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. The documentation submitted by the competitor must state if the original prototype is non-aerobatic. The judges will discuss this information before the first flight commences in F4C. The Chief Judge shall make the final decision before any flight is made and this might affect the marks awarded under 6.3.6.11.d. (Choice of options).

6.1.9.3. The scale to which the model aircraft 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 (Static) points the following is the minimum documentation that must be submitted to the judges
(See Annex A - 6A.1.9. for recommended presentation of documentation):

a) Photographic evidence:

At least three photographs or printed reproductions of the prototype, including at least one of the actual subject aircraft being modelled are required. Each of these photographs or printed reproductions must show the complete aircraft, preferably from different aspects and must not be smaller than A5. These main photos must be submitted in triplicate, the second and third copies may be photocopies. Photographs of the model are not permitted unless the model is posed alongside the full size prototype and the photo used as proof of colour. The use of photographs based on digital files which show evidence of being enhanced or manipulated shall result in disqualification. The photographic evidence is the prime means of judging scale accuracy against the prototype.

b) Scale Drawings:

Accurate scale drawing of the full-size aircraft that show at least the 3 main aspects of Side View, Upper Plan View and Front End View. These drawings must be to a common scale giving a minimum span of 250 mm, and a maximum span of 500 mm or if the fuselage is longer than the wingspan, these measurements will be made on the fuselage. The drawings must be submitted in triplicate. Unpublished drawings by the competitor or other draftsman are not acceptable unless certified accurate in advance of the contest by an authoritative source such as the respective National Scale Committee or equivalent, the builder of the original aircraft, or other competent authority.

c) Proof of Colour:

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

d) Aircraft speed:

The cruising speed of the subject aircraft must also be included in the documentation, and repeated on all flight score sheets before each official flight starts. In the case of early aircraft, where only maximum speeds are likely to be listed, the maximum speed alone may be quoted in the documentation. The competitor must be prepared to substantiate this information if required.

e) Competitor’s declaration:

The competitor must include in his documentation a signed declaration that his model conforms to the requirements and rules appropriate to the class of model. The Competitor’s Declaration also contains a questionnaire which is used by the Judges to determine the origin of the model design and its construction and the extent of use of commercially available components.
The declaration form is at ANNEX 6E.1

cont/…

6.1.10. Judging for Fidelity to Scale and Craftsmanship

K - Factor

1.	Scale Accuracy	
	a. Side view	13
	b. End view	13
	c. Plan view	13
2.	Colour	
	a. Accuracy	3
	b. Complexity	2
3.	Markings	
	a. Accuracy	8
	b. Complexity	3
4.	Surface texture and scale realism	
	a. Surface Texture	7
	b. Scale Realism	7
5.	Craftsmanship	
	a. Quality	12
	b. Complexity	5
6.	Scale detail	
	a. Accuracy	9
	b. Complexity	5
Total K Factor.....		K = 100

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

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 static judges. These static points shall be used for final scores classification only when the model aircraft has completed an official flight.

Normalisation:

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

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

Where:

Static Points_x = Normalised Static Score for competitor *x*

S_x = Static Score for competitor *x*

S_w = Highest Static Score

6.1.12 Organisation of Scale Events

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

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

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

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

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

cont/…

6.1.13 Builder of the Model

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

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

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

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

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

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

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

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

6.1.14 Demonstration of Functional Scale Detail during Static Judging

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

ANNEX 6A

CLASS F4B, C AND G 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. Where a K-factor (K) is noted, marks shall be awarded from 0 to 10 inclusive using increments of a tenth of a mark for Static Judging. The score shall then be calculated by multiplying the marks awarded by the K-factor (K) (see 6.1.5.). The use of increments 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.

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 must be presented as a top hinged bound volume in landscape format (calendar format) with a maximum size of A3. The sequence of pages must reflect the sequence of judging aspects eg: Side View, Front View, etc. If a specific photograph is required to document more than one of the judging aspects, it must be repeated on the relevant page to avoid that the judges have to continually turn pages back and forth to cross reference.

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 Drawings

The drawings and the photographs are used to determine the accuracy of the model relative to the full size aircraft.

Then using the drawings and photographs, check:

Side view, this may be either left or right depending upon the drawings supplied. 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 Realism

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.

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.

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.

CHAMPIONSHIP LOGO and FAI emblem

COMPETITORS DECLARATION FORM (ANNEX 6E.1)

This form must be completed and signed by the competitor and endorsed by the competitor's NAC. Competitors are to indicate answers YES or NO by circling the appropriate boxes.

Competitor's Name	National Identification.	Prototype Name & Designation	Class:F4C,F4G, F4H or F4K

If your flight schedule is to include Optional Demonstrations 6.3.7. S or T - Flight functions 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

AIRCRAFT CRUISING OR MAXIMUM SPEED – attach proof on a separate sheet.

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. (Refer to Rule 6.1.13)

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, F4G, F4K: 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 CONTRO

I certify that the Competitors Certification is valid and the answers given above have been verified.

Name ……..(block letters) Signature……

Position Held /Authority ……

CHAMPIONSHIP LOGO and FAI emblem

PROTOTYPE NAME AND DESIGNATION:	CONTESTANT NUMBER:
	CONTESTANT NAME:

F4C, F4G and F4K Static Score Sheet

(ANNEX 6E.3)

STATIC JUDGING QUALIFICATION	CLAIMED	AWARDED
3-view (minimum span 250mm; maximum span 500mm)		
Colour Documentation		
Three photos minimum		
Competitors Declaration Form		

Judge Initials:	Chief Judge Signature:

STATIC SCORE (0-10 Decimals permitted)

No	ITEM	ASPECT	MARK	K	SCORE
1	SCALE ACCURACY	Side view(s)		13	
		End view(s)		13	
		Plan view(s)		13	
2	COLOUR	Accuracy		3	
		Complexity		2	
3	MARKINGS	Accuracy		8	
		Complexity		3	
4	SURFACE TEXTURE & R EALISM	Surface Texture		7	
		Realism		7	
5	CRAFTMANSHIP	Quality		12	
		Complexity		5	
6	SCALE DETAIL	Accuracy		9	
		Complexity		5	
			TOTAL		

CHAMPIONSHIP LOGO and FAI emblem

Flight Score Sheet F4K

(ANNEX 6E.5)

Competitor Number:	**Round:**
Judge Number:	**Competitor Name:**
Judge Signature:	**Prototype Name and Designation:**

Aircraft type: (X)	**Aerobatic**	**Non-aerobatic**
Cruising / Maximum Speed:		
Scale of Model:		

No.	MANOEUVRES		MARK	K-factor	SCORE
1	Take-off			14	
2	Option 1:			10	
3	Option 2:			10	
4	Option 3:			10	
5	Option 4:			10	
6	Option 5:			10	
10	Approach and Landing			14	
11	Realism in Flight	Model Sound		4	
		Speed of the model		9	
		Smoothness of flight		9	
			TOTAL		

6.11. CLASS F4K - RADIO CONTROLLED SCALE HELICOPTERS (PROVISIONAL)

Note: New class in 2015

6.11.1. General Characteristics

This is a rotary wings motorised scale model class.

The requirement for the competitor to have constructed his own model in F4K (rule 6.1.9.4.e) only applies to the fuselage and the main and tail rotors, not to the mechanical components, but he must have completed the assembly of all the mechanical components in the model.

See also 6.1.10 (Judging for Fidelity to Scale and Craftsmanship) and 6.1.11. (Static Scoring).

The maximum weight of the complete model aircraft with fuel, in flying condition, including any dummy pilot is 23 kg (≈230 Newton).

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

The scale model weight must be taken at the helipad just before take-off.

Note: For all other scale model specifications, see Volume *CIAM General Rules* B.1.3.

6.11.2. Noise

See 6.3.2

6.11.3. Documentation

See 6.1.9.

6.11.4. Official Flights

a) Each competitor will be called to fly three rounds, and must execute an official flight within the required time limit on each occasion to be eligible for flight points for that flight. 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 is considered to have commenced at whichever of the following is first:

  i) The competitor signals to the timekeeper that he is commencing to start his engine(s).

  ii) Three minutes after the competitor is instructed to start his flight.

c) An official flight is terminated when the model aircraft lands and stops.

6.11.5 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 10 minutes to complete his flight.

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

6.11.6. Starting Time

a) If the model aircraft is not airborne within 5 minutes, after the official flight and timing commences, 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 starts the second manoeuvre (the first one is the take-off), the engine(s) may be restarted.

c) 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 6.12.5(a) still applies

cont/…

6.11.7. Flight

6.3.6.1. Take-off ..... …… K =14
6.3.6.2. Option 1 ..... …… K =10
6.3.6.3. Option 2 ..... …… K =10
6.3.6.4. Option 3 ..... …… K =10
6.3.6.5. Option 4 ..... …… K =10
6.3.6.6. Option 5 ..... …… K =10
6.3.6.10. Approach and Landing ..... …… K =14
6.3.6.11. Realism in flight
a) Model sound ……... …… 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: (i) 10 (ten) second hover with clearing turns (take off) and (ii) 45º climb out to a minimum of 8 (eight) metres, 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.

6.11.8 Optional Demonstrations

The two manoeuvres, 10(ten) second hover clearing turns (take off) and 45º climb out at a minimun of 8 metres 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.

Selection must be indicated on the score sheet and given to judges before commencing the flight.

The options may be flown in any order.

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 = 10
B Flight in a straight line at constant height.....K = 10
C Figure Eight…….....K = 10
D Side flight to left or right ....K = 10
E Flight in triangular circuit..... ..... .K = 10
F Flight in rectangular circuit .... .K = 10
G 180º Ascending turn..... ....K = 10
H 360º Descending circle..... .....K = 10
I Lazy Eight ....K = 10
J 90º Procedure to the right and 180º Circle..... ..K = 10
K One loop ..... K = 10
L Inverted flight..... K = 10
M Figure Backward.....K = 10

6.11.9 Marking (flight points)

See 6.3.8

6.11.10 Flight Score

See 6.3.9

cont/…

6.11.11 Final Scoring

See 6.3.10

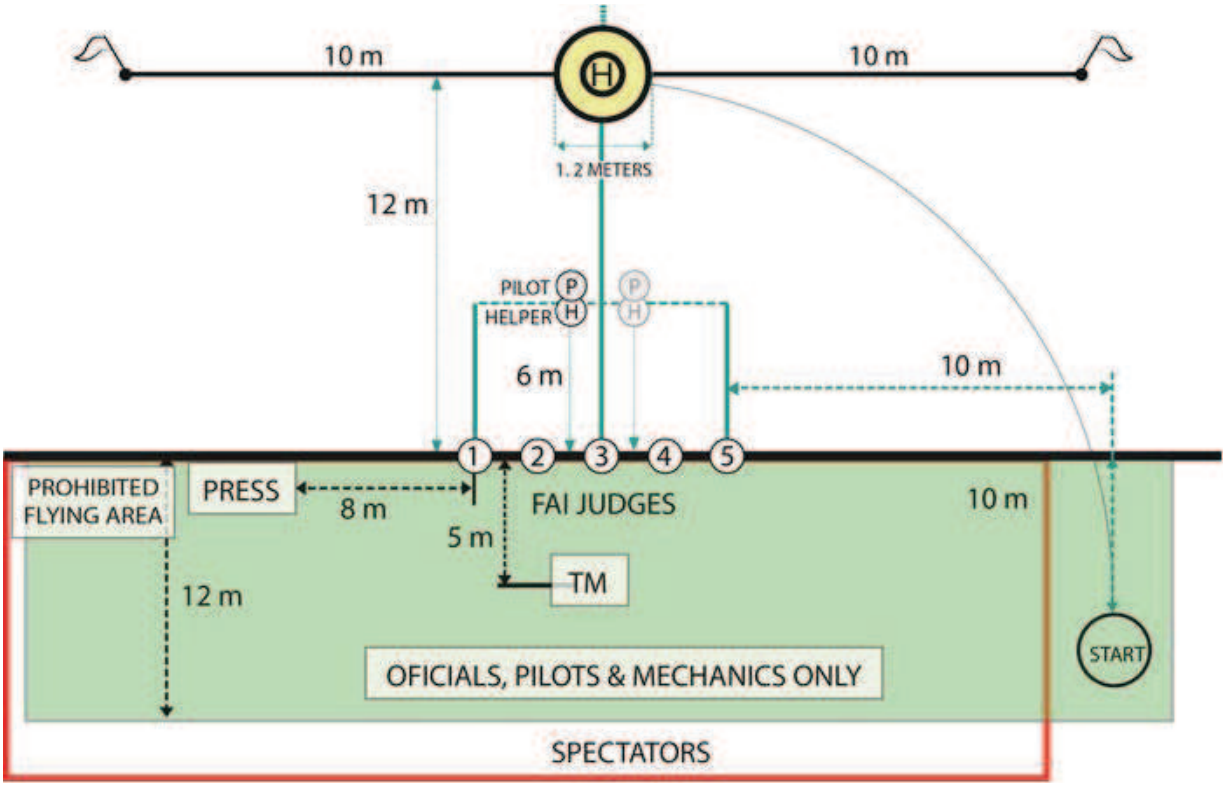
6.11.12 Safety

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) 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.

6.11.13 F4K Contest Area Layout



F4K Contest Area Layout

ANNEX 6G
F4K – JUDGES' GUIDE

6G.1 Static Judging

See Annex 6A – Class F4 Judges' Guide for Static Judging

6G.2 Flight Judging

6G.2.1 Realism in Flight

See 6C.3.6.11

6G.2.2 Mandatory Manœuvres

A Take off with 90º turn and 180º turn

B 45º Climb out

6G.2.3 Landing Manœuvres

NOTE: The competitor may only choose one option in each round for landing.

1 Translational Landing

2 Run On Landing

3 Autorotation Landing

6G.2.4 Optional Manoeuvres

A Chandelle

B Fly Past at **Constant Height**

C Figure Eight

D Sideways Flight

E Flight in Triangular Curcuit

F Flight in Rectangular Circuit

G 180° Ascending Turn

H 360° Descending Turn

I Lazy Eight

J Procedure 90° with Straight Flight and 180° Angle

K One Loop

L Inverted Flight

M Figure Backward

A TAKE OFF WITH 90º TURN AND 180º TURN (MANDATORY)

To start the manoeuvre, take off smoothly from the centre of the helipad. The model must ascend vertically over the centre of the helipad until the skids or landing gear are at a height of two metres, with tail rotor facing the centre judge (Figure 1). Hold this position for a minimum of 10 seconds, followed by a 90º clearing turn to the left or right side. Hover in this position for 5 seconds followed by a 180º clearing turn in the opposite direction followed by a 5 second hover in this position. (See figures 2A and 2B)

Figure 1:

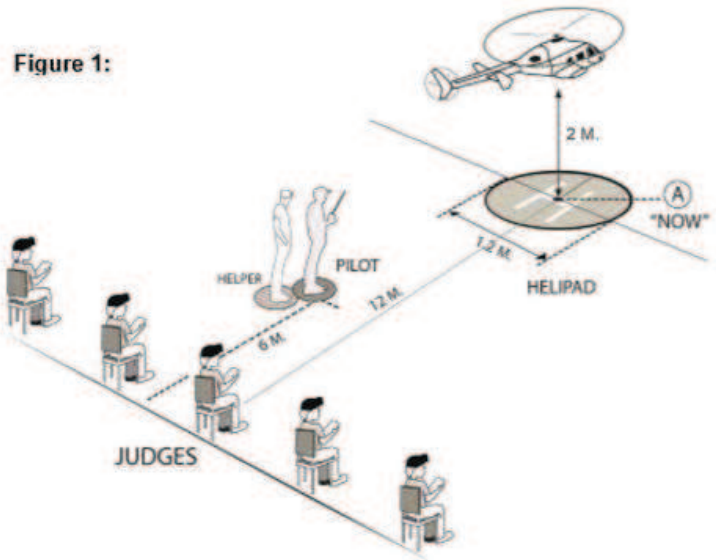


Figure 2(A):

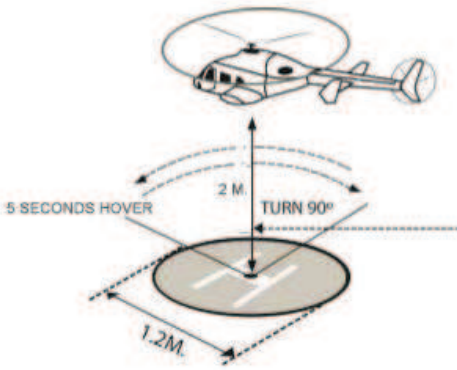
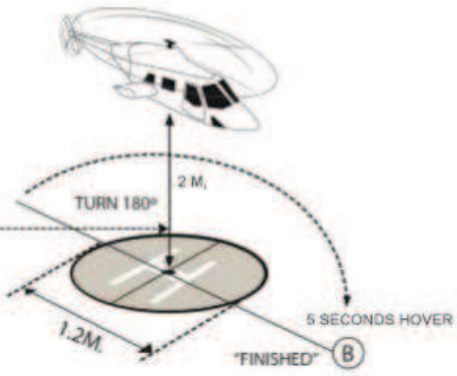


Figure 2(B):

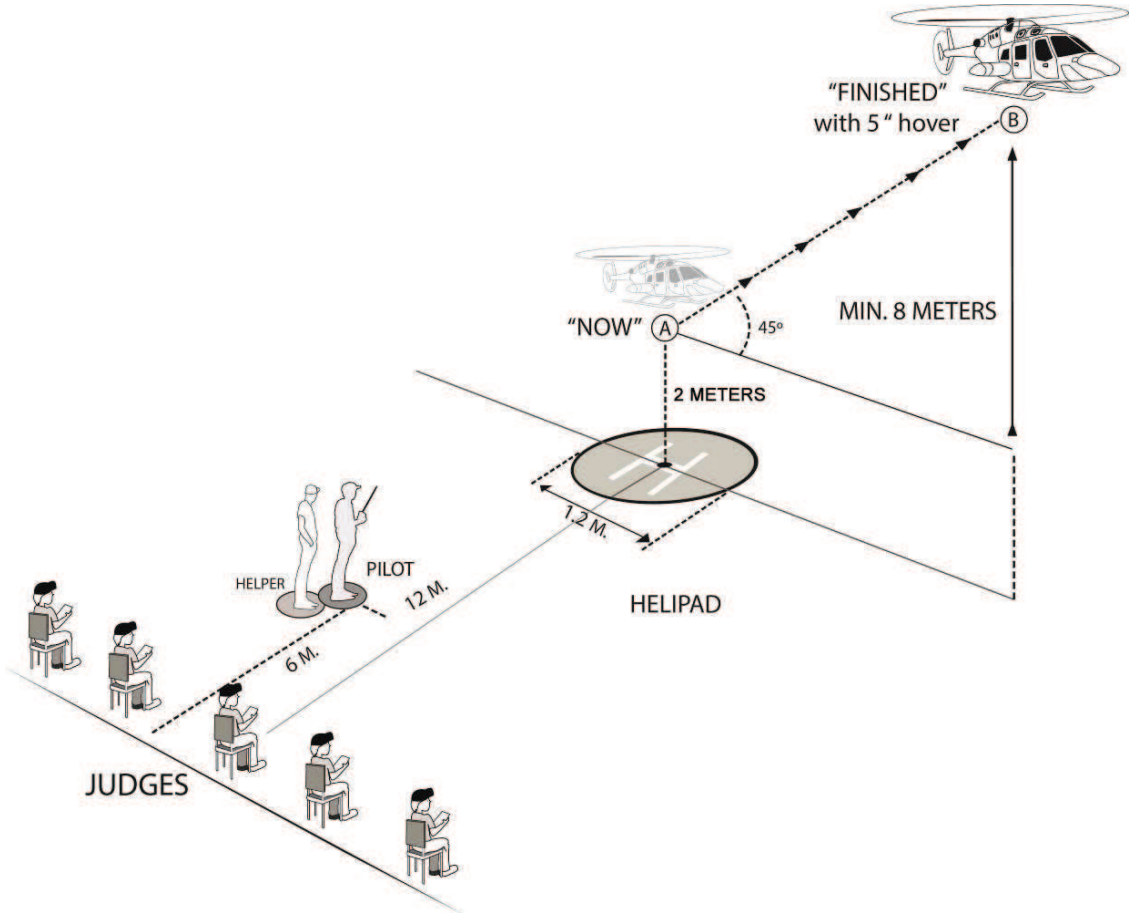


ERRORS:

1. Constant height of two metres not maintained.
2. Not centred on judge's position (Figure 1) or helipad centre (Figures 2A and 2B).
3. Two far away/too close/too high/too low over helipad centre.
4. Start and finish not centred on judges' position.
5. Climb up not smooth, continuous and steady.

B 45º CLIMB OUT (MANDATORY)

The manoeuvre starts at eye level (Point A) with a 45º climb out parallel to the flight line, finishing at point B. This figure can be made to left or right side.

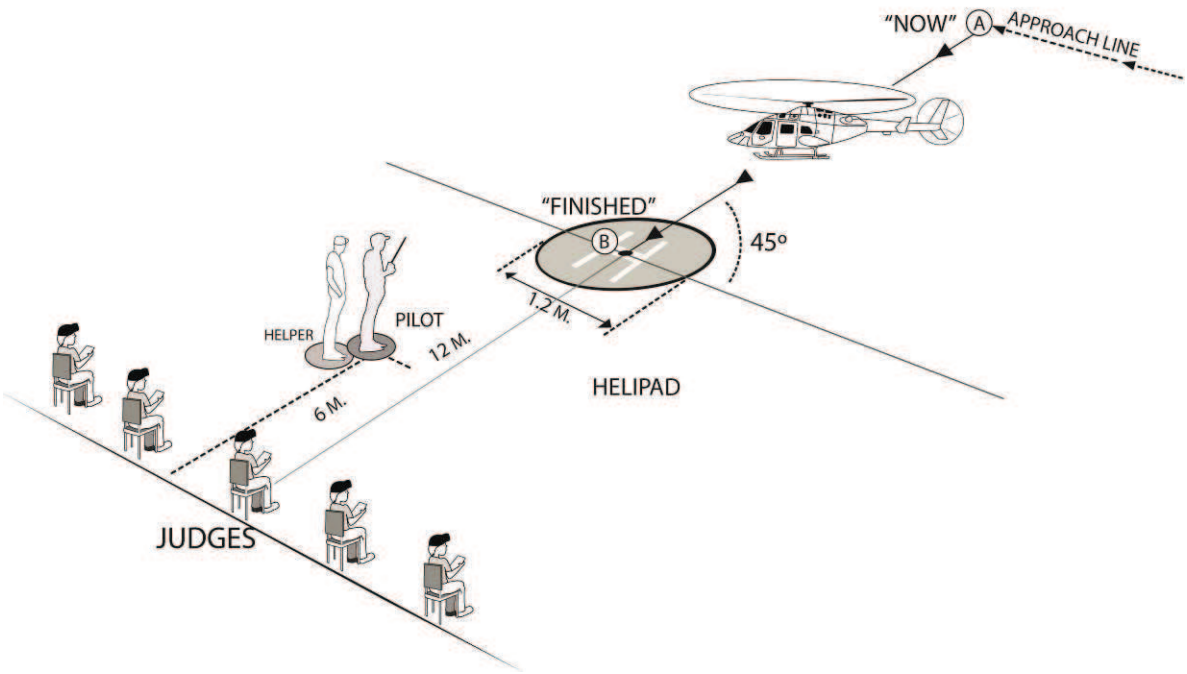


ERRORS:

1. Not starting at eye level.
2. Not finishing the manoeuvre at Point B (8 metres height).
3. Not keeping the climb out parallel to the flight line.
4. Climb out not smooth and at a continuous 45º angle.

TRANSLATIONAL LANDING (OPTION 1)

At the point A, the helicopter will begin a translational straight-line descent with 45º to a soft final landing on the helipad.

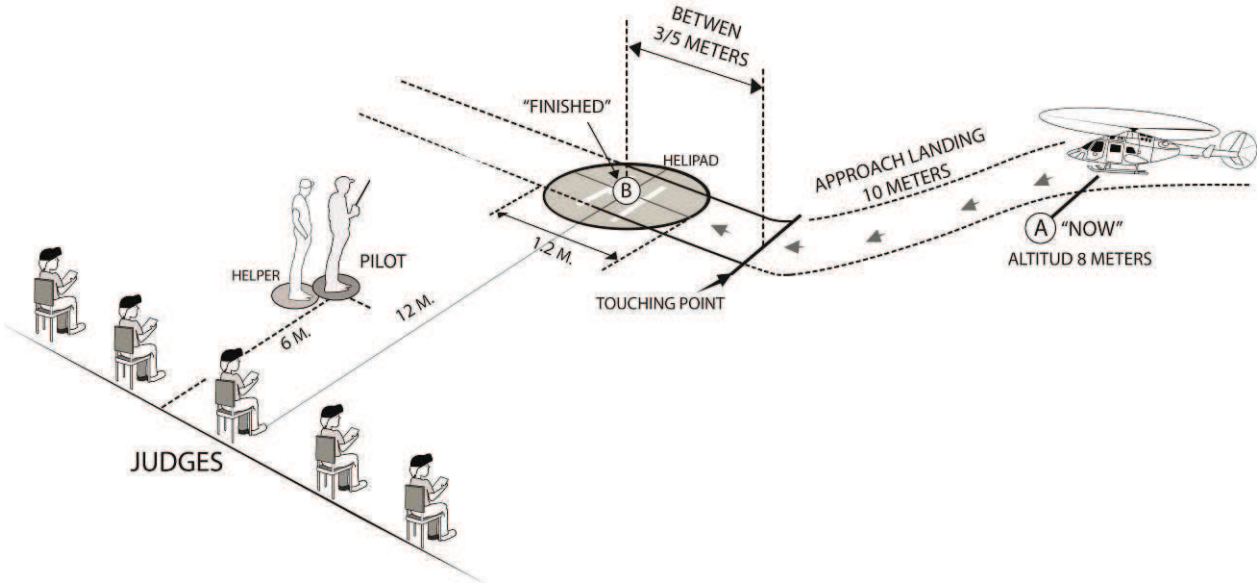


ERRORS:

1. Insufficient climb achieved.
2. The angle of descent is not constant throughout manoeuvre.
3. Model aircraft not smooth and steady.
4. Too far away/too close/too high/too low.
5. Model not landing on helipad centre.
6. The descending angle is not 45º.

RUN ON LANDING (OPTION 2)

The model approaches parallel to the flight line, descending smoothly. The manoeuvre starts at point A, which has a minimum height of 8 metres. The model must touch down at a distance of between 3 to 5 metres from the helipad, sliding to a stop within the helipad. This manoeuvre can be made to the left or right side.

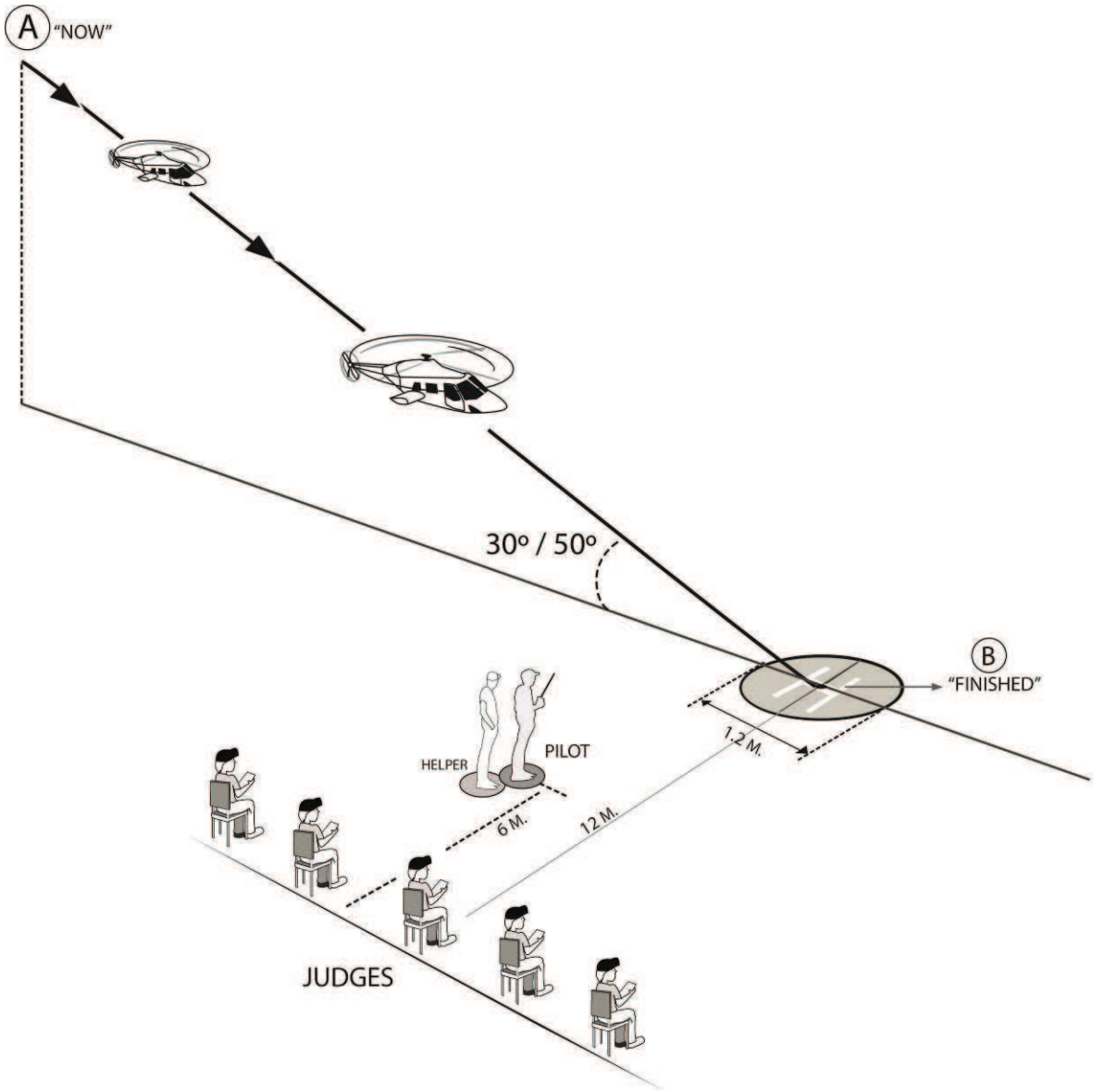


ERRORS:

1. Model descent not smooth and continuous.
2. Start and finish of manoeuvre not parallel with the flight line.
3. Run on slide is too short or too long.
4. Run on slide is not smooth.
5. Model does not stop within the helipad.
6. Model does not finish on helipad centre.

AUTORROTATION LANDING (OPTION 3)

The model enters the manoeuvre at a minimum height of 20 metres, descending at an angle that is between 30º and 50º, parallel to the flight line. The model must be in an autorotation state and the engine must be disengaged before the manoeuvre starts. The manoeuvre ends with the model landing safely within the helipad. This manoeuvre can be made from the left or right side.



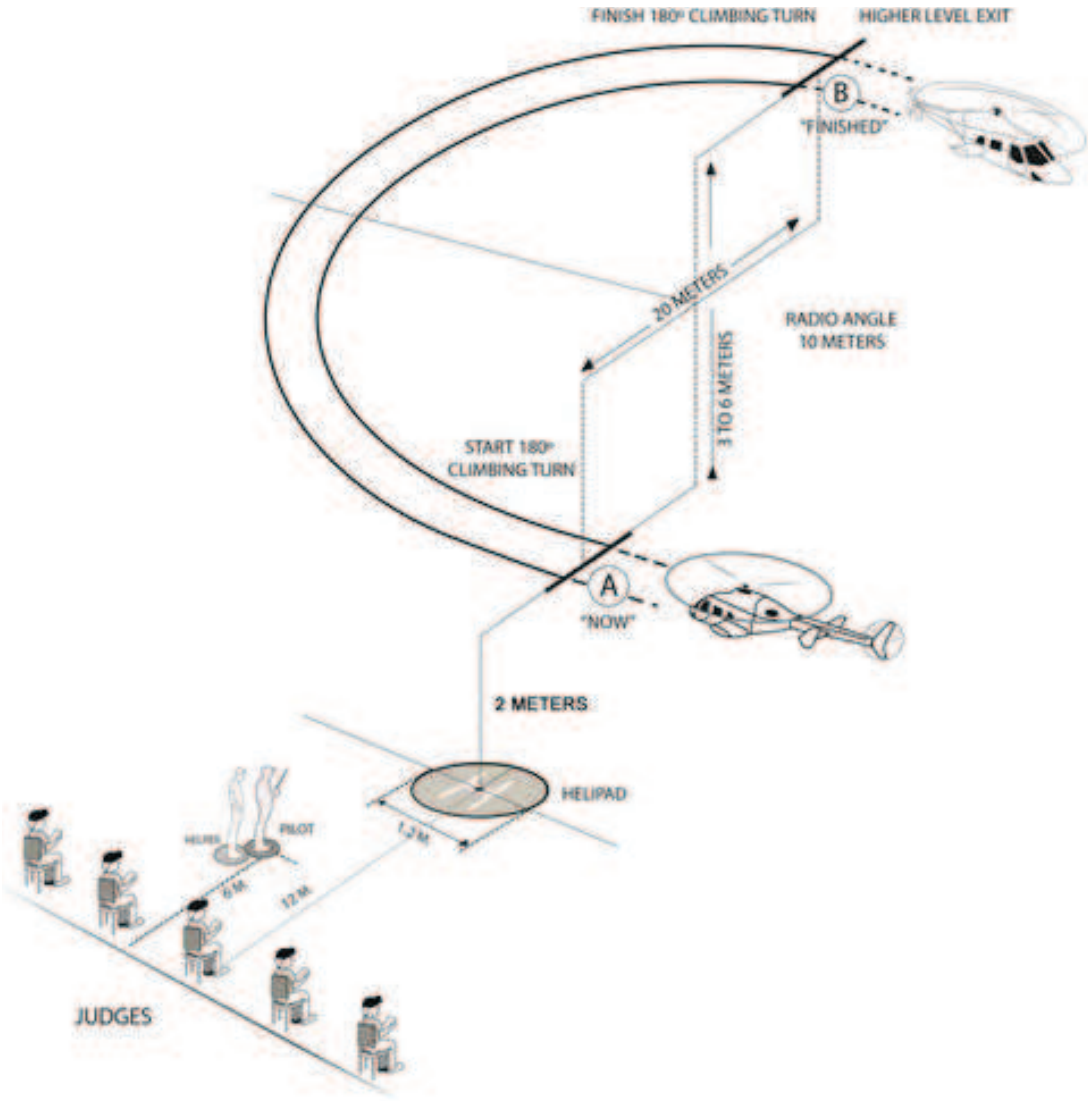
ERRORS:

1. The model bounces on touch down.
2. The model does not perform a smooth landing.
3. The model is not in a constant descent.
4. The model does not land within the helipad.
5. The engine was not stopped.
6. The model does not land parallel to the flight line.
7. The model does not land on the centre of the helipad.
8. The manoeuvre is too far away/ too close / too low / too high.
9. The main rotor edge is out of the helipad circle.

NOTE: The competitor may only choose one option in each round for landing.

A CHANDELLE

From a straight and level flight al eyes level, the model aircraft passes the judges and then performs a 180º 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.

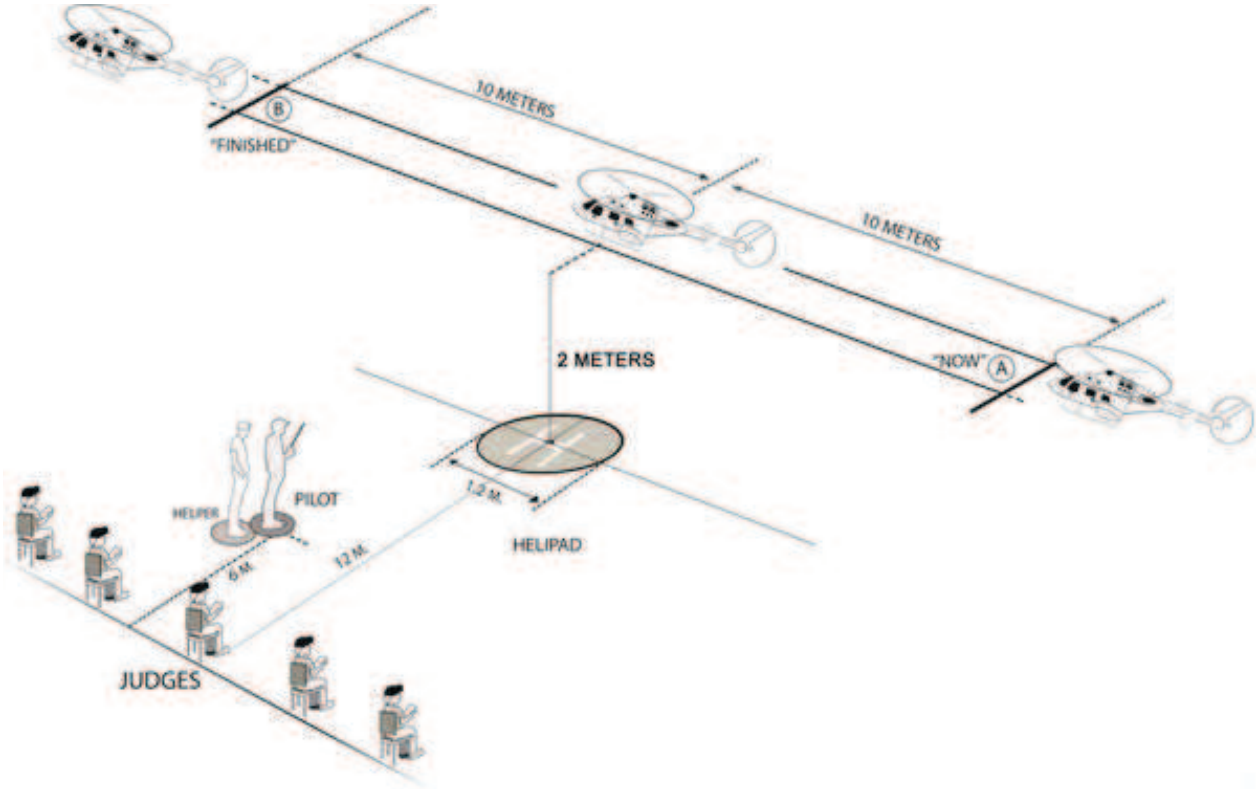


ERRORS:

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 180º opposite to entry.
9. Entry and exit not in straight and level flight.
10. Too far away or too high.

B FLY PAST AT CONSTANT HEIGHT

Model aircraft approaches in straight flight at a constant height not exceeding 2 metres for a minimum distance of 20 metres. This is in effect a low fly-past. The manoeuvre can be done to the left side or to the right side.

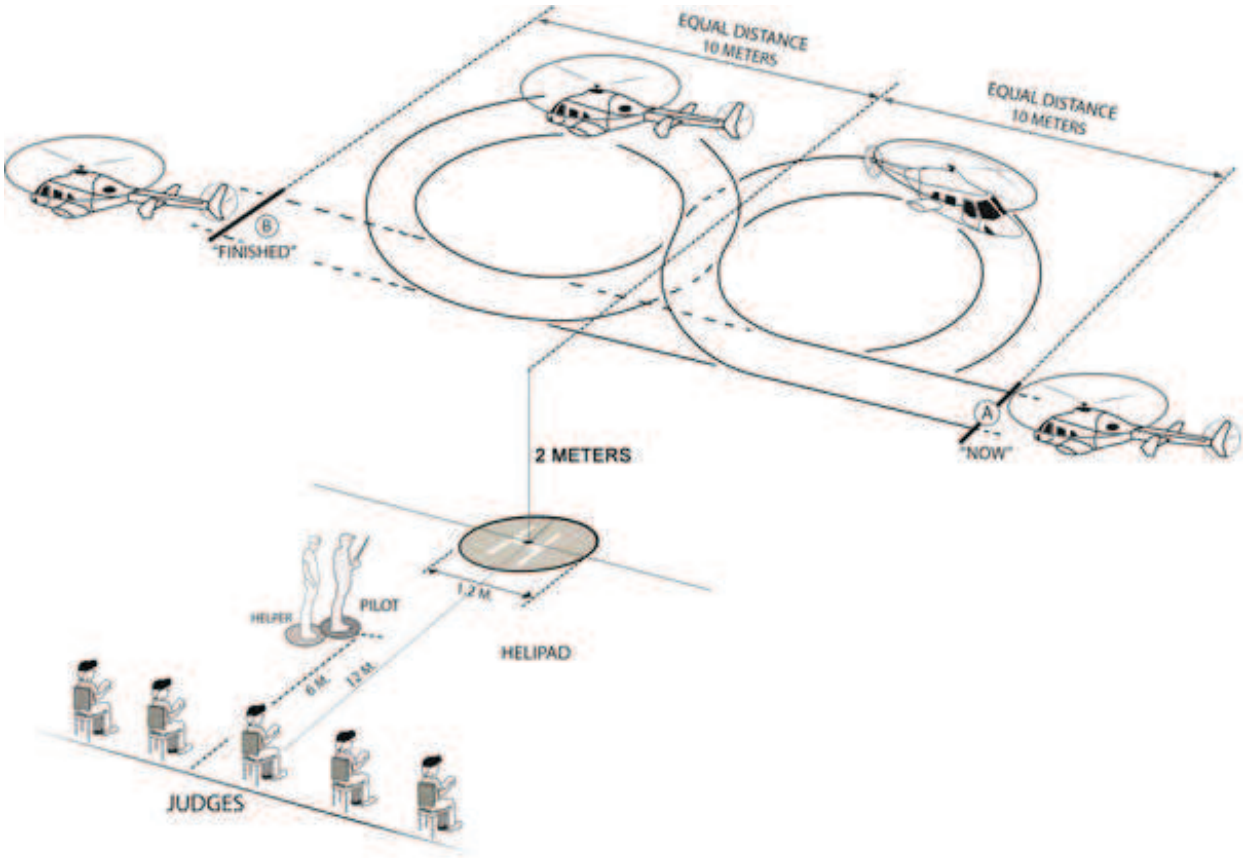


ERRORS:

1. Not a straight course (slight corrections acceptable with light aircraft).
2. Not at a constant height.
3. Not 2 metres or below.
4. Not passing over the landing area.
5. No centred on the judges' position.
6. Not parallel with the judges' line.
7. The distance is too short (too long is not an error).
8. The model aircraft's flight is not steady.
9. Model is too far away / too close / too low.

C 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 360º turn in the opposite direction, followed by a 270º turn in the first direction, completing the manoeuvre on the original approach line. The intersection 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.



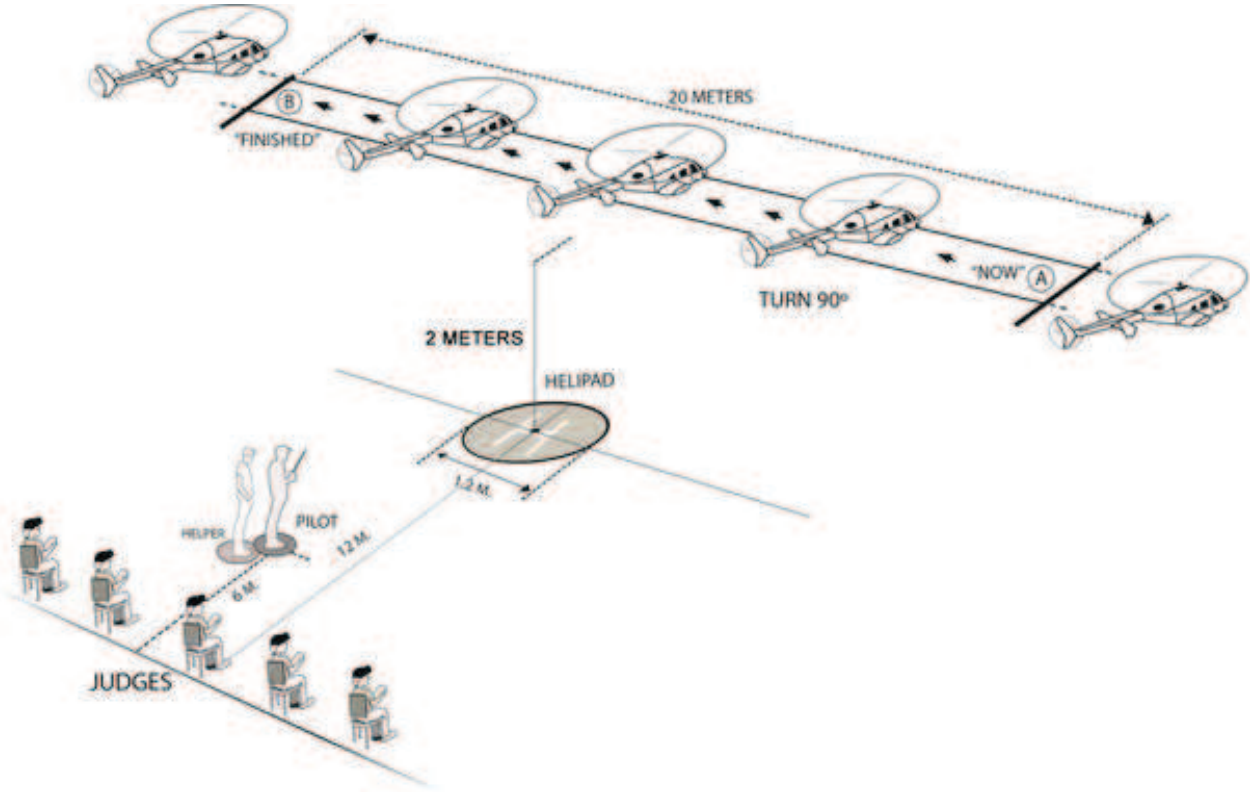
ERRORS:

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

D SIDEWAYS FLIGHT

The model aircraft approaches in straight flight at a constant height not exceeding eye level, parallel to the judges' line.

At Point A, start the manoeuvre with the nose of the model aircraft facing opposite to the judges' position and retain this orientation during the rest of the manoeuvre to the end. Maintain the height to the end of the manoeuvre. This is a low side fly past. This manoeuvre can be done from the right side or from the left side.



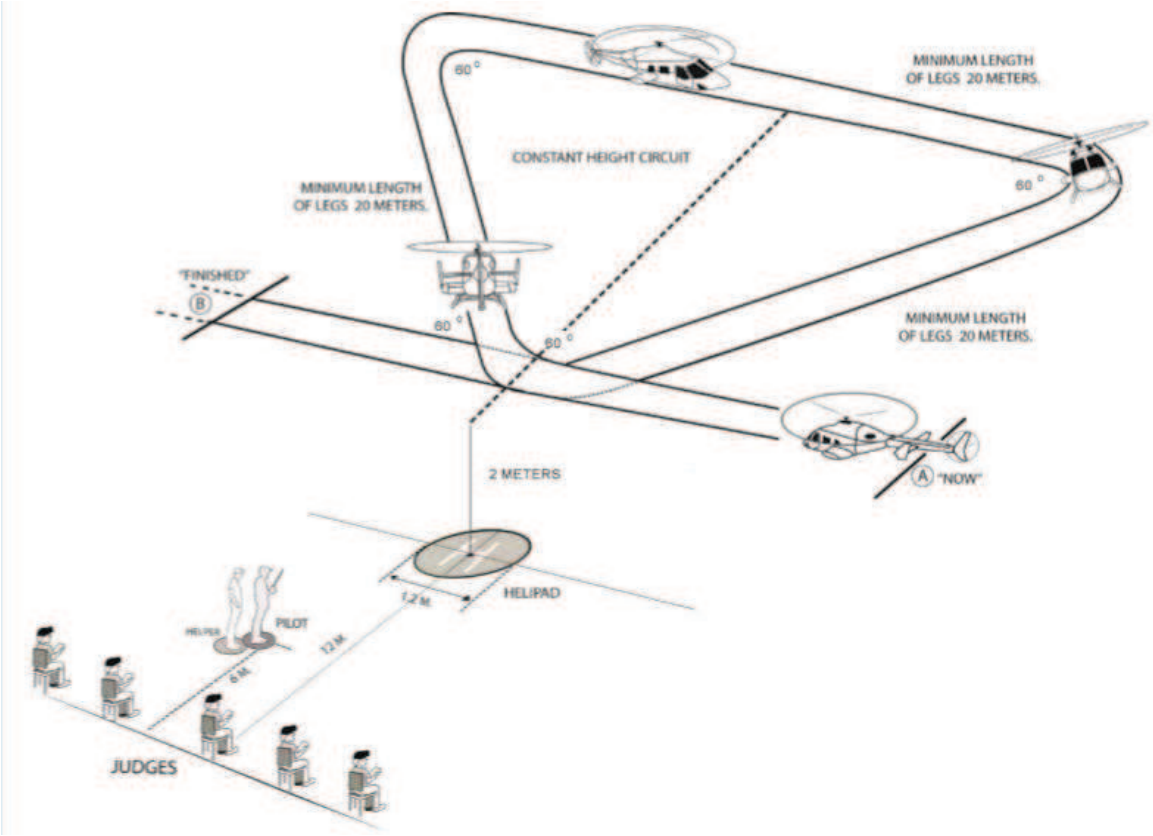
ERRORS:

1. Model is too far away / too close / too high / too low.
2. Model is not at constant height.
3. Height exceeds 2 metres.
4. The nose of the model aircraft is not facing opposite (90º) to the judges' position.
5. The manoeuvre is not steady.

E FLIGHT IN TRIANGULAR CIRCUIT

The model aircraft approaches in a straight and level flight at a maximum height of 2 metres to a point directly in front of the judges, then turns away to track 60º away from the judges' line, flies straight and level for a minimum of 20 metres, turns to track parallel with the judges' line, flies a further minimum of 20 metres, then turns to track towards the judges and flies a further minimum of 20 metres to a position above the centre of the landing area, which completes an equilateral triangle (a triangle with sides of equal length and included angles of 60º), before making a final turn to intercept the original entry track.

Angles of 60º have been marked on the diagram below.

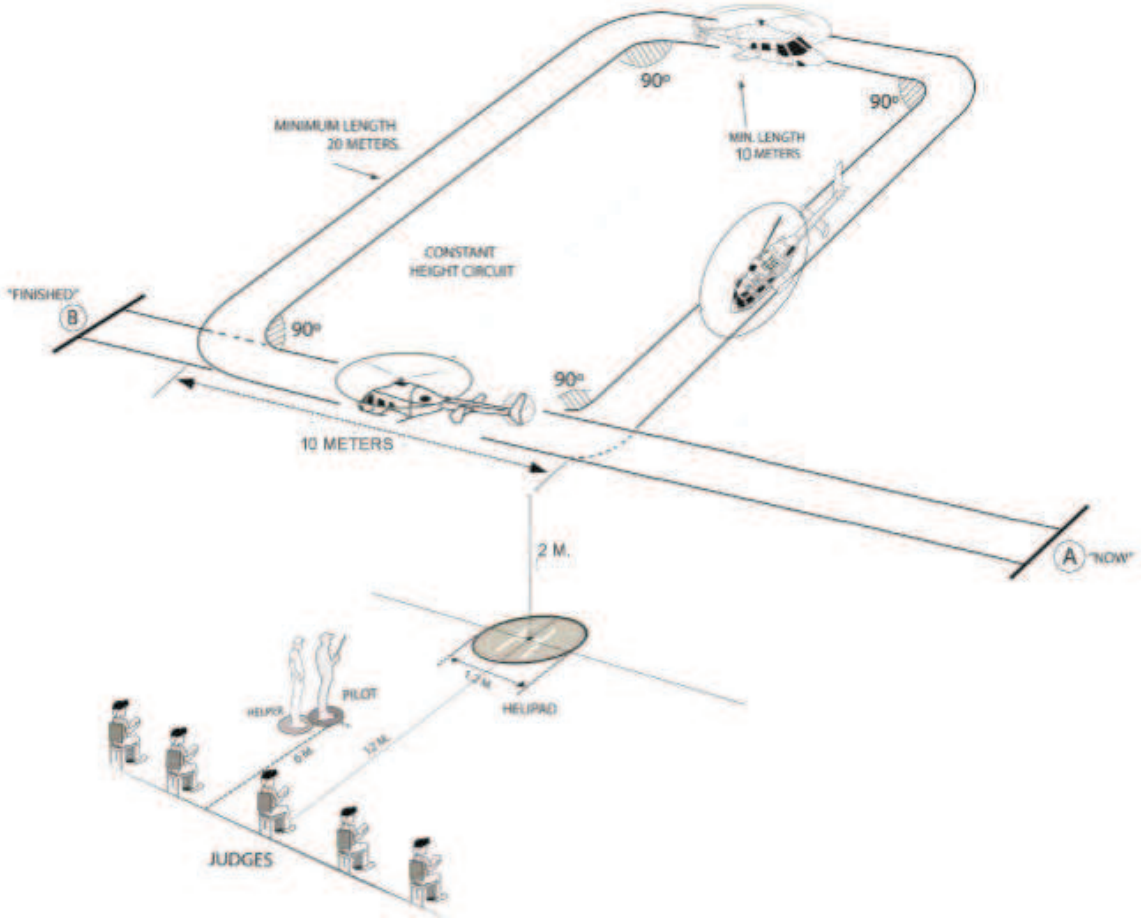


ERRORS:

1. Manoeuvre is 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 the triangle is not centred on judges' position.
8. Correction for drift not properly made.
9. Start and finish tracks are not the same.
10. Start and finish tracks are not parallel with the judges' line.
11. Model is too far away / too close / too high / too low.
12. Manoeuvre is not constant and smooth.

F FLIGHT IN RECTANGULAR CIRCUIT

The model aircraft approaches in straight level flight at a maximum height of 2 metres to a point directly in front of the judges, then continues for a minimum of 10 metres before it turns away to track 90º from the judges' line and flies straight and level for a minimum of 20 metres before turning to track parallel with the judges' line for a further minimum of 10 metres, turns to track directly towards the judges for a minimum of 20 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.



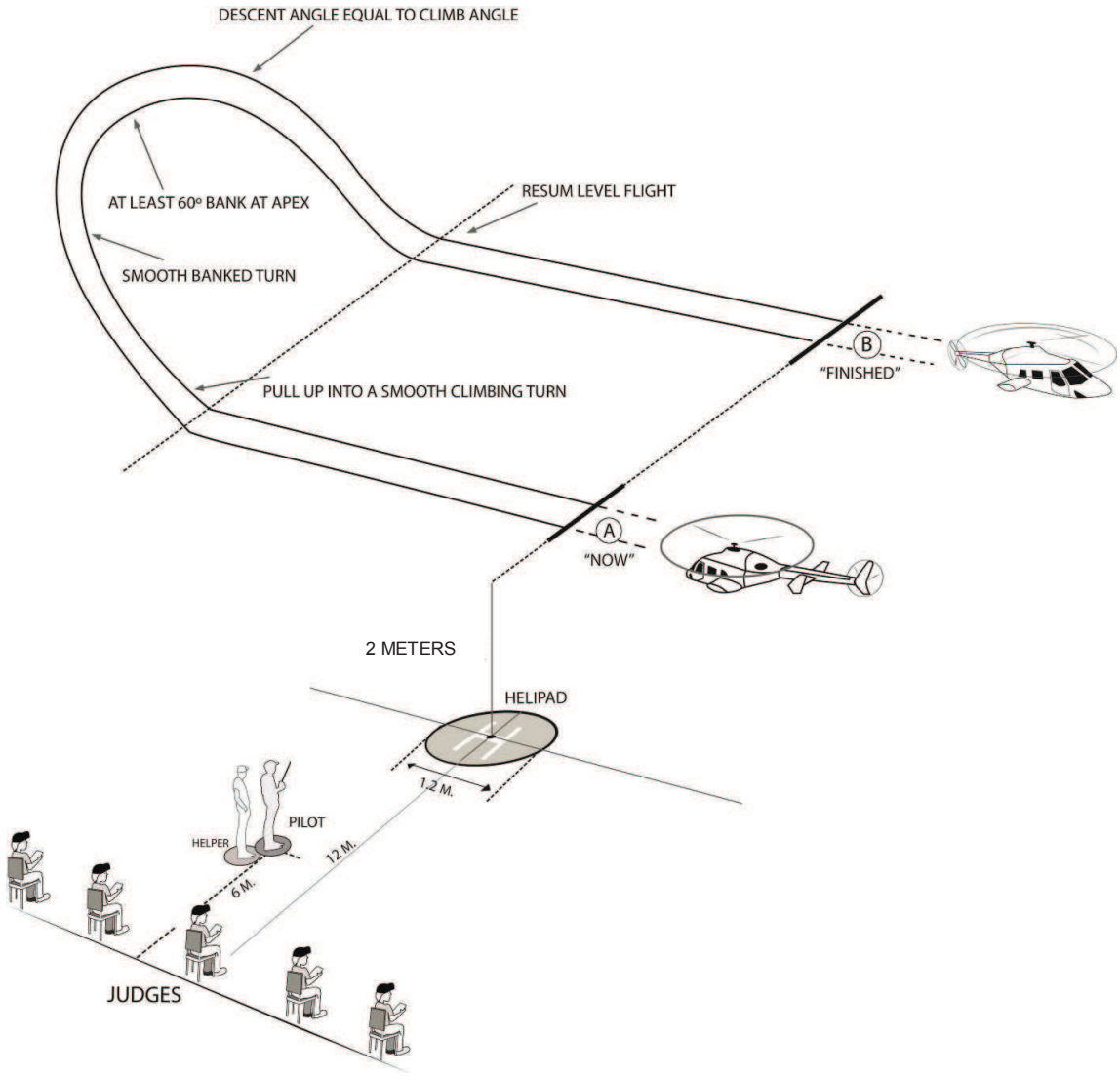
ERRORS:

1. Not commenced and finished at points equidistant from the judges.
2. The 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. The opposite sides of the 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. Model is too far away / too close / too high / too low.
12. Flight is not constant and smooth

NOTE: The manoeuvre must demonstrate a relationship between the straight legs of 2:1

G 180º ASCENDING TURN

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 60º 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. This manoeuvre can be done from the left or right side.

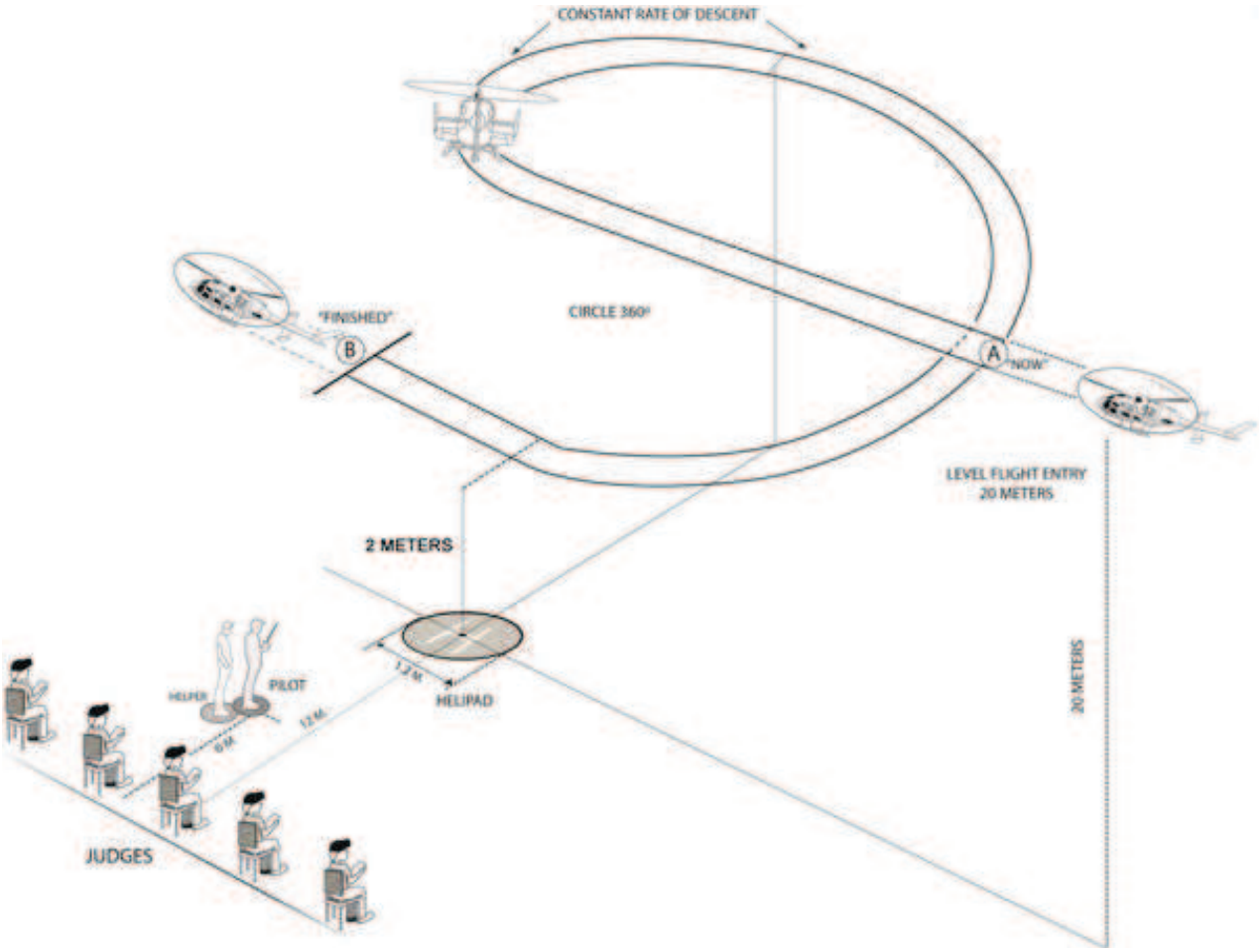


ERRORS:

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. Model is too far away / too close.

H 360º DESCENDING CIRCLE

Commencing from straight and level flight, the model aircraft performs a gentle 360º descending circle over the landing area, in a direction away from the judges, at a constant throttle setting. The manoeuvre terminates at a minimum at eye level, resuming straight and level flight on the same path. This manoeuvre can be done from the left or right side.

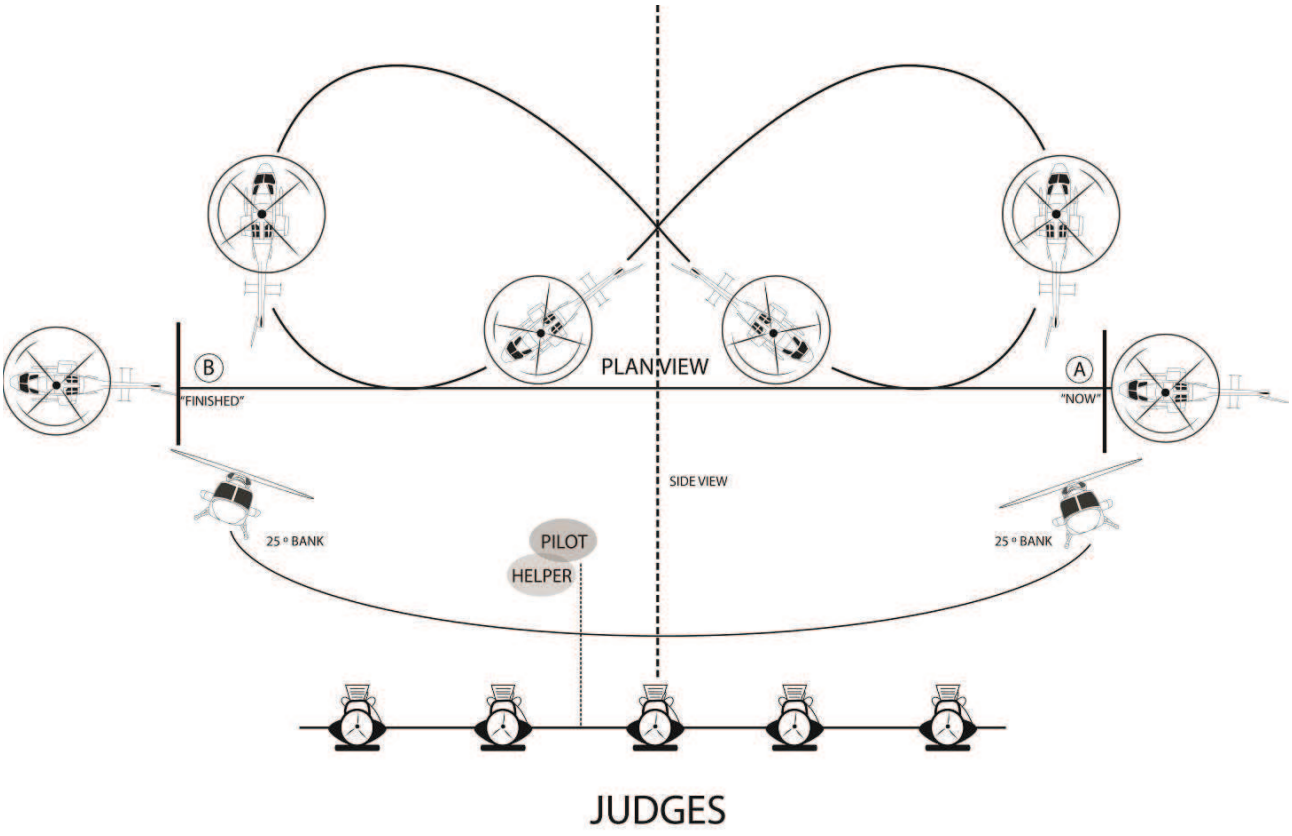


ERRORS:

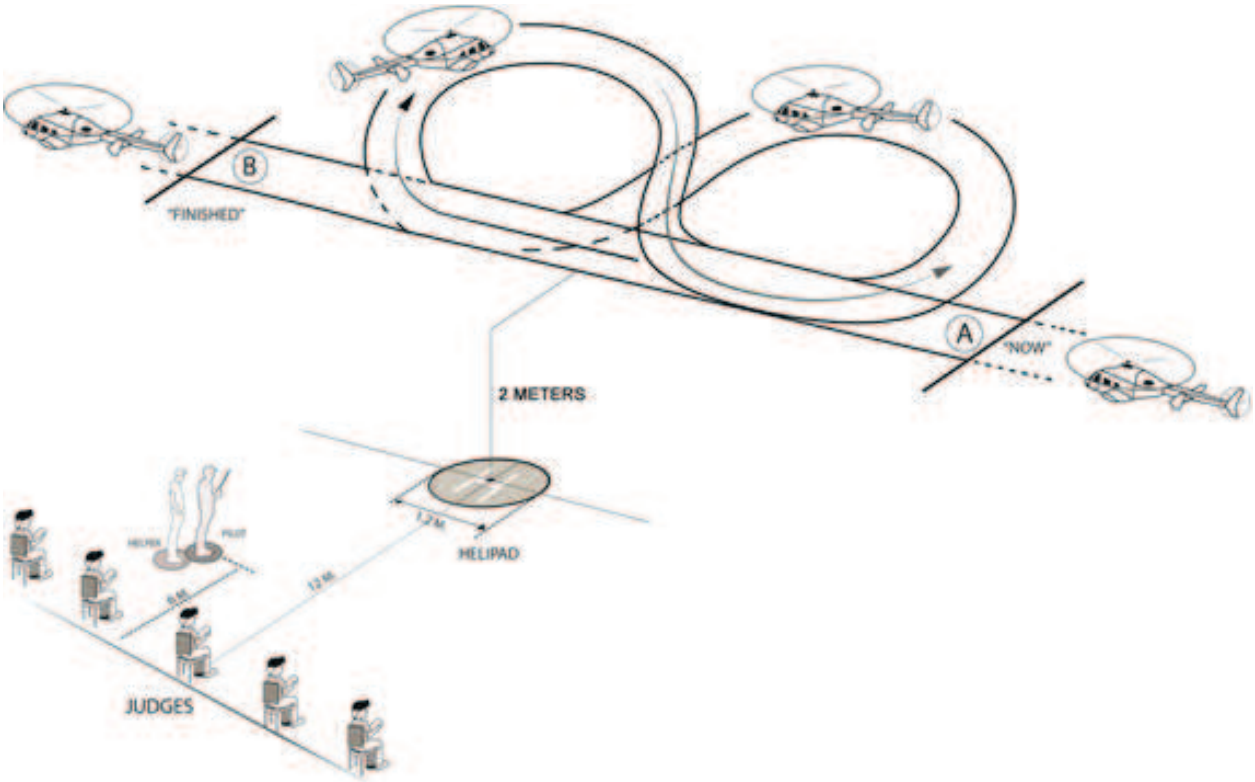
1. Rate of descent not constant.
2. Descent too steep.
3. Throttle setting not constant or low enough.
4. Circle misshapen.
5. No significant loss of height.
6. Model aircraft does not descend to 6 metres or below.
7. Circle not centred on judges' position.
8. Entry and exit paths not parallel with the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

I 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 25º 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 180º 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. The figure should be symmetrical each side of the judges' position.



View 2 of the figure



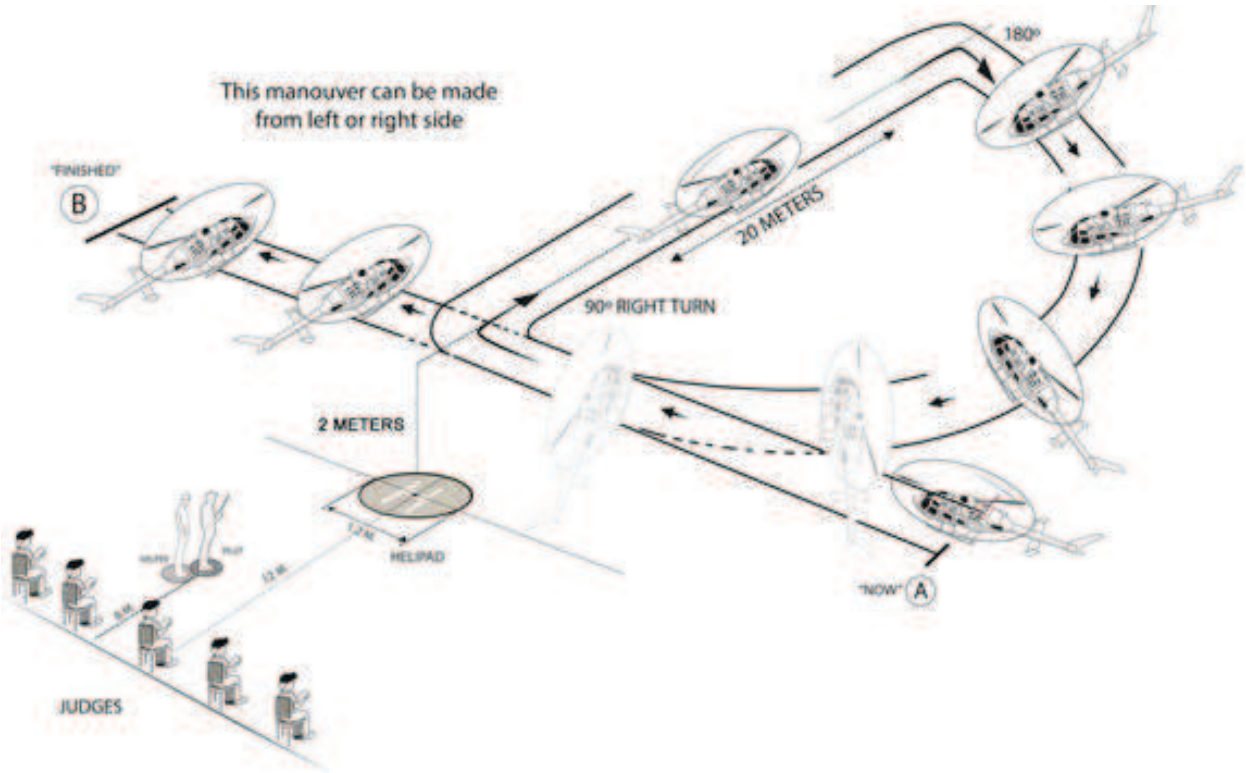
ERRORS:

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. Model is too far away / too close /too high / too low.

NOTE: The competitor will adjust the manoeuvre depending on whether it is done from the left or the right.

J PROCEDURE 90º WITH STRAIGHT FLIGHT AND 180º ANGLE

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 centre of the judges' line, the model makes a 90º turn opposite to the judges' line, followed by 20 metres of straight and level flight. Then the model makes a 180º arc, performing this arc with the tail rotor to the outside, and continuing this arc to the intersection with the entry track. This manoeuvre can be done from the left or right side.

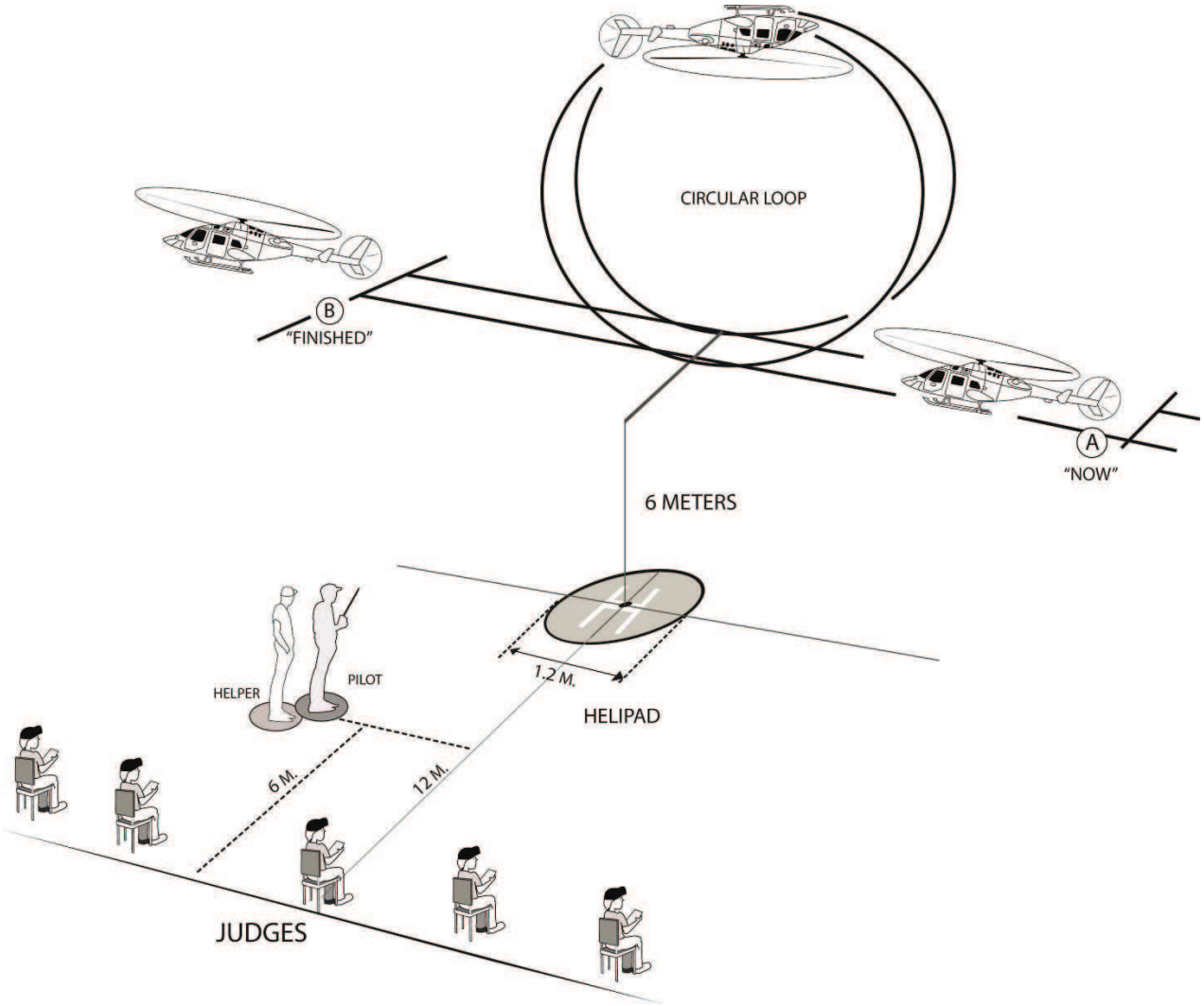


ERRORS:

1. The model is too far / too close / too high / too low.
2. The model does not maintain a constant height.
3. The model does not perform the manoeuvre at eye level.
4. The 90º and 180º turns are not constant.
5. The flight line of the model is not smooth and constant.
6. The 20 metre track is not straight.

K ONE LOOP

From straight flight at 6 metres high at maximum, the model aircraft pulls up into an inside loop and resumes straight and level flight on the same heading as the entry. The model may adjust the speed and size of the manoeuvre depending on the prototype flight performance. This manoeuvre can be made from the left or right side.

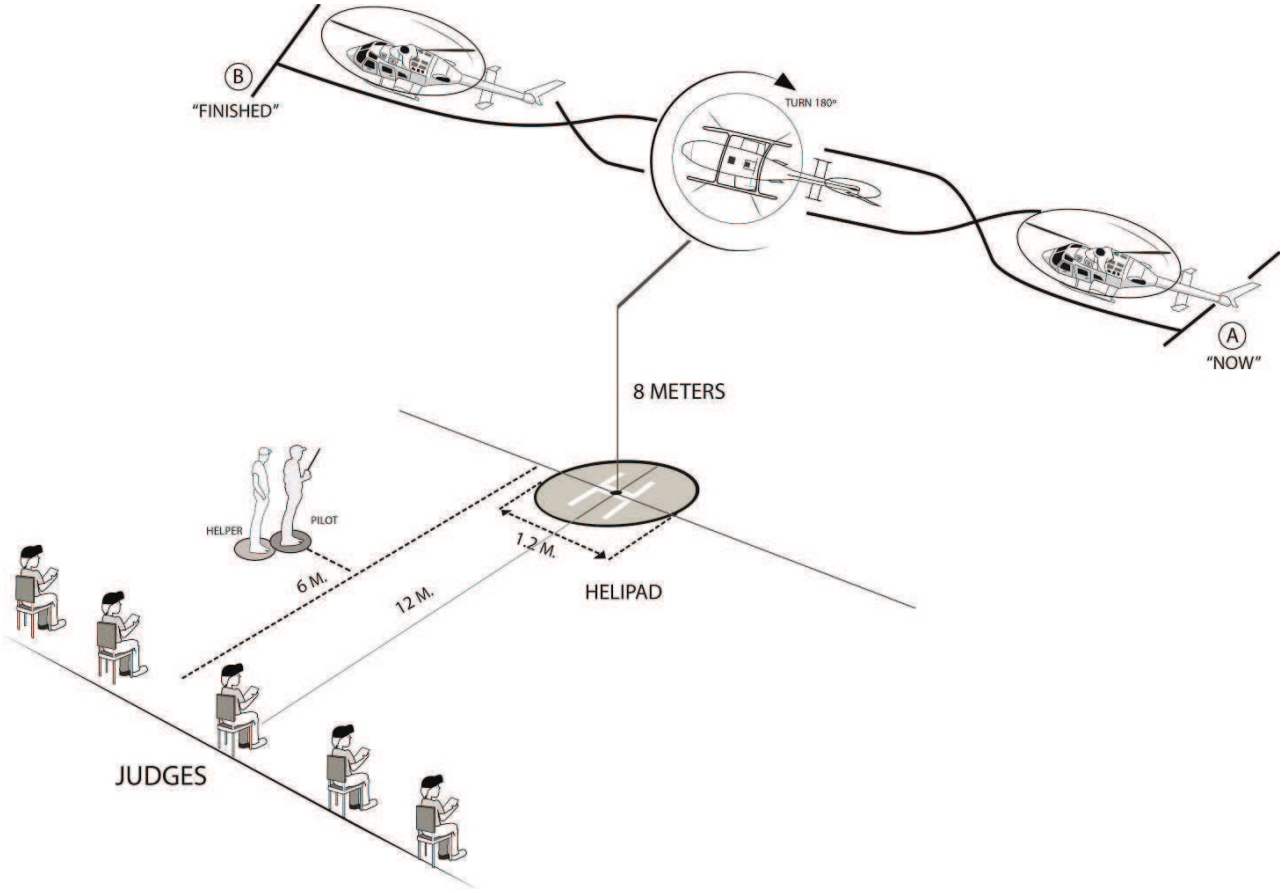


ERRORS:

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

L INVERTED FLIGHT

From straight and level flight at 8 metres high, the model aircraft makes a half roll into inverted attitude and makes a straight inverted flight of 20 metres in length, then makes another half roll out of inverted attitude and resumes normal straight flight. This manoeuvre can be made from the left or right side

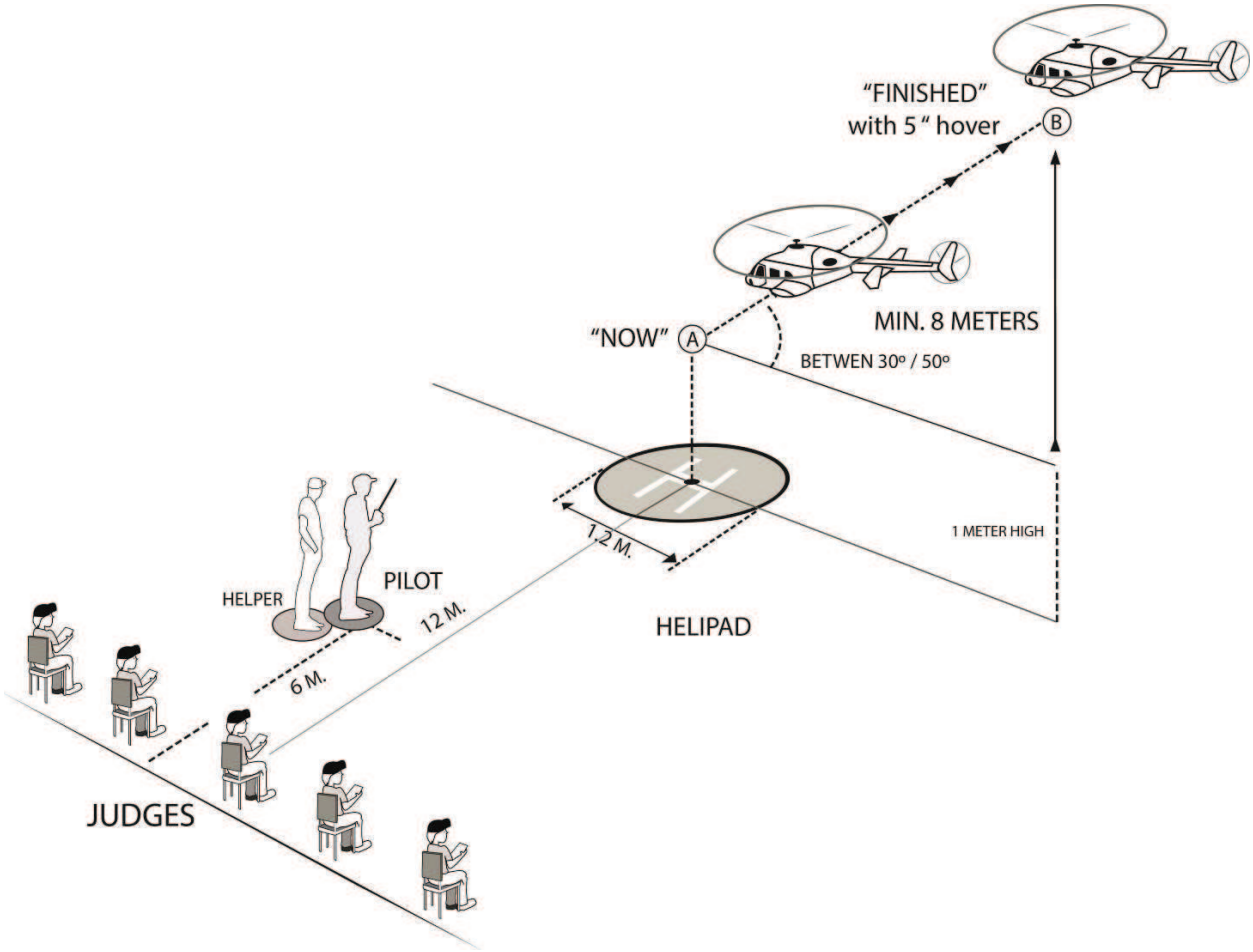


ERRORS:

1. Rate of roll 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 manoeuvre is too small or too large in reference to the prototype and scale of the model aircraft.
5. The model is too far/ too close / too high / too low.

M FIGURE BACKWARD

The model starts the manoeuvre at one metre high over the centre of the helipad (from Point A) then ascends in a smooth angle from 30º to 50º. The manoeuvre will finish with a 5 second hover at Point B at a minimum height of 8 metres. This manoeuvre can be made to the left or right side.



ERRORS:

1. Manoeuvre is finished too low.
2. The ascending angle is not between 30º and 50º.
3. The climb is not smooth, continuous and steady.
4. The model is too far / too close / too high / too low.