

## **PART SIX**

### **TECHNICAL RULES FOR FLYING SCALE MODEL CONTESTS**

#### **6.1 GENERAL RULES AND STANDARDS FOR STATIC JUDGING OF SCALE MODELS**

##### **6.1.1. Definition of Scale Models:**

A scale model shall be a reproduction of a heavier than air, fixed-wing, man-carrying aircraft. The aim of scale contests is to recreate the accurate appearance and realism of the full-size aircraft as best appropriate to each aeromodelling class. This shall apply equally to static judging and flight performance.

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

##### **6.1.2. System of Rules**

Rules are numbered as follows:

- 6.1. General rules and standards for judging Fidelity to Scale
- 6.2. Control Line Flying Scale Models
- 6.3. Radio Controlled Flying Scale Models

##### **6.1.3. Competition Programme:**

A competition programme for a particular event shall consist of part 6.1 plus the regulations for the specific event. Rules for C/L events shall consist of 6.1. plus 6.2. and for R/C events 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 has been flown. Thereafter flying and static judging will be carried out concurrently, models being flown before being presented for static judging.

##### **6.1.4. Judges**

The organiser of a Scale C/L World or Continental Championship (F4B) shall appoint five judges, of whom three will be nominated to do the static judging, but all five will judge the flying once static judging is complete.

The organiser of Scale R/C World or Continental Championship (F4C) shall appoint three judges to do static judging, plus a separate panel of five to judge the flying.

At other international flying Scale competitions, panels of three judges may be used for both flying and static.

Within each class (F4B and F4C) all the judges (static and flying) must be of a different nationality and selected from a list submitted by their NAC and approved by the CIAM.

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.

The static judges must have a common language.

If there are more than 70 competitors in a World or Continental Championship, the organiser may use two separate panels for static judging. Each panel will consist of three judges. The first panel will judge the points Scale Accuracy ( 6.1.10.1 - Side view, End view and Plan view). On completion of this, the second panel will judge the remaining aspects. ( 6.1.10. 2 - 6.)

### 6.1.5. Coefficient

Where a K-factor (K) is noted, scoring shall be from 0 to 10 inclusive using increments of half a mark. The score shall then be multiplied by the K-factor (K).

### 6.1.6. Remarks

- a) All models shall become airborne in the manner of their prototype.
- b) In the absence of suitable water surface conditions, models 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 structures will not be taken into consideration in the scoring of Fidelity to Scale and Craftsmanship.
- c) No parts of a model, except propeller and spinner may be removed, nor may anything except a dummy pilot and antenna be added externally to the model, between scale judging and flying. Bombs, drop-tanks, etc. must be presented in static, 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 air entries are permitted, provided they are covered by movable hatches for static judging; these hatches may be moved or opened manually prior to flight, or 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 in flight must not be unduly affected.
- d) A flying propeller of any form or diameter may be substituted for a scale propeller. The size, shape and colour of the spinner may not be changed.  
Note: Substitution for a scale propeller relates only to powered propellers that were intended to propel the subject aircraft. If a model of a multi-engined aircraft uses non-powered (windmilling) propellers, these may not be changed between static and flying. Features such as for example, the small generator propeller on the nose of an aircraft such as a Me163, may likewise not be changed for flying propellers
- e) Metal bladed flying propellers are forbidden.
- f) Explosives must not be dropped.
- g) If the pilot of the prototype is visible from the front or from the side during flight, a dummy pilot of scale size and shape must be equally visible during flight in the model. If such a pilot is not fitted, the total flight score shall be reduced by 10%. The dummy pilot may be present during static judging but will not be taken into account.
- h) A measurement of weight must be undertaken immediately after the first flight of each Model. No modification of the model except exhausting of fuel and cleaning of the model is allowed. If found to be overweight, then zero points will be awarded for that flight and the model must be reweighed after each subsequent flight. The officials responsible for weighing the models and the device to be used shall be available to all competitors for weighing prior to the first flight of the contest. The tolerance of the weighting equipment to be added to the maximum weight (i.e. C/L model max weight 6 kg, weight tolerance 15 grams gives total allowed weight of 6.015 Kg as maximum).
- i) Any model that, in the opinion of the judges or the Contest/Flight Line Director, appears to be noisy in flight will have to submit to a noise check after that flight. Turbine powered models are exempt from such noise checks. For details see sections 6.2.1 (F4B) and 6.3.1 (F4C). The organiser must provide the pilots with the possibility to conduct noise checks prior to the competition.

#### 6.1.7. **Number of Models**

Each competitor may compete only with one model in any one category, Control Line or Radio Control.

#### 6.1.8. **Helpers**

Each competitor is permitted one helper during the competition. In the case of multi-engined models one additional helper is permitted to assist in the starting of engines.

For radio control events no helper may touch the transmitter during an official flight except for assisting in starting engine(s).

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

#### 6.1.9. **Documentation ( Proof of Scale )**

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

6.1.9.2. The exact name and model designation of the prototype shall be indicated on the entry form, on the score sheet, and also in the "Proof of Scale" presentation.

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

6.1.9.4. To be eligible for Fidelity to Scale points the following documentation must be submitted to the judges: -

a) Scale Drawings:

An accurate 3view scale drawing of the full-size aeroplane, having a minimum span of 250 mm, and a maximum span of 500 mm. The drawings must be submitted in triplicate. Unpublished drawings by the competitor or other draftsman are not acceptable unless certified accurate in advance of the contest by an authoritative source such as the respective National Scale Committee or equivalent, builder of original aircraft, or other competent authority.

b) Proof of Colour:

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

c) Photographic evidence:

At least three photographs or printed reproductions of the prototype, including at least one of the actual subject aircraft being modelled. Each of these photographs or printed reproductions must show the complete aircraft, preferably from different aspects. These main photos must be submitted in triplicate, the second and third copies may be photocopies.

d) Aircraft speed:

The cruising or maximum speed of the subject aircraft must also be included in the documentation.

e) Competitor's declaration:

The competitor must supply a declaration listing all components of the model he did not make himself. The competitor must also sign a declaration that he is the builder of the model entered. If found in violation the competitor may be disqualified from the contest.

#### 6.1.10. Judging for Fidelity to Scale and Craftsmanship

	K - Factor
1. Scale Accuracy	
Side view .....	10
End view .....	10
Plan view .....	10
2. Colour	
Accuracy.....	2
Complexity.....	1
3. Markings	
Accuracy.....	4
Complexity.....	2
4. Surface texture and realism.....	8
5. Craftsmanship	
Quality .....	7
Complexity.....	3
6. Scale detail	
Accuracy .....	5
Complexity.....	3
Total:	K = 65

Items 1 to be judged at a minimum distance of 3m in F4B, and 5m in F4C, from the nearest part of the model. Judges must not touch the model.

#### 6.1.11 Static Scoring

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

#### 6.1.12 Organisation of Scale Events

For transmitter and frequency control see Section 4b, Para B.8.

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

The flight order of the competitors will not be changed unless, in the case of R/C events, the organisers need to do so to avoid frequency clashes. 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 placings after two flight rounds and static.

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

### 6.3. CLASS F4C - RADIO CONTROLLED FLYING SCALE MODELS

#### 6.3.1. General Characteristics

Maximum surface area: .....250 dm<sup>2</sup>

Maximum weight of the complete model without fuel in flying condition including any dummy pilot: ..... 12 kg

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

Motive Power:

- a) Rocket or pulse jet engines may not be used.
- b) The maximum thrust for a turbine motor shall be ..... 10 kg.
- c) Electric motors; maximum no load voltage of power source: ..... 42 volts.

If a model appears to be noisy in flight, the Judges or Contest / Flightline Director can demand a noise test. The transmitter and the model will then be impounded by the flightline official immediately following the flight. No modification or adjustment to the model shall be permitted other than refuelling. If the model features variable pitch propeller(s), the noise test will cover the total variation of pitch. The model shall be tested by a noise steward and in the event the model failing the noise test will be retested by a second noise steward, using a second noise meter. If the model fails the retest, the score for the preceding flight shall be zero. The 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 centre line of the model with the model placed on the ground, over concrete or macadam, at the flying site. With the motor running at full power, measurement will be taken 90 degrees to the flight path on the side chosen by the competitor and downwind from the model. The microphone will be placed on a stand 30 cm above the ground in line with the motor(s). No noise reflecting objects shall be nearer than 3 metres to the model or the microphone. If a concrete or macadam surface is not available then the measurement may be taken over bare earth or very short grass, in which case the maximum noise level will be 94 dB(A). In the case of multi-engine models, the noise measurement will be taken at 3 metres from the closest engine to the noise meter and the maximum noise level will be the same as for single engine models.

#### 6.3.2. Radio Equipment

The use of automatic attitude or motion stabilisation devices (e.g. gyros) is forbidden.

#### 6.3.3. Official Flights

- a) Each competitor will be called to fly three times, 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.
- 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 motor(s).
  - ii) Two minutes after the competitor is instructed to start his flight.
  - iii) An official flight is terminated when the model 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 14 minutes in the case of an aerobatic prototype, or 17 minutes in the case of a non-aerobatic prototype, to complete his flight.
- e) In the case of a multi-engined model, the time allowed in (d) above will be increased by one minute for each additional motor.
- 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 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 motor(s) stops after the take-off has commenced, but before the model is airborne, the motor(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 = 8
6.3.6.2.	Straight flight .....	K = 2
6.3.6.3.	Figure Eight.....	K = 6
6.3.6.4.	Descending 360 <sup>o</sup> Circle .....	K = 6
6.3.6.5.	Option.....	K = 4
6.3.6.6.	Option.....	K = 4
6.3.6.7.	Option.....	K = 4
6.3.6.8.	Option.....	K = 4
6.3.6.9.	Option.....	K = 4
6.3.6.10.	Approach and Landing .....	K = 10
6.3.6.11	Realism of flight	
	a) Engine sound (realistic tone & tuning)	K = 2
	b) Speed of the model.....	K = 4
	c) Smoothness of flight.....	K = 4
	d) Size of manoeuvres .....	K = 3

Total..... K = 65

**Notes:** The scale of the model and the cruising or maximum speed of the prototype must be stated on the score sheet.

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

### 6.3.7. Optional Demonstrations

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 B, C, D, L, and, if applicable, P or Q).

Selection must be given to judges in writing before taking off. The options may be flown in any order. (Options A, N, R, S, T and W are for models of non-aerobatic aircraft only). The order in which the optional manoeuvres are flown must be marked on the score sheet and any manoeuvre flown out of order will be marked zero.

A	Chandelle .....	K = 4
B	Retract and extend landing gear .....	K = 4
C	Retract and extend flaps .....	K = 4
D	Dropping of bombs or fuel tanks .....	K = 4
E	Stall turn.....	K = 4
F	Immelmann turn .....	K = 4
G	One loop.....	K = 4
H	Split S (Reversal).....	K = 4
I	Cuban eight .....	K = 4
J	Normal spin (three turns) .....	K = 4
K	Roll .....	K = 4
L	Parachute .....	K = 4
M	Touch and go .....	K = 4
N	Overshoot .....	K = 4
O	Side slip to left or right.....	K = 4
P	1 <sup>st</sup> Flight function by subject aircraft .....	K = 4
Q	2 <sup>nd</sup> Flight function by subject aircraft.....	K = 4

*Competitors may demonstrate up to two different flight functions of their own choice, but must be prepared to supply evidence that each function was performed by the prototype modelled. Competitors must indicate to the Flight Judges the nature of the demonstration(s) before going to the flight line).*

R	Flight in triangular circuit.....	K = 4
S	Flight in rectangular circuit .....	K = 4
T	Flight in a straight line at constant height (maximum height 6 metres) .....	K = 4
U	Flight in a straightline with one motor throttled (for multi-engined models only) .....	K = 4
V	Lazy Eight .....	K = 4
W	Wingover.....	K = 4
X	Inverted flight.....	K = 4

#### 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.

There shall be a flagman at the site to indicate by visual and acoustic signal if and when the model passes over spectators. If this happens before a manoeuvre is completed, ZERO points shall be given for this manoeuvre. The flagman will keep a record of these incidents.

If a model is in the opinion of the judges or Contest / Flightline Director unsafe, or being flown in an unsafe manner, they may instruct the pilot to land.

#### 6.3.9. **Flight Score**

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 (e.g.. 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.

## ANNEX 6A

# TECHNICAL RULES FOR FLYING SCALE MODEL CONTESTS CLASS F4

### JUDGES GUIDE FOR STATIC JUDGING

#### 6A.1 General

Prior to commencement, the judges should review the whole entry at a distance not closer than 3 metres in order that a standard is established for grading of points to be awarded. The entries should be studied in relationship to each other from a superficial aspect before detailed examination commences.

The evaluation is broken down into six items. 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 be marginal.

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

If models are flown before being static judged (see 6.1.3.), any damage sustained during flight shall be ignored by the static judges.

#### 6A.1.9. Documentation for Proof of Scale

The minimum documentation required must be provided. Failure to comply shall result in zero marks being awarded under 6.1.10. for items 1, 2, 3, 4 and 6.

Additional documentation is desirable, but a competitor should not be unduly penalised for lack of detail photographic authentication for an aircraft which no longer exists and for which it is impossible to obtain exhaustive authentication, provided that a fully detailed three-view drawing is presented.

#### 6A.1.10. 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 nearest part of the model. A handler should be prepared to position the model as directed by the judges. No measurements are to be taken and the judges must not handle the models.

##### 6A.1.10.1. Scale Accuracy

Firstly, have the model positioned in a pose similar to that in the best photograph and check for any obvious discrepancies, also assess the "character" and realism of the model. Repeat this procedure with other suitable photographs. Then, using photographs and drawings, check:

- a) The side view, including the fuselage outline, cabin or canopy shape, cockpit aperture shape, engine cowling and spinner shape, outline of fin and rudder, wing and tailplane sections, wing stagger and struts on biplanes; shape, angle and position of landing gear legs and tail wheel or skid, size of wheels and tyres.
- b) End views, for dihedral, wing thickness and taper, wing struts, bracing and gap on biplanes, thickness of fin, rudder and tailplane, cross-sections of fuselage and engine cowling, cowling shape and cut-outs, dummy propeller size and shape, shape of cockpit canopy or windshields; size, shape, position and angle of landing gear, wheel track, tyre thickness.

- c) Plan views (above and below) 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.

Notes:

The photographs must take precedence over the drawings if there is any doubt concerning any item of scale accuracy. Caution must be exercised when determining rigging angles using photographs that are taken at an oblique angle, as these might give the wrong impression. The three-view drawing is usually more correct and easy to use in this respect.

If a model is equipped with a silencer fully or partly protruding from the contours of the model, or if it is visible well from the outside, then the model does not correspond to its prototype.

6A.1.10.2. **Colour**

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.

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.

6A.1.10.3. **Markings**

Check the position and size of all markings and lettering. 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.

6A.1.10.4. **Surface Texture and Realism**

The texture and appearance of the surface of the model should be a good reproduction of that of the prototype. Fabric covered types should be covered in the correct material, and the outline of stringers and wing ribs should be visible. Ply covered or wooden monocoque types should be correctly simulated and any sag between the ribs and formers should be apparent if this is present on the prototype.

Metal stressed skin types should show simulation of panels and rivets.

In all instances, the appropriate gloss, eggshell or matt finish should be correctly reproduced.

6A.1.10.5. **Craftsmanship**

Model should be checked for quality of workmanship, with particular reference to filling grain; clean, sharp edges, especially trailing edges of wings and tail surfaces; correct gaps at hinge line of control surfaces; close fit where wings are attached to fuselage, and general finesse. Check for any components that have not been made by the competitor (see 6.1.9.4d) and adjust the mark awarded accordingly.

**Scale Detail**

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

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

Notes:

The marks awarded should reflect both the accuracy and the quantity of the scale detail present. A well documented highly detailed model should score proportionately higher than a model with little detail, even though the full-size prototype of the latter is similarly sparsely detailed.

Upon the completion of the static judging of each model, the chief judge must check all score cards for completeness before passing them to the calculators. The panel of the judges has the right to correct scores which are obviously wrong (e.g. first model deviations, details not proven by documentation, over looked items which were purchased). Only after this procedure has been followed should the scores be made available for publication, having been signed by the chief judge.

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

**6C.1 General**

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

The errors mentioned under each manoeuvre can not 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 manoeuvre that is carried out over the judges, competitors, or anyone else in a designated area behind the judges' line, will also score ZERO.

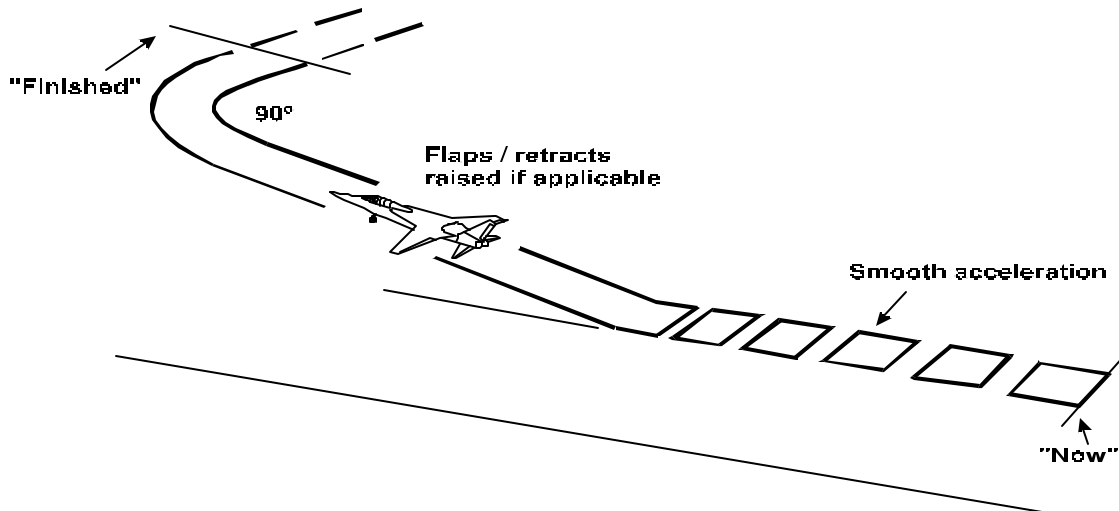
The height and positioning of individual manoeuvres should be proportional to that expected in a full size display typical to each prototype. Unless specified otherwise, manoeuvres that are carried out in a horizontal plane (e.g. Straight Flight, Figure Eight, Triangular Circuit) should commence on a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

The item 6.3.6.11. "Realism in Flight", should be discussed by all judges after completion of the flight and they should attempt to arrive at an agreed score for this item. At the end of each flight, the chief judge must check all score sheets for completeness.

### 6C.3.6.1. Take-Off:

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

If the prototype used flaps for take-off, then the model should also, but this may be subject to the competitor's 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 climbout after take-off. If applicable, the landing gear should be retracted during the climbout.

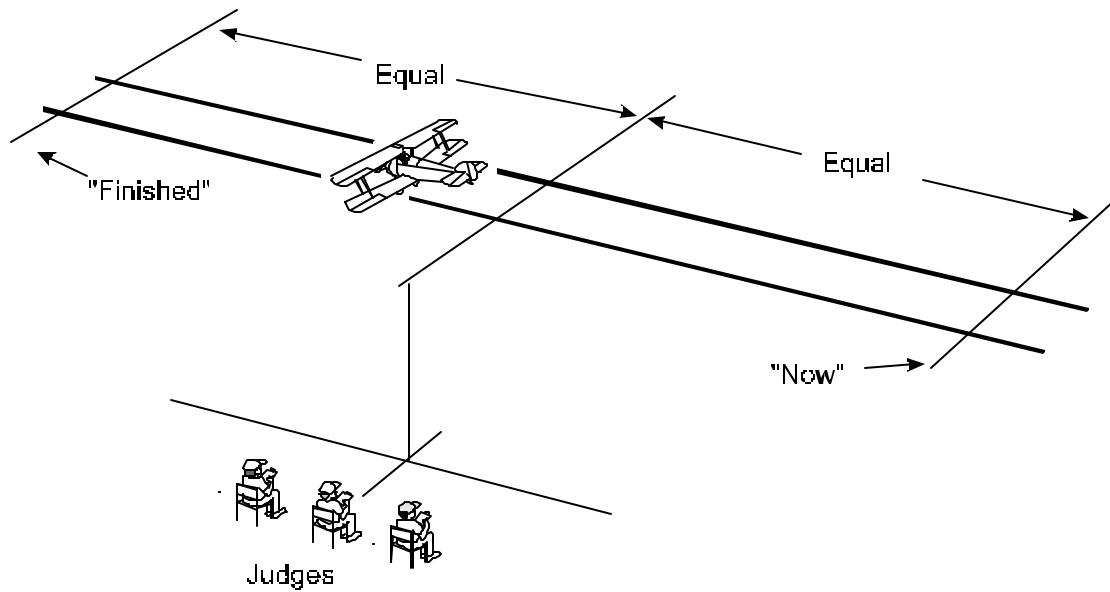


#### Errors:

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

6C.3.6.2. **Straight Flight:**

Model should make a straight and level flight of at least 100 metres length centred on the judges' position.



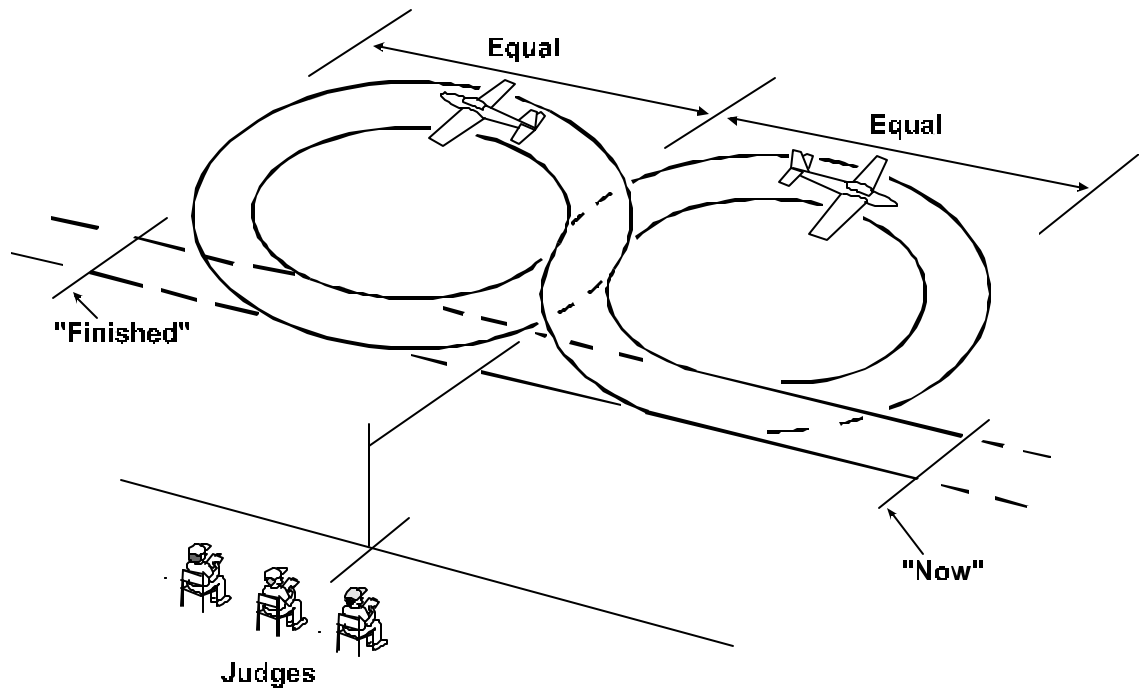
**Errors:**

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

6C.3.6.3. **Figure Eight**

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

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

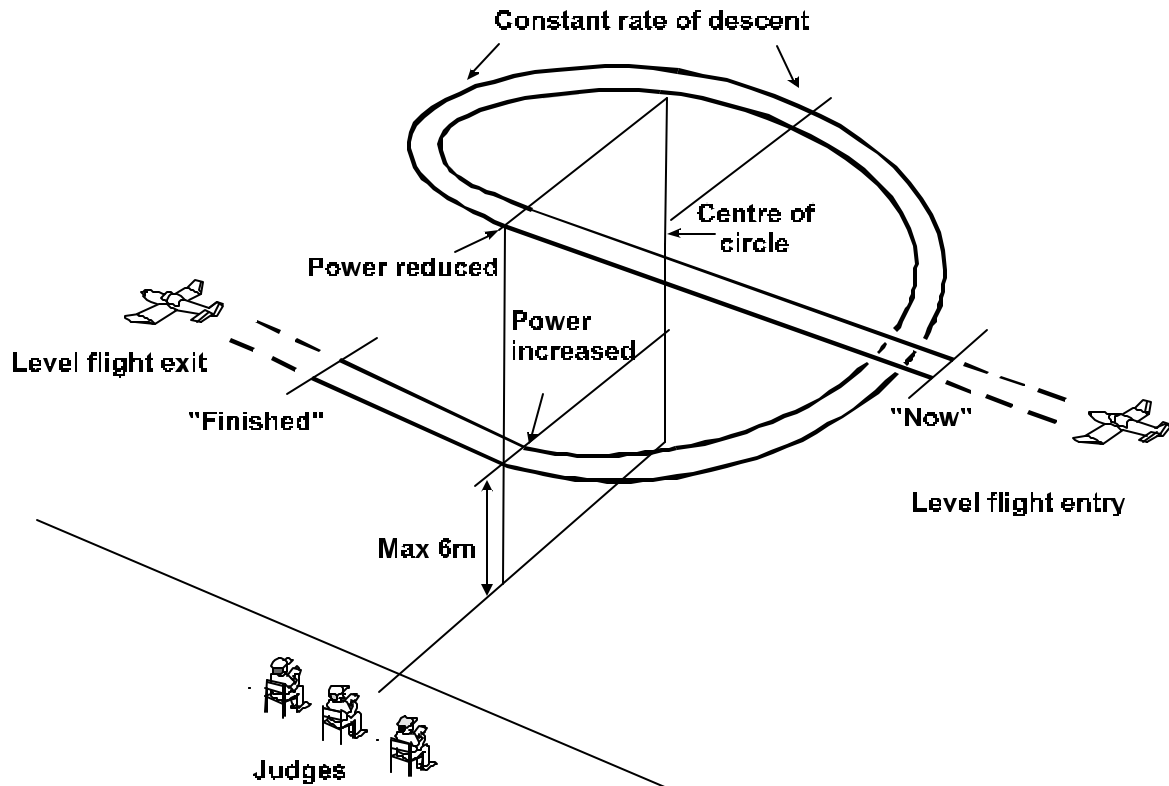


Errors:

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

#### 6C.3.6.4. 360° Descending Circle at Constant Low Throttle Setting:

Commencing from straight and level flight, the model performs a gentle 360° descending circle over the landing area, in a direction away from the judges, at a constant low throttle setting. The manoeuvre terminates at a maximum height of 6 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 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.3.7. **Optional Demonstrations:**

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

- ?? Aerobatic – Aircraft designed for aerobatic flight, examples of which are military fighters and fighter-bombers, training aircraft, purpose built aerobatic aircraft and some racing aircraft.
- ?? Non-aerobatic – Aircraft designed with limited manoeuvrability where the original prototypes of which were restricted by the manufacturer or licensing government agency. Examples are touring aircraft, passenger and cargo aircraft and heavy military transports and bombers.

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

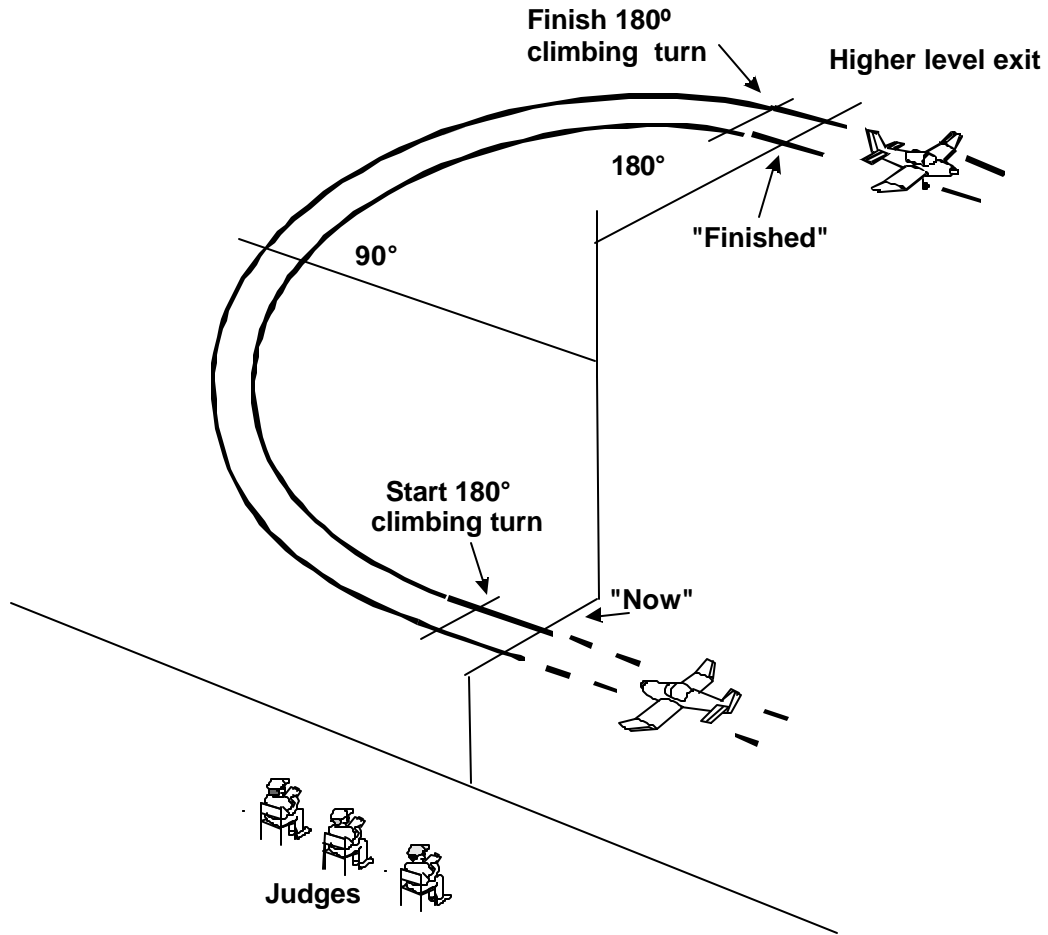
The competitor must be prepared, if required by the judges, to give evidence that the options selected are within the normal capabilities of the aircraft subject type modelled.

The following options may only be selected by Non-aerobatic aircraft: -

- A - Chandelle
- N - Overshoot
- R - Flight in triangular circuit
- S - Flight in rectangular circuit
- T - Flight in a straight line at constant height
- W - Wingover

A **Chandelle:**

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



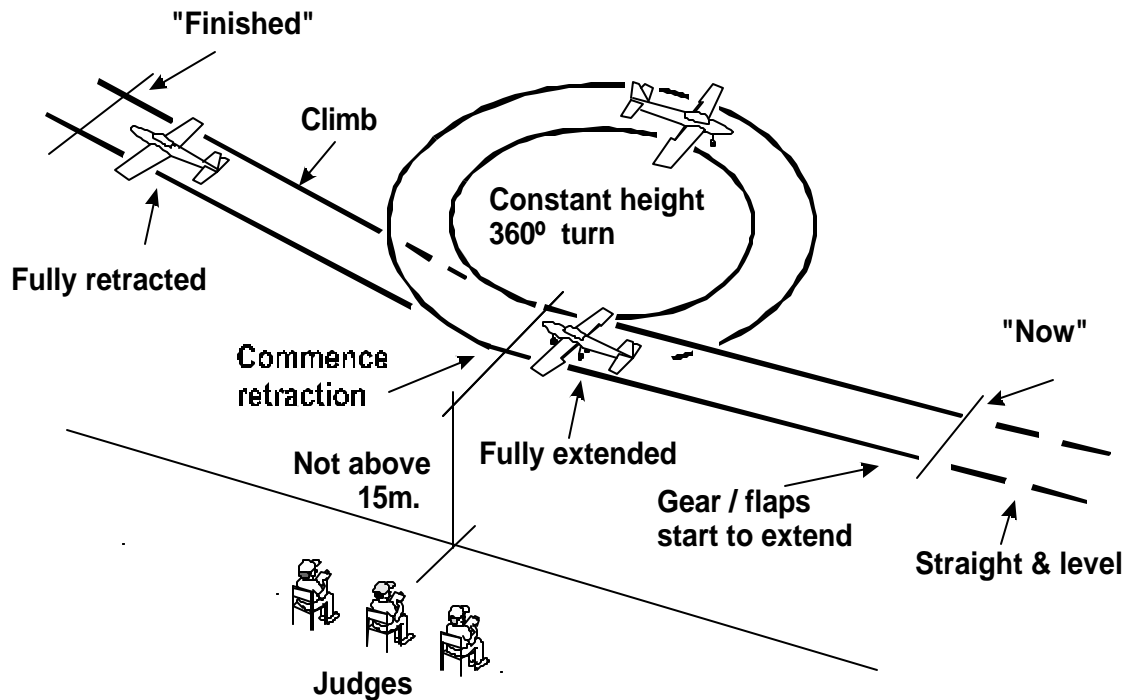
Errors:

1. Turn not smooth and continuous.
2. Climb not smooth and continuous.
3. Half height gain not at 90° position.
4. Excessive/unrealistic engine power used to achieve the climb.
5. Insignificant height gain.
6. Start & finish not 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 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 then executes a 360° turn in a direction away from the judges, and when again directly in front of the judges retracts the landing gear / flaps and climbs away in straight flight.



Errors:

1. Model speed too high for landing gear / flap lowering.
2. Gear / flaps not extended in full view of judges.
3. Speed and sequence of extension and retraction not realistic.
4. Flaps demo only:
  - a) Instability when flaps lowered.
  - b) No change in attitude with flaps.
5. Misshapen circle 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. Unscale-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.

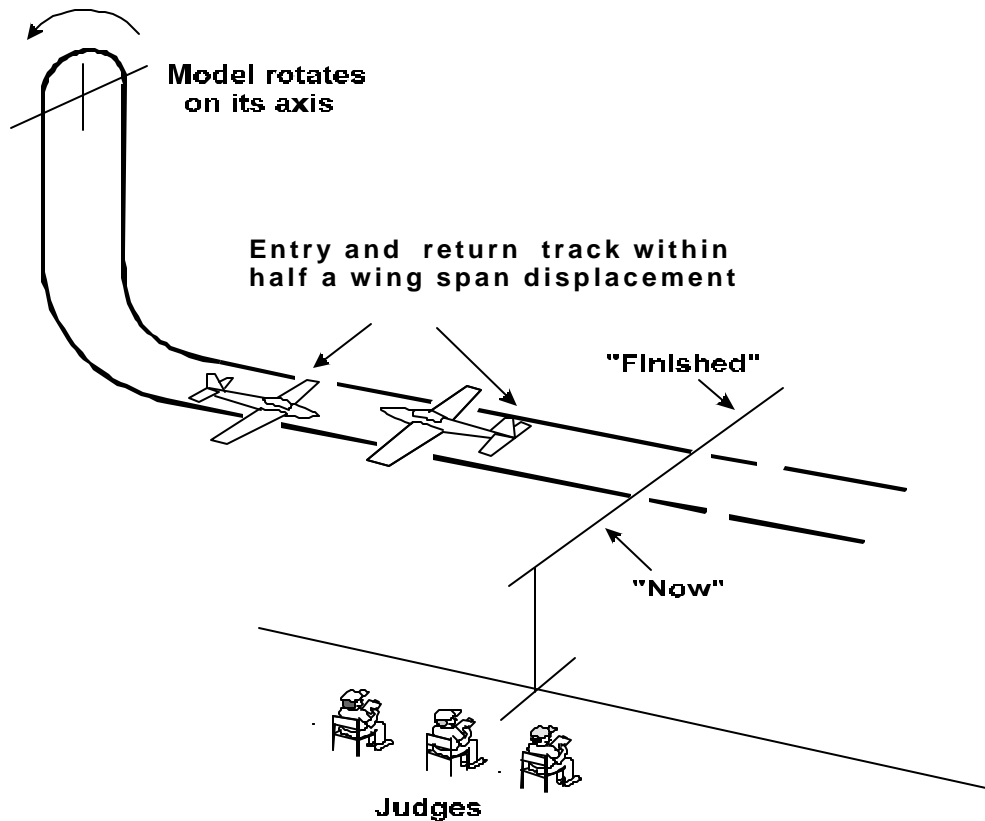
Any special features of the manoeuvre should be declared to the judges beforehand.

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.

E. **Stall Turn:**

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

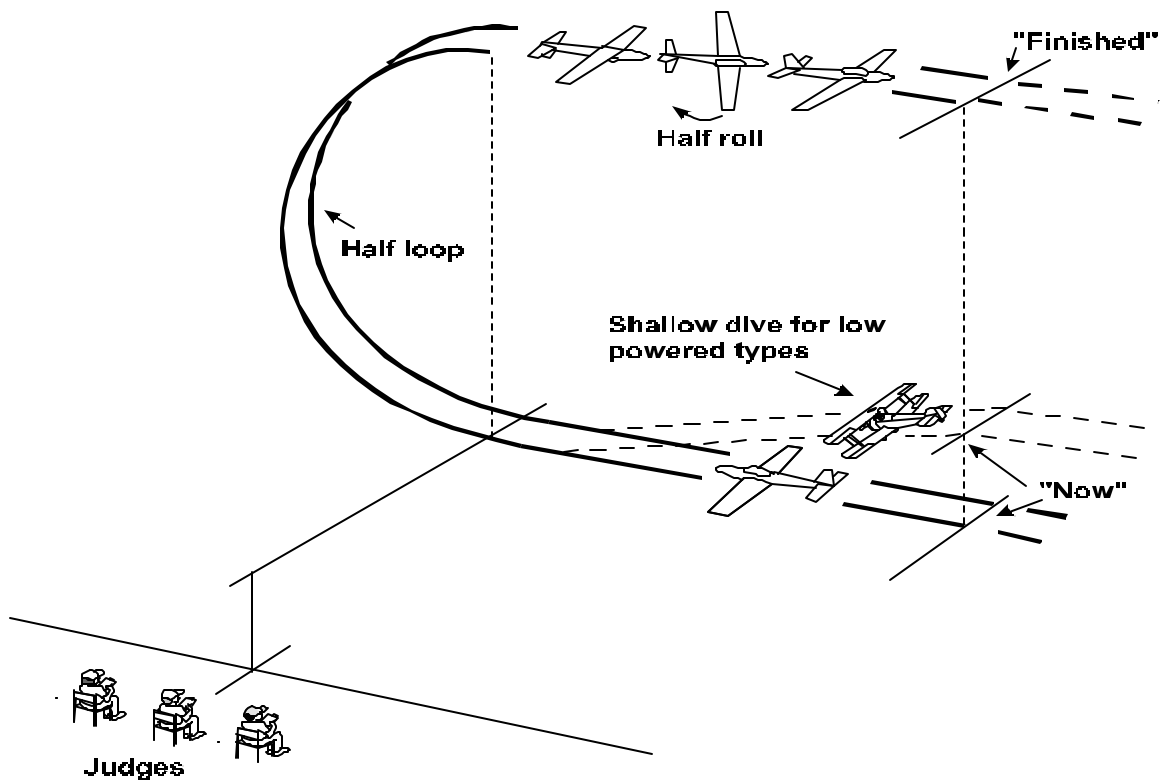


Errors:

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

F. **Immelmann Turn:**

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



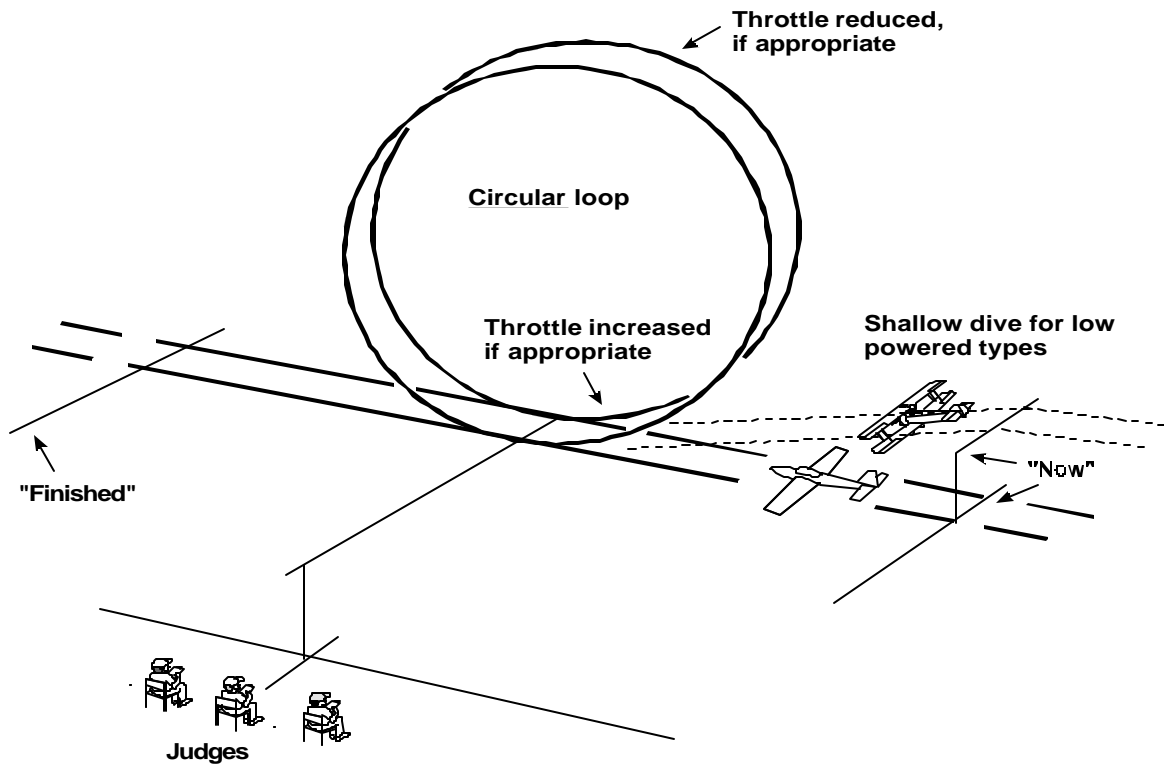
Errors:

1. Track of the half loop not vertical.
2. Half loop not 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 pulls up into a circular loop and resumes straight and level flight on the same heading as the entry. The throttle may be reduced at the top of the loop as appropriate to type, and opened if necessary when normal flight is resumed. Low powered aircraft types would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the loop.

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

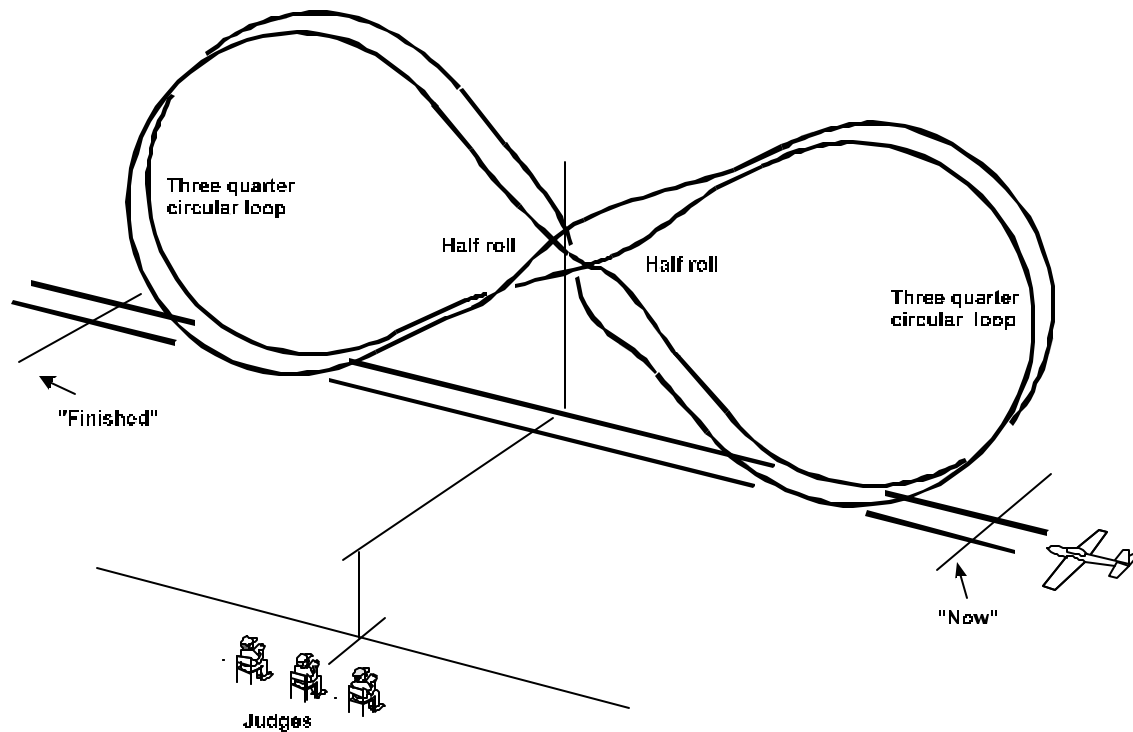


Errors:

1. Track of loop not vertical
2. Loop not sufficiently circular, commensurate with the subject type.
3. Inappropriate use of throttle.
4. Size and speed of Loop not in manner of prototype.
5. Not 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 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.

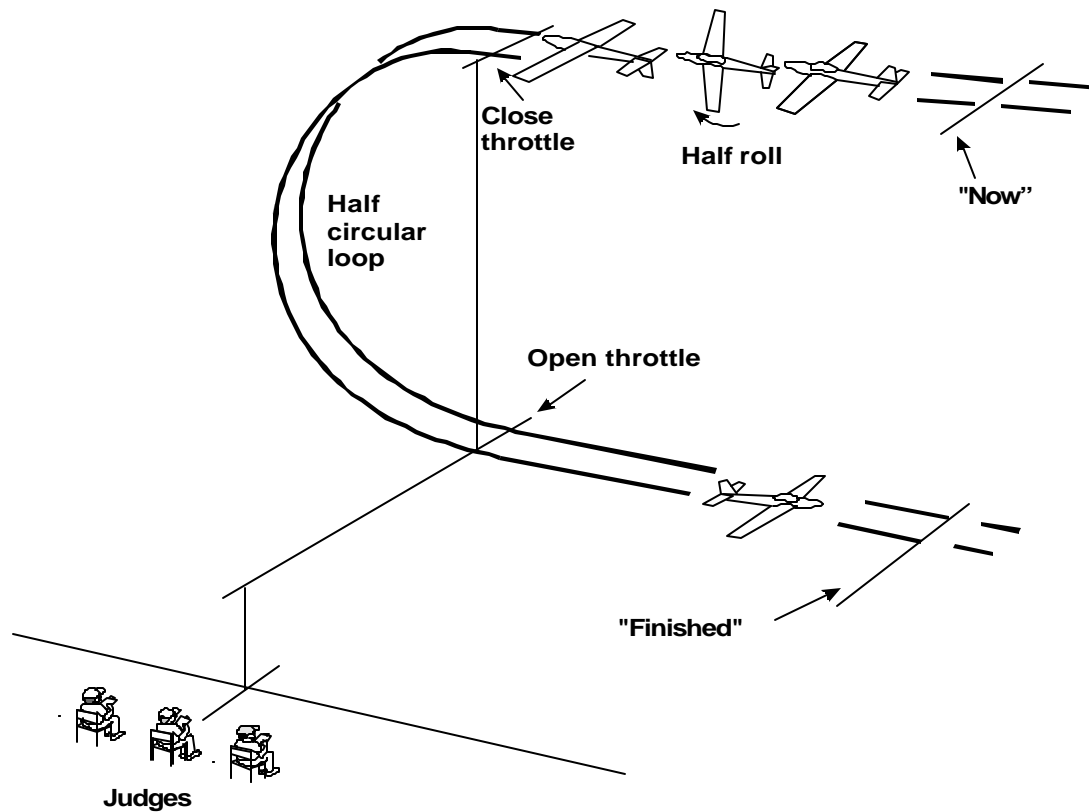


**Errors:**

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

I. **Split S (Reversal):**

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

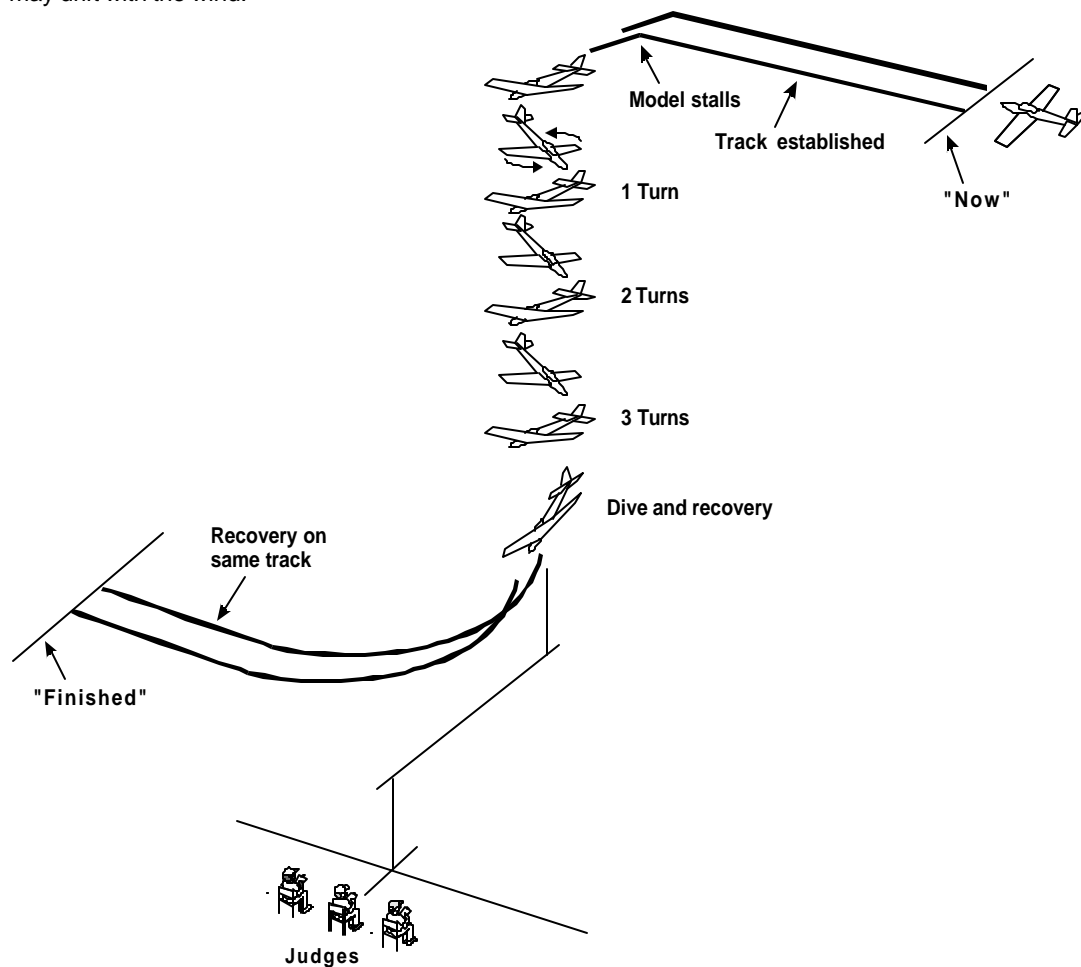


Errors:

1. Model changes track during half roll.
2. Model inverted too long or too short.
3. Inappropriate use of throttle.
4. Track of half loop not on line or vertical.
5. Half loop is not sufficiently semicircular.
6. Too fast or too tight a half loop.
7. Does not resume straight and level flight on opposite track to entry.
8. Half loop not 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 decelerates into a stall and commences the spin through three turns and recovers to level flight on the same track as the initial flight direction. During descent the model may drift with the wind.

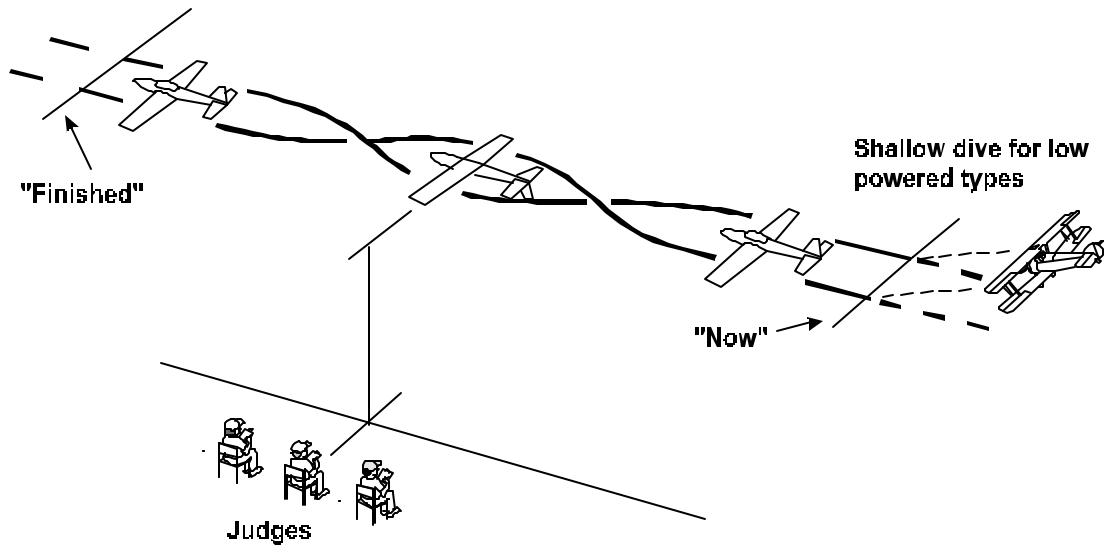


Errors:

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

K. **Roll:**

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



Errors:

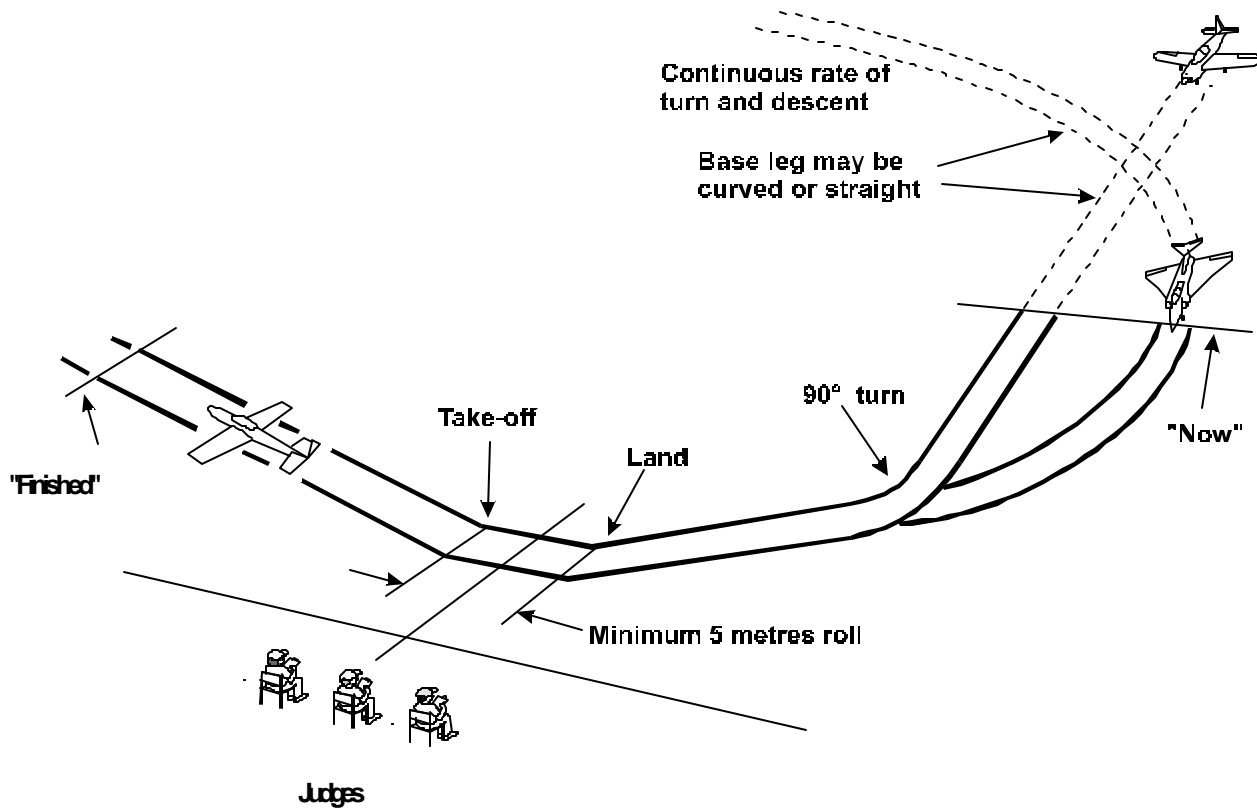
1. Rate of roll is not constant.
2. Style of roll not typical to prototype.
3. Roll not centred on judges' position.
4. Entry and exit at different heights.
5. Entry and exit at different speeds.
6. Entry and exit tracks and line of roll not parallel with judges' line.
7. Does not resume straight and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

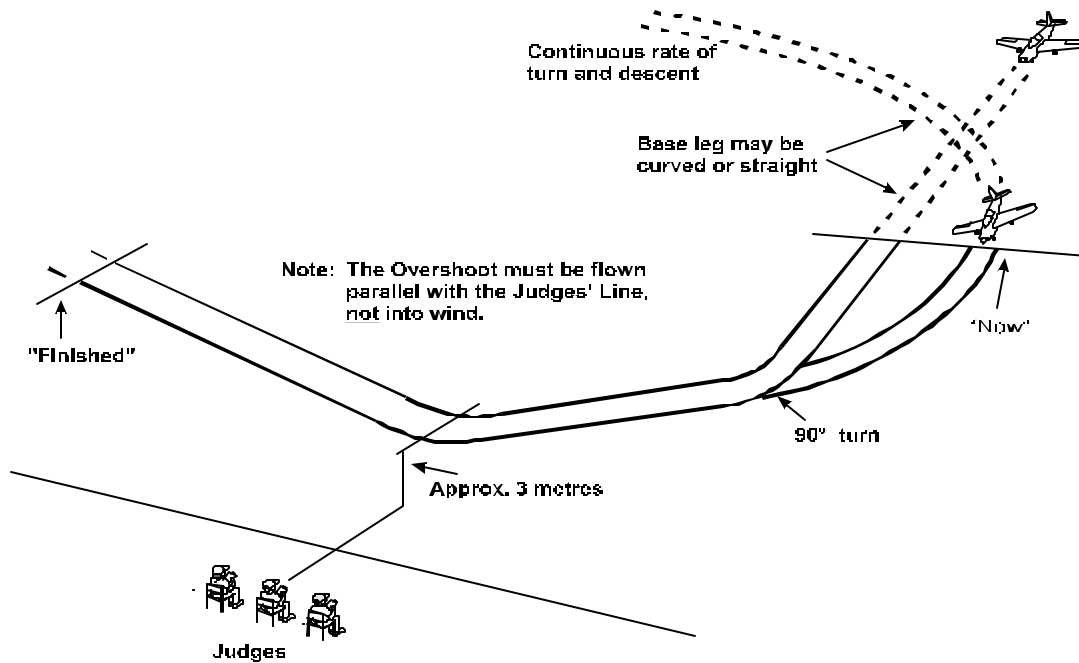


#### Errors:

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 does not achieve correct landing approach prior to touchdown.
5. Model 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 minimum 5 metres*).
6. Model bounces on landing.
7. Inappropriate use of flaps.
8. Climb out not smooth or realistic.
9. Approach and climb out tracks not the same.
10. Does not make best use of landing space available for wind direction.

## N. Overshoot

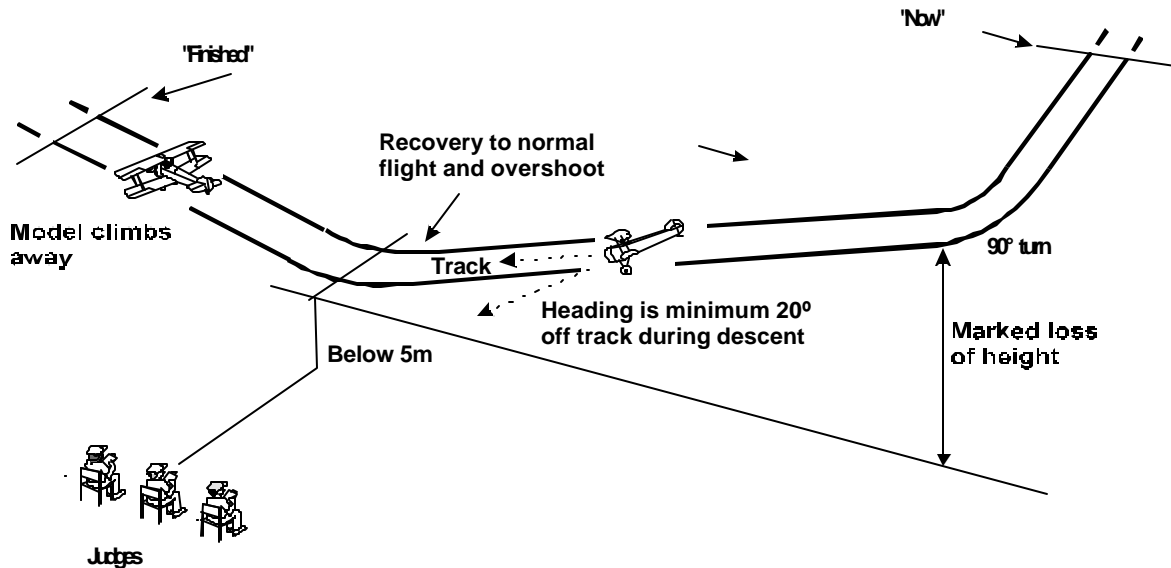
The model commences by descending from base leg, which may be either curved or straight as required by the pilot. The turn is continued through 90 degrees onto a higher than normal landing approach on low throttle, using flaps if applicable. On reaching the centre of the landing area at a height of approximately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



### Errors:

1. Manoeuvre does not commence on base leg.
2. Turn onto final approach not smooth and continuous or not 90°.
3. Model does not achieve correct high landing approach.
4. Model does not achieve correct landing speed or attitude.
5. Not continually descending until power applied.
6. Model descends to significantly above or below 3 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 could have landed from approach.
11. Model does not climb away smoothly.
12. Approach and climb out tracks not the same.
13. Too close or too far away.

**O Side Slip:** The model commences the manoeuvre in level flight by reducing power on base leg, and then turns onto a higher than normal final approach that is parallel with the judges' line. As the model enters the turn it starts a Sideslip by the application of opposite rudder to the direction of turn, achieving a yaw of at least 20° off track. A marked loss of height must be apparent whilst maintaining final approach speed. The aim of the Sideslip, if continued, would be to effect a landing in front of the judges. Before reaching the judges' position however, the Sideslip is corrected, normal flight is resumed and the model carries out an overshoot from below 5 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. This manoeuvre may be nominated by all types of models.



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

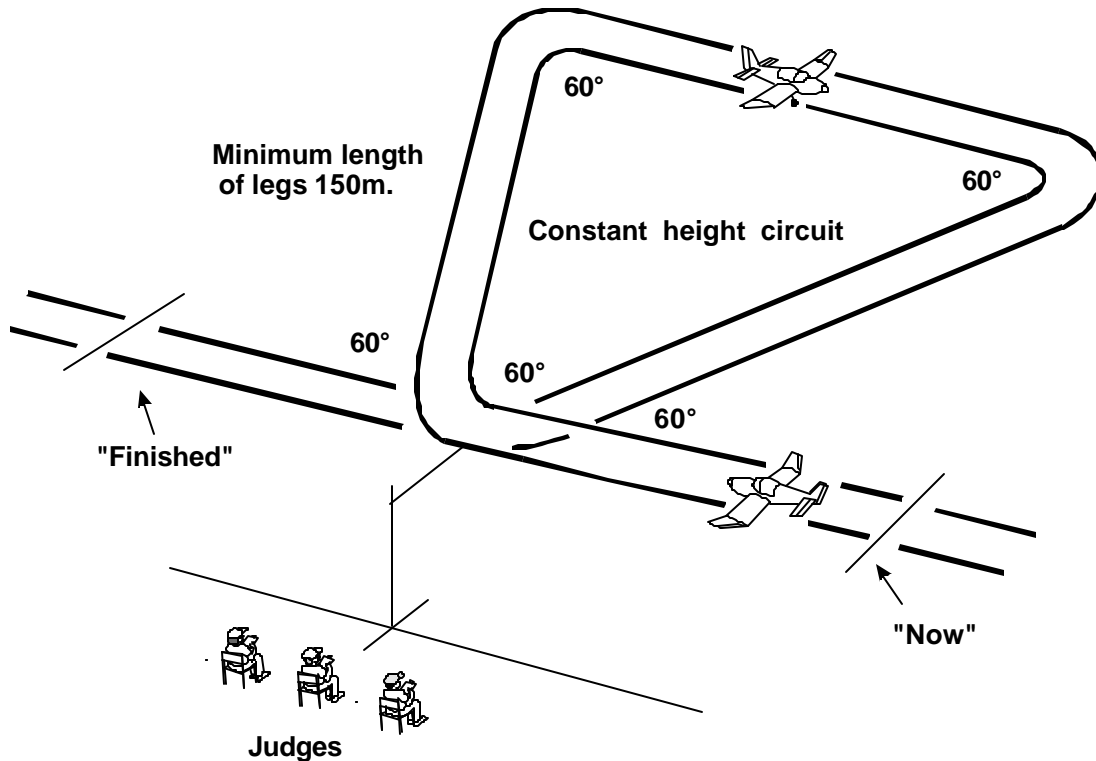
**P and Q. Flight Function(s) Performed by Prototype Aircraft:**

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, e.g. 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 (e.g. switching on and off lights), are also not allowed.

R. **Flight in Triangular Circuit:**

The model approaches in a straight and level flight to a point directly in front of the judges. It then turns away to track  $60^\circ$  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  $60^\circ$ ), before making a final turn to intercept the original entry track. This option may only be nominated for non-aerobatic aircraft.

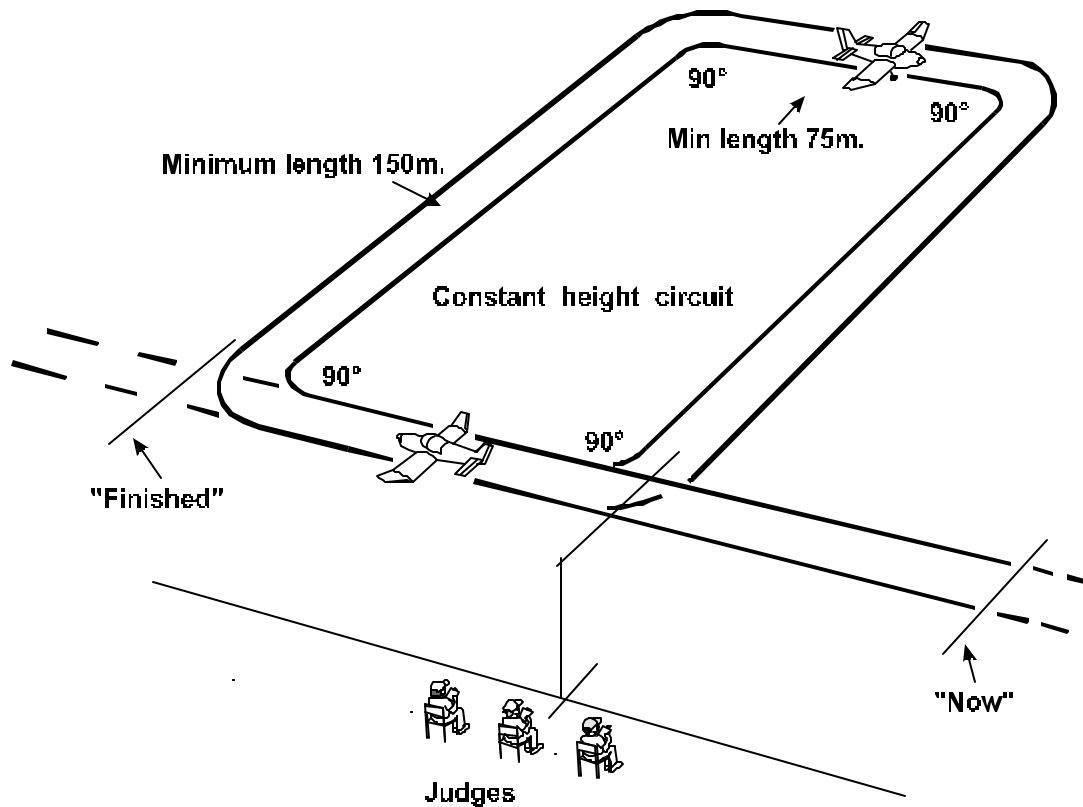


Errors:

1. Not commenced and finished at points equidistant from the judges.
2. Model changes height.
3. Rate of turn at corners not constant or inside corners of triangle not  $60^\circ$ .
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 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  $90^\circ$  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. This option may only be nominated for non-aerobatic aircraft.

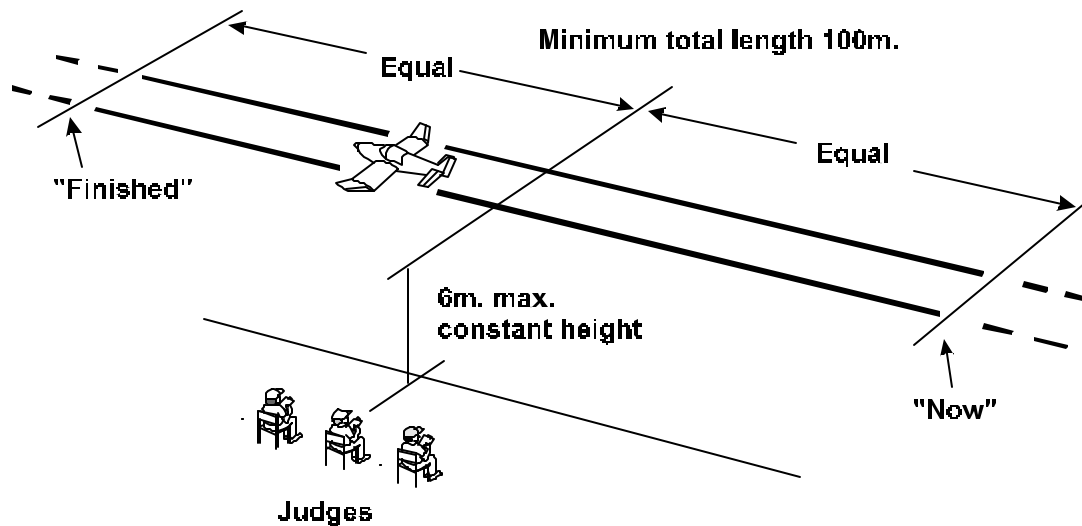


Errors:

1. Not commenced and finished at points equidistant from the judges.
2. Model changes height.
3. Rate of turn at corners not constant or corners not  $90^\circ$ .
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 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 and may only be nominated for non-aerobatic prototypes.

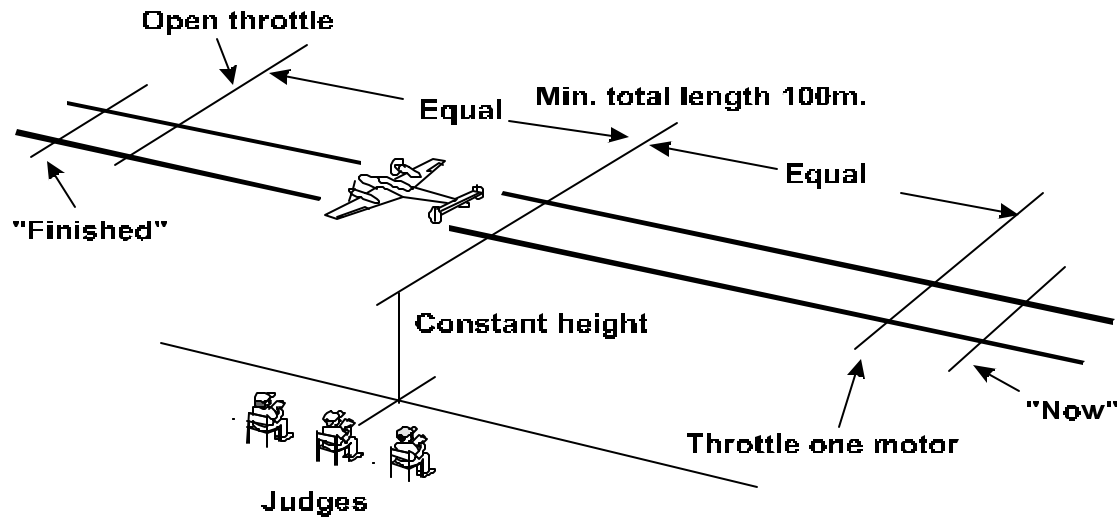


Errors:

1. Not a straight course (slight corrections acceptable with light aircraft).
2. Not constant height.
3. Not 6 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 flight path not steady.
9. Too far away / too close / too high / too low.

U. **Flight in a Straight Line With One Motor Throttled**

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



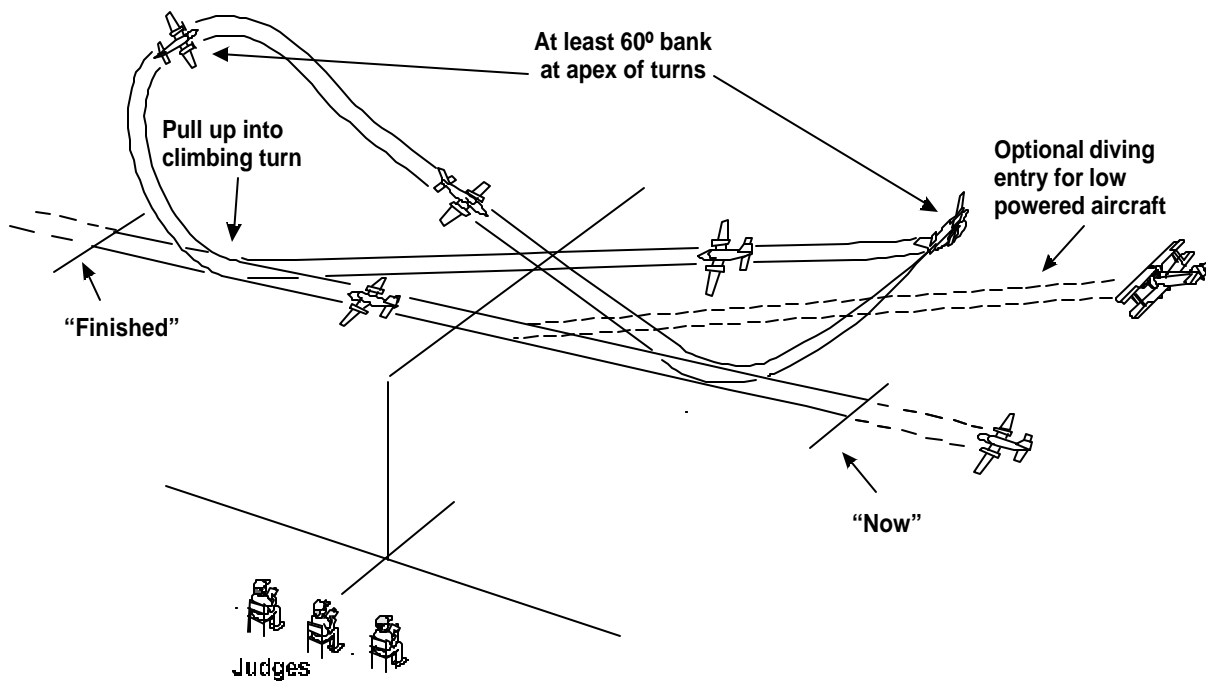
Errors:

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

## V. Lazy Eight

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

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



### Errors:

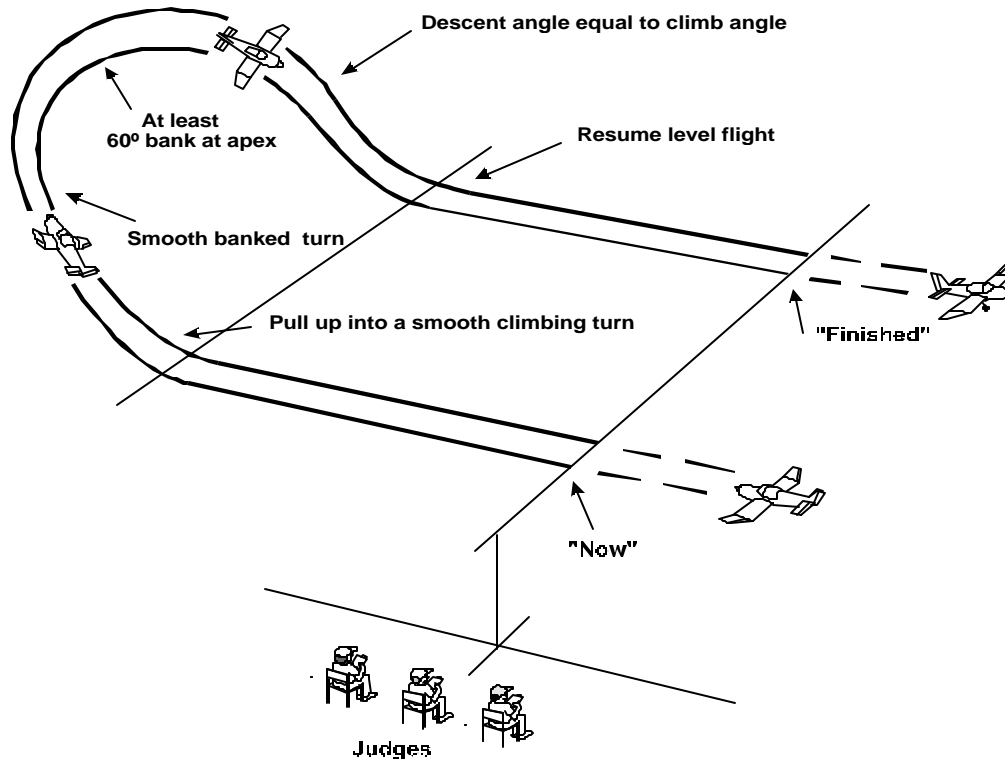
1. Entry and exit paths not parallel with judges' line.
2. Insufficient climb achieved.
3. Insufficient bank achieved.
4. Climb and descent angles not equal throughout manoeuvre.
5. Manoeuvre not symmetrical about judges' position.
6. Arcs misshapen.
7. Start and finish positions not as indicated.
8.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

W. **Wingover.**

The model approaches in straight and level flight on a line parallel with the Judges' line. After passing the judges' position a smooth climbing turn is commenced away from the judges. At the apex of the turn the bank should be at least 60°. The nose of the model then lowers and the bank comes off at the same rate as it went on. The turn is continued through 180° to recover straight and level flight at the same height and on a heading opposite to that of the entry.

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.

This option may only be nominated for non-aerobatic aircraft.

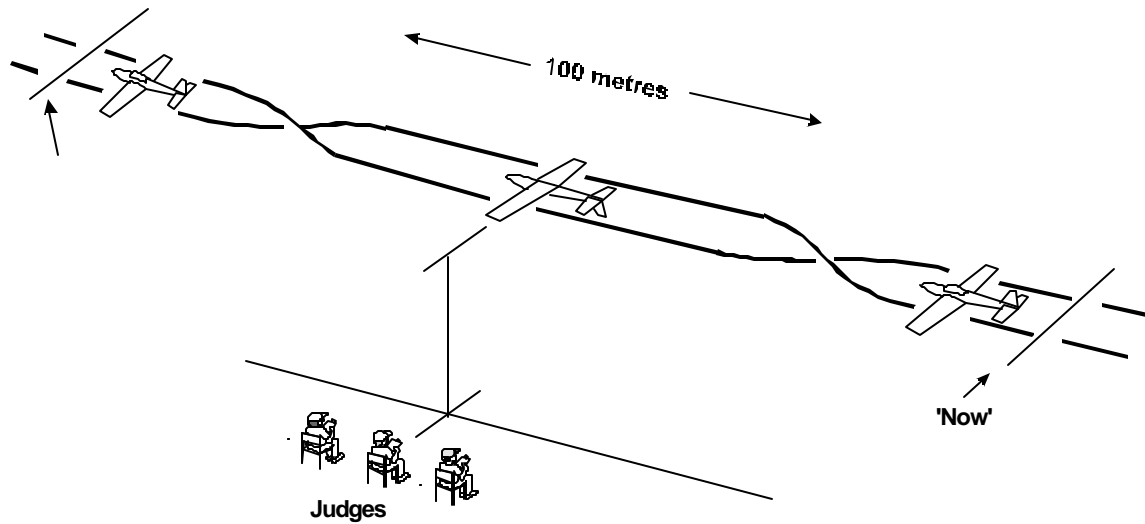


**Errors:**

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

X. **Inverted Flight**

Model 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.



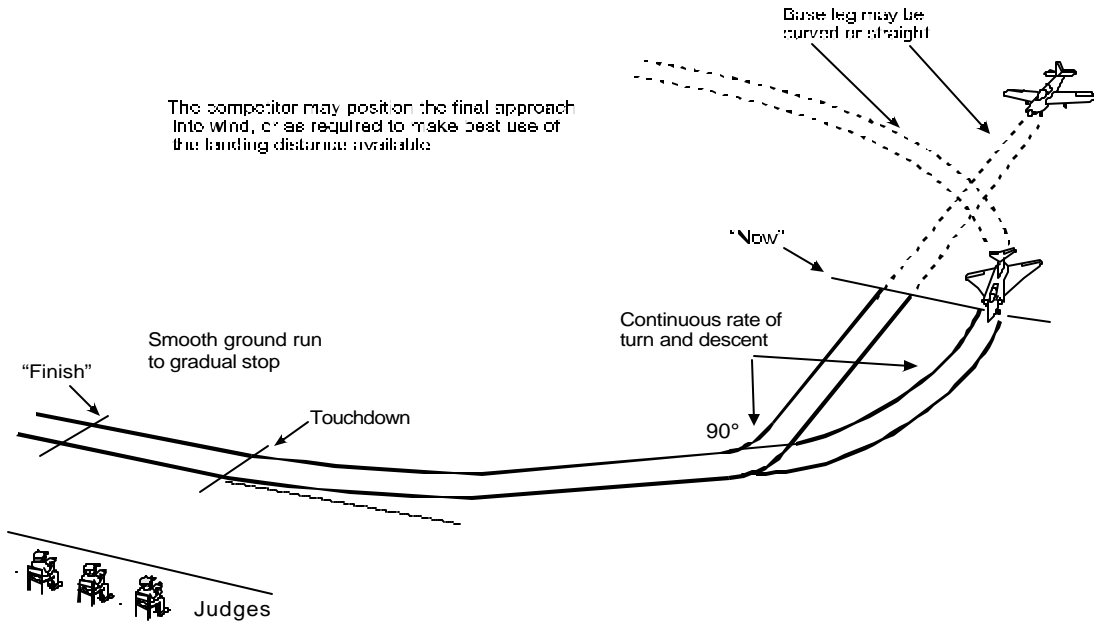
**Errors:**

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

### 6C.3.6.10 Approach and Landing

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

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



#### Errors:

1. Manoeuvre does not commence on base leg.
2. Turn onto final approach not constant rate or not 90°.
3. Descent from base leg not smooth and continuous.
4. Model does not achieve correct landing approach prior to touchdown.
5. Model does not round out smoothly.
6. Model bounces.
7. Drops a wing during landing.
8. Touches wing tip on ground.
9. Does not come to a gradual and smooth stop after landing.
10. Does not adopt landing attitude appropriate to subject type.
11. Model runs erratically or turns after landing.
12. Model noses over (note 30% penalty if only nose-down - zero if it over-turns).

Note: A crash landing scores zero points, but if the model makes a good landing and then stops nose down towards the end of the landing run, then the landing marks that would have been otherwise awarded should be reduced by 30% .

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

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

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

6C.3.6.11. **Realism in Flight**

This should be discussed by all judges after completion of the flight and they should attempt to arrive at an agreed score for each item. Realism in Flight covers the entire flight performance including the way in which the model 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 = 2

“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 noise should therefore be split equally between these two aspects.

?? Speed of the model ..... K = 4

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

?? Smoothness of flight ..... K = 4

The model 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 in flight, i.e. any nose-up or nose-down tendency.

?? Size of manoeuvres ..... K = 2

Unless otherwise specified, the size of manoeuvres should be in proportion to the scale of the model and the nature of the prototype. Judges must use their own experience to score this aspect based upon the amount of airspace that they would expect the prototype to use if it were performing a full size flying display.

Notes:

1. Any model that flies with wheels down, whereas the prototype actually featured retractable landing gear the total flight score shall be reduced by 10%.
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. If such a pilot is not fitted, the total flight score shall be reduced by 10%.

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