



FAI Sporting Code

*Fédération
Aéronautique
Internationale*

Section 4 – Aeromodelling

Volume F4 Flying Scale Model Aircraft

2014 Edition

Effective 1st January 2014

Revised 1st March 2014

- F4B - CONTROL LINE SCALE MODELS
- F4C - RADIO CONTROL SCALE MODELS
- ANNEX 6A - JUDGES' GUIDE – STATIC
- ANNEX 6B - JUDGES' GUIDE – CONTROL LINE FLIGHT
- ANNEX 6C - JUDGES' GUIDE – RADIO CONTROL FLIGHT
- ANNEX 6D - JUDGES' GUIDE – FREE FLIGHT
- ANNEX 6E - COMPETITOR'S DECLARATION FORM & SAMPLE SCORING SHEET
- ANNEX 6F - JUDGES' GUIDE – STAND-OFF SCALE
- F4A - FREE FLIGHT POWER SCALE MODELS (PROVISIONAL)
- F4D - INDOOR FREE FLIGHT SCALE MODELS RUBBER POWERED (Provisional)
- F4E - INDOOR FREE FLIGHT SCALE MODELS CO₂ POWERED (Provisional)
- F4F - INDOOR PEANUT FREE FLIGHT SCALE MODELS (Provisional)
- F4G - RADIO CONTROL LARGE SCALE MODELS (Provisional)
- F4H - RADIO CONTROL STAND-OFF SCALE MODELS
- F4J - TEAM SCALE (Provisional)

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6.3. CLASS F4C - RADIO CONTROLLED FLYING SCALE MODEL AIRCRAFT

6.3.1. General Characteristics

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

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

Motive Power:

Rocket or pulse jet engines may not be used.

Note: For all other scale model aircraft specifications see Volume ABR, Section 4C, Part One, paragraph 1.2. General Characteristics of Model Aircraft.

6.3.2. 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.

6.3.3. Official Flights

- a) Each competitor will be called to fly three rounds, and must execute an official flight within the required time limit (see 6.3.4.) on each occasion to be eligible for flight points for that flight.
In the case of two flightlines (see 6.1.4) each competitor will fly four rounds, two in front of each panel of judges and two on each flight line and the lower score from each panel will be deleted.
- b) If a competitor is unable to start or complete a flight and, in the opinion of the Contest/Flightline Director, the cause is outside the control of the competitor, the Contest/Flightline Director may, at his discretion, award the competitor a reflight. The Contest Director shall decide when the reflight shall take place.
- c) An official flight commences at the earliest of the following:
 - i) The competitor signals to the timekeeper that he is commencing to start his engine(s).
 - ii) Two minutes after the competitor is instructed to start his flight.
 - iii) An official flight is terminated when the model aircraft lands and stops, except during the option 6.3.7.M. (Touch and Go).

6.3.4. Flying Time

- a) A competitor will be advised that he will be required to start his flight not less than 5 minutes before the instruction to start.
- b) The competitor will then be instructed to start his flight.
- c) Timing of the flight will commence when the official flight commences (see 6.3.3.c).
- d) The competitor will be allowed 17 minutes to complete his flight.
- e) In the case of a multi-engined model aircraft, the time allowed in (d) above will be increased by one minute for each additional engine.
- f) No points will be awarded for any manoeuvre that is not completed at the end of the time allowed.

6.3.5. Starting Time

- a) If the model aircraft is not airborne within 7 minutes, plus one additional minute for each extra engine, after the official flight and timing commence, the official flight will end and no points will be awarded for the flight.
- b) If the engine(s) stops after the take-off has commenced, but before the model aircraft is airborne, the engine(s) may be restarted. There is only one attempt allowed to repeat the whole procedure. In the case of a repeated attempt, no points will be assigned for the interrupted manoeuvre.

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

6.3.6. Flight

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

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

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

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

6.3.7. Optional Demonstrations

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

Competitors must be prepared, if required by the judges, to give evidence that the options selected are typical and within the normal capabilities of the aircraft subject type modelled. Only one manoeuvre involving the demonstration of a mechanical function may be included in a competitor’s choice of options. These include (options D (Bombs/Fuel Tank Drop), L (Parachute Drop), and, if applicable, P or Q (Flight Functions by subject aircraft).

Selection must be indicated on the score sheet and given to judges before commencing the flight. The options may be flown in any order. Options A (Chandelle), N (Overshoot), R (Flight in triangular circuit), S (Flight in rectangular circuit), T (Flight in a straight line at constant height) and Z (Procedure Turn) may only be chosen by subjects certified and approved as “non-aerobatic” on the Competitor’s Declaration Form (Annex 6E.1). These are aircraft designed with limited manoeuvrability where the original prototypes of which were restricted by the manufacturer or licensing government agency.

Examples are:

Pioneer and early aircraft (pre 1915)

Purpose designed reconnaissance and bomber aircraft (note: this does not include fighter aircraft later adapted for reconnaissance duties or fighter/bombers where the designer intended an aerobatic capability)

Touring aircraft

Passenger and cargo aircraft

Military transports

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

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

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

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

Competitors may demonstrate up to two different flight functions of their own choice, but must supply evidence that each function was performed by the prototype modelled. Competitors must indicate on the declaration form and to the Chief Flight Judge the nature of the demonstration(s) before going to the flight line).

R Flight in triangular circuit.....	K = 7
S Flight in rectangular circuit	K = 7
T Flight in a straight line at constant height (maximum height 6 metres)	K = 7
U Flight in a straight line with one engine throttled (for multi-engined model aircraft only)	K = 7
V Lazy Eight	K = 7
W Wingover.....	K = 7
X Inverted flight.....	K = 7
Y Derry Turn.....	K = 7
Z Procedure Turn.....	K = 7

6.3.8. Marking (flight points)

Each manoeuvre will be awarded marks from 0 to 10, using increments of half a mark, by each of the judges during the flight. These marks are multiplied by the appropriate K - factor in each case.

The manoeuvres must be performed in a plane and at a height that will allow them to be seen clearly by the judges. The non-observance of this rule will be penalised by loss of points.

6.3.9. Flight Score

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

At World and Continental Championships, or whenever using five flight judges, the highest and lowest judge’s score for each manoeuvre will be deleted. The scores of the remaining three judges will then count towards the final score.

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

6.3.10. Final Scoring:

Add points earned in 6.1.10. to the average score of the two best flights under 6.3.9. If the competitor has achieved only one flight, the points awarded for that flight will be divided by two.

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

- a) If two rounds are flown, the average of the two flights as in 6.3.9. is used.
- b) If only one round is flown, the single flight score of that one round is recorded.
- c) The scores in an official round can be recorded only if all competitors had equal opportunity for a flight in that round.

6.3.11. Safety:

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

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

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

ANNEX 6A

CLASS F4 JUDGES' GUIDE FOR STATIC JUDGING

6A.1 General

- a) Before static judging commences the judges should review the whole entry in order that a standard be established for grading the points to be awarded. The entries should be studied in relationship to each other from a superficial aspect before detailed examination commences. The Chief Static Judge should take this opportunity to ensure that all judges are of a similar mind as to what is involved, particularly with respect to complexity aspects where these are applicable.
- b) A trial assessment using one or more non-competition model aircraft should be done prior to the start of the competition to establish a uniform standard.
- c) A Chief Judge shall be appointed as a spokesman for the static judges, and if two panels of static judges are to be used, the second panel will have a Deputy Chief Judge appointed to assist the Chief Judge in his work. The Chief/Deputy Chief Judge should discuss the merits and criticisms of each item in his responsible area with the other judges in his team, asking for suggestions for the scores.
- d) The static evaluation is broken down into six items as listed in 6.1.10. Judges must discuss each item as a team and attempt to arrive at a unanimously agreed score for each item, although each will retain the right to differ. Any degree of difference should however be minimal.
- e) The chief judge should discuss the merits and criticisms of each item with the other judges, asking for suggestions for the scores to be awarded as a basis for further discussion. The use of half points (see 6.1.5.) is important when judging top-class model aircraft. There may be instances where, for example, a 9 would be too low and a 10 too high, and a suitable score might be, say, 9.5.
- f) Regardless of the actual marks awarded, it is imperative that an accurate and fair comparison is attained across the whole range of model aircraft entered. The relative mark of one model aircraft compared to another is the most important standard to be achieved. Judges are encouraged to make use of analysis sheets and electronic or other archive devices to achieve this comparison.
- g) Upon the completion of the static judging of each model aircraft, the chief judge must check all score cards for completeness before submitting them for processing. The panel of judges has the right to alter scores retrospectively that they subsequently feel to be wrong (eg first model aircraft deviations, details not proven by documentation, over-looked commercial items). Sufficient time must be allocated by the organisers for this review to be done. Only when the Chief Judge agrees that this has been achieved should the scores be released for publication.
- h) If model aircraft are flown before being static judged (see 6.1.3.), any damage sustained during flight shall be ignored by the static judges provided the model aircraft is intact and it is practical to do so.

6A.1.9. Documentation for Proof of Scale

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

- | | | |
|--|---------------------------------------|------------|
| a) Less than 3 full photos of prototype: | ZERO points for Scale Accuracy | (6.1.10.1) |
| | Possible downmarking of Realism | (6.1.10.4) |
| | Possible downmarking of Craftsmanship | (6.1.10.5) |
| | Possible downmarking of Scale Detail | (6.1.10.6) |
| b) Missing or unauthorised drawings: | ZERO points for Scale Accuracy | (6.1.10.1) |
| c) No photo of subject aircraft: | ZERO points for markings | (6.1.10.2) |
| | Possible downmarking for Realism | (6.1.10.4) |
| | Possible downmarking of Scale Details | (6.1.10.6) |
| d) Incomplete colour documentation: | ZERO points for Colour | (6.1.10.3) |

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

cont/...

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

The static judges have a difficult task to do in a short period of time. Documentation should therefore be presented in a format that can be quickly and accurately assessed. Superfluous 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. A stiff A2 size sheet is considered to be the largest that may be comfortably handled by the judges. It will assist the judges if the documentation is presented in a format that reflects the sequence of the judging aspects, eg: Side view, End view, Plan view, Markings, Colour, etc.

6A.1.10. Static Judging

Items 6.1.10.1. must be judged at a minimum distance of 3 metres in F4B and 5 metres in F4C from the centre of the model aircraft. 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.

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.

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

6A.1.10.1. Scale Accuracy

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

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

Then using photographs and drawings, check:

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

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

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

6A.1.10.2. Colour

Colour Accuracy:

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

Colour Complexity:

Consideration should be given to the greater effort involved in reproducing multi-coloured finishes compared to model aircraft which feature only one or two basic colours. The system for awarding colour complexity points should be agreed before starting competitive judging. Up to two complexity points may be given for each main colour that covers a significant part of the airframe. A maximum of a single point may be given for each minor colour, such as those for the insignia, struts, guns, bombs etc. Basic colours of black and white should attract a fraction of a complexity

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

6A.1.10.3. Markings

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

Markings Accuracy:

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

Markings Complexity:

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

6A.1.10.4 Surface Texture and Scale Realism

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

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.

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

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

6A.1.10.5. Craftsmanship

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

Craftsmanship Quality:

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

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

Craftsmanship Complexity:

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

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

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

6A.1.10.6. Scale Detail

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

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

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

Scale Detail Accuracy:

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

Scale Detail Complexity:

A well-documented highly detailed model aircraft should score proportionately more than a model aircraft with little detail, even if the full-size prototype is itself sparsely detailed. Judges should ensure when marking this aspect that they are relating to the complexity of detail actually on the model aircraft, not awarding marks for just what the prototype should have.

ANNEX 6C**CLASS F4C JUDGES' GUIDE - FLYING SCHEDULE****6C.1 General**

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

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

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

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

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

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

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

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

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

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

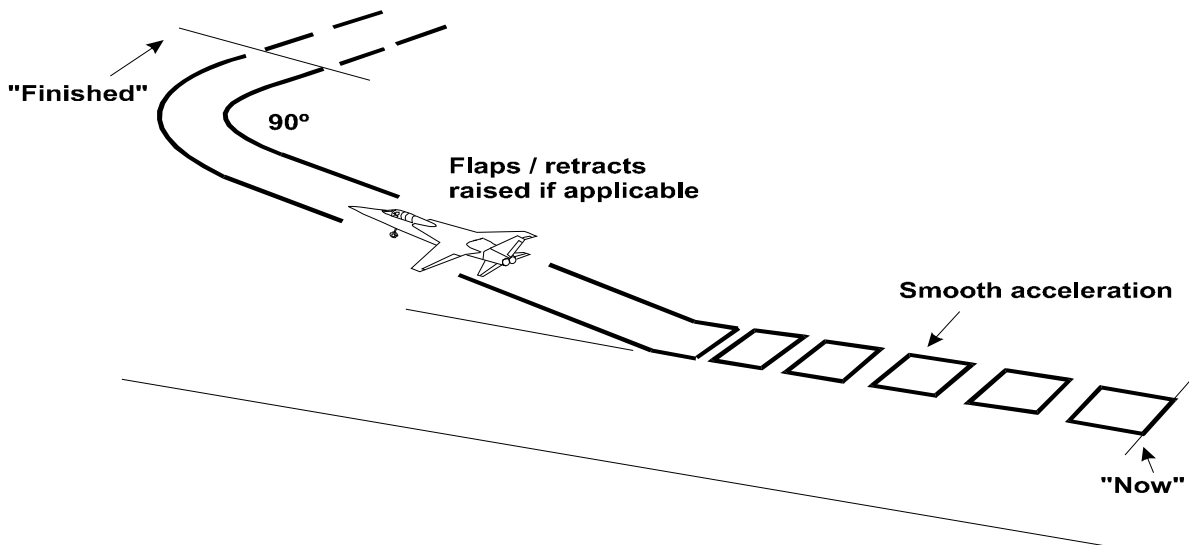
After each flight, the Flight Judges will record any non-standard event that causes downgrading or loss of flight points. If for any reason the mark awarded is corrected or changed, the change must be initialled by the judge. The Chief Flight Judge will review all flight score sheets for completeness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

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6C.3.6.1. Take-Off:

The model aircraft should stand still on the ground with the engine running without being held by the pilot or mechanic and then take-off into wind, or as required by the competitor to make best use of the take-off distance available (jet subjects). If the model aircraft is touched after the competitor calls "Now" the take-off will score 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 prototype. The take-off is completed after the model aircraft has turned 90 degrees.

If the prototype 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.

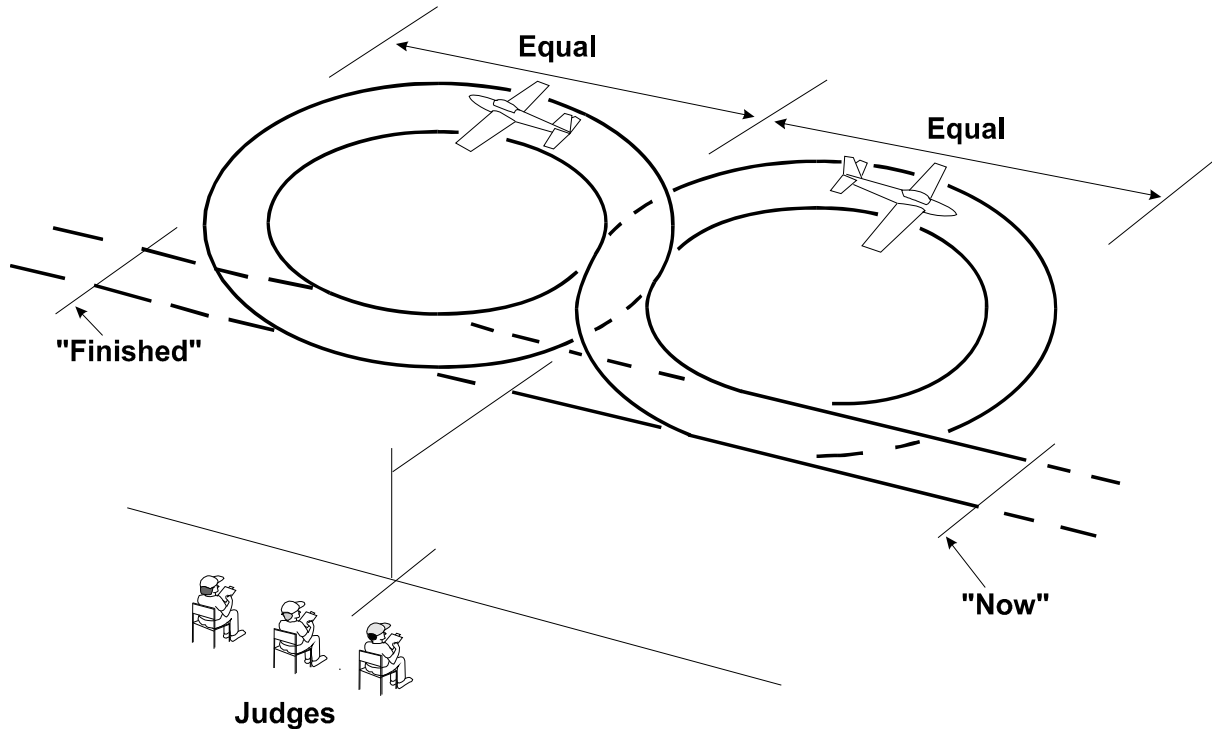
**Errors:**

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.

6C.3.6.2. Figure Eight

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.

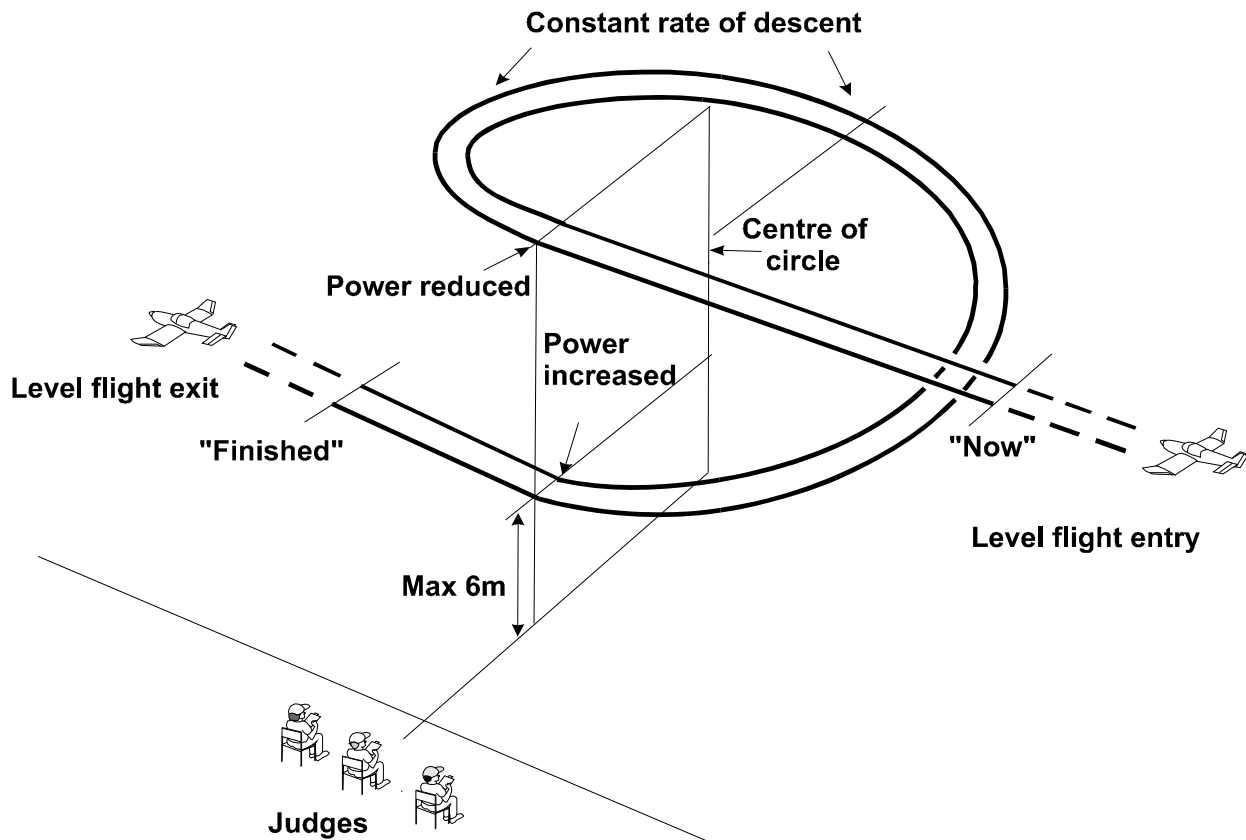
The intersection (mid point) of the manoeuvre shall be on a line that is at right angles to the direction of entry and passes through the centre of the judges' line.

**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 prototype.
9. Model aircraft flight path not smooth and steady.
10. Too far away/too close/too high/too low.

6C.3.6.3. 3600 Descending Circle at Constant Low Throttle Setting:

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.

6C.3.6.4. Optional manoeuvre, see 6C.3.7

6C.3.6.5. Optional manoeuvre, see 6C.3.7

6C.3.6.6. Optional manoeuvre, see 6C.3.7

6C.3.6.7. Optional manoeuvre, see 6C.3.7

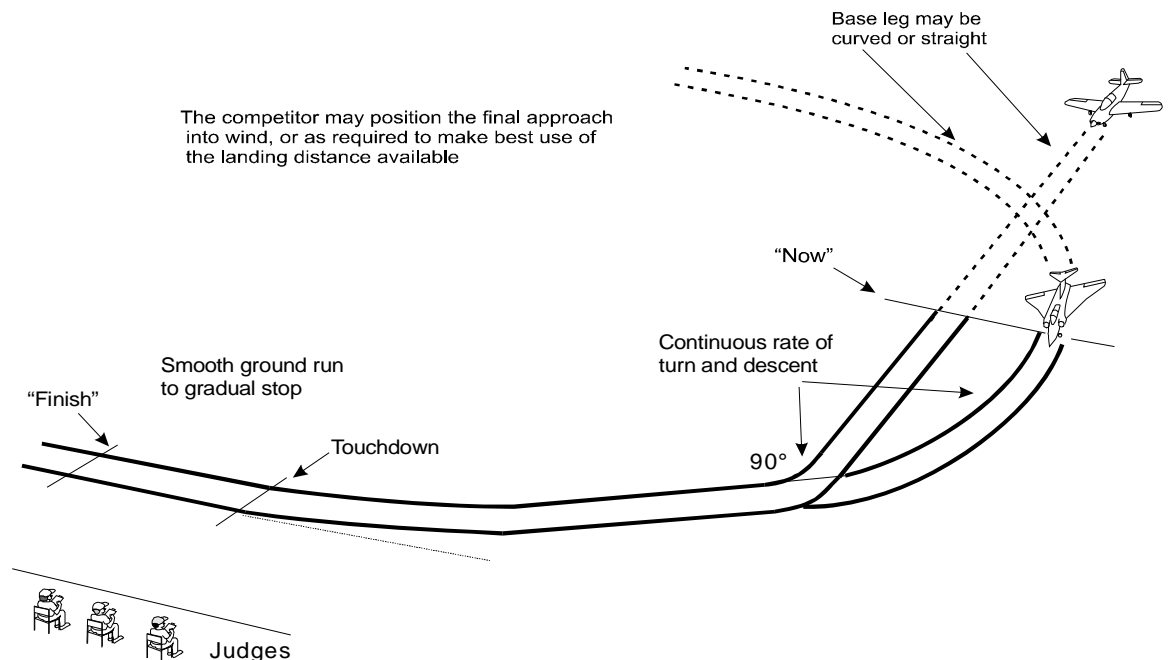
6C.3.6.8. Optional manoeuvre, see 6C.3.7

6C.3.6.9. Optional manoeuvre, see 6C.3.7

6C.3.6.10 Approach and Landing

The manoeuvre commences by descending from base leg (in the same way as the Touch and Go). Prior to this point the model 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 (eg 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 prototype, the prevailing wind conditions, or the surface of the landing area. An aircraft with tricycle landing gear will land on the main wheels first and then gently lower the nose wheel.



Errors:

1. Manoeuvre does not commence on base leg.
2. Turn onto final approach not constant rate or not 90°.
3. Descent from base leg not smooth and continuous.
4. Model 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.
12. Model aircraft noses over (note 2 points penalty if only nose-down; zero if over-turns).

cont/...

Note: A crash landing scores zero points, but 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 points.

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

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

6C.3.6.11. Realism in Flight

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

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

Engine sound (realistic tone & tuning)..... K = 4

“Tone” relates to the character of the sound by comparison with the full size 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 = 9

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

Smoothness of flight K = 9

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

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

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

NOTES:

1. For any model aircraft that flies a manoeuvre with two or more wheels down, where the prototype actually featured retractable landing gear, the score shall be reduced by two points on that manoeuvre. If one wheel is down, the score shall be reduced by one point. If one or more wheels are only sagging during the manoeuvre, the score shall be reduced with one half or one point depending on the seriousness of the sagging.
2. If the pilot of the prototype is visible from the front or from the side during flight, a dummy pilot of scale size and shape shall be equally visible during flight in the model aircraft. If such a pilot is not fitted, the total flight score shall be reduced by 10%.

cont/...

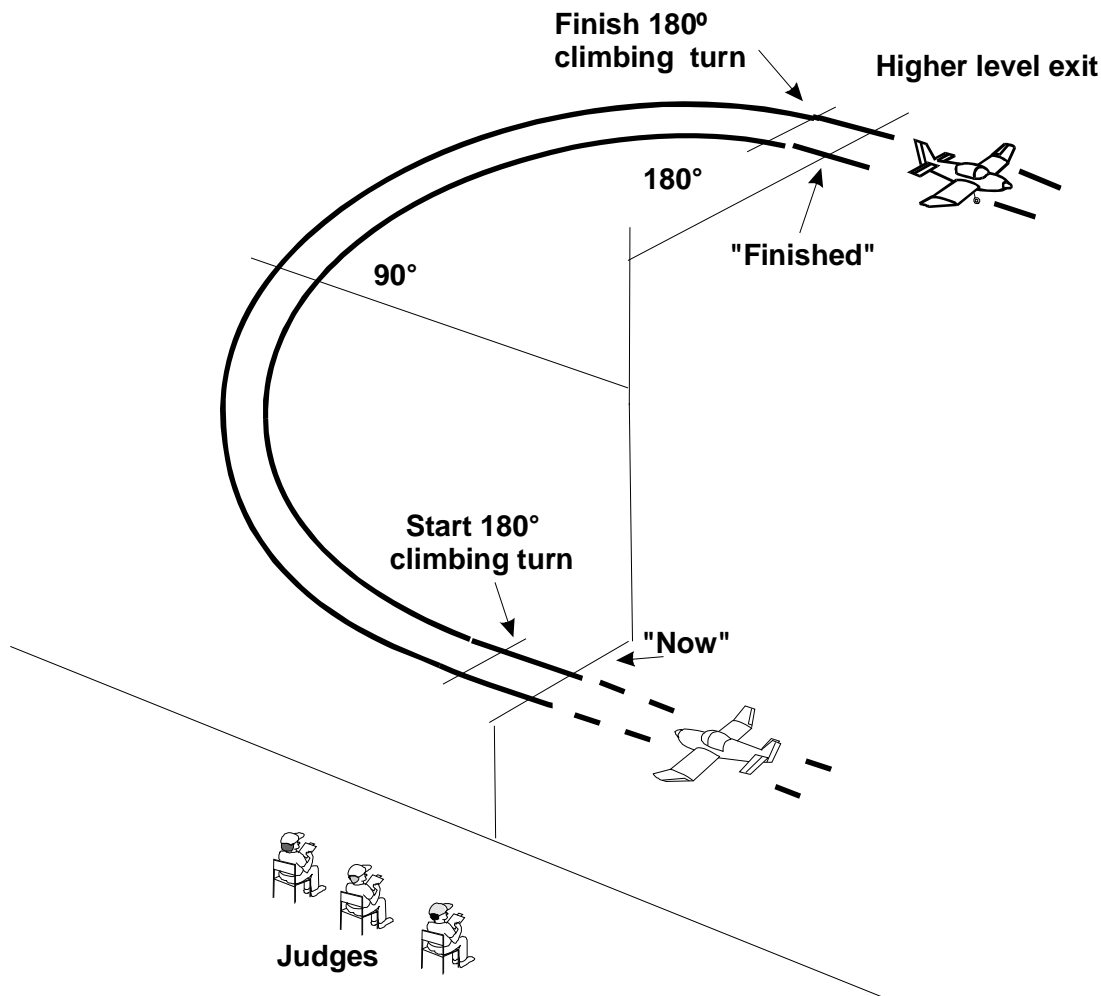
6C.3.7. Optional Manoeuvres

The selection of optional manoeuvres should demonstrate the fullest possible capabilities of the aircraft subject type modelled.

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. Chandelle:

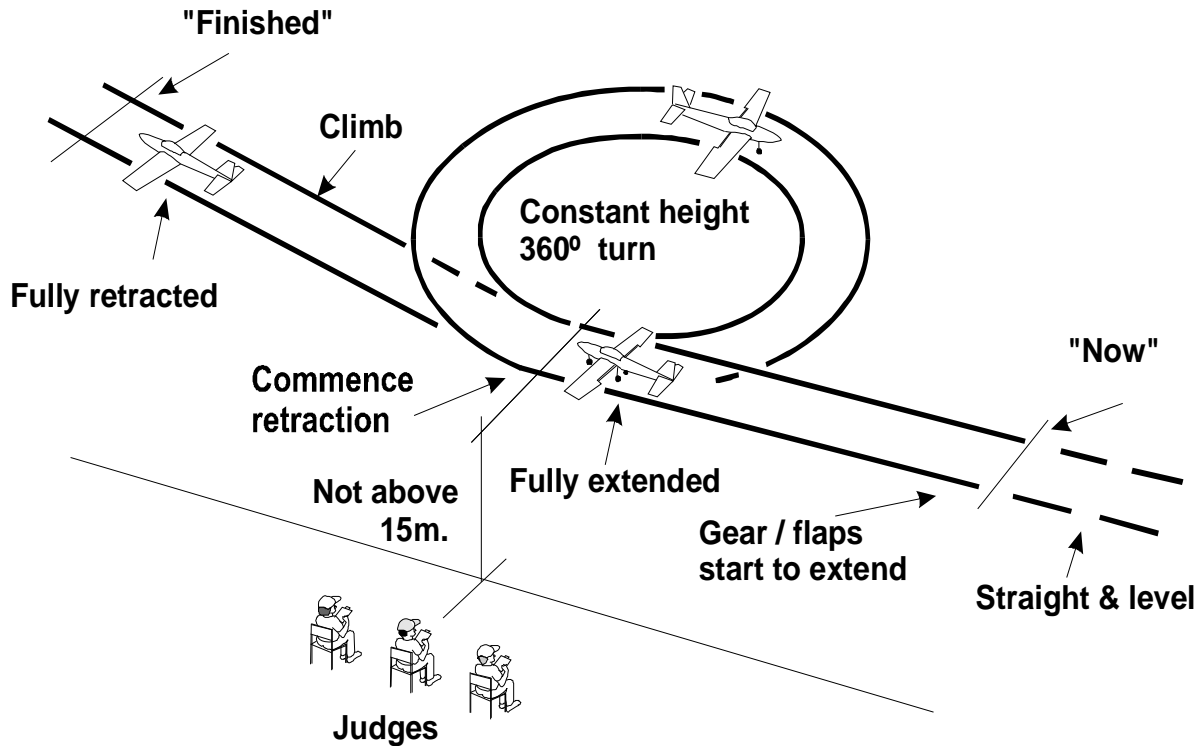
From a straight and level flight the model aircraft passes the judges and then performs a 180° climbing turn in a direction away from the judges, resuming straight and level flight on the opposite heading. The rate of climb should be commensurate with that of the prototype.

**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.

B. Extend and Retract Landing Gear:**C. Extend and Retract Flaps:** (Diagram and errors applicable to both manoeuvres 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, extends the landing gear/flaps. 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 landing gear/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. Un-scale-like climb out.
12. Too far away or too close.

D. Dropping of Bombs or Fuel Tanks:

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

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

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

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

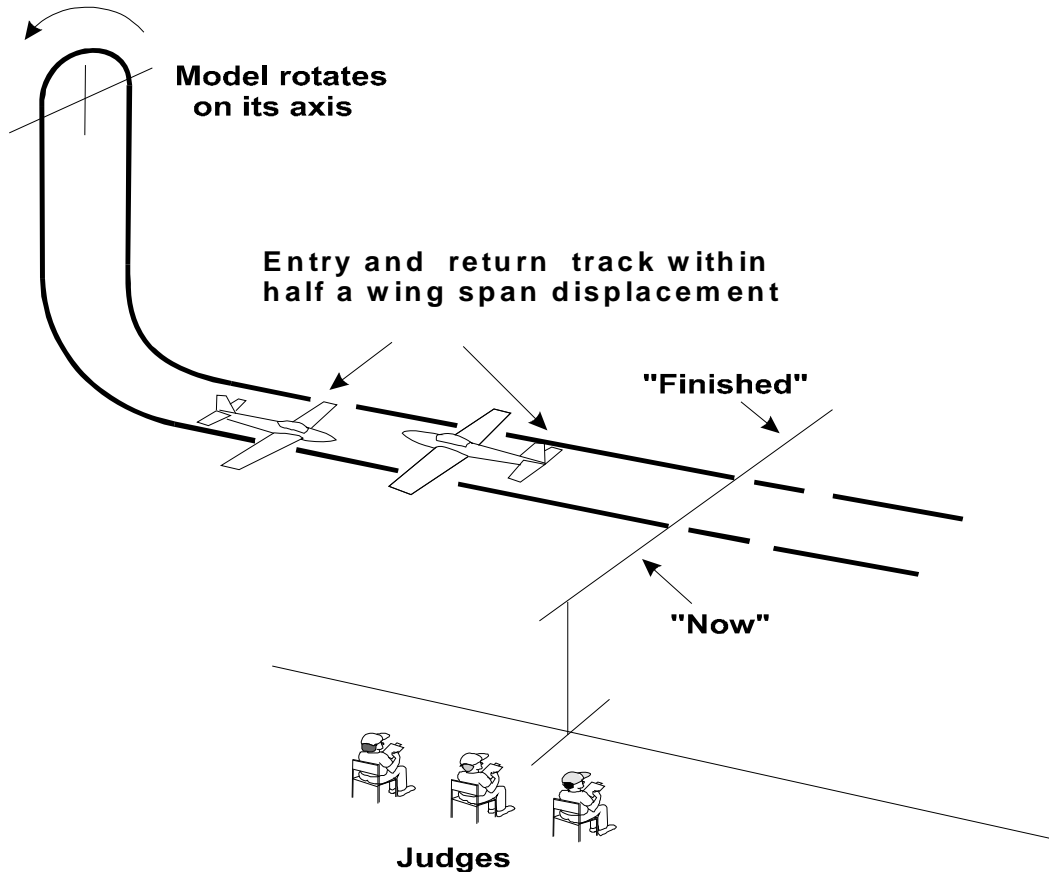
Errors:

1. Bombs or tanks do not detach and fall in a realistic manner.
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.

cont/...

E. Stall Turn:

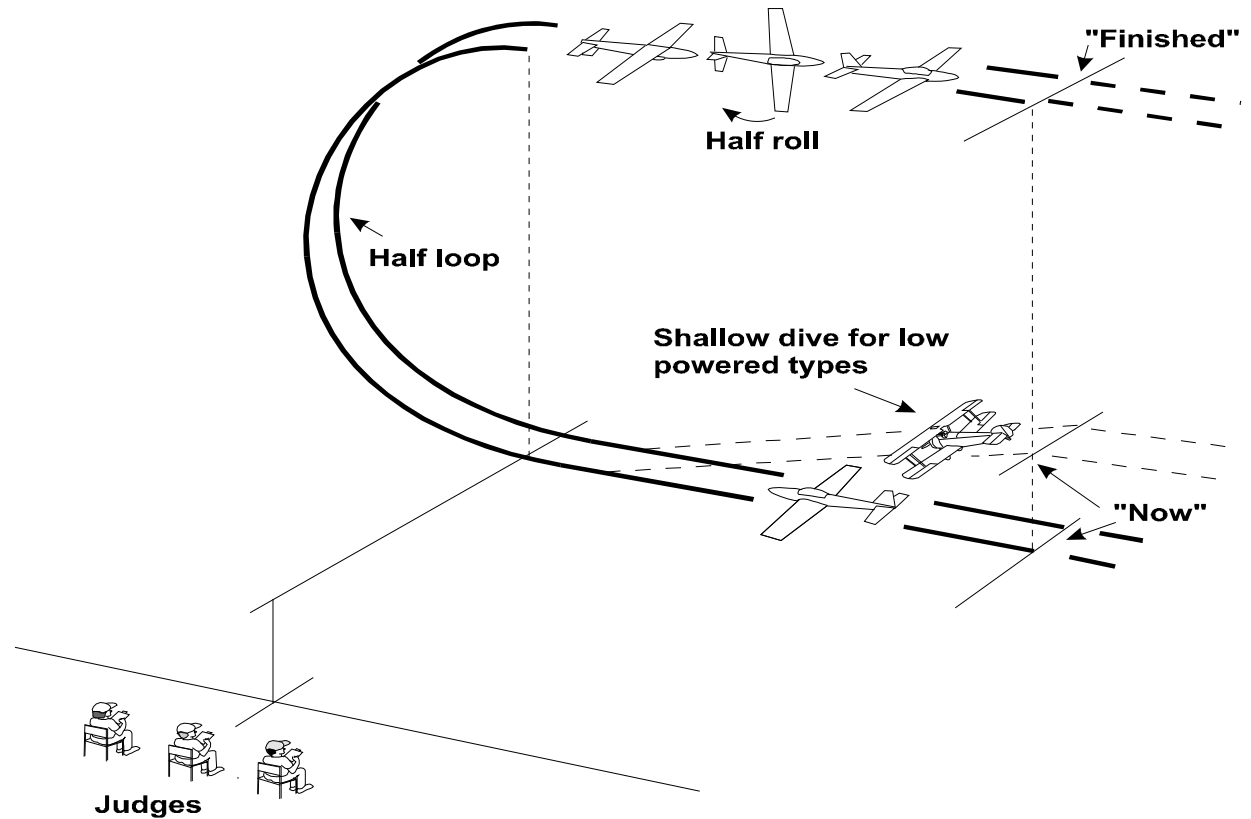
The model aircraft starts in level flight, noses up to a vertical flight path until it comes to a stop. At which point the model aircraft yaws through 180 degrees, then dives and finally recovers straight and level on a flight path in the opposite direction to the entry. Entry and exit should be at the 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.

F. 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.

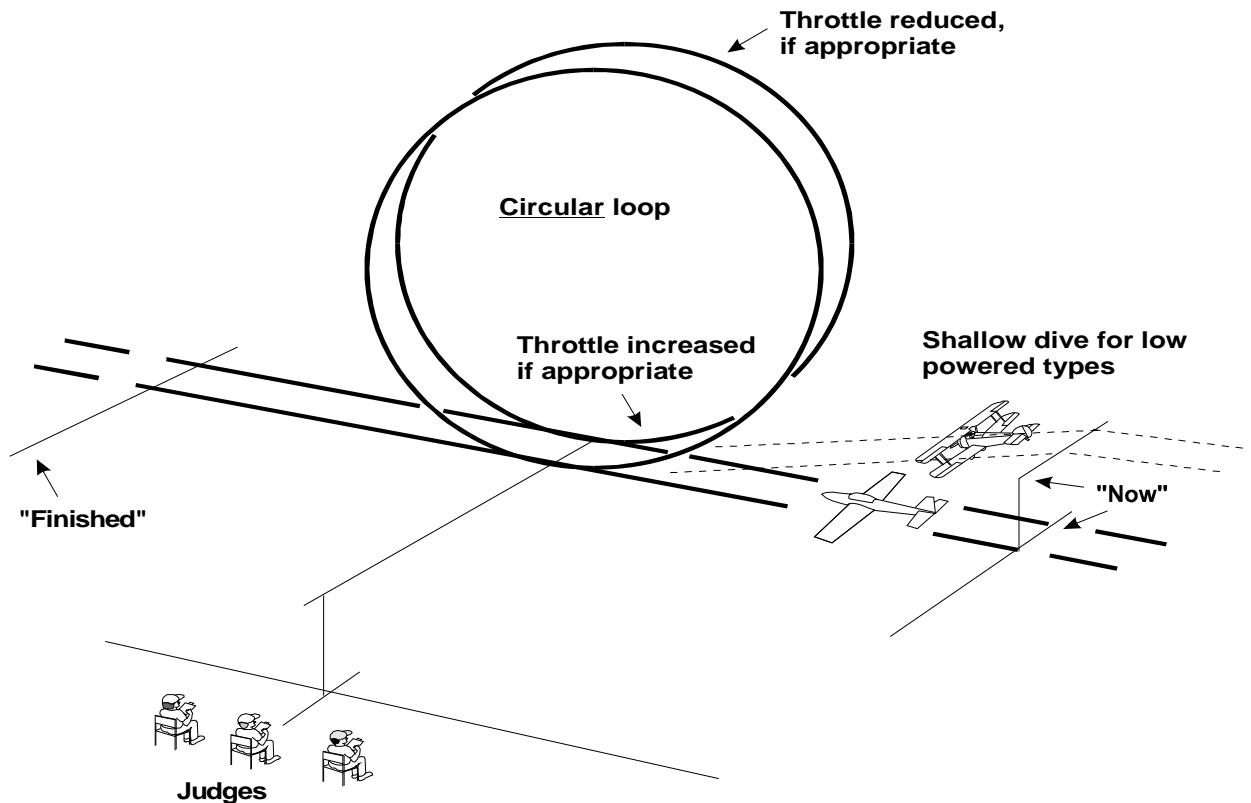
**Errors:**

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

G. 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 prototype.
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.

H. Cuban Eight:

Model aircraft pulls up into a circular inside loop until 45° nose down. The 45° inverted flight is held until a half roll when abeam the judges, 45° upright then held until entry height is achieved when a similar circular inside loop is flown to repeat the manoeuvre in the opposite direction. Straight and level recovery is to be at the same height as the original entry. Throttle may be closed at the top of each loop, as appropriate to subject type, and reopened during each descent. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

Included in this manoeuvre are the following deviations based on the primary Cuban Eight:

“Half Cuban Eight”

After the first 45 degree dive, the model pulls out level at the entry height.

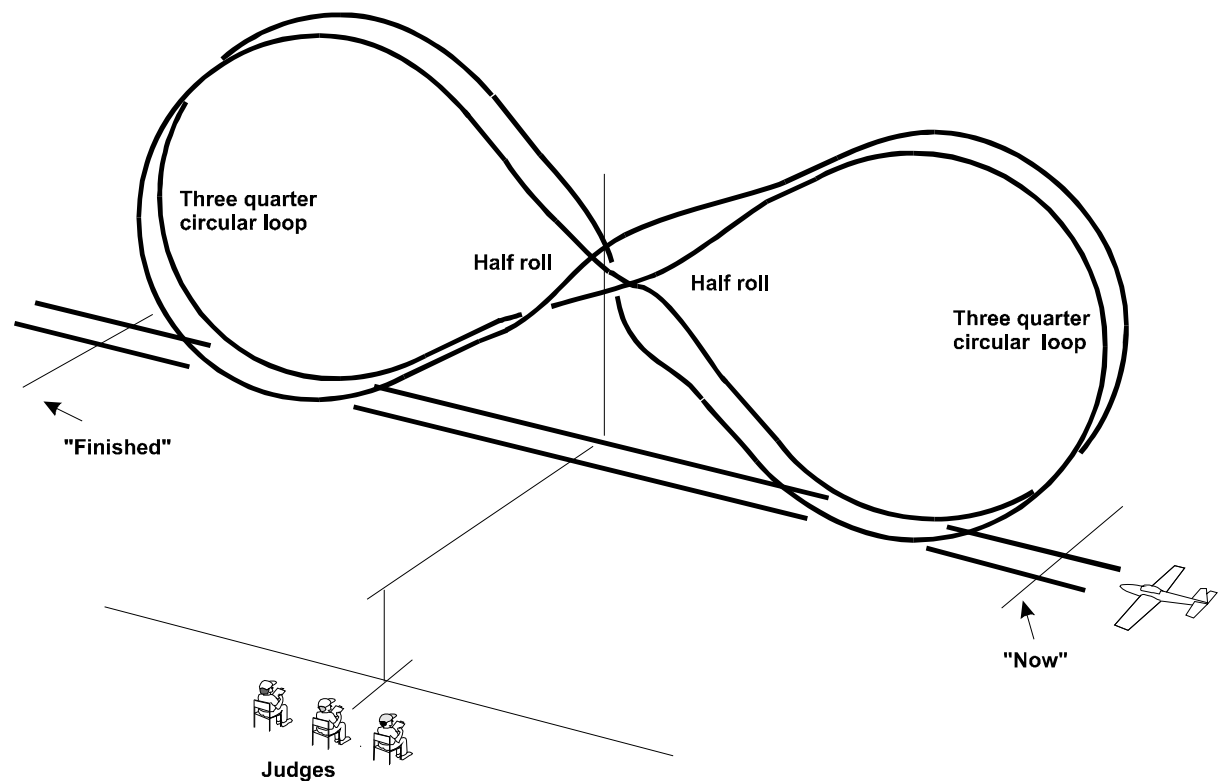
“Reversed Cuban Eight”

The model aircraft starts with a pull up 45° climb with half roll then enters the loop and continues as above but in reverse order.

“Reversed Half Cuban Eight”

Start with the 45° climb and half roll then loop to finish level with entry.

Competitor must specify on the score sheet which variation will be used.

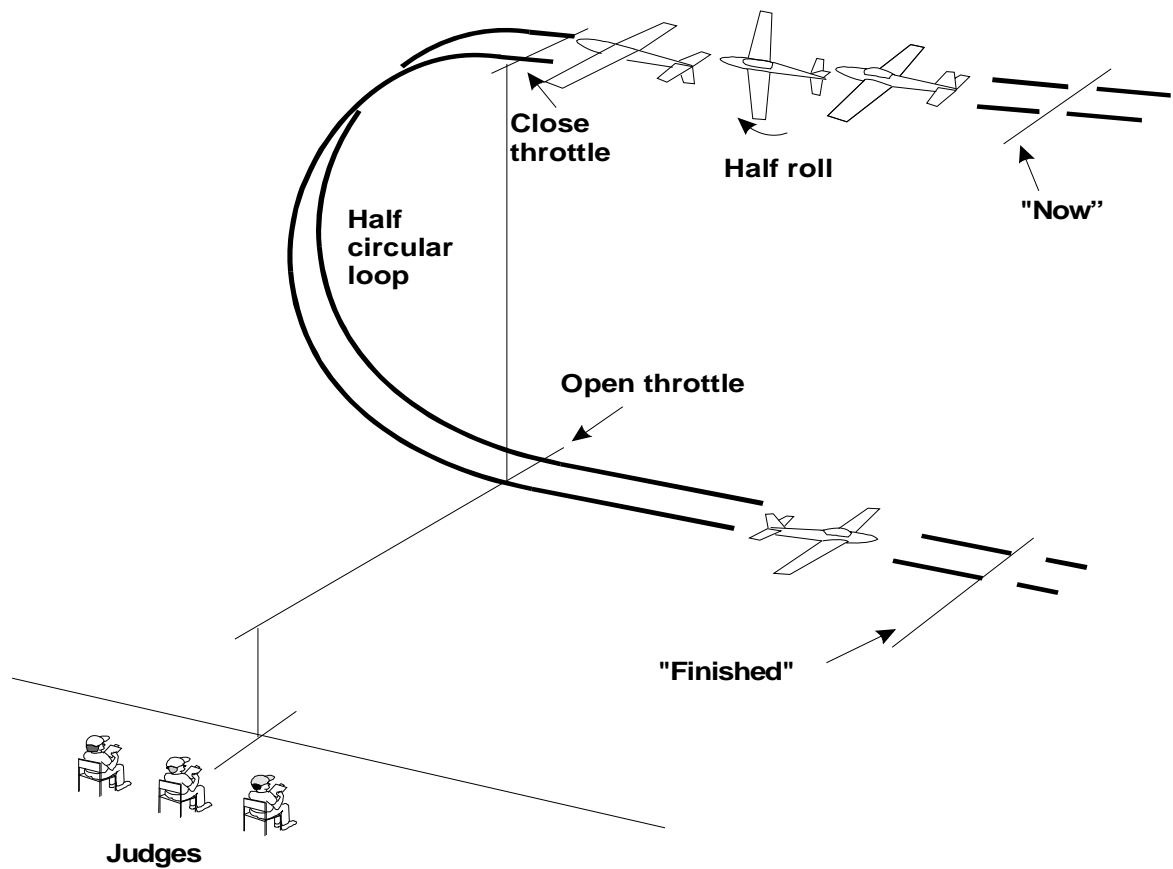


Errors:

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 loops not in manner of prototype.
10. Too far away/too close/too high/too low.

I. 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.

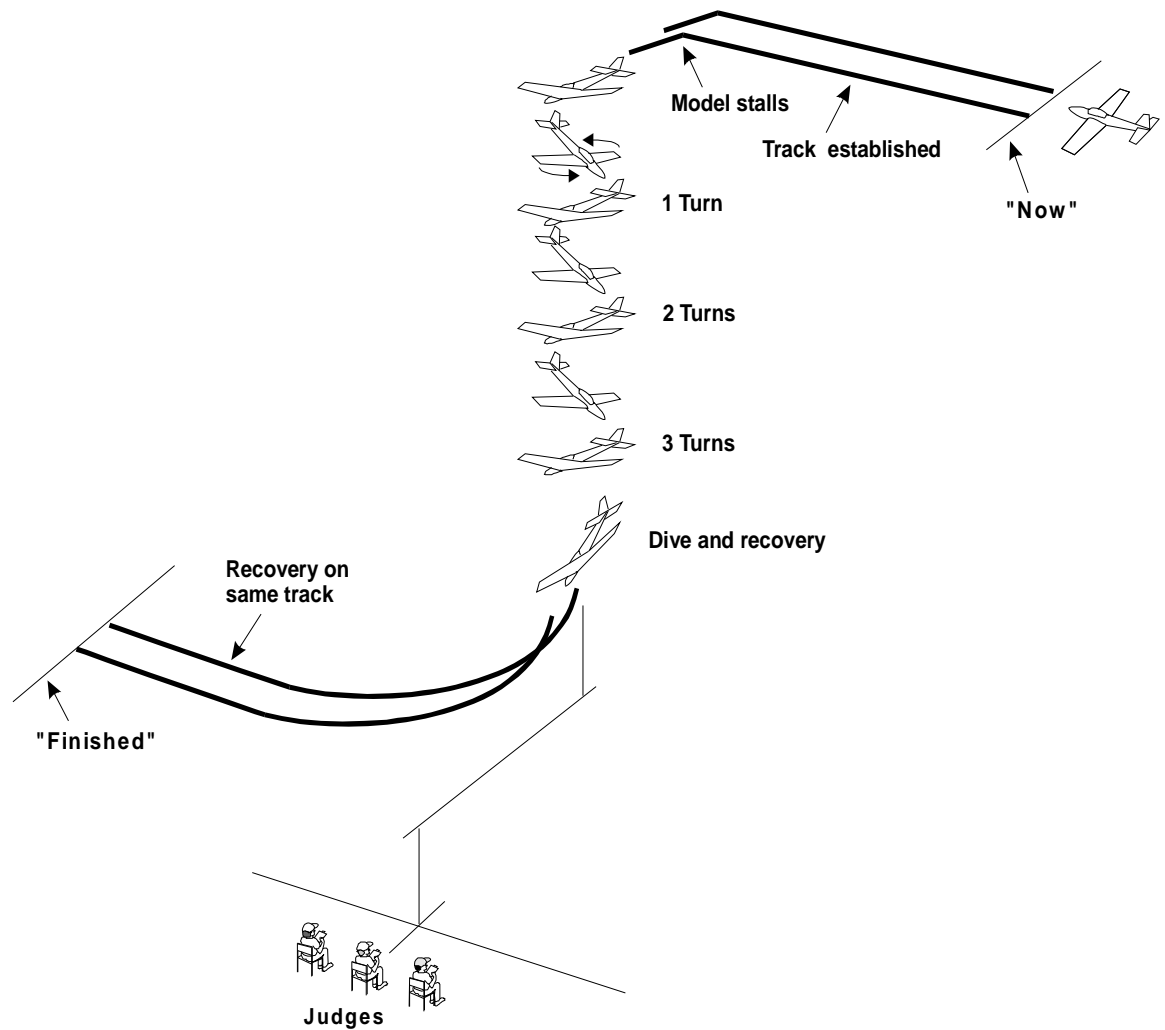


Errors:

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 on line or vertical.
5. Half loop is not sufficiently semicircular.
6. Too fast or too tight a half loop.
7. Does not resume straight and level flight on opposite track to entry.
8. Half loop not centred on judges' position.
9. Manoeuvre not flown parallel with the judges' line.
10. Too far away/too close/too high/too low.

J. 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.

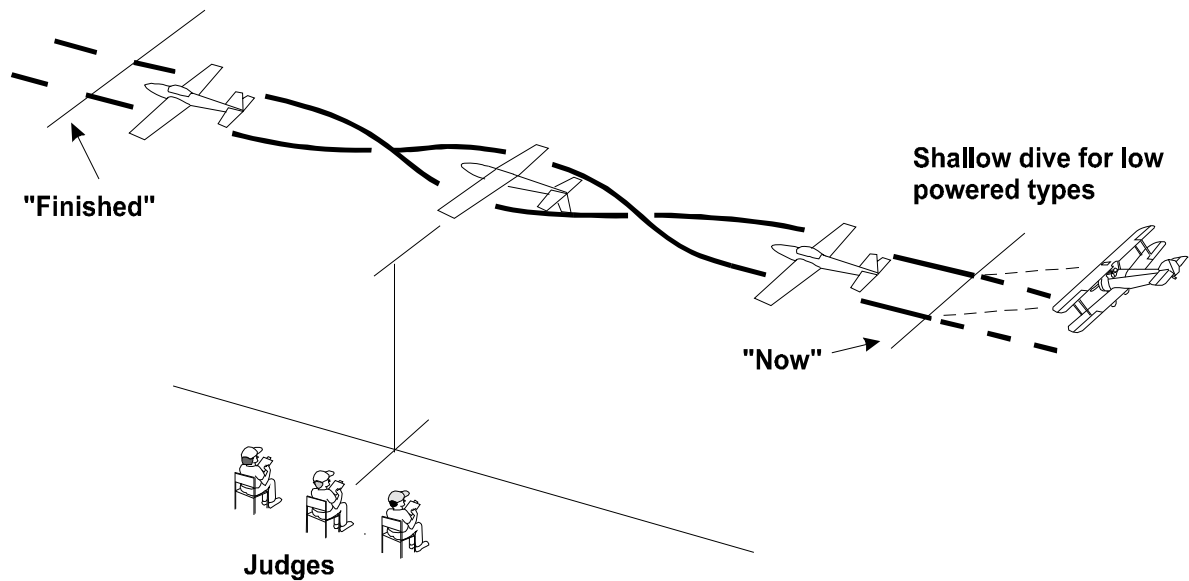


Errors:

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 descent path will be close to C of G of 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.

K 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, eg Slow, Barrel, Snap.

**Errors:**

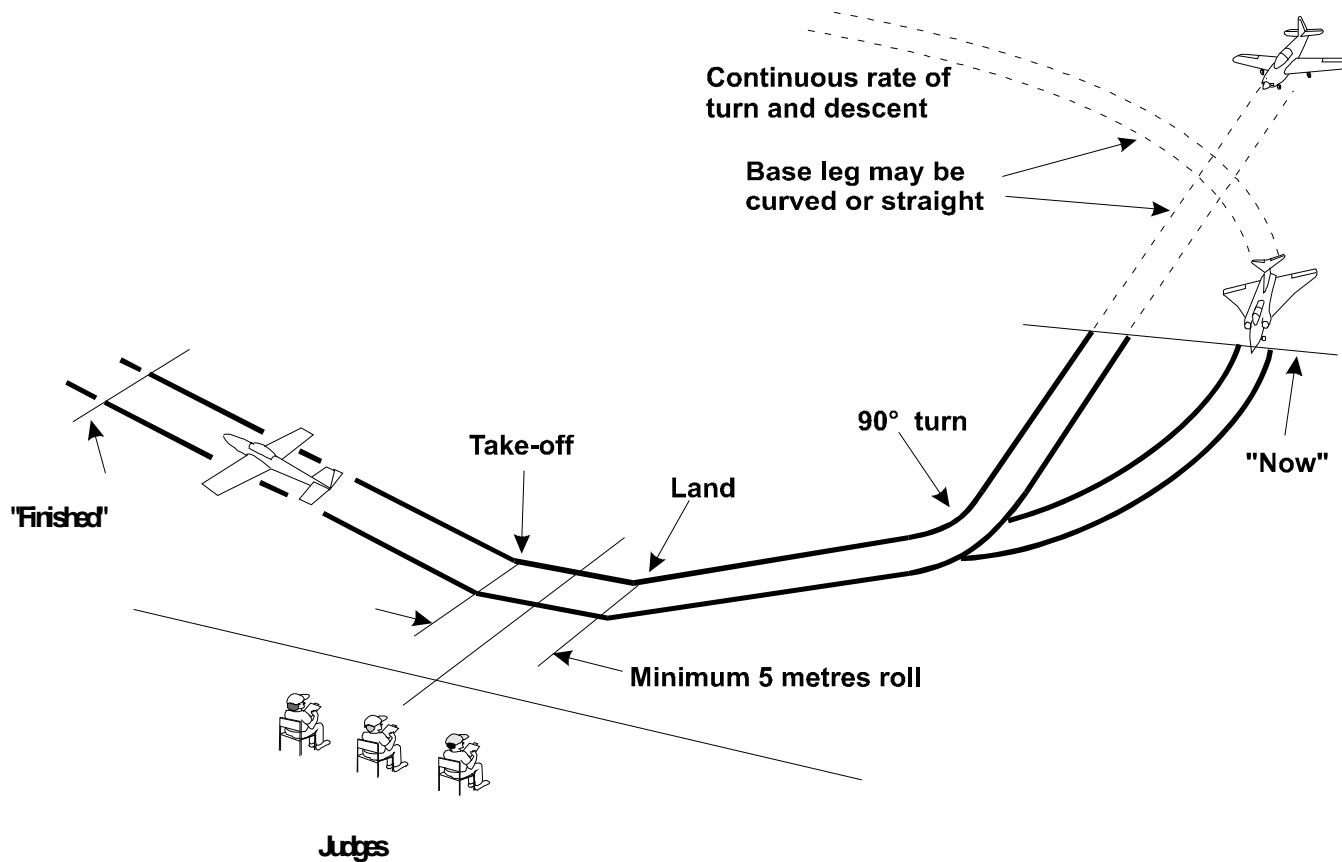
1. Rate of roll is not constant.
2. Style of roll not typical to prototype.
3. Roll not centred on judges' position.
4. Entry and exit at different heights.
5. Entry and exit at different speeds.
6. Entry and exit tracks and line of roll not parallel with judges' line.
7. Does not resume straight and 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.

L Parachute:

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

M 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:**

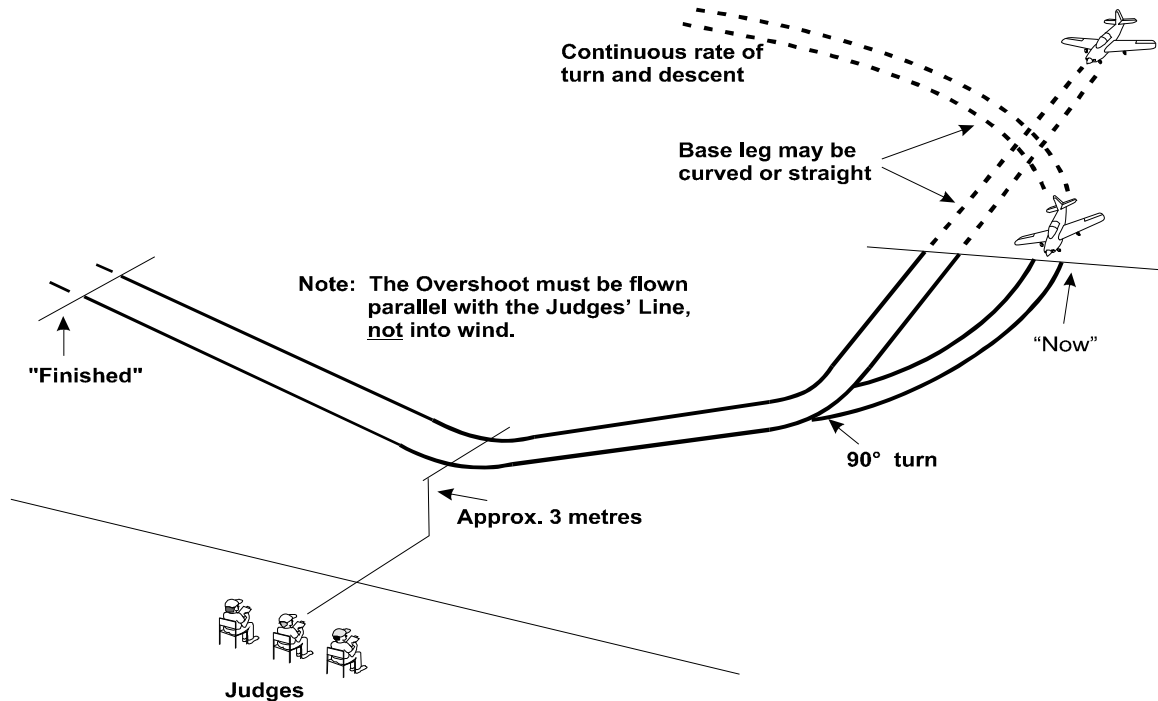
1. Manoeuvre does not commence on base leg.
2. Turn onto final approach too tight or not 90°.
3. Descent from base leg not smooth and continuous.
4. Model aircraft does not achieve correct landing approach prior to touchdown.
5. Model aircraft does not achieve a minimum ground roll of 5 metres.

Note: if prototype 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.

N Overshoot:

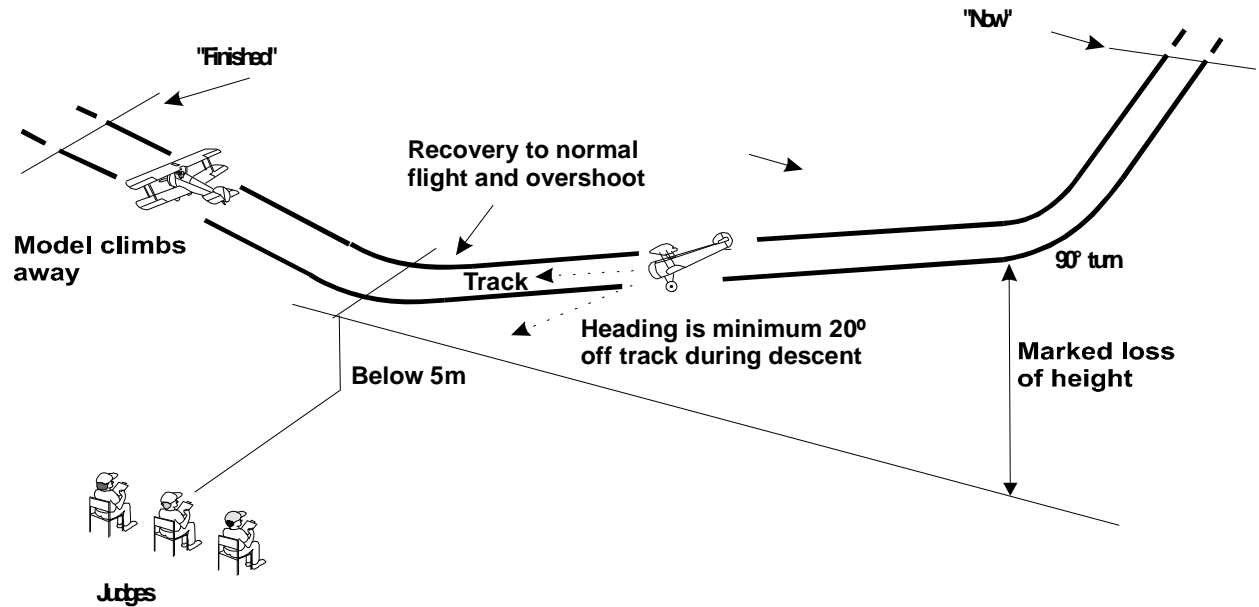
The model aircraft commences by descending from base leg, which may be either curved or straight as required by the pilot. The turn is continued through 90 degrees onto a higher than normal landing approach on low throttle, using flaps if applicable. On reaching the centre of the landing area at a height 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.

O Side Slip:

The model aircraft commences the manoeuvre in level flight by reducing power on base leg, and then turns onto a higher than normal final approach that is parallel with the judges' line. As the model 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 effect a landing in front of the judges. Before reaching the judges' position however, the Sideslip is corrected, normal flight is resumed and the model 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.

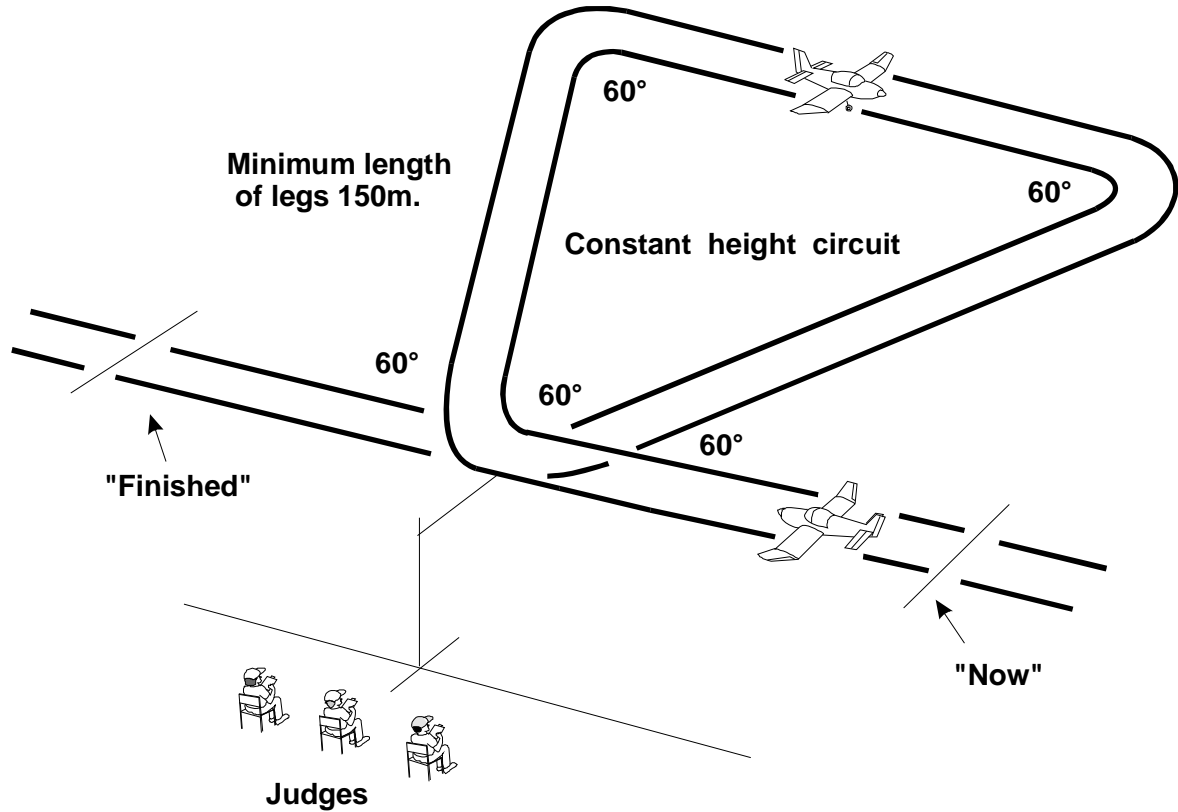
P and Q. Flight Function(s) Performed by Prototype Aircraft:

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

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

R. Flight in Triangular Circuit:

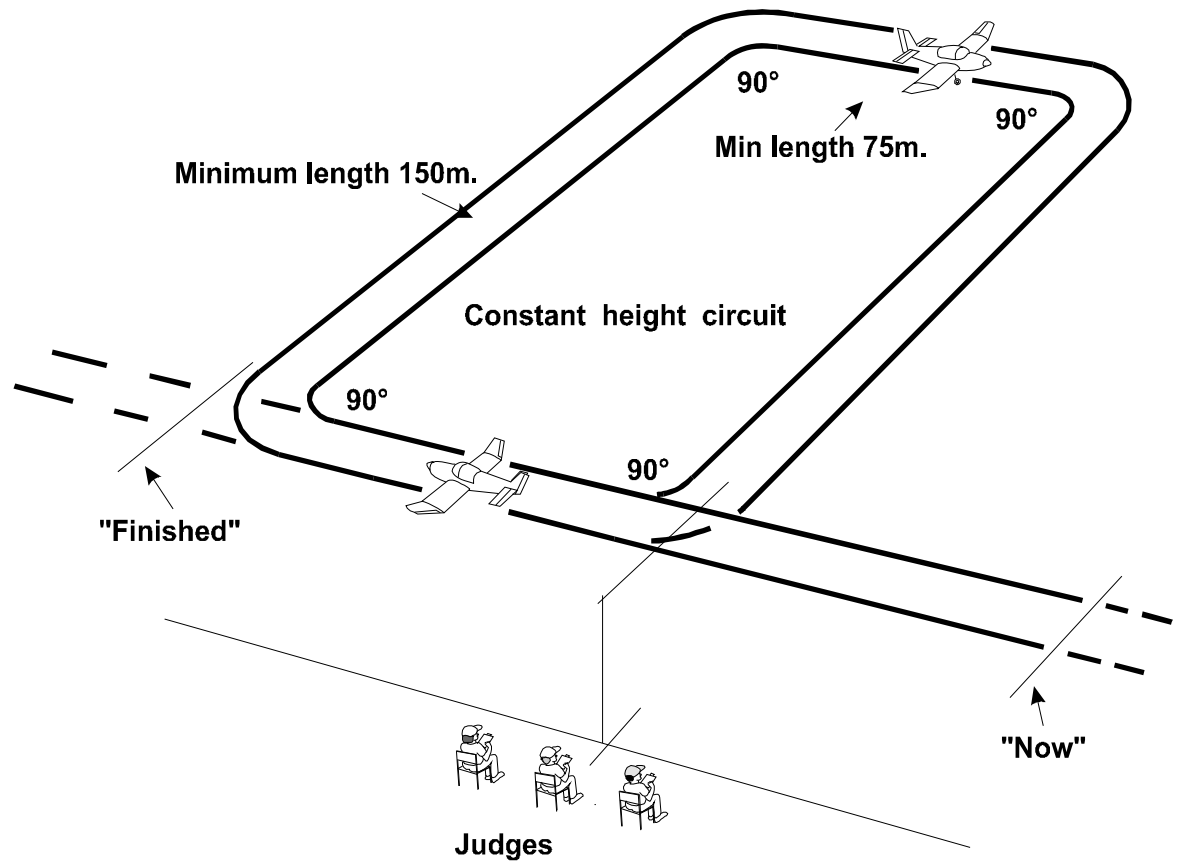
The model aircraft approaches in a straight and level flight to a point directly in front of the judges. It then turns away to track 60° away from the judges' line. It then flies straight and level for a minimum of 150 metres, turns to track parallel with the judges' line, flies a further minimum of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

S Flight in Rectangular Circuit:

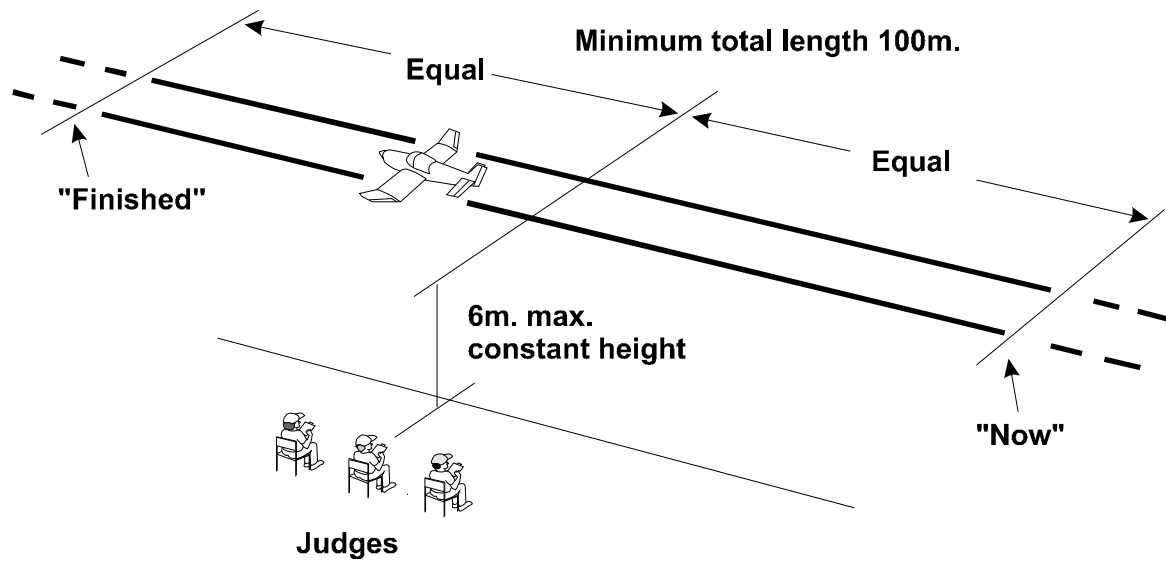
The model aircraft approaches in straight level flight to a point directly in front of the judges. It then continues for a minimum of 75 metres before it turns away to track 90° from the judges' line and flies straight and level for a minimum of 150 metres before turning to track parallel with the judges' 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.

T 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.

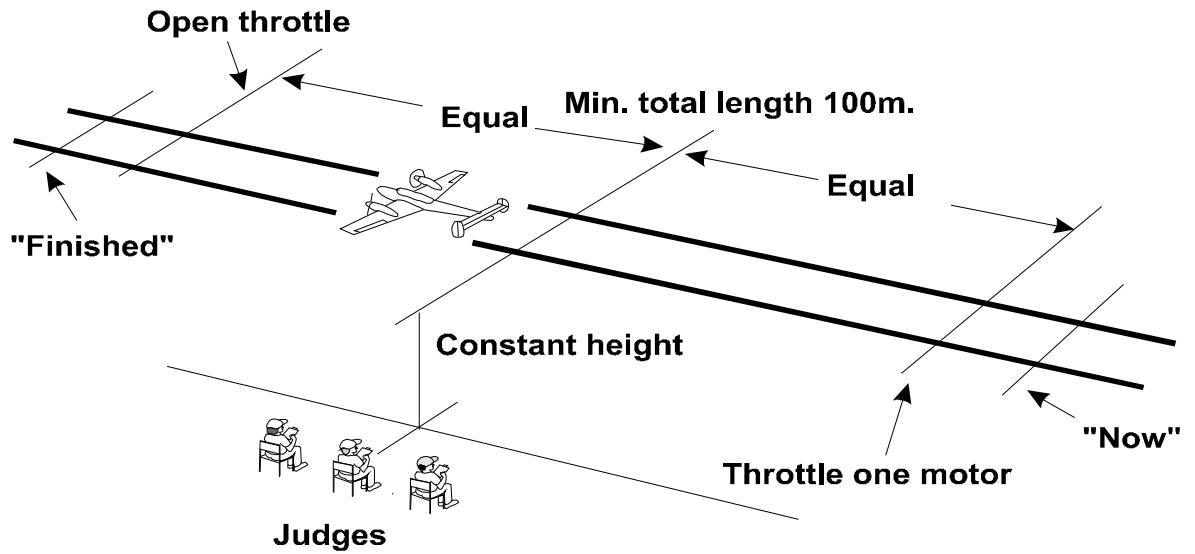


Errors:

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.

U 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.)



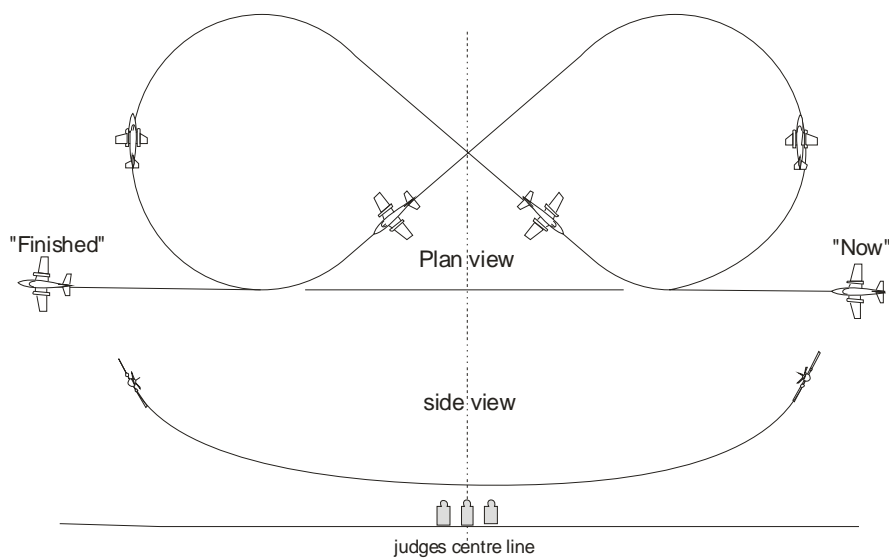
Errors:

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.

V 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 at least 60° 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.



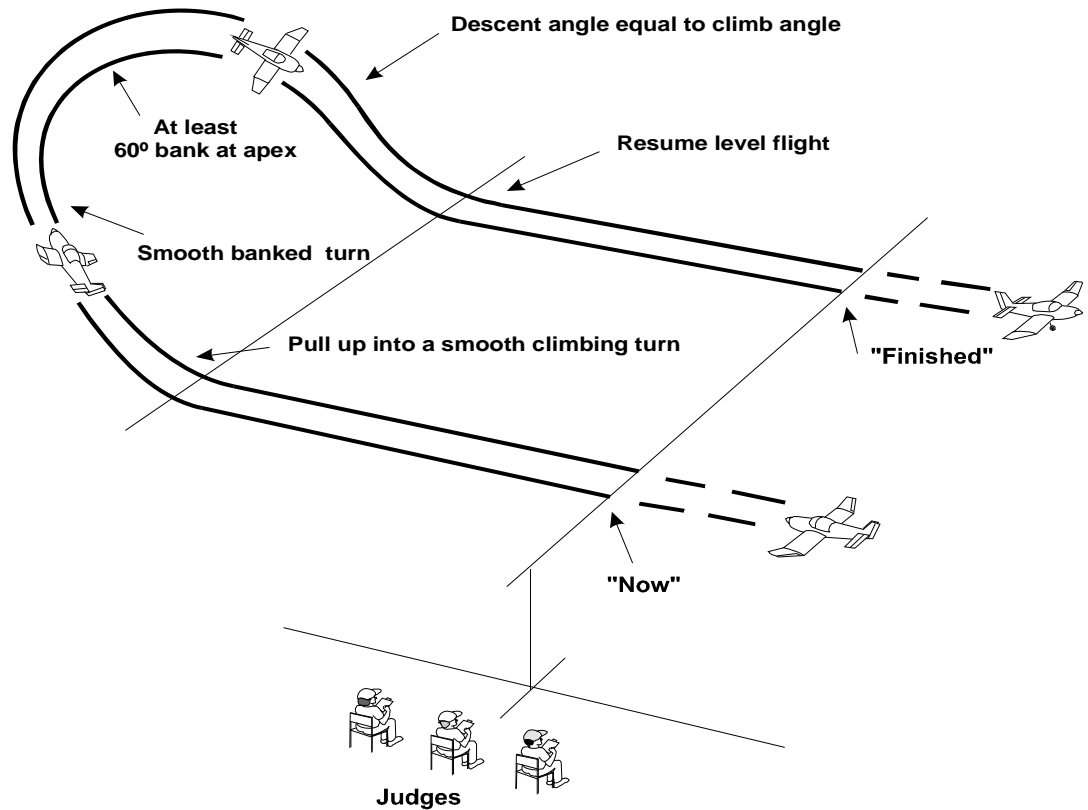
Errors:

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

W 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 at least 60° for a non-aerobatic model and at least 90° for an aerobatic model. The height gain should be appropriate to the capability of the prototype. The model then continues on a mirror image of the entry flight path and recovers to straight and level flight at the same height but on the opposite heading to the entry and on a line displaced away from the judges.

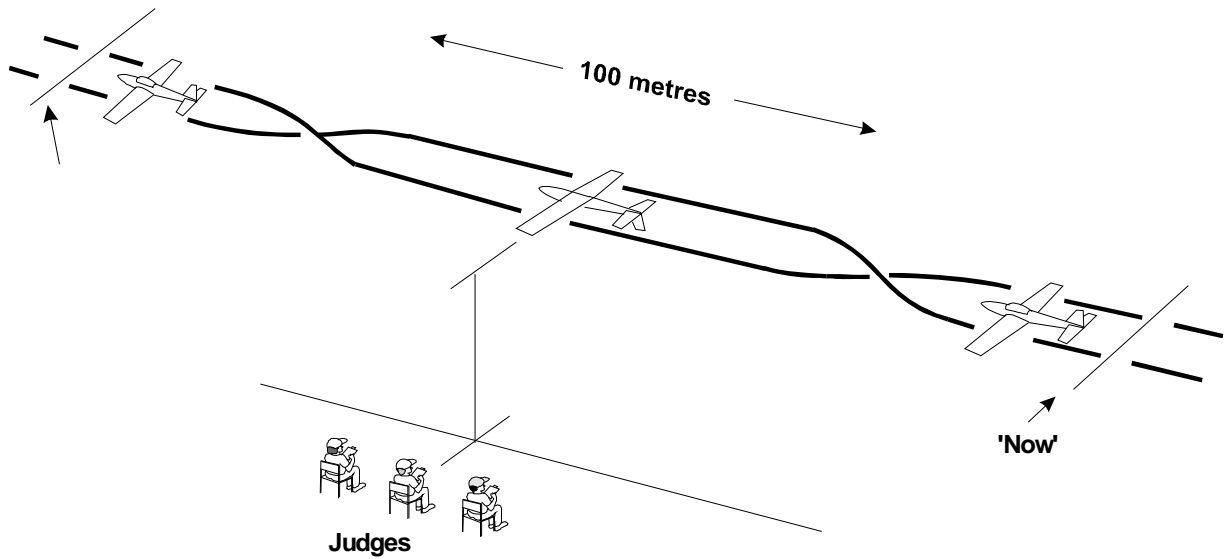
A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

**Errors:**

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

X Inverted Flight.

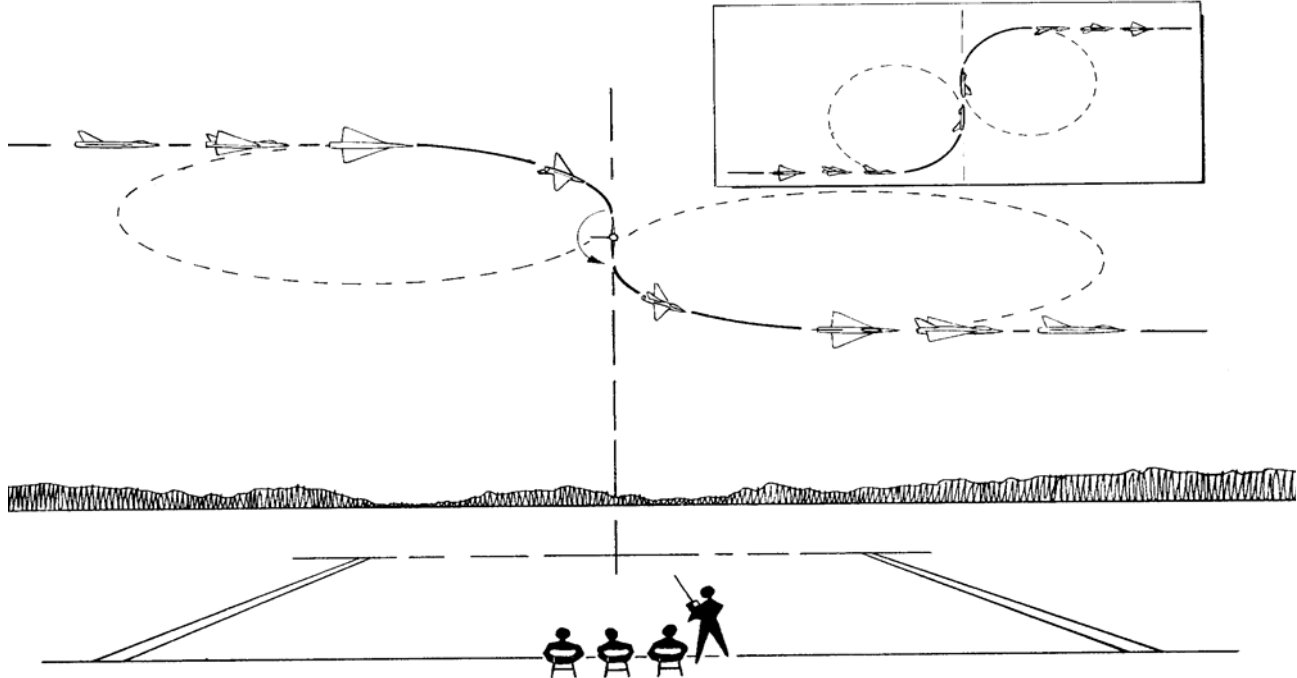
Model aircraft half rolls into inverted attitude and makes a straight inverted flight of 100 metres in length, and then half rolls out of inverted attitude and resumes normal straight flight. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed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

**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.

Y. 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.

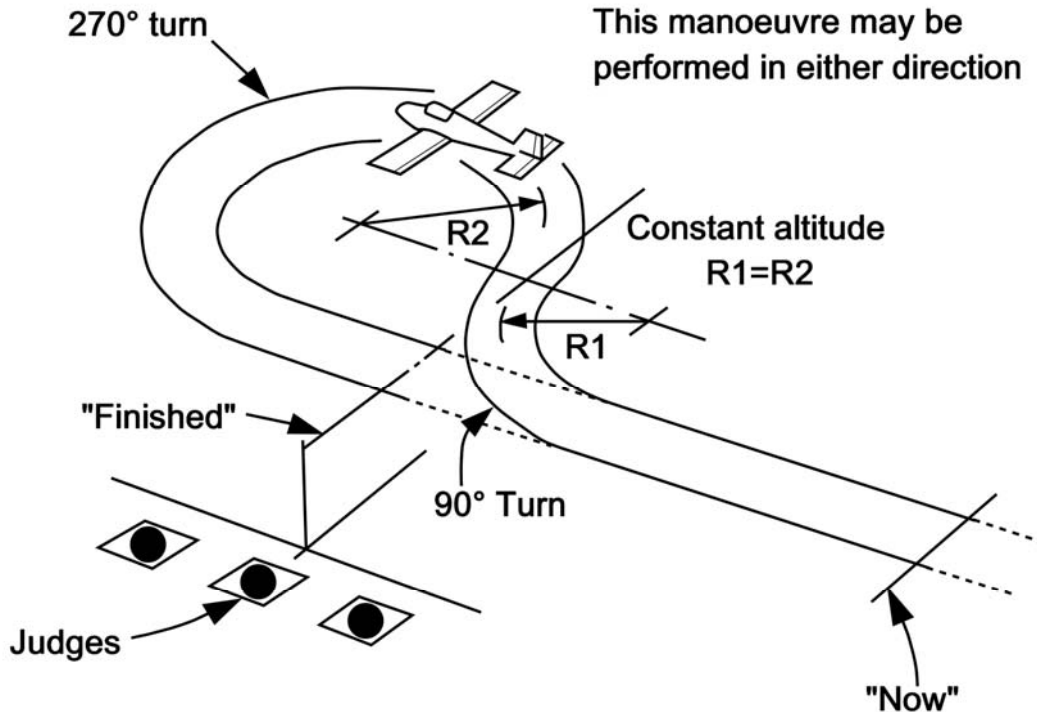


Errors

- 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.

Z. 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.

ANNEX 6E
FORM(S) FOR USE IN SCALE MODEL AIRCRAFT CONTESTS
CLASSES F4B, F4C, F4G & F4H

ANNEX 6.E1 COMPETITOR'S DECLARATION FORM.

This form must be completed and signed by the competitor and endorsed by the competitor's NAC.

CHAMPIONSHIP logo and FAI emblem

Competitors are to indicate answers YES or NO by circling the appropriate boxes

Competitor's Name	National Identification	Model Name & Type	Class – F4B F4C, F4G, F4H

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

NON-AEROBATIC DECLARATION - Under the terms of rule 6.3.7, do you consider your aircraft to be non-aerobatic? If YES give reasons below.

YES	NO
-----	----

cont/...

Annex 6E.1 .../cont

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

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

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

COMPETITOR'S CERTIFICATION

F4B, F4C and F4G: I certify that I am the builder of the model and that the answers given above are correct. Name(block letters) Signature.....
F4H only – I certify that I applied the colour scheme and markings to the model and the answers given above are correct Name(block letters) Signature.....

ENDORSEMENT BY THE COMPETITOR'S NATIONAL AIRSPORTS CONTROL

I certify that the Competitors Certification is valid and the answers given above have been verified. Name(block letters) Signature..... Position Held /Authority

ANNEX 6E.2 Example of a Flight Score Sheet

(Championship Title & Logos)

FLIGHT SCORE SHEET

Flight
Number

Name Nationality Competitor Number

Aircraft Scale Cruise/Max Speed

Competitors must select below (*in flying order 2 to 9*) **EIGHT** of the following manoeuvres appropriate to the subject aircraft, two of which **MUST be the Figure Eight and the Descending Circle.**

		K	Mark	Comments
1	Take Off (including climb-out + 900 turn)	11		
	Figure eight (900 + 3600 + 2700)	7		
	Descending Circle (360°, descent below 6 m.)	7		
	Extend and Retract Landing Gear/Flaps (360° turn, not above 15 m.)	7		
	Drop Bombs/Fuel Tanks (nominate either)	7		
	Parachute	7		
	Touch and Go (main wheels on ground for minimum of 5 m.)	7		
	Lazy Eight (direction away from the judges, minimum bank 60°)	7		
	Sideslip (minimum yaw 20°, descent below 5 m.)	7		
	Flight in straight line with one engine throttled (min 100m)	7		
	Stall Turn Left/Right (direction to be nominated beforehand)	7		
	Immelmann Turn	7		
	Inside Loop	7		
	Split 'S' (Reversal)	7		
	Cuban Eight	7		
	Normal Spin (Three Turn)	7		
	Roll (nominate any special type, eg Slow, Barrel, Snap)	7		
	Inverted Flight (½ roll - 100m - ½ roll)	7		
	Derry Turn	7		
	1st Flight Function performed by subject aircraft:	7		
	2nd Flight Function performed by subject aircraft:	7		

Any of the following six manoeuvres may only be selected by subjects certified and approved as "Non-Aerobatic" on the Competitor's Declaration Form (Annex 6E.1)

	Chandelle (180° Climbing turn)	7		
	Flight in a Triangular Circuit (sides minimum length 150m.)	7		
	Flight in a Rectangular Circuit (sides min. lengths 75m. x 150m.)	7		
	Flight in a Straight Line at constant height (min 100m, max ht 6m.)	7		
	Wingover (direction away from the judges, minimum bank 60°)	7		
	Overshoot (at approx 3m.)	7		

10	Approach and Landing	11		
11	Realism in Flight			
	Engine Sound (Realistic Tone and Tuning)	4		
	Speed of the Model	9		
	Smoothness of Flight	9		

Declaration seen: YES / NO Judge's signature: Chief Judge's signature:

Notes/For scorekeeping use