



FAI Sporting Code

*Fédération
Aéronautique
Internationale*

Section 4 – Aeromodelling

Volume F4 Flying Scale Model Aircraft

2023 Edition

Effective 1st January 2023

F4B	CONTROL LINE SCALE AEROPLANES
F4C	RADIO CONTROL SCALE AEROPLANES
F4H	RADIO CONTROL STAND-OFF SCALE AEROPLANES
F4A	FREE FLIGHT OUTDOOR SCALE AEROPLANES (Provisional)
F4D	FREE FLIGHT INDOOR RUBBER SCALE AEROPLANES (Provisional)
F4E	FREE FLIGHT INDOOR CO ₂ OR ELECTRIC SCALE AEROPLANES (Provisional)
F4F	FREE FLIGHT PEANUT SCALE AEROPLANES (Provisional)
F4G	RADIO CONTROL LARGE SCALE AEROPLANES (Provisional)
F4J	RADIO CONTROL TEAM SCALE AEROPLANES (Provisional)
F4K	RADIO CONTROL SCALE HELICOPTERS (Provisional)

ANNEXES deleted from this list for clarity

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1	FAI Statutes,	Chapter 1,	para. 1.6
2	FAI Sporting Code, Gen. Section,	Chapter 4,	para 4.1.2
3	FAI Statutes,	Chapter 1,	para 1.8.1
4	FAI Statutes,	Chapter 2,	para 2.1.1; 2.4.2; 2.5.2 & 2.7.2
5	FAI By-Laws,	Chapter 1,	para 1.2.1
6	FAI Statutes,	Chapter 2,	para 2.4.2.2.5
7	FAI By-Laws,	Chapter 1,	paras 1.2.2 to 1.2.5
8	FAI Statutes,	Chapter 5,	paras 5.1.1, 5.2, 5.2.3 and 5.2.3.3
9	FAI Sporting Code, Gen. Section,	Chapter 4,	para 4.1.5
10	FAI Sporting Code, Gen. Section,	Chapter 2	para 2.2.
11	FAI Statutes,	Chapter 5,	para 5.2.3.3.7
12	FAI Statutes,	Chapter 6,	para 6.1.2.1.3

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FOUR-YEAR ROLLING AMENDMENTS FOR REFERENCE

Paragraph	Plenary meeting approving change	Brief description of change	Change incorporated by
6.3.1.	2019	Early Implementation: 1st June 2019 Clarification as to the use of gyros and other devices.	Pål Anthonisen Subcommittee Chairman & Kevin Dodd Technical Secretary
F4H			
6.9.2		Early Implementation: 1st June 2019 Clarification of permitted models in F4H.	
6.9.3		Consequential clarification from new Declaration Form.	
6.9.4.2		Early Implementation: 1st June 2019 Clarification as to the difference between F4C and F4H.	
6.9.4.3		Consequential clarification from 6.9.5	
6.9.4.4		Consequential clarification from 6.9.5	
6.9.5		Early Implementation: 1st June 2019 Clarification that static in F4H is 50% of the flight score.	
Judges' Guides			
Annex 6A.1.9		Early Implementation: 1st June 2019 Clarification as to the preferred format for documentation.	
Annex 6E.1.2		Early Implementation: 1st June 2019 Consequential new F4H Declaration Form, with consequential changes to the F4C Declaration Form (6E.1.1) and the numbering of the subsequent forms.	
Annex 6F.3		Early Implementation: 1st June 2019 Clarification as to the difference in building demands between F4H and F4C. Consequence of 6.9.4.2 above. Added guide to how points should be awarded, to avoid confusion.	

Paragraph	Plenary meeting approving change	Brief description of change	Change incorporated by
6.1.6.	2018	Amendment regarding spinners in support of Rule 6.1.6. d)	Pål Anthonisen Subcommittee Chairman & Kevin Dodd Technical Secretary
6.1.9.2.		Rewrite paragraph to clarify and correct the existing.	
6.1.9.2 & Forms		Consequential removal of reference to non-aerobatic aircraft following 6.3.6.11, (not minuted).	
6.1.9.3.		Scale is required to be entered on the Flight Score sheet.	
6.1.9.4.		Clarification to documentation for cruising speed.	
F4C			
6.3.6.11.		Change category a) in Realism in Flight, from 'Model Sound' to 'Flight Presentation'. Consequential changes to F4G, F4H and F4K and associated documentation.	
6.3.7.		Consequential change resulting from renumbering the list with the inclusion of the Cuban Eight variations.	
6.3.7.		Consequential change resulting from amendment 6.3.6.11.	
6.3.7.		Addition to the list of manoeuvres of the variations of the Cuban Eight theme. Remainder of the list renumbered.	
Annex 6C.3.6.11.		Consequential amendment to Judges Guide to explain 'Flight Presentation' category.	
Annex 6C.3.7.		Consequential additions and renumbering in the Judges Guide - clarification of the Cuban Eight variations.	
F4K			
Annex 6G.1		Clarification: the parts of the model helicopter that are excluded from static judging.	

Paragraph	Plenary meeting approving change	Brief description of change	Change incorporated by
F4C	2017		Johan Ehlers Subcommittee Chairman & Kevin Dodd Technical Secretary
6.3.1.		Early implementation – effective 1st June 2017 Clarification regarding permitted and not permitted technologies.	
F4K			
Annex 6G: 2B,4A, 4B, 4C, 4D, 4H, 4I, 4J		Early implementation – effective 1st June 2017 Changes made to clarify confusing details between description, diagram and list of errors in Annex 6G.	
Annex 6E	n/a	Forms for use in competitions available for download.	

Paragraph	Plenary meeting approving change	Brief description of change	Change incorporated by	
F4, F4C, F4H	2016	Approved for early implementation at 01/05/2016	Johan Ehlers Subcommittee Chairman & Kevin Dodd Technical Secretary	
6.1.11.		Normalisation of static scores		
6.1.13.		Procedure for Declaration Forms – handling protests		
6.3.9.		F4C – normalisation of total flight score		
6.3.10.		F4C – calculating final normalised scores		
6.9.5.		F4H – normalisation of static scores		
6.9.7.		F4H – normalisation of total flight score		
6.9.8		F4H – calculating final normalised scores		
F4		Approved for normal implementation at 01/01/2017		
6.1.3.		Amend the circumstances and composition where there are two panels of static judges		
6.1.4.		Amend the circumstances and composition of judging panels for F4C and F4H WCh and CCh.		
6.1.6.j)		Interruption of contest due to wind speed		
6.1.14.		Amend procedure for demonstration of functional scale detail during static judging		
F4B				
6.2.10.		National team classification		
F4C				
6.3.9.		Consequential change of 6.1.4. for tallying flight scores		
6.3.10.		National team classification		
F4H				
6.9.4.		Consequential change of 6.1.4.		
6.9.5.		Amend static judging K-Factors		
6.9.6.1.		Clarify photographic evidence requirements		
6.9.8.		National team classification		
6.9.9.1.		Clarify photographic evidence requirements for F4H		
Annexes				
6A		Amend the heading to direct F4H to Annex 6F		
6A.1.9.		Clarify requirements for presentation of documentation		
6A.1.10.1.		Clarify the use of photographs and drawings		
6A.1.10.4		Paragraphs rearranged to agree with heading		
6C.3.7.W.		Clarify the 'wingover' manoeuvre		
6F.2 (F4H)		Consequential change for 6A.1.10.1		
6F.3.		Consequential change regarding originality		
6G.2.2A		Clarify manoeuvre A (diagram) for class F4K		
6G.2.4E		Clarify manoeuvre E (conflicting details) for class F4K		
6G.2.4F		Clarify manoeuvre F (conflicting details) for class F4K		
6.11.8		n/a		Correct the K-Factors for the optional manoeuvres for class F4K from 7 to 10 to agree with 6.11.7.

NOTE: THE WORD "ENGINE" MEANS COMBUSTION ENGINES AND "MOTOR" MEANS ELECTRIC, CO₂ AND EXTENSIBLE MOTORS.

RULE FREEZE FOR THIS VOLUME

With reference to paragraph A.10.3. of the Volume *CIAM General Rules*:

In all classes, the two-year rule for no changes to model aircraft/space model specifications, manoeuvre schedules and competition rules will be strictly enforced. For Championship classes, changes may be proposed in the year of the World Championship of each category.

For official classes without Championship status, the two-year cycle begins in the year that the Plenary Meeting approved the official status of the class. For official classes, changes may be proposed in the second year of the two-year cycle.

This means that in Volume F4:

- (a) changes can next be made at the 2020 Plenary meeting for application from January 2021;
- (b) provisional classes are not subject to this restriction.

The only exceptions allowed to the two-year rule freeze are genuine and urgent safety matters, indispensable rule clarifications, noise rulings and changes to the provisional classes

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" implies a future happening which may not be mandatory.

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VOLUME F4

PART SIX - TECHNICAL RULES FOR FLYING SCALE AIRCRAFT CONTESTS

6.1 GENERAL RULES AND STANDARDS FOR SCALE MODEL AIRCRAFT

6.1.1. System of Rules

This document must be read in conjunction with the FAI Sporting Code Section 4 CIAM General Rules

All rules in this document are contest rules as defined in the CIAM General Rules, Section C – General Rules for International Events.

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

6.1.2. Definition of Scale Model Aircraft:

A Scale model aircraft shall be a reduced size reproduction of a full size aircraft

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.

The aim of Scale contests is to find the best model in its class which accurately recreates the appearance and realism of the subject full-size aircraft both on the ground and in flight.”

6.1.3. Competition Programme:

A competition programme for a particular event shall consist of part 6.1 plus the regulations for the specific class. E.g.. Rules for the C/L events shall consist of 6.1. plus 6.2. and for the R/C events, shall be 6.1. plus 6.3.

The C/L event will commence with static judging, flying will start upon completion of this.

The R/C event will commence with flying on the first day of competition, with static judging commencing after the first model aircraft has been flown. Thereafter flying and static judging will be carried out concurrently, model aircraft being flown before being presented for static judging. No competitor will be required to fly more than one flight before being static judged.

If there are more than 45 competitors by the official closing date for entries in a World or Continental Championship, the organiser may use two separate panels for static judging. Each panel shall consist of two judges. The first panel will judge Scale Accuracy (6.3.5.1– Side View, End View and Plan View). On completion of this, the second panel will judge the remaining aspects (6.3.5.2. – 6.). Under these circumstances the R/C event will commence with static judging. Flight judging will commence once the first 10 models have been statically assessed. In this case all competitors shall have their static judging done before the first flight.

6.1.4. Judges

The organiser of Scale R/C World or Continental Championship (F4C) shall appoint three (or four for two panels) judges to do static judging, plus a separate panel of three or five judges to judge the flying. When five judges are used, the highest and lowest judge's marks for each manoeuvre will be dropped. The remaining three judge's marks will be counted towards the final score.

If there are more than 45 competitors at a World Championship, then the organisers may use two static panels of two judges each as well as two flight lines with three judges on each flight line.

For Championships with less than 45 competitors in a class, the organiser is allowed to use two sets of two static judges instead of one set of three judges to speed up static judging.

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

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

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

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

6.1.5. Scoring

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

6.1.6. Final Scoring:

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

NOTE: For Class F4H the balance between Static scores and Flight scores is different. (see 6.9.1)

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:

- a) If two rounds are flown, the average of the normalised scores of the two flights will be used.
- b) If only one round is flown, the single normalised flight score of that one round will be recorded.
- c) The scores in an official round can be recorded only if all competitors had equal opportunity for a flight in that round.

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

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

6.1.7. Number of Model Aircraft

Each competitor shall only compete with one model aircraft in any one class.

6.1.8. Helpers

Each competitor is permitted one (1) helper during a flight. An additional helper may assist with engine starting and pre-flight preparation, should the competitor require this. All but one helper must retire clear of the flying area before the take-off is announced. For radio control events no helper may touch the transmitter during an official flight.

The timekeeper is responsible for watching helpers do not touch the transmitter once the first manoeuvre has been called. If a helper touches the transmitter the flight is scored zero.

6.1.9 Organisation of Scale Competitions

For transmitter and frequency control see Volume General Rules Section C, paragraph C.16.2

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

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

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

Competitors must be called at least seven minutes for F4B and five minutes for F4C before they are required to occupy the starting area (see 6.2.4 flying time F4B).

6.1.10 Builder of the Model and the Competitors Declaration

Scale models must be constructed and finished solely by the competitor. The only exceptions to this rule are for models entered in Class F4B, F4H and for team entries entered in Class F4J.

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

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

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

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

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

If found in violation of this rule the competitor may be disqualified from the contest.

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

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6.2 CLASS F4B - CONTROL LINE SCALE MODEL AEROPLANES

6.2.1. General Characteristics

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

Motive Power:

- a) Rockets or pulse jets may not be used.
- b) The maximum thrust for a turbine engine shall be 6 kg. (Or 60 Newton)
- c) Electric motors - maximum voltage of power source to be 72 Volts

Note: For all other scale model aircraft specifications see volume *General Rules*, Section 6.1.

6.2.2. Control Mechanism

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

b) Primary 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.

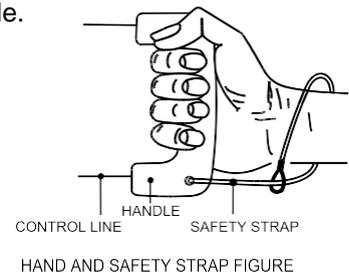
c) Secondary Control Functions:

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

d) Secondary Control Functions may also be controlled using 2.4GHz radio control equipment. The radio control equipment must conform to rule 6.3.3.1 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.

e) Before each flight the entire mechanism including control line and their attachments to the model aircraft and the control handle, shall be subject to a pull test equal to 5 times the weight of the model aircraft, as recorded at Processing, with a maximum of 25 kg. Control line length (central point of handgrip to vertical centre line of model aircraft) shall be not less than 15 metres or more than 21.5 metres. The pull test does not require repeating between flights, provided the model has remained attached to the lines and handle.

f) 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.



6.2.3. Official Flights

- a) Each competitor will be called to fly three times. To be eligible for flight points for that flight he must execute an official flight within the required time limit (see 6.2.4.) on each occasion.
- b) If a competitor is unable to start or complete a flight and, in the opinion of the Contest/Flightline Director the cause is outside the control of the competitor, the Contest/Flightline Director may, at his discretion, award the competitor a reflight. The Contest/Flightline Director shall decide when the reflight shall take place.
- c) An official flight commences at the earliest of the following:-
 - i) The competitor signals to the timekeeper that he is commencing to start his engine(s).
 - ii) Two minutes after the competitor is instructed to start his flight (see 6.2.4.).
 - iii) An official flight is terminated when the model aircraft lands and stops, except during the option 6.2.7.J (Touch and Go and the taxi demonstration after landing).

6.2.4. Flying Time

Competitors must be called at least 7 minutes before they are required to occupy the starting area. Each competitor shall have 9 minutes to complete each flight programme. Time shall start when the competitor begins to crank the engine, or two minutes after entry to the starting area, whichever is the first. The model aircraft must become airborne within the first five minutes (plus one minute for each additional engine, in excess of one). No points may be scored after the expiry of the time limit (9 minutes plus one for each added engine).

6.2.5. Starting Time

- a) If the model aircraft is not airborne within the 5 minutes, plus one minute for each additional engine, the competitor must immediately make room for the next competitor. If the engine(s) stop after take-off has begun but before the model aircraft is airborne, it may be restarted within the 5 minutes starting period.
- b) There is only one attempt allowed to repeat the take-off.
In the case of a repeated attempt, no points will be assigned for the take-off.

Note: In this case, rule 6.2.5.a. still applies.

6.2.6. Flight

The manoeuvres must be executed in the order listed below. Between the end of one manoeuvre and the start of the next one, the competitor must fly the model aircraft a minimum of two laps. Less than two laps between the end of one manoeuvre and the start of the next one will result in zero points for the subsequent manoeuvre.

6.2.6.1. Take-off.....	K = 14
6.2.6.2. 5 laps of straight level flight.....	K = 8
6.2.6.3. Optional demonstration.....	K = 12
6.2.6.4. Optional demonstration.....	K = 12
6.2.6.5. Optional demonstration.....	K = 12
6.2.6.6. Optional demonstration.....	K = 12
6.2.6.7. Landing	K = 14
6.2.6.8. Realism in flight	
a) Engine noise (realistic tone and tuning) ...	K = 4
b) Speed of the model aircraft.....	K = 6
c) Smoothness of flight.....	K = 6
Total K-factor	K = 100

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

6.2.7. Optional Demonstrations

The competitor must be prepared to give evidence to the judges during the static judging that the flying options selected for the flights are typical and within the normal capabilities of the aircraft subject modelled. The F4B chief judge will make the decision before the flight commences.

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

cont/...

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

Not more than one (1) drop option may be nominated.

Any model aircraft that flies with wheels down whereas the full sized aircraft actually features retractable landing gear shall have the total flight score reduced by 25%.

Only one attempt is permitted for each manoeuvre, the only exception is the procedure of getting a model aircraft airborne, as defined in 6.2.5.b.

All options carry a K factor of 12.

The FOUR optional demonstrations must be selected from the following list:

- A. Multi-engine option
- B. Retract and extend landing gear
- C. Retract and extend flaps
- D. Slow flight
- E. Demonstrate asymmetric flight
- F. Droppable ordnance
- G. High flight over 30°line-angle
- H. One inside loop
- I. Three inverted laps
- J. Wingover
- K. Figure eight
- L. Touch and go
- M. Lazy Eight
- N. Parachute drop
- O. Overshoot/go around
- P. Non-listed manoeuvre or Flight function
- Q. Taxi demonstration

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

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

6.2.8. Marking (flight points):

Each manoeuvre may be awarded marks between 0 and 10, using increments of half a mark, by each judge during the flight. The marks are multiplied by a coefficient that varies with the difficulty of the manoeuvres.

6.2.9. F4B Static Judging:

F4B models shall be static judged to the same rule set as F4H (6.9).

Refer to 6.9.1 Annex C F4H Static Judging Summary.

6.2.10. Normalisation of Static Scores:

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

Static Points x = $S_x/S_w \times 1000$

Where:

Static Points x = Normalised Static Score for competitor x

S_x = Static Score for competitor x and

S_w = Highest Static Score

6.2.11. Flight Score:

The flight score shall be the sum of the points awarded by all three judges in 6.2.6.

6.2.12. Normalisation of Flight Scores

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

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

Where:

Flight Points x = Normalised Flight Score for competitor x

F_x = Flight Score for competitor x and

F_w = Highest Flight Score

6.2.13. Final Scoring

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

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

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

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

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

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

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

6.2.14. Noise

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

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

6.2.15. Flying Area

Contest organisers should clearly mark the following circles on the ground.

- 1) The pilot's circle - radius 1.5 metres

This is the area in which a competitor should remain. A warning will be given by the Circle Marshal if the competitor steps outside this 1.5 metre radius "Pilot's Circle", but no penalty will be incurred.

- 2) The penalty circle - radius 3.0 metres

If the competitor steps outside this 3.0 metre "Penalty Circle", the manoeuvre will score ZERO.

- 3) The flying area circle - radius 26 metres

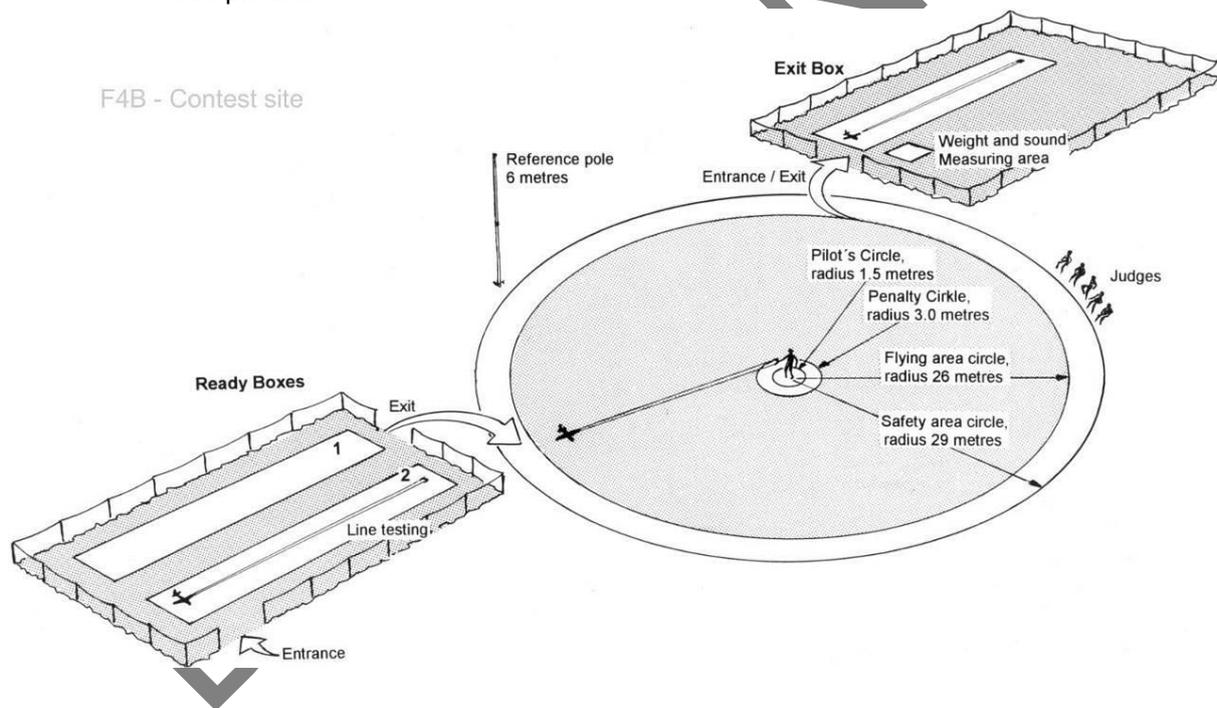
This is the extent of the flying area when a model aircraft using the longest lines is flown from the edge of the penalty circle.

- 4) The safety area circle - radius 29 metres

This is the area defined as item (3) above plus a further all round safety zone of 3 metres width.

In addition, contest organisers should provide a minimum of 1 (ideally 2) "Ready Boxes", plus 1 "Exit Box", all immediately adjacent to the flying circle. All these Boxes should, like the flying circle itself, be clearly separated from access by the general public, and each of these Boxes should be clearly marked on the ground and have sufficient length for 1 model aircraft complete with full length lines attached.

See picture:



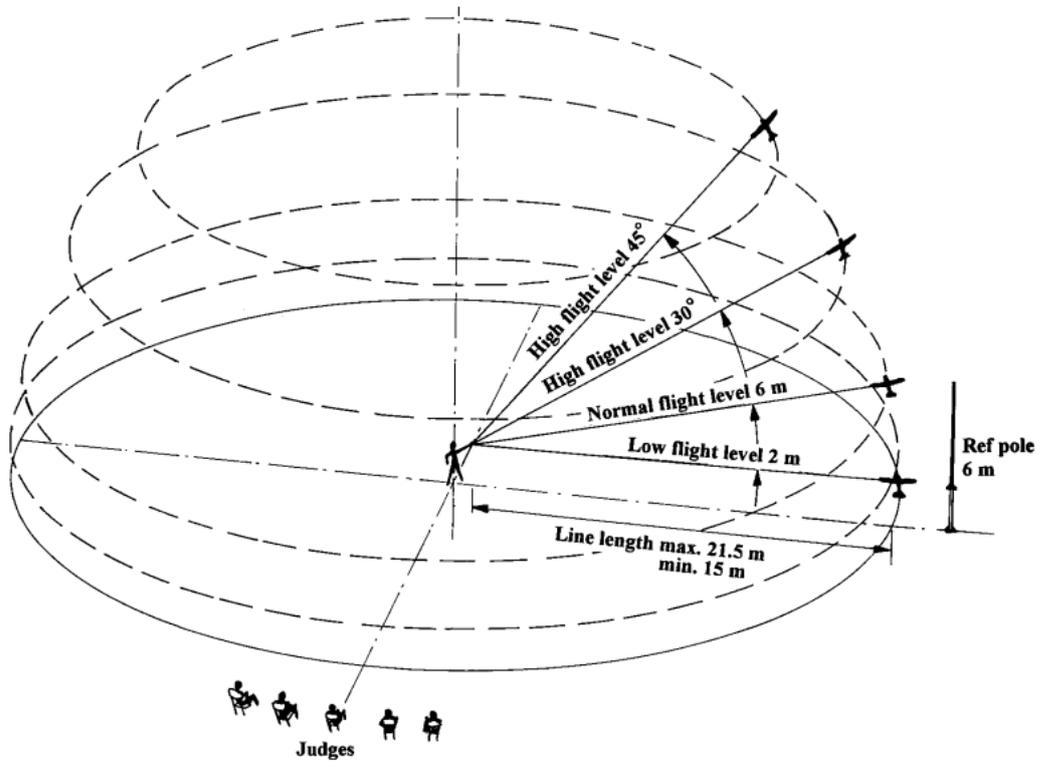
6.2.16. Flight Level Definitions:

Three basic levels of flight are defined:

Low Flight Level at approximately 2 m height.

Normal Flight Level at approximately 6 m height.

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



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6.2 ANNEX A - F4B COMPETITOR DECLARATION FORM

Championship logo and FAI emblem

This form must be completed and signed by the competitor and endorsed by the Team Manager.

Competitor's Name	National Identification.	Aircraft Name & Designation
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If your flight schedule is to include 6.2.7.P - Provide full details of your manoeuvre(s) here or on a separate sheet.

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Aircraft cruising and/or maximum speed
Attach supporting evidence on a separate sheet

--

ORIGINALITY of the MODEL - insert ✓ in the appropriate box

Competitor built – traditional construction from plan or kit	
Third Party built using traditional construction – competitor covered and paint finished	
Third party built from moulded components – competitor paint finished	
Third Party built (ARF kit) - competitor modified	
Third party built (unmodified ARF kit)	
Third party built – model purchased ready to fly	

Comments and/or explanation

COMPETITOR'S CERTIFICATION

I certify that the model conforms to the current F4B rules and answers given above are correct.

Name(block letters) Signature.....

TEAM MANAGER'S ENDORSEMENT

I certify that the answers given above are correct.

Name(block letters) Signature.....

6.2 ANNEX B - F4B STATIC SCORE SHEET

CHAMPIONSHIP LOGO and FAI emblem

Competitor Number:	Competitor Name:
Model Name & Designation	

Documentation checklist					
Competitors Declaration		Minimum 3-View Drawing		Maximum 5 Photos	Proof of Colour

No.	STATIC JUDGING ASPECT	Judges Mark	K-factor	SCORE
1	Scale Accuracy -- Side view		7	
	Scale Accuracy – Front View		7	
	Scale Accuracy – Plan View		7	
2	Markings Accuracy		7	
3	Markings Complexity		3	
4	Colour Accuracy		4	
5	Colour Complexity		2	
7	Scale Realism		7	
11	Originality of Model		6	
Judges notes		TOTAL		

Judges Signature.....Chief judge’s signature.....

6.2. ANNEX C - CLASS F4B JUDGES' GUIDE - FLYING SCHEDULE

6.2.C.1 General:

All flying manoeuvres must be judged bearing in mind the performance of the full size subject aircraft. The aim of the scale flight schedule is to recreate the flight characteristics and realism of the full-size aircraft within the limits of the control-lines. Judges must therefore not confuse scale F4B contests with aerobatics F2B contests.

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

1. The shape, size and technical requirements of the intended manoeuvre.
2. The positioning of the manoeuvre relative to the judges position or other datum.
3. How well the pilot is able to suppress the limiting factor of the control-lines yet still achieves scale realism in his flight.

It remains the responsibility of the judges to decide from their own experience on the importance of each error and deduct marks accordingly, always taking into account the characteristics of the full size aircraft

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

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

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

In the interest of safety, any manoeuvre that is carried out when the Competitor steps outside the 1.5 metre radius "Pilot's Circle" will carry a warning by the Circle Marshall to the Competitor, but no penalty. If the Competitor steps outside the 3.0 metre radius "Penalty Circle" the manoeuvre will score ZERO.

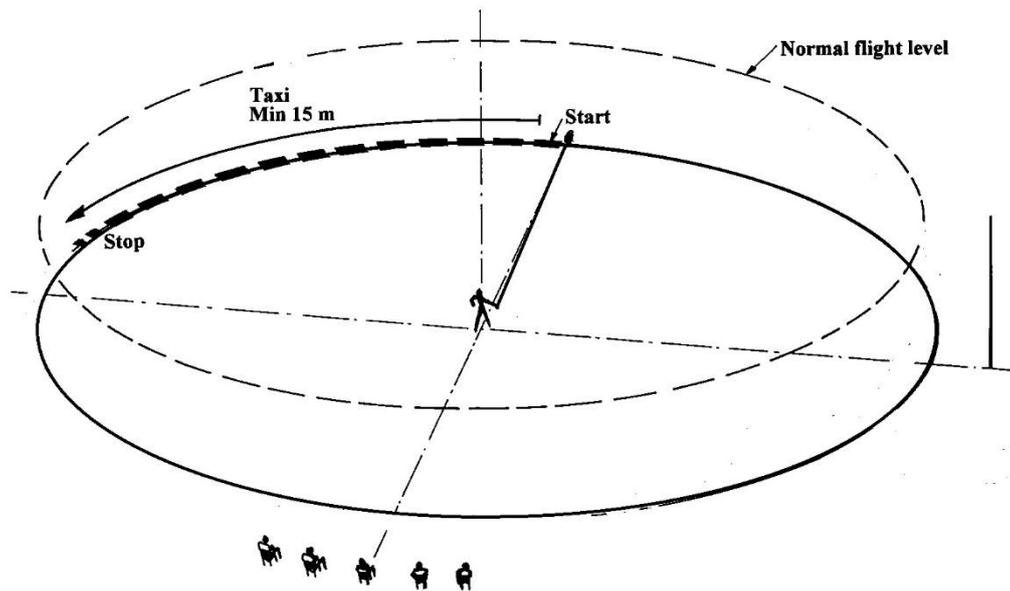
Before the flying part of the contest commences, normally done in conjunction with the static judging, there must be agreement between the Chief Judge and the respective team manager on the exact nature of manoeuvres M if such a manoeuvre is chosen by any competitor. There must be no such discussion at the flight circle.

The item 6.2.6.8. "Realism in Flight", should be discussed by all judges after completion of the flight and they should attempt to arrive at an agreed score for this item. At the end of each flight, the chief judge must check all score sheets for completeness.

After each flight, the Chief Judge will record any non-standard event that causes downgrading or loss of flight points. As examples: Missed figures, figures flown out of order, out of time, stepping outside the penalty circle, missing dummy pilot or crash landing, etc....

6.2.C.2 Taxi:

The model aircraft should taxi a minimum distance of 15 metres in a realistic manner and speed and finally come to a full stop. The model aircraft should stand still on the ground with the engine(s) running without being held. All engines must be operating for full marks. If the model aircraft is touched after the word "NOW" has been called the manoeuvre will score zero.



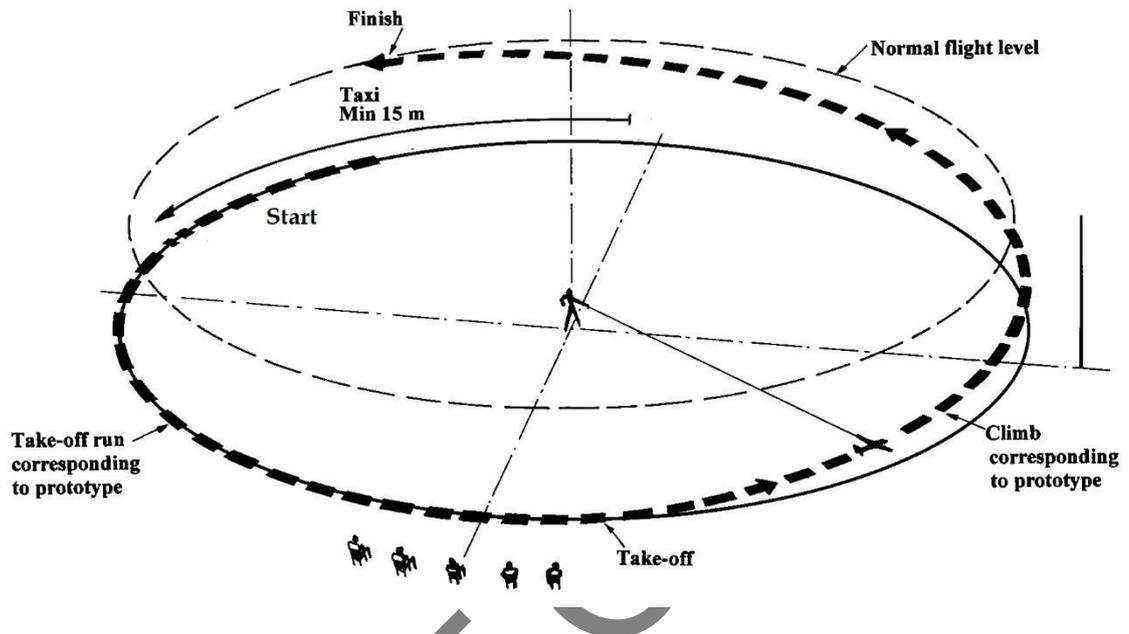
Errors:

1. Taxi not 15 metres.
2. Not a realistic taxi for the subject aircraft.
3. Not all engines operating.
4. Model does not come to a full stop.
5. If held or touched by anyone during the manoeuvre, the score is zero.
6. Model aircraft touched after calling "NOW" (zero marks).

6.2.C.3 Take-off:

The model aircraft should stand still on the ground with the engine(s) running without being held. All engines must be operating for full marks. If the model aircraft is touched after the word "NOW" has been called the manoeuvre will score zero.

The model aircraft should then 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 finish.



Errors:

1. Model is not stopped prior to take off.
2. Not all engines operating.
3. If held or touched by anyone during the manoeuvre, the score is zero.
4. Model aircraft touched after calling "NOW" (zero marks).
5. Climb erratic.
6. Climb not consistent with subject aircraft.
7. Level off not smooth.

6.2.C.5 Optional Demonstrations – General

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

A. Multi-engines:

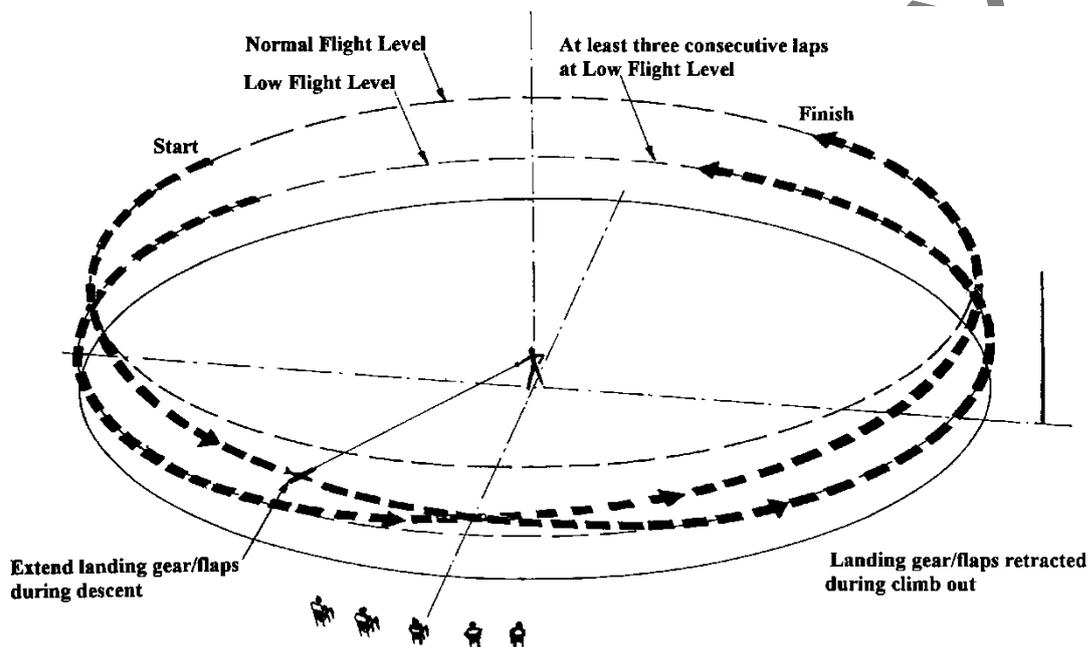
To qualify for full multi-engine points, all engines must run for the complete flight. Should any engine cut prematurely, then the mark will be reduced accordingly.

B. Retract and Extend Landing Gear:

C. Extend and Retract Flaps:

(Diagram and errors applicable to both manoeuvres unless stated)

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



Errors:

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

D. **Slow Flight**

TBA

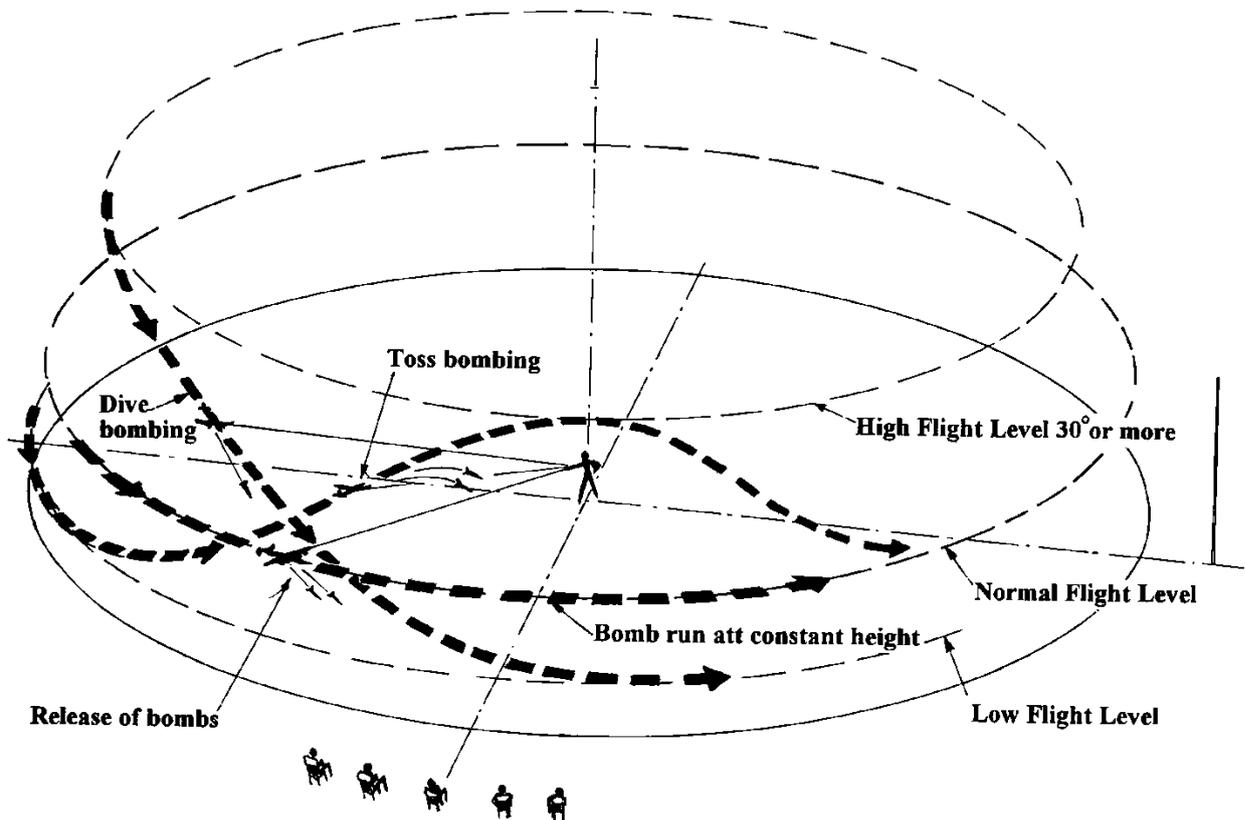
E. **Demonstrate asymmetric flight**

TBA

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F. Droppable Ordnance:

If ordnance is carried internally, ordnance doors must be open and be closed after the drop. If ordnance is carried externally, they must be fitted in the correct position and in the correct manner. Dropping should be in the manner of the full-size. The dropping zone shall be positioned in front of the judges as a circle with the radius of five (5) meters and shall be clearly marked on the ground with paint or tape. Any special features of the manoeuvre should be declared to the Judges beforehand.



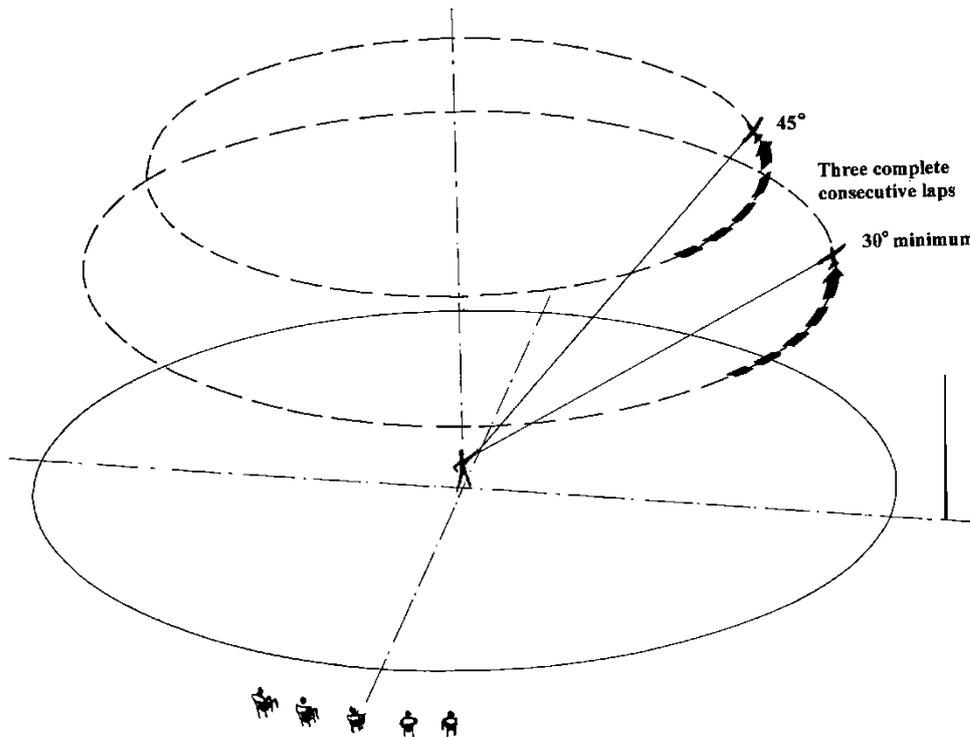
Errors:

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.

G. High Flight Over 30° Line Angle:

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

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

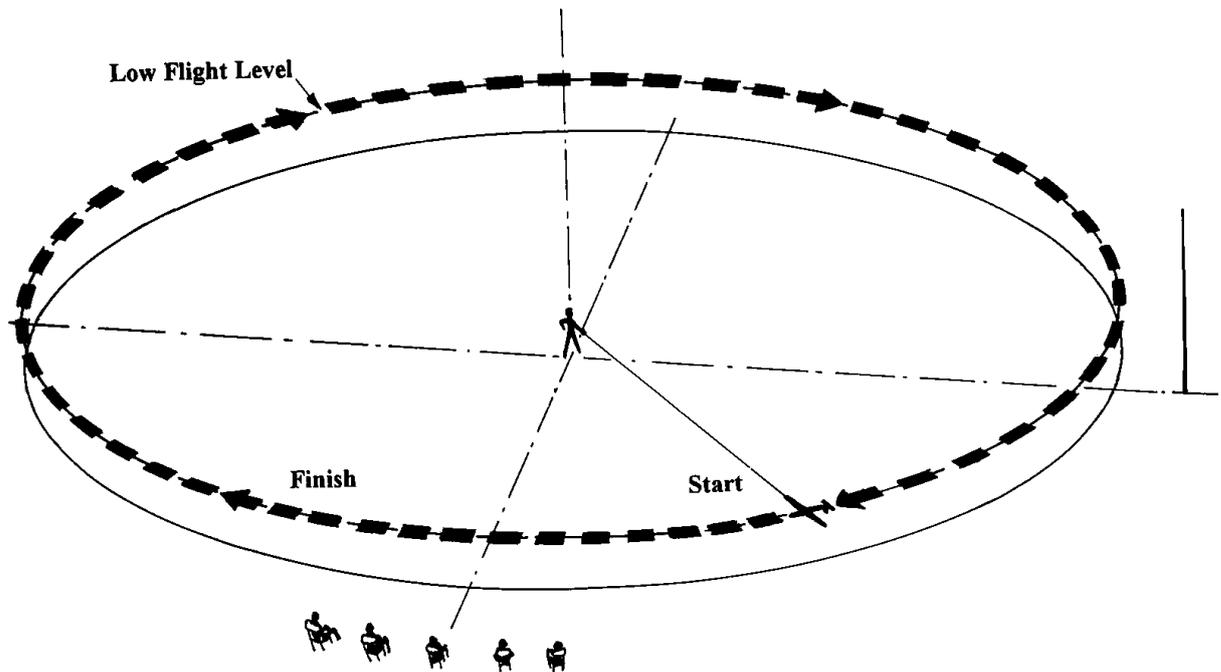


Errors:

1. Not three consecutive laps.
2. Not between 30° and 45° line angle.
3. Great variations of height during the flight.
4. Centring varies during the flight.
5. Below 30° line-angle, at any moment, zero marks.

I. Three Inverted Laps:

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

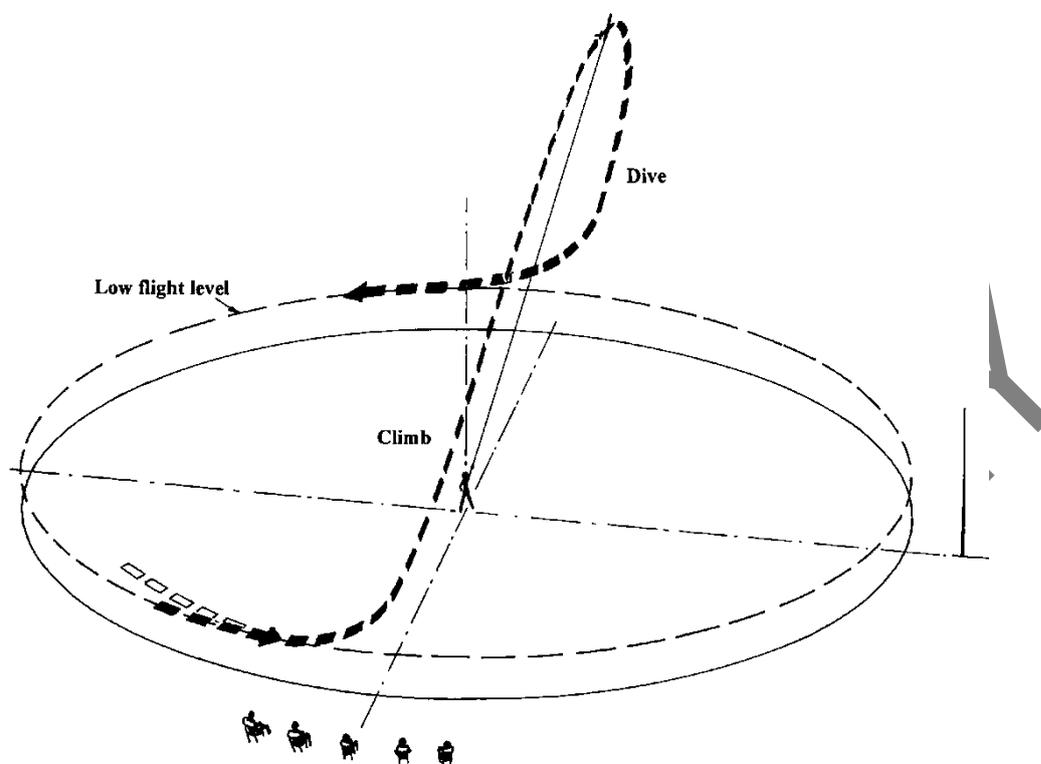


Errors:

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

J. Wingover:

From Low Level Flight the model aircraft should make a near vertical climb, then perform an equally near vertical dive and finally level out at Low Level Flight. The radius 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.

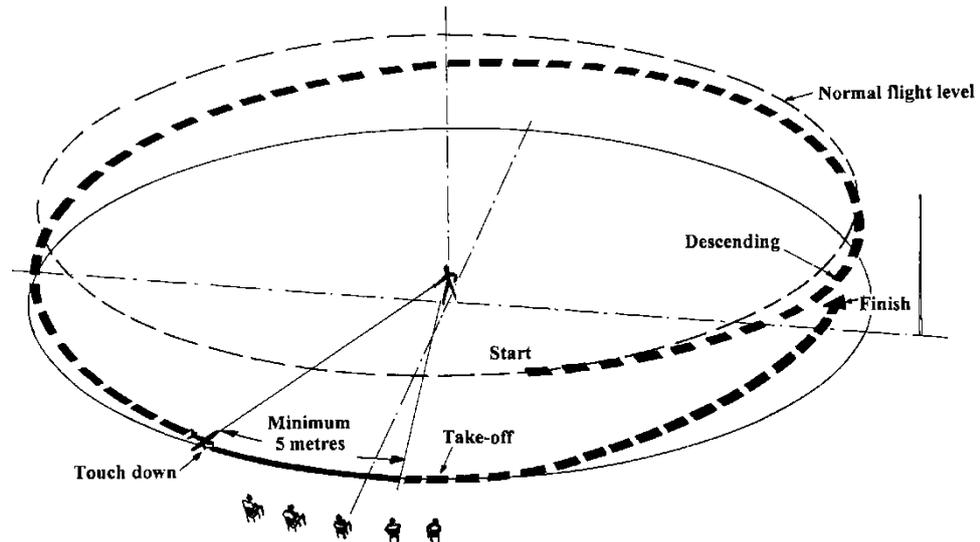


Errors:

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

L. Touch and Go:

From Normal Flight Level, the model aircraft 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 metres of the actual model aircraft. The model aircraft 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.

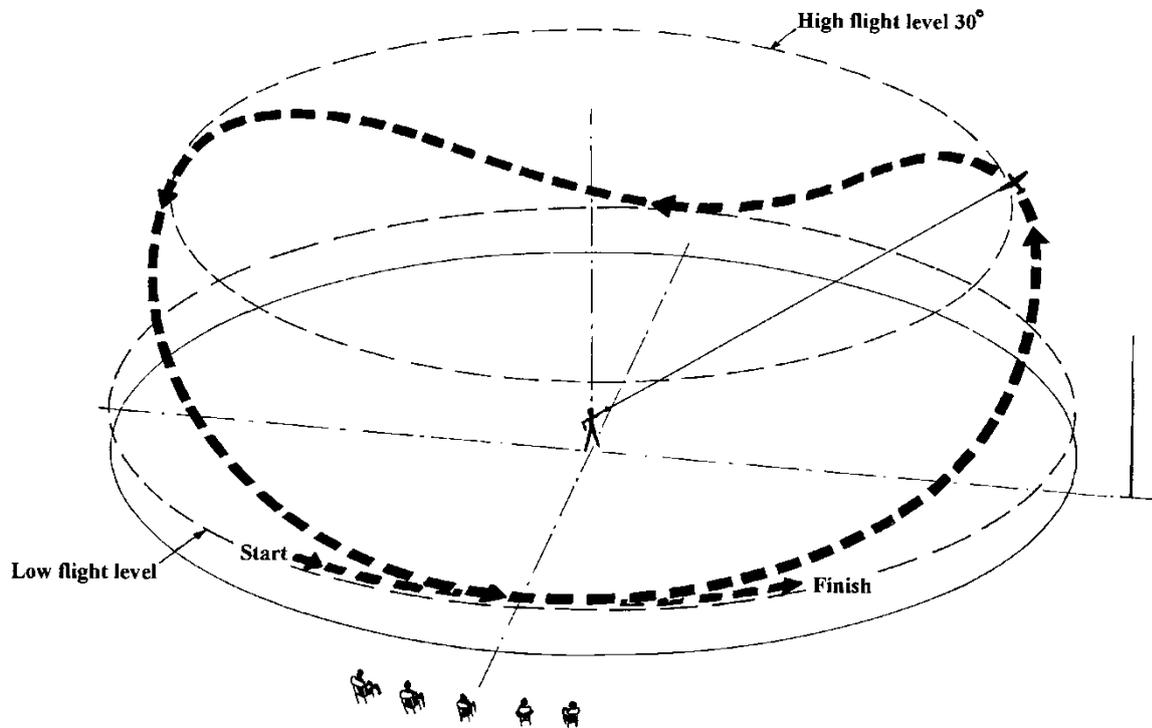


Errors:

1. Descent not commenced from Normal Flight Level.
2. Throttle, gear and flaps not operated smoothly during the descent.
3. The model aircraft 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 aircraft.
5. Not a normal take off and climb out to Normal Flight Level.

M. Lazy Eight

From Low Flight Level in front of the judges the model aircraft 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 sorts of aircraft.

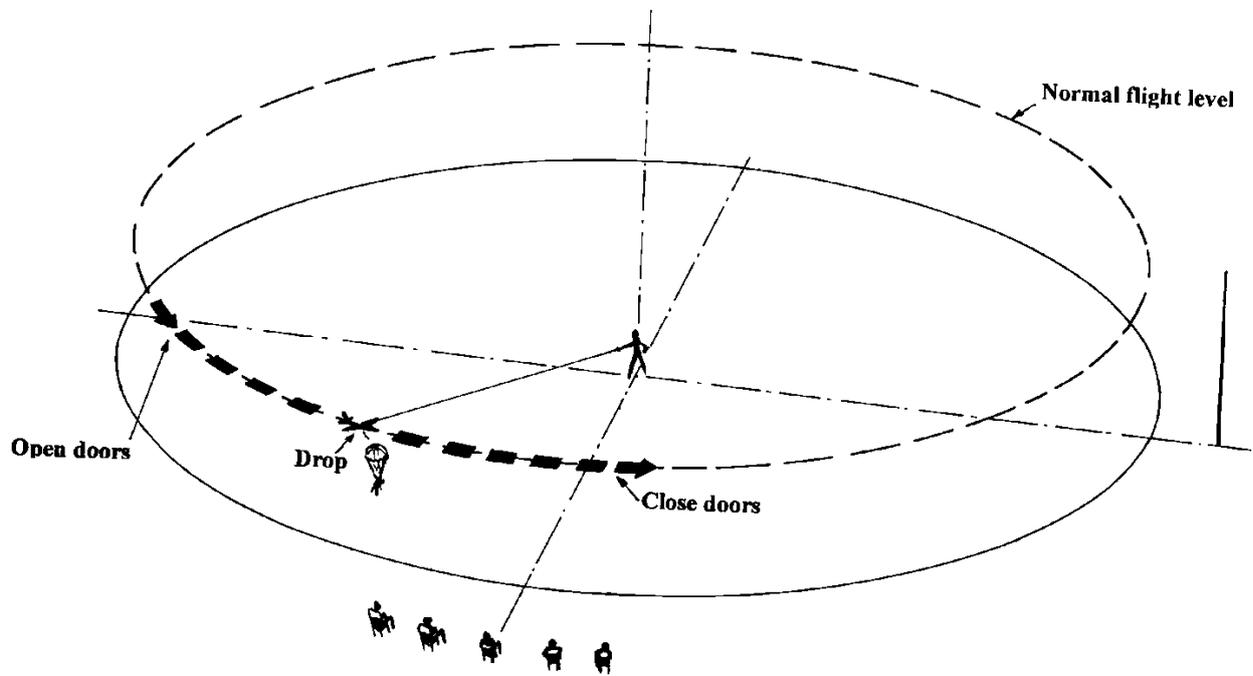


Errors:

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

N. 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. The dropping zone shall be positioned in front of the judges as a circle with the radius of five (5) meters and shall be clearly marked on the ground with paint or tape.

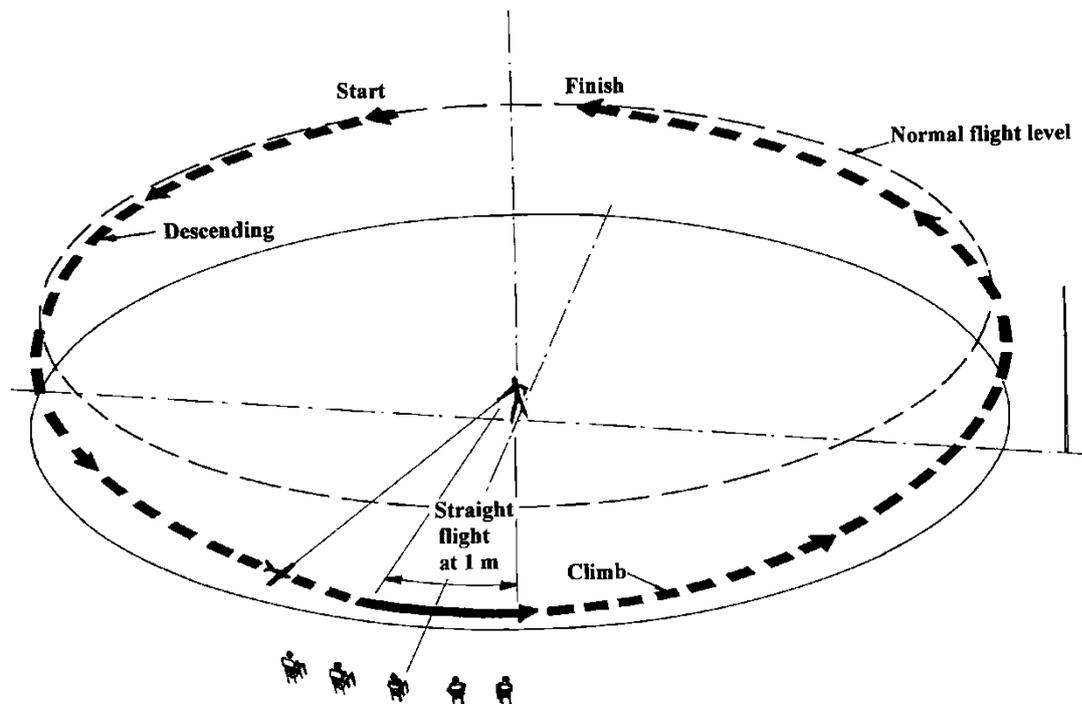


Errors:

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

O. Overshoot:

From Normal Flight Level, the model aircraft reduces speed and extends landing gear and flaps, as applicable to the subject aircraft. When the model aircraft reaches not more than one metre height and at least 15-meter length it picks up speed before it then makes a normal climb out and completes the manoeuvre at Normal Flight Level. The descending to approximately one metre may take more than one lap to finish.



Errors:

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

P. Non Listed Manoeuvre or Flight Function:

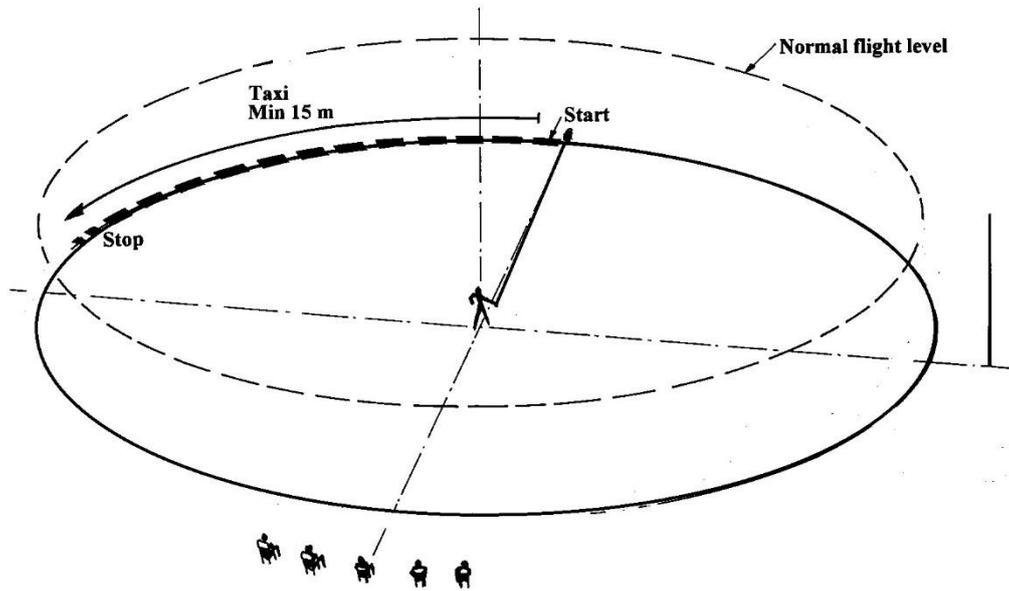
The competitor may demonstrate **one** flight function of his own choice, in each flying round. These must be agreed prior to the commencement of the flight program.

Note: Not more than one drop option may be nominated.

Flight functions should be of a nature that is easily understood by the judges. Pure mechanical options, which could equally be performed on the ground, are not allowed.

Q. Taxi Demonstration:

The model aircraft should taxi a minimum distance of 15 metres in a realistic manner and speed and finally come to a full stop. The model aircraft should stand still on the ground with the engine(s) running without being held. All engines must be operating for full marks. If the model aircraft is touched after the word "NOW" has been called the manoeuvre will score zero.

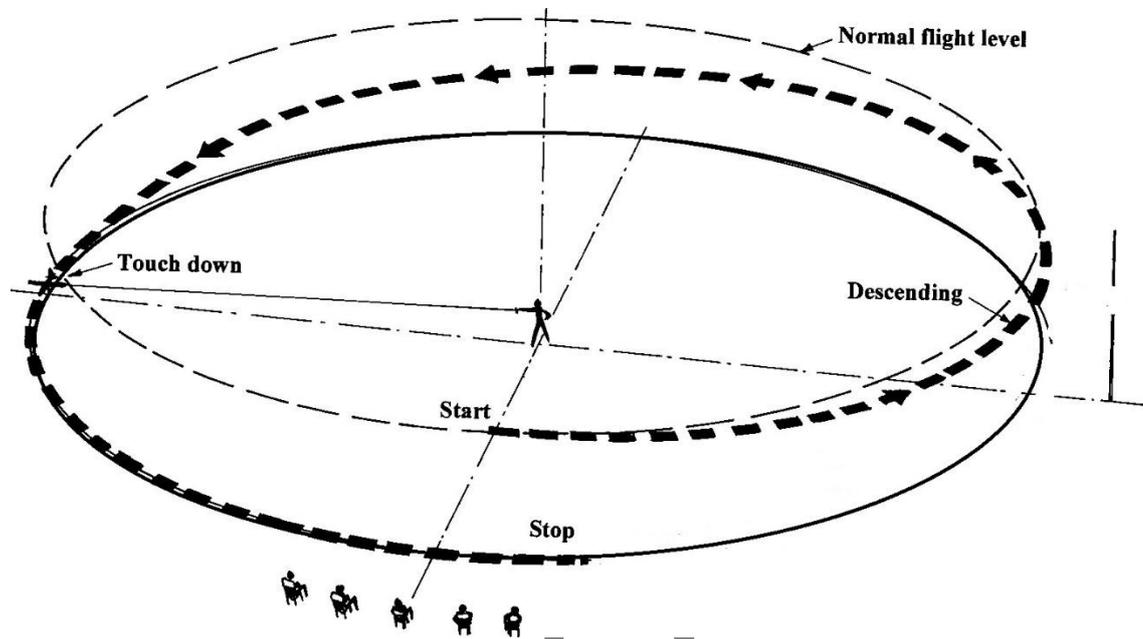


Errors:

1. Taxi not 15 metres.
2. Not a realistic taxi for the subject aircraft.
3. Not all engines operating.
4. Model does not come to a full stop.
5. If held or touched by anyone during the manoeuvre, the score is zero.
6. Model aircraft touched after calling "NOW" (zero marks).

6.2.C.6. Landing

From Normal Flight Level, the model aircraft smoothly descends while throttling back and begins the approach with flaps and gear down, when applicable, the model aircraft 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. All engines must be operating for full marks.



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 aircraft too fast, not correct approach configuration.
6. Model aircraft bounces on touch down.
7. Model aircraft does not come to a gradual and smooth stop after landing.
8. Model aircraft noses over (30 % penalty when nose-down, zero if it overturns).
9. Engine(s) stops before the landing manoeuvre is finished.
10. Model does not come to a full stop.

6.2.C.7 Realism of Flight:

All judges should discuss this after completion of the flight, and they should attempt to arrive at an agreed score for each item. Realism of Flight covers the entire flight performance including the way the model aircraft flies between the manoeuvres. Judges will allot points for Realism within the following aspects, always keeping in mind the likely characteristics of the subject aircraft.

Engine sound (Tone and Tuning)

K = 4

"Tone" relates to the character of the sound by comparison with the subject aircraft at all throttle settings.

" Tuning" is the smoothness of operation of the engine at all throttle settings.

The marks for engine sound should therefore be split equally between these two aspects.

Speed of the model aircraft

K = 6

This should be an assessment of the scale speed of the model aircraft, calculated from the speed of the full-size aircraft (as indicated on the score sheet and documentation) divided by the scale of the model aircraft. Model aircraft invariably fly faster than scale speed and marks should be deducted accordingly. For example, a model aircraft that appears to be flying at twice scale speed should score no more than half marks, a model aircraft flying at three times scale speed, or faster, should score zero.

Smoothness of flight

K = 6

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

Notes:

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

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 shall be equally visible during flight in the model aircraft. If such a pilot is not fitted, the total flight score shall be reduced by 10%.

6.2 ANNEX D - F4B FLIGHT SCORE SHEET

CHAMPIONSHIP LOGO and FAI emblem

Competitor number:	Competitor Name	Flight Round
---------------------------	------------------------	---------------------

Model Name and Designation:	
Cruising / Maximum Speed of Subject Aircraft:	Scale of Model:

No.	FLIGHT SCHEDULE	JUDGES MARK	K	SCORE
1	Take-off		14	
2	5 Laps of Straight and Level Flight		8	
3	Option 1:		12	
4	Option 2:		12	
5	Option 3:		12	
6	Option 4:		12	
7	Landing		14	
8	Realism in Flight	Engine Noise (Tone and Tuning)	4	
		Speed of the model	6	
		Smoothness of flight	6	
Judge's comment.		Flight Score		

Judge's Signature.....Chief Judge's Signature.....

6.3 CLASS F4C RADIO CONTROLLED SCALE AEROPLANES

6.3.1 STATIC JUDGING RULES for CLASS F4C

6.3.1.1 Static Judging (Fidelity to Scale and Craftsmanship)

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

A handler should be prepared to position the model aircraft as directed by the judges. No measurements are to be taken and the model aircraft must not be handled by the judges.

No parts of a model aircraft, except propeller and spinner may be removed, nor may anything except a dummy pilot and antenna be added externally to the model aircraft, between Static judging and flying. Bombs, drop-tanks, etc must be presented for static judging, but may be replaced before flying by simpler and repairable examples of the same shape, colour, size and weight. Any infringement will result in disqualification. Additional non-scale air inlets or entries are permitted provided they are covered by movable hatches for static judging; these hatches may be moved or opened manually prior to flight, or if in flight by means of radio control. Necessary repairs due to flight damage are permitted, but the maximum weight limit still applies. The appearance of the model aircraft in flight must not be unduly affected.

A flying propeller of any form or diameter may be substituted for a scale propeller. The size, shape and colour of the spinner may not be changed, and the spinner used for flight must be presented with the model for static judging.

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

6.3.1.2 Demonstration of Functional Scale Detail during Static Judging

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

6.3.1.3. Documentation

The Documentation for Scale models consists of the Competitors Declaration, Scoresheets and the Proof of Scale Evidence. The exact name and designation of the aircraft must be entered on all documentation.

6.3.1.3.1 The Competitors Declaration

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

The declaration form for class F4C is at 6.3.1.ANEX A.

6.3.1.3.2 Score Sheets

The Static score sheet is at 6.3.1.ANEX B and the Flight score sheet is at 6.3.2.ANEX B. The model aircraft may be built to any scale, but the scale must be entered on the Flight score sheet.

6.3.1.3.3 Proof of Scale

Proof of scale is the responsibility of the competitor. To be eligible for Fidelity to Scale marks, (Static marks) the following is the minimum documentation that must be submitted to the judges.

a) Photographic evidence:

At least three photographs or printed reproductions of the aircraft, including at least one of the actual subject aircraft being modelled are required. Each of these photographs or printed

reproductions must show the complete aircraft, preferably from different aspects and must not be smaller than A5. These main photos must be submitted in triplicate, the second and third copies may be photocopies. Photographs of the model are not permitted unless the model is posed alongside the full-size subject aircraft and the photo used as proof of colour. The use of photographs based on digital files which show evidence of being enhanced or manipulated shall result in disqualification. The photographic evidence is the prime means of judging scale accuracy against the full size aircraft and the photographic documentation provided should be as comprehensive as possible if a high score is to be achieved.

b) Scale Drawings:

Accurate scale drawing of the full-size aircraft that show at least the 3 main aspects of Side View, Upper Plan View and Front-End View. These drawings must be to a common scale giving a minimum span of 250 mm, and a maximum span of 500 mm or if the fuselage is longer than the wingspan, these measurements will be made on the fuselage. The drawings must be submitted in triplicate. Unpublished drawings 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 respective National Scale Committee or equivalent, the builder of the original aircraft, or other competent authority.

c) Proof of Markings:

This may be in the form of colour photographs or published colour illustrations from books or magazines. Black and white photographs or illustrations are acceptable if accompanied by suitable colour samples. Evidence of all the markings including their position on the aircraft must be provided to avoid loss of marks.

d) Proof of Colour:

Correct colour may be established from colour photographs, from published descriptions if accompanied by colour chips certified by a competent authority, from samples of original paint, or from published colour drawings, e.g. "Profile" type publications.

e) Proof of Texture:

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

6.3.1.4 Penalties for Inadequate Documentation

Failure to provide the minimum proof of scale documentation as specified in above will result in a reduction of marks as follows:

a) Fewer than three full photos of the full-size aircraft

ZERO marks for Scale Accuracy
Likely downmarking of Realism
Likely downmarking of Craftsmanship
Likely downmarking of Scale Detail

b) Missing or unauthorised drawings

ZERO marks for Scale Accuracy

c) No photo of subject aircraft

ZERO marks for markings
Likely downmarking for Realism

d) Inadequate proof of colour

ZERO marks for Colour

e) Insufficient evidence of Texture

Likely downmarking of Texture

6.3.1.5 Presentation of Proof of Scale 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. If a specific photograph is used as evidence for more than one judging aspect, it must be copied and repeated on the relevant page to avoid the need for the judge to have to turn pages back and forward to.

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

6.3.1.6 Static Judging Aspects and K-Factors

Aspect	K - Factor
1. Scale Accuracy	
a. Side view	13
b. End view	13
c. Plan view	13
2. Markings Accuracy	8
3. Markings Complexity	3
4. Colour Accuracy	3
5. Colour Complexity	2
6. Surface Texture	7
7. Scale Realism	7
8. Craftsmanship Quality	12
9. Craftsmanship Complexity	5
10. Scale Detail Accuracy	9
11. Scale Detail Complexity	5
Total K Factor	K = 100

Scale Accuracy (Item 1a to 1c), is judged at a distance of 5m from the centre of the model aircraft to the judge's chair. There are no restrictions on judging distance for the other aspects, but Judges must not touch the model aircraft.

6.3.1.7 Static Scoring

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

6.3.1.8 Normalisation of Scores:

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

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

Where:

Static Points_x = Normalised Static Score for competitor x

S_x = Static Score for competitor x

S_w = Highest Static Score

6.3.1. ANNEX A – F4C Competitors Declaration Form

Championship logo and FAI emblem

COMPETITOR’S DECLARATION FORM

Applicable to Classes F4C, F4G and F4K

This form must be completed and signed by the competitor and endorsed by the Team Manager.

Competitor's Name	National Identification.	Aircraft Name & Designation
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If your flight schedule is to include Unlisted Optional Manoeuvres (See 6.3.2 ANNEX A 31 & 32) Provide full details of your manoeuvre(s) here or on a separate sheet.

DRAFT ONLY

Aircraft cruising and/or maximum speed Attach proof on a separate sheet	
---	--

Builder of the model QUESTIONNAIRE – Answer all questions with YES or NO in the box

Was the structure of this model researched and designed entirely by you?	
Was this model built using a commercially available design or plan? If YES state the name of the person who has drawn the plan.....	
Was this model built from a kit? If YES, state kit manufacturer's name:.....	

Are any of the following items supplied or manufactured by a third party ?

Moulded or built up fuselage	
Pre-formed or built up wing panels	
Pre-formed or built up tail surfaces	
Moulded canopy	
Moulded or spun engine cowlings	
Undercarriage assembly	
Wheels	
Tyres	
Guns, bombs or other fittings	
Spinners	
Scale propellers	
Instrument panel or cockpit interior	
Printed or pre-cut markings or decals	
Wire rigging or fittings	

List any additional items (other than R/C equipment or engines) on a separate sheet.

COMPETITOR'S CERTIFICATION

<p>I certify that the model conforms to the current F4C rules and the answers given above are correct. Name(block letters) Signature.....</p>
--

TEAM MANAGER's ENDORSEMENT

<p>I certify that the answers given above are correct. Name(block letters) Signature.....</p>
--

6.3.1. ANNEX B F4C, F4G & F4J STATIC SCORESHEET

CHAMPIONSHIP LOGO and FAI emblem

Competitor Number:	Competitor Name:
Model Name & Designation	

Documentation checklist							
Competitors Declaration		Minimum 3-View Drawing		Minimum of 3 Photographs		Proof of Colour	

No.	STATIC JUDGING ASPECT	Judges Mark	K-factor	SCORE
1	Scale Accuracy -- Side view		13	
	Scale Accuracy – Front View		13	
	Scale Accuracy – Plan View		13	
2	Markings Accuracy		8	
3	Markings Complexity		3	
4	Colour Accuracy		3	
5	Colour Complexity		2	
6	Surface Texture		7	
7	Scale Realism		7	
8	Craftsmanship Quality		12	
9	Craftsmanship Complexity		5	
10	Scale Detail Accuracy		9	
11	Scale Detail Complexity		5	
Judge's notes		TOTAL		

Judge's Signature.....

Chief judge's signature.....

6.3.1.ANEX C – F4C STATIC JUDGING SUMMARY

(Also applicable to classes F4G and F4J)

6.3.1.C.1 STATIC JUDGING - GENERAL

The Rules which specify the Static Judging process for F4C models are stated in Section 6.3.1. and the Static Judges must work together as a team and attempt to reach agreement on the marks to be awarded for each aspect.

Static judging is a complex and detailed process and it is important that the rules are applied in a consistent manner. A more in-depth supporting document to this Static Judging Summary is available in the form of a F4 Scale Judges Manual which can be found at [TBA](#). This Scale Judges Manual is recommended reading for all Judges and shall be required reading for all Judges selected for Scale World Championship Judging Panels.

Regardless of the actual marks awarded, it is imperative that an accurate and fair comparison is attained across all the models entered in the competition. The relative mark of one model compared to another is the most important standard to be achieved. Before any static judging commences, the judges should make a general comparison of the complexity aspects of as many as possible of the models entered in the competition and place them in an approximate order of merit.

Each aspect of static judging is marked by each judge out of 10 in increments of 0.1 of a mark. Although each judge retains the right to differ, any degree of difference should be minimal.

If the model aircraft has completed a scoring flight before being static judged in the same competition, any damage sustained during that flight shall be ignored by the static judges provided it is practical to do so and the model is intact.

It is important that the static judges retain all the static score sheets until all the models have been static judged and the final review has been completed.

6.3.1.C.2 EXAMINATION OF DOCUMENTATION

The documentation required consists of Score sheets, the Competitors' Declaration and the Proof of Scale documentation. These documents must be available when the model is presented for static judging and the Static Judges should carefully examine this documentation before assessing the model.

6.3.1.C.2.1 Static judging Score sheets

The competitor is responsible for ensuring that the Static Judges are provided with the correct scoresheets which must be correctly filled in with the Competitors details and the details of the model.

6.3.1.C.2.2 Competitor's Declaration

The Declaration provides the certification that the model conforms with the "Builder of the Model rule" and should provide details of components which have been produced by a third party.

6.3.1.C.2.3 Proof of Scale Documentation

The minimum requirement for proof of scale documentation is specified in the Static Judging rules para 6.3.1.3.3 and the penalties for inadequate documentation are listed in para 6.3.1.4. However, this minimum standard of documentation will not provide all the evidence necessary for the judges to award maximum or high marks for scale accuracy.

Proof of Scale documentation should be presented in a format which can be quickly and easily understood. Advice to competitors on how the documentation should be presented is given in para. 6.3.1.5 of the Static Judging rules.

6.3.1.C.2.3.1 Photographs.

The photographs provided should be of good quality, with good definition, a good depth of focus and be free from distortion. Static Judges must have a good understanding of camera lens distortion and perspective distortion and how these factors can influence the photographic image of the subject aircraft.

With the ready availability of computerised photo editing software (e.g., Photoshop), Judges should be on their guard in order to spot photographs of the full size aircraft which may have been edited in order to hide errors on the model. Similarly, judges must be on the lookout for photographs of the model which have been edited to make the model appear to be the full-size aircraft.

6.3.1.C.2.3.2 Scale Drawings.

The specification for drawings is defined in rule 6.3.1.3.3b) which specifies minimum dimensions. However, line thickness is also important and drawings which show thick outlines are often an indication that the drawing has been enlarged from a small image and will be of dubious accuracy. The line thickness of a drawing should be no greater than 0.5mm.

The drawings should be applicable to the same Mk./variant or modification standard of the full-size subject aircraft that has been modelled. Drawings of a different variant of the same aircraft are acceptable providing the differences between variants are minimal, clearly identified and illustrated with supplementary sketches and/or cross referred to photographs.

6.3.1.C.2.3.3 Proof of Markings and the Colour Scheme

Proof of all markings and the complete colour scheme on both sides of the subject aircraft as well as the upper and lower surfaces of the wings, must be provided. Judges must not make assumptions that the markings are the same on each side of the aeroplane or that similar aircraft carry the same markings and colour scheme.

6.3.1.C.2.3.4 Proof of Colour Accuracy.

Colour accuracy is concerned with the tonal accuracy of the colours used on the model by comparison with the proof of colour evidence submitted. If high marks are to be awarded for colour accuracy, evidence must be presented for all the colours used .

Published colour chips and charts are acceptable when identified in a published written description, but judges should be suspicious when colour patches painted by the competitor are accompanied by a letter authorising authenticity, unless the patches themselves are identified and authorised by a competent authority.

6.3.1.C.2.3.5 Proof of Surface Texture.

The correct surface texture of all the different surfaces of the model is equally as important as the shape (outline and detail,) and the colour and markings of the model.

In practice, because of the scale factor and because judges are not permitted to touch the model, judging texture is not a question of what it feels like but what it looks like.

The best evidence of texture is good quality photographs taken in controlled lighting, but if this is not available because the subject aircraft is no longer in existence, a detailed written description of the surface structure of the subject aircraft, e.g. metal skinned, composite, plywood or fabric, may provide useful information for the judges.

6.3.1.C.2.3.6 Proof of Scale Realism.

Realism is by definition; "representing things as they really are" and when assessing realism in the context of scale model aeroplanes, it is best to make a comparison between the whole model and a photograph of the full-size subject aircraft.

The best evidence of realism is a good quality photograph or a series of photographs which show the whole of the full-size aircraft which has been modelled, including any weathering or signs of use and/or damage or imperfections in the structure and the finishing.

6.3.1.C.3 ASSESSMENT OF THE MODEL

Having first carefully examined the Competitor's Declaration and his Documentation, the judges can now commence assessment of the model. There are no rules governing the order in which the various aspects are marked but it is suggested that they are marked in the order laid out below which is also the order they appear on the score sheet. In practice there is considerable overlap of these aspects, e.g., errors in outline are often revealed by the colour scheme and the markings or the positioning or omission of details.

6.3.1.C.3.1 Assessing Scale Accuracy

The principle to adopt is that if it can be seen and it is adequately documented and it also conforms to the Builder of the Model rule, then it can be assessed and marked.

Particular attention must be paid to models whose overall outline is dependent upon the use of moulded major airframe components. Unless it is obvious, or stated in the documentation, judges should question the competitor to determine precisely who is responsible for the accuracy of the moulding. Marks can only be awarded for accuracy of outline when the judge is satisfied that the competitor did the work necessary to achieve it, e.g. when it can be proven that the competitor produced the plug and/or the mould.

At any time during the static assessment of the model, the Judges may question the competitor to resolve any queries they may have regarding the declaration or any third-party involvement in construction of the model. As a guide a model built using a commercially available moulded fuselage should not be awarded more than 50% of the available marks for Scale accuracy

If the competitor claims that he has used commercially available components but has modified them to improve scale accuracy, he must provide evidence of the extent of such modifications. The extent of any re-working or re-finishing must be clearly documented otherwise the marks awarded for scale accuracy must be reduced to reflect the origin of the components.

It is suggested that when assessing each view, the model should first be positioned in a pose like that in the best photograph and checked for any obvious discrepancies. Because of the possibility that the photographs may suffer from some form of distortion, Static Judges must cross check between photographs and the drawings.

6.3.1.C.3.1.1 Side view - Examine the fuselage outline, cabin or canopy shape (including significant internal structure where visible), cockpit aperture shape, engine cowling, propeller and spinner shape, outline of fin and rudder, wing and tailplane sections. Also, the shape, angle and position of landing gear legs and nose/tail wheel or skid and the size of wheels and tyres. If applicable a check should be made of wing stagger, wing gap and the shape and arrangement of struts and rigging wires. Particular attention should be given to the aerofoil section and any changes of section along the wing. It will be necessary to examine both sides of the model because there are few aeroplanes where the port side is identical to the starboard side.

6.3.1.C.3.1.2 Front-end view – Examine the wing or wings dihedral, thickness and taper, washout, prominence of ribs, wing struts, bracing and gap on multi-wing aircraft. Also, the thickness of fin, rudder and tailplane, cross-sections of fuselage and engine cowling, cowling shape and cut-outs, propeller size and blade shape, shape of cockpit canopy or windshields; size, shape, position and geometry of landing gear, wheel track, tyre thickness.

6.3.1.C.3.1.3 Plan view, Examine the wing or wings outline and fairings, aileron size, flaps; tailplane size and outline; elevator size, shape and cut outs, trim tabs, fuselage shape and taper, cockpit or canopy shape, engine cowling shape. It is important to also examine the underside of the model if there are features of the outline which are not clearly visible in any other view. The plan view assessment also provides the opportunity to check the accuracy and the position of the markings, particularly on the top and underside of the wings.

6.3.1.C.3.2 Assessing Markings and Colour Scheme Accuracy

Check that all the elements of the colour scheme and the position, size and style of all the markings are correct.

As a guide, if the evidence for markings shows only one side elevation of the subject and there is no evidence to support the markings on the other surfaces, irrespective of how complex they are, no more than 2.5 marks should be awarded.

6.3.1.C.3.3 Assessing Markings and Colour Scheme Complexity

Prior to commencing judging, the judges should agree the principle for awarding complexity points in relation to markings. A high mark for markings complexity is not solely dependent upon the number of different colours and markings, but also on the difficulty in achieving the required effect.

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

6.3.1.C.3.4 Assessing Colour Accuracy

The assessment must be made by comparing the evidence of colour with all the different colours on the model and this includes the accuracy of all the colours used for markings, lettering, and insignia. It may be necessary to place the proof of colour evidence against the model and step back to make an accurate assessment.

Judges should avoid wearing polarizing or tinted glasses (unless a neutral grey tint) when assessing colour.

6.3.1.C.3.5 Assessing Colour Complexity

The system for awarding colour complexity marks should be agreed before starting judging and consideration should be given to the greater effort involved in reproducing multi-coloured finishes compared to models which feature only one or two basic colours.

It is suggested that up to two complexity marks may be given for each main colour that covers a significant part of the airframe. A maximum of a single mark may be given for each minor colour, such as those for the insignia, struts, guns, bombs etc. and basic colours of black and white should attract a fraction of a complexity mark.

The marks awarded should not be confined simply to the number of colours used, but also how the colours are distributed on the model and whether the colour boundaries are on a flat or curved surface/structure.

6.3.1.C.3.6 Assessing Surface Texture

The texture and appearance of the surface of the model should be a good scale reproduction of the surface of the subject aircraft, but to assess the accuracy of the surface textures of the model the judge must rely on the quality of the documentation. The judge must not use any special knowledge he may have of the subject aircraft, nor must he make assumptions of the texture of the model based on the design of the full-size aircraft and when it was built.

In all instances the appropriate surface roughness and gloss or matt finish should be clearly documented and correctly reproduced.

6.3.1.C.3.7 Assessing Scale Realism

The quality of the documentation is of vital importance when assessing realism and if the documentation does not contain a good quality picture or a photograph that 'captures' the character of the full size aeroplane, then this omission must be reflected in the marks awarded. The judge must be careful to avoid making assumptions based on the type of aeroplane.

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

6.3.1.C.3.8 Assessing Craftsmanship - Quality

This is an assessment of the skill, ingenuity, workmanship, artistry and general finesse involved in the construction and surface finish of the model. If high marks are awarded for Scale Accuracy, Colour and Markings accuracy and Surface Texture, this is usually an indication of good craftsmanship.

Any visible non-scale items such as switches, needle valves, silencers, exhaust pipes, fuel hose, control horns, etc. except for "take-off aids", must result in a loss of marks. Non-scale wing joints or fixings necessary for dismantling the model and non-scale hatches or access panels used for model operation should be carefully disguised to avoid any loss of marks.

It is the skill of the competitor which is being assessed and not the skill of a third party. Judges must consult the competitor's declaration to check for any components that have not been made by the competitor and any such items must be excluded from this assessment. Judges should also be aware that the use of traditional methods i.e. handmade moulds/plugs to produce components requires a greater level of craftsmanship than when using CNC technology or 3D printing.

6.3.1.C.3.9 Assessing Craftsmanship - Complexity

Judges must consult the competitor's declaration and check for any components that have not been made by the competitor. Any such items must not be included in this assessment.

Judges should consider the overall complexity of the aircraft construction awarding higher marks for more intricate shapes and structures and the difficulty of replication. Judges should also

consider the variety of construction techniques and processes used in the subject aircraft and whether these have been accurately replicated or simulated.

It is also important to separate complexity from repetition e.g. a multi-bay triplane with straight identical wing panels will have an impressive number of struts and rigging wires, but they will all be of the same dimensions and be simple to reproduce. Contrast this with a monoplane having an elliptical wing of varying chord and cross-section containing flaps and retractable undercarriage mechanisms. Compound curves are more difficult to reproduce than straight line or flat structures and functional mechanical parts will require a greater number of different skills and construction techniques.

6.3.1.C.3.10 Assessing Scale Detail Accuracy

The documentation presented should clearly show the details that are to be assessed, but the marks awarded for Detail Accuracy should not simply reflect the accuracy of the detail that is highlighted by the evidence presented, it must also reflect the completeness of scale detail that is present on the model.

This is of course easier said than done and to some extent is an eyesight test for the judges. Judges must carefully examine the photographs of the full-size aircraft to determine whether the competitor has omitted details which the documentation shows are clearly visible on the full-size aircraft. Marks must be deducted if the Judge finds details that appear in the documentation, but which are not present on the model.

Particular attention should be paid to dummy engines and those parts of engines visible inside air intakes, air vents and around exhaust pipes and jet nozzles.

Judges must consult the competitor's declaration and check that marks are not being awarded for scale detail items which have been manufactured by a third party.

6.3.1.C.3.11 Assessing Scale Detail Complexity

This aspect is easily misunderstood, and Judges should ensure that the marks they award relate to the complexity of the detail that has been included on the model and that they are not awarding marks for the design complexity of the subject aircraft.

A well-documented, highly detailed model should score proportionately more than a model with little detail, even if the subject aircraft is itself sparsely detailed.

Again, Judges must consult the competitor's declaration to check for any components that have not been made by the competitor and any such items must be excluded from this assessment and the marks reduced proportionately.

6.3.1.C.4 FINAL ASSESSMENT REVIEW

When all the models have been individually assessed the spread of marks awarded for all the models, particularly the complexity marks should be reviewed under the guidance of the Chief Static Judge.

The relative complexity marks of one model compared with the others is important and to ensure this is achieved, the static judges must be given time to complete this review and if necessary, make retrospective alterations to the marks previously awarded.

A judge's marks can only be changed by the same judge who made the original assessment, and any alterations must be initialled by the same judge.

The use of a summary sheet for this review is recommended and the score sheets must only be released for final computation of the static scores when the review has been completed.

6.3.2 R/C SCALE MODEL AIRCRAFT- FLYING RULES

Applicable to classes F4C, F4H, F4G and F4J

6.3.2.1 General Characteristics

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

A measurement of weight must be undertaken immediately after the first flight of each model aircraft. No modification of the model aircraft except draining usable fuel and cleaning of the model aircraft is allowed. If found to be overweight, then zero points will be awarded for that flight and the model aircraft must be re-weighed after each subsequent flight.

The officials responsible for weighing the model aircraft and the device to be used shall be available to all competitors for weighing prior to the first flight of the contest.

The tolerance of the weighting equipment is to be added to the maximum weight (i.e. model aircraft max weight 15kg, if weighting equipment tolerance is 15 grams then total allowed weight will be 15.015 Kg).

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

Rocket or pulse jet engines are not permitted.

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

6.3.2.2 Radio Control Equipment:

Permitted:

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

Not Permitted:

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

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

6.3.2.3 Noise

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

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

engine to the noise meter and the maximum noise level will be the same as for single engine model aircraft. Turbine engines will not be subject to noise measurement.

6.3.2.4 Preparation for Flight

No parts of a model aircraft, except propeller and spinner may be removed, nor may anything except a dummy pilot and antenna be added externally to the model aircraft, between Static judging and flying. Bombs, drop-tanks, etc presented for static judging, may be replaced before flying by simpler and repairable examples of the same shape, colour, size and weight. Additional non-scale air inlets and outlets may be moved or opened manually prior to flight, or if in flight by means of radio control, but the appearance of the model aircraft in flight must not be unduly affected.

A flying propeller of any form or diameter may be substituted for a scale propeller. The size, shape and colour of the spinner may not be changed, and the spinner used for flight must be presented with the model for static judging. Metal bladed flying propellers are forbidden

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

6.3.2.5 Official Flights

Each competitor will be called to fly three rounds and must execute an official flight within the required time limit on each occasion to be eligible for flight points for that flight.

When there are two flight lines for the same class each competitor will fly four rounds, two in front of each panel of judges and two on each flight line and the lower score from each panel will be deleted.

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

An official flight commences when the competitor signals to the timekeeper that he is commencing to start his engine(s), or two minutes after the competitor is instructed to start his flight.

An official flight is terminated when the model aircraft lands and stops, (except if the model stops while attempting a Touch and Go manoeuvre).

In the event the wind is continuously stronger than 9m/s measured at two (2) metres above the ground at the flight line for at least one minute, the Contest Director can interrupt, or delay the start of, the contest.

6.3.2.6 Flying Time

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

The competitor will be allowed 17 minutes to complete his flight or in the case of a multi-engine model aircraft, the flying time will be increased by one minute for each additional engine.

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

6.3.2.7 Starting Time

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

If the engine(s) stops after the commencement of the take-off has been called, but before the model aircraft is airborne, the engine(s) may be restarted, but the take-off will be marked Zero.

Only one attempt will be allowed to repeat the take-off procedure and if the model fails to take-off, the official flight will be terminated.

6.3.2.8 Aircraft speed:

The Competitor must enter the cruising speed of the subject aircraft on the Flight Score Sheet 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.

6.3.2.9 Flight Schedule

The flight schedule must be produced by the Competitor using the Flight Score sheet. The order in which all manoeuvres are to be flown must be marked on the score sheet and any manoeuvre flown out of order will be marked zero.

The manoeuvres "Figure Eight" and "Descending 360° Circle" are mandatory manoeuvres which must be included in each flight and positioned in the flight schedule at the competitor's discretion.

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

Only one manoeuvre involving dropping something or the demonstration of a mechanical function may be included in a competitor's choice of options. This includes dropping bombs, fuel tanks or Parachutes. Explosives or incendiary devices must not be dropped.

A competitor may choose to demonstrate either the retractable undercarriage system or the extension and retraction of the flaps on the model as an optional manoeuvre. (See 6.3.2.A.31)

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 any proposed unlisted 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 sliding cockpit canopies and switching on and off lights, are not acceptable as optional flight manoeuvres. However, such functions may be included in the flight schedule to enhance realism in flight.

6.3.2.10 List of Manoeuvres

- Take-off
- Figure Eight
- Descending Circle
- Chandelle.
- Wingover
- Immelmann turn
- One loop
- Split S (Reversal)
- Roll
- Stall turn
- Normal spin (three turns)
- Cuban Eight
- Reverse Cuban Eight
- Half Cuban Eight
- Half Reverse Cuban Eight
- Lazy Eight
- Inverted flight
- Derry Turn
- Side slip to left or right
- Procedure Turn
- Straight flight at low speed
- Flight in triangular circuit
- Flight in rectangular circuit
- Flight in a straight line at constant height
- Flight in a straight line with one engine throttled
- Dropping of bombs or fuel tanks
- Parachute Drop
- Overshoot
- Touch and go
- Retract and extend landing gear or flaps

1st Unlisted manoeuvre/Flight function
2nd Unlisted manoeuvre/Flight function
Landing

Descriptions and theoretical diagrams for all manoeuvres are at 6.3.2.ANEX A.

6.3.2.11 K-Factors

Take-off	K = 11
Option 1	K = 7
Option 2	K = 7
Option 3	K = 7
Option 4	K = 7
Option 5	K = 7
Option 6	K = 7
Option 7	K = 7
Option 8	K = 7
Approach and Landing	K = 11
Realism in flight	
a) Flight Presentation	K = 9
b) Speed of the model aircraft	K = 9
c) Smoothness of flight	K = 4
Total K Factor	K = 100

6.3.2.12 Flight Judging

All model aircraft shall become airborne in the manner of the full size aircraft

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

The aim of the scale flight schedule is to recreate the flight characteristics and realism of the full-size aircraft. Judges must not therefore confuse scale contests with aerobatics contests.

Only one attempt is permitted for each manoeuvre, the only exception is the procedure of getting a model aircraft airborne, as defined above in 6.3.2.7.

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

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

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

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

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

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

After each flight the Chief Flight Judge will review all flight score sheets for completeness and fairness and verification of any manoeuvres which are marked zero. Examples are missed manoeuvres, manoeuvres flown out of order, out of flight time, flying behind the "Judges' Line", or crash landing. If for any reason the mark awarded is corrected or changed, the change must be initialled by the judge. The Chief Flight Judge must then sign the score sheets before they are sent for processing.

6.3.2.13 Flight Score

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

6.3.2.14 Normalisation of Flight Scores

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

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

Where:

Flight Points_x = Normalised Flight Score for competitor x

F_x = Flight Score for competitor x and

F_w = Highest Flight Score

6.3.2.15 Safety

Any manoeuvres overflying a designated area behind the judges' line laid out for the protection of spectators, officials and other competitors or helpers, will be marked ZERO.

If a model aircraft is in the opinion of the Chief Flight Judge or the Flight line Director considered to be unsafe, or being flown in an unsafe manner, the pilot will be instructed to land the model and the flight will be marked ZERO.

6.3.2. ANNEX A - R/C FLIGHT MANOEUVRES

6.3.2A.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 a display of aerobatics using a scale model.

The descriptions and diagrams in this ANNEX indicate the theoretical shape of the manoeuvres and this theoretical shape can only be achieved by models of aircraft designed and built for aerobatics. 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.

Judges will examine each manoeuvre from three aspects:

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

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.

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

The diagrams in this section also indicate where the start and finish of the manoeuvres should be called 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.

All manoeuvres must be performed at an appropriate distance and at a height that will allow them to be seen clearly by the judges. The non-observance of this rule will be penalised by loss of marks.

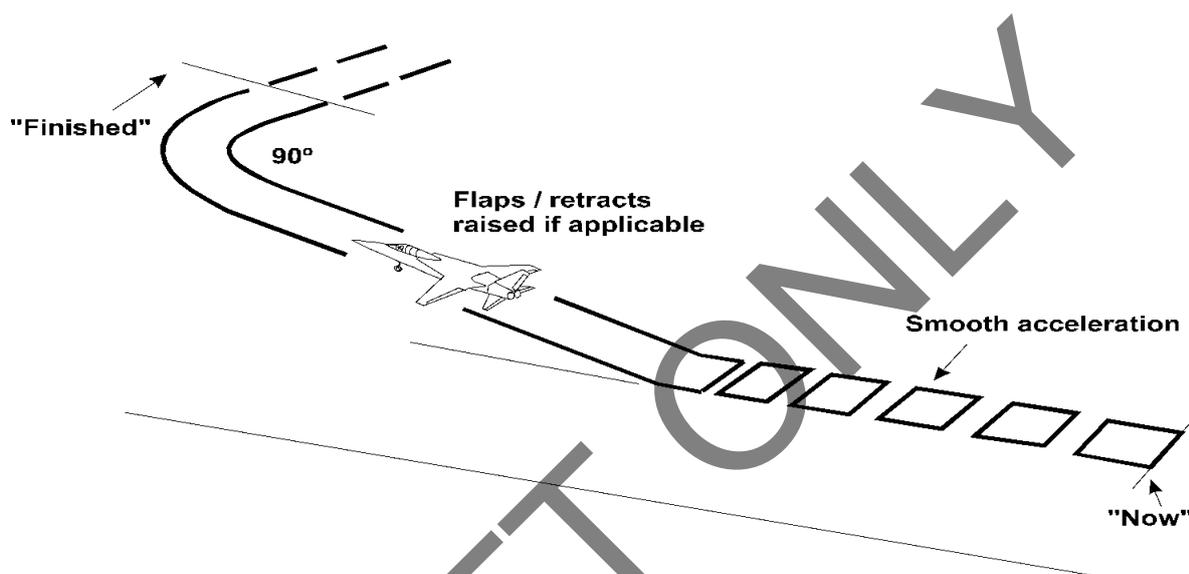
For any model aircraft that flies a manoeuvre with two or more wheels down, where the aircraft actually featured retractable landing gear, the marks awarded for that manoeuvre shall be reduced by two. If one wheel is down, one mark shall be deducted. If one or more wheels are unlocked during the manoeuvre, one mark or a half of a mark shall be deducted accordingly.

Manoeuvres may be flown into wind or downwind at the competitor's discretion.

6.3.2A.2 Take-Off:

The model aircraft should stand still on the ground with the engine/engines running without being held by the pilot or helper and then take-off into wind, or as required by the competitor to make best use of the take-off distance available. If the model aircraft is touched after the competitor calls "Now" the take-off will be marked zero. The take-off should be straight and the model aircraft should smoothly accelerate to a realistic speed, and then lift gently from the ground and climb at an angle consistent with that of the full size aircraft. The take-off is completed after the model aircraft has turned 90 degrees away from the judges.

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



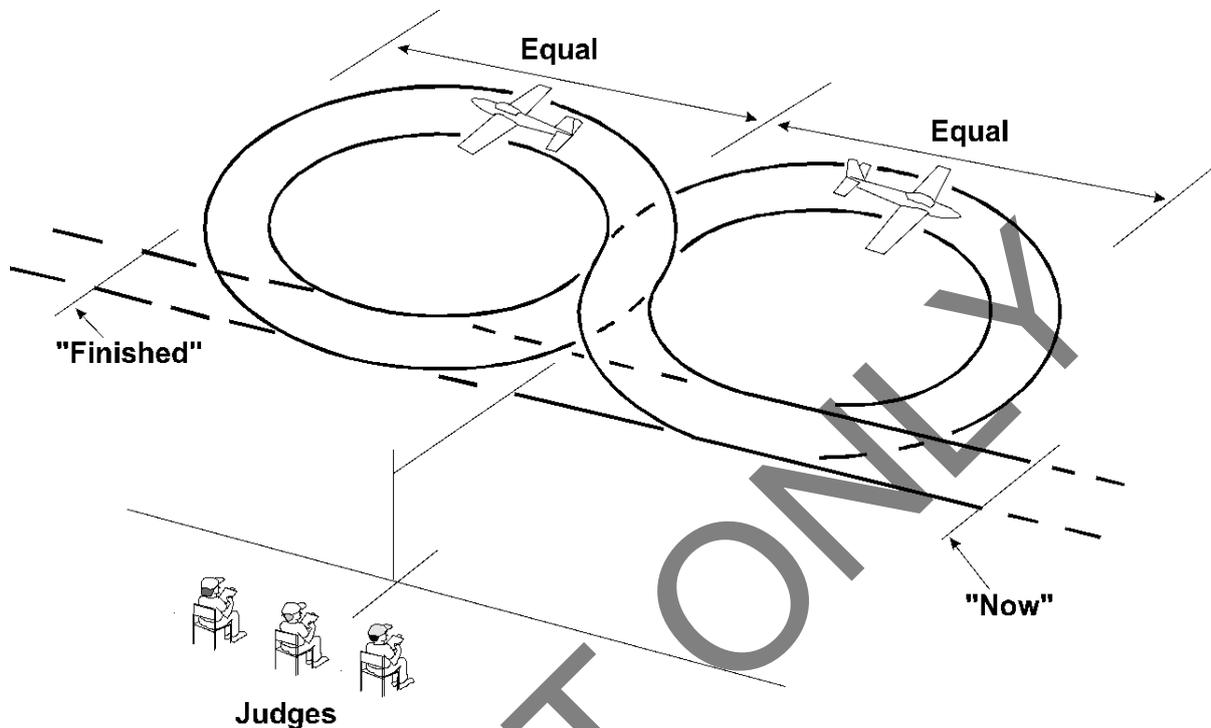
Errors:

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

6.3.2.A.3 Figure Eight (Compulsory Manoeuvre)

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

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



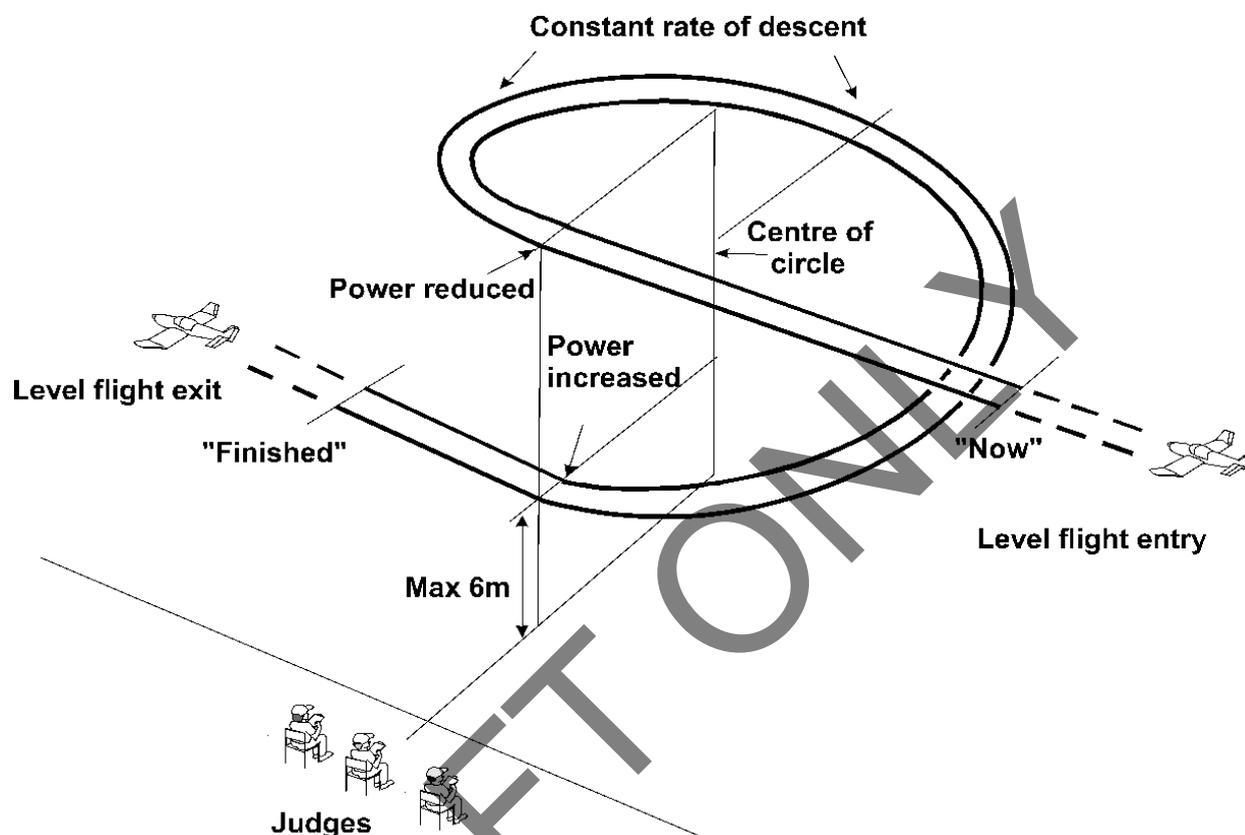
Errors:

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

6.3.2.A.4 360 Degree Descending Circle (Compulsory Manoeuvre)

Commencing from straight and level flight, the model aircraft performs a gentle 360° descending circle over the landing area, in a direction away from the judges, at a **constant** low throttle setting.

The manoeuvre terminates at a maximum height of 6 metres, resuming straight and level flight on the same path.

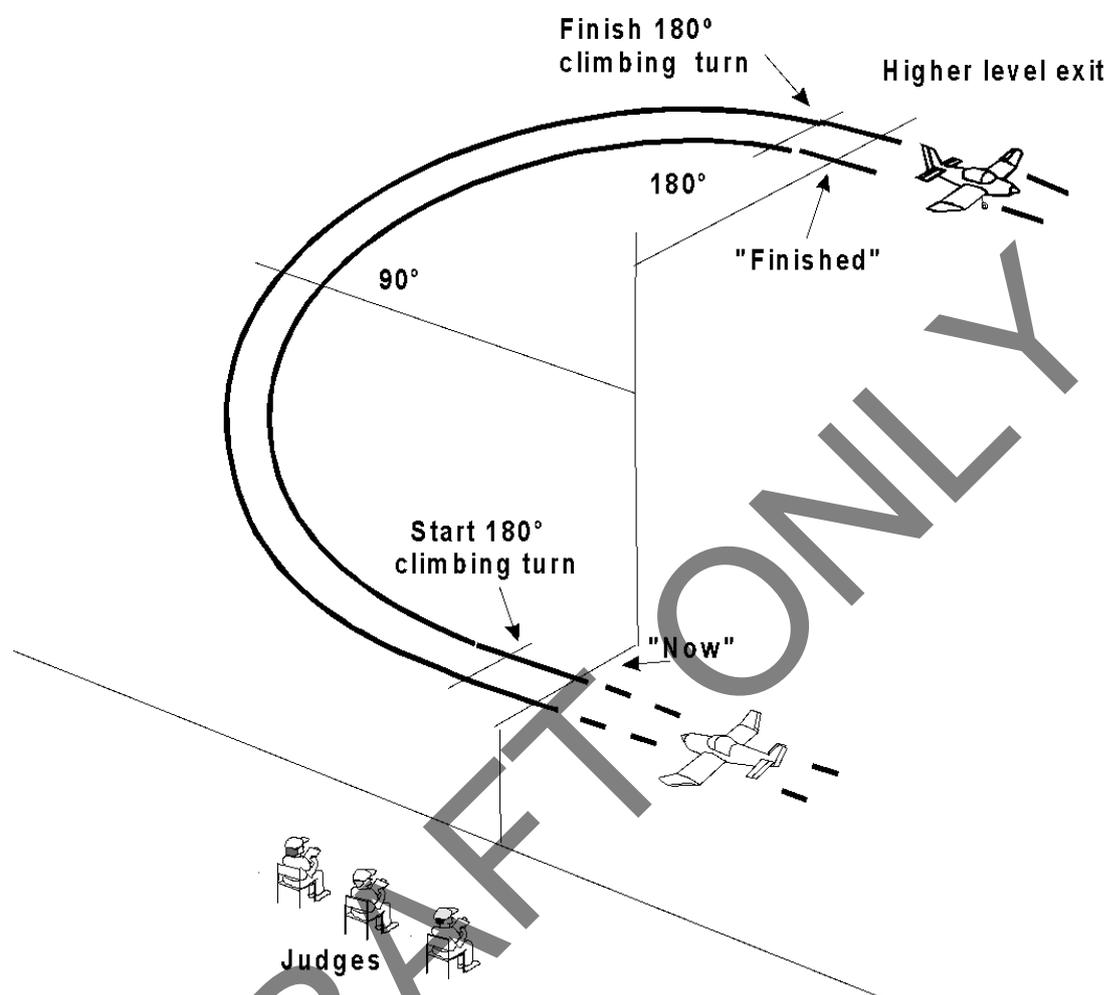


Errors:

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

6.3.2.A.5 Chandelle

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



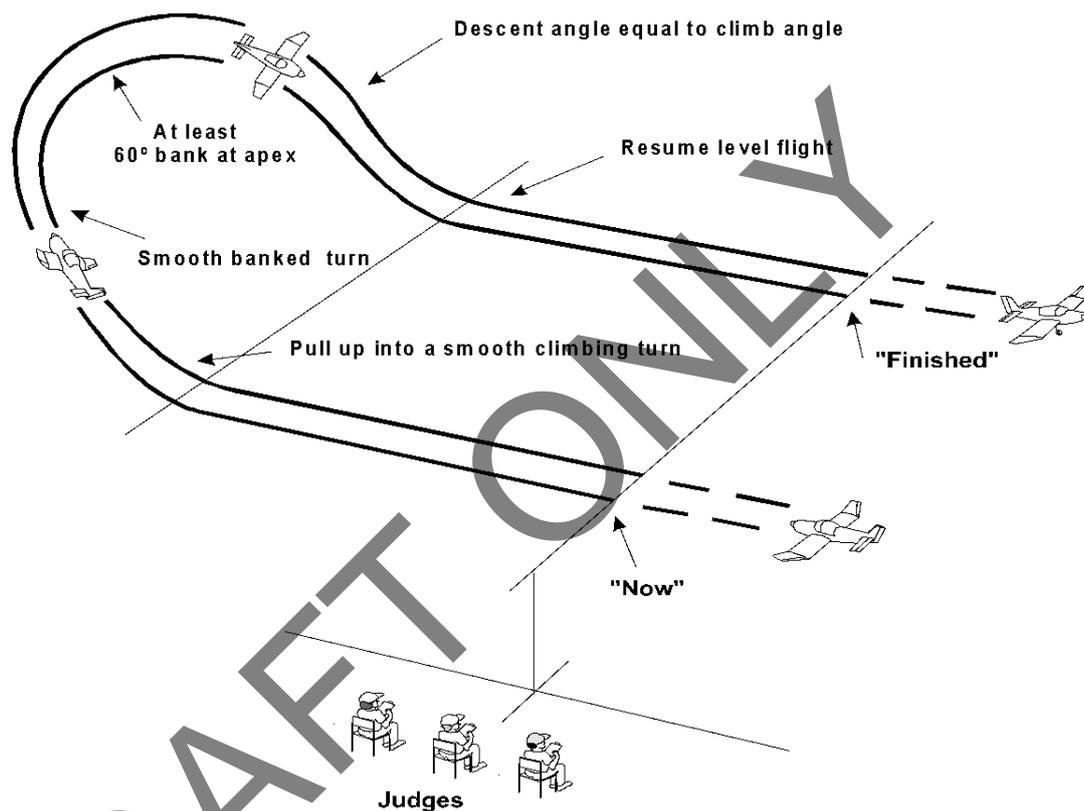
Errors:

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.
6. Start and 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.

6.3.2.A.6 Wingover.

The model aircraft approaches in straight and level flight on a line parallel with the Judges' line. After passing the judges' position a smooth climbing turn is commenced away from the judges. At the apex of the turn, the model should track 90° to the entry track and the bank angle should be appropriate to the capability of the full-sized aircraft. The height gain should be appropriate to the capability of the full size 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 track displaced away from the judges.

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

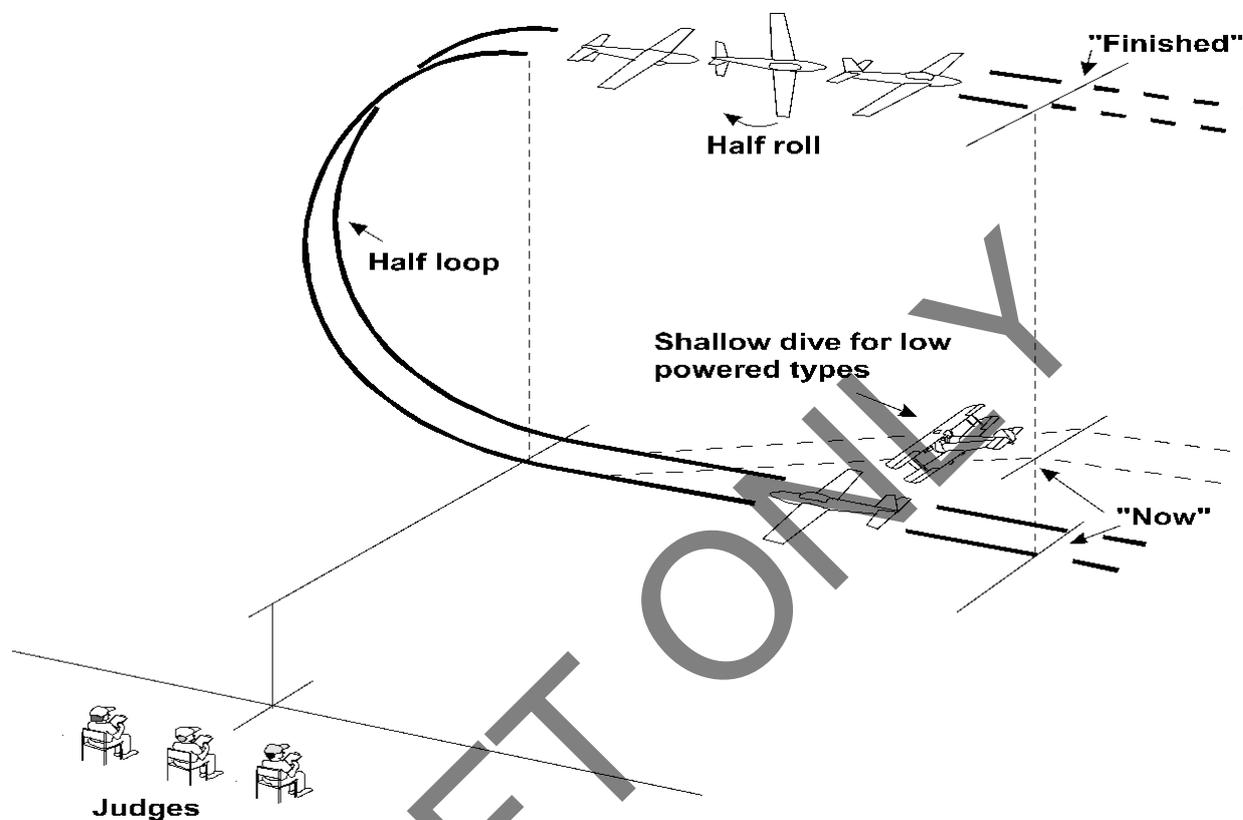


Errors:

1. Start and finish positions not as indicated.
2. Insufficient climb achieved.
3. Insufficient bank achieved
4. Climb and descent angles not equal throughout manoeuvre.
5. Model aircraft 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 the full-sized aircraft.
- 8 Model aircraft flight path not smooth and steady.
9. Too far away/too close/too high/too low.

6.3.2.A.7 Immelmann Turn:

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



Errors:

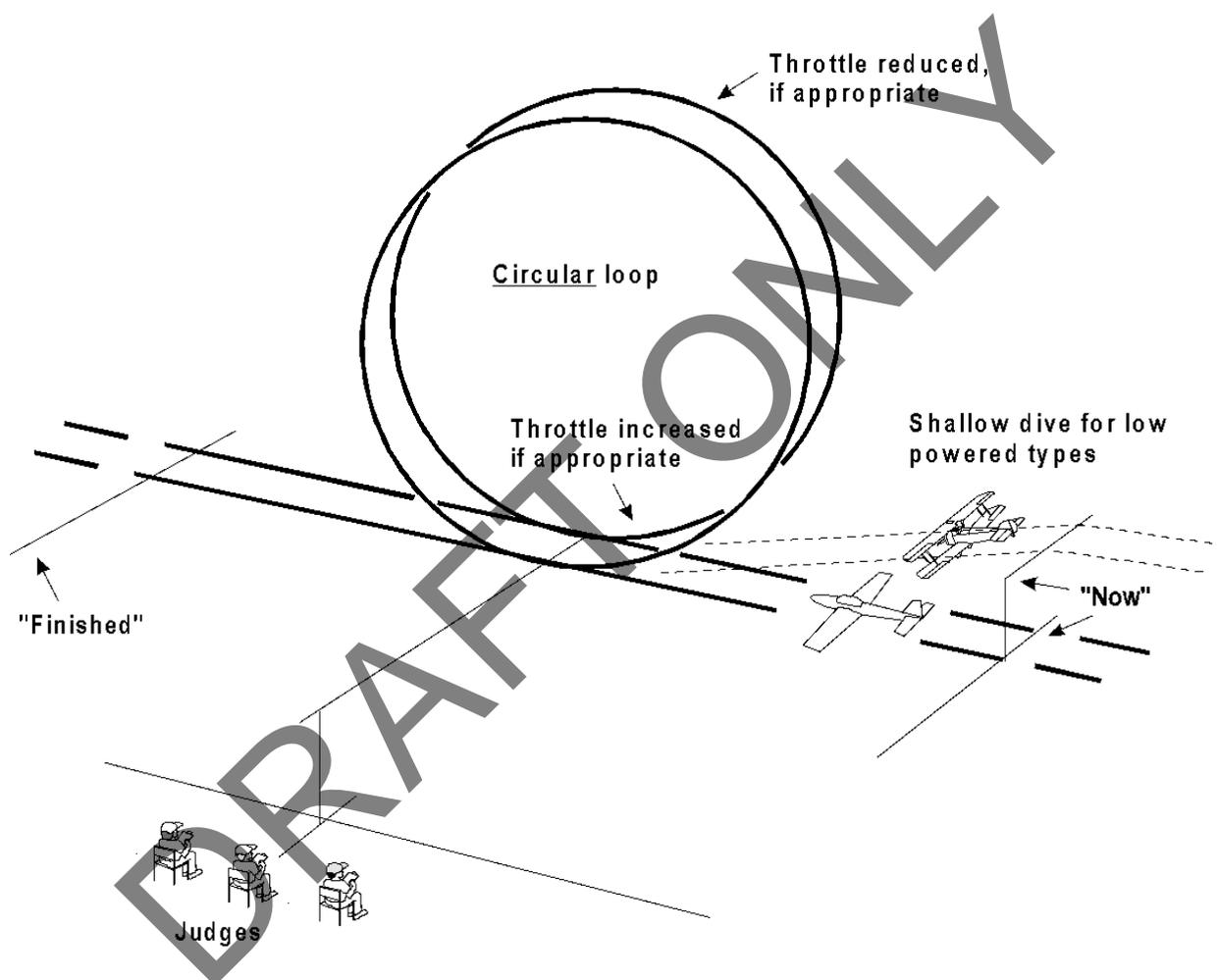
1. Track of the half loop not vertical.
2. Half loop not centred on judges' position.
3. Half loop is not sufficiently semi-circular.
4. Roll starts too early or too late.
5. Excessive height loss in the roll.
6. Track veers during the roll.
7. Does not resume straight and level flight on the opposite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

6.3.2.A.8 Loop:

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

Note:

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

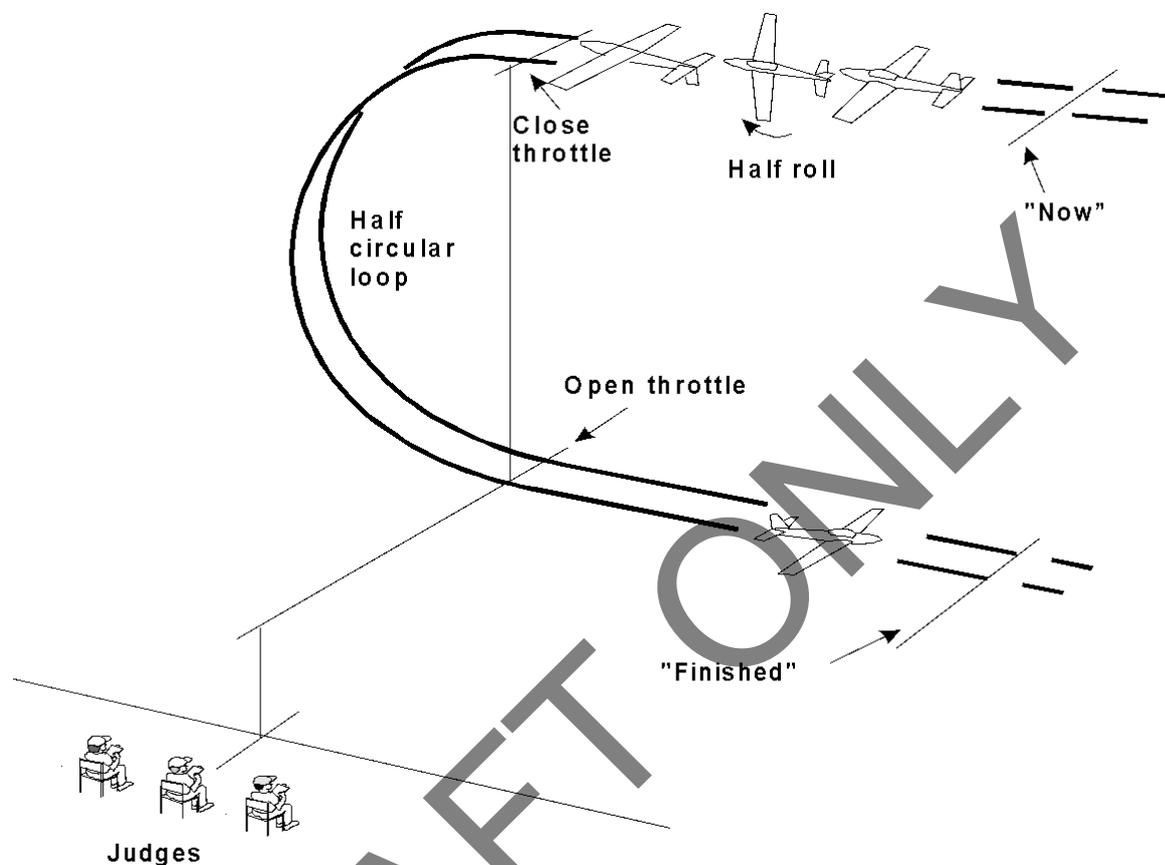


Errors:

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

6.3.2.A.9 Split S (Reversal):

From straight flight, the model aircraft 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.

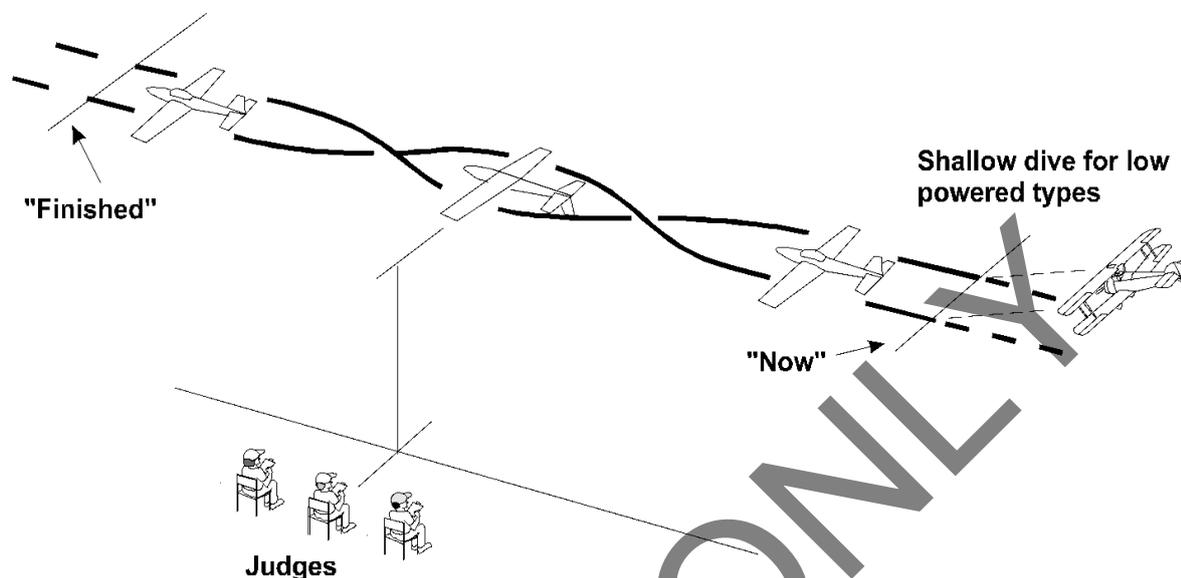


Errors:

1. Model aircraft changes track during half roll.
2. Model aircraft 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. Too fast or too tight a half loop.
7. Does not resume straight and level flight on opposite track to entry.
8. Half loop not centred on judges' position.
9. Manoeuvre not flown parallel with the judges' line.
10. Too far away/too close/too high/too low.

6.3.2.A.10 Roll:

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

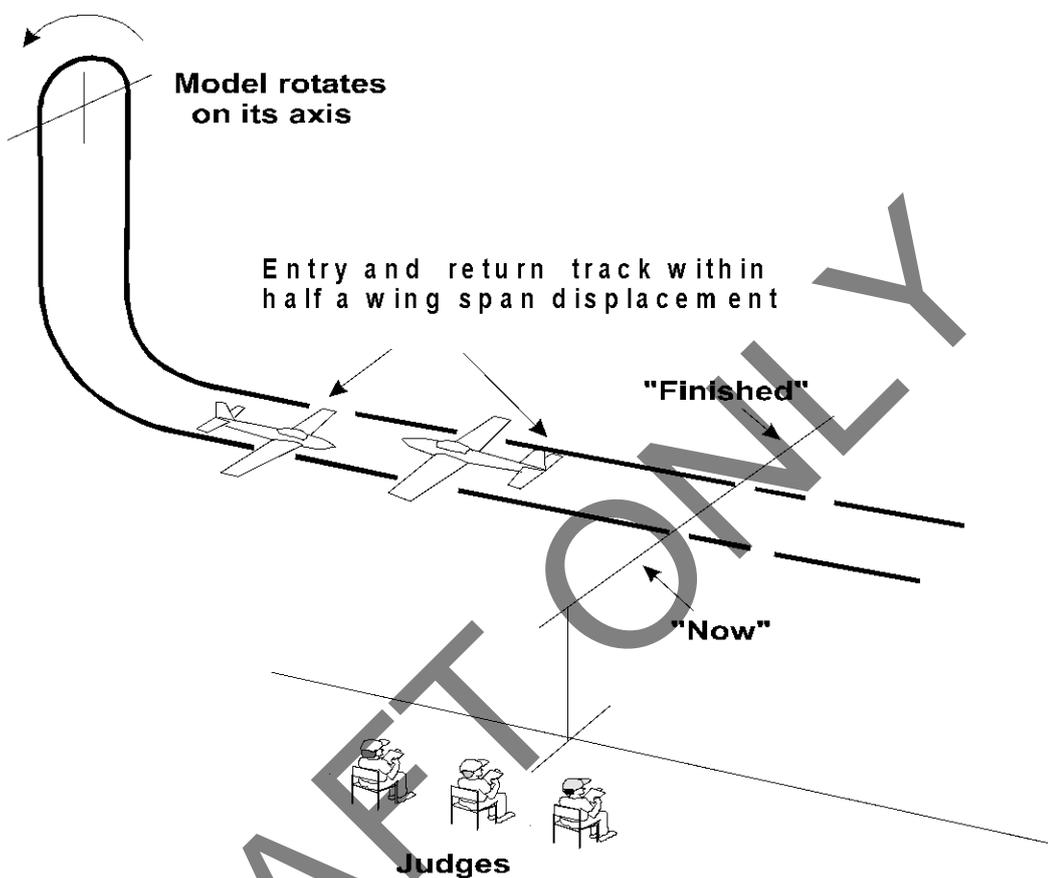


Errors:

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

6.3.2.A.11 Stall Turn:

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

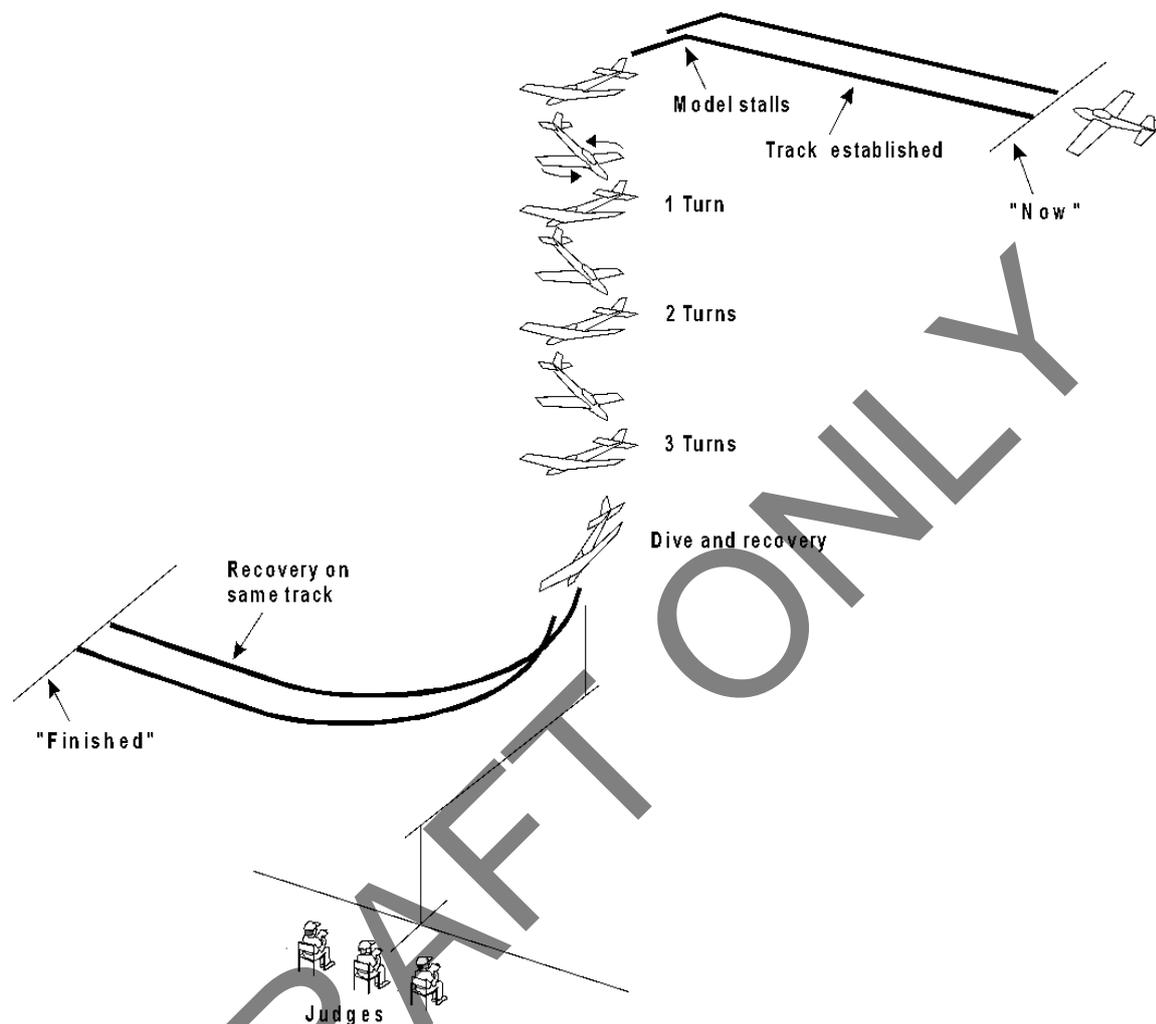


Errors:

1. Start 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 aircraft does not stop.
6. Competitor does not specify or achieve nominated left/right turn.
7. Entry and exit paths are not at same height.
8. Model aircraft does not exit within half span displacement of entry track.
9. Entry and exit paths not parallel with the judges' line.
10. Too far away/too close/too high/too low.

6.3.2.A.12 Normal Spin – Three Turns:

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



Errors:

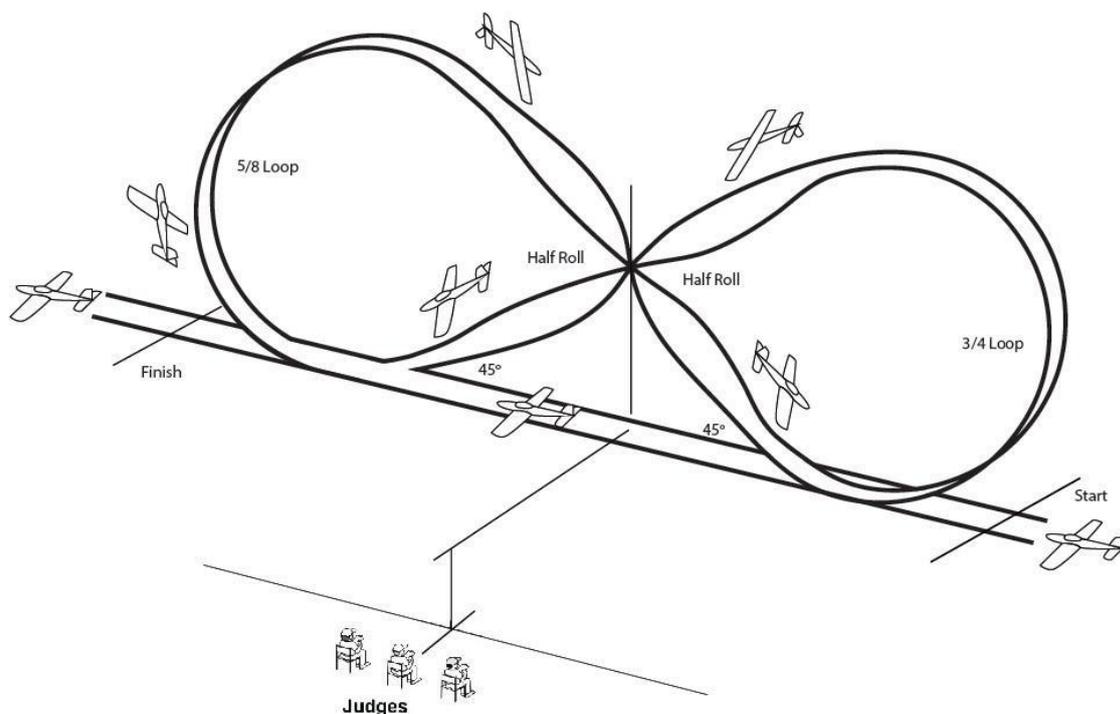
1. Engine not throttled back at point of stall.
2. Entry into spin not clean and positive.
3. Not a true spin but merely a spiral dive (which should score zero).

Note: In a true spin the centre line of the descent path will be close to the C of G of the model aircraft. A spiral dive is a tight vertical barrel roll.

4. Not three complete turns.
5. Start of spin not centred on judges' position.
6. Model aircraft 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.

6.3.2.A.13 Cuban Eight:

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

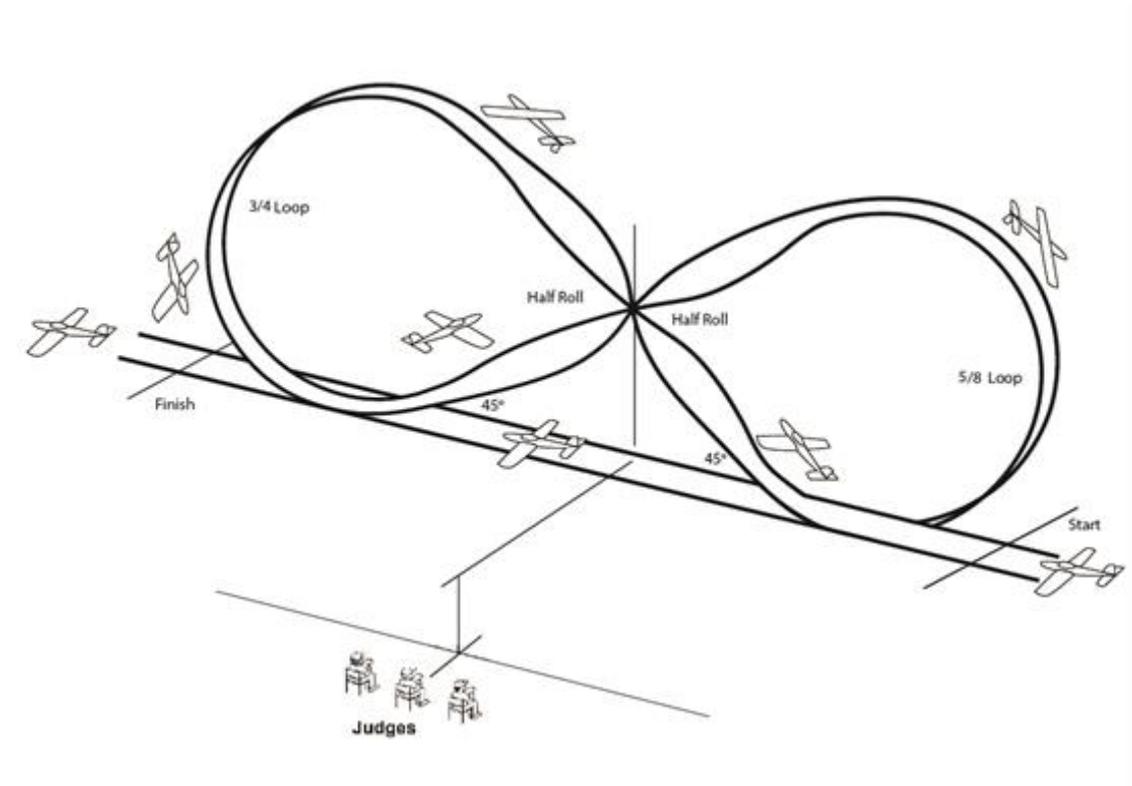


Errors:

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

6.3.2.A.14 Reverse Cuban Eight:

The model approaches in straight and level flight, parallel to the runway and pulls through a 1/8 loop to a 45 degree up line before reaching the judges centre line and then performs a half roll in front of the judges. It then pulls through a 3/4 inside loop into a 45 degree up line and performs a half roll in front of the judges and then pulls through a 5/8 inside loop to resume straight and level flight to exit the manoeuvre at the same altitude and track as the entry. The throttle may be closed at the top of each loop, as appropriate to the subject type, and reopened during each descent.

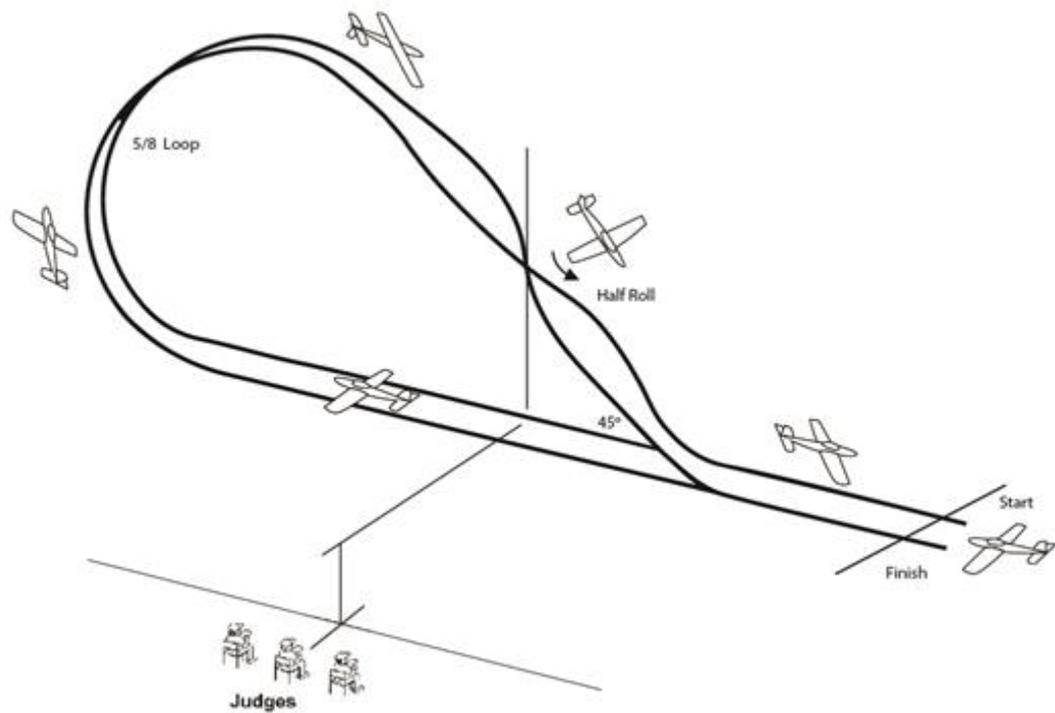


Errors:

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

6.3.2.A.15 Half Cuban Eight:

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

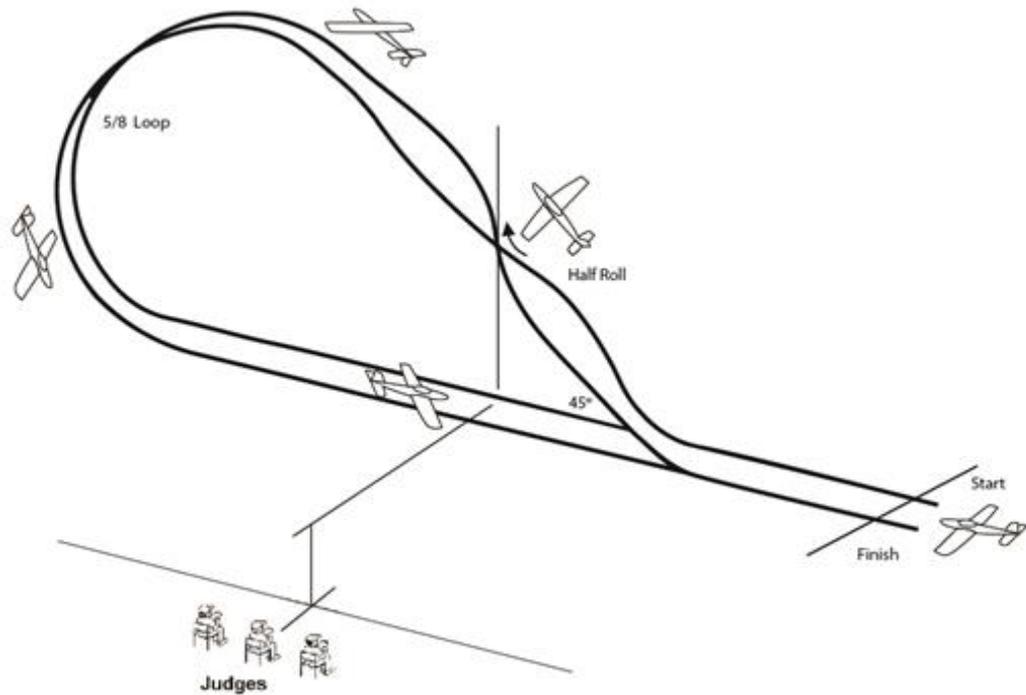


Errors:

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

6.3.2.A.16 Half Reverse Cuban Eight:

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



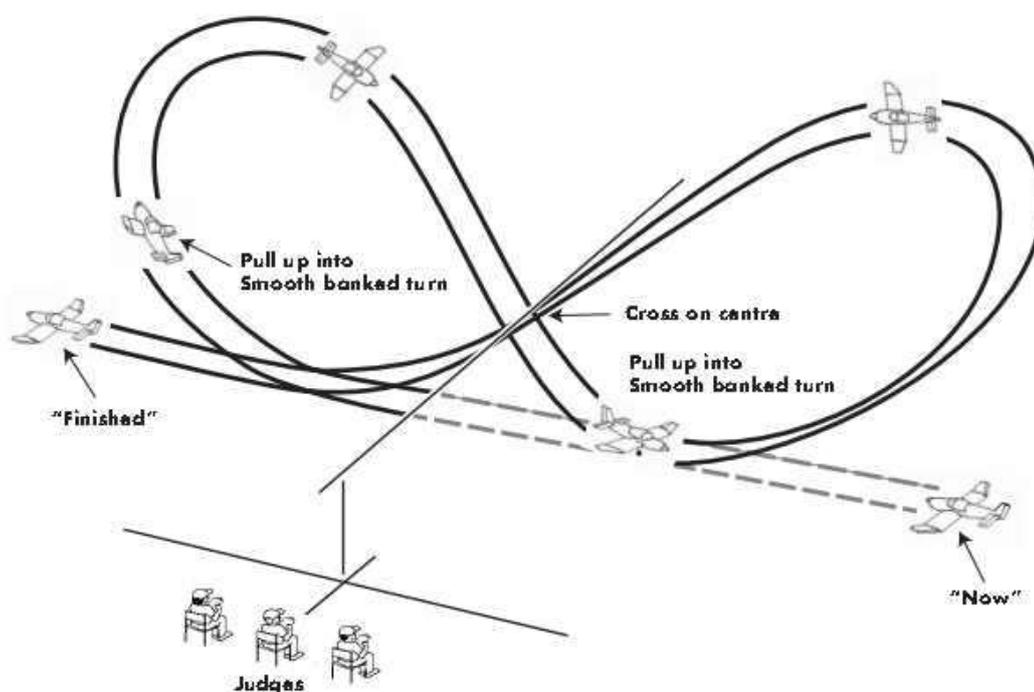
Errors:

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

6.3.2.A.17 Lazy Eight

The model aircraft approaches in straight and level flight on a line parallel with the Judges' line. When the model aircraft 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 capability of the full-sized aircraft but not more than 90° and the model aircraft shall be on a heading of 90° to the judges' line. The nose of the model aircraft then lowers and the bank comes off at the same rate as it went on. The turn is continued beyond 180° 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, the shape of which should be the same as the first turn, is immediately commenced away from the judges. The second turn is then continued beyond 180° to cross the centre with the wings level and at the same height as the entry into the manoeuvre. The Lazy Eight is completed by maintaining this height and heading with wings level before turning to intercept the original approach track to exit the manoeuvre parallel to the judges' line in straight and level flight. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre. The figure should be symmetrical each side of the judges' position.



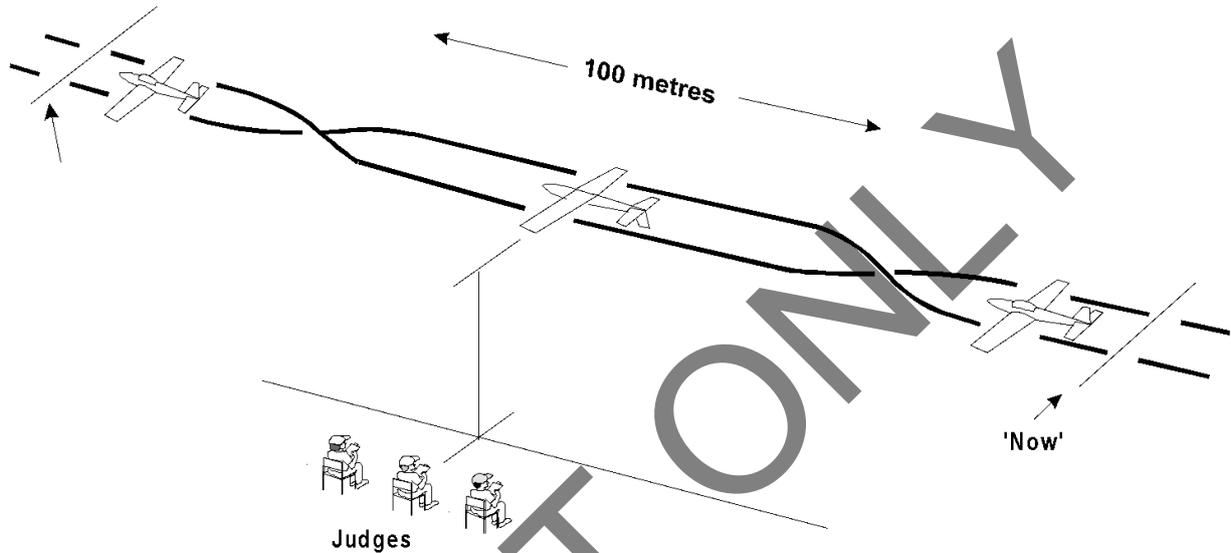
Errors:

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

6.3.2.A.18 Inverted Flight.

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

Note: Competitors must be prepared to provide evidence that the subject full-size aircraft was capable of sustained inverted flight.

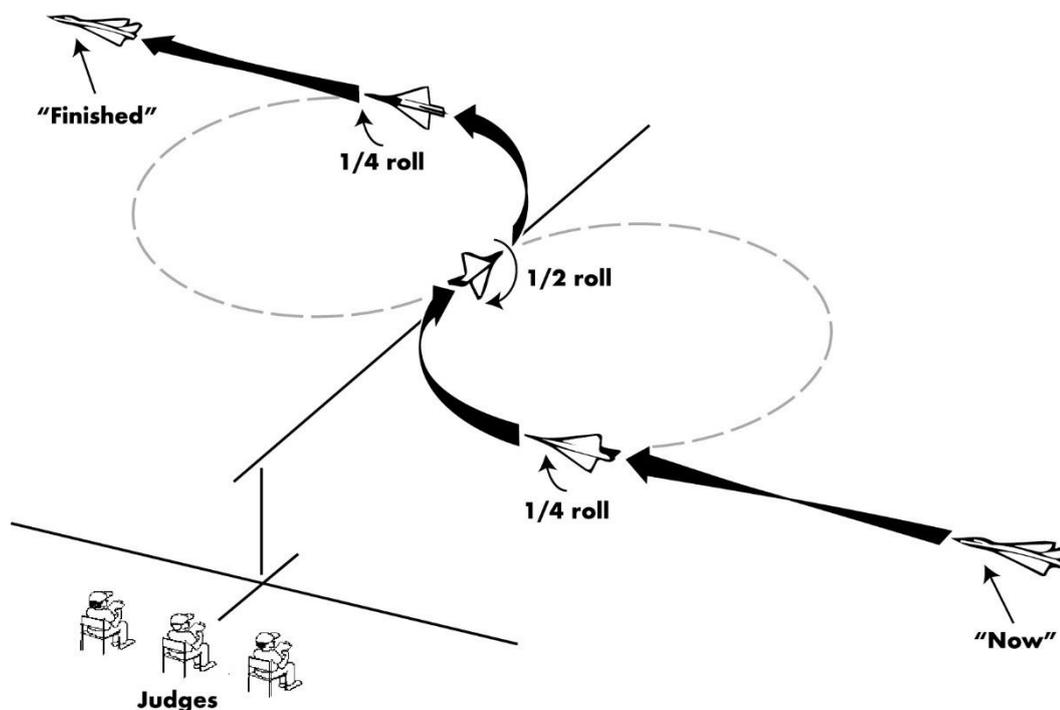


Errors:

1. Half rolls not performed on same track as inverted flight.
2. Model aircraft does not fly a straight course.
3. Model aircraft gains or loses height.
4. Model aircraft does not remain inverted for the prescribed duration.
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.

6.3.2.A.19 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 aircraft 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 aircraft makes a half roll in the same rolling direction as the entry, again directly followed by a steep one quarter circle turn in the opposite direction, and then flies off straight and level on a line parallel with that of the entry to the manoeuvre. The manoeuvre should be smooth and continuous.

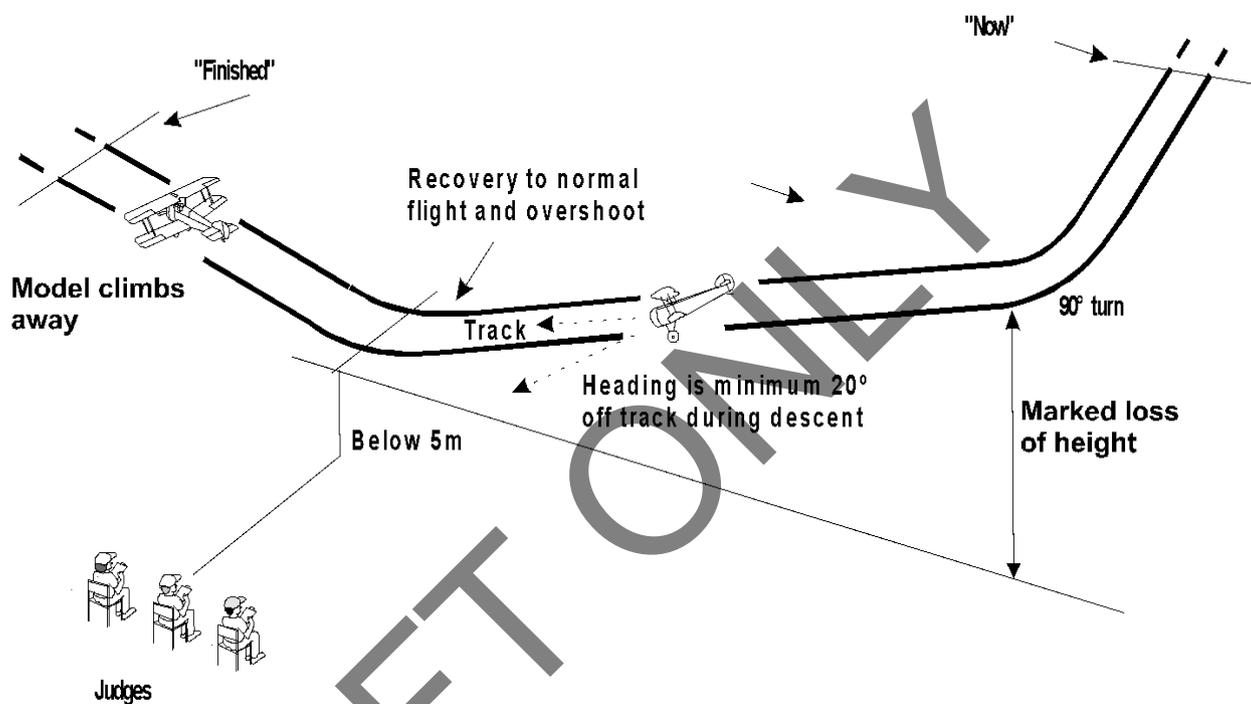


Errors

1. Entry not in parallel with the judges' line.
2. The manoeuvre not 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.

6.3.2.A.20 Side Slip to Left or Right

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

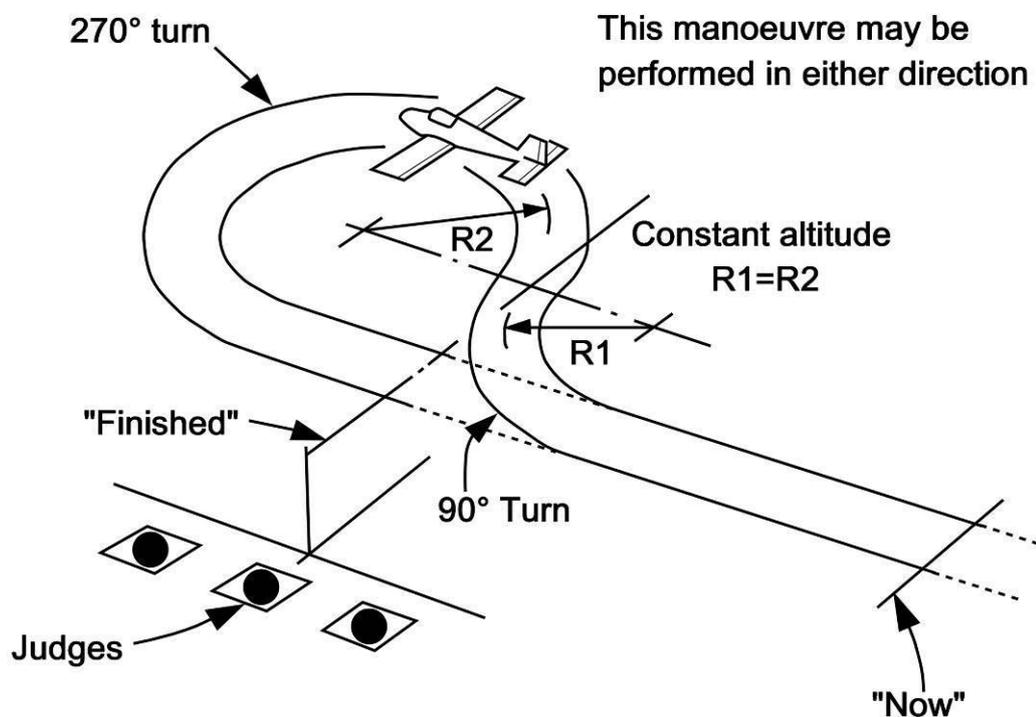


Errors

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

6.3.2.A.21 Procedure Turn

Commencing from straight and level flight the model aircraft must turn through 90° in a direction away from the judges and then turn through 270° in the opposite direction, resuming straight and level flight on the opposite heading to that of the entry. The manoeuvre must be commenced so as to place the point where the model aircraft 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.



Errors:

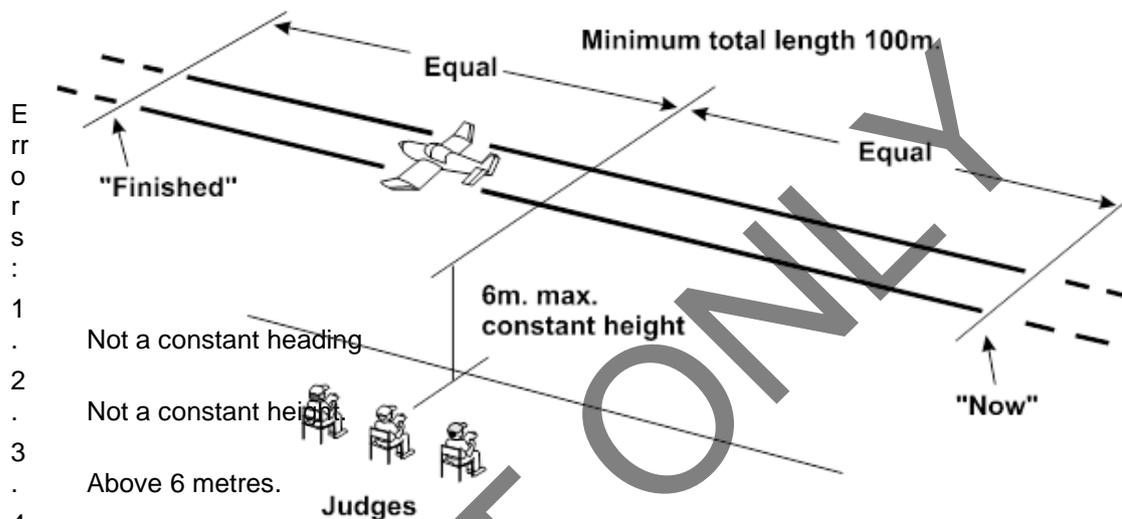
1. Rate of turn is not constant.
2. The model aircraft changes altitude during the manoeuvre.
3. The model aircraft does not resume straight and level flight on the correct heading.
4. The model aircraft does not change from 90° to the 270° turn at the correct position.
5. The manoeuvre is too small or too large in reference to the type and scale of the model aircraft.
6. The manoeuvre is too close or too far away to be observed properly.
7. The manoeuvre is too high or too low to be observed properly.

6.3.2.A.22 Straight Flight at Low Speed

The model flies in a straight line, and parallel with the judge's line, over the landing area for a minimum distance of 100 meters and centred on the judges position. The height must be constant and not exceed 6 metres and the model must fly at a speed which would represent the minimum safe flying speed for the full-sized aircraft.

Models of full-sized aircraft fitted with retractable undercarriage must have the U/C extended.

If the full-sized 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.



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Not a constant heading

Not a constant height

Above 6 metres.

Judges

Model does not pass over the landing area.

Manoeuvre not centred on judges' position.

Not parallel with the judges' line.

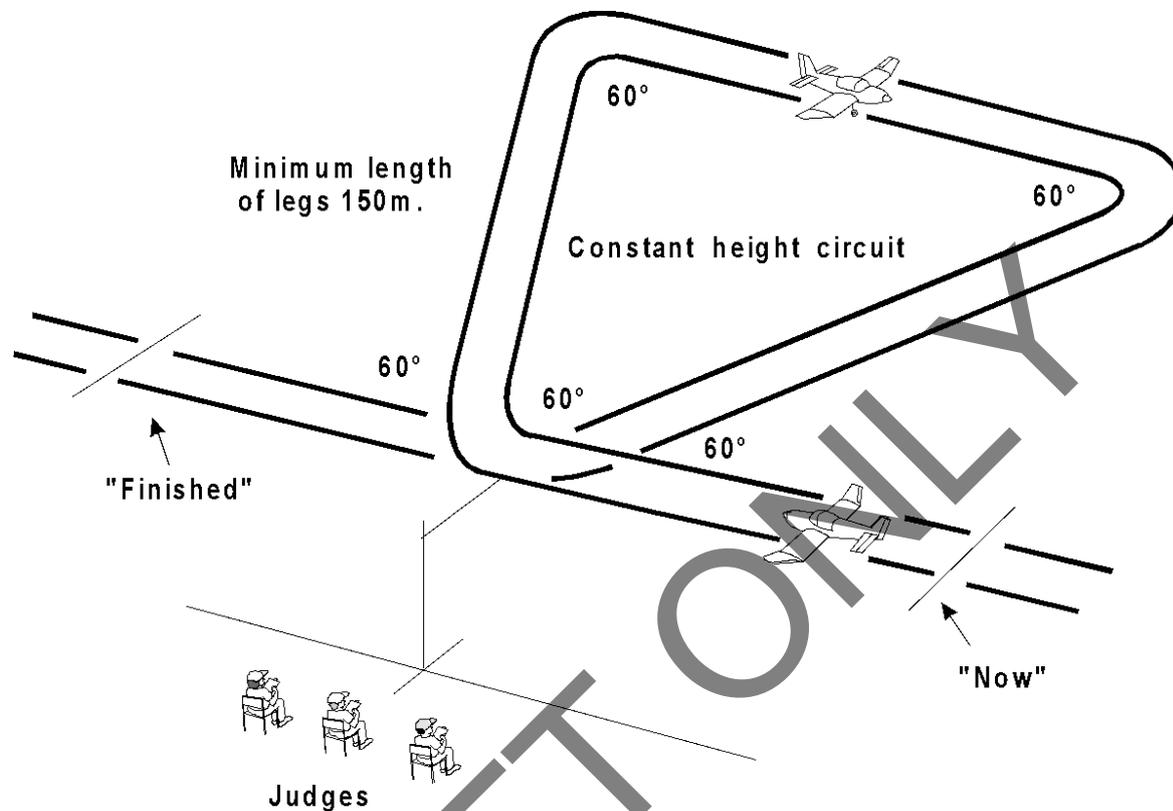
Too short distance (too long is not an error).

Failure to extend U/C or deploy high drag/low speed/high lift devices.

Model flying too fast.

6.3.2.A.23 Flight in Triangular Circuit:

The model aircraft approaches in a straight and level flight to a point directly in front of the judges. It then turns away to track 60° away from the judges' line. It then flies straight and level for a minimum of 150 metres, turns to track parallel with the judges' line, flies a further minimum of 150 metres, then turns 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 angles of 60°), before making a final turn to intercept the original entry track.

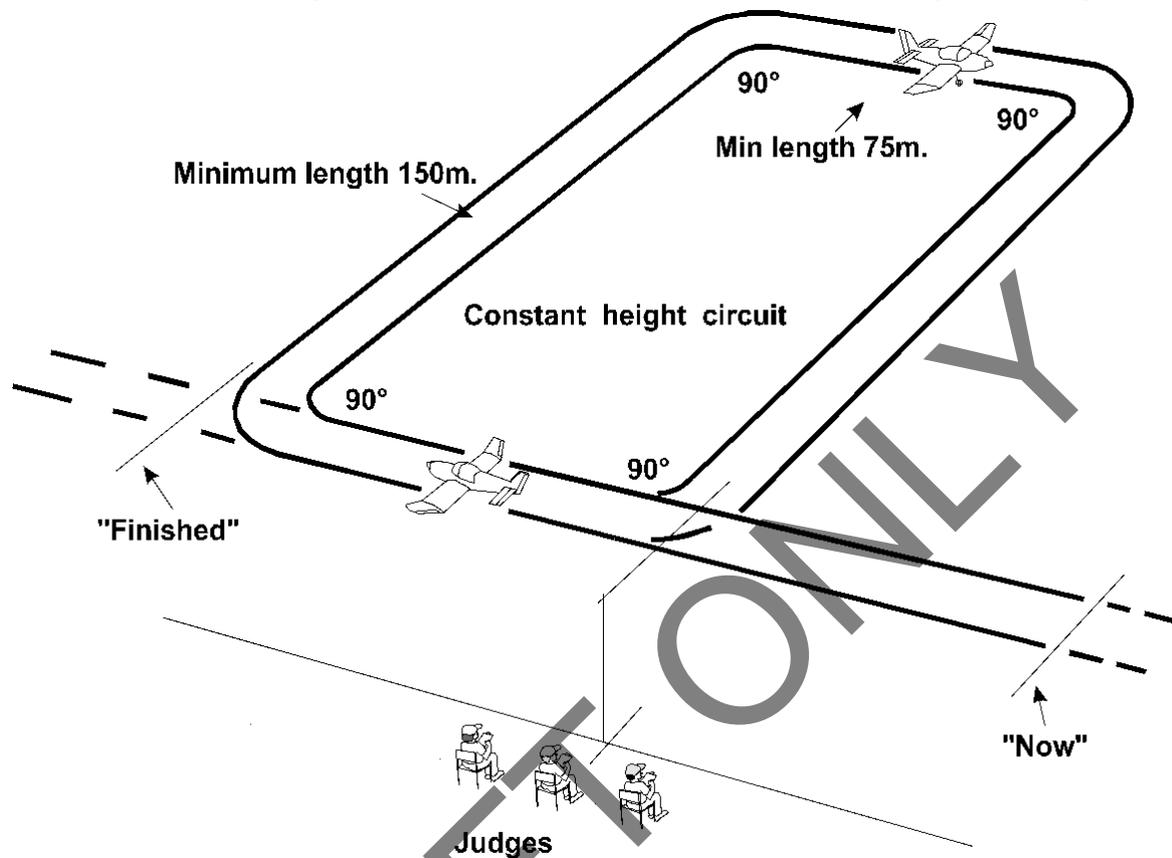


Errors:

1. Not commenced and finished at points equidistant from the judges.
2. Model aircraft 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.

6.3.2.A.24 Flight in Rectangular Circuit:

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

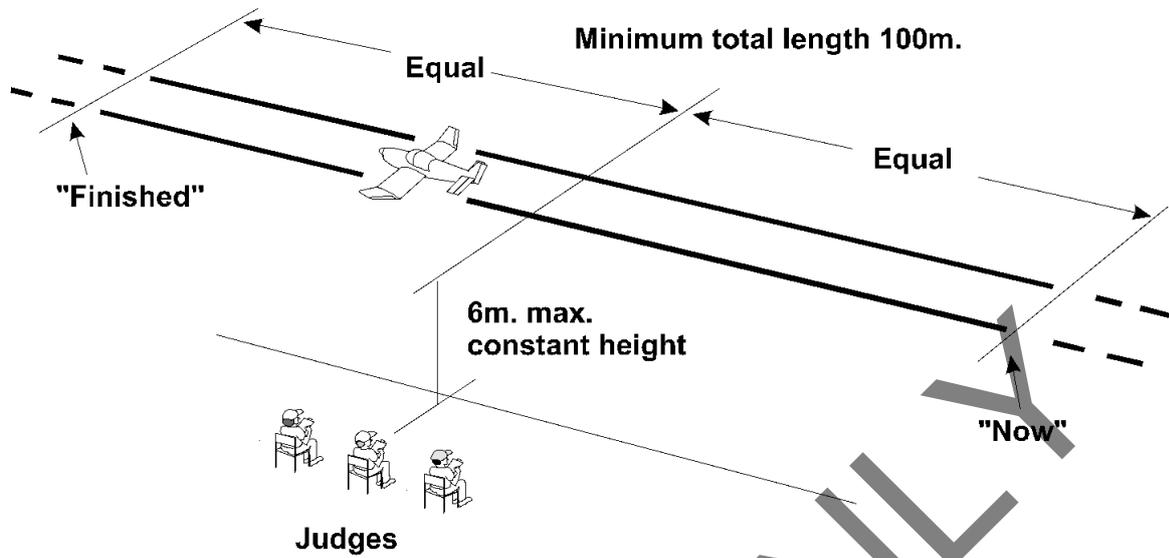


Errors:

1. Not commenced and finished at points equidistant from the judges.
2. Model aircraft 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.

6.3.2.A.25 Flight in a Straight Line at Constant Height (Maximum 6 m):

Model aircraft approaches in straight flight at a constant height not exceeding 6 metres for a minimum distance of 100 metres, then climbs away. This is in effect a low flypast.

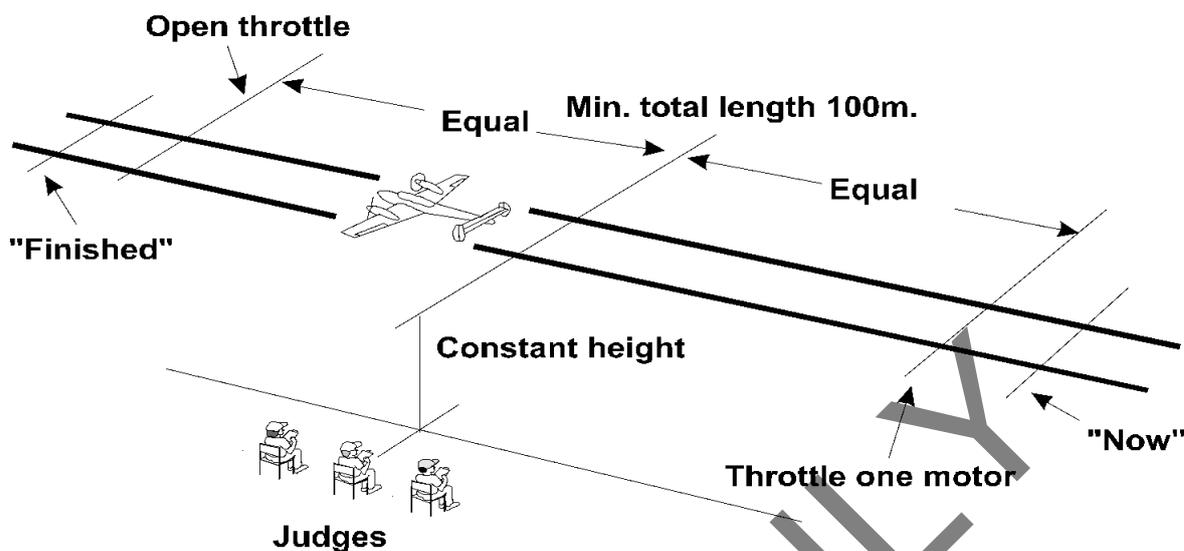


Errors:

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

6.3.2.A.26 Flight in a Straight Line with One Engine Throttled:

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



Errors:

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

6.3.2.A.27 Dropping of Bombs or Fuel Tanks:

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

If bombs or fuel tanks are carried externally, they must be carried in the correct positions and released in the manner of the full size aircraft. The flight profile during the manoeuvre must be in the manner of the full-sized 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. Bombs or tanks do not detach and fall in a realistic manner appropriate to the full size aircraft.
2. Drop is not in front of judges.
3. Overall dropping manoeuvre not presented in a realistic way
4. Too far away/too close/too high/too low.

6.3.2.A.28 Parachute Drop

The drop should be in the manner of the full-sized aircraft. For example, cargo should be dropped from a hatch, bomb bays or a rear ramp. A dummy man should exit from the cockpit, an escape hatch or a door, fall from an inverted aircraft or be ejected in the manner of the full size.

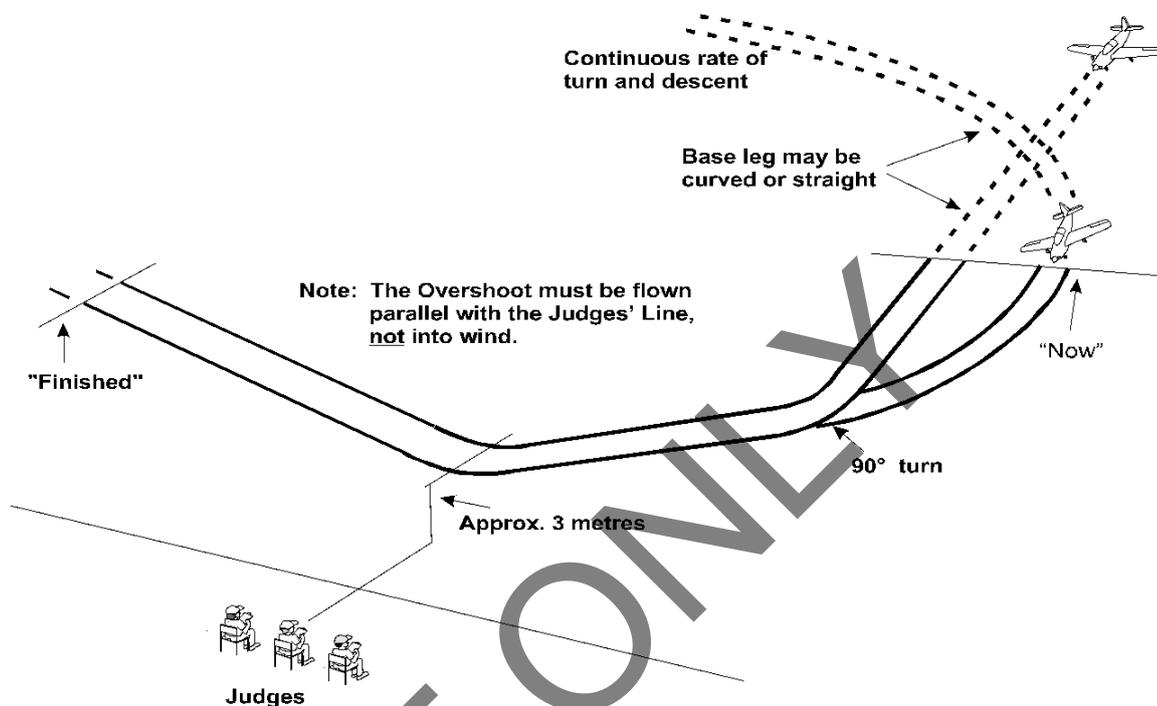
If appropriate the model aircraft should reduce speed before commencing the drop, possibly by using flaps and/or lowering the landing gear.

Errors

1. Parachute not deployed in the manner of the full size
2. Parachute drop not in front of the judges
3. Overall dropping manoeuvre not presented in a realistic way
4. Too far away/too close/too high/too low

6.3.2.A.29 Overshoot:

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

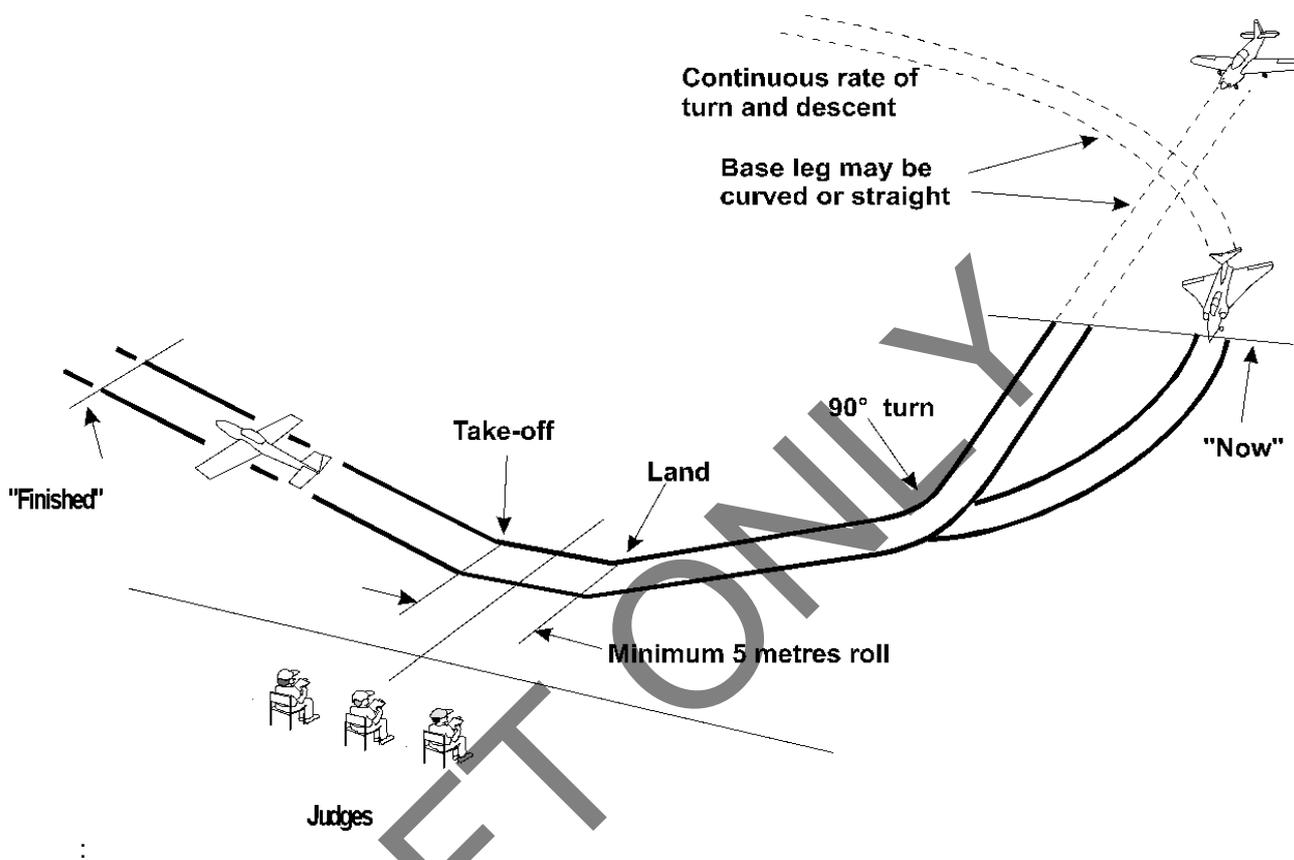


Errors:

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

6.3.2.A.30 Touch and Go:

The model aircraft commences by descending from base leg, which may be either curved or straight as required by the pilot. The turn is continued through 90 degrees onto final approach. The model aircraft 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. 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 aircraft does not achieve correct landing approach prior to touchdown.
5. Model aircraft does not achieve a minimum ground roll of 5 metres.

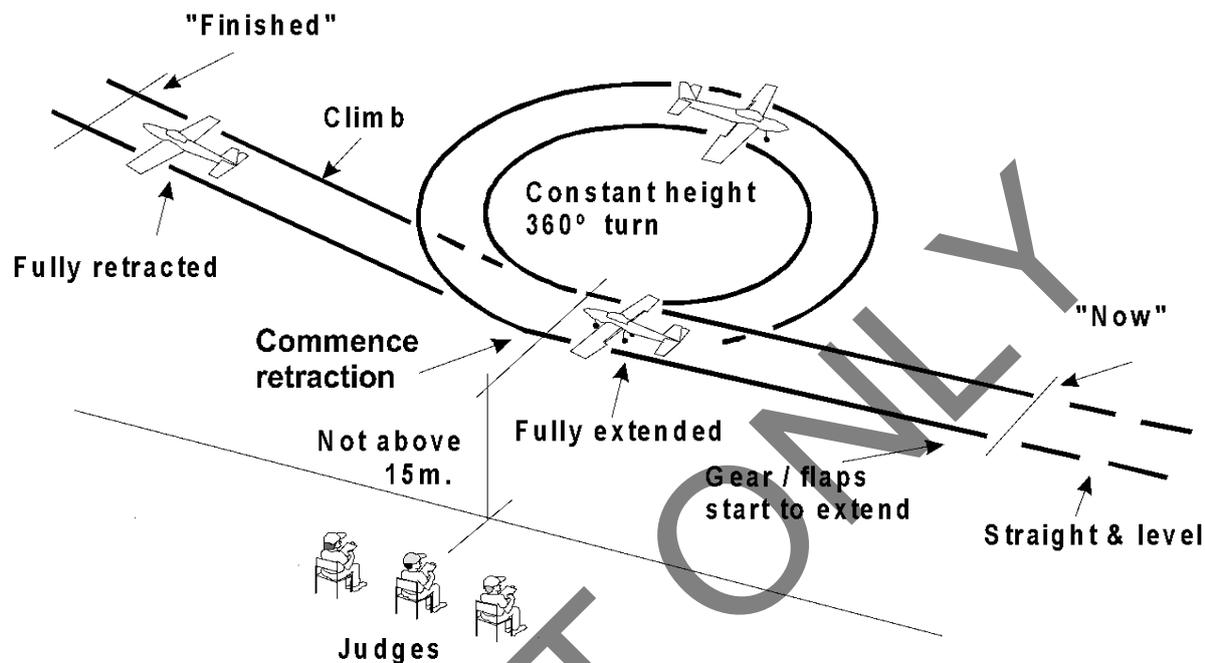
Note: If the full-sized aircraft has two main wheels then both wheels must roll on ground for a minimum 5 metres.

6. Model aircraft bounces on landing.
7. Inappropriate use of flaps.
8. Climb out not smooth or realistic.
9. Approach and climb out tracks not the same.
10. Does not make best use of landing space available for wind direction.

6.3.2.A.31 Extend and Retract Undercarriage or Extend and Retract Flaps:

Competitors may include one or the other – the Diagram and errors are applicable to both options unless stated.

Model aircraft approaches the landing area in straight and level flight at a height not exceeding 15 metres and in full view of the judges, lowers the undercarriage or the flaps. The model aircraft then executes a 360° turn in a direction away from the judges, and when again directly in front of the judges retracts the undercarriage or flaps and climbs away in straight flight.



Errors:

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

6.3.2.A.32

6.3.2.A.33 Flight Function(s) or non-Listed manoeuvres Performed by the Subject aircraft:

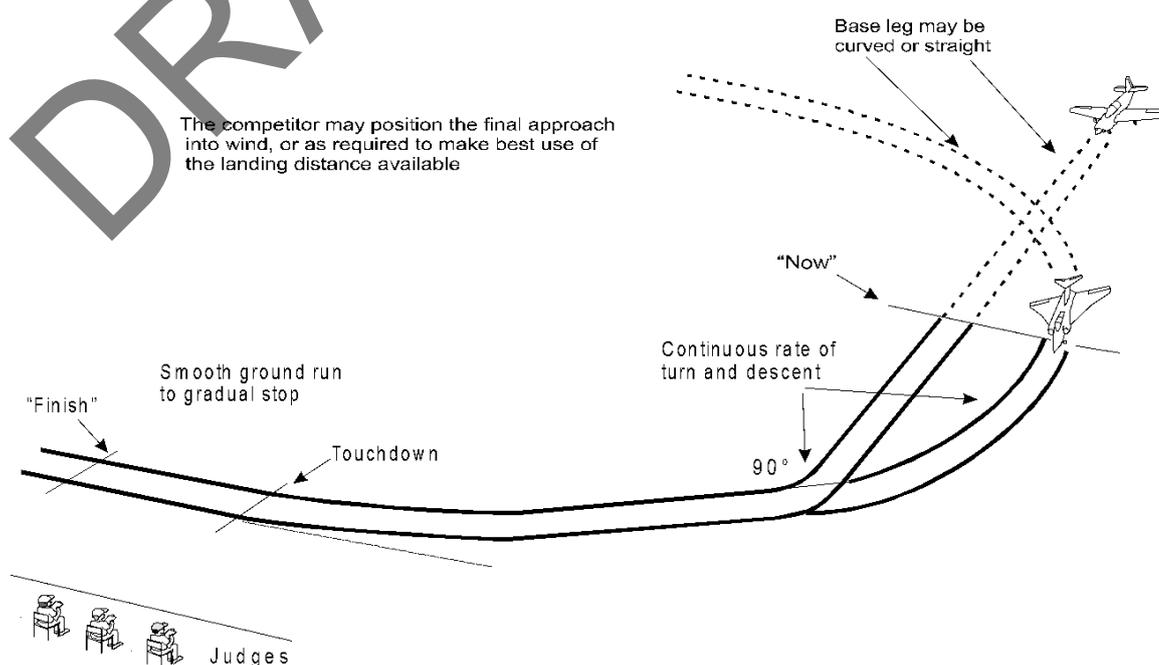
A competitor may include in his flight schedule one or two manoeuvres or flight functions which are not listed in this section. Full details of the proposed manoeuvre/s preferably with a diagram must be presented to the flight judges and agreement reached as to the precise nature of the manoeuvre/s before going to the flight line. The competitor must be prepared to supply evidence that the proposed manoeuvre/s are within the capability of the subject aircraft.

Procedural flying manoeuvres such as climbing turn, descending turn, etc are not acceptable. Mechanical options, which could be equally performed on the ground, e.g., switching on and off lights, opening/closing of canopy etc, are not acceptable as optional flight manoeuvres but may be included in the flight schedule to enhance flight realism.

6.3.2.A.34 Approach and Landing

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

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



Errors:

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

Notes: All landings ending with the model aircraft on its back will be considered a crash landing. A crash landing scores zero points.

If the model aircraft makes a good landing and then stops nose down towards the end of the landing run, the landing marks that would have been otherwise awarded should be reduced by 2 marks. If the nose down situation is solely the result of the model aircraft running off the prepared area because this is too short for the particular wind direction, the above down marking will not apply.

Model of aircraft with retractable undercarriage, landing with one or more wheels not locked down should have the landing marks reduced by 30%.

If the full size aircraft required the deployment of a braking parachute during landing and the model fails to use one, then the landing marks must be reduced by 30%

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CHAMPIONSHIP LOGO and FAI emblem

6.3.2.ANNEX B

R/C Flight Score Sheet

Applicable to F4C, F4H, F4G and F4J

Competitor number:	Competitor Name	Flight Round
---------------------------	------------------------	---------------------

Model Name and Designation:	
Cruising / Maximum Speed of Subject Aircraft:	Scale of Model:

No.	FLIGHT SCHEDULE		JUDGES MARK	K	SCORE
1	Take-off			11	
2	Option 1:			7	
3	Option 2:			7	
4	Option 3:			7	
5	Option 4:			7	
6	Option 5:			7	
7	Option 6:			7	
8	Option 7:			7	
9	Option 8:			7	
10	Approach and Landing			11	
11	Realism in Flight	Flight Presentation		9	
		Speed of the model		9	
		Smoothness of flight		4	
Judge's comment.			Flight Score		

Judge's Signature.....Chief Judge's Signature.....

6.3.2. ANNEX C – R/C FLIGHT JUDGING SUMMARY

Applicable to F4C, F4H, F4G and F4J

6.3.2.C.1 Flight Judging – General

The aim of the Scale Flight Schedule is to recreate the flight characteristics and flight realism of the full-size aircraft and the flight judges are required to assess the entire flight from the start of the take-off to the completion of the landing.

The flight manoeuvre descriptions are found in 6.3.2 Annex A. The judges must also consider many other factors:

- a) Flying Site and the Judges Line
- b) Flight Schedules and Score Sheets
- c) Flight Safety
- d) Flight Timing
- e) Assessing and Marking the Scheduled Manoeuvres
- f) Assessing Realism in Flight
- g) Automatic Stabilisation Devices (gyros)
- h) Retractable Undercarriage Failure
- i) Use of Flaps, Lift Enhancing Devices and Air Brakes.
- j) R/C Telemetry

A more in-depth supporting document to this Flight Judging Summary is available in the form of a F4 Scale Judges Manual and can be found at www.TBA.

This is recommended reading for all Judges and shall be required reading for all Judges selected for World Championship Judging Panels.

6.3.2.C.2 Flying Site and Judges Line

Although setting out the Flying Site and the Judges Line is covered by the Rules and is the responsibility of the Contest/Flight Line Director, the Flight Judges have a responsibility to ensure fairness and to recognise that any constraints imposed by the site and/or the weather conditions, do not give an unfair advantage to a particular model or type of model.

6.3.2.C.3 Flight Schedules and Score Sheets

While the competitor is responsible for ensuring that their flight schedule/Score sheet is presented to the Flight Judges prior to their flights, the Flight Judges have a responsibility to ensure the flight is flown in the order presented, non-listed manoeuvres are understood and that the manoeuvres are suitable for the aircraft being flown.

6.3.2.C.4 Flight Safety

Flight Safety is the responsibility of all Competitors and Officials at any F4 competition.

Flight Judges are exposed to some considerable risk if a model is being flown badly or is out of control. Judges should not hesitate to warn competitors if they feel the model is repeatedly flown too close to the judges and should instruct the competitor to land if they feel safety will be compromised if the flight is allowed to continue.

The Flight Judges must also be prepared to quickly assess the safety risk should parts of the model detach during the competition flight.

6.3.2.C.6 Flight Timing

The Judges must be guided by the Official Timekeeper for the timing milestones during each official flight. (Refer to 6.3.2.5 Official Flights, 6.3.2.6 Flying Time and 6.3.2.7 Starting Time). If the flight time is exceeded, all uncompleted manoeuvres will be marked ZERO

6.3.2.C.7 Assessing and Marking the Scheduled Manoeuvres

Descriptions with diagrams of most of the better-known flight manoeuvres for R/C Scale models are in **6.3.2. ANNEX A**. Also included are many errors that are likely during those manoeuvres, but these lists of errors are not exhaustive and mostly serve to enhance the manoeuvre description.

The flight judge must assess each manoeuvre from these three aspects:

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

These aspects often have an impact on each other and depending on the model these aspects can also be affected by the prevailing atmospheric conditions. Judges must decide upon the importance of each aspect whilst considering the performance of the full-size aircraft. There is no prescribed weighting for awarding marks to each of these aspects but whatever strategy the judge decides to apply, it is important that judges are consistent in this regard throughout the competition.

6.3.2.C.8 Assessing Realism in Flight

The assessment of Realism in Flight is made after the model has landed and covers the entire flight including what the model does between manoeuvres. The Flight Judges must confer when assessing Realism in Flight and should attempt to reach agreement on the marks to be awarded.

This is assessed by the following criteria:

- a) Flight Presentation
 - 1) Variety and combination of manoeuvres
 - 2) Assessment of Turnaround manoeuvres
 - 3) Complexity of manoeuvres
 - 4) Power management
- b) Speed of the Model
- c) Smoothness of Flight

6.3.2.C.9 Automatic Stabilisation Devices (Gyros)

The F4C, F4H, F4G and F4J rules allows for the use of Gyros in competition. However, judges must be aware of the capability of these devices and the use of non-approved capability of these devices. Judges must be careful not to over-inflate scores as full-size aircraft are affected by turbulence.

6.3.2.C.10 Retractable Undercarriage Failure.

If a model is fitted with a retractable undercarriage, it is expected to function correctly during the entire flight. There are instances this function does not operate correctly and these issues are covered by 6.3.2.A.34 - RC Flight Manoeuvres and 6.3.2.A.1 - Description of Manoeuvres in more detail.

6.3.2.C.11 Use of Flaps, Lift Enhancing Devices and Air Brakes.

Many full-size aircraft are fitted with Flaps, Lift enhancing devices and /or airbrakes. These should be replicated on the model and should be utilised in a scale like manner where required during the flight. Judges should be familiar with their function and may discuss the functionality with the competitor if there is any gap in the Judges knowledge.

6.3.2.C.12 R/C Telemetry

The F4C, F4H, F4G and F4J rules allows for the use of telemetry in competition. However, judges must be aware of the capability of these devices and the use of non-approved capability of these devices. They must be vigilante to use of the GPS functionality.

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6.9 - CLASS F4H - RADIO CONTROLLED STAND-OFF SCALE AEROPLANES

6.9.1 Introduction

Class F4H is for Radio Controlled model aircraft which have a reduced requirement for detailed scale accuracy of construction, but with a greater emphasis on consistent flight performance and flight realism. Accordingly, the balance of the maximum available judges' marks between Static Judging and Flight Judging is 1:2

The requirement for the competitor to have constructed his own model (the 'BOM' rule 6.1.10) is not applicable to F4H.

The Flying Rules shall be the same as F4C – Section 6.3.2. refers.

6.9.2 General Characteristics

The General Characteristics of the model shall be the same as for Class F4C. (Para 6.3.2.1 refers).

6.9.3. Eligibility

Any model which has previously been placed in the top five (5) in a Continental or World Championship F4C competition during the last 6 years, including repaints and rebuilds, will NOT be permitted in F4H.

6.9.4 Declaration

The competitor must make a declaration to advise the judges as to the origin of the model, e.g. is the model constructed by the Competitor, is it built from kit, or is it an ARTF model purchased partially assembled? The competitor may supply evidence in support of his declaration and the declaration form must be counter-signed by the Team Manager to be valid. If an incorrect declaration is subsequently revealed, the competitor may be disqualified from the contest.

The Declaration Form for class F4H is at 6.9.1.ANNEX A

6.9.5 Proof of Scale Documentation

The documentation requirement is the minimum considered necessary to fully assess the accuracy of the outline and the major structural features of the model. Documented evidence is also required for the colour, the colour scheme, all the markings and the realism of the model.

Photographs and reproductions should be of a reasonable size, (approximate A5 minimum) and presented on separate sheets or as a montage no larger than A2. A book with page markers is not acceptable. Three copies of the proof of scale documentation must be made available. Good photographs take precedence when discrepancies exist between the drawings and the photographs.

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

6.9.5.1 Photographic evidence:

A minimum of one (1) photograph or printed reproduction and a maximum of five (5) photographs or printed reproductions of the full size aircraft are required. One or more of these photographs must show the actual subject aircraft which has been modelled and at least one photograph must show the whole aircraft. Ideally these photographs should show both sides, the front and the top and underside of the aircraft.

Photographs of the model are not permitted unless the model is posed alongside the full-size aircraft. Photographs which show evidence of digital manipulation shall result in disqualification.

There is no requirement for close up or detailed photographs.

6.9.5.2 Drawings:

As a minimum, the drawings must show one side view, the front view and the plan view.

All drawings must conform to the requirements for Class F4C (see para 6.3.1.3.3b).

6.9.5.3 Proof of colour and markings:

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

Authenticated colour chips will not be a requirement for proof of colour.

6.9.6 Static Judging

a) The appointment of Static Judges is similar to F4C except that only one panel of three judges is required.

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

c) Each aspect of the assessment will be awarded a mark out of 10 by each Judge using increments of a tenth of a mark

d) Judges are not concerned with the craftsmanship used on the model or any detail parts of the model which cannot be clearly seen at 5 metres.

e) The total judging time must not exceed 20 minutes per model. The Chief Static Judge is responsibility for setting a time limit for the assessment of each aspect of Static judging.

6.9.6.1 Scale Accuracy.

This is an assessment of the outline accuracy and major structural features of the model and is judged by comparison with the documentation presented. Any detail that is not clearly visible at 5 metres will not be included in the assessment.

6.9.6.2 Markings Accuracy

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

6.9.6.3 Markings Complexity

Markings Complexity is an assessment of the complexity of the colour scheme and the markings by comparison with all the other models entered in the competition.

6.9.6.4 Colour Accuracy

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

6.9.6.5 Colour Complexity

Colour Complexity is an assessment of the number of colours, the distribution of the colours and the boundary between colours by comparison with all the other models entered in the competition

6.9.6.6 Realism

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

6.9.6.7 Originality of Model

This is confirmation by the judges of the declaration of the origin of the model. Maximum marks will be awarded to a model which is built, covered and painted in its entirety by the competitor (from drawings or a traditional kit). A model which the competitor has only covered and painted will receive fewer marks and an ARTF model will score close to zero (unless evidence is presented of extensive modification by the competitor).

6.9.7 Static Judging Aspects and K-Factors

Aspect	K-factor
Scale Accuracy	
Side view	K = 7
Front view	K = 7
Plan view	K = 7
Markings Accuracy	K = 7
Markings Complexity	K = 3
Colour Accuracy	K = 4
Colour Complexity	K = 2
Realism	K = 7
Originality of Model	K = 6
Total K = 50	

6.9.8 Normalisation of Static Scores:

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

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

Where:

Static Points_x = Normalised Static Score for competitor x

S_x = Static Score for competitor x and

S_w = Highest Static Score

6.9.9 Normalisation of Flight Scores

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

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

Where:

Flight Points_x = Normalised Flight Score for competitor x

F_x = Flight Score for competitor x and

F_w = Highest Flight Score

6.9.10 Final Scoring

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

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

- a) If two rounds are flown, the average of the normalised scores of the two flights will be used.
- b) If only one round is flown, the single normalised flight score of that one round will be recorded.
- c) The scores in an official round can be recorded only if all competitors had equal opportunity for a flight in that round.

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

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

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6.9.1.ANNEX A - F4H Competitors Declaration Form

Championship logo and FAI emblem

COMPETITOR'S DECLARATION FORM For Class F4H

This form must be completed and signed by the competitor and endorsed by the Team Manager.

Competitor's Name	National Identification.	Aircraft Name & Designation
-------------------	--------------------------	-----------------------------

If your flight schedule is to include Optional Demonstrations 6C.2.S. and/or 6C.2.T - Flight functions by subject aircraft: Provide full details of your manoeuvre(s) here or on a separate sheet.

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Aircraft cruising and/or maximum speed Attach supporting evidence on a separate sheet	
---	--

ORIGINALITY of the MODEL - insert ✓ in the appropriate box

Competitor built – traditional construction from plan or kit	
Third Party built using traditional construction – competitor covered and paint finished	
Third party built from moulded components – competitor paint finished	
Third Party built (ARF kit) - competitor modified	
Third party built (unmodified ARF kit)	
Third party built – model purchased ready to fly	

Comments and/or explanation

COMPETITOR'S CERTIFICATION

I certify that the model conforms to the current F4H rules and answers given above are correct.

Name(block letters) Signature.....

TEAM MANAGER'S ENDORSEMENT

I certify that the answers given above are correct.

Name(block letters) Signature.....

CHAMPIONSHIP LOGO and FAI emblem

6.9.1.ANNEX B

F4H STATIC SCORE SHEET

Competitor Number:	Competitor Name:
Model Name & Designation	

Documentation checklist					
Competitors Declaration		Minimum 3-View Drawing		Maximum 5 Photos	Proof of Colour

No.	STATIC JUDGING ASPECT	Judges Mark	K-factor	SCORE
1	Scale Accuracy -- Side view		7	
	Scale Accuracy – Front View		7	
	Scale Accuracy – Plan View		7	
2	Markings Accuracy		7	
3	Markings Complexity		3	
4	Colour Accuracy		4	
5	Colour Complexity		2	
7	Scale Realism		7	
11	Originality of Model		6	
Judges notes		TOTAL		

Judges Signature.....

Chief judge's signature.....

6.9.1.ANNEX C – F4H STATIC JUDGING SUMMARY

6.9.1.C.1 STATIC JUDGING - GENERAL

The static judging process for flying scale models in class F4H is a simplified version of the process used for class F4C. Because the Builder of the Model rule (BOM) see para. 6.1.10 is not applicable to F4H, the assessment is carried out without regard as to who built the model.

All the assessment is carried out with the Static Judges positioned 5 metres away from the centreline of the model, consequently, the F4H static judging process is much less intensive because if any part or detail of the model cannot be clearly seen at 5 metres it is not include in the assessment. Surface Texture, Scale Detail and Craftsmanship are not assessed because these aspects cannot be clearly seen at 5 metres.

Each aspect of static judging of the model is marked by each judge out of 10 in increments of 0.1 of a mark. The Static Judges must work together as a team and attempt to reach agreement on the marks to be awarded for each aspect. Although each judge retains the right to differ, any degree of difference should be minimal.

Regardless of the actual marks awarded, it is imperative that an accurate and fair comparison is attained across all the models entered in the competition. The relative mark of one model compared to another is the most important standard to be achieved.

Before any static judging commences, the judges should make a general comparison of the complexity aspects of as many as possible of the models entered in the competition and place them in an approximate order of merit. This need not be a formal process and does not require all the models to be 'lined up' and presented to the judges. These observations can usually be achieved by simply walking around the 'pit area' or the place provided for competitors to assemble and prepare their models.

The competitor must remain with the model throughout the static judging process in case the judges need to question the competitor on any aspect of the model or the documentation. Depending upon the size of the model, additional handlers should also be available to position the model as directed by the judges.

Judges should not exceed 20 minutes to complete the assessment of each model.

It is important that the static judges retain all the static score sheets until all the models have been static judged and the final review has been completed.

6.9.1.C.2 EXAMINATION OF DOCUMENTATION

The documentation required consists of Score sheets, the Competitors' Declaration and the Proof of Scale documentation. These documents must be available when the model is presented for static judging and the Static Judges should carefully examine the documentation before assessing the model.

6.9.1.C.2.1 Static judging Score sheets

The competitor is responsible for ensuring that the Static Judges are provided with the correct scoresheets which must be correctly filled in with the Competitors details and the details of the model.

6.9.1.C.2.2 Competitor's Declaration

A completed and signed Competitors Declaration form is an essential document and static judging cannot commence unless the completed Declaration has been presented to the Static Judges.

6.9.1.C.2.3 Proof of Scale Documentation

The Rules for class F4H specify the requirement for proof of scale documentation, (see para 6.9.5).

Photographs and printed reproductions must conform to the same requirements as F4C but the overall limit of five photographs or illustrations must not be exceeded.

If more than 5 different photographs or printed illustrations are presented, the judges must direct the competitor to remove or cover up the excess before judging commences.

Drawings must conform to the same requirements as Class F4C

The scale accuracy of the model can only be judged by comparing it with the proof of scale documentation or scale evidence presented by the competitor. Judges can only award marks for scale accuracy based on the information provided by the competitor. It follows therefore that if the documentation relating to any part of the model is missing, inadequate or poorly presented, then this must be reflected in the marks which can be awarded.

Proof of Scale documentation should be presented in a format which can be quickly and easily understood. Advice to competitors on how the documentation should be presented is given in para. 6.3.1.5 of the F4C Rules. Good presentation, however, is no guarantee that it is fully comprehensive.

Further guidance to Judges on what the optimum standard of proof of scale documentation should be is provided below. Judges must ensure that a competitor does not benefit by default when this documentation is incomplete or of poor quality.

6.9.1.C.2.3.1 Photographs.

Photographs submitted as evidence of outline should ideally show the complete aircraft and the image size should not be less than 15cm wide.

The photographs provided should be of good quality, with good definition, a good depth of focus and ideally be free from distortion. Static Judges must have a good understanding of camera lens distortion and perspective distortion and how these factors can influence the photographic image of the subject aircraft.

With the ready availability of computerised photo editing software (e.g., Photoshop), Judges should be on their guard in order to spot photographs of the full-size aircraft which may have been edited in order to hide errors on the model. Similarly, judges must be on the lookout for photographs of the model which have been edited to make the model appear to be the full-size aircraft.

6.9.1.C.2.3.2 Scale Drawings.

The specification for drawings is defined in rule 6.3.1.3.3b), which specifies minimum dimensions. However, line thickness is also important and drawings which show thick outlines are often an indication that the drawing has been enlarged from a small image and will be of dubious accuracy. The line thickness of a drawing should be no greater than 0.5mm.

Judges must seek to verify the origin of drawings and where they have been published. If the drawing is not clearly marked with the originator/publisher, it must be certified by the appropriate National Aerospace Council (NAC). Drawings which do not display proof of publication or have not been endorsed by the competitor's NAC are not admissible and must be disregarded.

The drawings should be applicable to the same Mk./variant or modification standard of the full-size subject aircraft that has been modelled. Drawings of a different variant of the same aircraft are acceptable providing the differences between variants are minimal, clearly identified and illustrated with supplementary sketches and/or cross referred to photographs.

6.9.1.C.2.3.3 Proof of Markings and the Colour scheme

Proof of all markings and the complete colour scheme on both sides of the subject aircraft as well as the upper and lower surfaces of the wings, can be difficult to obtain and all too often, whilst excellent photographs are provided for the aeroplane type, only one photograph or illustration shows the subject aeroplane. Judges must not make assumptions that the markings are the same on each side of the aeroplane or that similar aircraft carry the same markings and colour scheme.

6.9.1.C.2.3.4 Proof of Colour Accuracy.

Colour accuracy is concerned with the tonal accuracy of the colours used on the model by comparison with the proof of colour evidence submitted and it is essential that if high marks are to be awarded, a comprehensive standard of colour evidence must be presented.

Correct colour may be established from samples of original paint; published descriptions if accompanied by colour chips certified by competent authority; colour photographs or published colour drawings.

Colour photographs can be unreliable since they can be reproduced in virtually any shade; furthermore, the ambient light conditions (colour temperature and polarization) prevailing when the photographs were taken, may not be the same as when the model is judged. E.g., photographs taken of the full-size aircraft illuminated with artificial light are not a reliable proof of colour when the model is judged outdoors.

Proof of colour must also indicate whether the finish is matt or gloss, or somewhere in-between.

6.9.1.C.2.3.5 Proof of Scale Realism.

Realism is by definition; "representing things as they really are" and when assessing realism in the context of scale model aeroplanes, it is best to make a comparison between the whole model and a photograph of the full-size subject aircraft.

The best evidence of realism for an F4H model is a good quality photograph which shows the whole of the full-size aircraft which has been modelled, including any weathering or signs of use and/or damage or imperfections in the structure and the finishing.

This photograph can be the same as one of those used for assessing scale accuracy, but ideally the photograph should be presented separately.

6.9.1.C.3 ASSESSMENT OF THE MODEL

Most of the Guidance for the assessment of F4C models (6.3.1.ANNEX C) also applies to F4H but Static Judges should be careful to avoid penalising the omission of details which are not clearly visible at 5 metres.

There are no rules governing the order in which the various aspects are assessed but it is suggested that they are marked in the order laid out below which is also the order they appear on the score sheet. In practice there is often some overlap of these aspects, e.g., errors in outline are often revealed by the colour scheme and the markings.

6.9.1.C.3.1 Assessing Scale Accuracy

It is suggested that the model should first be positioned in a pose similar to that in the best photograph and checked for any obvious discrepancies. Because of the possibility that the photographs may suffer from some form of distortion (see 1.3.1 above), Static Judges must cross check between photographs and the drawings. Photographs that are taken at an oblique angle can often give a false impression of dihedral and/or rigging angles and the drawings may provide a more accurate reference.

6.9.1.C.3.2 Side view - Examine the fuselage outline, cabin or canopy shape, cockpit aperture shape, engine cowling, propeller and spinner shape, outline of fin and rudder, wing and tailplane sections. Also, the shape, angle and position of landing gear legs and nose/tail wheel or skid and the size of wheels and tyres. If applicable a check should be made of wing stagger, wing gap and the shape and arrangement of struts and rigging wires. Particular attention should be given to the wing thickness and any changes of section along the wing. It will be necessary to examine both sides of the model because there are few aeroplanes where the port side is identical to the starboard side.

6.9.1.C.3.3 Front-end view – Examine the wing dihedral, thickness and taper, washout, prominence of ribs, wing struts, bracing and gap on multi-wing aircraft. Also, the thickness of fin, rudder and tailplane, cross-sections of fuselage and engine cowling, cowling shape and cut-outs, propeller size and blade shape, shape of cockpit canopy or windshields; size, shape, position and angle of landing gear, wheel track, tyre thickness.

6.9.1.C.3.4 Plan view - Examine the wing outline and fairings, aileron size, flaps (if visible), tailplane size and outline; elevator size, shape and cut outs, trim tabs, fuselage shape and taper, cockpit or canopy shape, engine cowling shape. The plan view assessment also provides the opportunity to check the accuracy and the position of the markings on the wings.

6.9.1.C.3.5 Assessing Markings and Colour Scheme Accuracy

Judges should only award high marks for aircraft markings and colour scheme accuracy if the documentation provides evidence of all the markings and the total colour scheme. i.e. on all surfaces. It cannot be assumed that the markings are the same on each side of the aeroplane. As a guide, if the evidence for markings shows only one side elevation of the subject and there is no indicative evidence to support the markings on the other surfaces, irrespective of how complex they are, no more than 2.5 marks should be awarded.

6.9.1.C.3.6 Assessing Markings and Colour Scheme Complexity

Prior to commencing judging, the judges should agree the principle for awarding complexity points in relation to markings. A high mark for markings complexity is not solely dependent upon the number of different colours and markings, but the difficulty in achieving the required effect.

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

For high marks to be given in this section it is also important that evidence is provided for all the markings which are visible at 5 metres.

6.9.1.C.3.7 Assessing Colour Accuracy

The assessment must be made by comparing the evidence of colour with all the different colours on the model and this includes the accuracy of all the colours used for markings, lettering and insignia.

Judges should avoid wearing polarizing or tinted glasses (unless a neutral grey tint) when assessing colour.

It is essential that if high marks are to be awarded, a comprehensive standard of colour documentation must be presented.

6.9.1.C.3.8 Assessing Colour Complexity

The system for awarding colour complexity points should be agreed before starting judging and consideration should be given to the greater effort involved in reproducing multi-coloured finishes compared to models which feature only one or two basic colours.

It is suggested that up to two complexity points may be given for each main colour that covers a significant part of the airframe. A maximum of a single point may be given for each minor colour, such as those for the insignia, struts, guns, bombs etc. and basic colours of black and white should attract a fraction of a complexity point.

The marks awarded should not be confined simply to the number of colours used, but also how the colours are distributed on the model and whether the colour boundaries are on a flat or curved surface/structure.

6.9.1.C.3.9 Assessing Realism

The quality of the documentation is of vital importance when assessing realism and if the documentation does not contain a good quality picture or a photograph that 'captures' the character of the full-size aeroplane, then this omission must be reflected in the marks awarded. The judge must be careful to avoid making assumptions based on the type of aeroplane.

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

Judges must take care to avoid using any knowledge they have of the full-size aircraft and must not make assumptions based on the subject aircraft type, or the construction techniques used when it was built, or the environment the aircraft was in when it was photographed.

6.9.1.C.3.10 Assessing Originality of the Model

The judges must seek to confirm that the competitor has selected the correct category for the model on the declaration, however, an allowance should be made if the competitor is able to provide evidence that he has modified any third-party items to improve the Scale Accuracy.

A model which has been assembled 'straight out of the box' or built entirely by someone other than the competitor should score a zero.

The following should be used as a guide:

Competitor built (own construction from a plan or a traditional kit).....	10 marks
Pre-built airframe and wings, covered and painted by the competitor.....	6 - 8 marks
Fully moulded composite model painted by the competitor.....	4 - 6 marks
ARTF model with markings modified by the competitor.....	0 - 4 marks
'Out of the box' or purchased model with no added work	0 marks

6.9.1.C.4 FINAL ASSESSMENT REVIEW

When all the models have been individually assessed the spread of marks awarded for all the models, particularly the complexity marks should be reviewed under the guidance of the Chief Static Judge.

The relative complexity marks of one model compared with the others is important and to ensure this is achieved, the static judges must be given time to complete this review and if necessary, make retrospective alterations to the marks previously awarded.

A judge's marks can only be changed by the same judge who made the original assessment, and any alterations must be initialled by the same judge.

The use of a summary sheet for this review is recommended and the score sheets must only be released for final computation of the static scores when the review has been completed.

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6.4 CLASS F4A - FREE FLIGHT OUTDOOR SCALE AEROPLANES (PROVISIONAL)

6.4.1 GENERAL CHARACTERISTICS

Introduction:

Classes F4A, F4D, and F4E are for Free Flight scale model aircraft powered by a variety of motive sources. The marks scored are weighted equally between flying and static scores. The requirement for the competitor to have built his model remains and rule 6.1.10 applies to all classes. The general characteristics are defined for each class in sections 6.4, 6.5, and 6.6

6.4.1.2 Model Characteristics:

Maximum weight of complete model aircraft without fuel ... 2 kg (20Newton)

Maximum wing loading 50g/dm²

Motive Power:

(a) Piston engines, 2 Stroke 2.5 cc max

5cc total for multi engine models

(b) Electric Motors 200 watts Manufacturers rating max
400Watts total for multi motored models

Solid fuel reaction engines (Jetex) allowed

Safety Note:

Models above 250 gms weight fitted with electric motor(s) driving external propeller(s) must have a safety device(s) which cuts the power when the model's progress is terminated at any time or for any reason after release.

The device must also prevent the motor(s) being accidentally restarted if the model is picked up by a third party.

The competitor may be required to demonstrate the effectiveness of the safety device to the Competition Director.

The use of a Radio Control safety device is acceptable, but it must be operated by the competitor and all judging of the flight stops at the point when the competitor actuates the safety device.

6.4.1.2 Scoring:

a) Normalisation of Static Scores:

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

Static Points $x = S_x / S_w \times 1000$

Where:

Static Points $x =$ Normalised Static Score for competitor x

$S_x =$ Static Score for competitor x and

$S_w =$ Highest Static Score

b) Normalisation of Flight Scores

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

Flight Points $x = F_x / F_w \times 1000$

Where:

Flight Points $x =$ Normalised Flight Score for competitor x $F_x =$ Flight Score for competitor x and

$F_w =$ Highest Flight Score

6.4.1.3 Final Scoring

For each competitor, add the normalised static score to the average of the normalised scores of the best flight

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

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

6.4.1.4 Declaration:

The competitor must make a declaration to advise the judges as to the origin of the model. The competitor may supply evidence in support of his declaration and the declaration form must be counter-signed by the Team Manager to be valid.

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

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

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

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

6.4.2 F4A STATIC JUDGING REQUIREMENTS.

6.4.2.1 Proof of Scale Documentation:

The documentation requirement is the minimum considered necessary to fully assess the accuracy of the outline and the major structural features of the model. Documented evidence is also required for the colour, the colour scheme, all the markings and the realism of the model.

Photographs and reproductions should be of a reasonable size, (approximate A5 minimum) and presented on separate sheets or as a montage no larger than A1 or an equivalent area in smaller formats. A book with page markers is not acceptable. Two copies of the proof of scale documentation must be made available. Good photographs take precedence when discrepancies exist between the drawings and the photographs.

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

6.4.2.2 Photographic evidence:

A minimum of one (1) photograph or printed reproduction of the full-size aircraft modelled is required and this photograph must show the whole aircraft. Ideally photographs should show both sides, the front and the top and underside of the aircraft.

Photographs of the model are not permitted unless the model is posed alongside the full-size aircraft.

Photographs which show evidence of digital manipulation shall result in disqualification.

There is no requirement for close up or detailed photographs.

6.4.2.3 Drawings:

As a minimum, the drawings must show one side view, the front view and the plan view, but because of the small number of photographs allowed it may be necessary to show both side views and the top and bottom plan view. All drawings must conform to the requirements for Class F4C (see para 6.3.1.3.3b).

6.4.2.4 Proof of colour and markings:

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

types.

Authenticated colour chips will not be a requirement for proof of colour.

6.4.2.5 Static Judging:

- a) The appointment of Static Judges is similar to F4C except that only one panel of two judges is required.
- b) All static judging is carried out at a distance of 2.5 metres. This is measured from the centre line of the model to the judges seating position.
- c) Each aspect of the assessment will be awarded a mark out of 10 by each Judge using increments of a tenth of a mark
- d) Judges are not concerned with the craftsmanship used on the model or any detail parts of the model which cannot be clearly seen at 2.5 metres.
- e) The total judging time must not exceed 10 minutes per model. The Chief Static Judge is responsible for setting a time limit for the assessment of each aspect of Static judging.

6.4.2.6 Static Judging Aspects and K-Factors

Aspect	K – Factor
Scale Accuracy	
Side view	13
End view	13
Plan view	13
Markings Accuracy	8
Markings Complexity	3
Colour Accuracy	3
Colour Complexity	2
Surface Texture	7
Scale Realism	7
Craftsmanship Quality	12
Craftsmanship Complexity	5
Scale Detail Accuracy	9
Scale Detail Complexity	5
Total K Factor	K = 100

6.4.3 F4A FLIGHT JUDGING REQUIREMENTS.

6.4.3.1 Definition of an Official Flight

An official flight shall be recorded when the model aircraft has been airborne for 30 seconds except when the wind velocity exceeds 4 m/s when the qualifying time shall be reduced to 20 seconds.

6.4.3.2 Number of Flights

Each competitor should have the opportunity to make a minimum of four official flights. An attempt is recorded when the competitor releases the model with the intention of making an official flight. If the model fails to achieve an official flight on the first attempt, one further attempt is allowed.

6.4.3.3 Flying Time

Competitors must be called at least five minutes before they are required to occupy the starting area. Each competitor shall have a flying time of five minutes (plus one minute for each additional engine of multi-engined model aircraft) 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.

6.4.3.4 Flight Score K Factors

(a) Take-Off (Optional, see 6.1.6 (a)	K= 15
(b) Initial Climb	K= 15
(c) Cruise.....	K= 30
(d) Transition to descent	K= 10
(e) Descent and landing	K= 15

(f) Realism..... K= 15

Total K FactorK= 100

6.4.3.5 Complexity Bonus

The flight score shall be subject to a complexity bonus as listed in the following schedule. All bonuses are additive. The best flight score shall be factored by the appropriate total bonus, to become the scoring flight.

- a) Engines or motors (on different thrust lines) Bonus
 - Single 0
 - Two or More 10%

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

- b) UndercarriageBonus
 - Fixed (any configuration) 0
 - Retractable (remains up for landing) 5%
 - Retractable (lowers again for landing) 10%

6.4.3.6 Marking (Flight Points)

Each part of the flight as defined in 6.4.5. will be awarded marks between 0 and 10 by each judge during the flight. These marks are then each multiplied by the appropriate K factor and aggregated before the bonuses are applied as described in 6.4.6.

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6.4. ANNEX A - F4A, F4D AND F4E COMPETITORS DECLARATION FORM

CHAMPIONSHIP LOGO and FAI emblem

This form must be completed and signed by the competitor and endorsed by the Team Manager.

Competitor's Name	National Identification.	Aircraft Name & Designation
-------------------	--------------------------	-----------------------------

Aircraft cruising and/or maximum speed Attach supporting evidence on a separate sheet	
--	--

Comments and/or explanation of components not made by me.

COMPETITOR'S CERTIFICATION

I certify that the model conforms to the current F4A rules and answers given above are correct.

Name(block letters)
Signature.....

TEAM MANAGER'S ENDORSEMENT

I certify that the answers given above are correct.

Name(block letters) Signature.....

6.4. ANNEX B F4A, F4D AND F4E STATIC SCORE SHEET

CHAMPIONSHIP LOGO and FAI emblem

Competitor Number:	Competitor Name:
Model Name & Designation	

Documentation checklist							
Competitors Declaration		Minimum 3-View Drawing		Minimum Photos		Proof of Colour	

No.	STATIC JUDGING ASPECT	Judges Mark	K-factor	SCORE
	Scale Accuracy -- Side view		13	
	Scale Accuracy – Front View		13	
	Scale Accuracy – Plan View		13	
	Markings Accuracy		8	
	Markings Complexity		3	
	Colour Accuracy		3	
	Colour Complexity		2	
	Surface Texture		7	
	Scale Realism		7	
	Craftsmanship Quality		12	
	Craftsmanship Complexity		5	
	Scale Detail Accuracy		9	
	Scale Detail Complexity		5	
Judges notes		TOTAL	100	

Judges Signature..... Chief judge’s Signature.....

6.4. ANNEX C F4A, F4D AND F4E STATIC JUDGING GUIDE

Scale Accuracy:

This is an assessment of the outline accuracy and major structural features of the model and is judged by comparison with the documentation presented. Any detail that is not clearly visible at 2.5 metres will not be included in the assessment.

Colour Accuracy

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

Colour Complexity

Colour Complexity is an assessment of the number of colours, the distribution of the colours and the boundary between colours by comparison with all the other models entered in the competition

Markings Accuracy

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

Markings Complexity

Markings Complexity is an assessment of the complexity of the colour and the markings by comparison with all the other models entered in the competition.

Surface Texture

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

Surface Realism

This is a subjective assessment of how well the model captures the character of the full-size aircraft as illustrated by the documentation taking into account, the surface finish, weathering and any detail that is noticeable at 2.5 m.

Scale Detail – Accuracy

Check that items shown in the documentation are present on the model aircraft where applicable, and that they are accurately reproduced and correctly positioned.

The points awarded should reflect both the accuracy and the quantity of scale detail present. Higher marks should be awarded to those competitors who accurately reproduce these items.

Scale Detail - Complexity

A well-documented highly detailed model aircraft should score proportionately more than a model aircraft with little detail.

Judges should ensure when marking this aspect that they are relating to the complexity of detail actually on the model aircraft.

6.4. ANNEX D F4A, F4D AND F4E FLIGHT SCORE SHEET

CHAMPIONSHIP LOGO and FAI emblem

Competitor number:	Competitor Name	Flight Round
---------------------------	------------------------	---------------------

Model Name and Designation:	
Cruising / Maximum Speed of Subject Aircraft:	Scale of Model:

No.	FLIGHT SCHEDULE	JUDGES MARK	K	SCORE
1	Take-off		15	
2	Initial Climb		15	
3	Cruise – Speed of Model		30	
4	Transition to Descent		15	
5	Descent and Landing		15	
6	Realism		15	
		Flight Score		
	Complexity Bonus – Multi engine or motor			
	Complexity Bonus - Retractable Undercarriage			
Judge's comment.		Total Flight Score		

Judge's Signature.....Chief Judge's Signature.....

6.4. ANNEX E. F4A, F4D AND F4E FLIGHT JUDGING GUIDE

Models should always fly in the same manner as the full-sized aircraft. The following notes describe an average airplane. Judges should use their own personal judgement to decide on an appropriate flight style for the full-sized aircraft submitted and mark the flight accordingly.

Competitors may submit a description of the full-sized aircraft's flight characteristics (originated by a competent authority), which should be used to judge the flight.

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 the transition to flight should be smooth.

Errors

The take-off should be penalised if:

- the ground run is too short, too long or assisted,
- the nose or tail wheel does not leave the ground before the main wheels,
- the wing drops, or the run is curved.

(Note that a swing may occur as the tailwheel leaves the ground; this is normal and should not be penalised unless it is excessive.)

Initial Climb

The model should smoothly rotate to a climbing attitude and commence a gentle straight or curved climb. The climb should be smooth and appropriate to the full-sized aircraft.

Errors

The climb should be penalised if:

- too steep,
- too shallow,
- too highly banked,
- wing drop or
- wing rock occurs or
- nose attitude is too high or too low.

(Note that a high bank steep spiral climb is normal for a Pitts but that a Bleriot should hardly leave ground effect.)

Cruise

The model's flight path should smoothly change between cruise and descent. The change may be abrupt, after an engine failure, or prolonged as the power slowly reduces.

The direction of flight may or may not change.

Errors

The transition should be penalised if:

- the model stalls as the engine fails,
- wing drop or wing rock occurs or
- an excessive pitch change is apparent.

Descent and Landing

The descent should be smooth, continuous and stable. It may be straight or curved. The angle of descent should be consistent with that of the full-sized aircraft either engine on or engine off.

During the descent and landing, the model should mirror the flight characteristics of the full-sized aircraft in speed, flight attitude, stability, and balance. The model may fly in a straight line or turn in either or both directions. Turns should display an appropriate amount of bank.

Errors

The descent and landing should be penalised if:

- the model stalls,
- drops or rocks the wings,
- shows too steep a glide or
- does not change to a landing attitude.

(Note that the glide angle may change significantly with engine on or engine off.)

Quality of landing (Indoor only)

After adopting the landing attitude, the model should descend slowly to the floor, and touch down without bouncing. The ground run should be smooth and straight, with the model coming slowly to rest. Touch down may be on main wheels only, or on tail down three points.

Errors

The landing should be penalised if:

- the model bounces,
- the ground run is curved,
- the model does not stop,
- it ground loops or touches down too hard.

(Landings in a nose down attitude, or on the nose wheel, should be penalised.)

Realism in Flight

During the entire flight, the model should mirror the flight characteristics of the full-sized aircraft in speed, flight attitude, stability, and balance.

Realism in flight should be penalised if:

- the model flies too slowly or too fast,
- the nose attitude is too high or too low,
- the model stalls, or shows fugal flight path,
- has persistent wing drop or wing rock,
- flies an out of balance turn or
- pitches harshly on engine failure.

(A stall or wing drop may occur if the model hits turbulence or its own slipstream. If the recovery to stable flight is smooth, this should not be penalised.)

A grossly out of balance turn, left turn with right bank for instance, or a flat turn should be penalised.

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6.5 CLASS F4D - FREE FLIGHT INDOOR and OUTDOOR RUBBER SCALE AEROPLANES (PROVISIONAL)

6.5.1. GENERAL CHARACTERISTICS

Introduction:

Classes F4A, F4D, and F4E are for Free Flight scale model aircraft powered by a variety of motive sources. The marks scored are weighted equally between flying and static scores. The requirement for the competitor to have built his model remains and rule 6.1.10 applies to all classes. The general characteristics are defined for each class in sections 6.4, 6.5, and 6.6

6.5.1.1 Model Characteristics:

OUTDOOR

Maximum flying weight: 2 Kg
Maximum wing loading: 30 gm/dm²
Motive power: Extensible rubber motor(s) only

INDOOR

Maximum flying weight: 250 g
Maximum wing loading: 15 gm/dm²
Motive power: Extensible rubber motor(s) only

6.5.1.2 Scoring:

a) Normalisation of Static Scores:

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

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

Where:

Static Points x = Normalised Static Score for competitor x

S_x = Static Score for competitor x and

S_w = Highest Static Score

b) Normalisation of Flight Scores

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

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

Where:

Flight Points x = Normalised Flight Score for competitor x F_x = Flight Score for competitor x and

F_w = Highest Flight Score

6.5.1.3 Final Scoring

For each competitor, add the normalised static score to the average of the normalised scores of the best flight

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

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

6.5.1.4 Declaration:

The competitor must make a declaration to advise the judges as to the origin of the model. The competitor may supply evidence in support of his declaration and the declaration form must be counter-signed by the Team Manager to be valid.

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

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

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

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

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6.5.2 F4D STATIC JUDGING REQUIREMENTS.

Static requirements for F4D are to the same Rules as F4A Section 6.4.2

6.5.3 F4D FLIGHT JUDGING REQUIREMENTS.

6.5.3.1 Definition of an Official Flight

An official flight shall be recorded when the model aircraft has been airborne for 15 seconds except when the wind velocity exceeds 4 m/s when the qualifying time shall be reduced to 10 seconds.

6.5.3.2 Number of Flights

Each competitor should have the opportunity to make a minimum of four official flights. An attempt is recorded when the competitor releases the model with the intention of making an official flight. If the model fails to achieve an official flight on the first attempt, one further attempt is allowed.

6.5.3.3 Flying Time

Competitors must be called at least five minutes before they are required to occupy the starting area. Each competitor shall have a flying time of five minutes (plus one minute for each additional engine of multi-engined model aircraft) 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.

6.5.3.4 Flight Score K Factors

(a) Take-Off (Optional, see 6.1.6 (a)	K= 15
(b) Initial Climb	K= 15
(c) Cruise.....	K= 30
(d) Transition to descent	K= 10
(e) Descent and landing	K= 15
(f) Realism.....	K= 15
 Total K Factor	 K= 100

6.5.3.5 Complexity Bonus

The flight score shall be subject to a complexity bonus as listed in the following schedule. All bonuses are additive. The best flight score shall be factored by the appropriate total bonus, to become the scoring flight.

a) Engines (on different thrust lines)	Bonus
Single	0
Two or More	10%

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

b) Undercarriage	Bonus
Fixed (any configuration)	0
Retractable (remains up for landing)	5%
Retractable (lowers again for landing)	10%

6.5.3.6 Marking (Flight Points)

Each part of the flights as defined in 6.4.5. will be awarded marks between 0 and 10 by each judge during the flight. These marks are then each multiplied by the appropriate K factor and aggregated before the bonuses are applied as described in 6.6.6.

6.5 F4D ANNEXES

REFER TO 6.4. ANNEX A FOR THE COMPETITORS DECLARATION

REFER TO 6.4. ANNEX B FOR THE STATIC SCORE SHEET

REFER TO 6.4. ANNEX C FOR THE STATIC JUDGES GUIDE

REFER TO 6.4. ANNEX D FOR THE FLIGHT SCORE SHEET

REFER TO 6.4. ANNEX E FOR THE FLIGHT JUDGES GUIDE

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6.6 CLASS F4E - FREE FLIGHT INDOOR and OUTDOOR CO₂ OR ELECTRIC SCALE AEROPLANES (PROVISIONAL)

6.6.1. GENERAL CHARACTERISTICS

Introduction:

Classes F4A, F4D, and F4E are for Free Flight scale model aircraft powered by a variety of motive sources. The marks scored are weighted equally between flying and static scores. The requirement for the competitor to have built his model remains and rule 6.1.10 applies to all classes. The general characteristics are defined for each class in sections 6.4, 6.5, and 6.6

6.6.1.1 Model Characteristics:

Maximum flying weight:250 g
 Maximum wing loading: outdoor.....30 g/dm²
 Maximum wing loading: indoor.....15 g/dm²

Motive power:

- a) Reciprocating motors driven by carbon dioxide gas with the gas storage tank carried on the model aircraft, or
- b) Electric motors with the batteries carried in the model aircraft, with a maximum power of 50 watts.

6.6.1.2 Scoring:

a) Normalisation of Static Scores:

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

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

Where:

Static Points x = Normalised Static Score for competitor x

S_x = Static Score for competitor x and

S_w = Highest Static Score

b) Normalisation of Flight Scores

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

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

Where:

Flight Points x = Normalised Flight Score for competitor x F_x = Flight Score for competitor x and

F_w = Highest Flight Score

6.6.1.3 Final Scoring

For each competitor, add the normalised static score to the average of the normalised scores of the best flight

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

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

6.6.1.4 Declaration:

The competitor must make a declaration to advise the judges as to the origin of the model. The competitor may supply evidence in support of his declaration and the declaration form must be counter-signed by the Team Manager to be valid.

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

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

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

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

6.6.2 F4E STATIC JUDGING REQUIREMENTS.

Static requirements for F4E are to the same Rules as F4A Section 6.4.2 with the following exception:

6.6.2.1 Static Judging:

- a) The appointment of Static Judges is similar to F4C except that only one panel of two judges is required.
- b) All static judging is carried out at a distance of 1.5 metres. This is measured from the centre line of the model to the judges seating position.
- c) Each aspect of the assessment will be awarded a mark out of 10 by each Judge using increments of a tenth of a mark
- d) Judges are not concerned with the craftsmanship used on the model or any detail parts of the model which cannot be clearly seen at 1.5 metres.
- e) The total judging time must not exceed 10 minutes per model. The Chief Static Judge is responsibility for setting a time limit for the assessment of each aspect of Static judging.

6.6.3 F4E FLIGHT JUDGING REQUIREMENTS.

6.6.3.1 Definition of an Official Flight

An official flight shall be recorded when the model aircraft has been airborne for 15 seconds except when the wind velocity exceeds 4 m/s when the qualifying time shall be reduced to 10 seconds.

6.6.3.2 Number of Flights

Each competitor should have the opportunity to make a minimum of four official flights. An attempt is recorded when the competitor releases the model with the intention of making an official flight. If the model fails to achieve an official flight on the first attempt, one further attempt is allowed.

6.6.3.3 Flying Time

Competitors must be called at least five minutes before they are required to occupy the starting area. Each competitor shall have a flying time of five minutes (plus one minute for each additional engine of multi-engined model aircraft) 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.

6.6.3.4 Flight Score K Factors

- | | |
|---|-------|
| (a) Take-Off (Optional, see 6.1.6 (a) | K= 15 |
| (b) Initial Climb | K= 15 |
| (c) Cruise..... | K= 30 |
| (d) Transition to descent | K= 10 |
| (e) Descent and landing | K= 15 |
| (f) Realism..... | K= 15 |

Total K FactorK= 100

6.6.3.5 Complexity Bonus

The flight score shall be subject to a complexity bonus as listed in the following schedule. All bonuses are additive. The best flight score shall be factored by the appropriate total bonus, to become the scoring flight.

a) Engines (on different thrust lines)	Bonus
Single	0
Two or More	10%

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

b) Undercarriage	Bonus
Fixed (any configuration)	0
Retractable (remains up for landing)	5%
Retractable (lowers again for landing)	10%

6.6.3.6 Marking (Flight Points)

Each part of the flight³ as defined in 6.4.5. will be awarded marks between 0 and 10 by each judge during the flight. These marks are then each multiplied by the appropriate K factor and aggregated before the bonuses are applied as described in 6.6.6.

6.6 F4E ANNEXES

REFER TO 6.4. ANNEX A FOR THE COMPETITORS DECLARATION

REFER TO 6.4. ANNEX B FOR THE STATIC SCORE SHEET

REFER TO 6.4.1 ANNEX C FOR THE STATIC JUDGES GUIDE

REFER TO 6.4.1 ANNEX D FOR THE FLIGHT SCORE SHEET

REFER TO 6.4.1 ANNEX E FOR THE FLIGHT JUDGES GUIDE

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6.7 CLASS F4F - FREE FLIGHT PEANUT SCALE AEROPLANES (PROVISIONAL)**6.7.1. General Rules**

Only the following rules from 6.1 will apply:

- a) 6.1.7. Number of models
- b) 6.1.9.2. Name of entry

6.7.2. Definition of Peanut Formula Scale Models

A Peanut Formula scale model aircraft shall be a reproduction of a heavier-than-air man carrying aircraft.

6.7.3. General Characteristics:

Maximum dimensions:

33 cm span or

23 cm overall length excluding the propeller.

Motive power: Extensible motor(s) only.

6.7.4. Documentation

The minimum documentation is to be one of the following:

- a) A general arrangement drawing of at least two inches (5 cm) wingspan, plus one photograph or printed reproduction of the prototype. If the photograph or printed reproduction is not in colour, then an authentic written colour description must be included; or
- b) a coloured three-view (eg "Profile" publication) to a minimum of 1/144 scale. The competitor must also state in the documentation, the type of covering material used.

6.7.5. Flying Section

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

6.7.6. Appearance Score

Models will be judged visually, in comparison with the documentation provided, by one or more judges. No measurements will be taken. Marks will be awarded as follows:

- a) Workmanship 0 - 15
- b) Complexity and accuracy of colour and markings 0 - 10
- c) Authentic details:..... 0 - 5
- d) Flying surfaces:
 - All double surface 4
 - Double surface wing but single surface tail..... 2
 - Single surface..... 0

Note: If however the prototype itself was single surface, then the model aircraft should be likewise single surface and be awarded the full 4 points.

- e) Surface Finish:
 - Authentic colour 5 - 9
 - Unpainted colour tissue 4
 - Unpainted condenser paper 3
 - Clear Microfilm 0
- f) Landing gear:
 - Scale length 3
 - Slightly enlarged 2
 - Greatly enlarged or no documentation 1
 - None or retracted 0

cont/...

g) Dihedral:		
Scale		3
Slightly exaggerated		1
Grossly exaggerated or no documentation.		0
h) Stabiliser outline:		
Correct size and shape		3
Correct size, wrong outline		2
Enlarged		1
Grossly enlarged		0
i) Bonus Points for complexity:		
Low wing		9
Biplane		9
Triplane		15
Autogyro.		21
Helicopter		27
Flying boat or floatplane	2	per wing
Scale number of tailplane ribs	1	
Scale number of rudder ribs..	1/2	
Separate ailerons	1	
Separate rudder	1/2	
Separate elevator or all-moving tailplane	1/2	
Other than square fuselage	1	
Wheel spats or pants	1	
Three dimensional pilot	1	
Exposed engine	1	
j) Negative points for deviation from scale to assist flying performance:		
Lengthening of nose or tail moment	2	each
Moving wing back	2	
Simplifying fuselage cross-section	2	
Enlarging rudder	2	
All other non-scale performance aids	2	each

The competitor's appearance score for his model aircraft will be the sum of the marks awarded in 6.7.6.(a) through 6.7.6.(j).

6.7.7 Scoring

The order of marking in 6.7.5. and 6.7.6. will produce a "place" in the Flying and Appearance sections respectively. Each competitor's numerical "places" in the two sections are added. The lowest overall totals then determine the final overall placings in the competition. A fly-off in which the realism of flight is the determining factor (marked to section 6.4.5.) will be held, if necessary, to break ties in the final placing of the leaders. In the event of a tie, places shall be decided by referring to the Appearance score, followed if necessary by reference to the flight scores, comparing first flights, then the second flights. If there is still a tie, then places will be decided by a duration fly-off.

**6.8. CLASS F4G – RADIO CONTROLLED LARGE SCALE AEROPLANES
(PROVISIONAL)**

6.8.1. General Rules

As 6.1. with the following addition:

Maximum weight excluding fuel: 20 kg

Note: The maximum take-off weight including fuel: 25 kg still applies, ref Volume *CIAM General Rules* B.1.3. and may be checked at random.

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**6.10. CLASS F4J – RADIO CONTROLLED TEAM SCALE AEROPLANES
(PROVISIONAL)**

The rules for F4J are the same as those for F4C except for the variations as shown.

- 6.10.1. See 6.3.1.
- 6.10.2. A F4J team shall consist of one pilot and one designated builder with their Sporting licenses issued by the same NAC. The pilot can only be the pilot for one builder.
- 6.10.3. See 6.1.9.
- 6.10.4. See Annex 6E but the Declaration Form must be signed by both the pilot and the builder.
- 6.10.5. See 6A.1.
- 6.10.6. See 6C.1.

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6.11 CLASS F4K RADIO CONTROLLED SCALE HELICOPTERS

6.11.1.1 Definition of a radio controlled scale helicopter model

A scale model helicopter is a replica of a full size heavier than air man carrying powered rotary winged aircraft. The aim of scale helicopter competitions is to evaluate the accuracy of replication of the shape, colour, and makings as well as the performance of the model compared to the full-size example. This evaluation entails the evaluation of the accuracy of the build replication as well as the flight performance of the model.

The full-size helicopter that was modelled is always referred to as the "prototype" and the scale model of the prototype is referred to as the "model".

6.11.1.2 Competition Programme

The Competition Programme must entail all the rules and provisions as laid out in this document. Depending on the competition programme each model may be static judged before its first flight or after completion of its first-round flight. It must however be static judged before its second-round flight.

6.11.1.3 Judges

The Organiser of a scale helicopter competition must nominate three (3) Static Judges, which will determine the accuracy of the model compared to the prototype and at least three (3) Flight Judges which will evaluate the flight performance

6.11.1.4 Scoring

All items to be judged are awarded a point between zero (very bad) and ten (excellent). Scoring with half points (0,5) is allowed. Where a Coefficient (K) is indicated on the score sheet, the score out of ten is multiplied by the coefficient (K) to obtain the final score for the item that was judged.

6.11.1.5 Final Scores

The following ratio applies: **Static: 50% and Flight: 100%**

- a) In the event that three or more rounds of flying is completed:
The Static Score is added to the average of the best two flights.
- b) In the event of only two rounds of flying is completed:
The Static Score is added to the average of the two flights.
- c) In the event of only one round of flying is completed:
The Static Score is added to the single flight score.
- d) The Static Score can only be used for the final score if the model has completed an official flight.

6.11.1.6 Model Requirement

- a) All models must take off and land in the manner of the prototype.
- b) No part of the model may be removed or replaced before flight after Static Judging, except the scale dummy pilot which may be removed or added. Visible flight batteries of electric powered models are excluded from this provision.
- c) Load hooks, model figures and cargo for relevant optional manoeuvres may be added or exchanged.

6.11.1.7 Number of Models

Each competitor may participate with one (1) model only.

6.11.1.8 Helper

A competitor must have a helper for an official flight. The helper is not allowed to touch the radio transmitter during an official flight, except during the start-up process. It is the responsibility of the timekeeper to ensure that this rule is complied with. If the helper touches the transmitter the flight will be score zero (0).

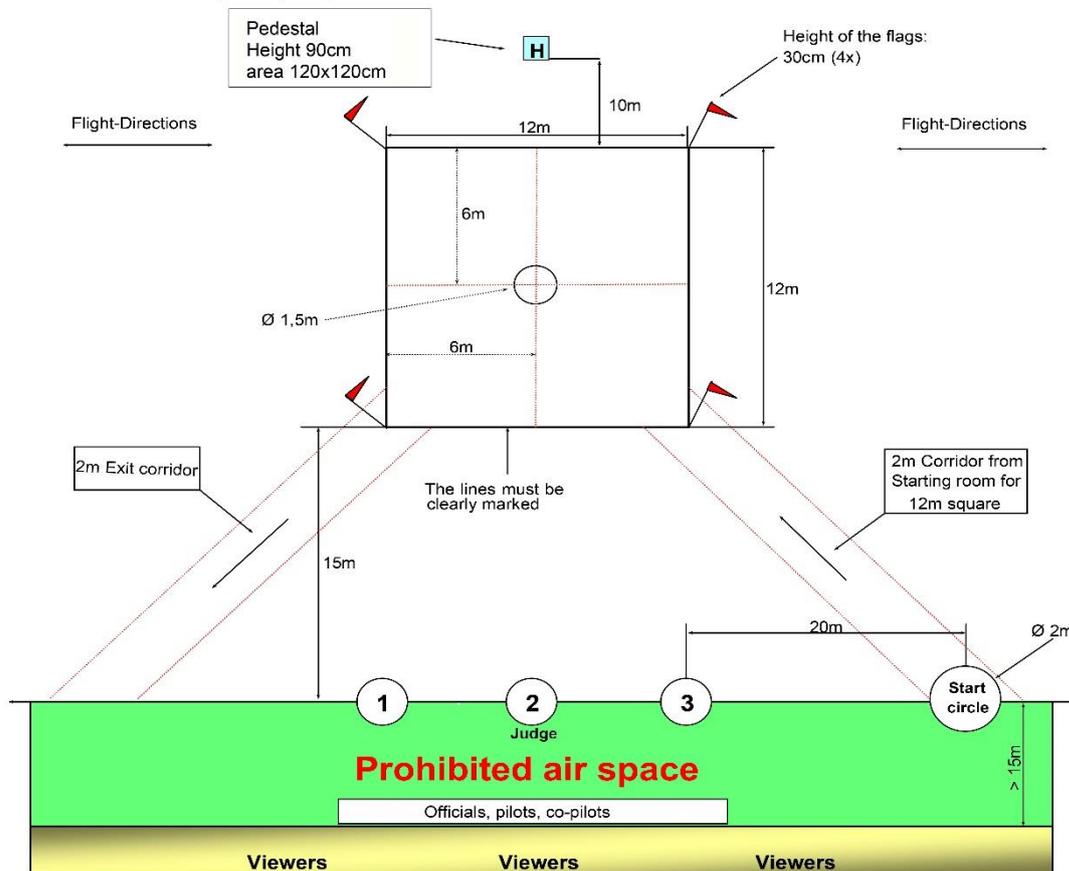
6.11.1.9 Contest organisation

Transmitter and frequency control is the responsibly of the organiser.

The starting order of the contestants will be drawn before the commencement of the competition. The order of the participants remains the same throughout the competition. The organiser reserves the right to change the starting order if it is dictated so by circumstances.

6.11.1.10 Contest Area Layout

A2.1.2 Airfield (Helipad)



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6.11.2. R/C SCALE HELICOPTERS – STATIC RULES

6.11.2.1 Judging

The aspects according to paragraph 6.11.2.3 must be judged from a minimum distance of five (5) meters from the model. The pilot and/or helper must be present at the judging in order to position the model as required by the judges. The judges may not take measurements of the model and may not touch the model.

6.11.2.2 Proof of Scale

The following documentation must be submitted:

A maximum of five (5) photos of the prototype, of which 2 to 3 must show the complete helicopter, preferably from different angles. The direction of rotation and the number of blades of the rotor system must be clearly documented. This documentation must be submitted in triplicate, the second and third sets may be photocopies.

6.11.2.3 Evaluation of the Static Accuracy of the model

The static judging is carried out as specified under 6.11.2.1 and 6.11.2.2 from a distance of 5 meters from the model. All items are awarded a point between zero (0) (very bad) and ten (10) (excellent). Scoring with half points (0,5) is allowed.

The main and tail rotor systems are not judged.

The time limit for static judging is 30 minutes.

6.11.2.3a	Accuracy of Outline (excluding main and tail rotor systems)	K = 7
6.11.2.3b	Accuracy of Colour	K = 8
6.11.2.3c	Identification marks and markings	K = 5
6.11.2.3d	Realism	K = 5

The static points can only be used for the final score if the model has completed an official flight.

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6.11 ANNEX A: STATIC JUDGING GUIDE

6.11.A.1 General

The Static Judges must be given the opportunity to do an overview of all the model helicopters entered in the competition in order to get an impression of the range of static standard of the entries. This superficial comparison must not be done from closer than three (3) meters from the models.

The Static assessment consists of the two elements: Outline and Colour and Identification Marks and other Markings. The judges must discuss all aspects during the judging in order to try and reach a mutually agreed score for each aspect. Each judge does have the right to differ and note a different score. Any deviations should however be minimal. A Chief Static Judge should be appointed before the start of the competition. He must have a good understanding of the judging process and be able to take leadership in discussing the errors found on the model and also make a suggestion for the points to be awarded for each aspect as a point of departure for further discussion by the judging panel. The use of half (0,5) points is allowed. Any damage incurred by a model, due to having flown an official flight before static judging as a result of the contest programme, should not be penalised.

6.11.A.2 Static Judging

The judging under this aspect is to determine how closely the model resembles the prototype as far as its outlines and colour compared to the photos of the prototype in the documentation that was submitted. The interior and the cockpit and passenger area, where applicable, is not judged.

No measurements are taken, and the judges may not touch the model.

The number of rotor blades as well as their direction of rotation must be clearly documented. See paragraph 6.11.2.2.

6.11.A.3 Accuracy of Outline and Colour

The model is firstly positioned according to the photos in the documentation. The accuracy and peculiarities of the model is assessed from these aspects. Other aspects can then be checked with the aid of the photographs and captions in the documentation.

6.11.A.4 Identification Marks and Markings

All markings must be checked for their correct position. The size and font of all letters and numbers must be checked.

6.11 ANNEX B: F4K STATIC JUDGING SCORE SHEET

CHAMPIONSHIP LOGO and FAI emblem

Competitor Number:	Competitor Name:
Model Name & Designation	

Documentation checklist							
Competitors Declaration				Minimum Photos		Proof of Colour	

No.	STATIC JUDGING ASPECT	Judges Mark	K-factor	SCORE
	Outline		7	
	Colour		8	
	Markings		5	
	Realism		5	
Judges notes			TOTAL	

Judges Signature..... Chief judge’s Signature.....

6.11.3. R/C SCALE HELICOPTERS – FLYING RULES

6.11.3.1 General Characteristics

The total take-off weight shall not exceed 25 kg.

Empty weight without batteries or fuel shall not exceed 22 kg

Piston internal combustion motors, turbine motors and electric motors allowed.

All axis may be equipped with electronic stabilisation (gyros). GPS supported systems are not allowed.

6.11.3.2 Official Flights

- a) Each participant will be called to the flight line in order to complete an official flight within the allowed preparation and flight times (6.11.3.4) in order for the flight score to count.
- b) The Contest Director may, at his discretion (and not that of the contestant) decide to award a reflight to a contestant that failed to take-off or complete his flight. The time at which the re-flight is to be flown is also at the discretion of the Contest Director.
- c) An official flight starts at the earliest when:
 - the contestant indicates to the timekeeper that he is ready to start his drive system
 - an official flight is considered to be completed when the model has landed and the main rotor has come to a stop, except in the case of the optional manoeuvres 6.11.3.6 Rescue and 6.11.3.6 Cargo Flight.
- d) In the event that the wind speed is 3m/sec or more for at least 2 minutes continuously, flying may be suspended upon a request by the Contest Director.

6.11.3.3 Preparation Time

- a) The contestant must be given at least five (5) minutes warning to prepare for his flight.
- b) The contestant will then be instructed to initiate his start-up procedure for an official flight.
- c) In the event that the model has not taken off within seven (7) minutes after the start-up instruction was given, the flight will be called complete and zero (0) points will be scored.
- d) If the power unit of the model fails at take-off before the model has lifted from the ground, a single restart of the power unit will be allowed. In this event the total flight time under paragraph 2.1.4. remains unchanged.

6.11.3.4 Flight Time

- a) The timing of a flight starts when the caller announces the initiation of the start-up procedure.

The maximum flight time to complete a flight is 20 minutes.

Any manoeuvres performed after the expiry of the flight time will score zero (0).

6.11.3.5 Flight Schedule.

Take-off	K = 12
Straight Flight	K = 6
Horizontal Circle (Left or Right)	K = 10
Landing Approach and Landing	K = 15
Optional Manoeuvre	K = 8
Flight Realism	

a) Model Speed	K = 6
b) Stability and trim	K = 6
c) Size of Manoeuvres and Flight Elegance	K = 5
Total	K = 100

6.11.3.6 Flight Schedule - Optional Manoeuvres

Five (5) from the following list:

Mountain Landing	K = 8
Quick Stop	K = 8
Tail-in Circle	K = 8
Hover M	K = 8
Obstacle Flight	K = 8
Horizontal Eight	K = 8
Procedure Turn	K = 8
Wingover	K = 8
Triangular Circuit	K = 8
Horizontal Square	K = 8
Personnel and/or Freight Transport	K = 8
Invisible flight with Emergency climb	K = 8
Rescue	K = 8
Cargo Flight	K = 8
Light Demonstration	K = 8
Overshoot	K = 8
Drop Demonstration	K = 8

6.11.3.7 Manoeuvre Selection

The competitor must be able to prove that the selected optional manoeuvres are typical for the prototype he has modelled. The selected manoeuvres must be indicated on the Flight Score Sheet in the order that they are to be flown. The order of the manoeuvres is at the discretion of the competitor, but they must be flown in the order that they are indicated on the score sheet. Any manoeuvres flown out of sequence will score zero (0). The selection and order of the optional manoeuvres may be change from one flight round to the next.

6.11.3.8 Score Reductions:

- a) The overall flight score of a model of a prototype which has a retractable undercarriage which flies with the undercarriage extended will be reduced by 10%.
- b) If the pilot of the prototype is visible flight, a dummy pilot of scale size and shape shall be equally visible during flight in the model helicopter. If such a pilot is not fitted, the total flight score shall be reduced by 10%.

6.11.3.9 Safety

The Flight Line Director must ensure that the safety lines are not overflown. In the event of such an overflight, the flight is terminated, and the contestant will be instructed to land. If a model is flown in an unsafe manner or the pilot's control of the model is questionable, he may instruct the pilot to land the model.

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6.11. ANNEX C: FLIGHT JUDGING GUIDE

6.11.C.1 General

The flight capabilities of the prototype must be taken into account when assessing the flight of the model. All straight flight elements of manoeuvres must be clearly defined before the respective turns are initiated.

The flight judges must not confuse scale helicopter flight with that of the F3C class.

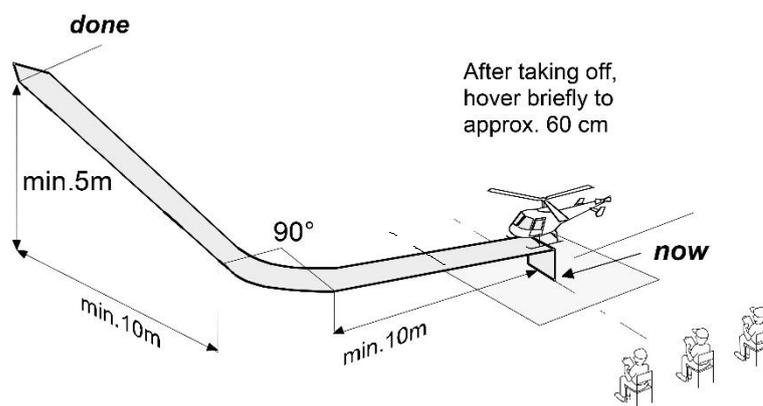
Each manoeuvre must be announced with a clear “Now” at its start and a clear “Complete” when it has ended.

The pilot is allowed to freely choose his position on the flight line for each manoeuvre but must then keep his position for the duration of the manoeuvre.

The manoeuvres may be flown from the left or the right depending on the wind direction. In the interests of safety, any flying behind the Safety Line will be score zero (0) and the pilot will be instructed to land.

6.11.C.2 Take-off Manoeuvre

The model stands with a running motor in the middle of the centre circle (Ø1.5 m). The model ascends to an approximate altitude of 60cm and hovers briefly. The model then climbs away at a constant rate in the manner of the full size. After covering a minimum of 10m, the model turns away through 90°. Where applicable, the undercarriage must be retracted during the initial climb-out. The manoeuvre is complete when the model has completed the turn and covered at least 10 m and has reached an altitude of at least 5m.

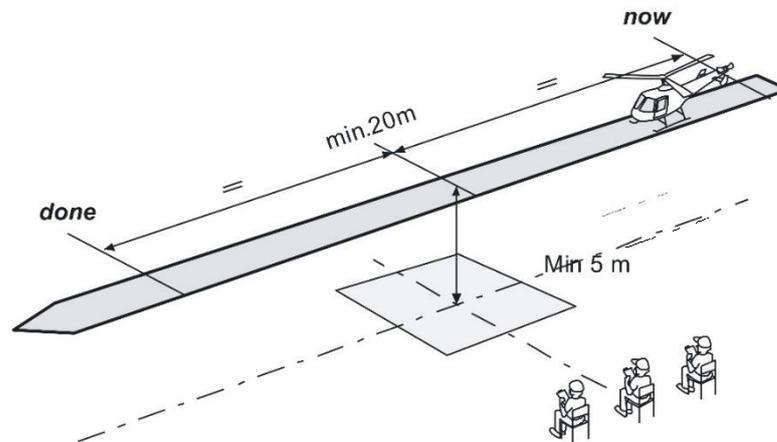


Errors:

1. The model is unstable during the climb-out.
2. No visible hover is maintained at the 60 cm altitude.
3. The model does not maintain a steady climb rate over the entire distance.
(Climb rate too steep or too shallow)
4. The turn away is not 90°
5. Retractable undercarriage is not retracted.
6. Unrealistic take-off and climb speed.
7. The two climb legs are less than 10m in length
8. The minimum height of 5m is not reached at the end of the manoeuvre.

6.11.C.3 Straight Flight

The model flies a straight and level flight of at least 20 m, parallel to the 12 (15) meter line at a minimum altitude of 5 meters. A constant speed must be maintained over the entire distance.

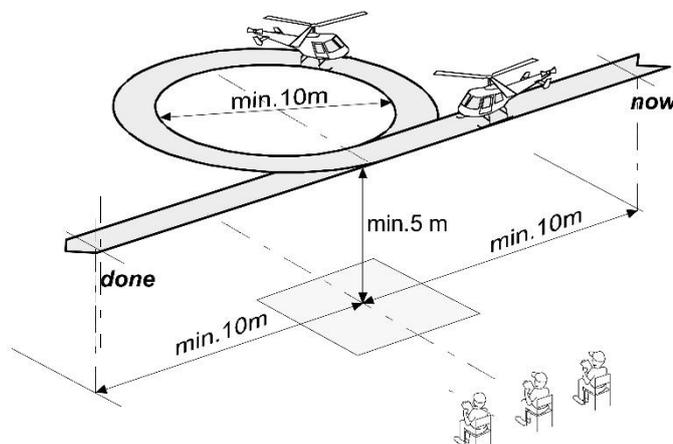


Errors:

1. Model does not fly straight
2. Model does not fly at a constant height
3. Model does not fly over the 12 meter line
4. Model does not fly parallel to the judge's line
5. Manoeuvre shorter than 20 m
6. Manoeuvre flown below 5 m
7. Flight path is not stable
8. Flight speed not constant

6.11.C.4 Horizontal Circle (Left or Right)

The model approaches in a straight and horizontal flight on a line that runs parallel to the judge line and is at least 10 meters. At the intersection of the 12-meter line, the model flies a 360° curve and ends the figure identically to the excursion to the flight. The flown circle must have a diameter of at least 10 meters and the altitude of the entire figure must be at least 5 meters.



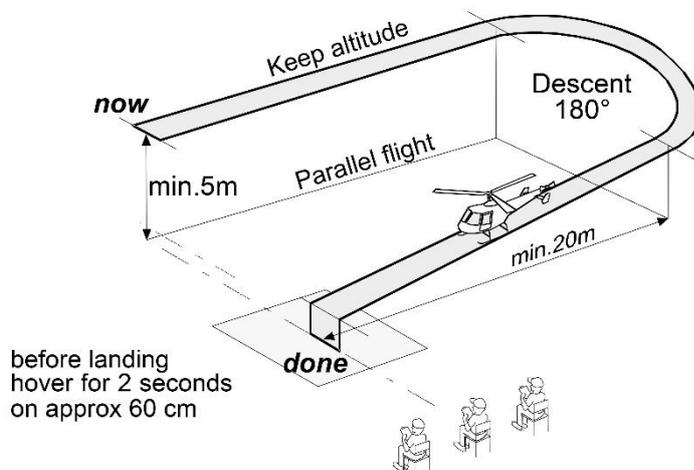
Error:

1. The entry and excursion is not at least 10 meters long
2. The flight altitude is not at least 5 meters
3. The entry and excursion is not in the same line
4. The entry and excursion is not parallel to the judges' line
5. Circle is not at least 10 meters in diameter
6. Circle failed, warped
7. The intersection is not in the center of the 12-meter line

6.11.C.5 Landing Approach and Landing

The model begins the figure with a transverse approach at a height of at least 5 meters. In the extended axis from the middle of the 12 meter line, the parallel approach begins. The route of the transverse approach is at the discretion of the pilot. This is followed by a 180° turn with simultaneous descent to the center of the middle landing square.

If a landing gear is present on the model, it is extended at the beginning of the descent. Above the circle (Ø1.5 meters), the model hovers for at least 2 seconds and then lands gently and evenly.

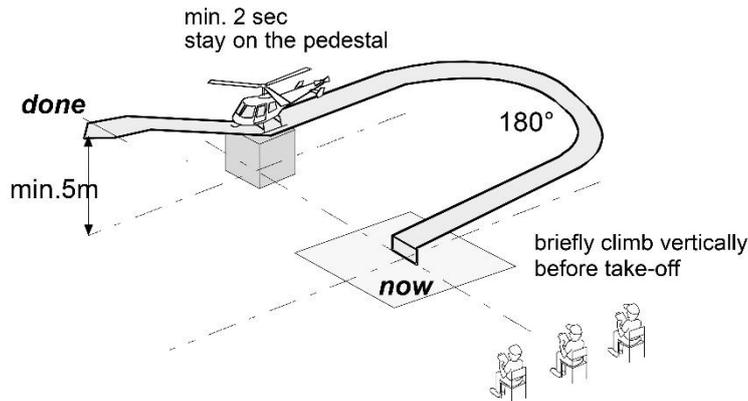


Error:

1. The approach does not start parallel to the landing approach
2. The minimum height of 5 meters is not observed at the beginning of the figure
3. The model does not fly at the same altitude up to the 180° turn
4. At the beginning of the 180° turn, the model does not sink evenly and continuously over the entire route. (The sink rate is too steep or too flat)
5. The model does not fly a regular 180° turn
6. Model oscillates and moves during descent
7. At 60cm floating height no visible hold can be detected
8. Model oscillates and moves during descent

6.11.C.6 Mountain Landing (Optional Manoeuvre)

The model takes off from the middle circle (Ø1.5 meters) and rises in a slow forward flight to an altitude suitable for approaching the point of contact. The approach curve should describe a 180° turn. The model then sets up with both runners, or .dem chassis in the "mountains" (pedestal). It remains there for at least 2 seconds and then continues to rise to a height of at least 5 meters.

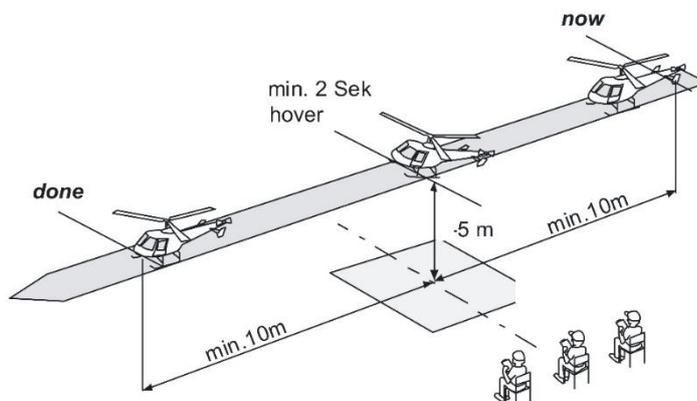


Error:

1. The model does not describe a 180° turn from the take-off field to the landing point
2. The model does not remain on the pedestal for at least 2 seconds
3. The model does not remain quiet on the pedestal
4. The model does not land on the podium
5. The model does not reach the minimum height of 5 meters after the stopover

6.11.C.7 Quick Stop (Optional Manoeuvre)

The model flies at least 10 meters straight ahead at a brisk speed. This at a height of at least 5 meters and parallel to the judges' line. The Quick stop takes place directly above the center of the 12x12m square. The quick stop must be at least 2 seconds and must be clearly visible. After the stop, a uniform departure of at least 10 meters takes place at the same height of the approach.



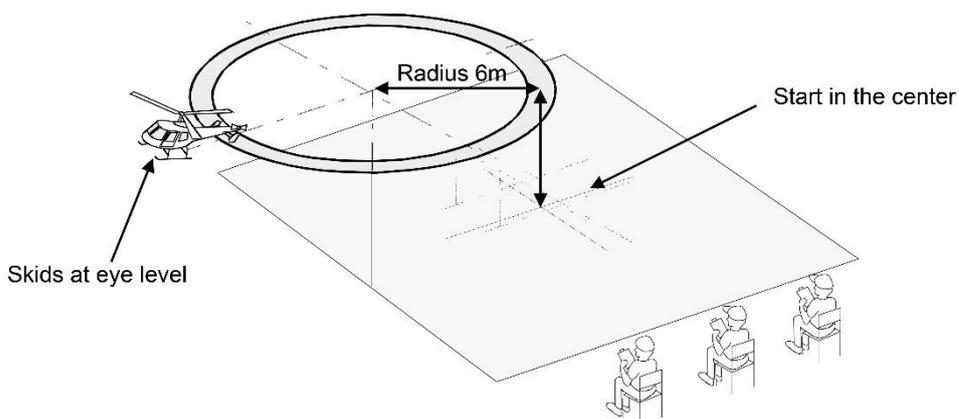
Error:

1. The model must not rise or break out sideways during approach and departure
2. The model does not stop in the middle of the 12 meter x 12 meter square
3. The model does not float at least 2 seconds after the visible stop
4. The model tilts to its side or rises away during quick stop
5. The model erupts uncontrollably
6. The figure is not executed between 5 meters
7. The arrival and departure is not at least 5 meters high
8. Figure was flown as a "hovering figure" and not at a brisk speed

6.11.C.8 Tail-in Circle (Optional Manoeuvre)

Start from the middle circle ($\varnothing 1.5$ meters) to the pilot's eye level.

Pilot is at the center of the circle. Then a short stay of at least 2 sec. Subsequently, a circular flight with a radius of 6 meters is to be flown. The rear of the model always points to the pilot. After 360° , the model remains for 2 seconds before the descent into the middle circle ($\varnothing 1.5$ meters) begins.

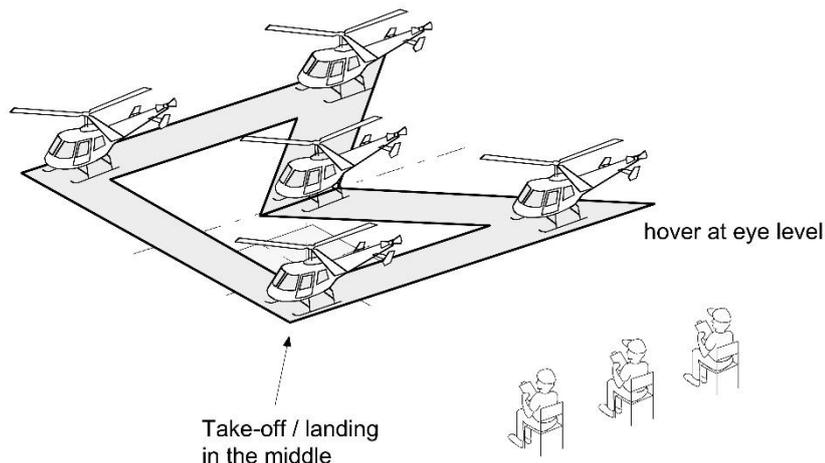


Error:

1. The model oscillates or moves during the ascent or descent
2. The rotation is not uniform and correspondingly slow
3. The rear does not point to the center
4. The altitude is not at eye level
5. The short stay of 2 sec. before and after the tail circle is not present

6.11.C.9 Hover “M” (Optional Manoeuvre)

The model starts from a circle (Ø1.5 meters) and climbs evenly vertically up to eye level. There it floats at least 2 sec. With the same height, the model floats in a diagonal line to the right or left corner of the pilot. After 2 sec. with calm hovering, the model moves with the same height in a straight line to the front corner. After 2 sec. the model shifts to the opposite side and again after 2 sec. back to the corner at the height of the pilot. Finally, the model moves in a diagonal line over the middle square, where it again moves 2 sec. remains and then begins with the descent and lands again in the circle (Ø1.5 meters)

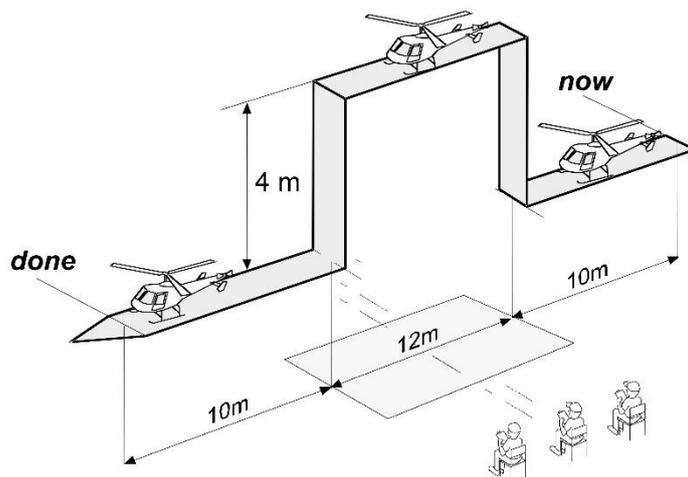


Error:

1. The model does not push, rotate or move during flight
2. The model does not fly the same height and the same speed
3. The model leaves the course or does not stop over the flags
4. Take-off and landing are not soft
5. The model lands only partially in the center or outside the circle (Ø1.5 meters)
6. The stops of the figure corners are not all identical and at least 2 sec.

6.11.C.10 Obstacle Flight (Optional Manoeuvre)

The model flies at eye level and at least 10 meters at the same height. Above the outer point of the 12 meter line, the model hovers at least 2 seconds and then begins with a steady climb of 4 meters. After that, it floats again for 2 seconds. and then makes a straight overflight at the same altitude to the opposite line by at least 2 sec. to carry out sustained hovering flight. Subsequently, the model sinks by 4 meters to eye level and floats again at least. 2 sec. Afterwards, the straight-lined onward flight of at least 10 meters takes place at a permanent height.

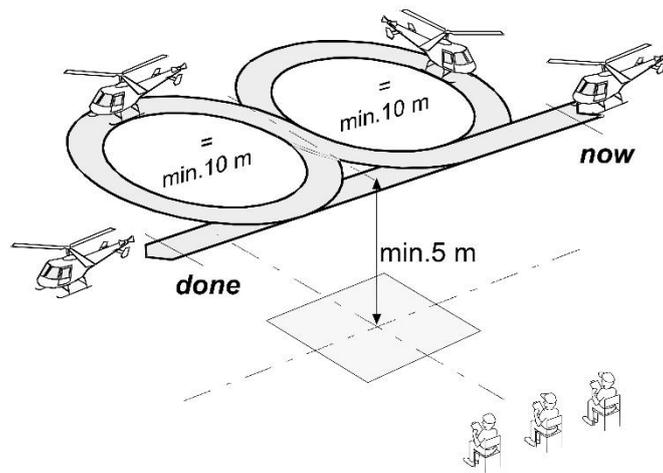


Error:

1. The model does not fly horizontally or vertically in the designated routes
2. Stops do not take place above the corresponding points
3. The stops are too short and uneven (min. 2 sec)
4. The required ascent and flight altitudes are not adhered to
5. The entrance and excursion is not at the same altitude and not min. 10 meters far

6.11.C.11 Horizontal Eight (Optional Manoeuvre)

The model approaches in a straight and horizontal flight on a line that runs parallel to the judge line, then flies a 90° curve away from this line, followed by a 360° circle in the opposite direction. A 270° curve in the original flight direction ends the figure on the original flight line. The intersection, the center of the figure, must be perpendicular to the entry line and on the centerline of the 12 meter line. This is at least 5 meters above the ground.

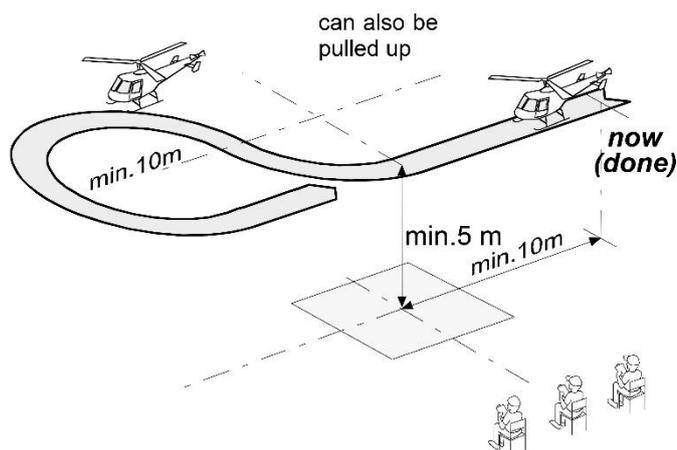


Error:

1. Circles are not the same as large (at least 10 meters)
2. Circles failed, warped
3. Height not the same and at least 5 meters
4. Intersection is not in the middle of the 12 meter line
5. Entry and excursion not in the same line
6. Entry and excursion not parallel to the judges' line

6.11.C.12 Procedure Turn (Optional Manoeuvre)

The model approaches in a straight and horizontal flight on a line that runs parallel to the judges' line. At the intersection of the 12 meter line, the model flies a quarter circle away from this line, followed by a 270° circle in the opposite direction. The excursion takes place on the same line as the flight. The minimum flight altitude must be at least 5 meters. The curve may also be pulled up.

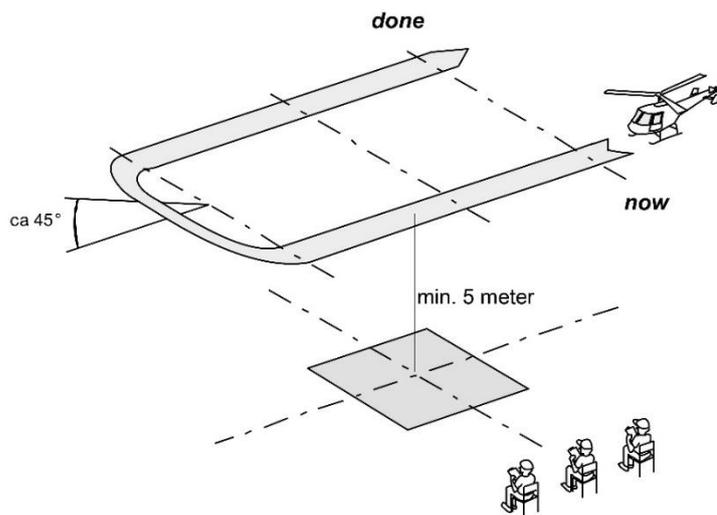


Error:

1. The circle is not at least 10 meters in diameter
2. The circle has failed, warped
3. The quarter circle does not begin at the intersection of the 12 meter line
4. The entry altitude is not at least 5 meters
5. Entry and excursion is not at least 10 meters
6. Entry and excursion not in the same line
7. Entry and excursion not parallel to the judges' line

6.11.C.13 Wingover (Optional Manoeuvre)

The model flies parallel to the judges and over the center of the 12x12 meter square and begins the ascent with a 45° radius after the 12x12 meter square line. The length of the climb is flown at your own discretion. However, a clear ascent phase must be recognizable before the turnaround. The subsequent rotation is flown as a 180° turn. The descent and excursion take place parallel to the ascent and ascent.

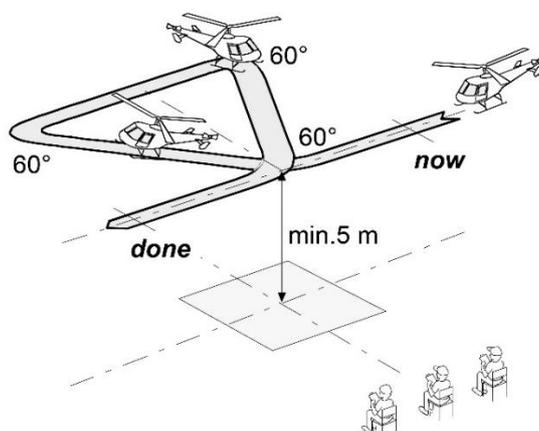


Error:

1. The model does not fly parallel to the judges and over the intersection of the 12x12 square
2. The radius 45° starts within the 12x12 square
3. The radius is not 45°
4. The turn is not 180° and is not uniform
5. Ascent and descent are not parallel and harmonious
6. One and the excursion are not parallel and harmonious

6.11.C.14 Triangular Circuit (Optional Manoeuvre)

The model approaches in a straight and horizontal flight on a line that runs parallel to the judges' line. Then flies away at the intersection of the 12-meter line in an arc of 60°. After at least 10 meters, a 60° curve is followed by a straight flight parallel to the entry. After at least 10 meters, a 60° curve takes place to the intersection. The excursion takes place in the same flight position as the flight. The minimum flight altitude of the entire figure is 5 meters. The triangular straights must all be of the same length.

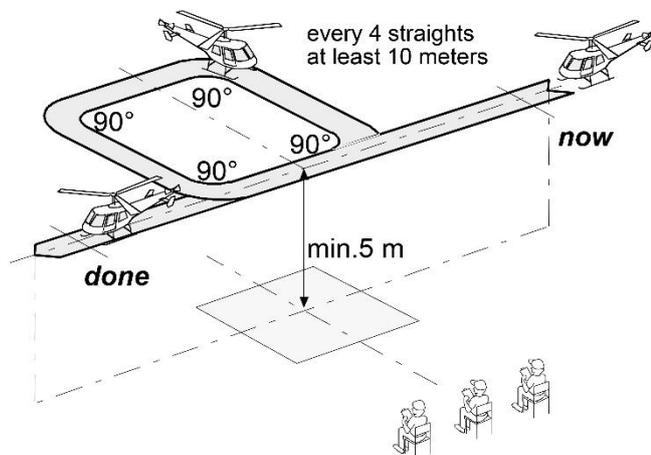


Error:

1. The entry and excursion is not at least 10 meters long
2. The flight altitude is not at least 5 meters
3. The entry and excursion is not in the same line
4. The entry and excursion is not parallel to the judges' line
5. The three 60° curves are not identical and even
6. The sections are unequally long. (Figure warped)
7. The intersection is not in the center of the 12 meter line

6.11.C.15 Horizontal Square (Optional Manoeuvre)

The model approaches in a straight and horizontal flight on a line that runs parallel to the judge line, then flies at least 5 meters after the intersection of the 12 meter line and then turns in an arc of 90°. After at least 10 meters, a 90° curve is followed by a straight flight parallel to the entry. After at least 10 meters, another 90° curve takes place, which ends after at least 10 meters with a 90° curve parallel to the entry. The excursion takes place in the same flight position as the flight. The minimum flight altitude of the entire figure is at least 5 meters. The square straights must all be the same length.



Error:

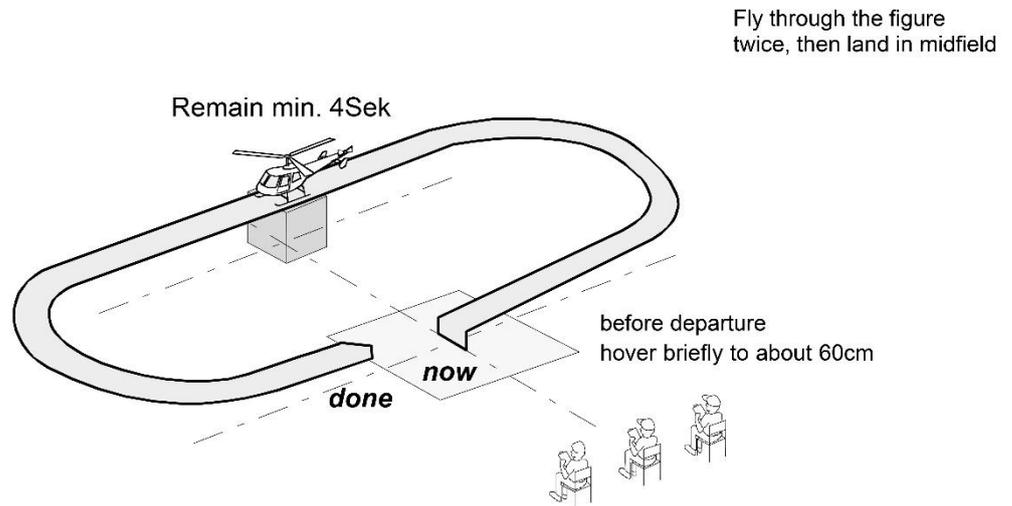
1. The entry and excursion is not at least 10 meters long
2. The flight altitude is not at least 5 meters
3. The entry and excursion is not in the same line
4. The entry and excursion is not parallel to the judges' line
5. The four 90° curves are not identical and even
6. The sections are unequally long. (Figure warped)
7. The intersection is not in the center of the 12 meter line

6.11.C.16 Personnel / Freight Transport (Optional Manoeuvre)

Start from the middle circle (Ø1.5 meters) at an initial altitude of 60cm, after a short check the transition to the ascent and departure to the "area of operation" with subsequent stopover in the mountains takes place. (pedestal)

After a short stay of at least 4 sec. in the mountains (pedestal), the flight continues. After another overflight, a new stopover takes place in the mountains. (pedestal) This stopover takes at least 4 seconds.

Afterwards, the return flight with landing in a circle (Ø1.5 meters) takes place



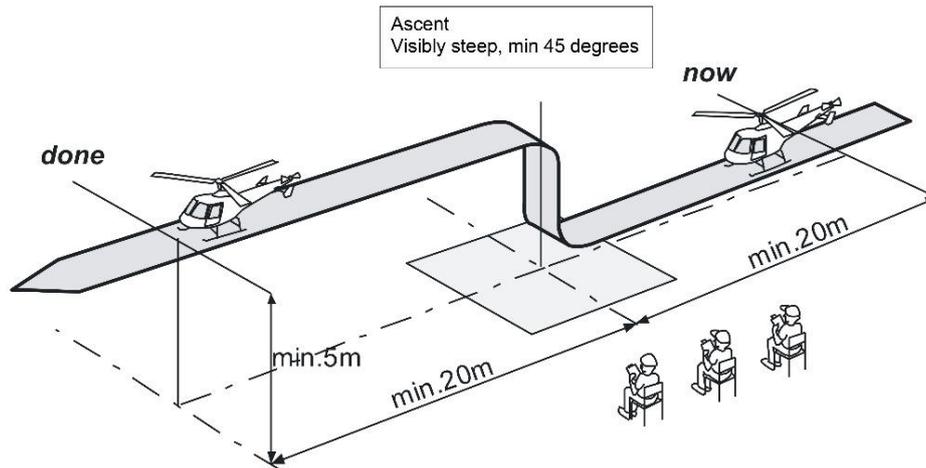
Error:

1. Model oscillates and moves during the climb
2. The model does not stand at least 4 sec. on the podium
3. The model does not stand perfectly still on the podium
4. The model does not land on the podium
5. The figure is not parallel to the judge line
6. The landing does not take place in a circle (Ø1.5 meters)

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6.11.C.17 "Invisible" Flight with Emergency Climb (Optional Manoeuvre)

The helicopter flies parallel to the judges with an entry of at least 20 meters as close as possible above the ground towards the middle square. (Invisible from enemy radar!) An obstacle (circle $\varnothing 1.5$ meters, fictitious) forces the helicopter to swerve steeply upwards. The helicopter rises to a height of at least 5 meters and continues its flight parallel to the judges. The figure ends after at least 20 meters of straight-line travel.

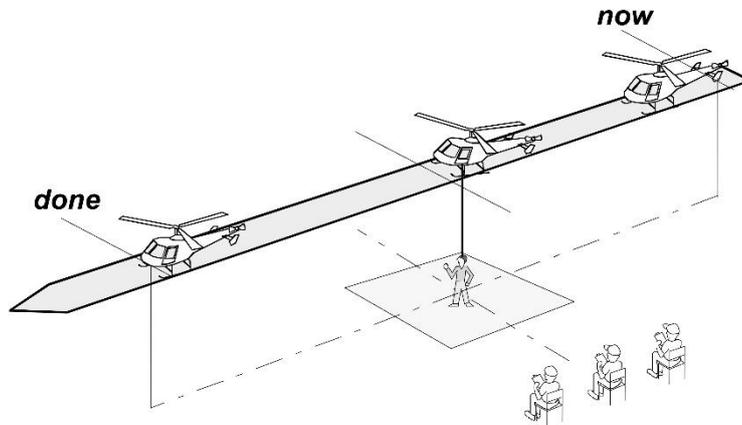


Error:

1. The "Invisible Flight" is not constantly low and at the same altitude and direction above the ground
2. The "Invisible Flight" is not parallel to the judges
1. The "Invisible Flight" is not at least 20 meters before the "emergency ascent"
2. The emergency ascent is not immediately in front of the circle ($\varnothing 1.5$ meters)
3. The model breaks out laterally during emergency ascent
4. The onward flight is not at least 5 meters above ground
5. The figure is not parallel to the judges' line and the 12 meter line
6. The onward flight is not at least 20 meters long

6.11.C.18 Rescue (Optional Manoeuvre)

The model flies about 10 meters straight ahead. This between 1.5 and 3 meters in height and parallel to the judges' line. Above the center of the 12-meter line, the model stops its flight. The rescue is carried out. After the rescue, a uniform departure takes place at the same height and direction as the approach.

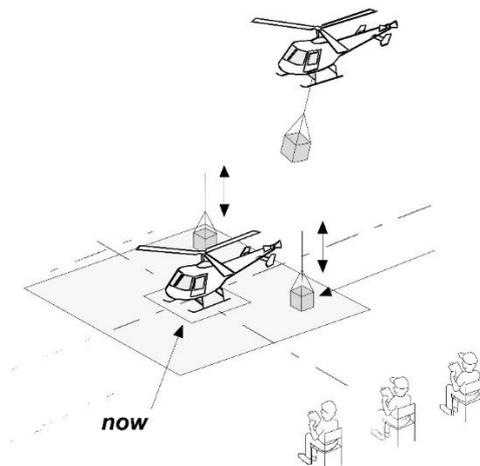


Error:

1. The entry and exit is not at the same height and direction and at least 10 meters long
1. The figure is not parallel to the judge line
2. The stop and departure from the center of the square is uneven
3. The rescue does not take place above the center
4. The model floats unstable during the rescue

6.11.C.19 Cargo Flight (Optional Manoeuvre)

The model takes off in a circle ($\varnothing 1.5$ meters) and flies a freely selectable sightseeing flight. The approach for load transfer or load absorption takes place in the 12x12 meter square. The subsequent landing of the model, on the other hand, takes place in a circle ($\varnothing 1.5$ meters).



Error:

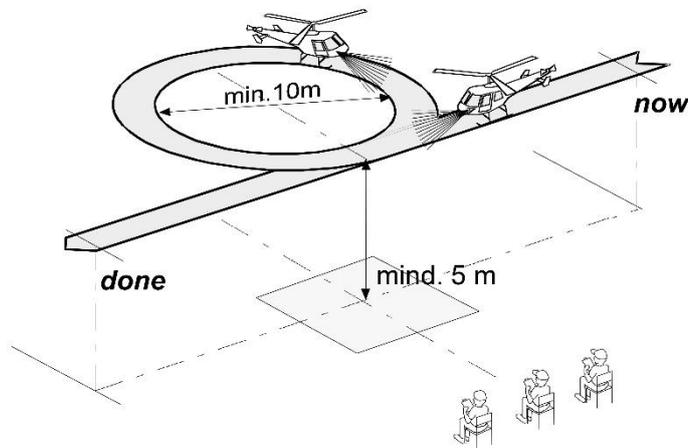
1. The start is not from the circle (Ø1.5 meters)
2. The load picking or setting down does not take place in the 12x12 meter square
3. The model is unstable throughout the figure
4. The landing does not take place in a circle (Ø1.5 meters)

6.11.C.20 Light Demonstration (Optional Manoeuvre)

The model approaches in a straight and horizontal flight on a line that runs parallel to the judge line and is at least 10 meters. At the intersection of the 12-meter line, the model flies a 360° curve and ends the figure identically to the excursion to the flight. During the figure, the lighting of the helicopter is skillfully staged.

The flown circle must be at least 10 meters in diameter and the altitude of the entire figure is at least 5 meters.

The lighting must be switched on in front of the figure.

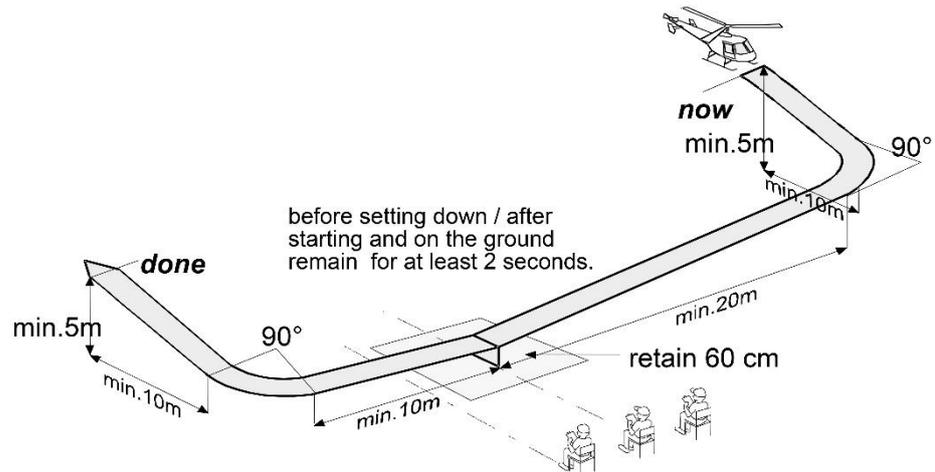


Error:

1. The entry and excursion is not at least 10 meters long
2. The flight altitude is not at least 5 meters
3. The entry and excursion is not in the same line
4. The entry and excursion is not parallel to the judges' line
5. The circle is not at least 10 meters in diameter
6. The circle has failed and/or warped
7. The intersection is not in the center of the 12 meter line
8. The lighting was not presented or switched on.

6.11.C.21 Overshoot (Optional Manoeuvre)

The model flies in a transverse approach of at least 10 meters. Then it turns 90° and begins with the final approach which must be at least 20 meters. The glide angle begins with the transverse approach and ends at about 60cm hovering height above the landing square. If a landing gear is present, it must be extended during the landing approach. Then the model lands in a circle (Ø1.5 meters) and remains there for 2 seconds. Afterwards it takes off again and remains again for a short moment at about 60cm height. Now the model, like the model, is continuously increasing. After at least 10 meters, a 90° curve takes place. If applicable, the landing gear must be retracted during take-off. This figure is finished when the helicopter has turned to the transverse descent and covered at least 10 meters and this at a flight altitude of at least 5 meters.

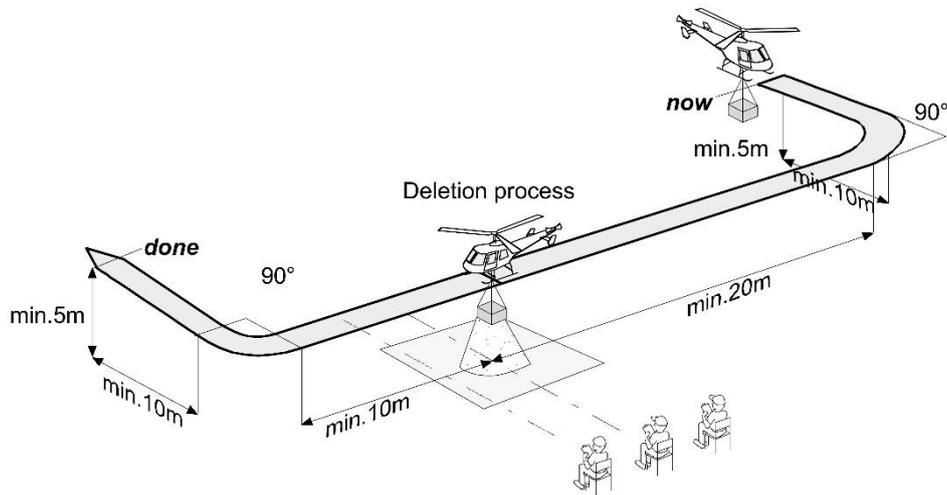


Error:

1. The model does not begin the figure with the described landing approach
2. The model does not start the final approach after 90°
3. The transverse flight and landing approach is not at least 10 meters, or 20 meters
4. The model does not sink continuously over the entire distance
(The sink rate is too steep or too flat)
5. Model oscillates and moves during descent
6. The retract, if available, is not extended
7. At approx. 60cm hovering height no visible hold can be detected
8. Model oscillates and moves during descent, landing and climbing
9. The model does not rise continuously over the entire route
(The climb rate is too steep or too flat)
10. Transverse flight angle is not 90°
11. The retract if available, is not retracted
12. Unrealistic start and climbing speed
13. The descent and transverse flight is not at least 10 meters
14. The minimum height of 5 meters is not reached at the end of the figure

6.11.C.22 Drop Demonstration (Optional Manoeuvre)

The model flies in a transverse approach of at least 10 meters. Then it turns 90° and begins with the final approach in the direction of center box, min. 20 meters. Now the deletion process takes place directly above the center. The model then flies at least 10 meters further and turns off with a 90° turn. The transverse descent must be at least 10 meters and end at a height of at least 5 meters.



Error:

1. The model does not begin the figure with the described transverse approach
2. The model does not start the final approach after 90°
3. The transverse approach is not at least 10 meters
4. The approach is not min. 20 meters
5. The "delete" operation is not performed and is not performed above the center
6. The model does not fly on the same level after the "extinguishing process" and does not make a 90° turn after at least 10 meters and rises to a minimum height of 5 met

6.11.C.23 Flight Realism

Scale flying is not an aerobatic or a precision flying contest for scale models and the rationale to be used when assessing display presentation is quite simple; does the flight represent what would be a typical display of the full-size aircraft at an airshow?

The successful display pilot keeps the aircraft in front of the spectators as much as possible. The selection of manoeuvres and the order they are placed in the flight schedule should be such as to achieve a continuous and flowing display. The turn-around manoeuvring should be such as to minimise the effort required to position the model at the correct altitude and track for the next manoeuvre in the schedule. Other than a low altitude fly-by, often seen as a photo opportunity at an airshow, fly-bys and unnecessary circuits to get the model to the starting position of the next manoeuvre should be minimized. The Drive sound (tone and volume) should also be assessed within this score.

This item on the score sheet should be jointly discussed by the flight judges after the flight has been completed and they should attempt to agree on the scores for this item. The Chief Judge must check all the score sheets for completeness after each flight

Model Speed

- a) The model speed should be correct in relation to the scale of the model as indicated on the score sheet.
- b) If the model flies twice as fast as the scale speed the score for this item should be halved. If it flies three times as fast it should be divided by three, etc.

Stability and Trim

- a) The model flies well-trimmed with no visible corrections or instability.
- b) The prevailing weather conditions must however be taken into account.

Size of Manoeuvres and Flight Elegance

- a) The size and type of the manoeuvres should be in keeping with that of the prototype, as well as in keeping with the available space.

6.11 ANNEX D: F4K FLIGHT JUDGING SCORE SHEET

CHAMPIONSHIP LOGO and FAI emblem

Competitor number:	Competitor Name	Flight Round
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Model Name and Designation:	
Cruising / Maximum Speed of Subject Aircraft:	Scale of Model:

No.	FLIGHT SCHEDULE	JUDGES MARK	K	SCORE
1	Take-off		11	
2	Option 1:		7	
3	Option 2:		7	
4	Option 3:		7	
5	Option 4:		7	
6	Option 5:		7	
7	Option 6:		7	
8	Option 7:		7	
9	Option 8:		7	
10	Approach and Landing		11	
11	Realism in Flight	Flight Presentation	9	
		Speed of the model	9	
		Smoothness of flight	4	

Judge's comment.	Flight Score	
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Judge's Signature.....Chief Judge's Signature.....