flown parallel with the Judges’ line.

(10) Too far away / too close / too high / too low.

6.3.7.4.5 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 rotates on the yaw axis through 180 degrees in the nominated direction 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 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) Competitor does not specify or achieve nominated left/right turn.

(8) Entry and exit paths are not at same height.

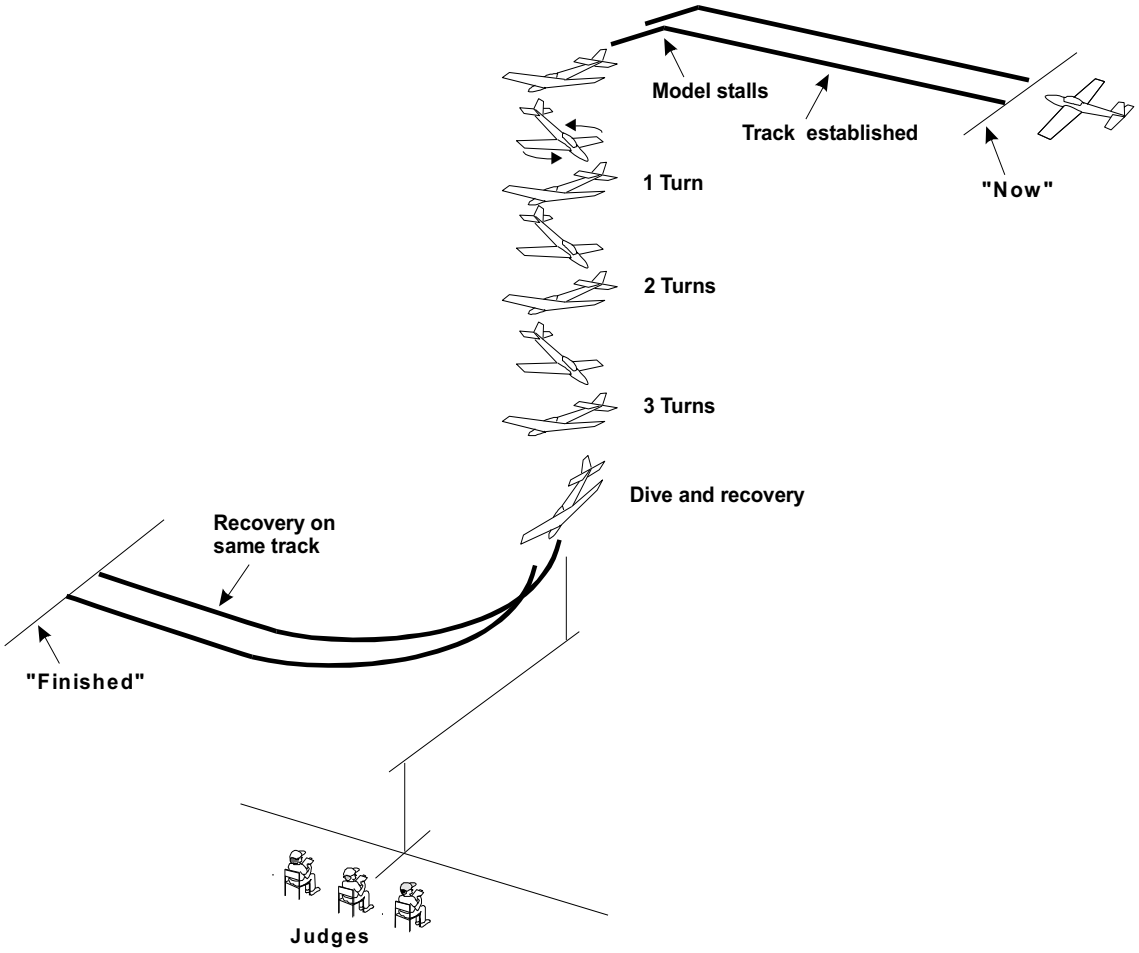
(9) Model aircraft does not exit within half span displacement of entry track.

(10) Entry and exit paths not parallel with the Judges' line.

(11) Too far away / too close / too high / too low.

6.3.7.4.6 Spin – Three Turns

From straight and level flight on a track parallel to the Judges' line, the throttle is closed, and the model is allowed to decelerate until it stalls in front of the Judges and the spin is initiated. After three turns the spin is arrested and the model recovers to level flight on the same track as the initial flight direction. During the spin, any drift due to the wind is to be ignored.



Errors

(1) Incorrect use of the throttle at point of stall.

(2) Model does not stall before entering spin

(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.

6.3.7.4.7 Cuban Eight

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

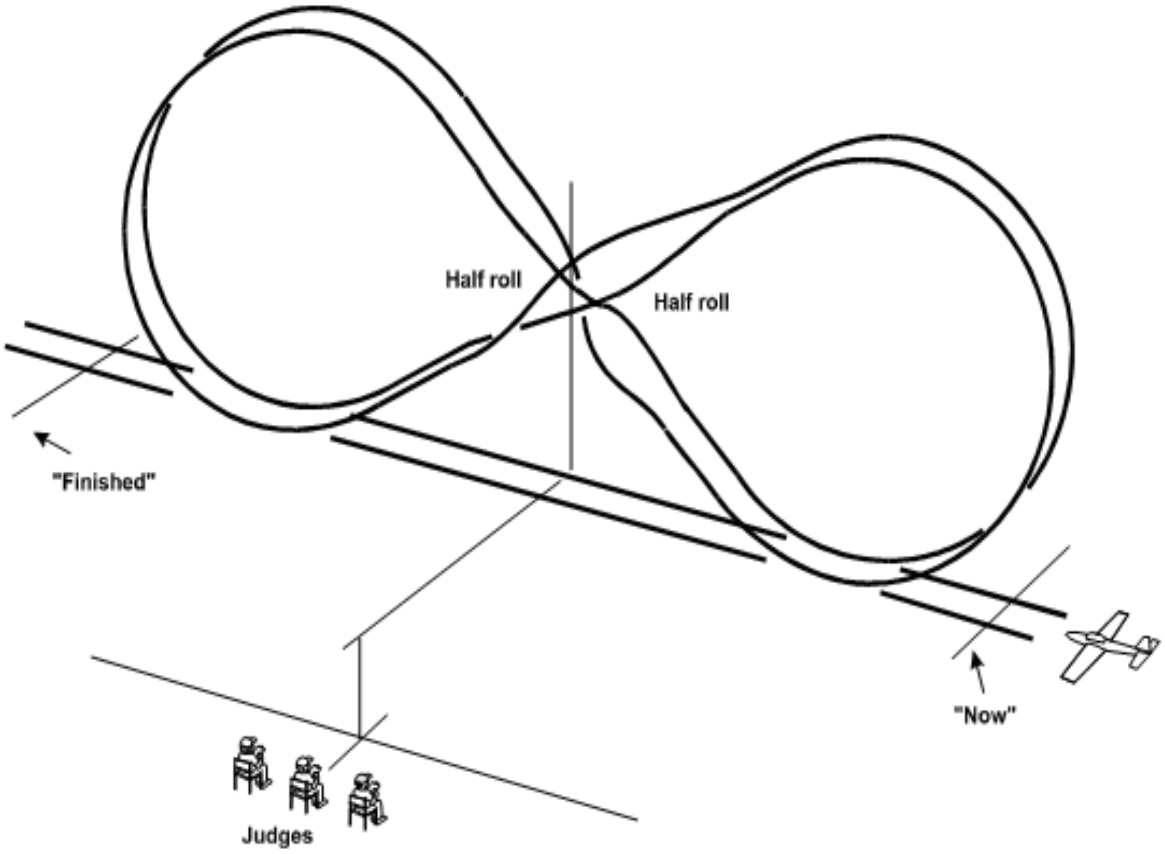
Normal Cuban Eight – From straight and level flight the model flies past the Judges and pulls up into a circular inside loop until 45° nose down. In the centre of the 45° inverted dive and when in front of the Judges, the model completes a half roll, and the 45° dive is continued until the entry height is reached. The model then commences a similar circular inside loop in the opposite direction, followed by a half roll In the centre of the 45° inverted dive when in front of the Judges. The model then pulls out of the 45° dive to straight and level flight at the same height as the original entry to complete the manoeuvre.

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

Half Cuban Eight - After the first 45° 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 to pick up speed before commencing the manoeuvre.



Errors

(1) Manoeuvre not performed in a vertical plane that is parallel with the Judges' line.

(2) Loops are not circular.

(3) Loops are not the same size (Normal and Reversed variations only).

(4) Half rolls are not centred on the Judges' position.

(5) 45º 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.

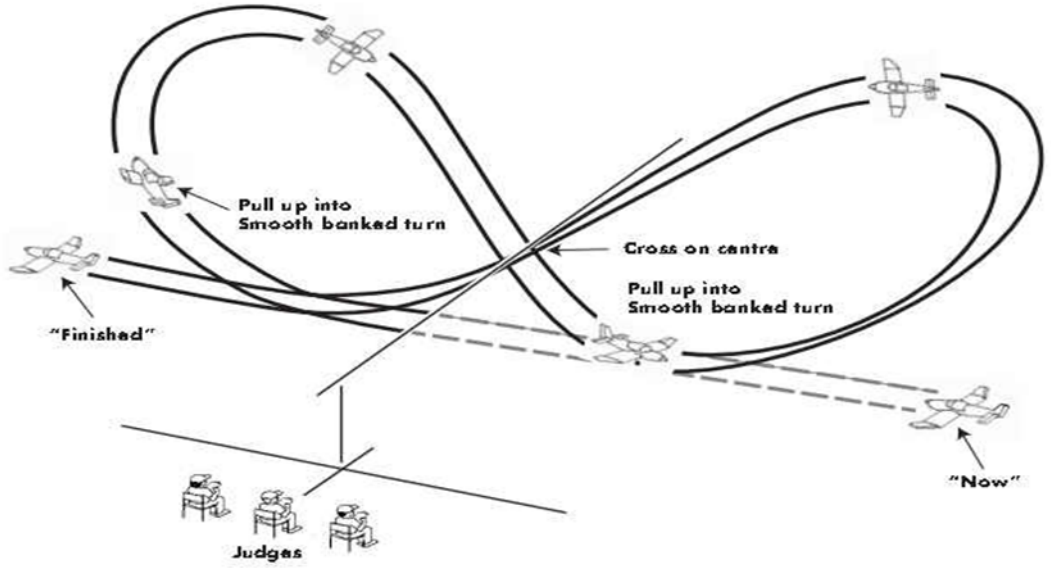
(9) Size and speed of loops not in manner of subject aircraft.

(10) Rate of roll inappropriate.

(11) Too far away / too close / too high / too low.

6.3.7.4.8 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 the maximum appropriate to the full-size aircraft but not more than 90° and the model shall be on a track 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 degrees 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 degrees 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.

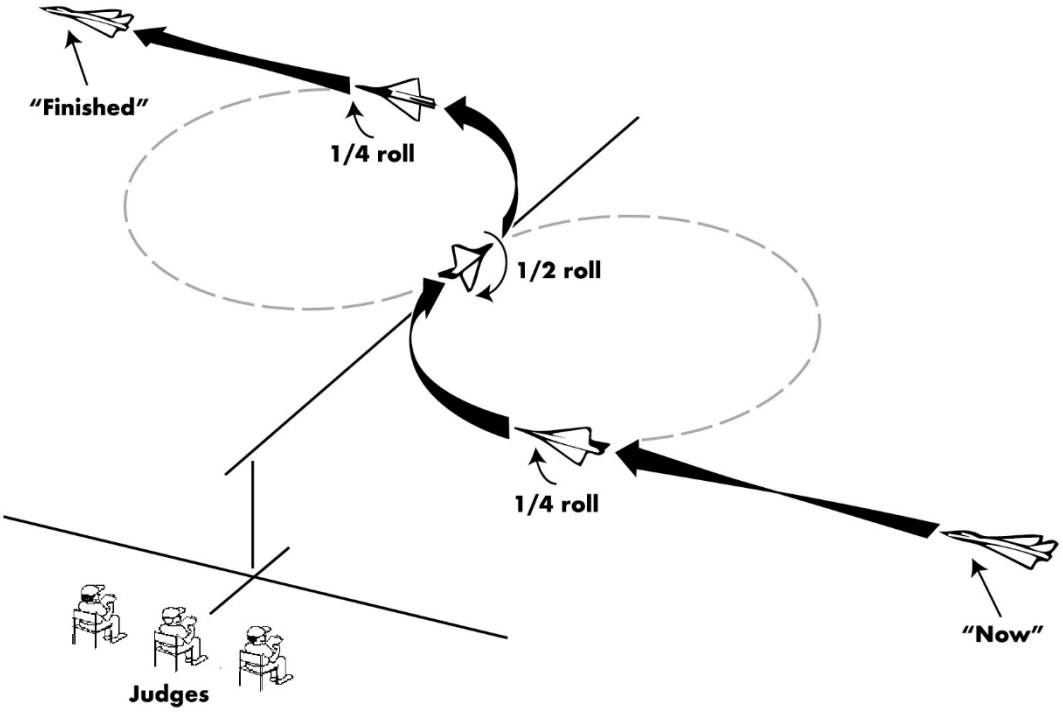


Errors:

1) Entry and exit paths not on same track 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) Apexes of turns not coincident with a model heading of 90 degrees.
(11) Wings not level at the crossover.
(12) Too far away / too close / too high / too low.

6.3.7.4.9 Derry Turn

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.

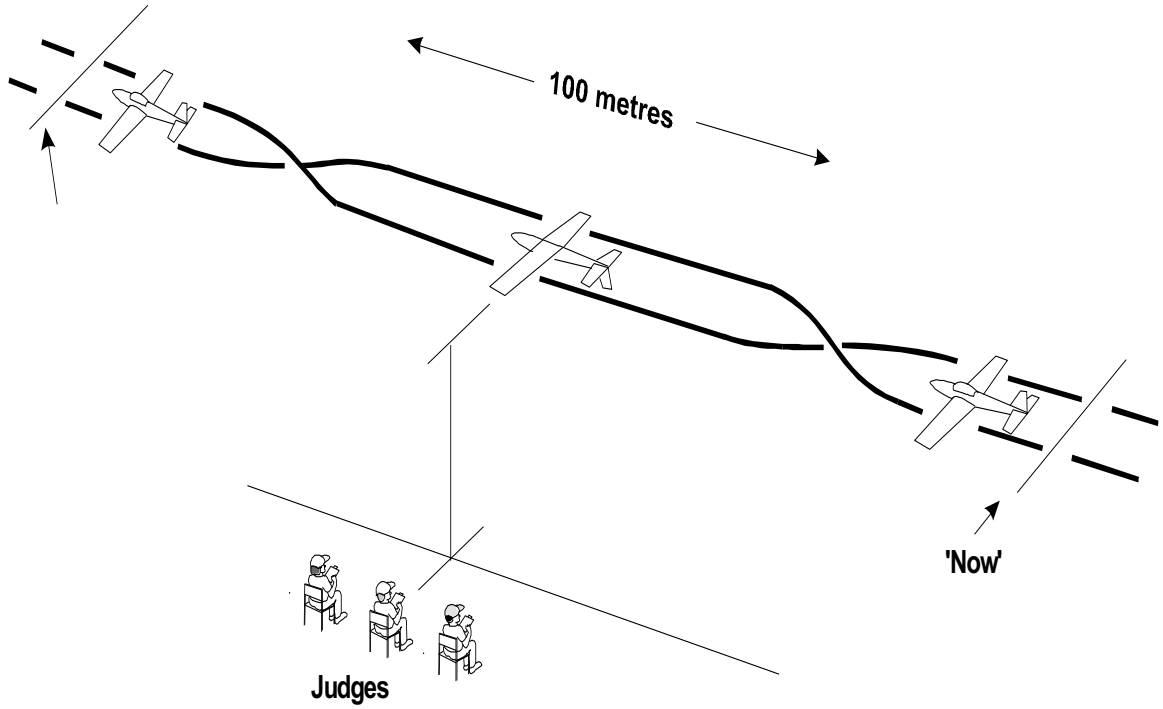
(9) The manoeuvre misshapen as seen as part of a figure eight.

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

6.3.7.4.10 Inverted Flight

Model half rolls into inverted attitude and makes a straight and level inverted flight at constant speed, track and altitude for a minimum of 100 metres (5 metres indoor) 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 to pick up speed before commencing the manoeuvre.

Note: 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 metres indoor)

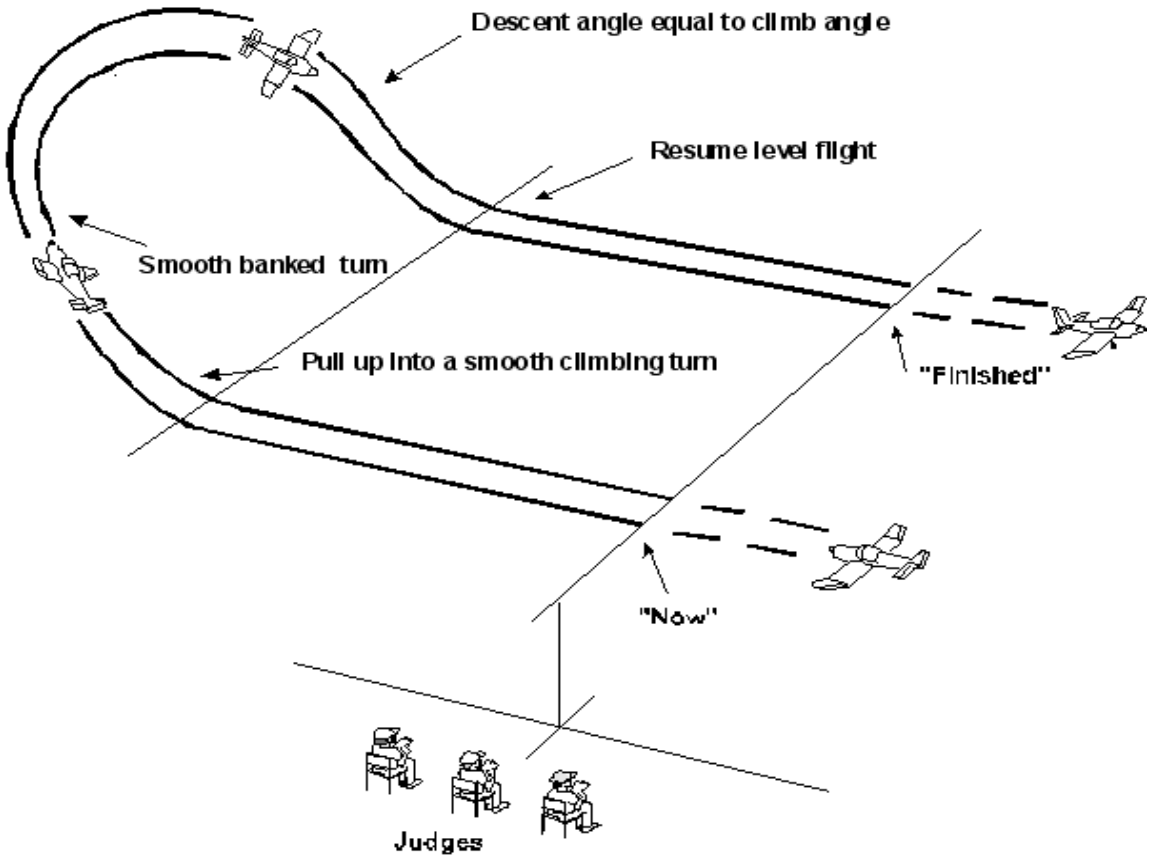
(5) Manoeuvre not centred on Judges' position.

(6) Manoeuvre not flown parallel with Judges' line.

(7) Too far away / too close / too high / too low.

6.3.7.4.11 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° 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 incorrect.

(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.

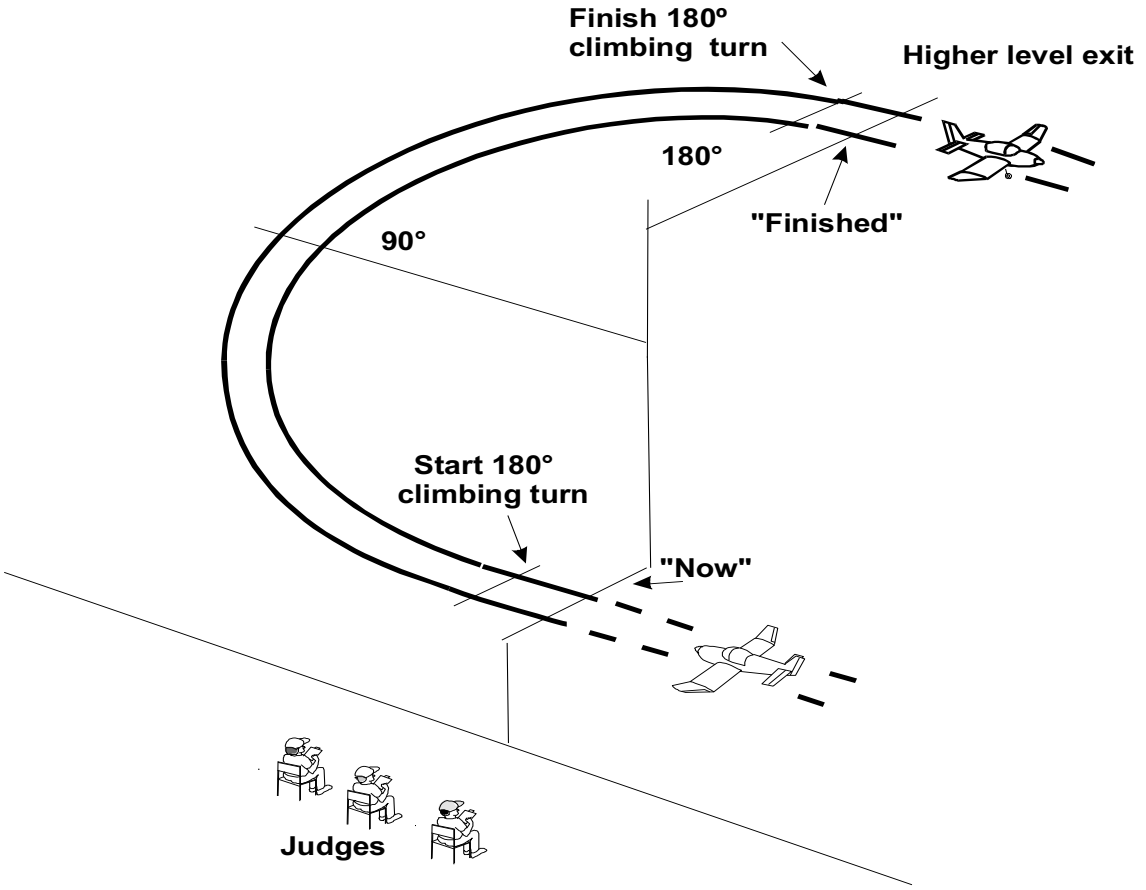
(7) Overall size of manoeuvre not realistic for subject aircraft.

(8) Model flight path not smooth and steady.

(9) Too far away / too close / too high / too low.

6.3.7.4.12 Chandelle

From straight and level flight the model passes the Judges and then performs a 180^0 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.

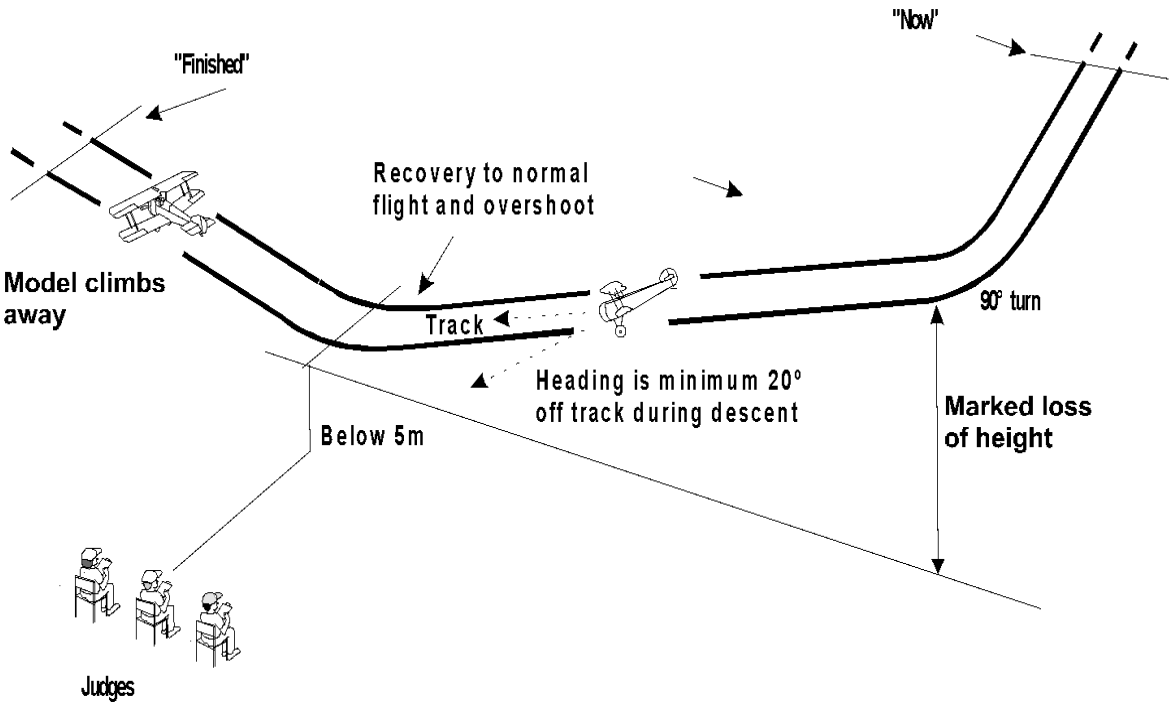
(10) Too far away or too high.

6.3.7.4.13 Sideslip

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 marked loss of height on final approach without the use of flap, whilst maintaining the final approach track and avoiding an excessive build-up of speed.

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 20º off track. The sideslip is continued to a point below 5 metres (2 metres indoor) in front of the Judges when the sideslip is corrected, normal straight flight is resumed, and the model climbs away.



Errors:

(1) Model does not smoothly enter sideslip after turning onto final approach.

(2) Model is not yawed at least 20º 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.

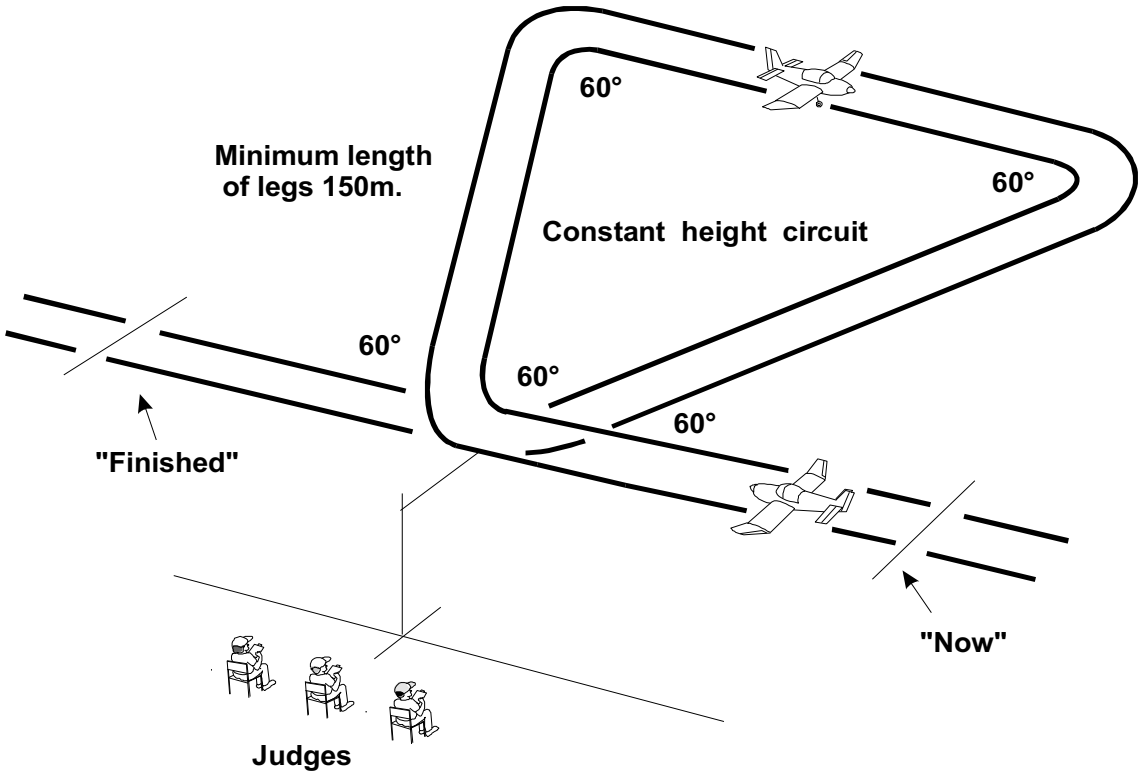
(8) Overshoot is not below 5 metres. (2 metres indoor)

(9) Not a smooth transition during return to normal flight and climb out.

(10) Too far away / too close / too high / too low.

6.3.7.4.14 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 60º 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. NOTE. When flown indoors this manoeuvre should make the most use of the available space.



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.

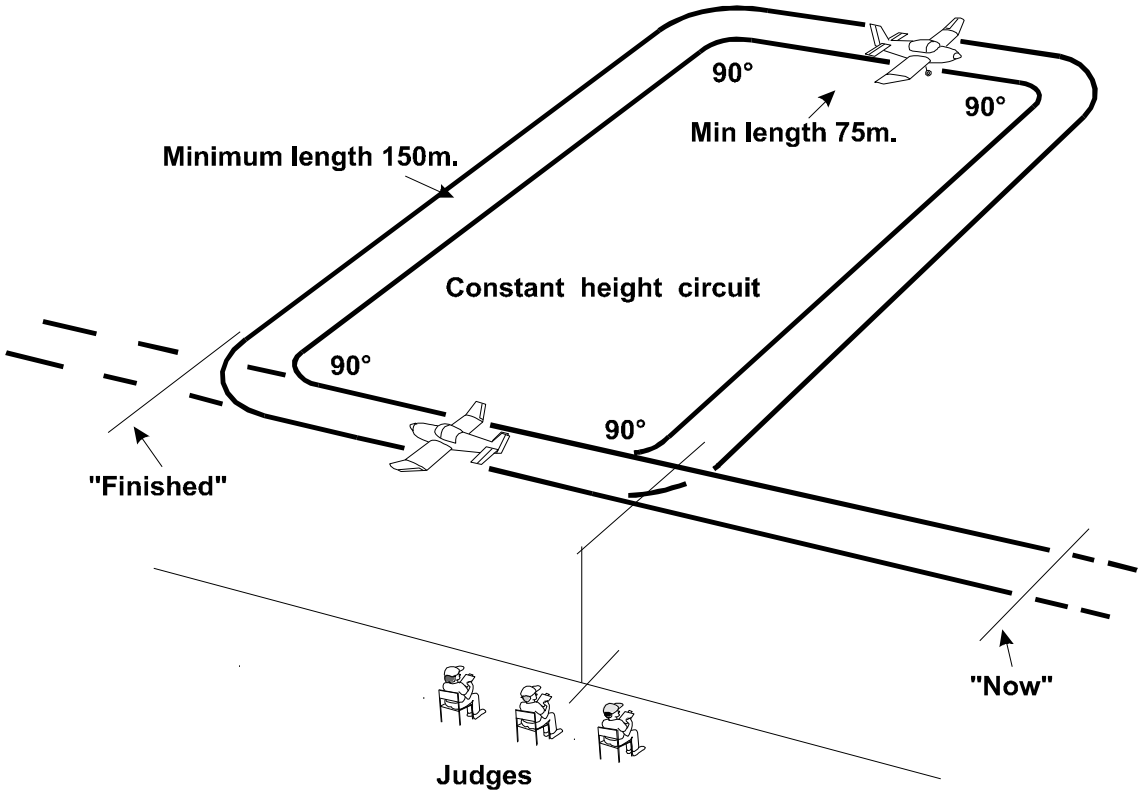
(9) Start and finish tracks not the same.

(10) Start and finish tracks not parallel with Judges' line.

(11) Too far away / too close / too high / too low.

6.3.7.4.15 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 90º 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. NOTE. When flown indoors this manoeuvre should make the most use of the available space.



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.

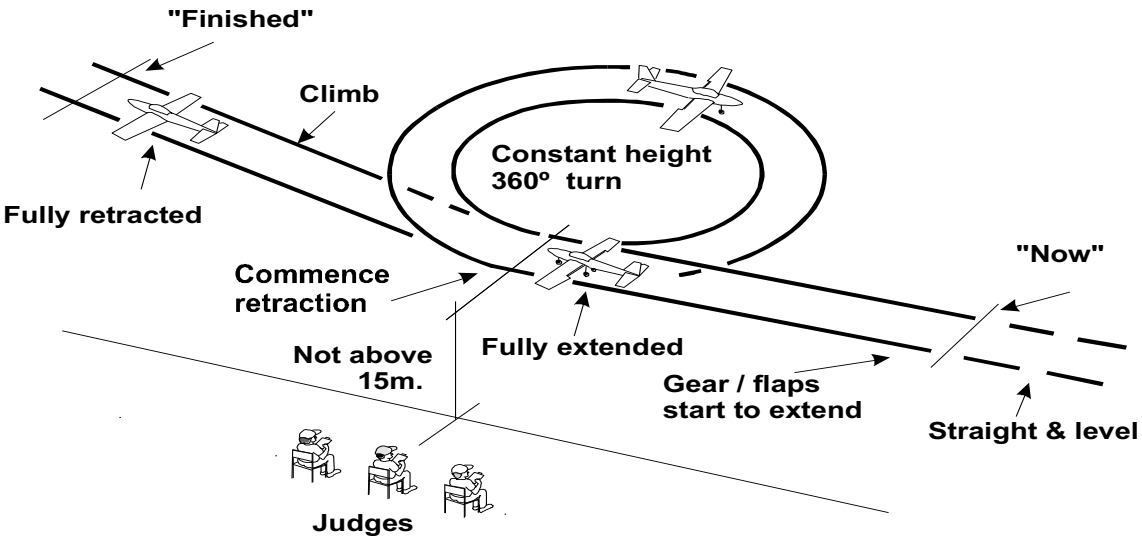
(10) Start and finish tracks not parallel with Judges' line.

(11) Too far away / too close / too high / too low.

6.3.7.4.16 Extend and Retract Landing Gear or Flaps

(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. (2 metres indoor) 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 or landing gear lowered.

(5) No change in attitude with flaps down.

(5) Misshapen circle or not constant height.

(6) Circle height exceeds 15 metres. (2 metres indoor)

(7) Inappropriate rate of turn / excessive bank angle

(8) Circle not central in front of judges.

(9) Retraction not commenced abeam of the Judges.

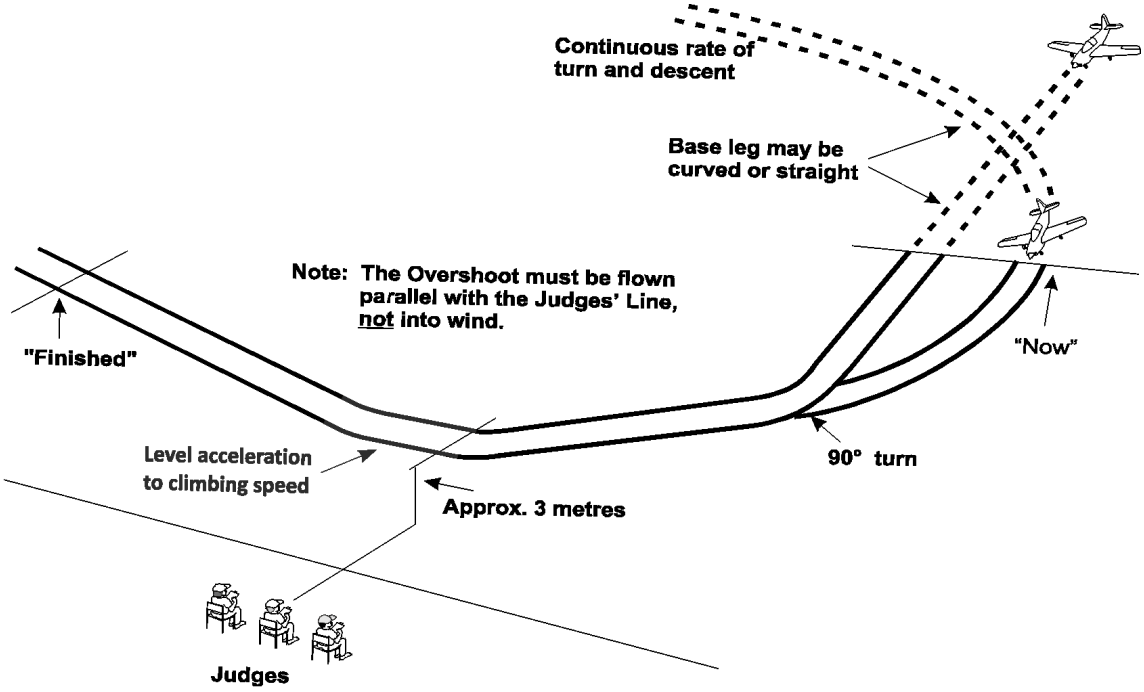
(10) Entry and exit paths not parallel with the Judges' line.

(11) Entry and exit tracks not the same.

(12) Too far away or too close.

6.3.7.4.17 Overshoot or Go-Around

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 a normal landing approach on low throttle, using flaps if applicable. On reaching the landing area the landing is aborted at a height of approximately 3 metres (0.5 metre indoor) and 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 circumstances beyond the pilot's control, e.g. unfavourable crosswind or obstruction on runway etc.



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. (0.5 metre indoor)

(7) Lowest point of manoeuvre not achieved in front of the Judges.

(8) Not smooth transition of speed and attitude from approach, through descent check, to climb out.

(9) Inappropriate use of flap and/or landing gear.

(10) Model does not climb away smoothly.

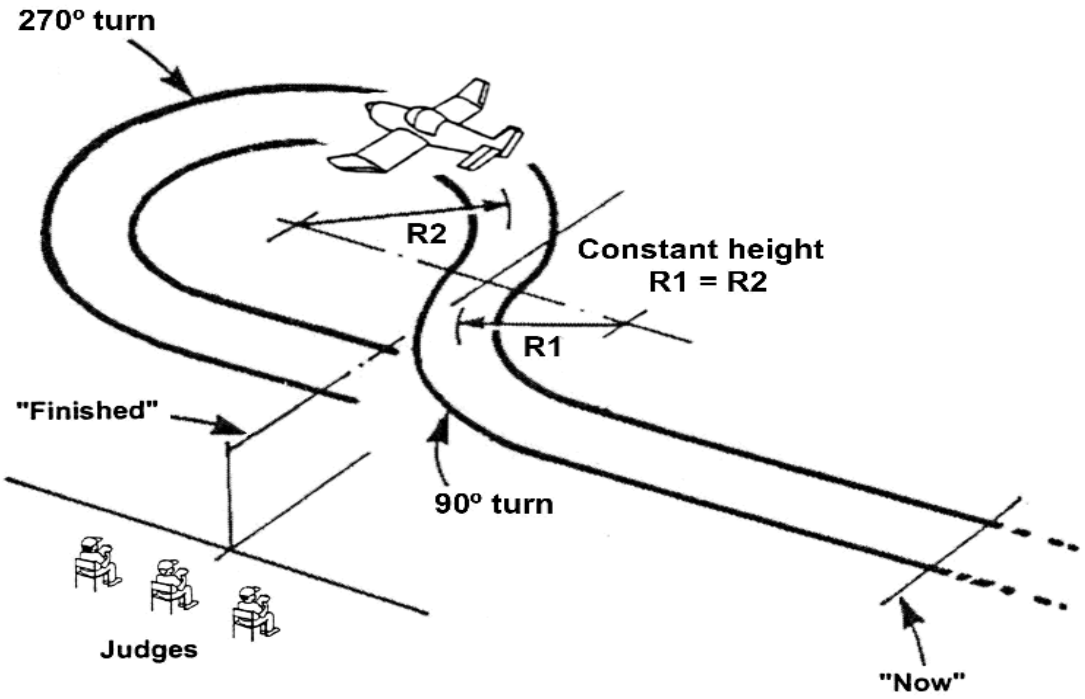
(11) Approach and climb out tracks not the same.

(12) Model gains height before accelerating

(13) Too close or too far away.

6.3.7.4.18 Procedure Turn

The model approaches in straight and level flight on a track 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 and track. 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' position. The radius of the turns must be the same throughout the manoeuvre.



Errors

(1) Rate of turn is not constant.

(2) Radius of turn is not constant.

(3) Constant height not maintained.

(4) Entry and exit tracks not the same

(5) Entry and exit tracks not parallel with the 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.

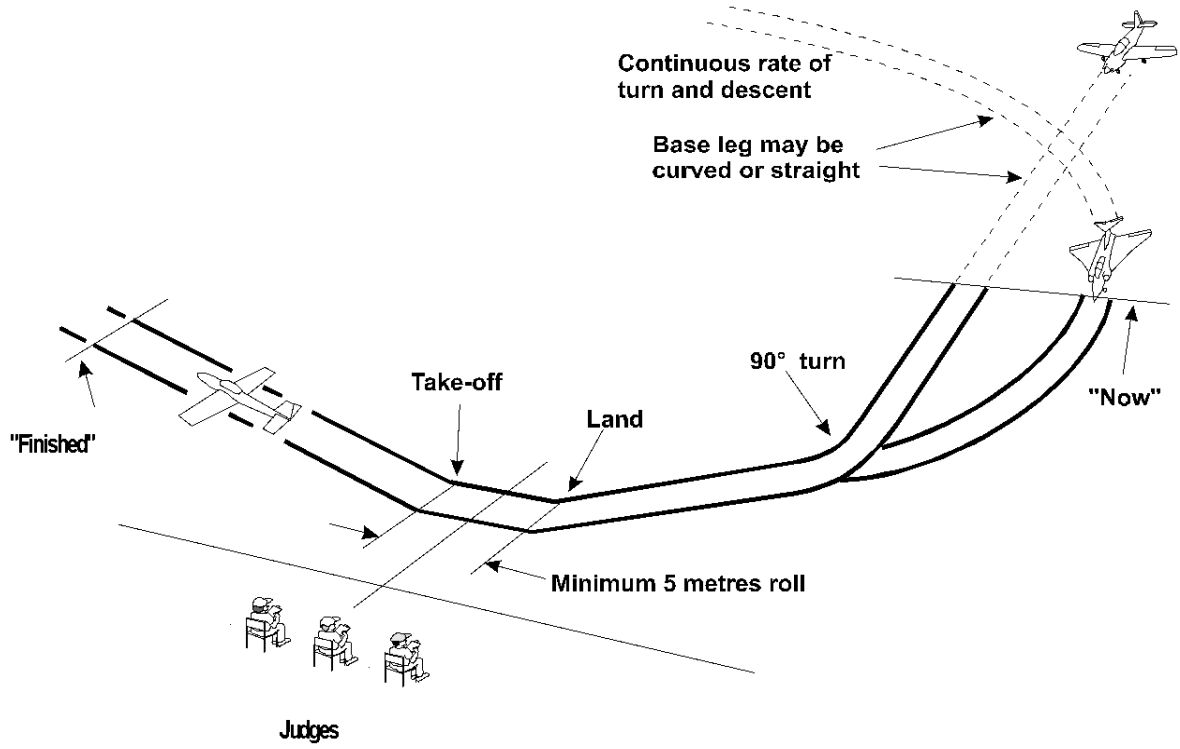
(9) Model flight path not smooth and steady.

(10) Too far away / too close / too high / too low.

6.3.7.4.19 Touch and Go

This manoeuvre may be flown into the wind and the model may cross the judge's 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. The ground roll does not have to be centred on the Judges' position, but the manoeuvre must make the best use of the available landing area. (For Scale R/C Indoor 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 metres for indoor models).

(6) Model bounces excessively on landing.

(7) Inappropriate use of flaps.

(8) Climb out not smooth or realistic.

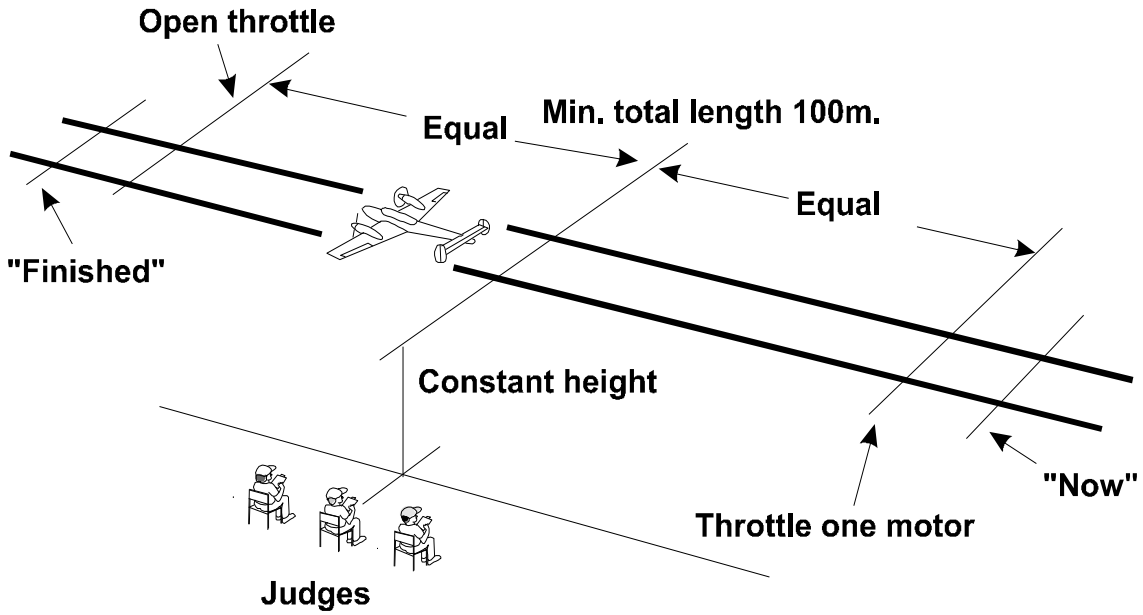
(9) Approach and climb out tracks not the same.

(10) Does not make best use of landing space available for wind direction.

6.3.7.4.20 Straight Flight with One Motor Throttled

This option is for multi-engine subjects only.

The model approaches in straight and level flight at a constant height and one throttle is then 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.



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 the Judges' position.

(8) Not flown parallel with the Judges' line

(9) Too far away / too close / too high / too low.

6.3.7.4.21 Straight Flight at Low Speed

The object of this manoeuvre is to demonstrate 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.

After reducing speed, the manoeuvre is commenced and the model then flies in a straight line parallel with the Judges' line over the landing area for a minimum distance of 100 metres (5 Metres indoor) and centred on the Judges' position. The height must be constant and not exceeding 6 metres (2 metres indoor).

Errors

(1) Not a constant heading

(2) Not a constant height.

(3) Above 6 metres (2 metres indoor).

(4) Model does not pass over the landing area.

(5) Manoeuvre not centred on the 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.

6.3.7.4.22 Dropping Bombs or Ordnance

If bombs are carried internally, bomb-bay doors must be opened before the drop and closed after the drop. If bombs are carried externally, they must be carried in the correct positions and released in the manner of the subject aircraft. The flight profile during the manoeuvre must be in the manner of the subject aircraft and any special features of the manoeuvre should be declared to the Judges before the flight commences.

Dropping must be within clear view of the Judges and the target must be centred in front of the Judges' position.

Errors

(1) Bombs do not detach and fall in a realistic manner.

(2) Drop is not in front of the Judges.

(3) Overall dropping manoeuvre not appropriate to the full-size aircraft

(4) Too far away / too close / too high / too low.

6.3.7.4.23 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.

Errors

(1) Parachute not deployed/opened in a realistic manner.

(2) Drop is not in front of the Judges.

(3) Overall dropping manoeuvre not appropriate to the full-size aircraft.

(4) Too far away / too close / too high / too low.

6.3.7.5 Non-Listed Manoeuvres or Flight Functions Performed by The Subject Aircraft.

A competitor may include in his flight schedule one or two manoeuvres or flight functions appropriate to the full-size aircraft modelled which are not listed or described in this section. Examples of such manoeuvres are crop spraying, falling leaf, outside loop, square loop etc.

Full details of the proposed manoeuvre/s 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 the chosen manoeuvre or function is appropriate to and within the performance capability of the full-size subject aircraft.

Procedural flying manoeuvres which are common to all aircraft types, such as climbing turn, descending turn, etc. are not acceptable.

Mechanical functions and demonstrations of functional scale detail, such as dropping auxiliary fuel tanks, sliding cockpit canopies and switching on and off lights, are not acceptable as optional flight manoeuvres. Such functions may be included in the flight schedule to enhance realism in flight.

6.3.7.6 Approach and Landing

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

The manoeuvre is commenced with the model on the 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. The model completes the turn on to the final approach which may be made into wind, or as required by the competitor to make best use of the landing area available.

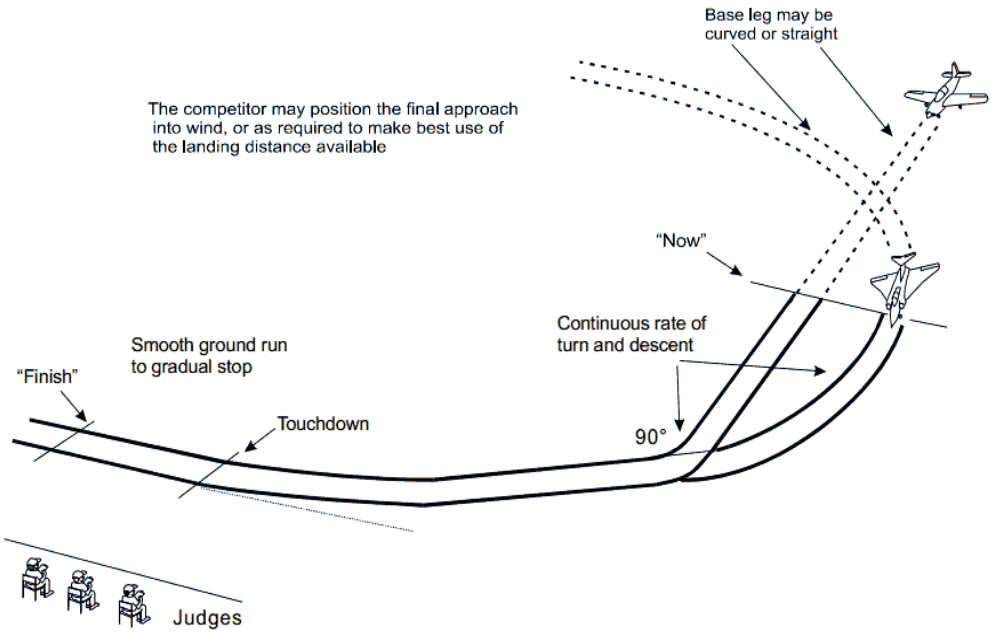
The model should descend smoothly, adopting the attitude applicable to the subject aircraft. An aircraft with conventional landing gear will make a three-point landing or will land on the main wheels and then gently lower the tail. An aircraft with tricycle landing gear will land on the main wheels first and then gently lower the nose wheel. The model is then braked or allowed to roll smoothly to a complete stop when the landing is complete.

Dependent upon the surface of the landing area and the prevailing wind conditions, a slight bounce or failure to touch down immediately in front of the Judges are not errors.

If the subject aircraft is fitted with wing tip protection devices, then such devices fitted to the model may contact the ground without penalty.

If the subject aircraft used flaps, lift enhancing devices and/or speed brakes for landing, then the model should also be fitted with these devices. These devises and/or the undercarriage should be deployed at the appropriate point in the landing circuit up to and including the final approach. In the event of a strong or gusty wind, the competitor may choose not to deploy these devices during landing providing the Judges are advised. However, this may result in a reduction of the marks awarded.

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) Excessive bouncing.

(7) Drops a wing during landing.

(8) Touches wing tip on ground (unless full size a/c has wing tip protection devices).

(9) Does not come to a gradual and smooth stop after landing.

(10) Does not adopt landing attitude appropriate to subject type.

(11) Model ground loops, runs erratically or turns after touchdown.

(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.

(14) Undercarriage lowered when inappropriate.

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 wind direction, the above down marking will not apply.

Models of aircraft which have retractable undercarriage, landing with one or more wheels not locked down should have the landing points reduced by 30%. All landings ending with the model on its back will be considered a crash landing.

6.4 SCALE FREE FLIGHT

6.4.1 GENERAL FREE FLIGHT RULES

6.4.1.1 Judging Arrangements

CAA Registration ID - Models over 250gms must comply with General Scale Rules (see **6.1.1.23)**

Double Entries in the same class may be allowed at the discretion of the CD. Only one podium place can be awarded. (see **6.1.1.5**)

The BOM rule, as defined in **6.1.1.3**. applies to all free flight scale models flown in indoor or outdoor competition.

It is the responsibility of the competition CD to provide the flying and static judging score sheets. Score sheets can be downloaded from the STC website at https://scale.bmfa.org/documents/scoresheets.

Static Judging - Unless otherwise specified in individual class rules, static judging will be carried out in accordance with section **6.1.2.***

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

***Note.** For Indoor and Outdoor Free Flight classes, the surface texture is not judged separately.

For National Championships the CD is responsible for producing the flying order which is established by means of a draw before the start of the contest.

6.4.1.2 Safety Cut-Off and 2.4GHz Radio Control

Electric motor-powered models weighing 250gms or more driving external propeller(s) must be fitted with a safety cut-out device which can stop the motor in the event of the model prematurely ending its take-off or flight. This device can be automatic or controlled on demand by the competitor using 2.4GHz radio control. This device must also prevent the electric motor(s) being accidentally restarted if the model is picked up by a third party.

The installation of R/C equipment in any Free Flight model must be declared to the Contest Director during registration or before any flying commences.

Competitors must be prepared to demonstrate the functionality of the safety cut-out device before any official flight if requested by the Contest Director or the Flight Judges.

If the motor cut-off system uses a R/C Transmitter, it may be held at readiness during the flight by the contestant, a third party or placed near to the point of launch.

With the exception of class FF5, Outdoor Scale Assisted Free Flight the following rules apply,

If the model is fitted with R/C operated trimming tabs or control surfaces and the transmitter is handheld or in a tray, then the Tx must be clearly in a **non-operational manner** e.g., held by its handle or strap or hands away from the Tx.

The competitor must declare activation of the cut-off or control surfaces to the judges immediately on activation of the Tx or the flight will be disqualified.

The flight scoring will cease at the point the competitor starts to use any Tx control or activation of the motor/engine cut-off.

6.4.1.3 Dummy Pilots

Models without dummy pilots may be marked down where the absence of a pilot detracts from Realism in Flight.

6.4.1.4 Retractable and Extending Undercarriage

Models of aircraft with retractable landing gear may be flown gear down or up. If the model is presented for static judging with the landing gear down, the landing gear must be fitted to the model for flight, but it need not necessarily be in the down position. Models that make an approach to land with gear up will not be penalised for lack of visible landing gear. Models built with the undercarriage retracted may be launched with the aid of a dolly and/or catapult system.

Undercarriage Retracts in flight after take-off..... + 5%

Undercarriage Extends in flight before landing..... + 5%

6.4.1.5 Multi Engines

Models using two or more engines of any type will be eligible for a multi-engine bonus. To qualify for the multi engine bonus each propeller or fan must be driven by a separate engine unless this was not the case with the subject aircraft modelled. The outermost thrust lines must also be separated by a minimum of 10% of the model wingspan.

The multiple engines bonus is .....+10%

6.4.1.6 Flight Bonuses

Where flight bonuses are applicable, (see **6.4.1.4** and **6.4.1.5**) they must be claimed by the competitor and the claim will be verified by the Flight Judges.

6.4.1.7 Flight Profilers

The use of flight profiling systems for in-flight power variation is allowed for all FF classes.

6.4.1.8 Electronic Motion Stabilising Devices (EMSDs) or Gyros

EMSD systems are not permitted in the Scale Indoor Free Flight Classes.

Unless specifically excluded in the class rules, the use of these devices is restricted to low-wing outdoor free flight scale models only.
For class FF5 Assisted Free Flight (see **6.4.6**) there is no restriction on model type,
The use of these devices is restricted to one axis only.

Devices which provide altitude, heading or speed hold and active GPS devices are not permitted.

6.4.1.9 Proxy Flying

For Peanut (FFX5) Pistachio (FFX6) and No-Cal (FFX7) indoor competitions organised by the STC, but not including the Indoor National Championships, proxy flying of UK and overseas models will be allowed at the discretion of the Contest Director.

Such models will be expected to be fully trimmed and be accompanied by extensive and clear trimming and flying instructions/guidelines to aid the proxy pilot. The relevant classes are noted in the individual class Model Characteristics.

Selection of the proxy pilot will be random following the guidelines in the STC Scale CD Guide

6.4.1.10 Additional safety measures when flying FF Power Models in front of the General Public

(a) Only one I.C or Electric model to be flying at any time. No restriction for rubber powered models

(b) Spectators' barriers will be provided a safe distance from the take-off area.

(c) An audible warning must be given when an I.C or Electric powered model is about to take-off or be launched.

(d) A minimum of one Safety Marshall must be present during the duration of the competition, equipped with a warning horn or megaphone.

(e) A briefing will be given to competitors before flying commences. Notices will be placed near the spectator barrier warning of the potential risks to spectators from Scale FF Power models.

6.4.2 CLASS FF1 - SCALE FF OUTDOOR SUPERSCALE

6.4.2.1 Eligible Models

The competition is open to any scale free flight model that complies with the BMFA General Regulations **1.2**, the General Scale Rules **6.1.1**, the General Scale Free Flight Rules **6.4.1** and the class-specific Model Characteristics below.

6.4.2.2 Model Characteristics

Maximum weight of complete model without fuel……...2 kg

Maximum wing loading ..... .50g/dm²

Motive Power

I/C Piston Engines ……..Maximum total engine displacement 2.5cc

Electric motors……..…Maximum voltage of power source 12 volts nominal

Extensible Rubber Motors…….No limit

CO_2, and Compressed Air……...No limit

Reaction Motors (Local rules may apply) ……No limit

Safety devices must be fitted in accordance with **6.4.1.2**

The competitor may be required to demonstrate the effectiveness of any fitted cut-off safety device to the Competition Director before flights are carried out.

6.4.2.3 Documentation

The Documentation requirement for this class is as specified in **6.1.2**.

6.4.2.4 Judging for Fidelity to Scale and Craftsmanship

The Static judging for this class is a simplified version of rule **6.1.2.6**

Each of the following aspects will be awarded a mark out of 10 in increments of 0.5 of a mark by each Judge and the following K-factors apply (see **6.1.1.11**):

1. (a) Scale Accuracy - side view .....K = 15
   (b) Scale Accuracy - end view .....K = 15
   (c) Scale Accuracy - plan view .....K = 15
2. Markings Accuracy.....K = 10
3. Colour Accuracy.....K = 5
4. Scale Realism .....K = 20
5. Craftsmanship.....K = 15
6. Overall Complexity.....K = 5

Total K = 100

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. **6.1.1.18**

6.4.2.5 Official Flights:

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. The competitor must notify the Judges when he is ready to release the model.

6.4.2.6 Number of Flights:

Each competitor is to have the opportunity to make a minimum of 4 flights and up to a maximum of 6 flights at the Contest Director's discretion.

6.4.2.7 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 to complete each flight programme (plus one minute for each additional engine of multi-engine models). The flying time commences 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.

6.4.2.8 Flight judging & K-Factors:

Each official flight will be judged in relation to the expected flight characteristics of the full-size subject aircraft.

Each flight will be marked between 0 and 10 in increments of 0.5 for each phase of the flight with the relative importance of each phase being determined by the following K - Factors (see **6.1.1.11**)

Models are hand launched. Take-off is permitted but not scored.

Flight Phases

(a) Initial Climb……K = 20

(b) Cruise……K = 30

(c) Transition to descent……..K = 10

(d) Descent and landing approach…….K = 20

(e) Realism in Flight…….K = 20

Total K = 100

6.4.2.9 Flight Bonuses

The flight score shall be subject to complexity bonuses as described in the FF General Rules Section **6.4.1**

6.4.2.10 Marking and Scoring

The sum of the individual Flight Judges scores is the Total Flight Score. The sum of the individual Static Judges scores is the Total Static Score.

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

In the event of a tied final score the next best flight score will be taken into account to determine placing

6.4.3 CLASS FF2– SCALE FF OUTDOOR SCALE FREE FLIGHT

6.4.3.1 Eligible Models

The competition is open to any Free Flight scale model that complies with the BMFA General Regulations **1.2,** the General Scale Rules **6.1.1,** the General Free Flight Rules **6.4.1**.and the class specific model characteristics below.

6.4.3.2 Model Characteristics

Maximum weight of model without fuel ..... 2 kg

Maximum wing loading.....50g/dm²

Maximum I/C piston motor displacement 2.5cc

Electric motors……Maximum voltage of power source to be 12 volts nominal

Rubber and Co2 ……No limit

Reaction (Local Rules may apply) ..... No limit

Safety devices must be fitted in accordance with **6.4.1.2**

The competitor may be required to demonstrate the effectiveness of any fitted cut-off safety device to the Competition Director before flights are carried out.

6.4.3.3 Documentation

Proof of scale documentation is not required but if the model is of an obscure subject unlikely to be recognised by the Flight Judges, the competitor must be prepared to provide proof of validity of the subject by means of a photograph or certified drawing.

6.4.3.4 Pre-Flight Scoring

The entered models will be assembled together prior to the contest in one place. Each Judge will assess the models for Realism and Craftsmanship and award a score between 0 and 100 for each model. Maximum total score 200

6.4.3.5 Flight Judging and K Factors

Each competitor will have the opportunity to make 4 flights at the Contest Director's discretion.

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 qualifying flight score returned,

The competitor must notify the Judges when he is ready to release the model.

Each official flight will be judged in relation to the expected flight characteristics of the full-size subject aircraft.

Each flight will be marked between 0 and 10 in increments of 0.5 for each phase of the flight with the relative importance of each phase being determined by a K - Factor as below. (See **6.1.1.11**)

Models can R.O.G or be hand launched. The take-off is not marked.

Flight Phases

(a) Initial climb ..... K = 20

(b) Cruise ..... K = 30

(c) Transition ..... K = 10

(d) Descent and Landing Approach ..... K = 20

(e) Realism in Flight ..... K = 20

Total K = 100

6.4.3.6 Flight Bonuses

There are no Flight Bonuses in this class

6.4.3.7 Marking and Scoring

The sum of the individual Judges' scores (Pre-Flight score added to Flight score) is the Total Score. The best total score is the Final Score

The highest Final Score will be used to determine the winner.

In a tied final score, the next best total score will be taken into account to determine placing.

6.4.4 CLASS FF3 - SCALE FF OUTDOOR. RUBBER PRECISION

6.4.4.1 Eligible Models

The competition is open to any rubber powered scale model that complies with BMFA General Regulations **1.2,** General Scale Rules **6.1.1** and the General Free Flight Rules **6.4.1** and the class-specific Model Characteristics below.

Models will not be judged for appearance, scale accuracy or flight realism, but if the model is of an obscure subject unlikely to be recognised by the Flight Judges, the competitor must be prepared to provide proof of validity of the subject by means of a photograph or certified drawing.

6.4.4.2 Model Characteristics

Maximum Weight of model less rubber..... 2kg

Maximum wing loading.....50g/dm^2

The colour scheme of the model is to be 'in keeping' with the subject aircraft.

EMSD systems (Gyros) are not permitted in this Class.

6.4.4.3 Flight Rules

The following Flight Rules apply:

a) The competition will be held over a one-hour time period. This may be extended at the discretion of the CD should conditions require.

b) All flights will be hand launched from a 10m x 10m launch area designated by the CD.
Competitors will make 3 official flights from within this launch area.

c) If a flight is less than 5 seconds, this will count as an attempt. One attempt per flight is allowed.

d) The target time will be set on the day by the CD. A maximum overrun time will be set at twice the target time.

e) The target time will usually be 30 seconds. with a maximum overrun set at 60 seconds.

f) Any flights greater than the maximum overrun will be scored 100.

g) Dethermalisers, including drop-out nose blocks, are permitted but must be set to operate at times in excess of the maximum overrun time. If a dethermaliser operates within the maximum overrun time a penalty flight score of 100 will be applied.

h) Any trimming flights must be made away from the launch area.

6.4.4.4 Flight Scoring

a) Competitors are required to have their flight times recorded in seconds, rounded down (e.g., 23.7 becomes 23) on an official flight score sheet supplied by the C.D. Flights must be timed by another competitor or a suitable person agreed by the CD.

b) The flight score is the difference between the flight time and the target time.

c) If a competitor fails to record any of the 3 flight scores, a score of 100 will be allocated for each missing flight.

d) The flight time difference of each of the three flights from the target time is summed for each competitor and the results published in increasing order.

e) The winner is the model with the lowest score.

f) In the event of a tie, the winner will be decided by a fly-off, with the winning time being that closest to the target time.

6.4.5 CLASS FF4 - SCALE FF OUTDOOR. EDDIE RIDING COMPETITIONS

6.4.5.1 Class Objectives

The competition has 2 elements that make up the overall competition:

1 - Eddie Riding Competition

A Scale Free Flight competition flown to FF2 Outdoor Scale Free Flight Class. (See **6.4.3)**

2 - E.J.R Designs Competition (Not eligible for the Eddie Riding Memorial Trophy) Flown to FF2 Outdoor Scale Free Flight class.
This contest celebrates the designs of E. J. Riding who was a major contributor to the development of Scale Free Flight in the UK.

6.4.5.2 EJR Designs Competition Eligible Models

The EJR Designed Model Class is open to any of the eight Eddie Riding designs published in the Aeromodeller between 1943 and 1950. Those designs are:

a) **Westland Widgeon -** Published April 1943 - 37" Rubber - Plan FSP211 (power conversion published in Jan 1984 Both plans are eligible.)

b) **BE2c -** Published Dec 1943 - 55" Rubber - Plan SR215 (featured as an article with no plan. Plan subsequently made available by the APS).

c) **Bristol Racer Type 77 -** Published Oct 1944 - 45" Rubber - Plan FSR216

d) **Bristol Scout Type D -** Published Dec 1945 - 37" Rubber - Plan FSR226

e) **ABC Robin -** Published July 1946 - 36" Rubber - Plan N/K, **See Note ***

*Note: The redrawn ABC Robin power conversion plan is not eligible.

f) **Fairchild Argus -** Published Oct 1947 - 36.5" Rubber - Plan FSR272

g) **Chrislea Super Ace -** Published Aug 1949 - 54" I/C power - Plan FSP331

h) **Missel Thrush -** Published Dec 1950 - 42" IC power - Plan FSP404

*Note: The redrawn ABC Robin power conversion plan is not eligible.

6.4.5.3 EJR Designed Model Characteristics

The outline of the model must not be altered in any way. even if considered to be 'un-scale'. No enlargement or reduction of the original design is permitted.

Changes made to improve structural integrity or the replacement of outdated materials with modern substitutes are permitted and should be sympathetic to the original design.

The colour scheme and markings of the model are to be ‘in keeping’ with the subject aircraft

EMSD systems (Gyros) are not permitted in this Class.

The following changes are permissible:

a) Change of motive power.
b) Deletion of geared motor trains or Moore Diaphragms.
c) Introduction or improvement of "crash resistance".
d) Strengthened undercarriage.
e) Flight trimming modifications. Adjustable and/or separate control surfaces in keeping with the subject aircraft.
f) Modern coverings sympathetic to the original designs.

6.4.6 CLASS FF5 - SCALE F/F OUTDOOR. ASSISTED SCALE FREE FLIGHT. (Provisional)

6.4.6.1 Class Objectives

This class has been introduced in order to encourage scale free flight modellers to make use of the advantages of limited radio control and/or electronic motion stabilisation (gyros) while retaining the delight of free flight.

6.4.6.2 Eligible Models

The competition is open to Scale Free Flight models that complies with the BMFA General Regulations **1.2,** General Scale Rules **6.1.1**, the General Free Flight Rules **6.4.1** and the class-specific Model Characteristics below

6.4.6.3 Model Characteristics

Maximum weight of model without fuel .....2 kg

Maximum wing loading 50g/dm²

Maximum total I/C piston motor displacement .....2.5 cc

I/C models may be fitted with a throttle.

Electric motors……Maximum voltage of power source 12 volts nominal

Electric models over 250grms must be fitted with a throttle.

The model can only use 2.4GHz Radio Control if fitted.

The model can only be flown with a single directional control function. (rudder or aileron)

If the model is fitted with more than one directional control function the additional function(s) must be demonstrated as disconnected or set to zero movement on the transmitter.

The competitor may be required to demonstrate the R/C control functions to the Competition Director before flights are carried out or during the competition.

An Electronic Motion Stabilisation Devise (gyro) is permitted on one axis only with or without radio control fitted.

6.4.6.4 Documentation

The documentation required is a single photograph which must be of the subject shown in its entirety and a minimum image size of 150mm

Proof of correct colour and markings may be provided by the supplied photograph or an additional photo or published colour drawings.

The guidelines for the presentation of documentation, as laid out in **6.1.2.5** should be applied to documentation for this class.

6.4.6.5 Pre-Flight Scoring

The entered models will be assembled together in one place. Each Judge will assess the models for Realism and Craftsmanship and award each model a score between 0 and 100. The sum of the two judges scores is the Total Pre-Flight Score. Maximum 200.

6.4.6.6 Official Flights

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight

6.4.6.7 Number of Flights

Each competitor will have the opportunity to make 3 flights at the Contest Director's discretion.

6.4.6.8 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 ten minutes to complete each flight programme (plus one minute for each additional engine of multi-engine models). The flying time commences 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.

6.4.6.9 Flight Scoring

It is expected that the model will fly for up to a minute and should be allowed to fly in a free flight manner with a minimum of directional and throttle control. (Keep it in the field where it was launched from)

Each official flight will be judged in relation to the expected flight characteristics of the full-size subject aircraft.

Each flight will be marked between 0 and 10 in increments of 0.5 for each phase of the flight with the relative importance of each phase being determined by a K - Factor as below: (see **6.1.1.11**)

Flight Phases

Models can R.O.G or be hand launched. The take-off is not marked.

(a) Initial Climb ..... …K = 20

(b) Cruise .....K = 30

(c) Transition to Descent .....K = 10

(d) Descent and Landing Approach.....K = 20

(e) Overall Realism in Flight .....K = 20

(The Landing is not marked) Total K = 100

6.4.6.10 Flight Bonuses

There are no Flight Bonuses in this class

6.4.6.11 Marking and Scoring

The sum of the individual Judges' scores (Pre-Flight score added to Flight score) is the Total Score. The best Total Score is the Final Score.

In the event of a tied final score the next best flight score will be taken into account to determine placing.

6.4.7 CLASS FFX1 - SCALE FF INDOOR OPEN (Rubber Powered)

6.4.7.1 Eligible Models

The competition is open to any rubber powered scale model that complies with the BMFA General Regulations **1.2**, the FF General Rules **6.4.1** and the class-specific Model Characteristics below.

Models fitted with EMSD systems are not permitted.

6.4.7.2 Model Characteristics

Maximum flying weight of complete model ..... 250 g

Maximum wing loading..... 15g/dm²

Motive Power ..... Extensible (Rubber) Motors

6.4.7.3 Documentation

The Documentation requirement for this class is as specified in **6.1.2**.

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

6.4.7.4 Static Judging

Static judging of this class will be in accordance **6.1.2.**

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. **6.1.1.18**

6.4.7.5 Official Flights

The flying order of the competitors will be established by the Contest Director before the start of the contest. The competitor is responsible for ensuring that he is aware of his position in the flying order and his model is prepared for flight if the competitor before him fails to make a flight.

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight. The competitor must notify the Judges when he is ready to release the model to ensure that the Flight Judges are ready to observe the flight.

The model must remain airborne for at least 15 seconds for the flight to be judged and a flight score returned.

If the flight is terminated by events outside the competitor's control, a re-flight may be authorised at the Contest Director's discretion.

6.4.7.6 Number of Flights

The aim is for each competitor to have the opportunity to make 3 flights unless entry levels/ time constraints require this to be reduced at the Contest Director's discretion. If time allows, a 4th flight will be flown at the Contest Director's discretion.

6.4.7.7 Flying Time

Competitors will be called at least five minutes before they are required to occupy the starting area. If the competitor fails to present his model for flight during that time period, the flight will be considered void.

Each competitor shall have a flying time of five minutes (plus one minute for each additional engine of multi-engine models) to complete each flight programme, the flying time commencing when the competitor is requested to fly. No points may be scored after the end of the flying time.

6.4.7.8 Flight Scoring

Each official flight will be marked between 0 and 10 in increments of 0.5 for each phase of the flight as below with the relative importance of each phase being determined by a K - Factor:

(a) Take-off ..... K = 15

(b) Initial Climb ..... K = 15

(c) Cruise ..... K = 30

(d) Transition to Descent and Landing Approach ..... K = 15

(e) Quality of Landing ..... K = 15

(f) Realism in Flight ..... K = 10

Total K = 100

6.4.7.9 Flight Bonuses

The flight score shall be subject to complexity bonuses as described in the General Rules, Section **6.4.1.**

6.4.7.10 Marking and Scoring.

Each Flight Judge awards marks out of 10 for each phase of the flight, as defined in **6.4.9.8.** These marks are then multiplied by the appropriate K - Factor and aggregated before the bonuses are applied as described in **6.4.1**.

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.

In the event of a tied final score the next best flight score will be taken into account to determine placing.

This represents a Flight to Static ratio of approximately 1:1.

6.4.8 CLASS FFX2 - SCALE FF INDOOR OPEN (CO_2 or Electric Powered)

6.4.8.1 Eligible Models

The competition is open to any CO_2 or Electric powered scale model aircraft that complies with the BMFA General Regulations **1.2**, the FF General Rules **6.4.1** and the class-specific Model Characteristics below.

Models fitted with EMSD systems are not permitted.

6.4.8.2 Model Characteristics

Maximum flying weight of complete model ..... 250 g

Maximum wing loading..... 15g/dm²

Motive Power ..... CO_2 motors or Electric motors

6.4.8.3 Documentation

The Documentation requirement for this class is as specified in **6.1.2.**

6.4.8.4 Static Judging

Static judging of this class will be in accordance with **6.1.2.**

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

6.4.8.5 Official Flights

The flying order of the competitors will be established by the Contest Director before the start of the contest. The competitor is responsible for ensuring 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 fails to make a flight.

An official flight shall be recorded when the competitor releases the model with the intention of making an official flight. The competitor must notify the Judges when he is ready to release the model to ensure that the Flight Judges are ready to observe the flight.

The model must remain airborne for at least 15 seconds for the flight to be judged and a flight score returned.

If the flight is terminated by events outside the competitor's control, a re-flight may be authorised at the Contest Director's discretion.

6.4.8.6 Number of Flights

The aim is for each competitor to have the opportunity to make 3 flights unless entry levels/ time constraints require this to be reduced at the Contest Director's discretion. If time allows, a 4th flight will be flown at the Contest Director's discretion.

6.4.8.7 Flying Time

Competitors will be called at least five minutes before they are required to occupy the starting area. If the competitor fails to present his model for flight during that time period, the flight will be considered void.

Each competitor shall have a flying time of five minutes (plus one minute for each additional engine of multi-engine models) to complete each flight programme, the flying time commencing when the competitor is requested to fly. No points may be scored after the end of the flying time.

6.4.8.8 Flight Scoring

Each official flight will be marked between 0 and 10 in increments of 0.5 for each phase of the flight with the relative importance of each phase being determined by a K - Factor as below:

(a) Take-off ..... K = 15
(b) Initial Climb ..... K = 15
(c) Cruise ..... K = 30
(d) Transition to descent and landing approach..... K = 15
(e) Quality of Landing..... K = 15
(f) Realism in Flight ..... K = 10

Total K = 100

6.4.8.9 Flight Bonuses

The flight score shall be subject to complexity bonuses/penalties as described in the General Rules, Section **6.4.1.**

6.4.8.10 Marking and Scoring

Each Flight Judge awards marks out of 10 for each phase of the flight, as defined in **6.4.10.8.** These marks are then multiplied by the appropriate K - Factor and aggregated before the bonuses are applied as described in **6.4.1**.

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.

In the event of a tied final score the next best flight score will be taken into account to determine placing.

This represents a Flight to Static ratio of approximately 1:1.

6.4.9 CLASS FFX3 - SCALE FF INDOOR INTERMEDIATE

6.4.9.1 Eligible Models

This class is open to any Rubber, CO_2 or Electric powered scale model that complies with the BMFA General Regulations **1.2**, the FF General Rules **6.4.1** and the class-specific Model Characteristics below.

Models fitted with EMSD systems are not permitted.

6.4.9.2 Model Characteristics

Maximum flying weight of complete model .....250 g

Maximum wing loading..... 15g/dm²

Motive Power .....CO_2 motors; Electric motors or Extensible Rubber Motors

6.4.9.3 Documentation

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

A single photograph showing the subject aircraft **in its entirety (**Minimum size of subject image in the photograph150mm)

A published 3 view black line or colour scale drawing of the subject aircraft with a minimum of 150mm wingspan or fuselage length (whichever is the greater dimension)

Proof of correct colour and markings may be provided by the supplied photograph or an additional photograph, paint samples, published colour drawings, published colour description

The guidelines for the presentation of documentation as laid out in **6.1.2.5** should be applied to documentation for this class.

6.4.9.4 Static Judging

Static judging distances will be as specified in **6.1.2.7.**
Judging for Fidelity to scale and craftsmanship for this class is a simplified version of the static judging system in **6.1.2**
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. **6.1.1.18**

Each of the following aspects will be awarded a mark out of 10 in increments of 0.1 of a mark by each Judge and the following K-factors apply (see **6.1.1.11**):

1. Overall Scale Accuracy and Realism.....K = 15

2. Craftsmanship and Complexity.....K = 15

Total K = 30

The total static score is the aggregate of each judge's score.

6.4.9.5 Official Flights

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 qualifying flight score returned.

6.4.9.6 Number of Flights

Each competitor will make 3 flights unless entry levels/ time constraints require this to be reduced at the Contest Director's discretion. A 4th flight may be flown at the Contest Director's discretion.

6.4.9.7 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-engine 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.

6.4.9.8 Flight Scoring

Each official flight will be marked between 0 and 10 in increments of 0.5 for each phase of the flight with the relative importance of each phase being determined by a K - Factor as below:

(a) Take-off ..... K = 15

(b) Initial Climb ..... K = 15

(c) Cruise ..... K = 30

(d) Transition to Descent and Landing Approach ..... K = 15

(e) Quality of Landing ..... K = 15

(f) Realism in Flight ..... K = 10

Total K = 100

6.4.9.9 Flight Bonuses

The flight score shall be subject to complexity bonuses as described in the General Rules, Section **6.4.1**.

6.4.9.10 Marking and Scoring

Each Flight Judge awards marks for each phase of the flight, as defined in **6.4.11.8.** Bonuses are applied as also described in **6.4.1**.

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 Total Flight Score.

This represents a Flight to Static ratio of approximately 3:1.

In the event of a tied final score the next best flight score will be taken into account to determine placing.

6.4.10 CLASS FFX4 - SCALE FF INDOOR KIT SCALE

6.4.10.1 Eligible Models

This class embodies the original kit Scale concept of simplicity and is open to any scale model including gliders, built from a commercial kit or to a plan of a design that has been commercially kitted (the term 'kit' is defined in section **6.1.1.4**)

The General Scale Rules **6.1.1** and the FF General Rules **6.4.1** will apply with any exceptions noted within the individual class rules below.

Models may be built from kit parts or the builder's own wood. Alternative material to that provided in the kit may be used for covering and for the application of colour and markings.

Modifications to the structure for the purposes of transportability, durability of landing gear, re-positioning of motor peg and the use of different flight propellers will not be penalised. The use of trim tabs and gurney flaps will not be specifically penalised but may result in a reduced static score under the 'Overall Impression' criterion if they are considered to excessively distort the aircraft lines. All other modifications will be assessed under fidelity to the plan.

When models are based on commercial enlargements of an original kit, proof of that commercial enlargement can be the kit box of the enlarged version or a copy of an advert, web page or statement from the manufacturer. The onus is on the competitor to demonstrate that the enlargement was undertaken as part of a commercial marketed kit production run.

Models that have won in Kit Scale at the BMFA Scale Indoor Nationals i.e. the model has achieved 1st place, will not be eligible for entry to any subsequent FF Kit Scale Indoor Nationals competition.

6.4.10.2 Model Characteristics

Models must meet the following characteristics:

Maximum Flying Weight 250g

Maximum Wing Loading 15g/dm²

Motive Power ..... Rubber, Co2 or Electric*

* NOTE: Where the original kit plan specifies an IC motor as an option, this motor type will not be permitted for this indoor class.

6.4.10.3 Documentation

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

The declaration must state if the model is painted, pre-coloured, and/or uses extensive computer-generated colour schemes. It must also state if the model uses pre-formed and ready built parts.

The minimum documentation required is the original (or photocopy) plan from which the model was built.

One photograph (minimum size of subject image 150mm) to indicate a typical colour scheme and markings. In the absence of a colour photograph, an illustration or colour drawing or painting (e.g. box art) of either the subject modelled or an aircraft of the same type and nationality from the same era or a scheme based on plan information is acceptable to authenticate the general colour scheme and markings

For kits containing ready built, pre-decorated or formed parts or models built from pre-decorated balsa sheets, a copy of the kit instructions showing how the model is assembled should be provided if no full-size plan is included with the kit.

6.4.10.4 Static Judging

The static judging philosophy for Indoor Kit Scale is different from the other Indoor Scale classes in that models are judged against authenticity and accuracy to the kit plan rather than scale accuracy to photographs and 3 views.

Marks will be awarded up to a maximum of 100 marks to reflect the authenticity and accuracy as follows:

(a) Accuracy of Structure to kit plan 0-30

(b) Appropriateness of colour scheme and markings

- Appropriateness of the colour scheme……0-5
- Appropriateness of the markings ……..……0-5
- Complexity of the colour and markings ……..0-5

(c) Workmanship

- Fineness, straightness and sharpness of line…….……..…..0-10
- Accuracy of component fit and straightness of structure.……...0-10
- Quality of surface preparation and application of covering…….……0-10

(d) Overall Impression of subject aircraft and spirit of kit …….…0-25

Max = 100

It is expected that models will have a conventional built-up structure with a coloured tissue finish and with painted, printed, transfer or tissue markings.

Kits with ready built parts or models built from pre-formed and decorated assembly packs will have a penalty of 10 marks deducted from their static score.

Models that have more than 50% of the surfaces painted and models having extensive computer generated or pre-decorated colour schemes and markings will not be excluded but will have a penalty of 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 in **6.4.12.1** and motive power **6.4.12.2** above or specified on the plan. (Typical deductions include increased dihedral, separate control surfaces where these are not shown on the plan etc).

The total static score is the sum of the individual Judges' scores. If a single judge is employed, the total static score is doubled.

6.4.10.5 Definition of an Official Flight

An official flight is to be recorded when the competitor releases the model with the intention of making a competition flight.
The model must fly for a minimum of 10 seconds to qualify for a flight score.

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 fails to make a flight

If the flight is terminated by events outside the competitor's control, a re-flight can be authorised at the Contest Director's discretion.

6.4.10.6 Flight Judging

The aim is for each competitor to have the opportunity to make 3 flights unless entry levels/ time constraints require this to be reduced at the Contest Director's discretion. If time allows, a 4th flight will be flown at the Contest Director's discretion.

Each official flight will be scored between 0 and 10 in increments of 0.5 for each phase of the flight with the relative importance of each phase being determined by a K - Factor as below:

(a) Take-Off.....K=15

(b) Initial Climb.....K=15

(c) Cruise .....K=30

(d) Transition to descent and landing approach .....K=15

(e) Quality of the Landing .....K=15

(f) Realism in Flight.....K=10

Total K = 100

6.4.10.7 Flight Score

The Best Flight score will be the highest aggregate of the flight scores awarded per flight by each of 2 Judges. If a single Flight Judge is used the highest flight score will be doubled.

6.4.10.8 Total Score

The Total Score will be three times the Total Static score added to the Best Total Flight score.

This represents a Flight to Static ratio of approximately 3:1.

In the event of a tied final score the next best flight score will be taken into account to determine placing.

6.4.11 CLASS FFX5 - SCALE FREE FLIGHT INDOOR – PEANUT

6.4.11.1 Eligible Models

This Class is open to any scale Free Flight rubber powered model that complies with the BMFA General Regulations **1.2**, the FF General Rules **6.4.1** and meets the class-specific Model Characteristics below.

Proxy flying of models in this class will be allowed at the discretion of the Contest Director. (see **6.4.1.9)**

6.4.11.2 Model Characteristics

Dimensions: .... Maximum Wingspan 13" (325mm) **or** Max' Fuselage Length 9" (228mm) excluding propeller. ..... (whichever is the greater dimension,)

Motive Power ..... Extensible Rubber Motor(s)

Weight Limit .....No Maximum or Minimum Weight Limits

For this scale class a scale propeller is not required and the flying propeller blades will be disregarded in the static judging.

6.4.11.3 Documentation

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

The minimum documentation is to be one of the following:

(a) A general arrangement drawing of at least 2 inches wingspan, plus one photograph or printed reproduction of the full size subject 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.

6.4.11.4 Static Judging/Appearance Accuracy of Outline — Marking Guidelines

Wing:	Wing Planform:	Scale	= 3
		Minor Deviations	= 2
		Major Deviations	= 1
	Wing Surfaces:	All Double covered	= 3
		Single covered	= 1
		Solid aerofoil	= 3
		Flat/Curved Plate	= 1
	Dihedral:	Scale	= 3
		Minor Increase	= 2
		Major Increase	= 1
Fuselage:	Shape:	Scale	= 3
		Minor Deviations	= 2
		Major Deviations	= 1
	U/C:	Scale length/spread/position	= 3
		Minor Deviations	= 2
		Major Deviations	= 1

Empennage:	Planform:	Scale	= 3
		Minor Deviations	= 2
		Major Deviations	= 1
	Surfaces:	All Double covered	= 3
		Single covered	= 1
		Solid aerofoil	= 3
		Flat/Curved Plate	= 1
Accuracy of Colour & Markings:		Scale	= 3
		Minor Deviations	= 2
		Major Deviations	= 1
		None	= 0
Complexity of Colour & Markings:		Very complex	= 5
		Complex	= 3
		Simple	= 1
		None	= 0
Surface Finish Realism:			Marked 0-5
Scale Detail:			
Details as per Documentation:		All	= 3
		Many	= 2
		Some	= 1
		None	= 0
Dummy Pilot:		3-Dimensional	= 3
		2-Dimensional	= 1
Bonuses:			
Aircraft Type:		Floatplane	= 2
		Flying Boat	= 4
		Autogyro	= 6
		Helicopter	= 8
Wing Type:		Low	= 3
		Bi-plane	= 2
		Tri-plane	= 3
		Multi-plane	= 5
Structure:			
	Accuracy:	All scale structure	= 3
		Part scale structure	= 2
		Simplified structure	= 1
		Non-scale structure	= 0
Airframe:			
	Complexity:	Marked	0-5

Multi Engines: Motors on diverse thrust lines >= 10% wingspan = 3
(Rule 6.4.1.5 does not apply)

Craftsmanship: Marked 0-5

6.4.11.5 Flight Judging

Each competitor is allowed a maximum of 9 flights. An official flight is counted each time the model is released for a declared official flight.

Flights may be hand launched or may take off from the floor. If take off is achieved without pushing or any other assistance then a 10 second bonus will be added to the flight score.

6.4.11.6 Marking and Scoring

The Total Static score is the average of the individual static scores of the two Judges. If only a single judge is used then the Total Static score is equal to that single score.

The Flight Score is the timed duration of the flight in seconds rounded down to the nearest second. Flight times are scored on a Max basis with a maximum score of 60 seconds applied to all hand launched flights. An ROG maximum is 50 seconds Plus the 10 second ROG bonus (= 60 seconds)

The overall score for the competition is the Total Static score plus the sum of the best two flight scores (giving a flight to static ratio of approximately 2:1)

In the event of a tie, final overall places will be determined by comparison of the next best flight scores on count back and, should that not provide a resolution, a fly-off will be used to determine the final positions.

Models that do not record a flight score will not qualify for a placing in the competition.

6.4.12 CLASS FFX6 - SCALE FREE FLIGHT INDOOR - PISTACHIO

6.4.12.1 Eligible Models

This class is open to any scale Free Flight rubber powered model that complies with the BMFA General Regulations **1.2** and the class-specific Model Characteristics below.

Proxy flying of models in this class will be allowed at the discretion of the Contest Director. (see **6.4.1.9**)

6.4.12.2 Model Characteristics

Dimensions: .....Maximum Wingspan 8" (204mm) **or** Max Fuselage Length 6" (152mm) excluding propeller ..... (whichever is the greater dimension)

Motive Power ..... Extensible Rubber Motor(s)

Weight Limits.....No Maximum or Minimum Weight Limits

For this scale class a scale propeller is not required and the flying propeller blades will be disregarded in the static judging.

6.4.12.3 Documentation

A fully completed and signed current Competitor's Declaration must accompany the model when it is presented for static judging. The model will not be static judged in the absence of the declaration.

The minimum documentation is to be one of the following:

(a) A general arrangement drawing of at least 2 inches wingspan, plus one photograph or printed reproduction of the full-size subject 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.

6.4.12.4 Static Judging/Appearance — Marking Guidelines

Accuracy of Outline

Wing:	Wing Planform:	Scale	= 3
		Minor Deviations	= 2
		Major Deviations	= 1
	Wing Surfaces:	All Double covered	= 3
		Single covered	= 1
		Solid aerofoil	= 3
		Flat/Curved Plate	= 1
	Dihedral:	Scale	= 3
		Minor Increase	= 2
		Major Increase	= 1
Fuselage:	Shape:	Scale	= 3
		Minor Deviations	= 2
		Major Deviations	= 1
	U/C:	Scale length/spread/position	= 3
		Minor Deviations	= 2

		Major Deviations	= 1
Empennage:	Planform:	Scale	= 3
		Minor Deviations	= 2
		Major Deviations	= 1
	Surfaces:	All Double covered	= 3
		Single covered	= 1
		Solid aerofoil	= 3
		Flat/Curved Plate	= 1
Accuracy of Colour & Markings:		Scale	= 3
		Minor Deviations	= 2
		Major Deviations	= 1
		None	= 0
Complexity of Colour & Markings:		Very complex	= 5
		Complex	= 3
		Simple	= 1
		None	= 0
Surface Finish Realism:			Marked 0-5
Scale Detail:			
Details as per Documentation:		All	= 3
		Many	= 2
		Some	= 1
		None	= 0
Dummy Pilot:		3-Dimensional	= 3
		2-Dimensional	= 1
Bonuses:			
Aircraft Type:		Floatplane	= 2
		Flying Boat	= 4
		Autogyro	= 6
		Helicopter	= 8
Wing Type:		Low	= 3
		Biplane	= 2
		Triplane	= 3
		Multi-plane	= 5
Structure:			
	Accuracy:	All scale structure	= 3
		Part scale structure	= 2
		Simplified scale structure	= 1
		Non-scale	= 0
	Airframe Complexity:	Marked	0-5
Multi Engines: Motors on diverse thrust lines >= 10% wingspan. (6.4.1.5 does not apply)			= 3
Craftsmanship:			Marked 0-5

6.4.12.5 Flight Judging

Each competitor is allowed a maximum of 9 flights. An official flight is counted each time the model is released for a declared official flight. Flights are hand launched.

6.4.12.6 Marking and Scoring

The Total Static score is the average of the individual static scores of the two Judges. If a single judge is used, then the Total Static score is equal to that single score

The Flight Score is the timed duration of the flight in seconds rounded down to the nearest second. Flight times are scored on a Max basis with a maximum score of 60 seconds applied to all flights.

The overall score for the competition is the Total Static score plus the sum of the best two flight scores (giving a flight to static ratio of approximately 2:1)

In the event of a tie, final overall places will be determined by comparison of the next best flight scores on count back and, should that not provide a resolution, a fly-off will be used to determine the final positions.

Models that do not record a flight score will not qualify for a placing in the competition.

6.4.13 CLASS FFX7 SCALE FF INDOOR STARTER NO-CAL PROFILE

6.4.13.1 Eligible Models

This class is open to any lightweight rubber powered model that complies with the class specific Model Characteristics below.

The model must be a recognisable facsimile of a full-size aircraft.

Proxy flying of models in this class will be allowed at the discretion of the Contest Director (see **6.4.1.9**)

6.4.13.2 Model Characteristics

Maximum Wingspan ..... 16" (407mm)

Minimum model weight excluding motor 6g

Motive Power ..... Extensible Rubber motor(s)

The model must be constructed with a two-dimensional fuselage structure and may make use of a motor stick or tube arrangement to accommodate the rubber motor. The model must have control surface outlines, window outlines and typical colour scheme and registration markings. The model must have the full landing gear as per the full-sized aircraft. No one-dimensional profile gear is allowed. Models of aircraft with retractable gear may be depicted with the gear retracted.

Balsa wood and Japanese (or similar) light weight tissue shall be the main construction materials. The use of hi-tech materials such as boron, carbon fibre etc. is not permitted.

No mechanical means of varying the propeller pitch or wing incidence are permitted.

6.4.13.3 Documentation

No proof of scale documentation is required for this class but the onus is on the competitor to provide proof of existence of obscure subject aircraft, in the form of a photograph or drawing, should this be requested by the CD, timekeeper or other officials.

6.4.13.4 Static Judging/Appearance

Static judging is not undertaken on this class.

6.4.13.5 Flight Judging

Each competitor is allowed a maximum of 6 flights. An official flight is counted each time the model is released for a flight declared as official to the timekeeper.

6.4.13.6 Marking and Scoring

The score for each flight is the timed duration of the flight rounded down to the nearest whole second.

The overall score for the competition is the aggregation of the two highest flight scores.

In the event of a tie, final overall places will be determined by a fly-off.

6.4.14 CLASS FFX8 SCALE FF INDOOR - FLYING ONLY (Provisional)

6.4.14.1 Eligible Models

The competition is open to any Free Flight scale model that complies with the BMFA General Regulations **1.2,** the General Scale Rules **6.1.1,** the General Free Flight Rules **6.4.1**.and the class specific model characteristics below.

6.4.14.2 Model Characteristics

Maximum flying weight of complete model ..... 250 g

Maximum wing loading..... 15g/dm²

Motive Power., ... Extensible (Rubber) motors, Co2, Electric

6.4.14.3 Documentation

Proof of scale documentation is not required but if the model is of an obscure subject unlikely to be recognised by the Flight Judges, the competitor must be prepared to provide proof of validity of the subject by means of a photograph or certified drawing.

6.4.14.4 Flight Judging and Scoring

Each competitor will have the opportunity to make 3 flights at the Contest Director's discretion.

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 qualifying flight score returned,

The competitor must notify the Judges when he is ready to release the model.

Multiple Entries may be permitted depending on the number of entries at the CDs discretion. If multiple entries are allowed, a competitor may only take one podium place.

Each official flight will be marked between 0 and 10 in increments of 0.5 for each phase of the flight with the relative importance of each phase being determined by a K - Factor as below. (See **6.1.1.11**)

(a) Take-Off (Optional) ..... K = 15

(b) Initial climb ..... K = 15

(c) Cruise ..... K = 30

(d) Transition to Descent and Landing Approach ..... K = 15

(e) Quality of Landing ..... K = 15

(f) Realism in Flight ..... K = 10

Total K = 100

Each Flight Judge awards marks out of 10 for each phase of the flight. These marks are then multiplied by the appropriate K - Factor and aggregated. The sum of the individual Flight Judges' scores is the Total Flight Score.

There are no flight bonuses or penalties.

The single best Total flight score will be used to determine the winner.

In a tied final score, the next best flight score will be taken into account to determine placing.

6.4.15 SCALE FREE FLIGHT – DESCRIPTION OF FLIGHT PHASES

Applicable to the following classes:

FF1 Scale FF Outdoor Superscale - 6.4.2

FF2 Scale FF Outdoor Scale Free Flight - 6.4.3

FF4 Scale FF Outdoor Eddie Riding Competitions – 6.4.8

FF5 Scale FF Outdoor Assisted Free Flight – 6.4.6

FFX1 Scale FF Indoor Open Rubber - 6.4.7

FFX2 Scale FF Indoor Open CO2 / Electric - 6.4.8

FFX3 Scale FF Indoor Intermediate Scale - 6.4.9

FFX4 Scale FF Indoor Kit Scale – 6.4.10

FFX8 Scale FF Indoor Flying Only – 6.4.14

6.4.15.1 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 Scale 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 always 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.

6.4.15.2 Take-off

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

(5) Gliders under tow or bungee launch not accelerating or becoming airborne in an unrealistic manner.

6.4.15.3 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 subject aircraft.

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.

6.4.15.4 Cruise

The model may fly in a straight line or turn in either or both directions. Any change of direction should reflect the agility of the subject aircraft and turns should display an appropriate amount of bank.

Errors:

(1) Model flies too slowly or too fast.
(2) Nose attitude is too high or too low.
(3) Model stalls or shows phugoidal flight path.
(4) Model flies one wing low or is unstable laterally.
(5) Model is unstable and does not recover smoothly after hitting turbulence.
(6) Turns are flat or out of balance, e.g., left turn with right bank.

6.4.15.5 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.

For models of gliders, this flight phase is used to assess the realism of the release of the glider from the towing mechanism and is the transition between the tow and glide phases.

Errors:

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

6.4.15.6 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 subject aircraft 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.

Models will not be penalised if the approach is made wheels up, provided the angle of approach is appropriate.

Errors:

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

6.4.15.7 Quality of Landing (Indoor classes 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.

6.4.15.8 Realism in Flight

The model should mirror the flight characteristics of the subject aircraft in scale speed, flight attitude, stability and balance.

The flight should be smooth and continuous, especially the transitions between take-off climb, cruise, descent and landing approach. Due allowance must be made for the prevailing wind conditions.

Errors:

(1) Model pitches harshly when motor stops

(2) Model dihedral or other rigging angle changes significantly in flight

(3) A model that should have an opaque finish, is ‘see through’ in the air

(4) Lack of pilot when it should be seen, or an obviously empty cockpit.

ANNEX 6A

BMFA SCALE TEAM SELECTION PROCESS

CLASSES F4B, F4C and F4H

6A.1 Team selection

(a) Selection of Teams will be via Team Trial event.

(b) To be eligible for entry to the trials competitors must have scored a minimum of 70% of the maximum available score in two competitions in the proceeding season.

(c) These scores can be achieved in any of the competitions in the 2025 STC calendar including RC3 class.

(d) The deadline for expression of interest for the trial is 30th November 2025.

6A.2 Minimum Performance Standards for Team Selection

At the trial competitors have to have achieved a minimum of 70% of the combined static and flight score to be a member of the team.

6A.3 Team Trials

For 2026, when the World Championship are to be held in the UK, the trials will be held in the spring of that same year.

Team Trials will be advertised as to dates and venue at least three months in advance. Team Trials will be held over two days (which do not have to be concurrent) and include judging of both flying and static elements to the FAI F4 Sporting Code.

6A.4 Team Selection Confirmation

The Scale Technical Committee will notify those selected one week after the team selection event as soon as they have held a selection meeting.

ANNEX 6B

ANNUAL SCALE TROPHIES

6B.1 Official BMFA Trophies

These trophies are administered by the BMFA Records Officer and are presented at the annual BMFA Dinner.

6B.2 BMFA National Championships

(a) Handley Page Trophy (122)

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

6B.2.1 Scale R/C classes

(a) Radio Modeller Scale Trophy (57)

Winner of the F4C competition.

(b) Radio Modeller II Trophy (65)

Please Note: This trophy is subject to change for 2025 as the "Flying Only" class has been discontinued.

Winner of Scale R/C "Flying Only" class

(c) Stand-Off Trophy (108)

Winner of Stand-Off Scale.

6B.2.2 Scale C/L Classes

(a) Knokke No 2 Trophy (18)

Winner of the Scale C/L competition.

(b) Tony Day Trophy (Hurricanes painting) (153)

Awarded annually to the winner of CL2 Control Line Flying Only

6B.2.3 Scale F/F (outdoor)

Please Note: These three trophies are subject to change for 2025 due to the realignment and updating of the Scale Free Flight classes.

(a) Superscale Trophy (19)

Winner of Scale Free Flight Open Power competition.

(b) Model Flier Trophy (97)

Winner of Scale Free Flight Open Rubber competition.

(c) Knight & Pridham Trophy (104)

Winner of Scale Free Flight CO2/Electric/Reaction motor competition.

6B.2.4 Scale Indoor Nationals

(a) Hotham Trophy (58)

Winner of Scale Open Rubber competition.

(b) Doug Sheppard Trophy (101)

Winner of Scale CO2/Electric competition.

(c) Butch Hadland Memorial (75)

Winner of Scale Peanut competition.

(d) Mike Goldby Memorial Trophy

Winner of the Kit Scale competition.

(e) **RC** Model **Flyer Trophy**

Donated by RC Model Flyer Magazine to be awarded to the best scratch-built Scale Indoor RC model at the Scale Indoor Nationals.

6B.3 Official BMFA Trophies at Other Competitions

(a) Ripmax Trophy (47)

Winner of Scale Class RC1 at a competition 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.

6B.4 Scale Technical Committee Trophies

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

(a) John David Jones Painting

The original painting is awarded annually 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 a modification or a rebuild of an existing model. The CDs of FF and RC competitions will have the sole responsibility for nominating candidates for the Trophy.

(b) Aeroplane Monthly Trophy

The original painting is awarded annually at the BMFA Scale FF Indoor Nationals to the highest placed model of a pre–WWII British ultralight aeroplane.

(c) Modellers Den Peanut Trophy

Awarded annually to the winner of the Scale Peanut competition at a contest nominated by the Scale Technical Committee.

(d) Credgington **Trophy**

Awarded annually at the to the winner of a Free Flight Scale Flying Only contest at a competition nominated by the Scale Technical Committee.

(e) Selby Trophy

Awarded annually to the winner of the Scale Free Flight Outdoor Class at a competition nominated by the Scale Technical Committee.

(f) Brian **Downham Trophy**

Awarded annually to the highest placed model of an aircraft powered by a reaction motor/s (i.e. turbojet or rocket) competing in all classes at the Nationals. Scoring is based upon each model's percentage score of the maximum available for its class.

(g) Calcutta **Cup**

Awarded annually to the winning team in the England v Scotland challenge for R/C Scale Flying Only to be held at a nominated competition each year.

(h) Veron **Truflite Trophy**

Awarded annually to the highest placed model built from a Veron Truflite series Scale plan in any class at the Indoor Free Flight Scale Nationals.

(i) Andrew Boddington Trophy

The original Jungmeister painting is awarded annually at the BMFA Scale RC Indoor Nationals to the highest placed model in the Flying Only competition.

(j) Kennedy Trophy

Awarded annually to the winner of Scale Class RC2 at a competition nominated each year by the Scale Technical Committee

(k) Free Flight Kit Scale Print (Fairchild)

Awarded annually to highest scoring Outdoor ff scale kit at a nominated Flying Only contest by the Scale Technical Committee.

(l) Aeromodeller and Model Aircraft Designs Print (Avro 504)

Awarded annually to highest scoring outdoor ff scale model built from Aeromodeller or Model aircraft Plan at a nominated Flying Only contest by the Scale Technical Committee.

(m) Rubber Precision Cup

Awarded annually to the winner of the Scale FF Outdoor FF6 Kit Scale Precision contest at a nominated contest by the scale technical committee.

(n) Mike Sollet Memorial Trophy

Awarded annually to the best newcomer at the RC Nationals

(o) Ivan Taylor Trophy (Doug McHard Heinkel Salamander original painting)

Awarded annually to the winner of the Scale Free Flight Intermediate competition at the BMFA's Scale Indoor Nationals Competition.

(p) The Kelsey Card Collection Trophy

Awarded annually to the winner of the Scale Free Flight Pistachio competition at the BMFA's Scale Indoor Nationals Competition.

(q) **Chris Strachan Trophy**

Awarded to the highest placed racing aeroplane in all BMFA classes at the Indoor Scale Free Flight Nationals.

6B.5. Free Flight Outdoor Eddie Riding Competitions

Trophies awarded annually to the winner of Free Flight Scale at a competition nominated by the Scale Technical Committee.

Winning model in the Eddie Riding Competition. Eddie Riding Memorial Cup (NWA-STC)
Plus the following trophies in the Eddie Riding Competition.

Highest scoring I/C Power	Bright Spark Trophy (NWA-STC)
Highest scoring Rubber Power	Liverpool Cup (NWA-STC)
Highest scoring Co2 / Elec / Air / Reaction	Knight and Pridham Cup No2 (NWA-STC)
Highest scoring multi-engine powered model	Twin Cup Trophy (NWA-STC)
Highest scoring reaction model	Rapier Cup (NWA-STC)
Highest scoring ducted fan model	Jet-x (Roy Lever) Trophy
EJR Designs Contest Winner	David Lloyd-Jones Cup (NWA-STC)

Annex 6C
STC Drawing Validation Service

The STC offers a Scale drawing review and validation service to any BMFA member who wishes to build a model of a full-size aircraft for scale competition for which there are insufficient or substandard published 3-view/drawings and who has generated his own unpublished 3-view/drawings or corrections based on photographs of the subject aircraft.

For this service a submission of a hard copy of the scale 3-view/drawings and photographic evidence is required.

This service is free of charge and uses nominated approvers that are experienced International and/or National scale judges.

Any member wishing to take advantage of this service should contact the Secretary of the STC in the first instance to initiate the validation process and provide contact details for the approvers.

Current contact details for the STC Secretary can be found on the committee page of the BMFA Scale website – www.scalebmfa.co.uk.

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