

# Stand Off Scale

## Definition

A scale model shall be a reproduction of a heavier-than-air, fixed wing, man carrying aircraft, which has been airborne.

**Note:** To indicate the subject full-size aircraft being modelled, the word “prototype” is always used.

## The Competition

- 1 The competition shall consist of one round of static judging and three rounds of flying. Each competitor’s score is calculated as the sum of the static score and the average of the better two of his flight scores.
- 2 For the purposes of a National Competition at least two rounds of flying should be completed for a result to be declared. For other purposes, and if conditions are such as to otherwise prevent a result, a single flight score may be used together with the static score. If this decision is taken at a National Championship, the decision shall be justified in writing to the MGA immediately after the event.

## General

- 3 Scale consists (as in power stand-off scale), of static judging, in which the accuracy of the model is assessed, and flying, in which the flying capability of the model and the pilot are assessed.
- 4 Scale is open to models of any unpowered, man-carrying prototype.
- 5 The competition is intended to reward the scratch builder while allowing the more prefabricated models to compete on an equitable basis.
- 6 All manoeuvres shall commence and end into wind, unless the competitor nominates otherwise beforehand and the CD is satisfied as to the safety of the change. (Fast low pass usually looks more impressive down wind and stall turns definitely work better across wind so that the stall itself occurs into wind).

## Static

- 7 Documentation must be provided by the competitor and must state the specific prototype being modelled.
- 8 It must include a signed declaration that the entrant is the builder of the model and the degree of prefabrication of the model. (This comes into the static K-factors).
- 9 Documentation must include sufficient information about the prototype to enable the judges to assess the accuracy of the model. If details of a particular feature of the prototype are not provided then the judges cannot award any points for that feature. e.g. If no information is provided about the planform then no points will be awarded for plan view.

**Note:** It is worth noting that a judge may not draw on his own knowledge to supplement the documentation — he may only compare the model with the documentation.

- 10 No rigid rules are laid down about what the documentation shall include but to allow the judges the best opportunity of awarding full marks, the following recommendations are offered.
  - a Documentation shall include a three-view drawing (showing the fuselage at least 100mm long) and sufficient information in drawings or photographs to allow the judges to assess the model.
  - b Drawings and three-views must have been published by a recognized source. e.g. Jane's or manufacturer's pamphlets.
  - c It is mandatory that all documentation be fixed to the inside of a double A4 folder, with no loose sheets, but additional information in the form of a book pegged open to a single page is acceptable.

## Static Scoring

- 11 The model shall be judged from a distance of six metres. Under each category below, the judges shall first award a K-factor (in the range specified; and depending on the complexity of the prototype in the case of colour scheme and markings, and on the degree of prefabrication in the case of outlines) and then award points from 0 to 10 in each category. The judges must confer and reach consensus on the K-factors.

- 12 Static Judging Categories are —

a Side View	K = 10 - 15
b Plan View	K = 10 - 15
c Front View	K = 10
d Colour Scheme	K = 10 - 15
e Markings	K = 10 - 15
f Workmanship	K = 10 - 15

- 13 K-factors for side and plan must be the same and shall be assessed as follows —

a Built from own plan	K = 15
b Built from commercial plan	K = 14
c Built from kit (no pre-assembly)	K = 13
d Built from kit (main parts pre-assembly)	K = 12
e Built from kit (main parts finished)	K = 11
f Ready to fly except radio	K = 10

- 14 A model not built by the competitor is acceptable but should be assessed on the basis of the work done on it by the entrant, e.g. K = 10, if he has simply installed his own radio, or K = 12 if he has repainted or refinished the model and so on.
- 15 The factors for colour scheme shall be assessed by the judges on the basis of the complexity of the prototype, e.g. sunburst, camouflage etc. and similarly the

K-factor for markings must be assessed on the basis of the complexity of the flashes, roundels, lettering etc.

- 16 The K-factor for workmanship shall be assessed by the judges on the basis of the complexity of the prototype ignoring colour scheme and markings, and provided the complex features are modelled. e.g. retracting undercarriage would be considered only if the u/c on the model does retract.

**Commentary:** The concept of using K-factors to compensate for complexity has been used before, although it has been largely eliminated or watered down in the power field, primarily because of the desire to adhere closely to FAI rules.

The concept seems to the writers to be particularly relevant to scale gliders which in many cases have very simple views and colour schemes, and so has been re-introduced in these proposals

The idea of also compensating/penalising varying degrees of prefabrication is also not new, but certainly less well known. Again, the writers feel that it is particularly relevant to gliders because there are many (very beautiful), fully prefabricated glass models of gliders, and while it is certainly not intended to discourage these models, it is felt that the modeler who does it all himself and chooses a more complex and interesting model should gain maximum reward for this efforts.

## The Flight Schedule

- 17 The flying section consists of eight manoeuvres which must be completed in the specific order, on as many flights as the entrant needs, within the allowed limit of ten minutes. Only the first take-off and the last landing are judged ... intervening landings and take-offs are totally ignored by the judges.
- 18 The first take-off must be rise off ground (RoG), (a hand-launch will score zero), but others may be hand-launched if preferred.
- 19 Manoeuvres —
- a **Take-off.** Smooth RoG.
  - b **Large Circle** — 100m diameter minimum with minimum height loss.  
(The imaginary start, and end of the circle is in front of the judges).
  - c **100m minimum Straight & Level flight**, at not more than 15m altitude, up- or down-wind, along the runway.
  - d Option.
  - e Option.
  - f Option
  - g **Rectangular Landing Pattern** — down to 2m altitude — as per full size.
  - h **Landing** — from 2m altitude to standstill.

- 20 The optional manoeuvres shall be selected from —
- a **One Loop.**
  - b **One Roll** — specify axial or barrel — also as per prototype.
  - c **720° Thermal turn** — 30m diameter maximum (gain of height not required — reasonable loss allowed)
  - d **Stall turn or Wingover** (specify).
  - e **Triangle pattern.** Length of each leg to be a minimum of 100m and the angle of the turn 120°.  
(The imaginary start, and end of the pattern is in front of the judges).
  - f **Fast Low Pass** — minimum of 50m at not more than 5m altitude.
- All manoeuvres shall have K-factor = 10.
- 21 The flight time may be extended or a reflight granted at the discretion of the CD if, in this opinion, the flight was adversely affected by factors beyond the control of the competitor.

## Description Of Manoeuvres -

(See Ribbon Diagrams with Aerobatic Descriptions)

- 22 **Take-off.** The model should rest on the ground, supported by helper(s) where desired. On lift-off the nose should not rise above 30° until the model reaches approximately 3m altitude, thereafter the model should climb as steeply as practicable. After release of the chute, the model should turn 90° left or right and fly straight and level across wind.
- 23 **Large Circle.** The model should fly over the runway, turn gently and smoothly through a full circle (diameter not less than 100m), and fly straight and level on the original heading.
- 24 **Fast Low Pass.** The model should dive, pull out not higher than 5m altitude and fly straight and level for not less than 50m along the line of the runway. The centre of the straight and level path should be in front of the judges. (The model should then still have enough speed to pull up and make a normal approach to the runway).
- 25 **Loop.** The model should dive to gain speed with wings level, pull up into a loop and then fly straight and level on the same heading and altitude as the entry to the loop.
- 26 **Roll.** The model should dive to gain speed with wings level, pull out into level flight and then roll through 360° and then fly straight and level on the same heading and altitude as the start of the roll. The pilot must specify beforehand whether he will do a barrel or an axial roll.
- 27 **720° Thermal Turn.** The model should dive to gain speed with wings level, pull out into level flight and bank to at least 45° turn through two full circles, then level wings and fly straight and level on the same heading as the entry.

- 28 **Stall Turn.** (Since the stall is always more certain if the model falls into wind, the description will be for a cross-wind entry. The judges will have to move their line if this option is selected.)  
The model should dive to gain speed with wings level and when it reaches a point approximately 45° past the 'centre line', it should pull up in a quarter loop to a vertical attitude, fall sideways (into wind), when it loses speed and dive vertically (not more than 2 wingspans from its upward track), and pull out with a quarter loop on the opposite heading but at the same altitude as the entry. The manoeuvre will be downgraded if the downward track is further than two wingspans from the upward track and it will be scored zero if the model falls more nearly forward or backward than sideways in the stall.
- 29 **Wing-over.** This manoeuvre is in most respects identical to the above (stall turn), except that, instead of falling sideways, the model flies a tight, unbanked, turn (usually on rudder only), at the top of the vertical climb and dives on a path 2-3 spans to one side of its climb path.
- 30 **Three Turn Spin.** The model should fly straight and level along the runway line, slow down (raising its nose) until, when it is in front of the judges, stalls and falls into a spin, turning three full revolutions before stabilizing, diving briefly to regain airspeed and pulling out on the same heading as the entry.
- 31 **Landing Pattern.** The model should fly straight along the runway line (long leg) turn through 90° and level out across wind (short leg), fly a short distance before turning 90° to level out heading downwind, fly to a point approximately the same distance down-wind of the judges' line as the first cross-wind leg was upwind of the judges' line, turn through 90° onto the final cross-wind leg, level out and start descending noticeably before turning through 90° onto the runway line and descending more steeply to an altitude of 2m over the end of the runway.
- 32 **Landing.** From an altitude of 2m over the end of the runway, the model should flare smoothly just above the runway until it loses flying speed and settles (ideally in front of the judges), and rolls/slides to a stop, without swinging and without dropping a wing tip onto the runway until (just before), it stops.

**Note:** Some of the manoeuvres are likely to be peculiar to certain prototypes and may deviate from the descriptions given above. This shall be considered by the judges if the competitor provides beforehand, satisfactory proof (e.g. written proof from an acceptable authority), that the prototype behaves in a particular manner.

## Judges' Guide

- 33 In awarding scores judges should bear the following in mind —
- 34 A perfectly performed manoeuvre deserves 10 points.
- 35 An unrecognizable manoeuvre or one which is missing an essential part deserves zero. Judges should confer and agree a zero in this case, but a manoeuvre recognizable as an attempt with all essential parts deserves a score.

36 The qualities to look for in assessing a manoeuvre can be summarized as follows —

- a Shape of manoeuvre; e.g. roundness of loop or circle.
- b Positioning; usually in front of the judges.
- c Smoothness; changes of angle of bank, roller-coaster path.
- d Heading; straightness of line and plane of manoeuvre.
- e Flight as per prototype — modern glass prototypes fly fast and smoothly — early trainers much more slowly.

**Note:** Scores should never be assessed simply by counting defects and subtracting from 10! This can often give a negative number! It is probably better to try to award a 5 to an average sort of manoeuvre and leave room for what it would probably look like if flown by Nick Wright or Daryl Perkins!

## Scoring

38 The flight score for a round shall be the average of the total scores from each judge.

39 Then the Static score is added to the average of the better two of three flight scores to give the competition total. For example —

Static			650
Flight #1	Judge A	570	
	Judge B	620	
	Judge C	590	average 593
Flight #2	Judge A	480	
	Judge B	550	
	Judge C	560	average 533
Flight #3	Judge A	660	
	Judge B	720	
	Judge C	680	average 686

The best flights are #1 and #3 so the Flying Score =  $(593 + 686)/2 = 640$

40 The Competition Total is now  $650 + 640 = 1290$  and the Static and Flying have roughly equal contributions to the score.