

2019 WAGGA MILITARY SCALE EVENT OFFICIAL RULEBOOK

v6.0 November 2018

SPORTSMANSHIP

We consider that one of the most important features of this competition is its congenial atmosphere. While it is a reasonably serious contest, we would like rivalry to take second place to camaraderie. We will always protect this combination of competitiveness and good fellowship. The Wagga event is, as much as anything, a social occasion.

THE EVENT CONCEPT

The philosophy that governs the Wagga Event is: "No rule shall intentionally, or accidentally, provide an unfair advantage or disadvantage to any particular type of subject choice." The rules in this document have been refined to give the contestant a free hand to choose a subject appealing to him or her. Quality alone, both in building and flying, will determine the outcome.

Please note that while drawing upon the FAI standoff Scale Rules for guidance, these Rules for the Wagga Military Scale Competition differ in a number of ways and it is up to the Entrant to become familiar with the content of this Rule Book **before** attending our Event. Understanding the rules may well influence your choice of model and/or manoeuvres flown.

For the 2019 Event, Scratch and Kit-built entries will not be competing directly with ARF's, which are now placed in their own Class.

There is now a Military Scale Helicopter class.

As has always been the case, there is a static points advantage to being a good builder, and due to the separate Classes, ARF Entrants are encouraged to enter Static judging where they can potentially receive the same number of points as Scratch-built entries. This is also to encourage ARF entrants to exercise their skills to create more accurate and detailed scale models.

Flight rules and Flight scoring for both Classes is the same and remain unchanged from previous years.

THE FIELD

The Wagga flight area is mowed grass, with an 85m long textile mat adjacent the pilot's box. Competition flights however, are conducted exclusively off the grass flight surface, with the pink matting classed as a buffer zone to protect Pilots and Callers. The flight area measures 175m x 90m, sloping very gently from North to South and surrounded by flat crop/fallow paddocks. Fences to the North, East and South are removed or laid flat for the event to allow safe over-runs. The Southern over-run area can be quite rough. There is a height limit of 1,000ft.

The flight strip is roughly aligned North/South, although there is provision to allow a shorter cross-runway aligned North-East/South-West if crosswinds become excessive on the main strip.

PART 1 - GENERAL RULES

1... This event is open to any model of any heavier than air, man-carrying aircraft ever built and flown in any military-related role. Helicopters, Turbines and EDF's are welcome.

If a pilot was visible in the full-scale aircraft then an appropriately sized Scale Pilot figure must be visible in the model aircraft, during the entire flying portion of the contest. If a pilot figure is not in

place during the flying rounds, 10% of the flight score will be deducted. Obviously, Static points will be lost if a pilot is absent during the inspection.

2... We offer provision for a backup aircraft to be used if the primary entry is damaged beyond repair, (e.g. in pre-event practice) **before** it has flown in a competition round. There also must be time available for it to be Static judged prior to a Scoring Flight round. This provision will be available at the Contest Director's discretion

3... Wagga allows for 2.4GHz & 36MHz frequencies to be used, although 2.4GHz is strongly preferred and recommended. A frequency board is available for the use of 36MHz entrants.

4... A pilot may enter ANY or ALL Categories or Class at the Event, including Team entry, provided that there is room in those Categories or Class's to accommodate the additional entries. There is no restriction on an Entrant entering two or more models in the same category. e.g. an ARF Spitfire and an ARF Mustang may be entered in WW II Category by the same Contestant.

Fees for the 2019 event are; \$45 per entry with no extra fee for additional models. Camping and Saturday Dinner fees are not included. Camping fees are \$15/site/night for 2 adults, with \$5/site/night for each additional adult. Children <12 are free.

5... All pilots must have a "Caller" for each flight and both must wear a coloured Safety vest at all times while airside during the event

6... All pilots must be a member of the MAAA, hold a current F.A.I Licence and at the time of the Event, hold Gold Wings. The Contest Director reserves the right to cancel the entry of any pilot who is obviously not up to this standard

7... All models over 7.00 kg are to have a **current** MAAA MOP certificate that must be produced at registration or to the CD prior to the commencement of **any** flying, competition or practice. By prior arrangement, a Heavy Model Inspector can be made available

8... All competitors are to act in a sportsmanlike manner and in accordance with these rules and the spirit of the event

9... The Contest Director will decide upon all queries and disputes

10... The contest is divided into 2 parts: Static Judging and Flight Judging. Static judging is available to both Classes, i.e. ARF, Helicopter & Scratch/Kit-built models.

Any Entrant may elect to skip Static Judging completely, but will obviously forego the chance to gain additional points that would count toward the Entrant's overall total for the Event.

There is no longer a separate 'Flying only' Category or awards

11... **Builder of the Model Rule***. For Scratch-built and Kit-built Class

This rule is intended to reward those who have taken the time and effort to create a competitive model from a pile of balsa and ply. Whilst no rule can eliminate cheating, the rules are made for the guidance of the honest contestant. Violation of the B.O.M. Rule will result in disqualification from this and possibly future Wagga events. The ARF Category is obviously exempt from the Builder of the Model rule, however, when presented for static judging, ARF's will still be subject to all other Static Inspection documentation requirements.

* **The B.O.M. Rule**, which applies to Scratch-built and Kit-built classes only, is defined as follows:

11 a...Scratch-built:

Built from either commercial or hand-drawn plans only, and **wholly by the entrant**. All airframe parts to be formed and assembled by the entrant, although;

- Very limited laser cutting is allowed, provided these items were not part of a purchased short kit of materials
- Purchased canopies, turrets, landing gear, wheels, spinners, props, engine mounts and fittings & other flight control hardware items like linkages & connectors are allowed. Detailing scale accessories, (e.g. guns, antennas, RDF/ADF sensors, pitot tubes, etc.) not part of the control systems **must** be made by the builder.

11 b...Kit-built:

Built, **by the entrant**, from either a purchased short or long kit that may contain all parts necessary to complete the model. Uncovered foam wing & tail cores and bare-shell fibreglass fuselages are permitted, but the fuselage, wings or tail elements **may not** be fully or partly covered or assembled as part of the kit. (**This would result in ARF classification**) (An exception to the tail element rule is where a moulded fin is part of an otherwise bare-shell fibreglass fuselage)

12... Models of multi-engine aircraft may be entered using less than the scale number of operating engines as long as those operating engines represent at least 50% of the scale number of engines. For example, a B-24 Liberator may fly with only 2 operating engines as long as the other 2 “dummy engines” are not readily distinguishable as such at a glance. It is expected that dummy engines would have free-rotating propellers for Static judging and flight. An F-4 Phantom can use one engine in a bifurcated duct, so that from outside appearance, the model has 2 engines.

13... Dual transmitters controlling a single model are not permitted, although a single transmitter case with dual Tx modules is permitted (e.g. Jeti, Weatronic, ACT systems) Telemetry systems are allowed, provided the audio is confined to a ear piece so as not to be a distraction to the other flight line crew.

14... Gyros

As the flight section of the competition is meant to be a test of pilot's skill, we feel that the use of gyros should be confined to rudder-only on multi-engine models, any longitudinally unstable design and WWI bi-planes for safety reasons. We acknowledge that the very small size of these units, (including those that are built-in to the receiver), has made regulating their use quite impossible. Therefore, we ask entrants to take into account the spirit of the event when considering the use of 3-axis gyros.

Helicopters are exempt from this Gyro rule.

For the same reasons, autopilots, or any other device, including the automated or programmable flight manoeuvre functions available in upscale Transmitters, should not be used

15... All engines, except turbines, ducted fans and diesels, must use mufflers. 4-strokes may use minimal mufflers or collector rings on radials.

16...Helicopters

These will only compete against other Helicopters in the Military Scale Class. Static Judging will be available, with the same documentation requirements as fixed wing entries. Helicopters are required to fly in a scale manner at all times, with pilots choosing their optional manoeuvres from

the same list as fixed-wing models. The only extra optional manoeuvre available to helicopters will be an auto-rotation. This manoeuvre is not mandatory.

Apart from the optional Autorotation, all manoeuvres shall be flown as per the manoeuvre list appended to the end of these rules. Take offs will be totally scale-like with a lift off to a low hover, (<300mm) followed by progressive transition to forward flight. The same take-off flight profile as for fixed wing must be followed, including the 90° turn, left or right, before calling 'Complete'.

Landing approaches will be scale-like with a steep descent, with forward airspeed and descent rate slowing as the ground approaches, before coming to a low hover, (<300mm) followed by a soft touchdown. Points will be deducted for; excessive height gained vertically after initial lift-off, not flying in a scale-like manner, non-scale approach profile, poor landing control. This is not an exhaustive list, but highlights the fact that the helicopter must be flown in a scale-like manner at all times and in all manoeuvres.

The optional Autorotation touch down point will be on the pink matting on or close to the Judges sighting line, directly out from the judges seating position. This will also be the touchdown point for the normal landing. The Pilot or Caller may manually position the helicopter prior to the take off manoeuvre, but both must be back in the Safety cage before blades start rotating.

Due to the presence of other entrants positioning or retrieving models, a Safety Call of "Helicopter starting up" must be made before the rotor drive is engaged.

17...AWARDS

Certificates will be awarded for the following. The following Awards will be available for both Classes and they will be separate awards:

- WWI 1st, 2nd, 3rd-----Scratch & ARF
- WWII 1st, 2nd, 3rd-----Scratch & ARF
- Military 1st, 2nd, 3rd-----Scratch & ARF
- Model of the Meet (Pilot's choice) -----Scratch & ARF
- Tim Smith Memorial for best WMAC entry score regardless of Class (Perpetual Trophy)
- Best Military Helicopter - combined score
- Top Flight-----Scratch & ARF
- Top Static-----Scratch & ARF
- Top Team-----Scratch & ARF

Note: To be eligible for any award, a model **must** have completed at least one complete flight round. Pit Queens don't qualify for awards.

18...CATEGORIES: 2019 Wagga Military Scale Event will have three competition Categories, WW I, WW II & Military. Models will be entered into the category that fits the model, rather than it's construction origin.

e.g. A Spitfire will be placed in WWII category, regardless of whether it is Scratch-built, Kit or ARF. It's still a WWII Spitfire (**See Note 1 below**)

A Douglas Skyraider, regardless of construction origin, will be in Military

An ARF Fokker D-VIII will be in WWI. How it was built or who built it, won't alter the category into which it is entered

Note 1: Consideration for a category change will be given where a model displays the colours and marking of an aircraft that was operated outside the most obvious period for that type of aircraft.

e.g. A Hawker Sea Fury that is presented in Korean War colours and markings may be entered in Military, rather than WW II.

However, the entrant must nominate the category that applies to the model presented and have the appropriate documentation to prove it at the Static inspection

- **WW1**-Models of Aircraft that flew in any military-related role whatsoever, by any country, *(including prototypes, but excluding proposed or concept aircraft that were not actually constructed and flown)* during the period of the war, 28 July 1914 to 11 November 1918
(All such aircraft are to be presented in the authentic WW I colours and markings of that aircraft. The entrant must provide proof that the aircraft and its colours and markings were used during WW I. Failure to do so will result in the model being reassigned to the Military Category)
- **WW2**- Models of Aircraft that flew in any military-related role whatsoever, by any country, *(including prototypes, but excluding proposed or concept aircraft that were not actually constructed and flown)* during the commonly accepted period of the war, which is, 1 September 1939 to 2 September 1945. (An exception would be a model of a Japanese combat aircraft that flew in the Sino-Japanese wars from 19 September 1931 to 7 December 1941 will be accepted as WW2)
(All such aircraft are to be presented in the authentic WW II colours and markings of that aircraft. The entrant must provide proof that the aircraft and its colour and markings were used during WW II. Failure to do so will result in the model being reassigned to the Military Category)
- **Military**- Models of aircraft that flew in any war and/or military-related role whatsoever, by any country, *(including prototypes, but excluding proposed or concept aircraft that were not actually constructed and flown)*, other than in WW I and WW II, and;
Prior to WW I or between WW I & WW II, and **not** flown in WW I or WW II, or;
From the end of WW II (3 September 1945) to the present day.
All such aircraft are to be presented in the authentic colours and markings of the aircraft for that period. The entrant must provide proof that the aircraft and its colour and markings were actually used at that time.
All Helicopters will be in this Category

19...Classes

Models will be entered in one of the following three classes at Wagga 2019. Please note that for Competition purposes, Scratch and Kit-built models are classified together. The other Class's will be ARF and Helicopter. As stated above, Entrants may enter as many Classes and Categories as they wish.

Scratch-built:

Built from either commercial or hand-drawn plans only, and **wholly by the entrant**. All airframe parts formed and assembled by the entrant, although;

- Limited laser cutting is allowed, provided these items were not part of a purchased short kit of materials
- Purchased canopies, turrets, landing gear, wheels, spinners, props, engine mounts and fittings & other flight control hardware items like linkages & connectors are allowed. Detailing scale accessories, (guns, antennas, RDF/ADF sensors, pitot tubes, etc.) not part of the control systems must be made by the builder.

Kit-built:

Built, **mainly by the entrant**, from either a purchased short or long kit that may contain all the parts necessary to complete the model. Uncovered foam wing & tail cores and bare-shell fibreglass fuselages are permitted, but the fuselage, wings or tail elements **may not** be fully covered or assembled as part of the kit. (This would result in ARF classification) (An exception to the tail element rule is where a moulded fin is part of a bare-shell fibreglass fuselage)

ARF:

The main airframe components have been pre-built by someone **other than the entrant**. (This 'someone' could be a Commercial Manufacturer or another model builder in the case of a Scratch or Kit-built model) As received by the Entrant, the model may be fully finished, painted and decorated or it may require a great deal of painting and fitting out. Engines and control equipment may or may not be already installed.

Regardless of the amount of work required to fit-out, finish, or re-finish the model, a pre-built model where the main airframe components of wings, fuselage and tail components were acquired ready-built, will always be classified as an ARF. This classification will also apply to a Scratch or Kit-built model that is purchased by the entrant in ready-built condition, regardless of who built it or where it came from.

A "Builder of the Model" declaration will be on the entry form. Any entrant who chooses to not sign this declaration will automatically have their model classified as an ARF.

If the Entrant didn't build it, it's an ARF... Once an ARF, it is always an ARF!

Note 3: The only exception to this rule will be for a Team entry as detailed in **Rule 21**-Team Entry, below.

All ARF models are fully eligible for Static judging. To attempt to gain the maximum 100 points available, an ARF-class entrant will have to provide the same documentation to the Static judges as Scratch/ Kit class.

HELICOPTERS:

Helicopters shall be Military Scale and representative of a helicopter type that was used by the Military of any country, at any time. It may be of a civil type that was used by the Military, e.g. the Hughes/McDonnell/Douglas MD500, or a dedicated Military build like the Blackhawk/Seahawk. Care should be taken when presenting the model, since many types were produced in both Military and Civil versions at the same time to defray costs and the only difference could be the colour scheme and markings.

Flybar-less rotor systems will score well, unless the full scale aircraft had flybars or paddles. e.g. Bell Uh-1 series.

20...Turbine and electric ducted fan models are strongly encouraged to enter

21...Team entry

- Team entry is available where the builder of the model is **not** the pilot or Entrant
- A team shall be only two persons
- The builder of the model must be part of the team as nominated on the entry form and act as caller
- The builder of the model can only be part of one Team at the Event

- If the builder of the model is not present, then he/she is not part of the Team and the entry will be classified as a solo ARF entry
- The pilot shall be considered the principal entrant and must comply with the required flight standards
- The Pilot may not be changed once the flight rounds have commenced
- Static judging for Scratch or Kit-built models will be scored the same as for solo entrants, but the Team total flight score will be penalised by 10%

PART 2 — STATIC RULES

1... There will be a minimum of two Static Judges.

2... The static judging portion of the contest will commence on the Friday morning prior to flying. The flying rounds will commence prior to the conclusion of static judging, with those entries that have already been static judged, or elect not to be static judged or Flying Only

3... Static judging will be performed in 3 categories:

Outline; Finish, Colour & Markings; Craftsmanship.

The score from both judges will be averaged. Each model presented for static judging will be assessed equally, regardless of class.

4... Static judging points available shall be:

A. Outline (Plan, Side, Front).....	15 points each = 45 Points (max)
B. Finish, Colour & Markings	10 points each = 30 Points (max)
C. Craftsmanship	25 Points (max)
.	
Maximum Available	100 Points

5...Judging distance for all categories shall be the Stand Off Scale minimum of 5 meters

6...CLASS HANDICAPS

Deductions will be made from the static scores, based on the Class as follows:

0% handicap for Scratch-built

10% handicap for Kit-built

0% handicap for ARF

7... Documentation paperwork covering the aircraft from which the model may be judged is required. If no documentation accompanies the model, no Static Judging will be performed and no points awarded. Missing or poorly presented documentation will result in a heavily marked down score, regardless of how good the model is.

Required contents of the documentation package:

A... A published 3-view, (4 or 5-view is better) of the aircraft. Size is not limited but large drawings or plans should be mounted on stiff card, etc. If no 3-view is available, a sufficient

number of photos of the aircraft type are necessary to allow the three main views to be verified. Pictures of a model aircraft are not allowed in documentation. Entrant-generated, or altered views are NOT allowed unless differences or errors in published documentation are discovered. In that case, altered views must be submitted for approval, with appropriate photographic backup, and then signed off by the Chief Static Judge.

B... Proof of the markings is required. This may be a photo, a published painting, (artist's conception, plastic kit box art etc.) or a published, detailed drawing.

C... Proof of the colour match is required. This may be presented in the form of colour chips, colour photos or an artist's rendition. In cases of very obscure subjects; e.g. where only one aircraft was built, a description of the colours is sufficient. Since it is very difficult and sometimes impossible to document more than one side or view of a subject aircraft there will be no loss of points for failure to show the colours and markings of the "other side or bottom" of the aircraft.

D... Colour chips take precedence and are the best proof of colour, but when they are used, they must be from an accepted published source. (e.g. M & M Models Military Colour Guide) Contestants may NOT paint their own colour chips!

E... Any parts of the model aircraft that are fitted, but are not permanent (e.g. bombs, rockets, drop tanks, crop dusting equipment, etc.) and are not shown on the 3-views, must be documented elsewhere, by photos, scrap drawings, etc. Optional ordnance, drawn on the three-view, does not have to be represented on the model, and may be omitted.

8... Documentation shall be sufficient to verify the model as presented for Static Judging. Any item not verified will be cause for loss of points; Examples: If the documentation is vague as to the appearance of the landing gear, the Outline score will be down graded. If the documentation is vague in proving the colour scheme presented, the portion for colour score may be downgraded.

9... Contestants are cautioned against presenting conflicting data in their documentation. In cases where, for example, a colour painting is shown for colour layout, and it conflicts in detail with a photo provided of the same aircraft, **the photo would have precedence.**

10... Canopies and any moveable control surface may be presented in any position. However, the judges may request that these be re-configured during judging to aid in comparison with the documentation provided. Additional working features will be presented in the manner shown on the 3-view presented to the judges.

11... The Class (Scratch/Kit, ARF or Helicopter) and Category (WW I, WW II or Military) for each model entered is to be declared on the contestant's entry form.

12... Any items that will not be on the model when it is flown, e.g. chocks, tie-downs, ordnance that will not be carried in flight, or other "dioramic" features, may not be presented during Static Judging.

13... **Exception to Rule 12:** Scale props/spinners may be included for Static Judging. However, the flight spinner must be approximately the same size and shape as the static version, and it must

be exactly the same colour. The overall shape of the flying spinner may be blunted or rounded for safety reasons. Aircraft not incorporating a spinner should utilize a rounded safety nut.
A scale rotor head fitted to a helicopter for Static judging may be replaced with a Flybar type for Flight judging without penalty.

14... No other items presented on the model during Static Judging may be removed or changed prior to the flying rounds, with the following exceptions;

- A. Pitot tubes; radio or radar masts and antenna may be removed
- B. Stores or ordnance intended to be dropped during a scoring flight may be substituted, but must be the same size, shape and colour as those presented for Static Judging
- C. Intake strakes or grillwork on jet aircraft intakes may be removed, if their inclusion would interfere with proper performance

15... Sometimes, a model engine may not be mounted in the same position as in the full-scale airplane. Therefore, the static score will not be downgraded for visible engine parts, such as a head, spark plug, muffler, or for additional openings to aid engine cooling provided that the installation was made to be as inconspicuous as possible

16... The cockpit interior and any external R/C aerial/s will NOT be static judged
Note: See General rule #1 re Pilot Figure for flying rounds

17...Craftsmanship

In this Judged section, there are no longer any points available for so-called 'Special Features'. We take the view that if the Full-Scale aircraft had a feature, (e.g. retractable gear, operating flaps, sliding canopy, pilot access door) then the represented model should also. At the Judges discretion, the **lack** of a **Major** feature could very well mean a loss of points! These penalties will generally only be applied in the case of a lack of a Major feature. The lack of Minor features will be overlooked.

18...When all entries have been static judged, and the first round of flying has been completed, the scores will be promptly posted. Once posted, no score will be changed for any reason other than to correct an error in tabulation.

PART 3 - FLYING RULES

1...Flight judging will not take into account the class or type of construction of the model. ARF's and Helicopters will be flight-judged equally beside Scratch/Kit-built models

2...There will be 2 flight lines available with a minimum of 2 judges for each flight line

3... Round One flight order will be in the order as registered and available for flying. i.e. Static judging completed or waived. The second & third round flight order will remain the same as Round One, although there is sufficient flexibility to accommodate variations in the order to suit Entrants who have problems with their aircraft. There will be a reversal of Flight Line for Rounds 2 & 3, so as to even out the scoring, or any perceived advantage conferred by a particular flight line or set of judges.

4...If conditions permit, a minimum of three rounds shall be flown, commencing on the Friday morning with those entrants either opting **not** to be Static judged or who have already been Static judged. The lowest scoring round will be dropped and the two remaining scores averaged to give a final overall score for the flying component

5... In the event of only two rounds being completed, both round scores will be counted, but will be averaged to give a final overall score for the flying component

6... In cases where conditions prevent any flying, Static Judging shall determine the result. The first tiebreaker will be the Outline and Realism total; the second tiebreak will be by the addition of one half of the craftsmanship score. For those models not Static Judged, all contestants will cast a vote for the class winner

7... Time limit for each flight is 12 minutes, starting from the call of “take-off commenced”. Any manoeuvre commenced after the time has expired will score zero. An additional 2 minutes is allocated for single engine starting. For multi engine aircraft, one additional minute is awarded for each additional engine. This rule will be strictly enforced if time is limited or relaxed at the CD’s discretion.

8... A model is deemed to have commenced a round when it has become properly airborne for the first manoeuvre

9... Crossing the 30m “safety no-go zone” (the Eastern edge of the Pink matting) during any part of the flight will incur one warning. A repeat crossing will disqualify the flight and the contestant must land. To receive a warning or to be disqualified, the entire aircraft must cross the “no-go zone”. Additionally, any dangerous flying, unsafe models, flying over the pits, spectators or the adjacent highway **WILL** result in the model being immediately grounded.

Exemption: Helicopter landing and take offs may take place on the Eastern portion of the matting to avoid dust and grass clippings, and to provide a smooth, level surface. The take off area is to be aligned with the Flight line Judges sight line.

10... If the contestant’s flight is delayed or flight time lengthened after the clock has started due to external factors (e.g. due to adjacent flight-line traffic, manoeuvre conflict or a crash) the delay will not count as part of the entrant’s 12-minute time slot

11... The Competition flight plan shall consist of 9 manoeuvres, of which 4 are mandatory and 5 are options, producing 9 flight manoeuvre scores. The 10th score will be for the realism of the **entire** flight. Maximum score for each manoeuvre is 10. The 5 option manoeuvres must be as selected from the approved list as appended to these Rules, as nominated on the Flying Judging form & in the same order

12... As shown upon the Flying Judging forms, the points available shall be:

1. Take-off ...(mandatory)..... 10 points
2. Low High Speed Pass ...(mandatory)..... 10 points) These may be flown
3. Low Slow Speed Pass ...(mandatory)..... 10 points) anywhere in the order
4. Option 1 10 points
5. Option 2 10 points
6. Option 3 10 points
7. Option 4 10 points

8. Option 5	10 points
9. Landing ...(mandatory).....	10 points
10. Realism	10 points
Maximum Available	100 points

13... With the exception of the high speed and low speed passes, the contestant must complete all nominated manoeuvres/scale operations in the order on the flight plan as submitted to the Judges. The 2 fly-passes may be done at any time, but must follow each other. If a manoeuvre is called or flown out of sequence, the entire flight will not receive a Zero, but the Flight Judges will apply a 2-point penalty to that manoeuvre only and inform the pilot that he is out of sequence, allowing him to get back on sequence.

14... The nominated sequence of manoeuvres should be advised at registration or at the very latest, well prior to the first round of flying, and that sequence of manoeuvres for each entrant must remain the same for all rounds. Flight judges are not able to create or re-adjust flight sequences.

15... The only manoeuvre allowed to be inserted between the slow speed and high-speed flyby will be an ordnance or wing tank drop in the interest of cleaning up the aircraft for the high speed run. This "drop" must be done in the opposite direction of the flybys.

16... If the CD or flight judges make multiple runways available, the contestant may choose whichever is preferred for either take-off or landing. That is, the aircraft is permitted to take off from one runway but land on another.

17... Only four set-up passes may be made in front of the judges without performing a manoeuvre

18... Flight Judges may change between rounds, but may not be changed mid-round

19... **OPTIONS:**

It is the intent of Wagga Military Scale to require models to be flown in a "realistic display-type" manner. To ensure this, certain restrictions apply to nominated options:

A. Regardless of prototype, competitors may perform any combination of Non-Aerobatic or Aerobatic manoeuvres he/she so chooses. **However, for example, a B17 demonstrating a loop or inverted flight will have their "realism" score downgraded, so we recommend you select manoeuvres reflective of your prototypes NORMAL flight envelope.** Please note that in the spirit of realism, many WW II aircraft equipped with carburettors were unable to sustain inverted for negative 'G' flight.

B. No "on the ground" mechanical options may be performed as a scoring manoeuvre. However, they are encouraged to be used to "enhance" the presentation. (Refer next para. 'C') A complete list of "Flying Manoeuvres" and mechanical options are listed later in the rulebook.

C. Operations like the following, or similar to them, may be incorporated as part of some manoeuvre, or performed independently to enhance realism, but may not be nominated for a scored option: e.g. Retractable landing gear, Smoke System, Light Systems, remote

Canopy Movement, Individual Engine Run-ups on multi-engine models, Brakes, Pilot Movement, Folding Wings, Flaps, Speed Brakes, Slats and similar devices.

D. The contestant may perform any additional option to enhance his/her demonstration, within the time allowed, but no additional points will be scored except perhaps for Realism.

E. A maximum of ONE SCORING mechanical option (e.g. bomb drop, torpedo drop) may be performed by any aircraft per round. (See Scoring Mechanical Options, Pages 14/15 below)

F. A contestant may perform any manoeuvre typically flown by the full-scale aircraft, but if it is not in this Rulebook, will be only with prior clearance from the Contest Director and prior notification to the Flight Judges.

Exception: Helicopters may elect to perform an Auto rotation as an Optional scoring manoeuvre without the need to comply with the requirements of 'F'.

20... **Attempt**

The "attempt" rule (allowing a second attempt at a flight) is operative only during any ONE round of the competition. An "attempt" occurs if the model does not become properly airborne. If the model does not become properly airborne at its first attempt:

A. Any points earned are cancelled.

B. At the discretion of the Judges, and/or the Contest Director, the Contestant may be allowed to make a second attempt immediately if little or no delay will be caused. Otherwise, the Contestant will go to end of the line, or somewhere else determined "fair" by the Contest Director, for his second and final attempt. If the model becomes airborne, the flight is classed as official and no attempt may be called, regardless of subsequent events.

21... Maximum achievable flight score is 100 points.

22... Total contest score for any model will be the sum of the static score and the flight score in the best two scoring rounds.

23... In the event of a tie, the model with the highest aggregate flight score of all rounds shall have ascendancy. If this results in a tie as well, the static score will be added to the aggregate flight score. Any tie breaking required after that will be determined by waving 3 feathers from a Zulu Bird over the score sheets and we will see what happens.

24... Only under extreme weather conditions will the flying portion of the contest be cancelled; and then, only by the decision of the Contest Director.

25... To be eligible for any awards, a model must have completed at least one full flight round. No flying, no awards - no pit queens will be eligible for awards.

PART 4— FLIGHT JUDGING

1... The subject of flight-judging scale RC models has occupied the minds of competition fliers and judges for quite some time. In many cases, problems arise for which there are no real solutions, because unlike any other model aircraft contest category, we aren't comparing apples with apples.

In this preface to the Flight Judging Guide, some assistance to the judge, and to the flier, is offered in an attempt that fairness can be accomplished.

2... As a basis for further guidance, let us compare the "Pattern Aerobatics" model against the scale replica of a full-size aircraft. The scale model is not by definition a flying machine in the same way as a pattern model. The designer of the pattern model, having no physical limitations to his application of aerodynamics to RC models, has free reign. He can make adjustments to cure any unwanted tendency. Aerofoils, moments, dihedral, and a host of other considerations can all be tuned individually to achieve a "perfect" flying machine.

3... On the other hand, consider the scale model. To a great degree, its design is "locked-in." Yes, a few things can be adjusted, like wing loading, C.G. position, and force arrangements, but many other factors cannot be changed. The only type of scale model, perhaps, that could be expected to compare in flying accuracy with the pattern model would be a model of a purpose-built aerobatics-only subject, such as the popular Extra. For this type of subject, a high standard of flying finesse could be justifiably demanded. But consider this: how good would a scale Fokker Tri-plane be as a pattern model? Clearly, it would be useless.

4... Yet, here is a contestant with a model of this "useless" flying machine and he is going to fly it, in competition. Furthermore, one of the most important, perhaps the most important aspect of scale modelling is that the contestant shall have free choice to build a model of whatever aircraft "rings his bells" as the saying goes—makes him want to recreate a particular piece of aviation history enough that he will make all the effort required. Moreover, he must be able to be "competitive" with whatever choice he makes.

5... This free choice is at the very core of scale modelling, but it poses a serious dilemma for the judge. By what yardstick can its flying performance be judged? Obviously not by the same criteria as a machine designed for flying alone. A thousand other examples could have been named in lieu of the Fokker. But the point is the same; **any scale model can only be judged by the yardstick of the subject chosen.** For instance, in the case of a full-size Fokker, nine landings out of ten may have resulted in a ground loop or a nose-over. The ground crew merely righted it and life went on. Having no effective throttle control, and with a design that violated every rule of ground-handling we know of, the pilot had little chance of making an uneventful landing.

6... Therefore, the sophisticated scale judge will bear these inherent factors in mind. The Fokker model pilot who made a perfect approach, and actual touch-down, rolled a few meters then nosed-over, may have done as good a job as was possible to do. Neither the judge nor any pilot on the field could have done better. Would it be "fair" to apply a Zero score?

7... We don't believe so. For the same reason, a judge should consider making small allowances for a narrow-tracked tail-dragger. If he doesn't, soon the only competitive subjects will be tricycle-gear jets. Nobody wants this to happen.

8... From this one example, the flying judge can get some idea of what is needed from him in scale competition. He cannot compare the performance delivered, to some theoretical ideal as obtainable from a pattern design. He must use a different yardstick— comparison against the best that could have been done by the subject involved! Crosswinds and other factors must be taken into account, too.

9... Nobody could expect every judge to be familiar with the inherent flying characteristics of every aircraft; nevertheless, aircraft can be "grouped." The judge who rates the performance delivered to that expected from the model before him will be doing the best that can be asked.

10...Pilots should note that manoeuvres flown too high or well over the judges heads will receive a low or zero score. If the manoeuvre cannot be clearly seen, the judges will mark it down heavily!

REALISM

1... It is required that any manoeuvre or operation not listed in the Rule Book be cleared with the contest director prior to flight. The contestant should be armed with "proof" that the subject aircraft is capable of, and routinely performed the operation or manoeuvre.

Note: Many Warbirds with dihedral were unable to execute a true Slow or Aileron roll. At best they could only achieve a fairly tight barrel roll. Biplanes could only perform a Barrel roll - never an Aileron roll.

2... Also, the size of aerobatic manoeuvres performed by a contestant should reflect the capabilities of the aircraft modelled. For example, it would be expected that a loop performed by a J-3 Cub would be smaller in diameter than one performed by a P51 Mustang if both were modelled to the same scale. The speed at which manoeuvres are performed also must reflect the capabilities of the prototype.

3... Consideration should be given in all aerobatic manoeuvres to the forces that would be exerted on the full-scale counterpart. Exceedingly small or tight manoeuvres with unnecessarily high rates of roll, pitch or yaw do not simulate the performance of the majority of full-scale aircraft that are required to carry a human pilot or crew, and should be down graded accordingly.

4... Finally, the contestant should acknowledge that the smoothness or gracefulness of the flight presentation would have a large impact on its realism. The judges should consider themselves to be a passenger in the model and assess these manoeuvres in terms of the effect they would have on their well being.

MANDATORY MANOEUVRES

1... Unless specified otherwise, ALL manoeuvres are to be centred on the judges the pilots are flying in front of. However, if the manoeuvre is called at a specific location, say to the left or right of the judges, it will be judged accordingly. This is NOT a license to describe HOW the manoeuvre is to be flown, only its placement. Other than explaining an unusual manoeuvre or placement of a manoeuvre to the judges, **no other conversation or discussion is appropriate before take-off.**

2... There are 4 mandatory manoeuvres, plus a score for "Realism", and five optional manoeuvres. All aircraft, regardless of class, must fly 9 manoeuvres and get a realism score. The 4 mandatory manoeuvres are:

Take-off

Low High Speed Pass (Between 1 and 6 meters altitude)

Low Slow Speed Pass (Between 1 and 6 meters altitude)

Landing

FLY-PASS (High Speed) – Refer FLIGHT IN A STRAIGHT LINE AT CONSTANT HEIGHT for description

FLY-PASS (Low Speed) - Refer FLIGHT IN A STRAIGHT LINE AT CONSTANT HEIGHT for description

(For detailed descriptions of each manoeuvre, refer to the list of all FAI-approved manoeuvres later in this document.)

MECHANICAL OPTIONS

RETRACT AND EXTEND GEAR..... MANDATORY (if fitted), NOT AN OPTION

1... Retraction should commence immediately following the take-off manoeuvre, during climb out, before the model reaches 8 meters altitude. It is important that the judges "see the gear actually retract". If the model makes its first turn away from the flight line and the gear is not yet "beginning" to retract at that point, there will be a downgrade. The speed of gear operation and its action should approximate that of the prototype. If the gear fails to function correctly during flight, an appropriate downgrade will be made.

NOTE: Non-Static Judged Aircraft only: Inner wheel doors and tail wheel doors on tail draggers may be omitted. Nose wheel doors may be omitted on tricycle landing gear aircraft. Main gear doors must be in place on all aircraft to gain maximum realism points.

MULTI-ENGINES:

1... It is preferable, but not necessary for the model to have the same number of operating engines as the prototype. Non-functioning Static props should be in place for Flight judging. For maximum Flight realism score, all engines should be running from beginning of take-off until the landing manoeuvre is completed.

FLAP OPERATION.....MANDATORY (if fitted), NOT AN OPTION

1... If the prototype had flaps, then the model must incorporate their use in the same manner as the prototype. Flaps may or may not be used for take off, but **MUST** be used for landing. A minimum angle of 30° of flaps is to be used for landing. For maximum points during Landings, the flaps should be lowered on the base or final leg of the traffic pattern.

In addition to the landing, the flaps **must** also be used during the Slow Fly-By, Touch-and-go or an Overshoot, and points will be deducted from the realism score if the contestant fails to use them.

2... It is suggested that if flaps are incorporated in the design, that they be run through a cycle as the airplane is taxied away from the judges prior to take-off. This will show the judges that the minimum angle of 30 degrees is attained.

Errors:

3... Failure to operate flaps when required. Model exhibits violent trim change during flap operation.

BOMB DROP-Scoring manoeuvre

1... Bombs should be carried and dispensed in the same manner as the prototype. For bombs carried internally, bomb bay doors should open, bombs should drop and doors should close for maximum score. The model must perform a bomb run in the manner of the prototype. For example, if the model is a dive-bomber, the bomb/s must be dropped in a dive.

2... A contestant is permitted to substitute an expendable bomb or bombs for the flight presentation as long as the number, size, shape and colouring are the same as those used for Static Judging. For maximum score, the bomb or bombs should contact the ground approximately in front of the judges or a spot called by the pilot in advance. For safety reasons, no ordnance may land closer to the flight line than the designated flight strip

Errors:

1... Bombs are not carried or delivered in the manner of the prototype. Bomb doors are grossly different in operation from prototype. Bomb drop not preceded by a bomb run. Finned bombs tumble erratically after release. Externally mounted bomb(s) wobble(s) in slipstream during flight prior to release. Bomb is released prematurely or misses the "target zone".

TORPEDO DROP-Scoring manoeuvre

1... For maximum points a torpedo drop should be performed as a part of a torpedo run at low altitude. Actual altitude of the model at release would depend on its scale, but it should be low enough to enable the torpedo to strike the ground in a relatively flat attitude. Release should be performed with the model in a level attitude, and approximately in front of the judges.

Errors:

- 1... Model is too high at release
- 2... Release is not preceded by a straight run
- 3... Release is too early or too late

TANK DROP- Scoring manoeuvre

1... Jettisonable fuel tank(s) should be carried in the manner of the prototype. The drop should be performed with the model in level flight in clear view of the judges.

Errors:

- 1... Tank(s) not securely attached to model, has visible oscillation in slipstream prior to release
- 2... Tank does not fall clearly away from model at release
- 3... Model is not in level flight at release.

PARACHUTE DROP-Scoring manoeuvre

1. A parachute drop or ejection should be performed in the manner of the prototype. Cargo should be dropped via doors or hatch. A single-seat aircraft must not drop its pilot. For maximum points the parachute(s) must be to scale with the model.

Errors:

- 1... Parachute fails to open
- 2... Chute does not fall clear of aircraft
- 3... Chute is emitted from the aircraft in a manner not typical of the prototype
- 4... Parachute(s) not properly sized to aircraft

OTHER MECHANICAL OPTIONS

1. A contestant may elect to perform a scale operation of his own choice that was typical of the prototype. Any such operation must be cleared by the Contest Director and explained to the judges before flight.

STRAFING RUN-scoring manoeuvre

1. This manoeuvre represents an attack upon personnel or equipment. It consists of a wings level, slightly diving pass, followed by a fairly steep pull-up. There **must** be some form of **on-board representation** of firing guns **or** some sort of ordnance must be dropped. A Strafing Run during which nothing is dropped from the model or gun firing is not simulated will score zero. **Gun firing may not be simulated verbally or by a sound-making device on the ground.**

NOTE:

ROTATING BEACONS, STROBE LIGHTS, OPERATING CARGO DOORS, ROTATING RADOMES, ETC., ARE NOT ALLOWED AS ANY SCORED OPTION, BUT THEY MAY BE INCORPORATED IN A MANOEUVRE FOR THE ENHANCEMENT OF THE REALISM SCORE!

OPTIONAL FLIGHT MANOEUVRES

1...All manoeuvres, whether mandatory or optional, are listed and fully described in this Wagga Military Scale Event 2019 Rulebook, and are taken directly from the current FAI Flying Scale Model Aircraft rulebook.

2...Any of these manoeuvres are available for the pilot to choose from for his/her flight schedule.

3...Contestants are reminded that they should choose manoeuvres that are typical of the full-scale aircraft. Non-typical or inappropriate manoeuvres will be marked down.

4...Military Scale helicopters are required to choose from this list and fly the manoeuvres as defined. The only additional Optional Manoeuvre specifically for Helicopters is an Autorotation, which once commenced, must be flown to a touchdown without any application of throttle or power.

Helicopter take off and landing manoeuvres must be executed in a **helicopter** scale-like manner or the point loss will be severe. No vertical climb-outs! There may not be any non-scale manoeuvres flown at any stage. This means that, for the purposes of this competition, the helicopter is being flown like a fixed wing aeroplane and this is the only way an entrant will receive a flight score.

MANOEUVRE LIST

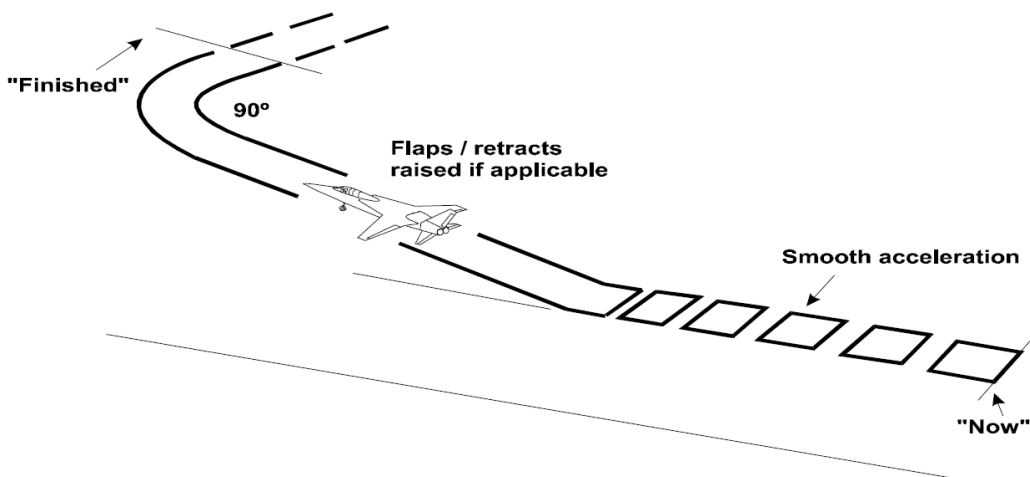
NOTE: Any portion of a scoring manoeuvre that is flown too high or above a comfortable viewing angle for the Judges, (up to about 45° or 50° is good) will be scored zero for that manoeuvre and a warning issued. Repeat offences will score zero for the Round. If the Judges can't see the model clearly, they can't judge it properly.

TAKEOFF

1... The model aircraft should stand still on the ground with the engine running without being held by the pilot or mechanic and then take-off into wind, or as required by the competitor to make best use of the take-off distance available (e.g. jet subjects). **While strongly discouraged for safety reasons,** the pilot may stand behind his/her model during the take-off sequence, but must very promptly return to the pilots' box at the completion of the manoeuvre. If the model is touched after the competitor calls "Now" the take-off will score zero.

2... The take-off should be straight and the model aircraft should smoothly accelerate to a realistic speed, and then lift gently from the ground and climb at an angle **consistent with that of the prototype.** The take-off is completed after the model aircraft has turned 90 degrees from the take-off heading.

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



Errors:

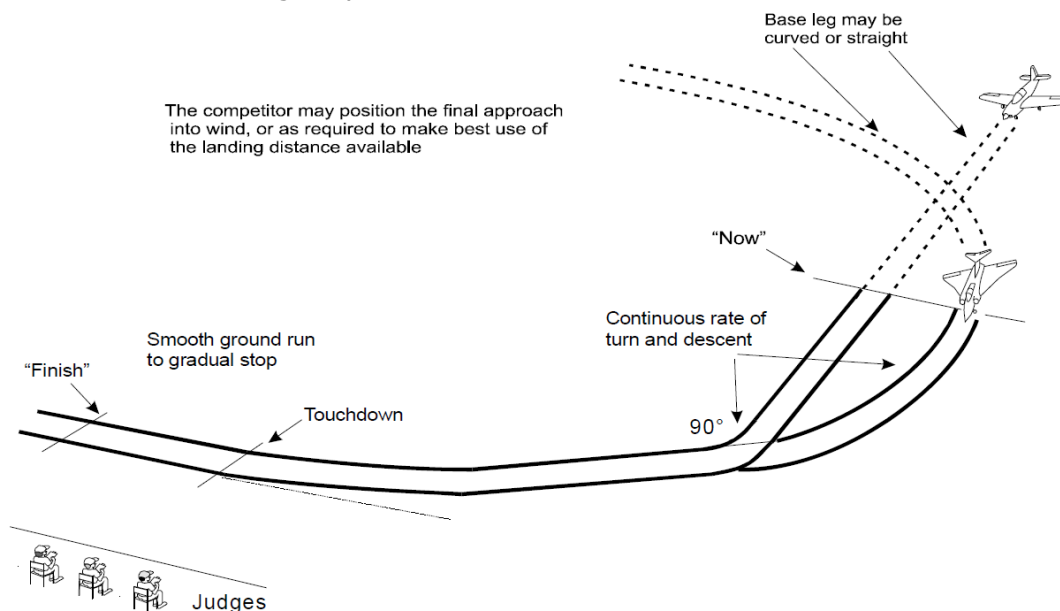
1. Model aircraft touched after calling "Now" (zero marks)
2. Swings on Take-off (a slight swing with other than a tricycle undercarriage is acceptable as the aircraft tail is raised)
3. Take-off run too long or too short
4. Unrealistic speed /too rapid acceleration
5. Inappropriate attitude at lift-off for undercarriage configuration
6. Not a smooth lift-off. Climb rate wrong (too steep or too shallow)
7. Nose attitude wrong during climb (nose too high or too low)

8. Flaps not used if functional
9. Wheels not raised if retractable
10. Significant wing drop
11. Climb-out track not same as take-off run
12. Unrealistic rate of turn onto crosswind leg
13. Crosswind track not 90° to climb out track

LANDING

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

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



Errors:

1. Manoeuvre does not commence on base leg.
2. Turn onto final approach not constant rate or not 90°.
3. Descent from base leg not smooth and continuous.
4. Model aircraft does not achieve correct landing approach prior to touchdown.
5. Model aircraft does not round out smoothly.

6. Model aircraft bounces.
7. Drops a wing during landing.
8. Touches wing tip on ground.
9. Does not come to a gradual and smooth stop after landing.
10. Does not adopt landing attitude appropriate to subject type.
11. Model aircraft runs erratically or turns after landing.
12. Model aircraft noses over (note 30% penalty if only nose-down - zero if it over-turns).

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

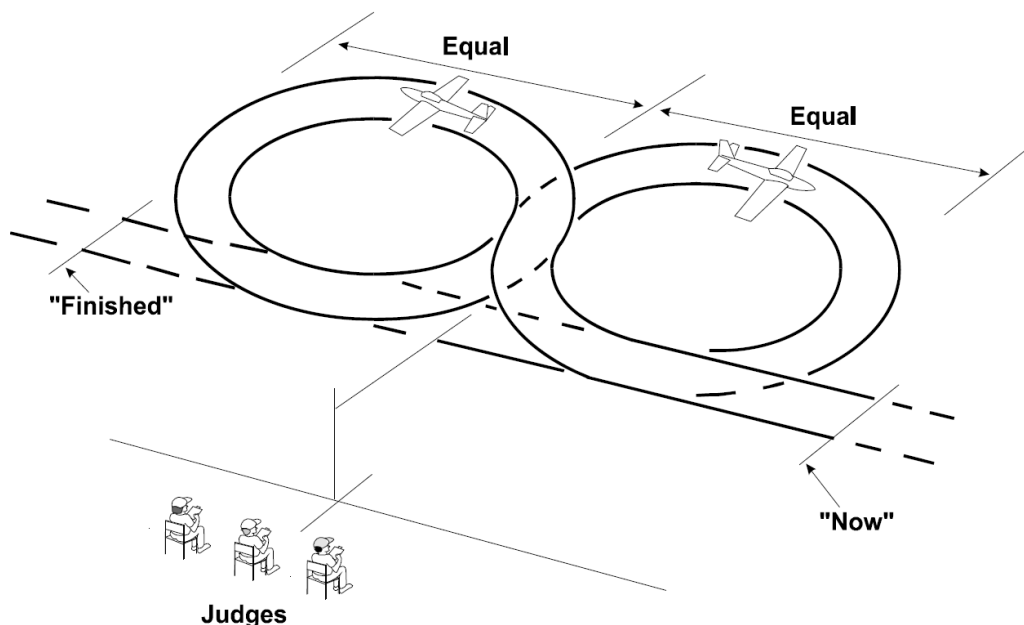
If the nose down situation is solely the result of the model aircraft running off the prepared area, because this is too short for the particular wind direction, the above down marking will not apply.

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

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

FIGURE EIGHT

1. The model aircraft approaches in straight and level flight on a line parallel with the judges' line, and then a one-quarter-circle turn is made in a direction away from the judges' line. This is followed by a 360-degree turn in the opposite direction, followed by a 270-degree turn in the first direction, completing the manoeuvre on the original approach line.
2. The intersection (mid point) of the manoeuvre shall be on a line that is at right angles to the direction of entry and passes through the centre of the judges' line.

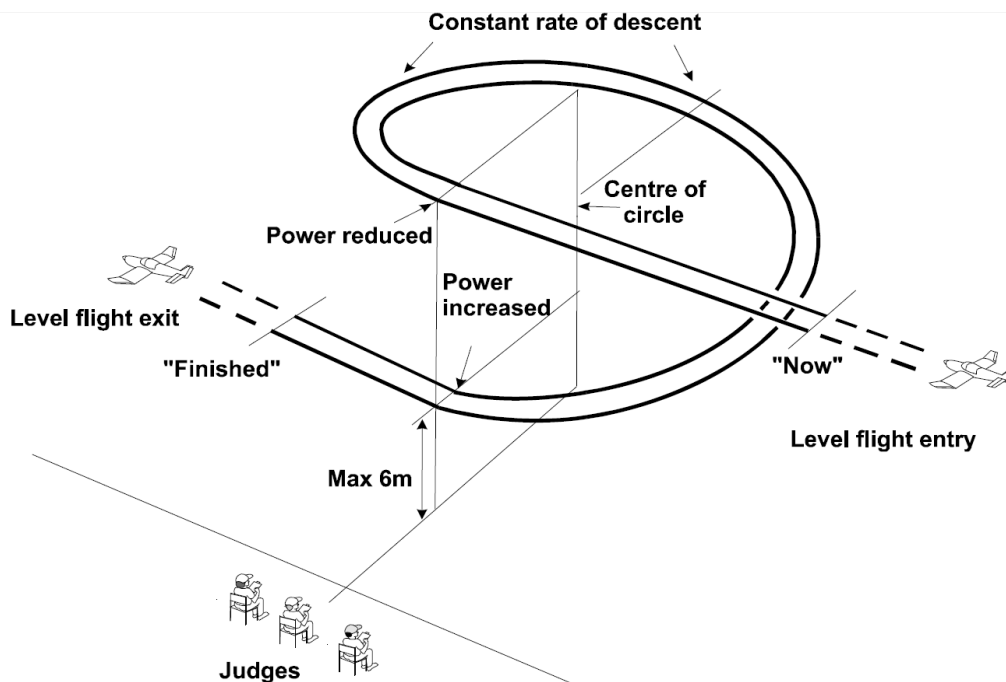


Errors:

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

DESCENDING 360° CIRCLE

1. Commencing from straight and level flight, the model aircraft performs a gentle 360° descending circle over the landing area, in a direction away from the judges, at a constant low throttle setting. The manoeuvre terminates at a maximum height of 6 metres, resuming straight and level flight on the same path.



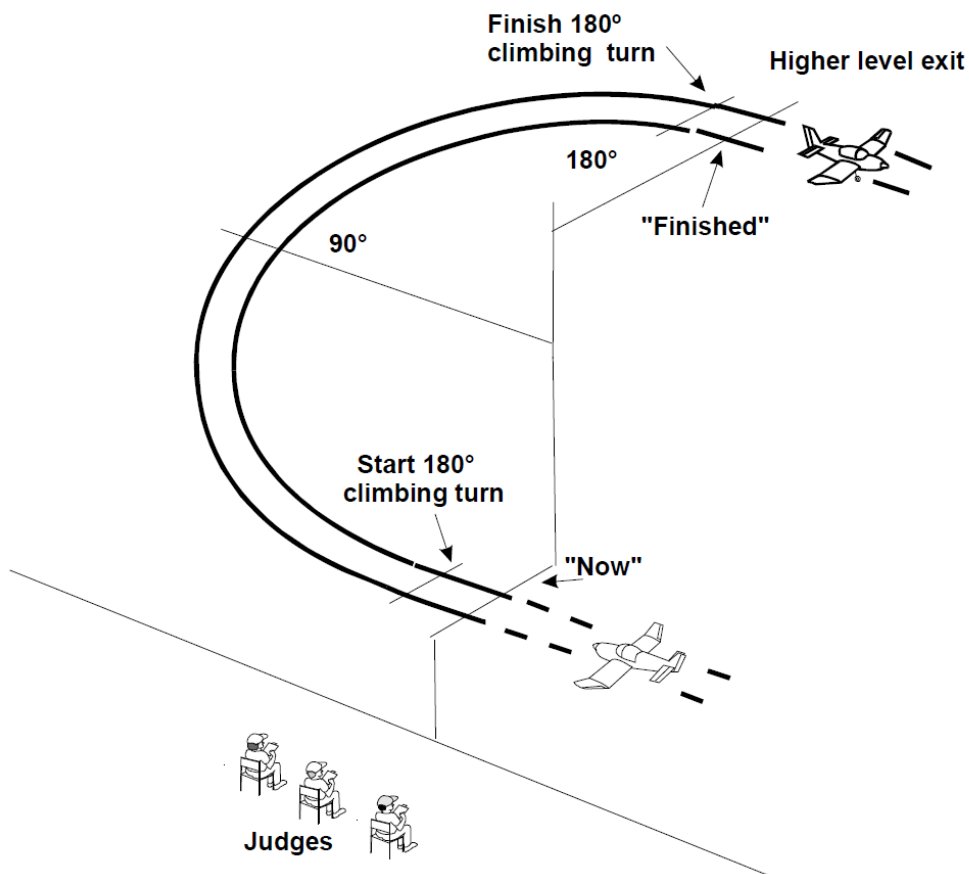
Errors:

1. Rate of descent not constant.
2. Descent too steep.
3. Throttle setting not constant or low enough.
4. Circle misshapen.
5. No significant loss of height.
6. Model aircraft does not descend to 6 metres or below.

7. Circle not centred on judges' position.
8. Entry and exit paths not parallel with the judges' line.
9. Start and finish not called in straight and level flight
10. Too far away, too close.

CHANDELLE

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

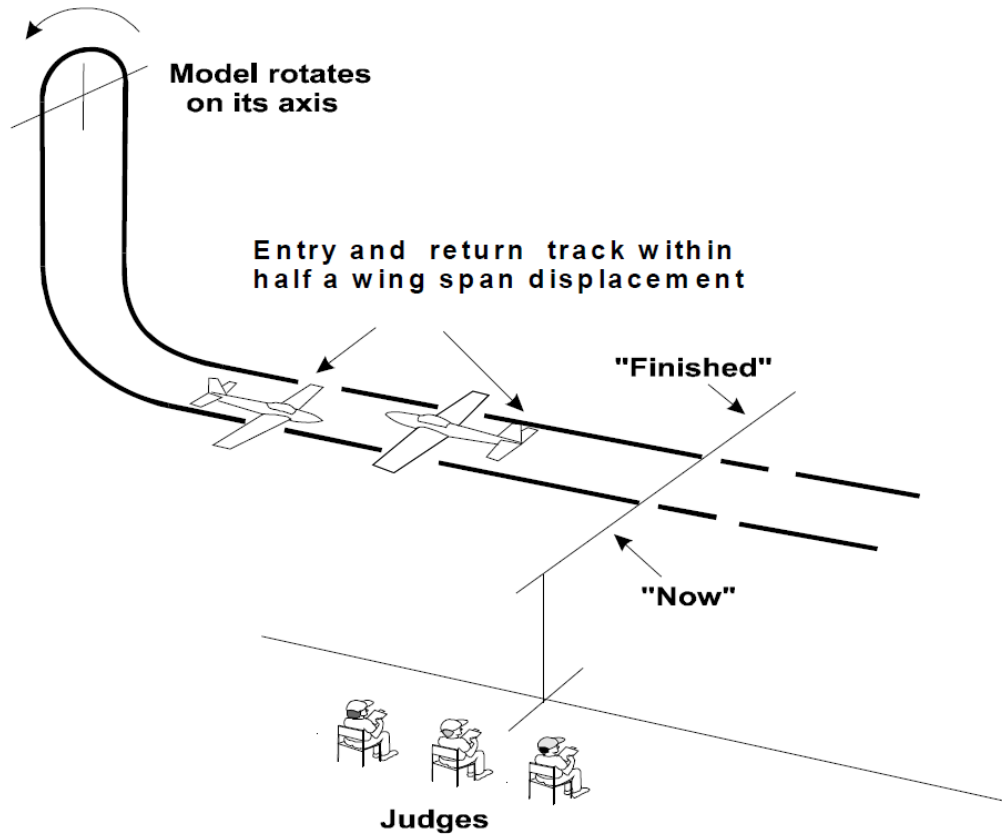


Errors

1. Turn not smooth and continuous.
2. Climb not smooth and continuous.
3. Half height gain not at 90° position.
4. Excessive/unrealistic engine power used to achieve the climb.
5. Insignificant height gain.
6. Start and finish not centred on judges' position.
7. Entry and exit paths not parallel with the judges' line.
8. Final track not 180 degrees opposite to entry.
9. Entry and exit not in straight and level flight.
10. Too far away or too high.

STALL TURN

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

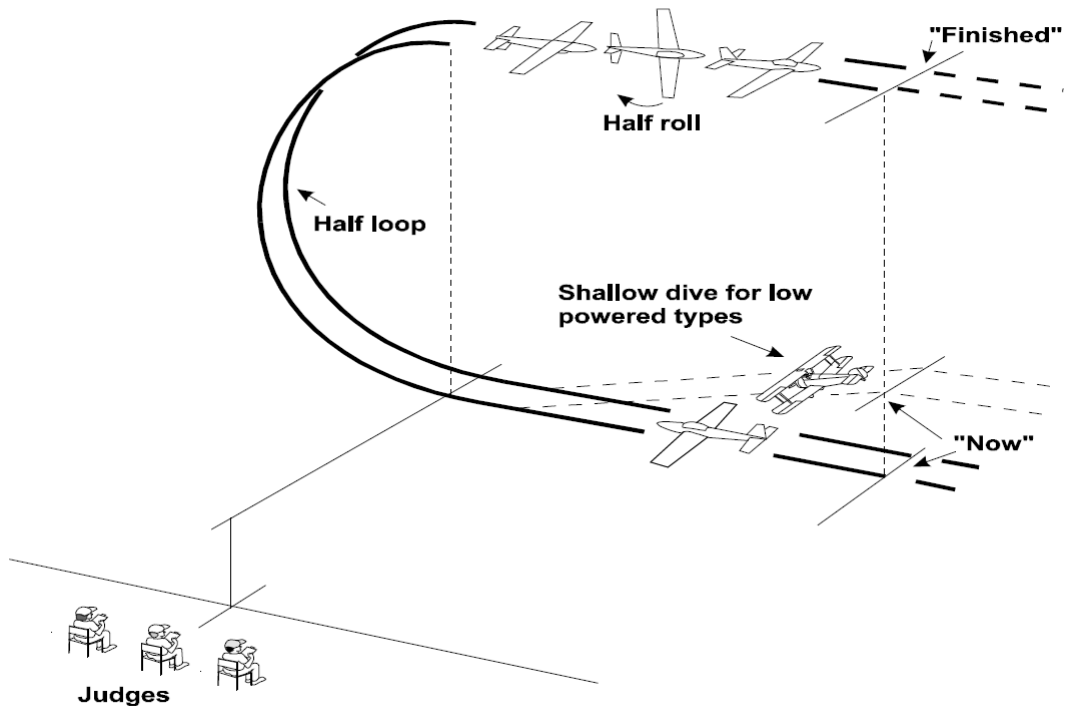


Errors:

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

IMMELMAN TURN

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



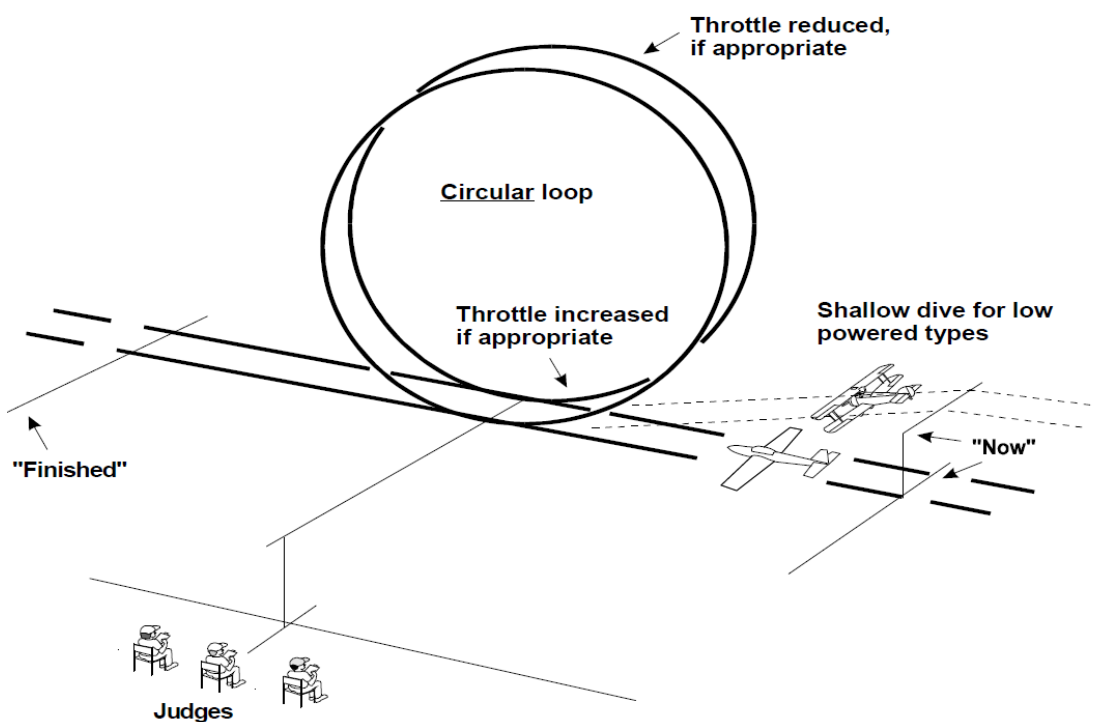
Errors:

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

LOOP

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

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



Errors:

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

CUBAN EIGHT

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

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

“Half Cuban Eight”

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

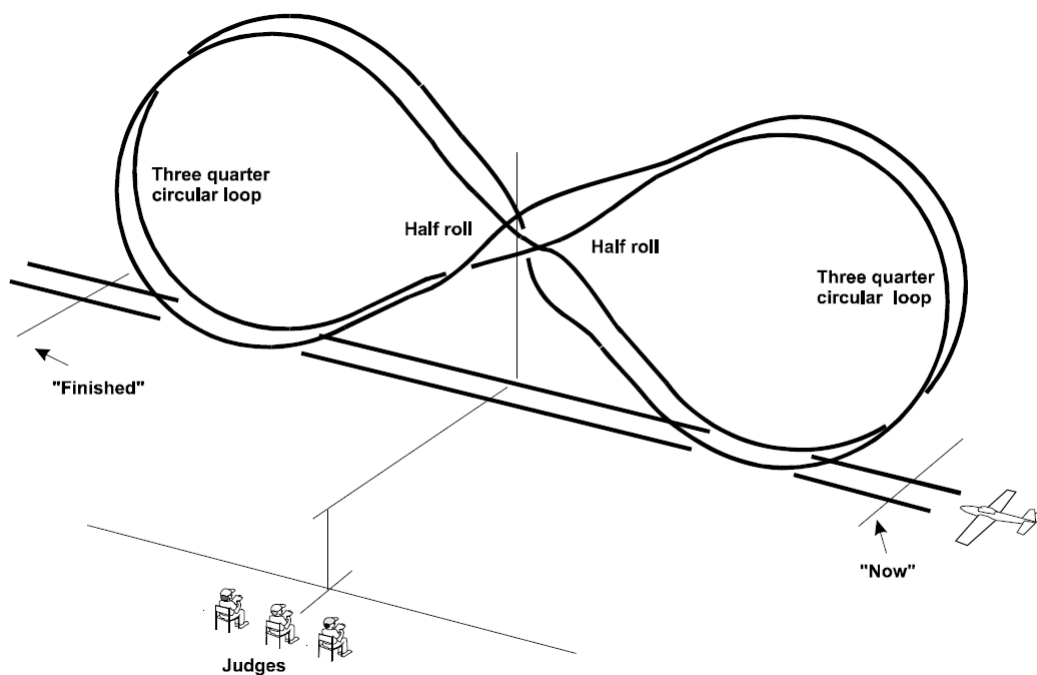
“Reversed Cuban Eight”

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

“Reversed Half Cuban Eight”

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

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



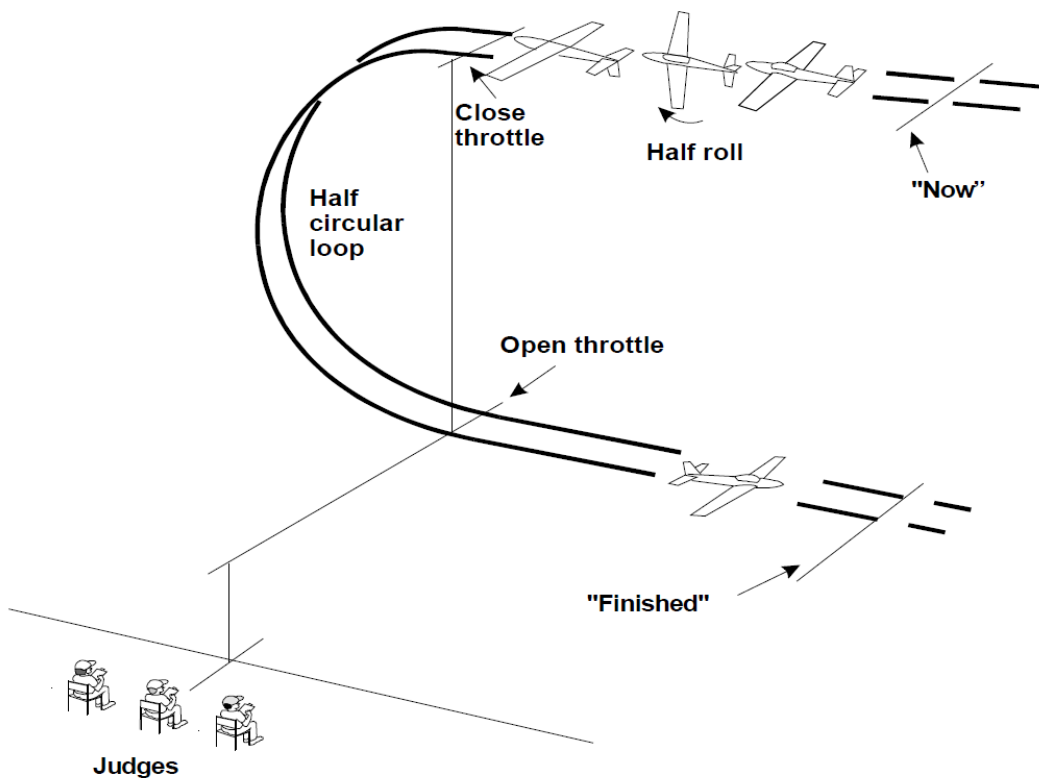
Errors:

1. Manoeuvre not performed in a constant vertical plane that is parallel with the judges' line.
2. Loops are not circular.
3. Loops are not the same size.
4. Half rolls are not centred on the judges' position.

5. 45° descent paths not achieved.
6. Model aircraft does not exit manoeuvre at same height as entry.
7. Model aircraft does not resume straight and level flight on same track as entry.
8. Inappropriate use of throttle.
9. Size and speed of loops not in manner of prototype.
10. Too far away/too close/too high/too low.

SPLIT S

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



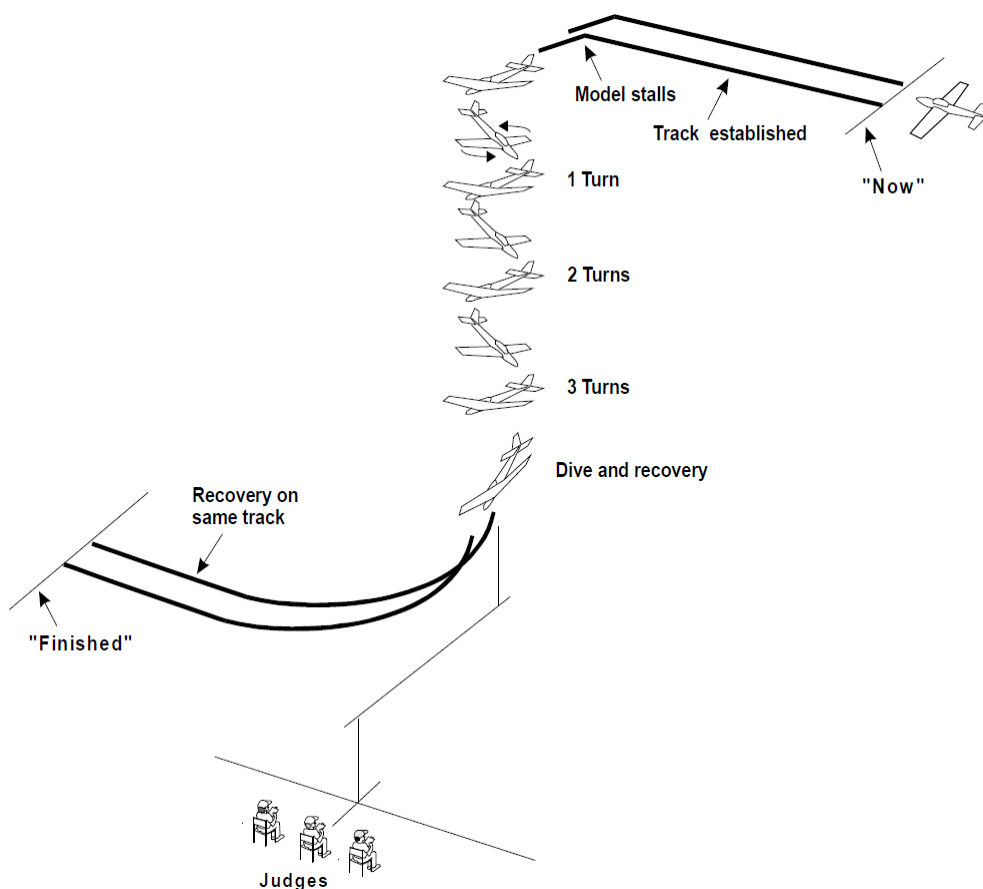
Errors:

1. Model aircraft changes track during half roll.
2. Model aircraft inverted too long or too short.
3. Inappropriate use of throttle.
4. Track of half loop not on line or vertical.
5. Half loop is not sufficiently semicircular.
- 6 Too fast or too tight a half loop.
7. Does not resume straight and level flight on opposite track to entry.
8. Half loop not centred on judges' position.

9. Manoeuvre not flown parallel with the judges' line.
10. Too far away/too close/too high/too low.
11. Model is pitched up from the inverted position, immediately before the throttle cut and pull-through

THREE TURN SPIN

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



Errors:

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

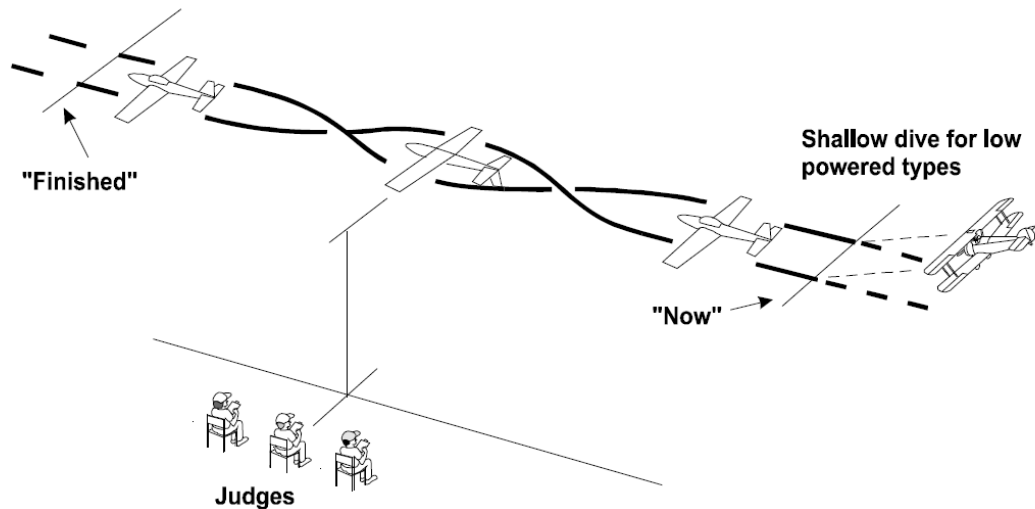
Note: In a true spin the descent path will be close to C of G of model aircraft. A spiral dive is a tight vertical barrel roll.

4. Not three complete turns.
5. Start of spin not centred on judges' position.
6. Model aircraft does not resume straight and level flight on same track as entry.
7. Entry and exit paths not parallel with judges' line.

8. Entry and exit not in level flight
9. Too far away/too close/too high/too low.

ROLL

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



Errors:

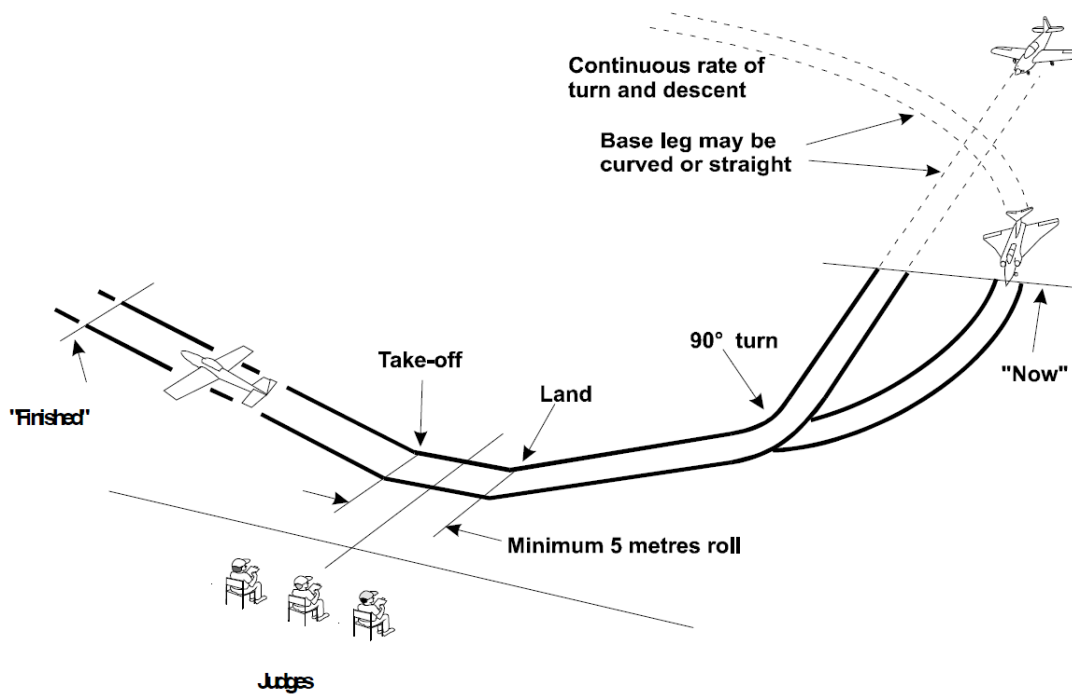
1. Rate of roll is not constant.
2. Style of the roll not typical to prototype.

Note: many Warbirds with dihedral were unable to execute a true Slow or Aileron roll. At best they could only achieve a fairly tight barrel roll. Biplanes could only perform a Barrel roll - never an Aileron roll.

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.

TOUCH AND GO

1. The model aircraft commences by descending from base leg, which may be either curved or straight as required by the pilot. The turn is continued through 90 degrees onto final approach. The model aircraft then lands and takes off again into wind without coming to a halt. The main wheels must roll on the ground for a minimum of five metres. Flaps will be used if applicable.



Errors:

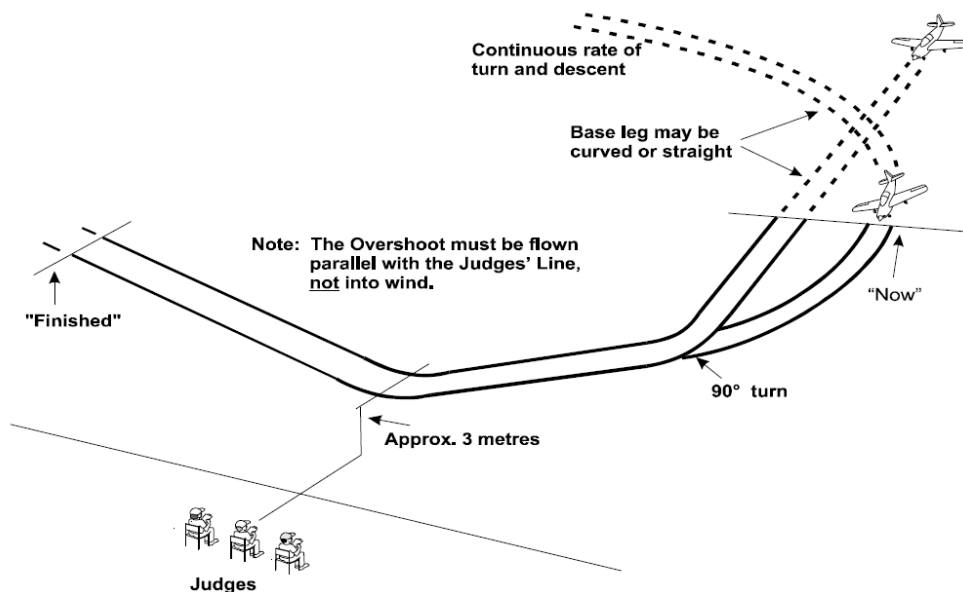
1. Manoeuvre does not commence on base leg.
2. Turn onto final approach too tight or not 90°.
3. Descent from base leg not smooth and continuous.
4. Model aircraft does not achieve correct landing approach prior to touchdown.
5. Model aircraft does not achieve a minimum ground roll of 5 metres.

Note: if prototype has two main wheels then both wheels must roll on ground for a minimum 5 metres.

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

OVERSHOOT

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



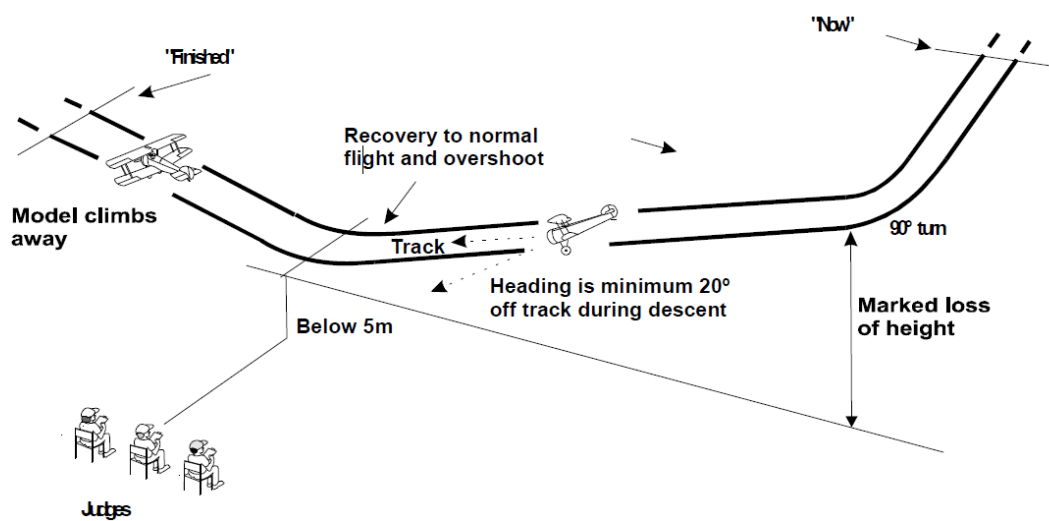
Errors:

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

SIDE SLIP

1. The model aircraft commences the manoeuvre in level flight by reducing power on base leg, and then turns onto a higher than normal final approach that is parallel with the judges' line. As the model aircraft enters the turn it starts a Sideslip by the application of opposite rudder to the direction of turn, achieving a yaw of at least 20° off track. A marked loss of height must be apparent whilst maintaining final approach speed. The aim of the Sideslip, if continued, would be to affect a landing in front of the judges.

2. Before reaching the judges' position however, the Sideslip is corrected, normal flight is resumed and the model aircraft carries out an overshoot from below 5 metres before climbing away. The purpose of this manoeuvre is to demonstrate a marked loss of height on final approach without an excessive build up of speed or the use of flap.

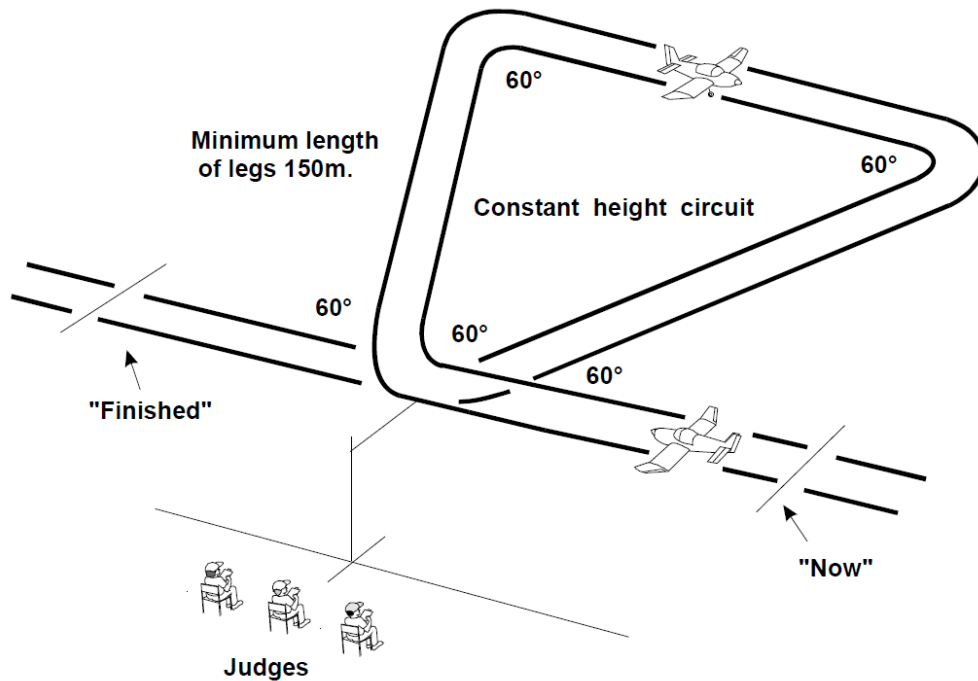


Errors:

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

FLIGHT IN TRIANGULAR CIRCUIT

1. The model aircraft approaches in a straight and level flight to a point directly in front of the judges. It then turns away to track 60° away from the judges' line. It then flies straight and level for a minimum of 150 metres, turns to track parallel with the judges' line, flies a further minimum of 150 metres, then turns to track towards the judges and flies a further minimum of 150 metres to a position above the centre of the landing area, which completes an equilateral triangle (i.e. a triangle with sides of equal length and angles of 60°), before making a final turn to intercept the original entry track.

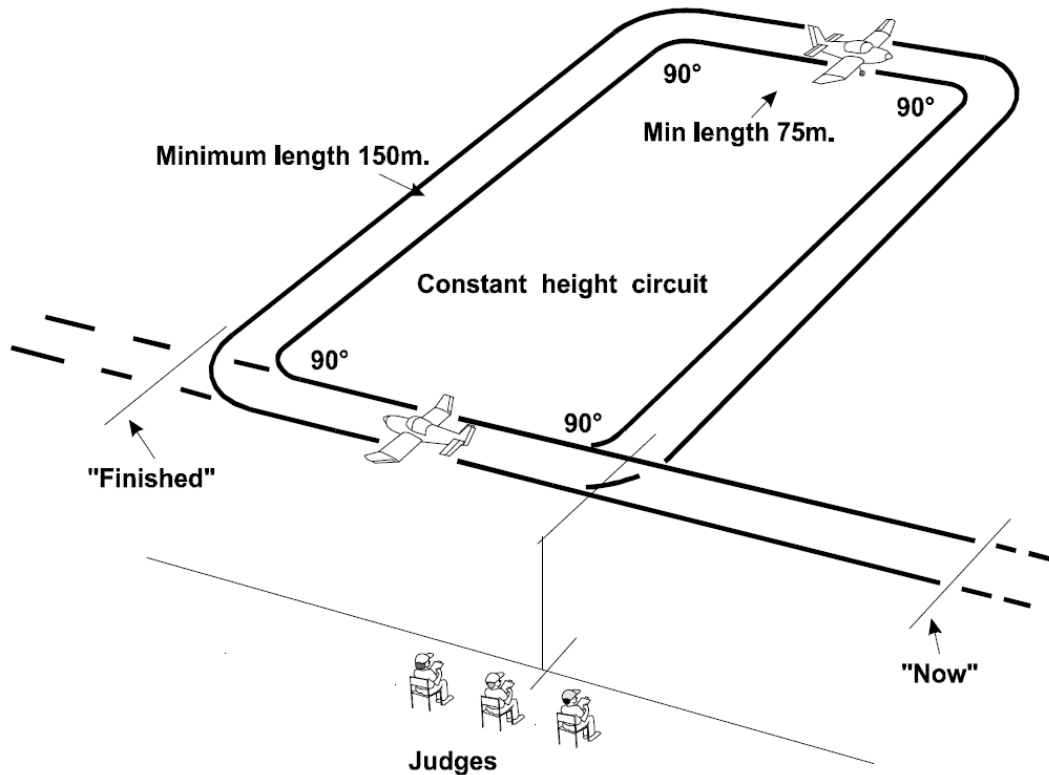


Errors:

1. Not commenced and finished at points equidistant from the judges.
2. Model aircraft changes height.
3. Rate of turn at corners not constant or inside corners of triangle not 60° .
4. Sides of the triangle are not straight.
5. Sides of triangle are not equal lengths.
6. Sides of the triangle are too long or too short.
7. Apex of triangle not centred on judges' position.
8. Correction for drift not properly made.
9. Start and finish tracks not the same.
10. Start and finish tracks not parallel with judges' line.
11. Too far away/too close/too high/too low.

FLIGHT IN RECTANGULAR CIRCUIT

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

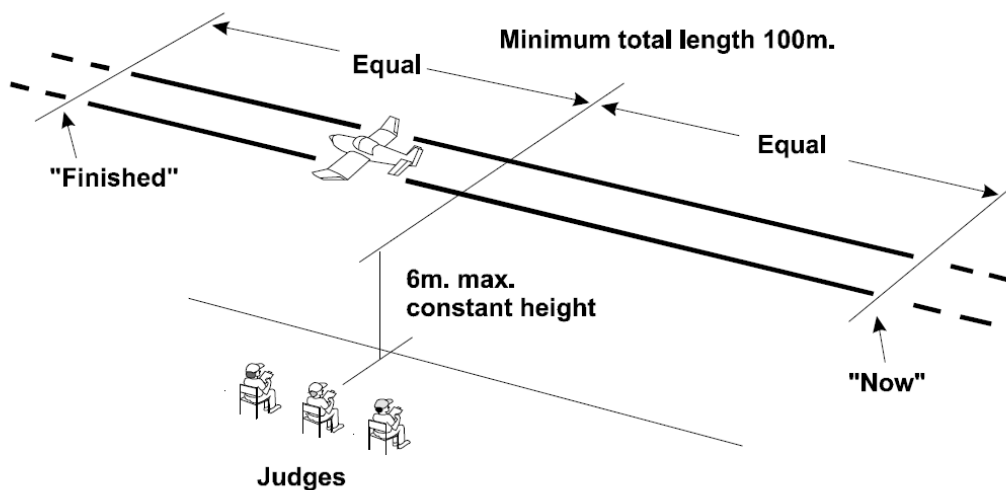


Errors:

1. Not commenced and finished at points equidistant from the judges.
2. Model aircraft changes height.
3. Rate of turn at corners not constant or corners not 90° .
4. Legs are not straight.
5. Legs too long or too short.
6. Opposite sides of rectangle are not of equal length
7. Correction for drift not properly made.
8. Final leg of rectangle not centred on judges' position.
9. Start and finish tracks not the same.
10. Start and finish tracks not parallel with judges' line.
11. Too far away/too close/too high/too low.

FLIGHT IN A STRAIGHT LINE AT CONSTANT HEIGHT (Maximum 6 m):

1. Model aircraft approaches in straight flight at a constant height not exceeding 6 metres for a minimum distance of 100 metres, then climbs away. This is in effect a low flypast. Compulsory low slow-speed and low high-speed passes MUST have an obvious speed difference.



Errors:

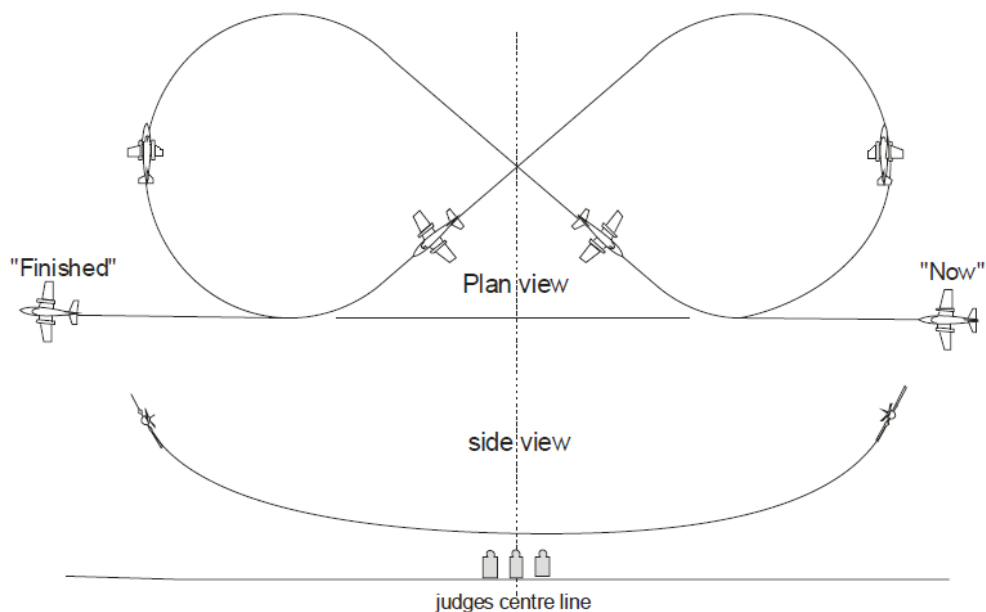
1. Not a straight course (slight corrections acceptable with light aircraft).
2. Not constant height.
3. Not 6 metres or below.
4. U/C or flaps not deployed during compulsory low slow speed pass
5. Not pass over the landing area.
6. Not centred on judges' position.
7. Not parallel with the judges' line.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

LAZY EIGHT

1. The model aircraft approaches in straight and level flight on a line parallel with the Judges' line. When the model aircraft is in line with the judges (the centre) a smooth curving climb is commenced which progresses to a smooth climbing turn of constant radius away from the judges. At the apex of the turn the bank should be at least 60° and the model aircraft shall be on a heading of 90° to the judges' line. The nose of the model aircraft then lowers and the bank comes off at the same rate as it went on. The turn is continued beyond 180° to intercept the centre with the wings level and at the same height as the entry height into the manoeuvre.

2. At the centre another smooth climbing turn, the shape of which should be the same as the first turn, is immediately commenced away from the judges.

The second turn is then continued beyond 180° to cross the centre with the wings level and at the same height as the entry into the manoeuvre. The Lazy Eight is completed by maintaining this height and heading with wings level before turning to intercept the original approach track to exit the manoeuvre parallel to the judges' line in straight and level flight. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre. The figure should be symmetrical each side of the judges' position.



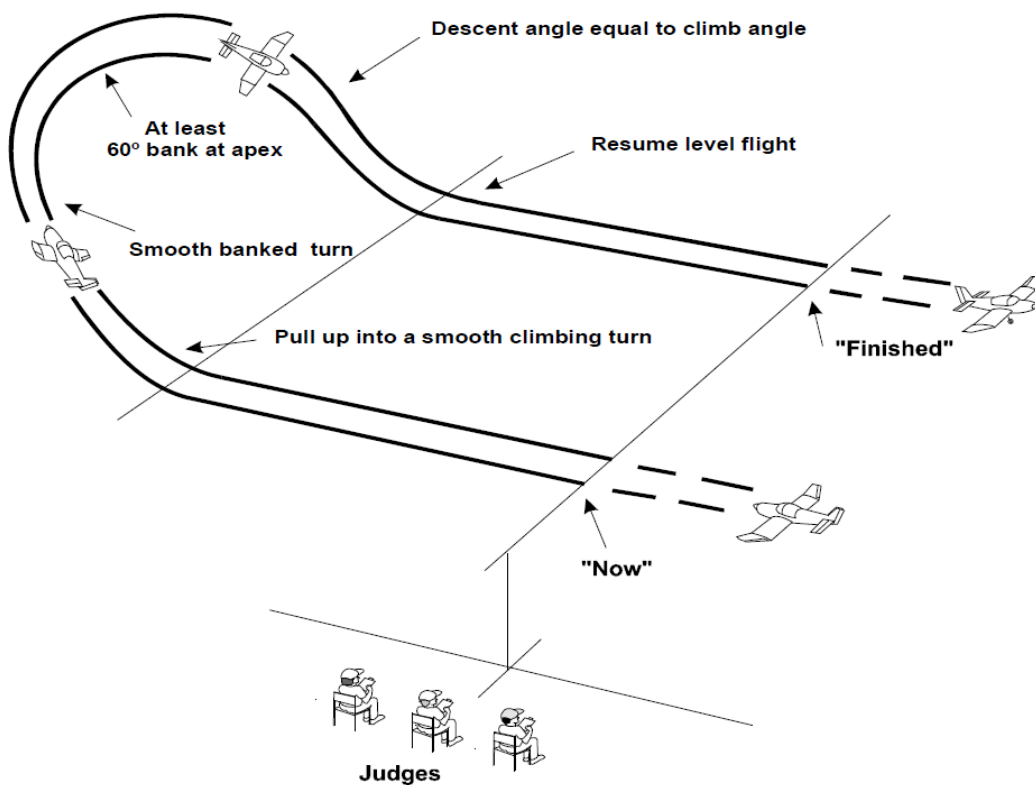
Errors:

- 1 Entry and exit paths not parallel with judges' line.
- 2 Insufficient climb achieved.
- 3 Insufficient bank achieved.
- 4 Climb and descent angles not equal throughout manoeuvre.
- 5 Manoeuvre not symmetrical about judges' position.
- 6 Arcs misshapen.
- 7 Start and finish positions not as indicated.
- 8 Overall size of manoeuvre not realistic for prototype.

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

WINGOVER

1. The model aircraft approaches in straight and level flight on a line parallel with the Judges' line. After passing the judges' position a smooth climbing turn is commenced away from the judges. At the apex of the turn, the model should track 90° to the entry track and the bank angle should be at least 60° for a non-aerobatic model and at least 90° for an aerobatic model. The height gain should be appropriate to the capability of the prototype. The model then continues on a mirror image of the entry flight path and recovers to straight and level flight at the same height but on the opposite heading to the entry and on a line displaced away from the judges.
2. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre.

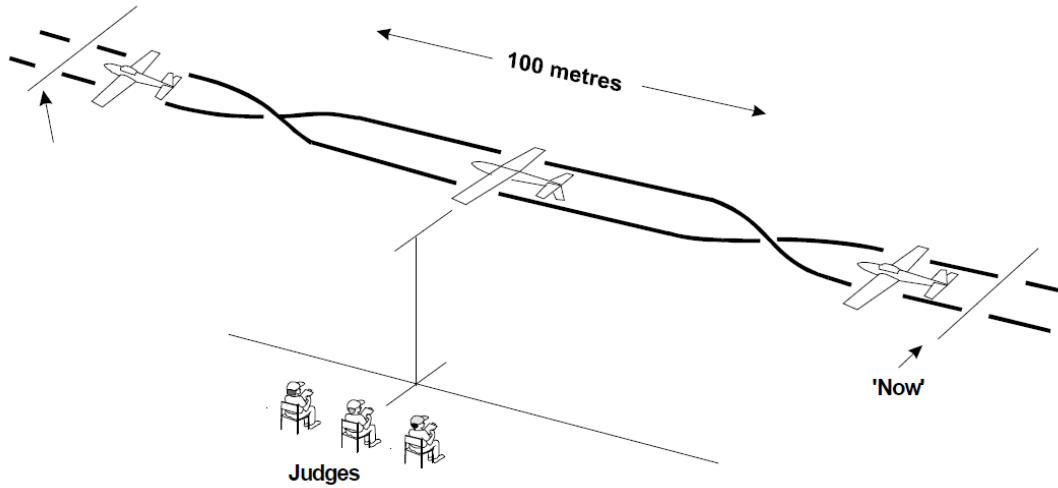


Errors:

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

INVERTED FLIGHT

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

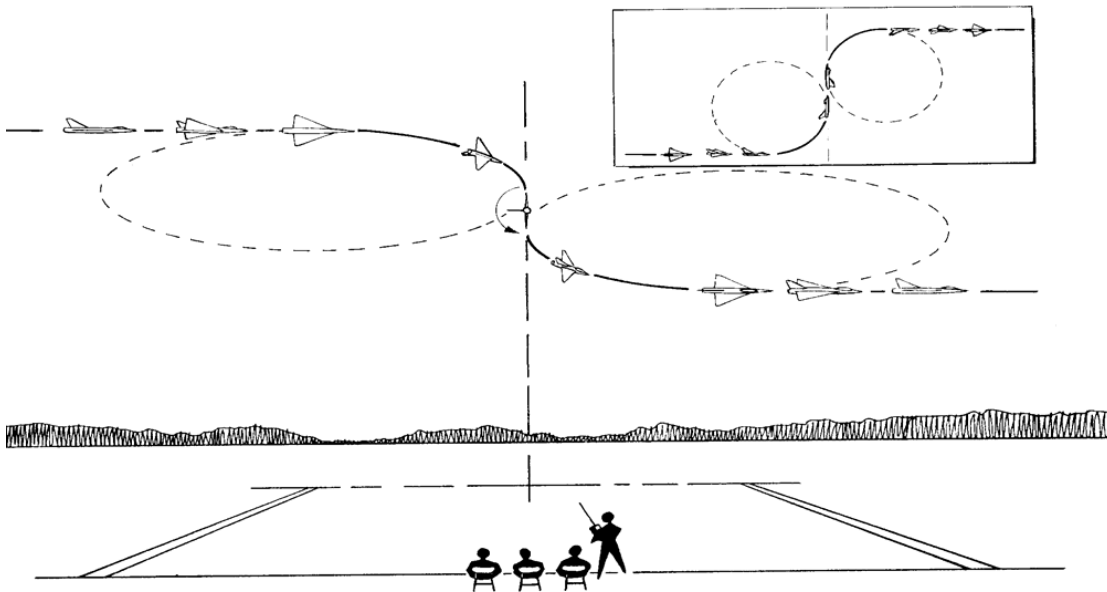


Errors:

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

DERRY TURN

1. The model approaches at a high speed in straight and level flight on a line parallel with the judge's line. The model aircraft then makes a steep, (in excess of 60° bank) one-quarter-circle turn in a direction away from the judges, without losing height. When centred in front of the judges the model aircraft makes a half roll in the same rolling direction as the entry, again directly followed by a steep one quarter circle turn in the opposite direction, and then flies off straight and level on a line parallel with that of the entry to the manoeuvre. The manoeuvre should be smooth and continuous.

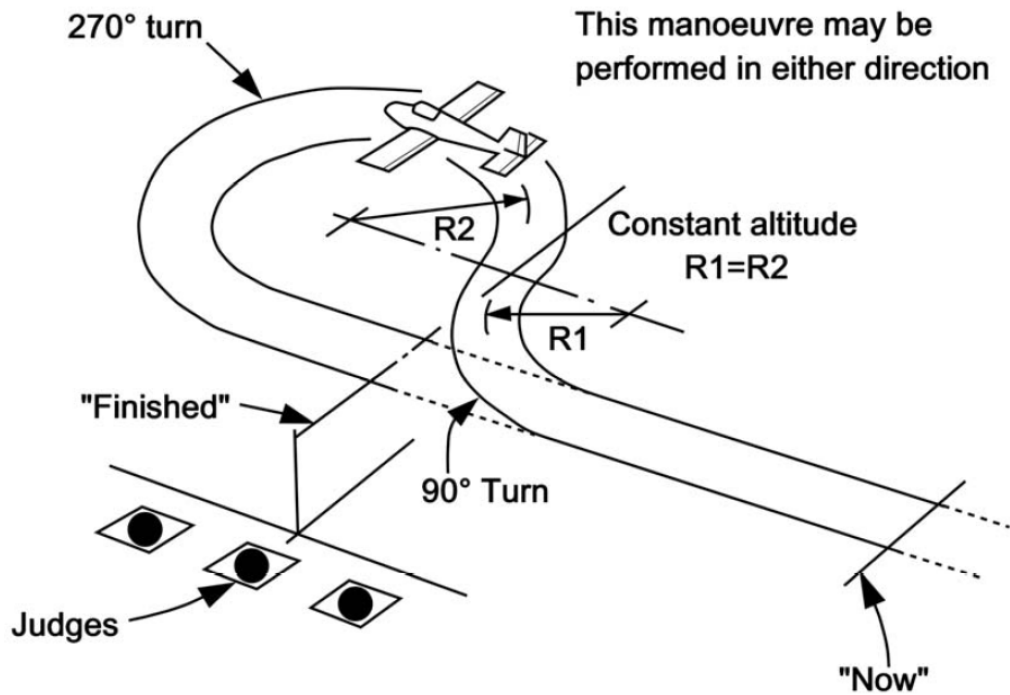


Errors

1. Entry not in parallel with the judges' line
2. The manoeuvre not centred in front of the judges
3. The rolling manoeuvre in front of the judges not axial
4. The roll in centre not in the same direction as the entry to the manoeuvre
5. The roll not carried out on a line directly away from the judges.
6. Any hesitation between the end of the first quarter turn, the roll and the start of the second turn.
7. Exit track not parallel with entry track
8. Significant height difference during the manoeuvre.
9. The manoeuvre misshapen as seen as part of a figure eight.
10. The manoeuvre is executed too low or too high to be easily judged.

PROCEDURE TURN

1. Commencing from straight and level flight the model aircraft must turn through 90° in a direction away from the judges and then turn through 270° in the opposite direction, resuming straight and level flight on the opposite heading to that of the entry. The manoeuvre must be commenced so as to place the point where the model aircraft changes from the 90° turn to the 270° on a line which is at a right angle to the direction of entry and passes through the centre of the judges' position.



Errors:

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