

**MODEL  
AERONAUTICS  
ASSOCIATION  
OF  
CANADA**



**CANADIAN  
RC SCALE RULES**

Version 3      Effective Date - January 1, 2017

[LINK TO SUMMARY OF RULE BOOK CHANGES](#)

# MAAC RC SCALE RULEBOOK - 2017

## Background

The MAAC's RC Scale Rules have been reworded and modernized so that they are aligned with recent rule changes and with the other National Organizations. World Sporting Code - FAI; Academy of Model Aeronautics - AMA; U.S. Scale Masters Association - USSMA

There are more Canadian RC Scale modellers travelling to contests in the United State than we have travelling East West to other events in Canada. American RC Scale modellers also travel North/South to events in Canada and the U.S.A. Competitors in the higher classes tend to travel much more than those in the entry level classes.

Modellers going to these events are far better prepared to compete and more importantly enjoy the event experience when the rules are more closely aligned and similar if not mostly the same as the rules they are used to at home.

### There are a number of significant changes in these rules.

- The document has been reorganized and re-arranged in an effort to make it clearer and to reduce repetition.
- The scoring system has been significantly revamped to make the system similar to other sets of rules, such as those used by AMA, FAI, and USSMA.
  - The number of Flight Events required in the Canadian Scale Rule Book has changed from 12 to 10, including Realism, resulting in a maximum flight score of 100. This will bring the rules more in line with other World Scale bodies (including FAI).
  - The static scores have been adjusted so that the maximum static score is also 100.
  - The calculation procedure has been modified so that the contests total score is a sum of the static score plus the average of all the flight scores, making the maximum total score 200.
  - Landing Pattern has been eliminated as mandatory manoeuvres in order to give the competitors a reasonable number of options. This is comparable to other rule sets. Note that the Figure Eight was added as a mandatory manoeuvre in the last edition and is a more challenging manoeuvre.
- The Sportscale class has been eliminated and replaced with an Open Class to which the Builder of the Model rule does not apply.
- Standoff Scale has been retained as an entry level where the Builder of the Model Rule applies.
- Additional safety related requirements, including:
  - Clearer definition of a deadline
  - Requiring a Spotter
  - Rules for use of multiple flight lines
- Judges Qualifications have been added – see the Guide for CD's, now a separate document.
- Noise Requirements have been added. These are less stringent than the FAI and Precision Aerobatics noise requirements.
- There are significant additions in explaining the static documentation and scoring requirements in order to make the static portion clearer for both the contestants and judges.

### There are also a number of small changes.

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## **SECTION 1: INTRODUCTION TO CANADIAN SCALE**

### **1.0 THE PRINCIPLE OF RADIO CONTROL SCALE**

To duplicate, in miniature, the appearance and performance of a prototype full-sized aircraft, both on the ground and in the air.

#### **1.1 The Aim of MAAC R/C Scale**

The events are designed to provide progressive classes from beginner through World Class FAI. The competitor may start at a level which feels comfortable and advance only if desired.

#### **1.2 What Does This Mean?**

Primarily it means that we are trying to duplicate the performance of full size aircraft, not copying the R/C Precision Aerobatics event manoeuvres. R/C scale events are therefore unique and challenging and should be flown and judged accordingly.

#### **1.3 Scope of Rules**

These rules are published by the Radio Control Scale Committee of the Model Aeronautics Association of Canada (MAAC). They define the standard by which Radio Control Scale contests held in Canada should be operated.

For these rules to be effective as a standard, each Contest Director (CD) should do their best to apply the rules to their contest. If these rules are not to be applied, particularly at MAAC sanctioned contests, then the advertising for the contest should reflect the changes that will be made.

Guidelines for the operation of contests are presented in a separate document, the Contest Director's Guide. It is intended that the Contest Director should have some flexibility, for example: to allow a smaller, local contest to proceed without being bound to the more rigid format of a larger, or FAI competition.

The intent of any set of rules is to have a pre-determined guideline by which you can attend an event and reasonably know what to expect. (If the rules are such that they are unreasonable or unmanageable then there is a predetermined path to change or update those rules to reflect what the group of persons who utilize them needs.)

The content of this rulebook is only as effective as the ability and dedication of its users to understand and apply its regulations. It is not perfect, but it should reflect the actual practice of Radio Control Scale events in Canada. Should you have any questions or suggestions to enhance the rules or the book, contact your local RC Scale committee member or the RC Scale Chairman.

#### **1.4 Guidelines for Contest Directors**

Refer to the separate document "MAAC RC Scale Contest Director's Guide".

## **SECTION 2: GENERAL RULES**

### **2.1 CLASSES OF COMPETITION**

There are seven classes in which competitors can compete. They are organized from an entry level, in steps, to the highest level, in order to allow competitors to compete at a comfortable level and to progress as their experience and skills develop.

The flight portion rules and scoring are identical for all classes, except FAI.

The classes differ due to the Static scoring, and due to the application of the Builder of the Model Rule.

#### **2.1.1 Fun Scale – Division #1**

The intent of Fun Scale is to provide an RC scale event which is, and is to remain, simple in concept.

There are two divisions of RC Fun Scale. Division #1 is for the novice contestant only. This is purely an entry level division for RC scale competition.

There are minimal documentation requirements for this class, and the “Builder of the Model” rule does not apply.

#### **2.1.2 Fun Scale – Division #2**

Division #2 is open to any contestant with previous RC scale competition experience.

There are minimal documentation requirements for this class, and the “Builder of the Model” rule does not apply.

#### **2.1.3 Open Scale**

This is an intermediate level class which has a static judging component, and a documentation package is required.

The “Builder of the Model” rule does not apply.

#### **2.1.4 Standoff Scale**

This is both an intermediate level class and an entry level in which the “Builder of the Model” rule is applied. This class has a static judging component.

Standoff Scale provides more of a challenge than either Fun Scale or Open Scale in that a model must be built to the “Builder of the Model” rule.

#### **2.1.5 Expert Scale**

This is the most advanced level. The “Builder of the Model” rule is applied. This class has a significant static judging component.

Expert Scale provides the most challenge in both static and the flying portion of the event. The intent of Expert Scale is to provide competition requiring the maximum of building and flying skills of the modeller without the size and weight restrictions of FAI - F4C.

#### **2.1.6 Team Scale**

This class is very similar to Expert Class, except entries will consist of the builder of the model and a pilot of the builder's choice. The “Builder of the Model” rule is applied. This class has a significant static judging component.

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Team Scale is an advanced level of scale competition. This event will be judged by the same rules as Expert Scale and provides the most challenge in both static and the flying portion of the event. The intent of Team Scale is to provide competition requiring the maximum of building and flying skills of the team.

The builder must be present at the contest to fulfill the definition of a team.

### 2.1.7 FAI F4

The Fédération Aéronautique Internationale (FAI) provides the rules for International Competition at the World Championship level. Refer to the FAI Sporting Code, Section 4 – Aeromodelling, Volume 4, Flying Scale Model Aircraft, and related FAI documents. World Championships are held every two years.

As of 2014 there are four FAI classes for RC models:

- F4C – Radio Control Scale Models
- F4G – Radio Control Large Scale Models (Provisional)
- F4H – Radio Control Stand-off Scale Models
- F4J – Team Scale (Provisional)

## **2.2 CHARACTERISTICS OF RADIO CONTROLLED SCALE MODELS**

### 2.2.1 Definition of a Scale Model

A scale model shall be a replica of a heavier than air, fixed-wing, man-carrying aircraft that has actually been built and flown.

The aim of scale contests is to recreate the accurate appearance and realism of the prototype aircraft as best appropriate to each model aircraft class. This shall apply equally to static judging and flight performance.

To indicate the subject full size aircraft being scale modeled, the term "prototype" is used.

### 2.2.2 General Scale Model Characteristics

- Maximum surface area - unlimited
- Maximum power - unlimited (pulse jet or rocket engines not allowed)
- Maximum weight - 35 kg. (77 lbs.)

If the pilot is visible in the prototype during flight, the model should also contain a visible pilot, left in or removed for static judging at the option of the contestant.

### 2.2.3 Equipment Used

There is no limitation on the mechanical equipment used by the modeller.

Electronic multi-axis stabilization units or multi-axis gyros are not allowed.

Single-axis gyros are permitted on the rudder only.

Otherwise there is no limitation on the radio or electronic equipment used by the modeller.

### 2.2.4 Noise Restrictions

The maximum noise level will be 98 dB measured at three meters from the centerline of the model placed on the ground at the flying site. With the model running at full power, measurement will be taken 90 degrees to the flight path on the right hand side, downwind from the model. The microphone will be placed

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on a stand 30 cm. above the ground in line with the motor. No noise reflecting objects shall be nearer than three meters to the model or microphone.

The equipment used for measurement should comply with International Electronic Commission on document No. 179, "Precision Noise Level Instruments".

### 2.2.5 Builder of the Model

The **Builder of the Model** is the individual who constructed the airframe from a kit, plans, or from scratch, using either raw materials or prefabricated components typically found in a kit or Almost-Ready to Cover (ARC) models such as: fiberglass formed skin components, foam cores, canopy or plastic molded exterior details, wheels, etc..

- The same individual, with material of their choosing, shall also perform all final assembly and finishing (covering, painting if applicable, and application of markings) of the model.
- Any other commercially advertised products may also be used without penalty to the modeller at the various stages of construction.
- Hardware may be commissioned independently when, in the judgment of the modeller, commercially available items are not adequate, when such items are independent of the airframe (visible or not) and such items:
  - Require machining or welding to assure reliability, and safety;
  - Or are required for operations of the scale model aircraft – items such as radio, engine accessories, and undercarriage gear, either commercially acquired or designed by the modeller for optimum outline accuracy.
- No other airframe construction may be commissioned in this manner.
- Reworking ARF models, no matter how extensive the effort, does not constitute 'Building the Model'

#### *Builder of the Model Classes*

In Standoff and Expert Classes it is required that the pilot also be the builder of the model.

#### *Non-Builder of the Model Classes*

In Fun Scale and Open Classes, the pilot does not need to be the builder of the model. Any scale model is permitted, be it an ARF, kit, or even a borrowed or purchased model.

#### *Team Scale*

Competitors in Team scale shall be a two person team, one of whom is the pilot and the other the builder of the model.

## **2.3 SAFETY REQUIREMENTS**

### **2.3.1 General**

All MAAC safety rules apply.

Metal propellers are not allowed for flying but may be used for static judging.

### **2.3.2 Proven Model**

The model shall have had a least six flights prior to participation in a contest.

- Scale models are usually complex and often challenging to fly. The reliability of the model needs to be established, and the pilot needs to be familiar with its flying characteristics.

### **2.3.3 Pre-flight Safety Inspection**

While the ultimate responsibility for the safety and airworthiness model rests solely with the Owner and/or Pilot, all items on the Safety Inspection Form must be checked, approved, and recorded on the form, in the presence of the event safety inspector, for the aircraft to be accepted for flight at the event.

A typical "Safety Inspection Form" is included in SECTION 6: FORMS.

Any contestant refusing to follow recommendations for correcting safety issues found shall be disqualified and not allowed to fly. The contestant must declare that the model has been flown the minimal number of flights required prior to attempting round one of the competition.

### **2.3.4 Flight Safety**

**FOR SAFETY OF FLIGHT OPERATION REFER TO**  
**SECTION**

## **3.3 FLIGHT REQUIREMENTS, PAGE 13.**

### **2.4 DOCUMENTATION REQUIREMENTS**

#### **2.4.1 Fun Scale Classes:**

For Fun Scale a picture, photograph, or coloured line drawing is all that is required to prove that the type of aircraft existed. This can be in the form of pictures, line drawings with colour references or even the picture from the box the model came in. The documentation does not have to be for the specific prototype modelled.

#### **2.4.2 All Other Classes:**

The modeller must provide "Proof of Scale" for the model to be judged by.

#### **2.4.3 Proof of Scale**

##### ***General***

To prove that the model resembles a particular prototype, some proof of scale material is required.

Proof of scale is the responsibility of the contestant.

The model must resemble a particular prototype.

- For example: A generic P-51 is not allowed, while a specific P-51, flown by a particular squadron and pilot, is allowed.

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

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

Computer generated drawings or computer printed photographs will be allowed if they have not been altered from their original published form.

If a conflict exists between outline drawings and submitted photographs, the photographs shall take precedence. 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 photograph provided of the same aircraft, the photograph will have ascendancy.

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It is not the intent of the documentation rules to limit the choice of scale subjects only to those aircraft for which a large amount of data is easily available or penalize the use of rare colour or markings schemes. In many cases it is not possible for the builder to provide enough photographs of the same plane to cover all aspects of colour or markings. In these cases no downgrading will be made for lack of proof of the "other" side or bottom, etc. or use of written proof of colour in lieu of colour photographs or drawings.

### *Accuracy of Outline*

To be eligible for Accuracy of Outline points, one of the following must be provided by the contestant:

**Either: a.** a three-view drawing. Drawings with more than three views are also acceptable. The three-view scale drawings must be from a reliable source such as the aircraft manufacturer, model or aviation magazines, books, etc. Commercially available three-view drawings are acceptable. Plans of non-flying solid or replica models, from either a kit or magazine, are acceptable.

Where the outline of the particular prototype being modelled is different than that of a generic drawing, the modeller should note the differences on the drawing and establish the accuracy of the model with photographs.

Three-views to a maximum size of 279 mm x 432 mm (11" x 17") are permitted and will also count as one page of the eight allowed for documentation.

Homemade or non-published drawings, corrected three-views, or drawings of flying models are not acceptable unless approved in advance by the MAAC RC Scale Committee Chairman, the manufacturer or builder, or other competent authority. Suitable photographs, historical background, and supporting data must accompany the drawings submitted for approval to permit verification.

**Or: b.** A selection of photographs of the aircraft modeled, sufficient to show the outlines of the aircraft in side view, front view and plan view. The photographs need not be taken from directly overhead or at exactly 90 degree angles to the side or front of the outlines but can be pictures taken from oblique angles which allow the judge to interpret the outlines.

**Or: c.** A plastic model of the type available commercially, unmodified and unpainted may be used. The use of a plastic model as proof of Accuracy of Outline will require the deletion of two 216 mm x 279 mm (8-1/2" x 11") pages or their equivalent from the documentation package.

### *Finish, Colour, and Markings*

To be eligible for Finish, Colour, and Markings points, some proof of the colour scheme used on the model is required. One of the following must be provided by the contestant:

**Either: a.** Photograph or photographs.

**Or: b.** Some other pictorial representation, such as a magazine or other published colour painting or drawing.

**Or: c.** A detailed written description of the colour scheme and/or markings from a reliable source.

**Or: d.** Notes and diagrams of markings on a black-and-white three-view.

"Profile" and similar types of colour paintings in three-view form can be used for both proof of Accuracy of Outline and Finish, Colour, and Markings.

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 airplane.

Colour chips may be used to supplement the proof of colour. If colour chips are used, they must be from a published source. Contestants may NOT paint their own colour chips.

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### *Documentation Package*

Documentation must be presented in an easily read binder or equivalent.

To facilitate rapid judging:

- Documentary presentations are limited to no more than eight pages sized 216 mm x 279 mm (8-1/2" x 11") or an equivalent area of some other arrangement.
- Up to three sets of the same three-view used as documentation may be provided by the contestant and will only count as one page in the documentation presentation.
- Extra three-views for judges' feedback, the cover page, index and signed Builder of the Model Declaration statement will not count toward the eight maximum pages.

Emphasis is placed on the quality of the documentation presented to the judges. Poor or hard to interpret drawings which make it difficult for judges to compare to the model will not enable a good score. Many examples of excellent models that score poorly due to poor quality documentation (or not enough) happen each year. Be careful not to fall into the trap of "less is better" as the judges must have adequate documentation to compare each item they see on the model to some reference shown on the presented documentation (including views of the aircraft's underside).

### *The Ideal Package*

The Ideal Documentation Package would contain:

- Cover Page and/or index page
- Three or more view drawing(s) showing the aircraft outlines, colour scheme and markings location. Separate drawing(s) may be used to show outline and colour/markings scheme.
- Three ring binders work well for being able to quickly separate outline drawings from colour and marking references such that each judge can have their own document to work with for Open, Standoff, Expert, and Team classes.
- Photographs of the actual aircraft being modeled
- Paint chips or other proof of colour for each colour used.
- Signed *Builder of the Model Declaration* statement for Standoff, Expert, and Team classes.

## 2.4.4 Declaration

Competitors in Standoff, Expert and Team shall provide a declaration that they are the Builder of the Model. The declaration shall include a listing of all major components of the model not made by the competitor. The judges will adjust the craftsmanship marks awarded for any components not made by the contestant.

### **Sample Declaration:**

*This model of a \_\_\_\_\_ was built from a kit which included a fibreglass cow and wingtips. This model was assembled, covered, painted, and detailed by myself. The pilot was created from a kit.*

*I have read the MAAC RC Scale rules and attest to the fact that I am the builder of the model in accordance with those rules.*

*I declare that any drawing and photographs contained in this documentation that were printed from electronic files have not been modified from their original form.*



## **SECTION 3: CONTEST OPERATION**

### **3.1 GENERAL REQUIREMENTS**

#### **3.1.1 Official Flight**

##### ***Definition of an Official Flight***

An official flight shall be recorded when the model becomes airborne.

An official flight is considered complete when any of the following occur:

- The time limit expires.
- Personal contact is made with the model after the model has been released for take-off during an official flight.
- The pilot has called "Flight Complete/Finished."
- Landing manoeuvre is complete if not followed by another manoeuvre in the flight plan.
- Disqualification for any reason.

A "round" of flying means a group of flights where every competitor is allowed an opportunity to complete an official flight.

#### **3.1.2 Attempts and Aborts**

##### ***Definition of an Attempt***

There is an attempt when the model fails to take off in the five minutes allowed.

(NOTE: - one minute extra allowed per each extra engine).

##### ***Number of Attempts***

Each contestant shall have only one attempt per round of flying to complete an official flight, plus one additional attempt per contest.

An attempt can be repeated if the pilot declares an attempt, due to safety concerns or other problems with the model, and the model has not become airborne within the five minutes allowed; or at the judge's discretion only when, for unforeseen reasons outside the control of the competitor or official, the model fails to take off in the allotted time.

The flight is official and no attempt may be called once the model becomes airborne, regardless of subsequent events.

If the model does not become airborne at its first attempt:

- Any points earned are cancelled.
- The contestant will go to end of the line, or a place in line deemed fair by the Contest Director, for a second and final attempt of the round.

##### ***Takeoff and Landing Aborts:***

In the interest of safety, a takeoff or landing may be aborted and restarted with 7 points maximum score (or 70% for each subsequent retry) rather than be given an automatic zero. The safety of the judging line should not be jeopardized because the pilot felt compelled to continue a bad takeoff roll or landing simply to avoid an automatic zero score. The contestant will still be on the clock for these additional tries.

Example scoring: After the first abort, the *maximum* score for the first *retry* is 7 points, 2<sup>nd</sup> retry is 5 points (70% of 7), 3<sup>rd</sup> retry is 3.5 points, etc.

### 3.1.3 Spotters and Helpers

The pilot shall have a Spotter. Pilots shall ensure that a Spotter is properly briefed on the pilot's expectations during all phases of the flight.

Although the terms Spotter and Helper are often used interchangeably and the associated duties of each are often combined, the need for and duties of each are quite different.

A Spotter is a person assigned to assist the pilot of an R/C model aircraft during all phases of flight.

A Helper is a person assigned to assist the pilot of an R/C model aircraft during start-up, ground running and ground handling of the model from the pit area to the flight line.

The pilot shall utilize the assistance of a Helper when:

- The model is too large or too powerful to be safely ground handled by the pilot alone.
- There is no other suitable means available for restraining the model during start up and ground running.
- The model requires hand launching and cannot be hand launched safely by the pilot.

The specific duties of both Spotters and Helpers may vary depending on many factors, and upon the agreement between them and the pilot. Their duties are covered in MAAC Policy and Procedures Documents:

- MPPD 4 – Duties of a Spotter, and
- MPPD 5 – Duties of a Helper.

#### *Number of helpers*

In addition to the Spotter, each contestant is permitted one Helper (mechanic) during the competition. In the case of multi-engine models, one additional Helper (for a total of 2) is allowed to assist in cranking the engines.

### 3.1.4 Contestants Responsibilities

The contestant is responsible for the registration of the contestant's model and the presentation of the appropriate documentation when attending the contest.

It is the responsibility of the contestant to provide proof that the optional manoeuvres the contestant chooses are within the capability of, and the flight envelope of, the prototype and that the prototype actually performed the manoeuvre in question. The contestant shall clear any unusual options with the Contest Director or Chief Flight Judge prior to the first round of flying. If the competitor cannot do so, then another optional manoeuvre that falls within the capability of the prototype must be chosen.

It is the responsibility of the contestant to be at the flight line for the designated time of the contestant's flight.

It is a responsibility of each competitor to fly safely and behave in a sportsmanlike manner at a scale contest. Dangerous flying of any sort, or poor sportsmanship of any kind, shall be grounds for disqualification of the contestant involved. The Contest Director's decision is final.

### 3.1.5 Time Allowed

The time allowed for each flight is a maximum of 15 minutes total (plus 1 minute per each extra engine) inclusive of starting-time and any required explanations or demonstration for the judges. The engine or motor shall not be running at the start of the time. The model must be released for flight in 5 min. (plus 1 min. per extra engine).

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The pilot shall not be penalized for any delays in take-off, maneuvering, or landing caused by other air traffic. The timing clock shall be stopped during the period that the pilot is delayed. The pilot, however, shall expect other aircraft traffic, and with the assistance of the Spotter, manage the flight to avoid unnecessary delays in maneuvering.

### 3.1.6 Hand Launch

Permitted but zero points will be allowed for take-off.

### 3.1.7 Field Procedures and Flight Line Rules

All contestants should be set up in a "Pit Area" assigned by the CD.

There will be no testing of non-2.4 GHz transmitters during the flying period of the contest except that which has the approval of the CD. Any unauthorized use will be grounds for immediate disqualification of the person involved.

At each flight line, a Flight Order board shall be setup to show the pilots' names and flight order. The flight line order should be determined by the Flight Line Coordinator.

Flying shall be done in the area of sky as designated by the CD, Air Boss, or judge(s): wind, sun, other flight line(s), and spectator's area, etc., shall be taken into consideration.

The procedures listed below are suggestions that may be altered at the discretion of the event director or CD to suit local conditions.

The Flight Line Coordinator and pilots should carry out the following procedure:

- The next pilot on the flight list should be in ready box #1 with aircraft, equipment, spotter, and one helper if desired.
- The following two pilots on the flight list should have their aircraft, and equipment in ready boxes #2 and #3. The pilots and crew should be on standby close by.
- As each flight is completed, each contestant shall move their aircraft to the next lower "ready box" number after ready box # 1 is vacated by the contestant going to fly.
- The Flight Line Coordinator will then fill box #3 from the flight list and warn the next contestant to get ready.
- It is strongly recommended that two flight lines and lists be used.
- Should a contestant oppose flying simultaneously with another, the competitor may only change position at the discretion of the Flight Line Coordinator. The Flight Line Coordinator's decision shall be final.
- Should a contestant not be ready to fly when the contestant's turn comes up, then that competitor may lose the flight of the round in question, subject to the discretion of the CD.

### 3.1.8 Disputes

Any grievances must be brought to the attention of the CD or the CD's representatives immediately. The CD's decisions or interpretations are final. If a contestant is not satisfied with a decision, the contestant may write to the RC Scale Committee Chairman, giving full details, so that further rules, changes, interpretations, etc., may, if necessary, be incorporated into the rule book. It is realized that due to unforeseen circumstances, problems do arise at a contest; in such cases the CD of that contest has the final say. This type of problem should be noted in the CD's report with the details of the decision made. A copy of the Contest Director's contest report must be sent to the RC Scale Committee chairman.

### **3.2 STATIC REQUIREMENTS**

Static refers to the judging of the appearance of the aircraft on the ground against the documentation provided by the contestant.

All models should be presented at the designated time for static judging; otherwise no points will be awarded for static. (Subject to the discretion of the Contest Director)

Each class shall be static judged in accordance to the rules of the class, as follows:

#### *Fun Scale classes*

**THERE IS NO STATIC JUDGING: THERE IS PROOF OF  
PROTOTYPE ONLY. REFER TO THE DOCUMENTATION  
SECTION**

- 2.4 DOCUMENTATION REQUIREMENTS, page 6.

#### *All Other Classes*

Shall be judged against the documentation provided for:

- Accuracy of outline
- Colour and markings
- Craftsmanship

#### **Judging Distance:**

Open and Standoff Scale shall be judged from a distance of 5 metres (16 feet).

Expert and Team Scale shall be judged:

- For Accuracy of Outline, and Finish, Colour and Markings from 5 metres (16 feet), and
- For Craftsmanship from 1 metre (39 inches)

## **3.3 FLIGHT REQUIREMENTS**

### **3.3.1 General**

Pilots may consult with judges prior to flight on selected manoeuvres and prototype performance. Manoeuvres must be in keeping with prototype capability. Onus of proof is on the modeller.

The pilot must stand in the designated flight box for the complete flight.

In strong crosswind situations, it will be up to the discretion of the CD to allow Take-off and/or Landing as scored manoeuvres to be optional. Other manoeuvres must be selected to replace take-off or landing manoeuvre should this occur. When used, each added replacement manoeuvre will be allowed one extra minute for total allowed flight time.

### **3.3.2 Number of Rounds**

Typically, the target for a contest should be three rounds of flying (weather permitting). At a National Championship, the Contest Director may consider having additional rounds.

Depending on the number of entries, most contests can only fit in two rounds per day. However, the CD should keep an eye on the timing, and if an additional round can be reasonably fitted in, then it should be done.

### **3.3.3 Calling of Manoeuvres**

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

Straight Flight and Procedure Turn will be flown together as one manoeuvre but judged as two; as will Traffic Pattern and Landing. To properly call these manoeuvres you may call to the judges "Straight Flight followed by a Procedure Turn" and "(Civilian or Military) Traffic Pattern followed by a Landing."

#### ***Spotter/Caller 1 Card:***

A typical "Pilot's Call Sheet" is included in SECTION 6: FORMS. The pilot should complete a call sheet for use by the Spotter. This is in addition to the score sheets for the Judges.

### **3.3.4 Runway Safety**

All manoeuvres not requiring access to the runway to perform shall be placed on the "Manoeuvring Line".

The Maneuvering Line is an imaginary line parallel to the runway, 10 to 50 feet beyond the far side of the active runway.

Manoeuvres requiring access to the runway will include Takeoff, Landing, Touch and Go, and Overshoots. The start of a Traffic Pattern must also begin beyond the far edge of the defined runway, but will be in alignment to the runway on final approach.

### **3.3.5 Deadline Safety and Infractions**

A safety "Deadline" shall be established. This is generally parallel with the runway centre line, and in line with the Judges' positions. Depending on the field rules, the "Deadline" may be parallel to, or coincide with the "Flight Line" as defined in MAAC Policy and Procedures Document MPPD 8 – R/C FLYING FIELD SPECIFICATIONS

The MAAC Flight Line serves as the line of reference which effectively divides the airspace into two halves, Flying Side and No Flying Side.

Flying behind the "Deadline" will be significantly penalized as specified in 3.4.2 Flight Manoeuvres and Overall Flight Realism, Flight Score Deductions, page 23.

### 3.3.6 Safe Use of Multiple Flight Lines

Where multiple flight lines are operated from a runway, then:

- Use of a Spotter by each pilot is mandatory.
- The Contest Director shall designate an “Air Boss”:
  - to coordinate air traffic control
  - to promote flight safety
  - to coordinate all takeoff and landings with the pilots, and
  - to notify pilots to clear the runway for emergency landings.
- Pilots shall not be penalized for any delays caused by coordination of takeoffs and landings.

### 3.3.7 Seaplanes and Flying Boats

Models of seaplanes or flying boats are permitted to use non-scale devices or dollies for takeoff in the absence of suitable water conditions. If dollies are used they must not be attached to the model in flight. Takeoffs or landing of such aircraft will be judged by the same criteria of Precision, Placement, and Realism except that the surface area such as rough grass may disrupt the models behaviour. The judges are to ignore for only this situation for the Realism portion of the score. Deviations from scale through the inclusion of permanently mounted, recessed wheels, skids, plug-in removable landing gear or similar devices, if neatly and inconspicuously executed, will not be penalized in the scoring of Accuracy of Outline points. The contestant may choose another optional manoeuvre to take the place of take-off or landing for seaplanes if desired.

### 3.3.8 Changes for Flight

No changes shall be made between static judging and flying which alter the scale appearance of the model except as noted below.

- A flying propeller of any diameter and colour may be substituted for a scale propeller for flight.
- The propeller spinner used in flying must be a similar size, shape and colour as the one presented for static judging except that it may have a different number of cut-outs appropriate for the flying prop. The overall shape of the flying spinner may be blunted or rounded for safety reasons. The flying spinner must be presented to the judges during static judging. If the flying spinner varies significantly from the static spinner, the model must be static judged with the flying spinner installed on the model. Aircraft not incorporating a spinner should utilize a rounded safety nut during flight.
- Radio antenna of any type may be added.
- If bombs, rockets, drop tanks, etc., are to be dropped or released, they must be in place at the time of judging. The bombs or other armament in place at static judging may be replaced during flying if the replacements are the same size, shape, and colour as those submitted for static judging. Static judges will make note on the static judging sheet of all observed droppable stores in place on the model at the time of static judging.

### 3.3.9 Number of Manoeuvres

In each class, a total of nine manoeuvres are flown: four mandatory manoeuvres and five optional manoeuvres. The various manoeuvres are described in section 4.1 DESCRIPTIONS OF MANOEUVRES, page 27. Additionally, a tenth score for Realism will be given.

### 3.3.10 Mandatory Manoeuvres

The four mandatory manoeuvres are:

- Take-Off

- Straight Flight at Constant Height
- Horizontal Figure Eight
- Landing
- Plus Realism

### 3.3.11 Optional Manoeuvres

“Touch and Go” is scored as two separate manoeuvres.

“Traffic Pattern” (when chosen) and “Landing” are flown as one continuous manoeuvre but judged separately.

### 3.3.12 Selecting Optional Manoeuvres

The selection of the Optional Manoeuvres is the modeller’s choice and should showcase the flight envelope of the prototype being modeled and demonstrate the fullest possible capabilities of the aircraft subject type modelled.

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

The competitor must be prepared, if required by the judges, to give evidence that the options selected are within the normal capabilities of the aircraft subject type modelled. The contestant shall clear any unusual options with the Contest Director or Chief Flight Judge prior to the first round of flying.

Rotating beacons, strobe lights, operating cargo doors, rotating radomes, etc. are not allowed as any scored option but they may be incorporated for the enhancement of the realism score!

### 3.3.13 Non-Aerobatic Aircraft

These are aircraft designed with limited manoeuvrability where the original prototypes of which were restricted by the manufacturer or licensing government agency.

- Typically these aircraft do not exceed 60-degree bank angles or 30-degree pitch angles.
- Typically these aircraft are not capable of inverted flight, extreme attitudes, or high-G manoeuvres.

Also see “3.4.3 Overall Flight Realism Score” for scoring aerobatic/non-aerobatic aircraft.

For more clarity on what the judges are looking for; See section; “**3.4.3 Overall Flight Realism Score**” - "Options Chosen".

While a competitor may choose any of the optional manoeuvres listed the following six manoeuvres are intended for aircraft for which the original prototype had little or no aerobatic capability:

- Chandelle
- Overshoot
- Flight in triangular circuit
- Flight in rectangular circuit
- Traffic Pattern
- Wing Over

Examples are:

- Pioneer and early aircraft (pre 1915)
- Purpose designed reconnaissance and bomber aircraft (Note: this does not include fighter aircraft later adapted for reconnaissance duties or fighter/bombers where the designer intended an aerobatic capability)
- Touring aircraft
- Passenger and cargo aircraft
- Heavy military transports and bombers

### **3.3.14 Manoeuvre Placement**

Most in-flight manoeuvres will optimally be placed directly in front of the judges on the manoeuvring line as shown in the manoeuvre descriptions. There are times manoeuvres may be offset to aid in visibility, for example: due to the sun location

The contestant may be allowed to offset the manoeuvre to either side of judging center as long as the contestant informs the judges before the manoeuvre.

Judges may request manoeuvres be offset. The contestant is not obligated to offset the manoeuvre if asked, but the competitor should be aware that if the judges cannot adequately view the manoeuvre it will be difficult to score.

## **3.4 SCORING**

### **3.4.1 Static Scoring**

The maximum static score shall be 100 points. Note that for Fun Scale the maximum static score is 5 points, and for Open and Standoff the maximum static score is 60 points.

Judges must note the reasons for downgrades on the static score sheets. Contestants are entitled to ask for clarification of scoring after all static judging is complete. Any disputes regarding static scoring should be brought to the attention of the CD or Head Judge as quickly as possible.

#### ***Score Sheet:***

Typical “Static Score” sheets are included in SECTION 6: FORMS to assist the Judges.

#### ***Proof of Scale***

No score is awarded for the Proof of Scale Documentation; however, it is reasonable that full static marks cannot be given for a poorly documented model.

If no proof of Accuracy of Outline accompanies the model, no points can be awarded for Accuracy of Outline.

If no proof of Finish, Colour, and Markings accompany the model, no points can be awarded for Finish, Colour, and Markings.

Points for Craftsmanship and Flight may still be awarded, even if one or both of the requirements for proof of Accuracy of Outline and Finish, Colour and Markings are not complied with.

#### ***Fun Scale Classes***

Five static points given for proof that the model represents a flying prototype; by presenting a photograph, three-view or picture of an aircraft of the type modelled. Marks will be awarded either 5 or 0 with no partial marks. Refer to 2.4.1 Fun Scale Classes: page 6.

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### *Open and Standoff Classes*

Shall be awarded a maximum of 60 static points total:

- 30 points for Accuracy of Outline
- 15 points for Finish, Colour and Markings.
- 15 points for Craftsmanship

For Open and Standoff Scale external mufflers are to be ignored, likewise cockpit detail, cowling interiors, wheel wells, etc.

### *Expert and Team Classes*

Shall be awarded a maximum of 100 static points total:

- 40 points for Accuracy of Outline
- 30 points for Finish, Colour and Markings.
- 30 points for Craftsmanship

### *Accuracy of Outline*

Outline consists of all major geometry features (location and proportion) of the full size aircraft including features of the cockpit or cabin that may be visible from the side view such as headrests, gun sights, etc. and other major geometric features that may be located inside of the aircraft's profile, include control surfaces, wheel wells, exhaust stacks, pods, air louvers, gun troughs, windows, and doors. Landing gear shall be considered only for size, angles and outline.

Any surface features of the aircraft shall not be considered when scoring Outline features.

Additional items such as: panel lines, brake lines, jack points, fill ports, and tie-down hooks; surface detail features such as panel lines, inspection panel doors, and methods of hinging, connector detail; or any other detail features described under Craftsmanship, shall only be considered under that separate scoring category.

Subjects that provide no opportunity to conceal the engine or exhaust system (such as water cooled in-line engines like the Spitfire, P-39, etc.) will not be downgraded by the outline judge if:

- Part of the model engine or exhaust system is exposed
- Non-scale openings that facilitate model engine cooling are visible.

However, a higher Craftsmanship score should be awarded to those who conceal the engine and exhaust system as compared to those who don't.

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The following are the recommended range of scores for accuracy of outline:

Category	Rating	Points for Open and Standoff	Points for Expert and Team
<b>General Appearance</b> Does it look like the full scale aircraft? Ground attitude scale/like? All parts in correct relationship?	Outstanding	3	4
	Excellent	2	3
	Good	1	2
	Fair	0	0-1
<b>Fuselage</b> Cross section and profile preserved? Surface covering (metal/fabric) preserved? Stringers/panels reproduced?	Outstanding	6	8
	Excellent	5	7
	Good	3-5	4-6
	Fair	0-2	0-3
<b>Wing</b> Airfoil, plan form, dihedral preserved? Shape & size of control surfaces preserved? Surface covering reproduced? Rib spacing, panels, fillets correct?	Outstanding	6	8
	Excellent	5	7
	Good	3-5	4-6
	Fair	0-2	0-3
<b>Tail Group</b> Airfoil, plan form, dihedral preserved? Shape & size of control surfaces preserved? Surface covering reproduced? Rib spacing, panels, fillets correct?	Outstanding	6	8
	Excellent	5	7
	Good	3-5	4-6
	Fair	0-2	0-3
<b>Landing Gear</b> Size and location correct? Wheel size & shape correct? Retracts (if prototype did)? Pants & fairings correct?	Outstanding	6	8
	Excellent	5	7
	Good	3-5	4-6
	Fair	0-2	0-3
<b>Engine, Cowl &amp; Propeller</b> Cowl shape correct? Attempts to conceal engine? Attempts to conceal muffler? Spinner size correct?	Outstanding	3	4
	Excellent	2	3
	Good	1	2
	Fair	0	0-1
<b>Maximum Total</b>		<b>30</b>	<b>40</b>

**Note:** Refer to section 5.3 STATIC JUDGES GUIDE, page 58 for definitions of Outstanding, Excellent, Good and Fair.

### *Finish, Colour and Markings*

The intent of this section is to verify the contestant has properly researched the prototype aircraft to prove that the model they are presenting matches the prototype aircraft.

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Some vintage aircraft were flying before colour photographs existed so modellers must rely on artist conceptions, black and white photographs, or coloured line drawings of the subject to document colour and markings. If black and white drawings and/or photographs are used, a description from an approved source of the colours used for the aircraft colour and markings and their location on the aircraft must be included in the documentation package. For subjects for which it is difficult or impossible to document more than one side or view of an aircraft, there shall be no penalty for failure to show the other side or bottom of the aircraft.

For the judge to determine location, colour, size, and graphic content, documentation of markings specific to the aircraft being modeled need to be provided. However the judging of colour in these markings will be included only in the score provided for overall Colour described previously (5 point maximum) to ensure the colour score is not over emphasized.

The following are the recommended range of scores for Finish, Colour and Markings:

Category	Rating	Points for Open and Standoff	Points for Expert and Team
<b>Finish</b>	Outstanding	6	12
	Excellent	5	10-11
	Good	3-4	5-9
	Fair	0-2	0-5
<b>Colours</b>  <i>Including the complexity of the colour scheme. Evaluation of Complexity should not affect more than 2 points for Expert and Team or 1 point for Open and standoff.</i>	Outstanding	3	6
	Excellent	2	5
	Good	1	3-4
	Fair	0	0-2
<b>Markings</b>  <i>Including the complexity of the markings. Evaluation of Complexity should not affect more than 2 points for Expert and Team or 1 point for Open and standoff.</i>	Outstanding	6	12
	Excellent	5	10-11
	Good	3-4	5-9
	Fair	0-2	0-5
<b>Maximum Total</b>		<b>15</b>	<b>30</b>

**Note:** Refer to section 5.3 STATIC JUDGES GUIDE, page 58 for definitions of Outstanding, Excellent, Good and Fair.

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***Craftsmanship***

Craftsmanship consists of judging the quality of workmanship on the model that is being presented. The quality of panel lines, brake lines, jack points, fill ports, inspection panels, tie-down hooks or any other scale detail feature will be considered by the Craftsmanship judge. Items such as non-scale exposed control horns would be a source of downgrade for craftsmanship.

Emphasis is placed on how well the modeller created the illusion of scale detail on the model as compared to the documentation (NOTE: Close proximity photographs or other documentation of the prototype aircraft may be beneficial to include for emphasizing applicable subtle features. Published three-views may lack sufficient detail that may otherwise benefit a contestant's craftsmanship effort).

The following are the recommended range of scores for Craftsmanship:

<b>Category</b>	<b>Rating</b>	<b>Points for Open and Standoff</b>	<b>Points for Expert and Team</b>
<b>Fuselage</b>	Outstanding	4	8
	Excellent	3	7
	Good	2-3	4-6
	Fair	0-1	0-3
<b>Wing</b>	Outstanding	4	8
	Excellent	3	7
	Good	2-3	4-6
	Fair	0-1	0-3
<b>Tail Group</b>	Outstanding	4	8
	Excellent	3	7
	Good	2-3	4-6
	Fair	0-1	0-3
<b>Landing Gear</b> <i>For Craftsmanship Only</i>	Outstanding	3	6
	Excellent	2	5
	Good	1	3-4
	Fair	0	0-2
<b>Maximum Total</b>		<b>15</b>	<b>30</b>

**Note 1:** Refer to section 5.3 STATIC JUDGES GUIDE, page 58 for definitions of Outstanding, Excellent, Good and Fair.

**Note 2:** Complexity should influence no more than 1/3 of the Craftsmanship score.

### 3.4.2 Flight Manoeuvres and Overall Flight Realism

Flight scoring is identical for all classes.

#### *Score Sheets*

It is mandatory that score sheets be used so that the score for each individual manoeuvre may be recorded. Judges are encouraged to use the space provided to provide feedback comments to the pilots.

A typical “Pilot’s Flight Score” is included in SECTION 6: FORMS.

After a flight score has been entered by a Judge, no manoeuvre scores can be changed after the flight has ended without the approval of the CD or designate.

The score sheets must be returned to the contestant after the total score has been recorded. This will allow the competitor to see how well each manoeuvre was done in the eyes of the judges. (The competitor may also check the score sheet for errors and comments.)

Contestants are not permitted to have the score sheet in their possession from the time the flight commences until the scores have been entered or tabulated.

Any disputes regarding the scoring of a manoeuvre or realism should be brought to the attention of the CD or Head Judge immediately after they are noticed.

Incorrect totalling of the score must be brought to the attention of the scorekeeper immediately.

#### *Manoeuvre scoring content*

Each of the nine manoeuvres is judged out of 10 points; additionally, each flight shall be awarded up to 10 points for the overall realism of the flight, for a flight score total of 100 points per round.

The maximum score for a flight shall be 100 points. Where multiple judges are used, the score for that flight shall be the average of all the judge’s scores.

Each manoeuvre will be scored for three basic content considerations listed below.

- Maximum of 5.0 points for **Precision** of the manoeuvre.
  - The pilot’s ability to perform the defined manoeuvre geometry.
- Maximum of 2.5 points for **Placement** of the manoeuvre.
  - Manoeuvres with horizontal symmetry (Cuban Eight, Loop, Roll, Figure 8, etc.) should have their midpoints with equal distance on each side of the defined centre for optimal score.
  - Although the placement of a manoeuvre normally represents only 2.5 points content, a greater penalty deduction will be imposed in the interest of safety when manoeuvres are performed unnecessarily close to the flight line (over the runway) as described in “Runway Safety and Deadline Infractions” of this Guide.
  - Optimum placement of bomb drops will be defined as the point of impact in front of the judges at the far side of the defined runway.
  - Parachute or empty tank drops will be scored for optimum placement as point of release rather than impact, since wind conditions may unpredictably affect the point of landing.
- Maximum of 2.5 points for **Realism** for each manoeuvre.
  - Note that this is not part of the overall realism score.
  - The realism content of the score is based upon the pilot’s skill in performing manoeuvres with the model like the prototype aircraft in actual flight. The size, shape, and speed of aerobatic manoeuvres performed by a contestant should reflect the capabilities of the full-

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size prototype. For example, it would be expected that a loop performed by a J-3 Cub would be smaller in diameter and egg-shaped compared to a loop of a P-51 Mustang, if both models were of the same scale. Consideration should also be given to throttle position during flight. In many full-scale aircraft, power must be reduced on the descent portion of that manoeuvre. Execution of such manoeuvres by a model at a constant full throttle setting should be downgraded in the realism portion of the manoeuvre score.

- Manoeuvres should appear realistic in scale size of performance (site and conditions permitting). Attitude, bank angle and g-loading appearance through turns should be consistent with those generally observed in the prototype. With scale-size manoeuvres, these prototypical attitude features are achieved through use of an optimum speed relationship to the prototype aircraft.

Each of the contents is scored to the nearest ½ point. A manoeuvre starts at 10 and then deductions occur

### *Flight Score Deductions*

If a model has not achieved an official flight in any round, the score for that round of flying shall be zero.

Any manoeuvres started after the allowed maximum flight time has expired shall be scored zero.

At the Judge's discretion, if a flight delay is imposed on the pilot due to safety considerations or other air traffic, then the competitor shall be allowed extra time. Refer to 3.1.5 Time Allowed, page 11.

When the whole of the aircraft crosses the "Deadline" into the no-flying area, as observed and agreed by the judges, during any part of a flight, will incur a warning to the contestant and score a zero for the manoeuvre being performed (or the previous manoeuvre if the occurrence is between manoeuvres). A repeat crossing disqualifies the flight and the contestant must land immediately. The Judges should all agree on such an occurrence, and if a separate person is used as the flight timer it is recommended that they assist in the task of determining when a model crosses the "Deadline" or passes over a controlled spectator area. Unanimity between the Judges in awarding zeros for unsafe flying practices should always be reached.

If a model aircraft is, in the opinion of the Judges or Contest / Flight-line Director unsafe, or being flown in an unsafe manner, they may instruct the pilot to land.

Downgrade for drifting in over the defined runway and violating the manoeuvring line in performing flight manoeuvres will be proportional to severity. For example, a manoeuvre that violates one half the runway width (up to centerline of runway) will score no better than a five, etc. (This deduction is from the maximum 2.5 points for "placement" and a portion of the 5.0 points for "precision".)

Failure to call a manoeuvre shall result in a score of zero for that manoeuvre.

Flying a manoeuvre out of order shall result in a score of zero for that manoeuvre.

### *Independent Judging*

It is suggested that each manoeuvre be scored immediately after it is performed.

Judges shall score manoeuvres individually and without any consultation between them.

Judges should not communicate or check with each other in routine scoring during flight and are encouraged to sit at a sufficient distance from one another to maintain the integrity of statistically independent judging for subsequent score averaging.

However if a zero is given for a score, such as for a "Deadline" infraction, flight judges must confer and, in this case, identical scores are required.

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At the conclusion of the flight, judges will confer on the Realism qualities and again need not award identical scores.

### 3.4.3 Overall Flight Realism Score

Each flight will also be awarded up to 10 points for the overall realism of the flight.

Overall Flight Realism is judged on overall impression of the total flight, including the portion of the flight between defined manoeuvres, and should reflect:

- The smoothness of flight as the model transitions through each axis (roll, pitch, and yaw) throughout the entire flight,
- Bank angles that are consistent with full-size aircraft,
- G-loadings that are consistent with full-size aircraft,
- The management of power appropriate with performed maneuvers ,
- The speed of flight, and
- The choice of optional maneuvers consistent with full-size aircraft's capabilities.

The Overall Flight Realism Score has three major components:

#### ***Consistency (2.5 points)***

Was the flight performed with realistic continuity and seamlessness, from the moment the aircraft taxied out to the time it taxied back? This includes taxi, airborne turnarounds, altitude, smoothness, continuity, take-off and landing, except for the time that the aircraft is performing a defined manoeuvre as called by the pilot.

Note that trim passes, when called by the pilot, are allowed without deduction to Consistency.

#### ***Options Selected and Demonstrated (5.0 points)***

##### **Options Chosen:**

Do the optional manoeuvres chosen best demonstrate the abilities of the prototype?

Pilots shall indicate non-aerobatic aircraft on the Flight Score Sheet.

Some original prototypes would have little or no aerobatic capability. These are aircraft designed with limited manoeuvrability where the original prototypes of which were restricted by the manufacturer or licensing government agency. Examples and suitable flight options are included in section 3.3.13 Non-Aerobatic Aircraft, page 16. These aircraft should still be considered for high marks in this section if the performance of the original prototype genuinely limits them to such manoeuvres. Conversely, if aircraft with greater manoeuvrability and performance choose these options when the original prototype would be capable of much more, then low marks should be awarded in this section.

##### **Options Demonstrated:**

Have the notable features of the prototype been demonstrated? This includes the visible presence of a pilot, scale operation of slats, flaps and realistic deployment and retraction of retractable landing gear.

For any model aircraft that flies with two or more wheels down, whereas the prototype actually featured retractable landing gear, the score shall be reduced by two points. If one wheel is down, the score shall be reduced by one point. If one or more wheels are only sagging during manoeuvres, the score shall be reduced with one half or one point depending on the seriousness of the sagging.

No Flaps. If the model does not have, or the pilot does not use, flaps during the flight where applicable, 2 points shall be deducted.

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If the pilot of the prototype is visible from the front or from the side during flight, a dummy pilot of scale size and shape shall be equally visible during flight in the model aircraft. If such a pilot is not fitted, the score will be downgraded by 2 points.

### ***Power Management and Airspeed (2.5 points)***

Does the model appear to be flying at a scale-like speed? Although, due to basic dynamics, model aircraft invariably fly faster than “scale” speed, models which fly excessively fast do not appear scale-like and marks should be deducted accordingly. Scale-like speed provides maneuver realism for realistic flight attitude appearance including bank angles in turns, realistic g-loading appearance and with appropriate maneuver size. For example, a model aircraft that appears to be flying at twice scale speed should have a deduction of 1 point, a model aircraft flying at three times scale speed, or faster, should have a deduction of 2.5 points.

Has skill in throttle and power management been demonstrated? Power variations are anticipated in flying an aircraft at moderate speeds for straight flight and turnarounds compared to other fast or slow speeds applicable to the maneuvers performed. Note that many early vintage (WW1) aircraft were not able to throttle in the conventional sense.

Aerobatic aircraft should adequately reflect power capability in engine selection, particularly when vertical maneuver options are performed.

### **3.4.4 Final Score:**

Typically, for a three round contest, the final score shall be the sum of the static score plus the average of the two best flight scores for:

- Fun Scale a maximum of 105 points.
- Open and Standoff Scale a maximum of 160 points.
- Expert and Team a maximum of 200 points.

### ***Variation with Number of Rounds***

If only two or three rounds are flown, the official score shall be the total of static points and the average of the two best flight scores.

If more than three rounds are flown, the official score shall be the total of static points and the average of the three best flight scores.

If only one round is flown, the official score shall be the total of the static and flight score.

***In the event conditions prevent flying and the contest cannot be postponed, static scores alone shall be the official score.***

### ***Ties***

To break a tie, the single best flight score will be added to the static score. If this does not break the tie, add the average of the two best flight scores to the static score. If this does not break the tie, add the average of the four best flight scores to the static score. Ties shall be broken by the outline score plus colour and markings followed by ½ the craftsmanship score.

### ***Score Sheet:***

A typical “Pilot’s Score Summary” is included in SECTION 6: FORMS to assist the scorekeeper.

## **SECTION 4: MANOEUVRES**

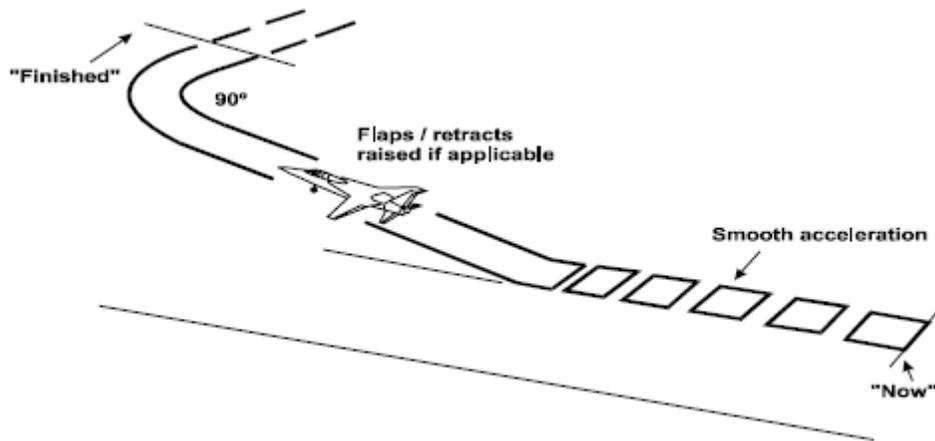
### **4.1 DESCRIPTIONS OF MANOEUVRES**

#### **4.1.1 Mandatory Manoeuvres**

##### *Take-Off*

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

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

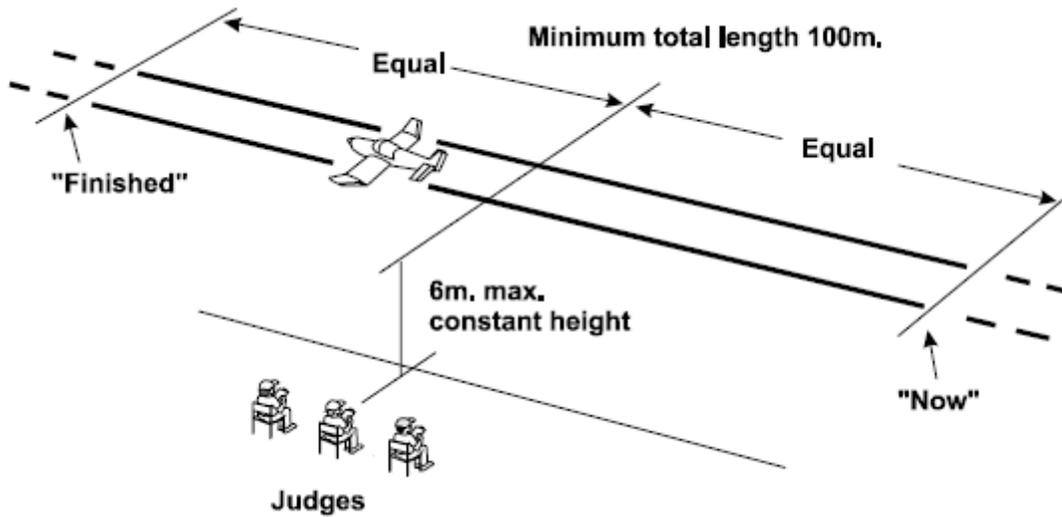


##### Take-Off Errors:

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

*Straight Flight at Constant Height*

Model aircraft approaches in straight flight at a constant height not exceeding 6 metres for a minimum distance of 100 metres, and then climbs away. This is in effect a low flypast.



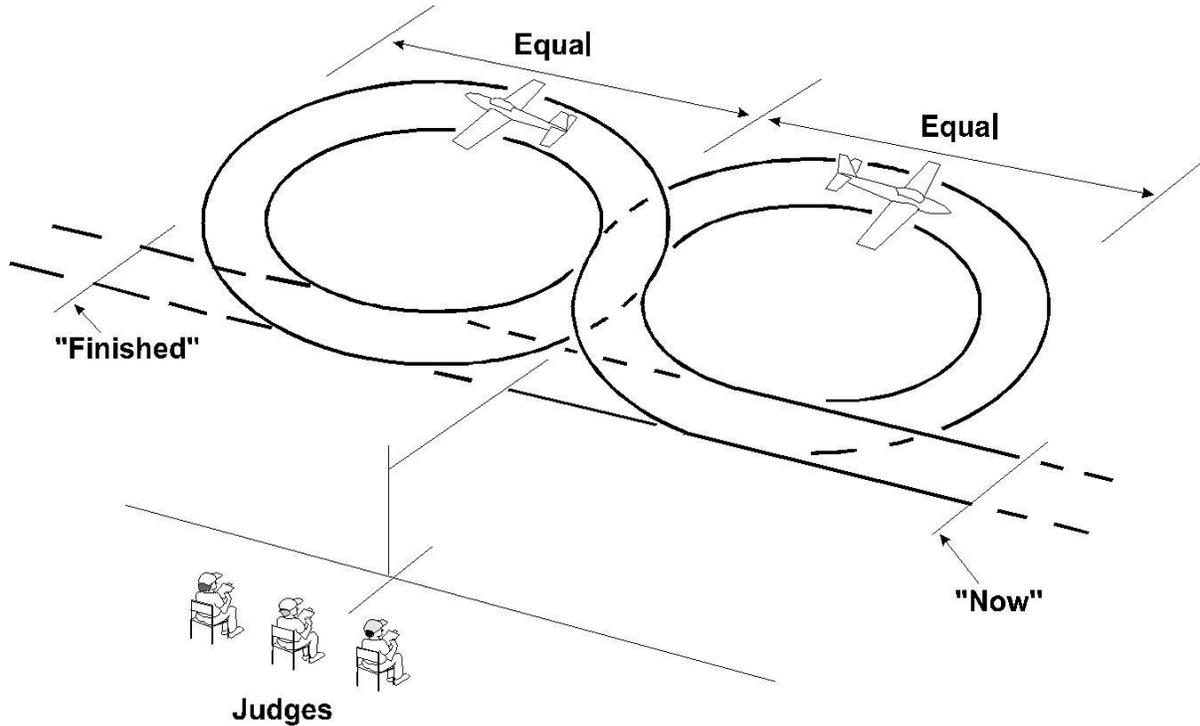
Straight Flight Errors:

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

**Horizontal Figure Eight**

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

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



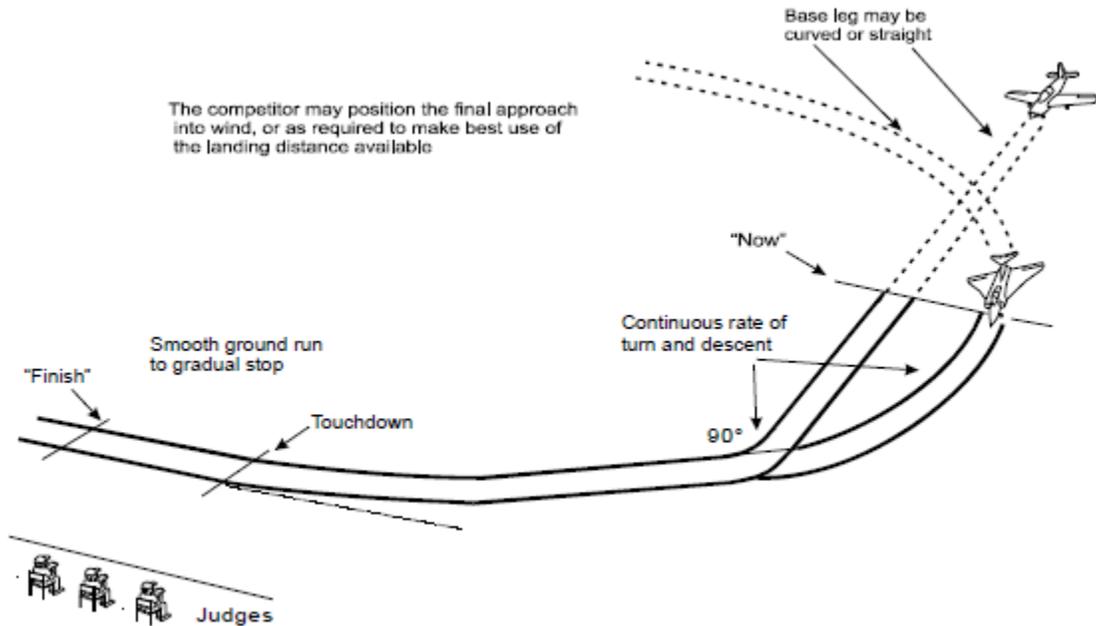
Horizontal Figure Eight Errors:

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.

**Landing**

The manoeuvre commences by descending from base leg. Prior to this point the model aircraft may complete a landing pattern to achieve a landing configuration. This may be a full rectangular (civilian) or oval pattern (military). The landing may be orientated into wind, or as required by the competitor to make best use of the landing distance available (e.g. jet subjects).

The base leg will be appropriate for the “Landing Pattern” chosen by the pilot. From the start position the model aircraft completes landing pattern 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.



Landing 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).

**LANDING NOTE:**

A crash landing scores zero points, but if the model aircraft makes a good landing and then stops nose down towards the end of the landing run, the landing marks that would have otherwise been awarded

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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 downgrade does not apply.

Note also that many early WWI aircraft frequently nosed over on landing; hence models of such aircraft should not be penalized.

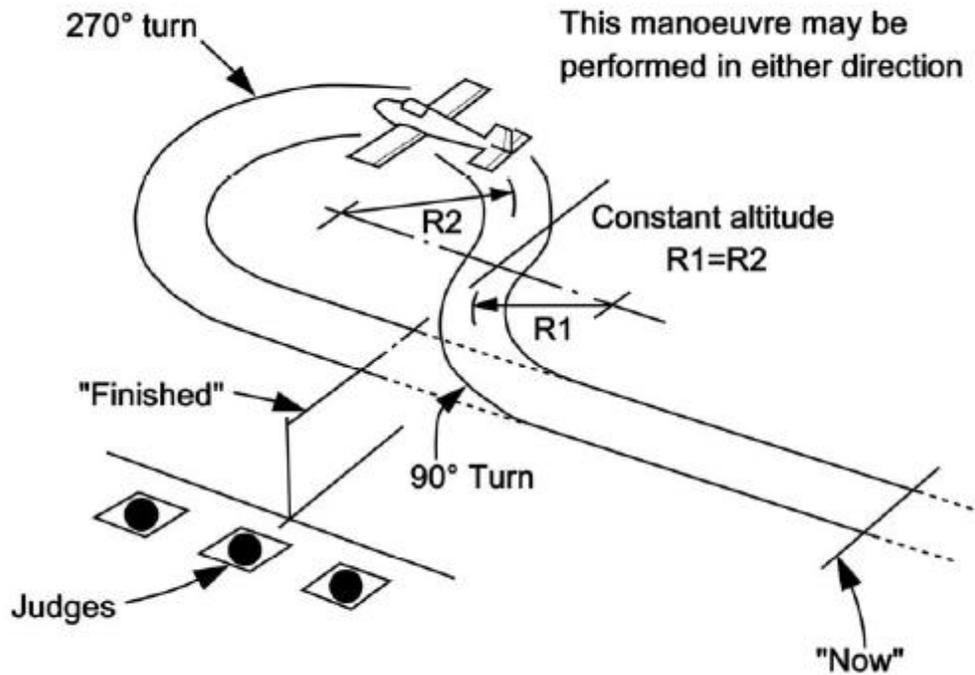
Model aircraft with retractable landing gears, landing with one or more gears retracted should have the landing points reduced by 30%.

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

### 4.1.2 Optional Manoeuvres

#### *Procedure Turn*

Smooth transition from straight flight into a 90 degree turn away from the flight line. Wings return level then a 270 degree turn in the opposite direction returning in the opposite direction to the flight line. Finish point and entry point coincident.



#### Procedure Turn Errors:

1. First turn is not 90 degrees away from the flight line.
2. Second turn in the opposite direction back to the flight path is not 270 degrees.
3. Changes in altitude during turns.
4. Turns not smooth and circular.
5. Model does not head back over exact outgoing path.
6. Rate of turn is not constant.
7. The model aircraft changes altitude during the manoeuvre.
8. The model aircraft does not resume straight and level flight on the correct heading.
9. The model aircraft does not change from 90° to the 270° turn at the correct position.
10. The manoeuvre is too small or too large in reference to the type and scale of the model aircraft.
11. The manoeuvre is too close or too far away to be observed properly.

#### *Traffic or Landing Pattern*

Rectangular in shape paralleling the runway (flight line) positioned central to the judges. Model at circuit altitude heading into the wind over the manoeuvre line at the start of the maneuver. Smoothness of turns,

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90 degree turns (civilian traffic pattern) and 180 degree (military traffic pattern). Maintain constant altitude until “Base Leg” then descend. Lowering of undercarriage and set flaps as per prototype i.e. on downwind leg. Throttle management as per prototype (reduce throttle on downwind leg, holding attitude as aircraft slows). Rate of descent appropriate to prototype.

The military traffic pattern may only be nominated for WWII to current military type aircraft.

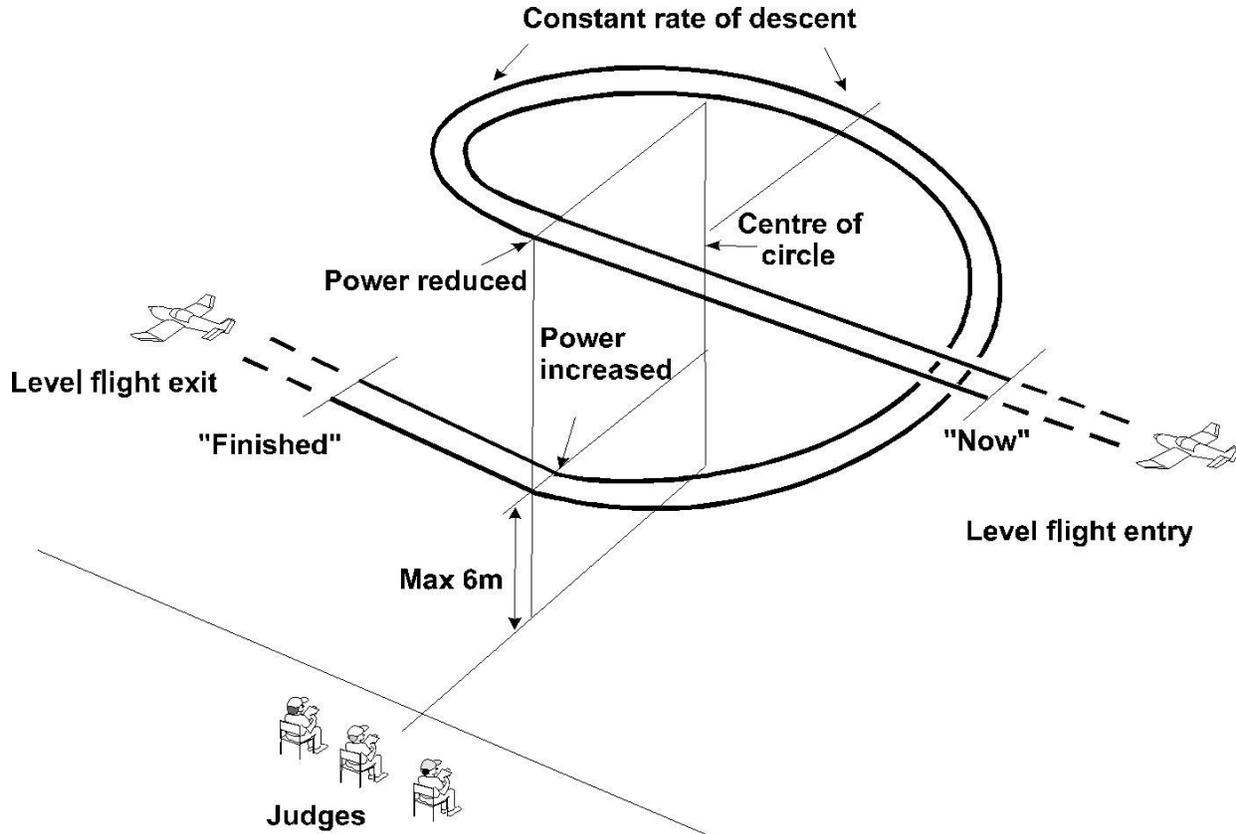
### Traffic or Landing Pattern Errors:

1. Changes in altitude during crosswind turns and downwind leg.
2. Deviation from straight flight on upwind and downwind legs.
3. Excessive use of throttle on final approach.

**Note:** “Traffic Pattern” (when chosen) and “Landing” are flown as one continuous manoeuvre but judged separately.

**360° Descending Circle at Constant Low Throttle Setting**

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

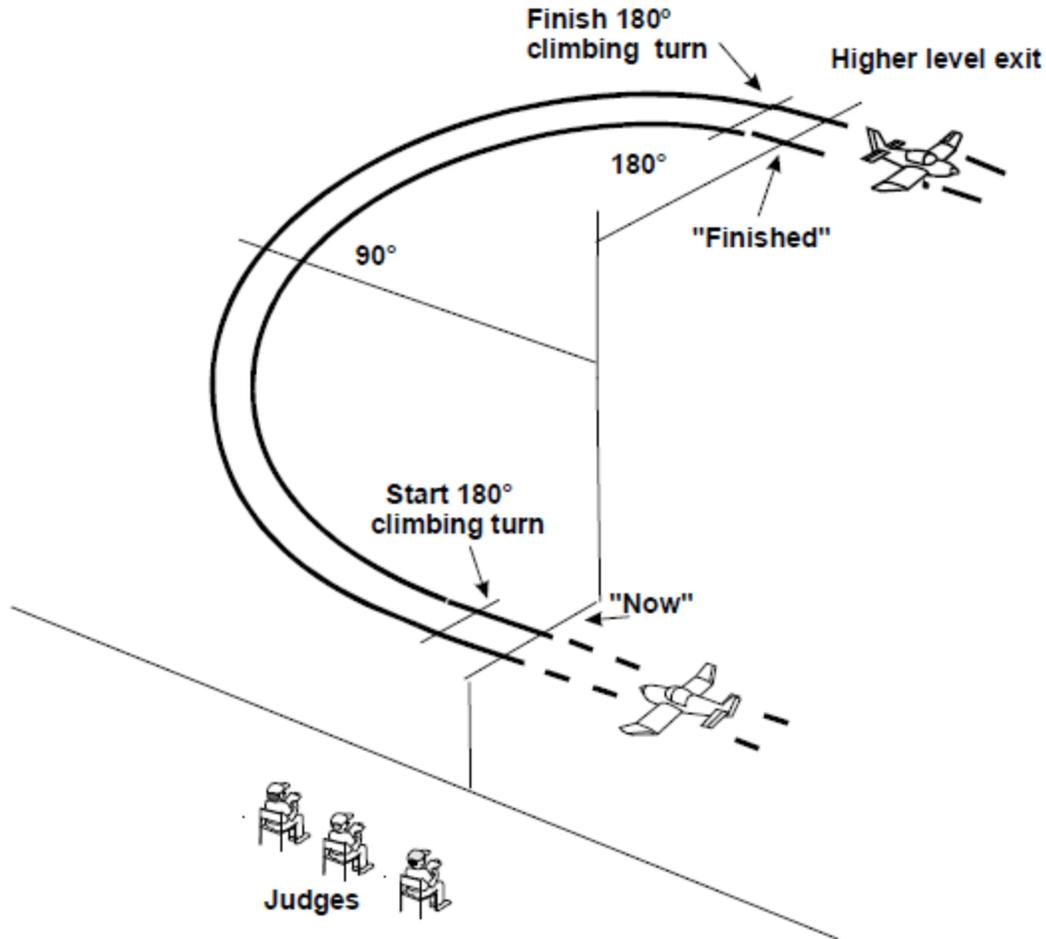


360° Descending Circle Errors:

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*

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.



Chandelle 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.

***Flight Functions Performed by Prototype Aircraft***

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

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

Flight Functions Errors:

1. No visible powder, etc. to drop
2. Manoeuvre not presented in full view of the judges.
3. Model follows an erratic course during the operation.
4. Manoeuvre is not representative of the prototype.

**NOTE: Items to be dropped must pass safety inspection - no exceptions!**

***Dropping of Bombs or Fuel Tanks***

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

If bombs or fuel tanks are carried externally, they must be fitted in the correct positions and in the correct manner. Dropping should be in the manner of the prototype. Dropping should be within clear view of the judges and centred on the judges' position. Any special features of the manoeuvre should be declared to the judges beforehand.

Dropping of Bombs or Fuel Tanks Errors:

1. Bombs or tanks do not detach and fall in a realistic manner.
2. Drop is not in front of judges.
3. Overall dropping manoeuvre not presented in a realistic way.
4. Too far away/too close/too high/too low.

***Parachute Drop***

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

Parachute Drop Errors:

1. Parachute does not fall clear of the aircraft.
2. Drop not in front of the judges.
3. Model does not demonstrate slow flight as per prototype, flaps etc.

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### *Drogue Chute*

To be imploded as per prototype.

#### Drogue Chute Errors:

1. Zero points for inadvertent release or release prior to touchdown.
2. Parachute emitted from the aircraft in a manner not typical of the prototype

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### *Dirty Pass*

This maneuver is only allowed for aircraft with flaps as a minimum. Where applicable, other “dirty” features such as retracts must also be deployed. The scoring content for this maneuver shall be scored relative to judging center with 5 points maximum for the entry portion of the maneuver and 5 points maximum for the initial clean-up portion after judging center. To simplify judging, only 50 metres prior to judging center and 50 metres after judging center shall be scored for the maneuver portion. The deployment of “dirty” scale operation features may occur prior to this described maneuver judging window distance as well as the final stages of scale operation clean-up extending beyond the judging window distances.

The pilot must demonstrate the ability to fly the aircraft slowly in a "dirty" configuration near stall speed with flaps deployed as a minimum along with any other applicable “dirty features” and, smoothly start to transition the aircraft back into a clean configuration.

At any time before establishing the heading for the Dirty Inspection Pass, the aircraft should be slowed sufficiently to deploy flaps (and slats where applicable) as a minimum. Also the landing gear shall be deployed in addition to any other features that are characteristic of the aircraft for its dirty appearance as would be seen for a possible landing configuration (slats or tail hook deployed if full size aircraft had these). The judging of the maneuver begins after establishing the heading at an altitude of 6 to 12 metres and a 50 metre straight fly by. Inspection Pass is performed where all applicable prototypical features must be in the fully extended position for that distance prior to reaching judging center. At judging center, the pilot begins to increase the throttle setting and then starts to raise the landing gear (where applicable) immediately after passing the judges. Also the flaps are slowly raised as speed is sufficiently increased to avoid stall while maintaining the heading already established. Where applicable, the slats or tail hook are also retracted during this period. For judging purposes, the maneuver portion for scoring is considered complete 50 metres after judging center if proper placement is used despite any extended cleanup for scale operations beyond that point. Equal emphasis in scoring is given to both the maneuver and the scale operation features. Therefore the Precision, Placement, and Realism shall be scored accordingly for this “maneuver combination.”

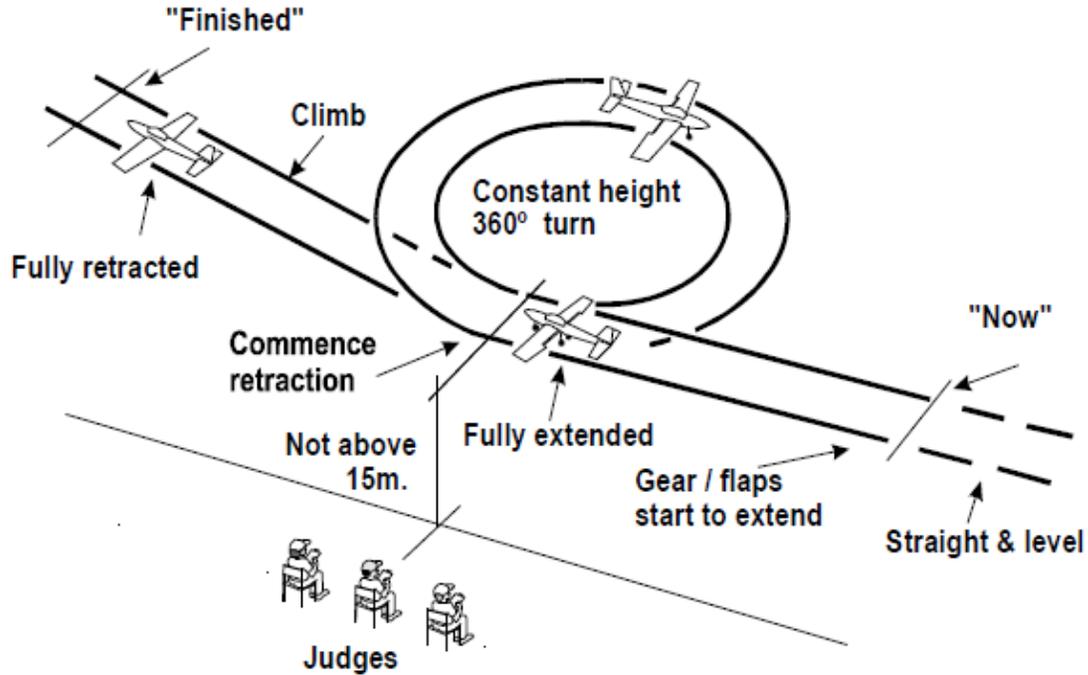
#### Dirty Pass Errors

1. Speed of Dirty Inspection Pass is not significantly slower than other flight maneuvers.
2. Deviations from heading occur.
3. A 50 metre minimum length dirty inspection configuration is not established prior to judging center where speed is at a minimum.
4. Power is not applied immediately after passing judging center.
5. Abrupt pitch/trim changes occur in the initial stages of cleanup after passing judging center.

***Extend and Retract Flaps and or Landing Gear (FAI)***

Diagram and errors are applicable to both manoeuvres unless stated.

Model aircraft approaches the landing area in straight and level flight at a height not exceeding 15 metres and in full view of the judges, extends the landing gear/flaps. Model aircraft then executes a 360° turn in a direction away from the judges, and when again directly in front of the judges retracts the landing gear/flaps and climbs away in straight flight.

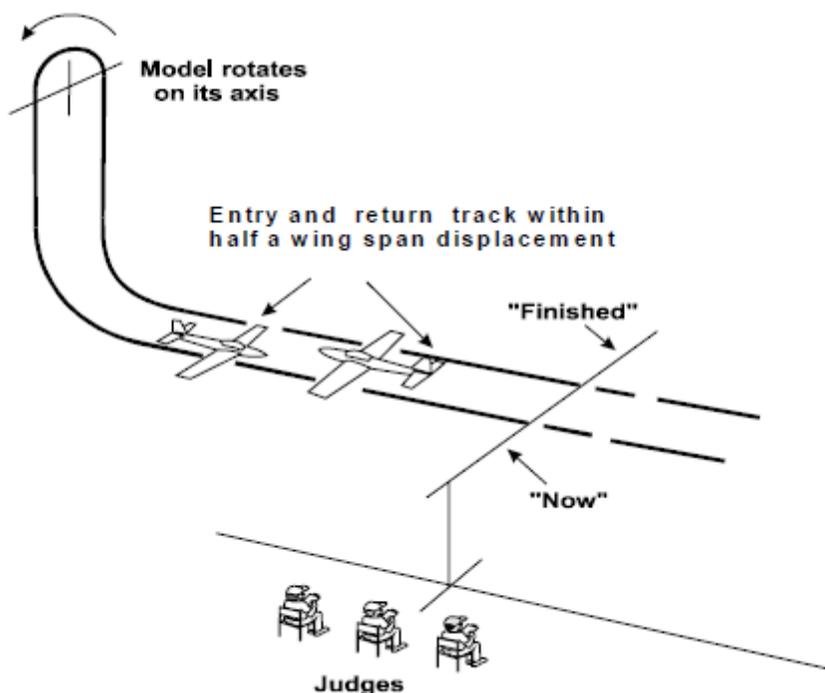


**Extend and Retract Flaps and or Landing Gear Errors:**

1. Model aircraft speed too high for landing gear/flap lowering.
2. Gear/flaps not extended in full view of judges.
3. Speed and sequence of extension and retraction not realistic.
4. Flaps demo only:
  - a) Instability when flaps lowered,
  - b) No change in attitude with flaps.
5. Misshapen circle or not constant height.
6. Circle height exceeds 15 metres.
7. Circle not centred on judges' position.
8. Retraction not commenced abeam judges.
9. Entry and exit paths not parallel with the judges' line.
10. Entry and exit tracks not the same.
11. Un-scale-like climb out.
12. Too far away or too close.

***Stall Turn***

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



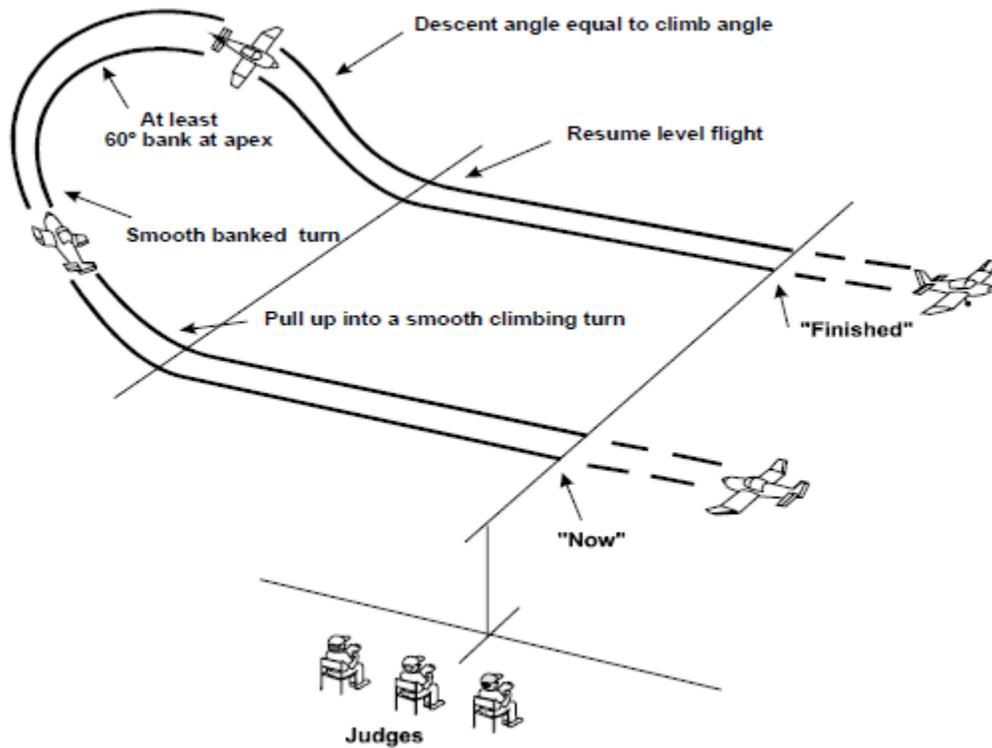
Stall Turn Errors:

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.

**Wingover**

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

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



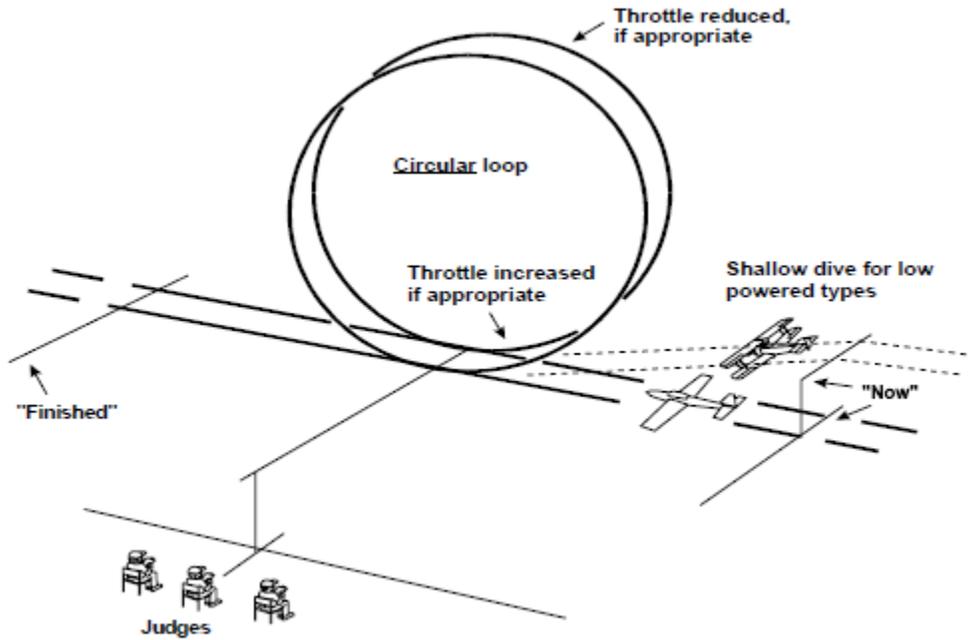
Wingover Errors:

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.

**Loop**

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

**Note:** While 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.

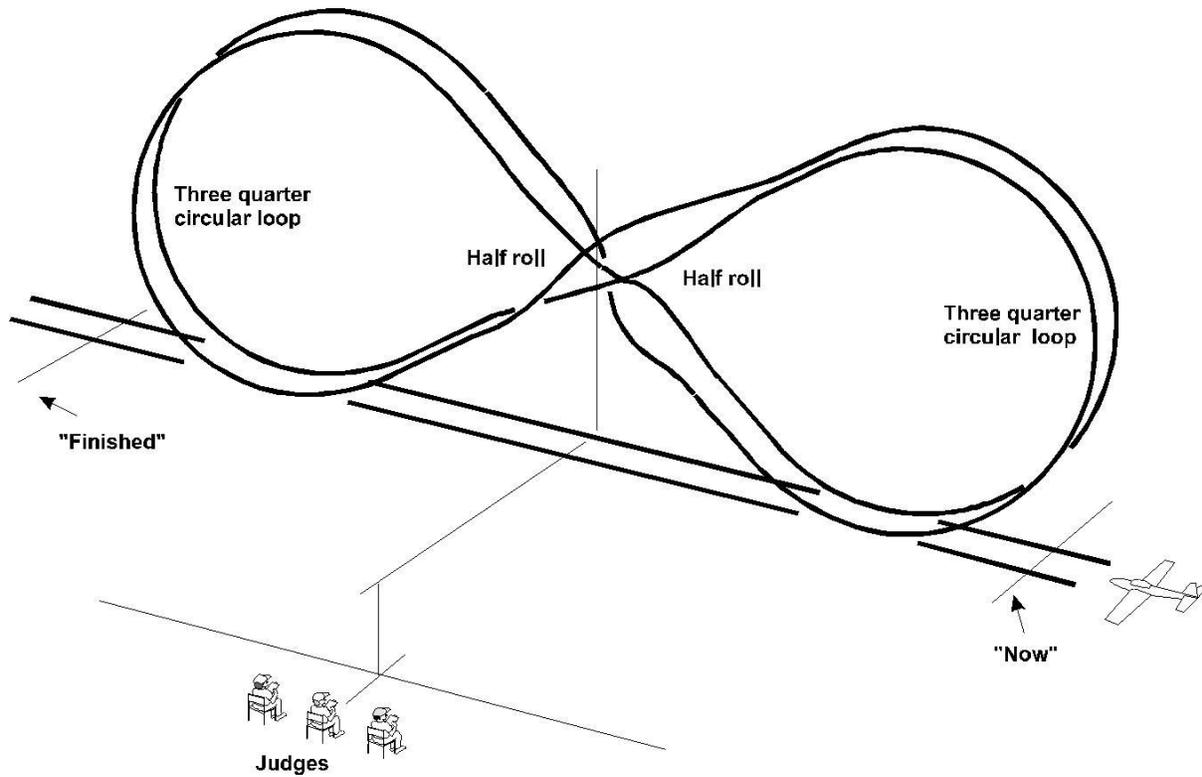


Loop Errors:

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**

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.

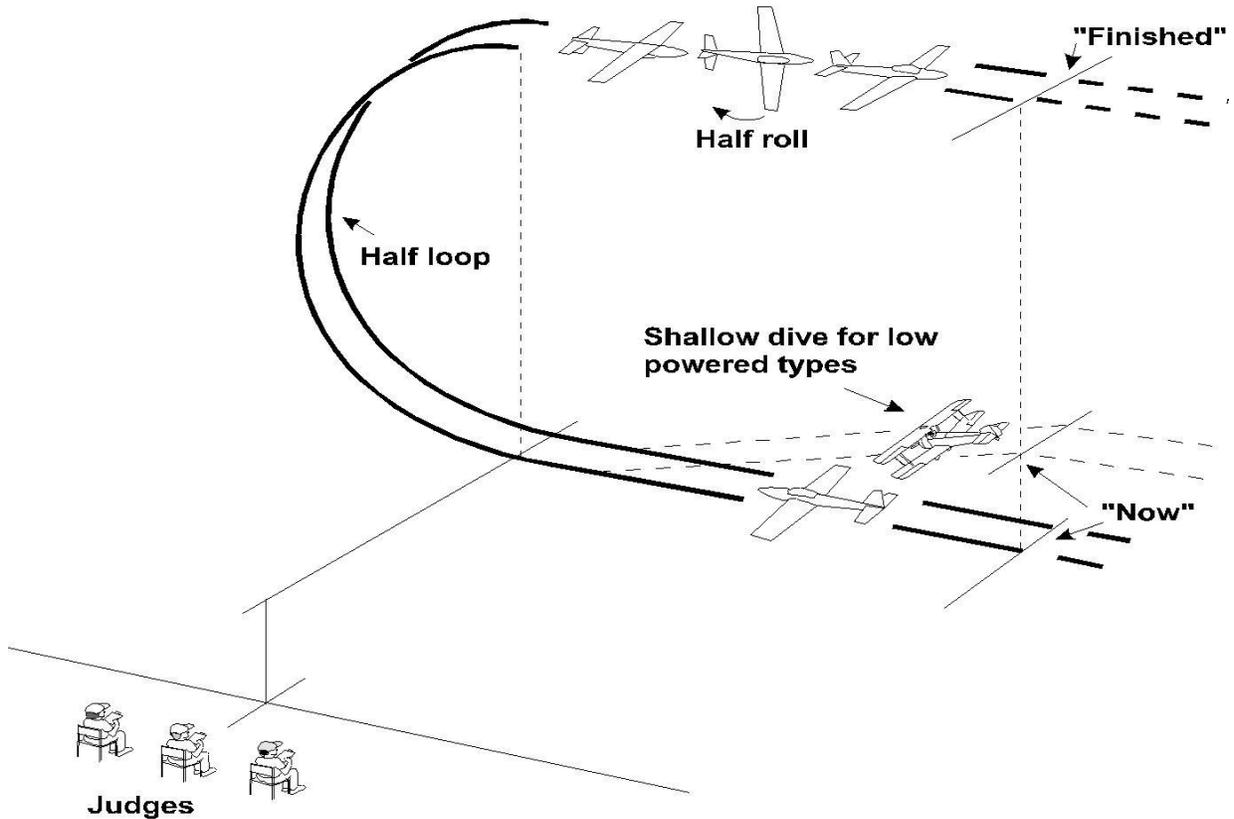


Cuban Eight Errors:

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.

***Immelmann Turn***

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

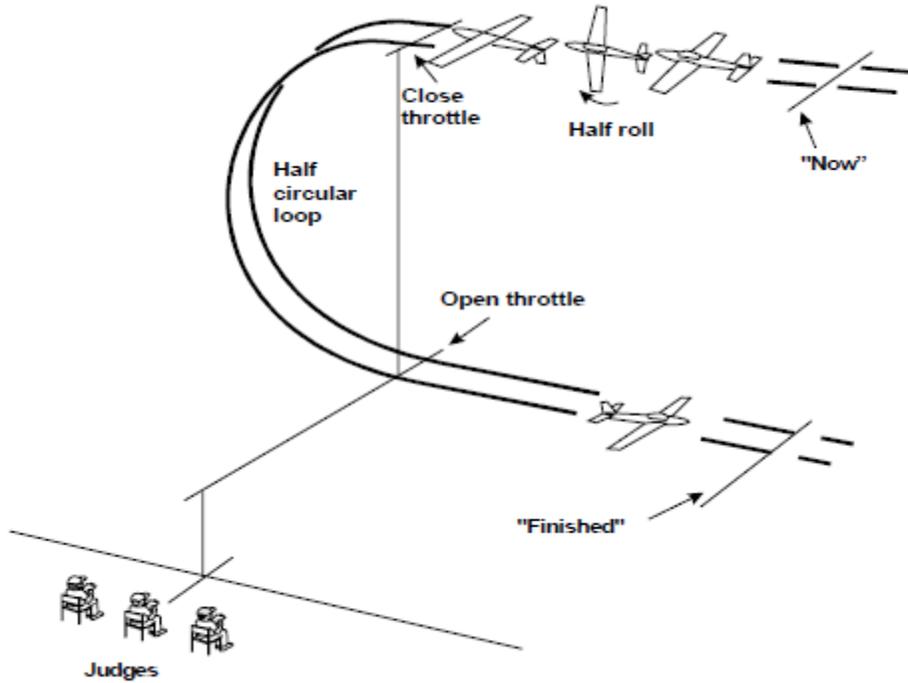


Immelmann Turn Errors:

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

*Split S (Reversal)*

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

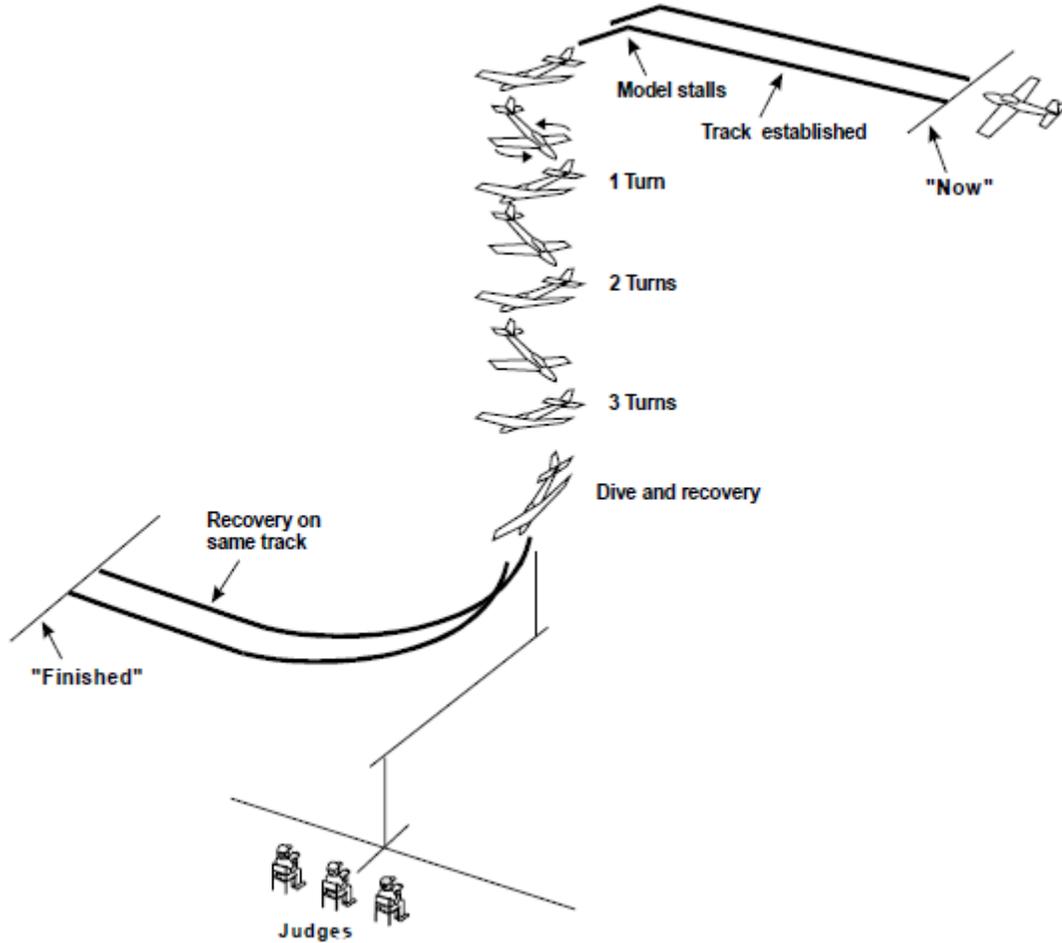


Split S Errors:

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.

*Three Turn Spin*

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.

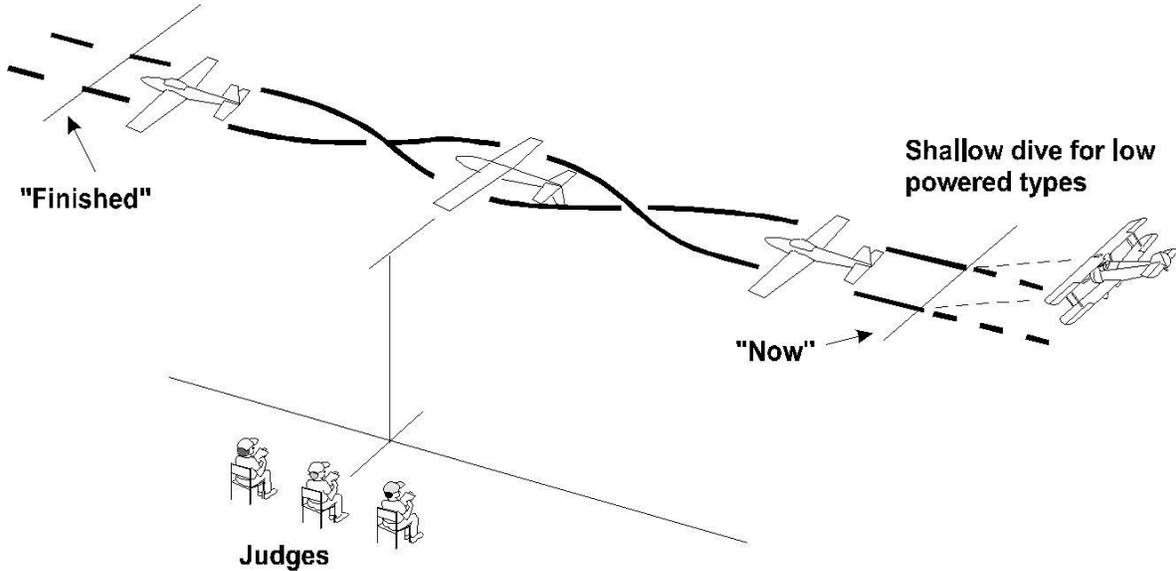


Three Turn Spin Errors:

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

**Roll**

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



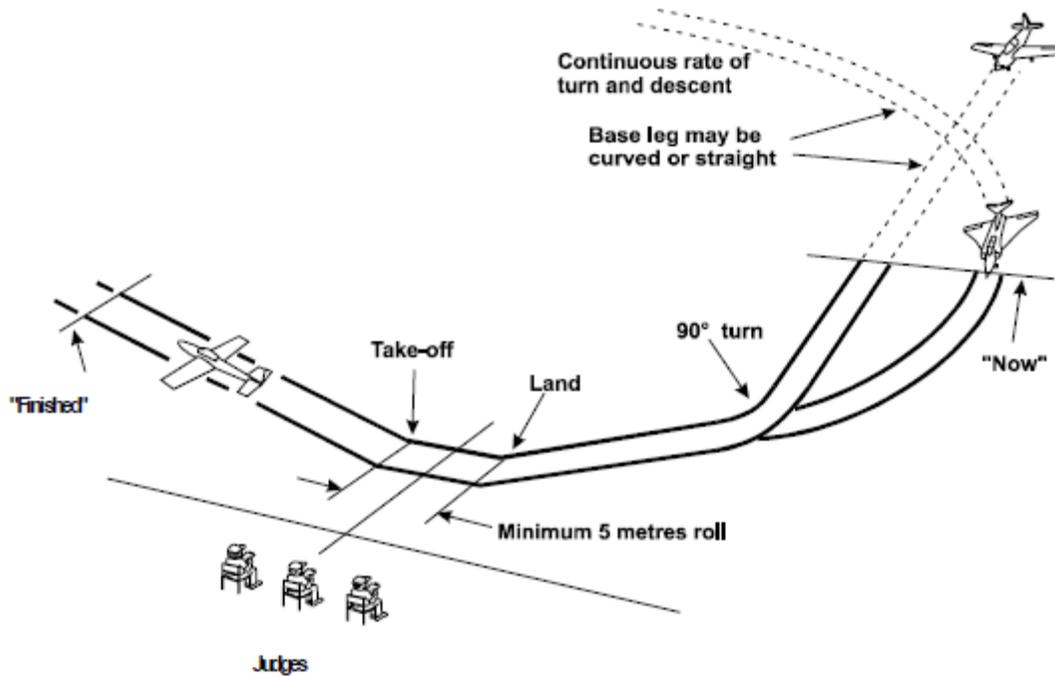
**Roll Errors:**

1. Rate of roll is not constant.
2. Style of roll not typical to prototype.
3. Roll not centred on judges' position.
4. Entry and exit at different heights.
5. Entry and exit at different speeds.
6. Entry and exit tracks and line of roll not parallel with judges' line.
7. Does not resume straight and level flight on same track as entry.
8. Style of roll not as nominated.
9. Inappropriate use of throttle.
10. Too far away/too close/too high/too low.

***Touch and Go***

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

**Note:** A “Touch and Go” is scored as two separate manoeuvres.

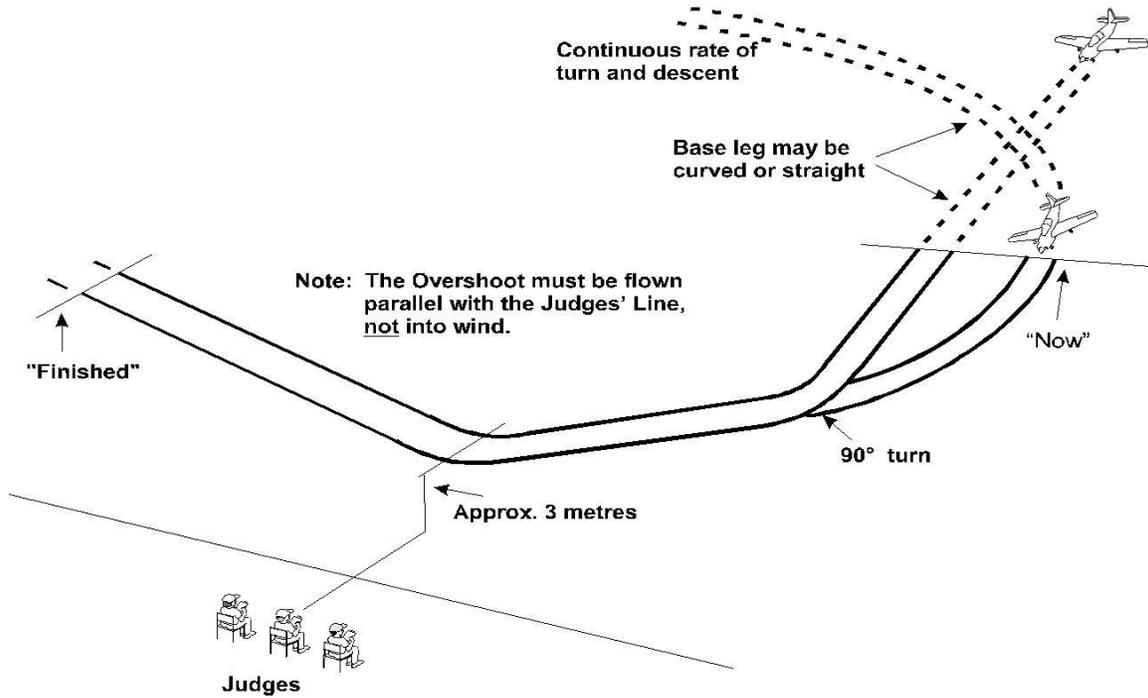


Touch and Go Errors:

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

**Overshoot**

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

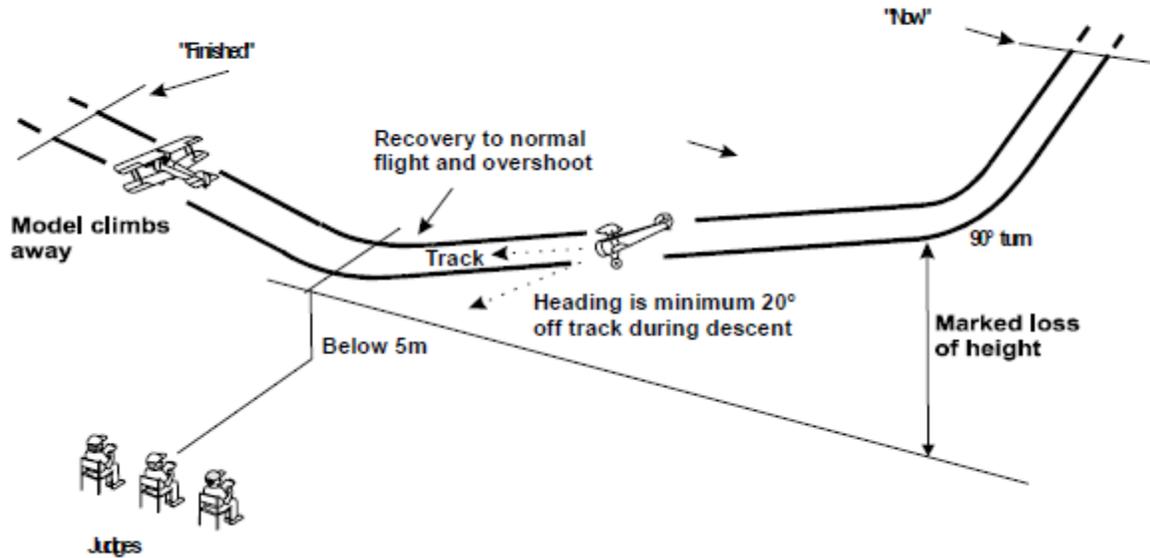


Overshoot Errors:

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 a 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.

*Sideslip*

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. 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 buildup of speed or the use of flap.

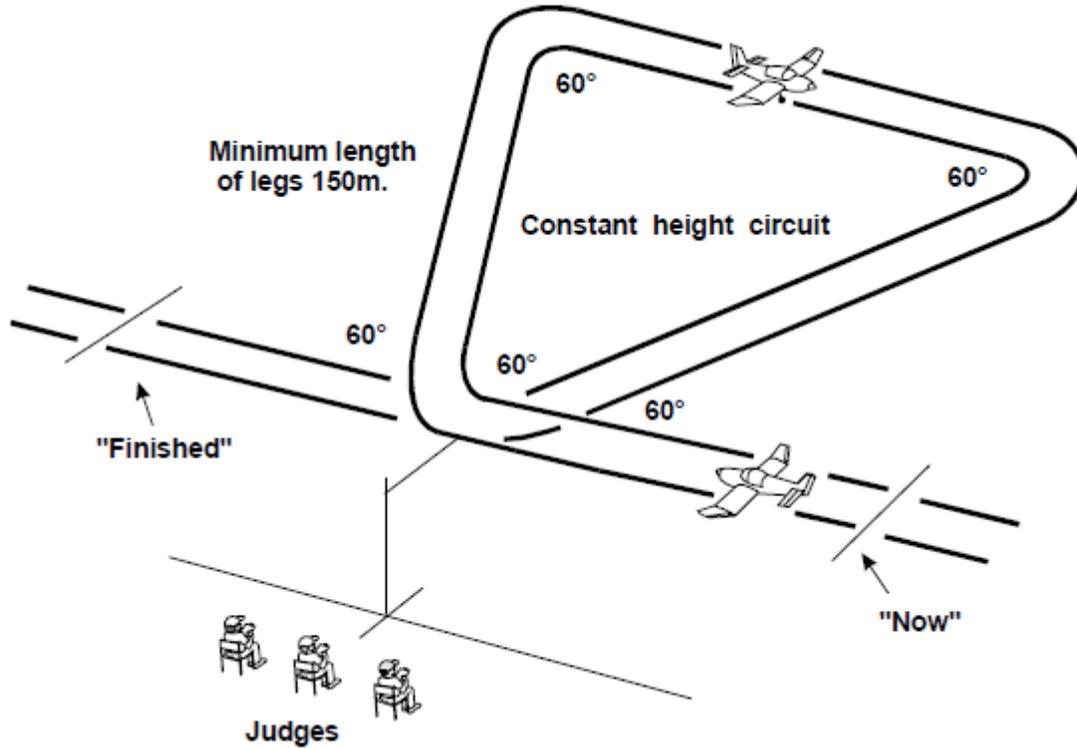


Sideslip Errors

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.

**Triangular Circuit**

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

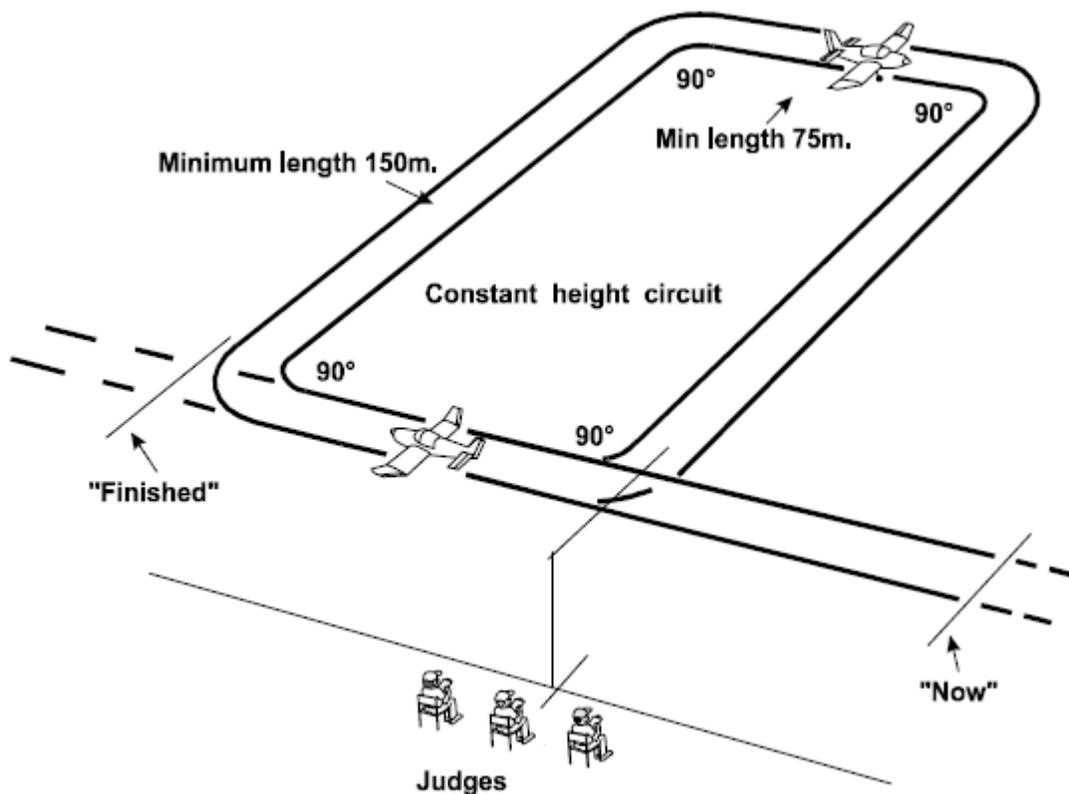


Triangular Circuit Errors:

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  $60^\circ$ .
4. Sides of the triangle are not straight.
5. Sides of triangle are not equal lengths.
6. Sides of the triangle are too long or too short.
7. Apex of triangle not centred on judges' position.
8. Correction for drift not properly made.
9. Start and finish tracks not the same.
10. Start and finish tracks not parallel with judges' line.
11. Too far away/too close/too high/too low.

***Rectangular Circuit***

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

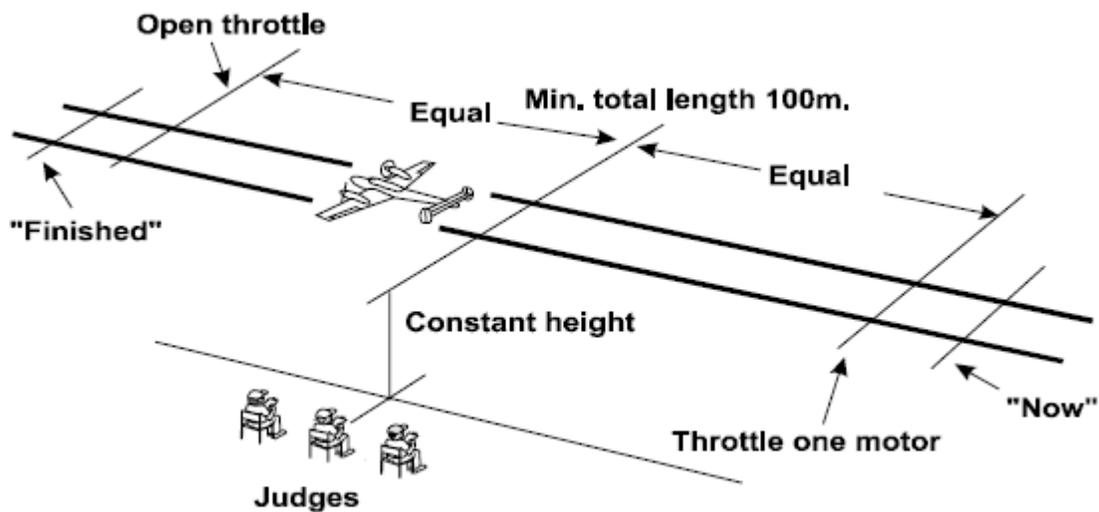


Rectangular Circuit Errors:

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 with One Engine Throttled (FAI)*

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



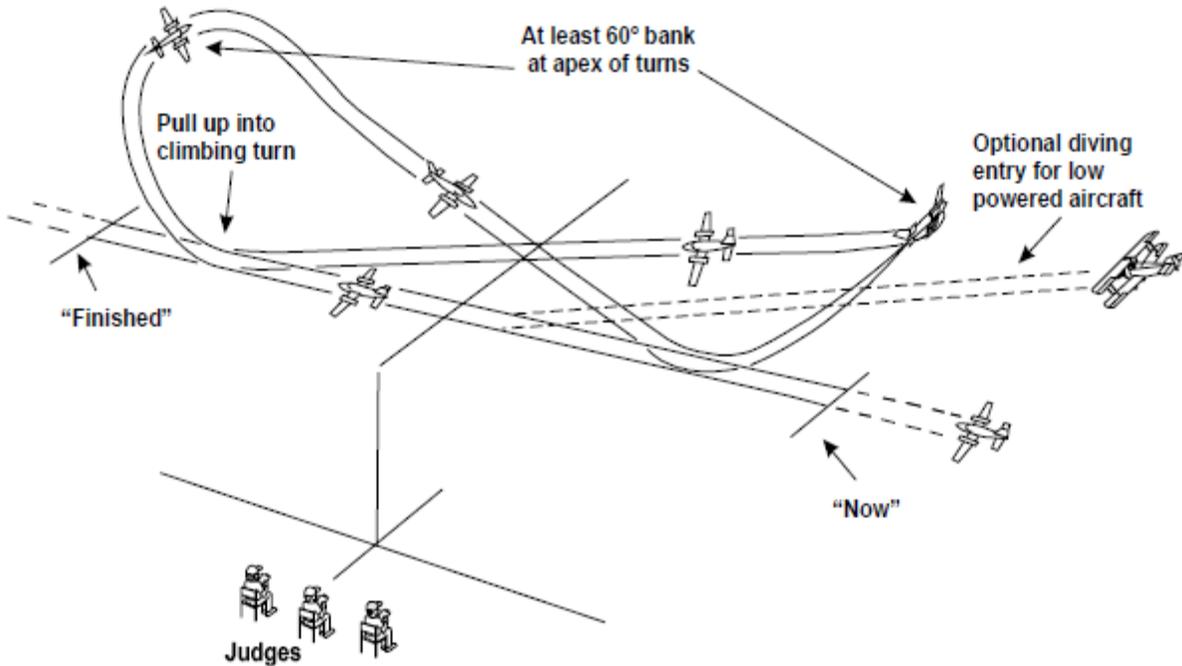
Flight in a Straight Line with One Engine Throttled Errors:

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

*Lazy Eight*

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 bank should be at least 60°. 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 cross in front of the judges with wings level before intercepting and turning on to the reciprocal of the original approach track. This completes half of the figure, which is then repeated in the opposite sense to give the full manoeuvre. Intercepting the original approach track parallel with the judge's line completes the Lazy Eight. A low powered aircraft would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the manoeuvre. The figure should be symmetrical each side of the judges' position.

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

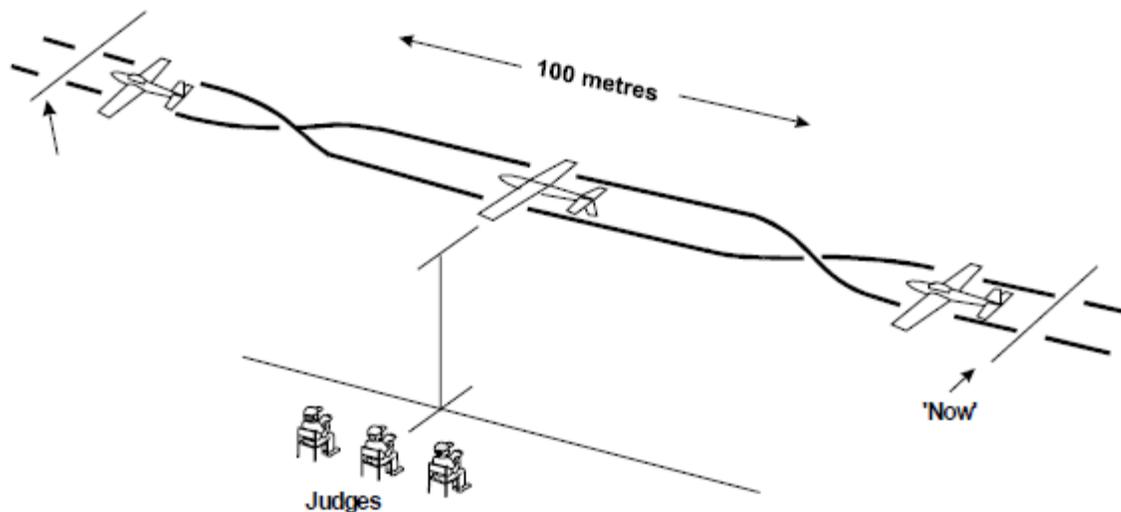


Lazy Eight Errors:

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.

***Inverted Flight***

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

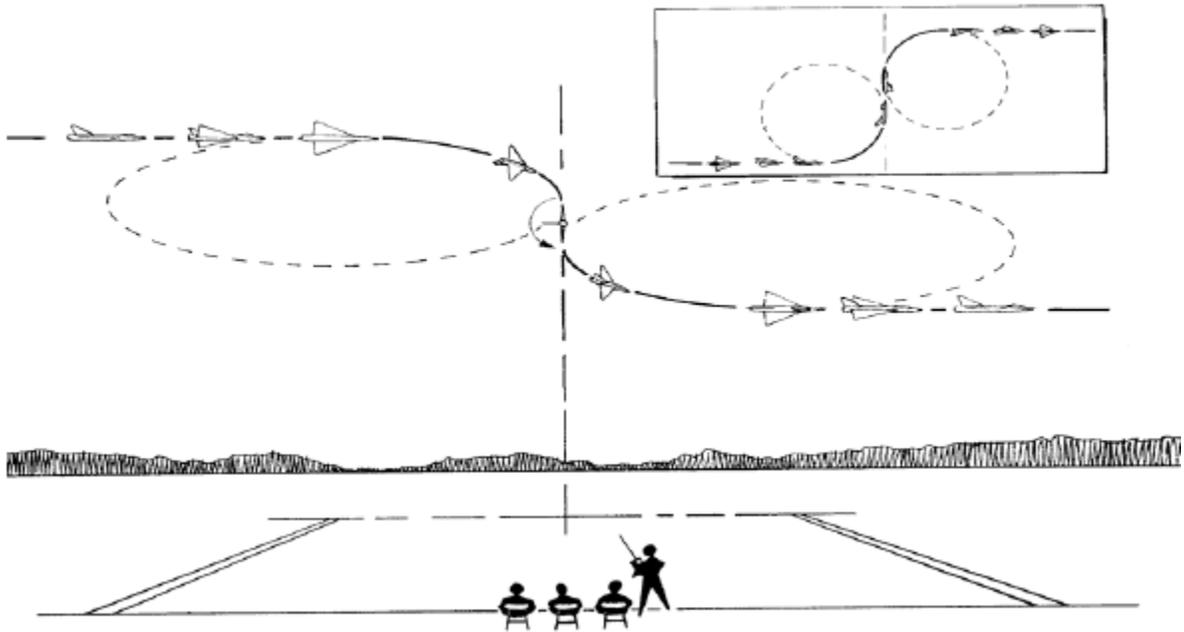


Inverted Flight Errors:

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*

The model approaches at a high speed in straight and level flight on a line parallel with the judge's line. The model 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 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.



Derry Turn Errors

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

### *Strafing Run*

The strafing run is a very popular option used by models of military aircraft at scale events, rallies, etc. It is realized that the prototype manoeuvre had hundreds of variations, the only commonality was that the run was done at low altitude and had to hit the target. The following is offered as a standard for contests to make the judge's task easier and fairer while at the same time offering some challenge to the modeller.

The manoeuvre is started with the a/c at altitude headed into wind in level flight, over the runway. At 'start' the model will "peel off" as shown, in a direction turning away from the spectators/pit area and continue in a diving turn downwind headed back to the runway.

The a/c will continue in a shallow dive angle 'aiming' at the center of the landing circle as a 'target'. The model must pass below 6 metres altitude in this dive. After passing over the 'target' the model will commence to climb out on the same heading in a smooth manner until turning off as per completion of the normal take off manoeuvre. Judged for realism, smoothness, and apparent accuracy of aim at the target.

### *The English Bunt*

A manoeuvre originating from WWI where it was used only on rugged fighter aircraft of the latter 1916-20 eras. In those days it was not as violent a manoeuvre as today. Flying manuals cautioned its use often lead to structural damage and loss of the aircraft.

Today, it is a manoeuvre that is reserved for special aerobatic aircraft. It is similar to an inverted Immelmann.

The aircraft starts a vertical full power climb, then reduces power and commences a sharp downward, outside loop. At the bottom of the loop the a/c rolls upright to finish straight and level at the same point as entry on a reverse heading. The manoeuvre is a rapid violent high G turn and should be judged on this basis. For earlier WWI fighters the manoeuvre should be relatively violent, for modern aircraft it is more so.

### *Pylon Lap*

An optional manoeuvre reserved for scale models of prototype pylon racers. To qualify for this manoeuvre the model must be of an aircraft used in pylon racing.

The aircraft executes one high speed pylon lap in a CCW direction around three imaginary pylons. Demonstrates pylon turns in a scale like fashion. This manoeuvre is judged for scale like impression, speed and smoothness of flight especially in the entry and recovery from the high banking pylon turns. It is not judged for accuracy of turns about the 'pylons' even if pylons happen to be there for other purposes.

#### Pylon Lap Errors:

- Model does not fly straight and level during the designated straight legs of the manoeuvre. Model does not make a pass parallel to the runway.

## **SECTION 5: JUDGES GUIDE**

### **5.1 ACCURATE AND CONSISTENT JUDGING**

The most important aspect of consistent judging is for each judge to establish a personal standard and then maintain that standard throughout the contest. It is advisable for the Contest Director or the organizer to hold a conference prior to the start in order to discuss judging and make the standards as uniform as possible.

For flight judging uniformity is often effected by means of demonstration flights, flown by a non-competitor, which all judges score simultaneously and privately. After these flights, the defects in each manoeuvre should be discussed by all judges and agreement reached about the severity of defects. Once the contest is started, the individual judge should not alter their standard under any influence. An accurate standard of judging is also very important. Being a consistent judge, whether high or low, is not good if the scores awarded are not a fair reflection of the manoeuvre performed.

Where multiple judges are used for the different components of static scoring, the judges must confer to ensure that the contestant is not downgraded twice for the same defect.

Any time that there is doubt, the advantage should go to the contestant.

### **5.2 FEEDBACK**

Judges feedback is critical to the success of the RC Scale program so that the competitors can understand the score and to guide the contestant in making improvements. Judges must use the space provided on the score sheets to provide feedback in a positive manner. The intent is to provide an opportunity for continuous improvement for the contestants.

### **5.3 STATIC JUDGES GUIDE**

#### **5.3.1 General**

In general, photographs of the prototype aircraft will always take precedence over drawings and sketches.

Models shall be on a table during static judging.

The contestant, assisted by a handler, if necessary, should be prepared to position the model aircraft as directed by the judges.

No measurements are to be taken and the model aircraft must not be handled by the judges.

The model aircraft must be judged against the documents presented and judges should award marks solely on this evidence. The quality of the documentation/evidence provided by the competitor will normally be reflected in the score that the judges award. Accurate and clear evidence deserves good marks if the model aircraft matches this. Judges must ensure that a competitor does not benefit by default by submitting poor or incomplete documentation.

Too often judges are seen coming up close to the model prior to and during judging. Judges should stay away from the models until after static judging. During judging, only the craftsmanship judge is allowed close to the model.

Judges should confer prior to judging and review the scope of models presented and agree on standards to be used. If doubt exists, then give benefit to the modeller. Judges should endeavor to remain consistent during the judging of all models and not let personal preferences affect their judgments.

Ideally, three judges should be used for static judging; one assigned to each of the static score components. These judges must confer to ensure that the score is not downgraded twice for the same item.

### *Judging Complexity*

Relative scoring of a simple monoplane with fixed undercarriage and no flaps compared to a complex warbird with multiple wings, retracts, flaps, complex colour schemes and markings, or multiple engines is a challenge. In essence, Judges are expected to approach each entry with the expectation that it is perfect, and deduct marks for imperfections. Judges need to be harsher with the deductions for simple aircraft and more forgiving of minor defects in complex aircraft.

### **5.3.2 Fun Scale Static Judges Guide**

Judge will award 0 or 5 static points only, no partial marks. As long as the competitor supplies proof that a prototype existed, the competitor will receive 5 points. Refer to section 2.4.1 Fun Scale Classes: page 6. If suitable documentation is not supplied the static score will be 0.

The CD will appoint someone to check the documentation for Fun Scale.

### **5.3.3 Open and Standoff Scale Static Judging Guide**

The main question being asked is: “Does it look like the real plane as compared to the photograph/drawing at the specified judging distance?”

For Open and Standoff Scale external mufflers are to be ignored, likewise cockpit detail, cowling interiors, wheel wells, etc. otherwise the approach to scoring shall be similar to that used for the Expert and Team Classes.

### **5.3.4 Expert and Team Scale Static Judging Guide**

The competitor should supply a declaration listing all the major components of the model not made by the competitor as required by section 2.4.4 Declaration, page 8. The judges will adjust the craftsmanship marks awarded for any major components not made by the contestant.

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

### *Outline*

#### **The Process**

The process used for judging Accuracy of Outline is based on the quality definitions below and the recommended range of scores is section 3.4.1 Static Scoring, page 17.

As a judge:

- Ask yourself “Is this Item Fair?”
- If so, ask yourself “Is it Good?”
- If so, ask yourself “Okay, but is it Excellent?” Few items are. If not, stop at Good.
- If you feel that it really is Excellent then you can ask yourself if it warrants even more. And, if it does, you can deem it Superior and award the 10 without qualm.

In answering these questions, decide upon the score to be entered in each box of the score sheet.

If necessary, fine tune the score: A minor deduction (1/4 point) is typically given where a mismatch is noted but is minor. Moderate or major deductions (1/2 to 1 points) will be typical where the mismatch is readily apparent.

Make notes on deductions and issues with the model to assist the contestant in understanding the score and to guide the contestant in making improvements.

### 5.3.5 Outline Judging Quality Level Definitions

Outline Quality Level
<p><b>Superior</b> Looks exactly like documentation presented, with a scale-like ground attitude, and all parts in the correct relationship. The cross section and profile are accurate, and all the outline features are accurately present.</p>
<p><b>Excellent</b> Minor discrepancies hardly noticeable differences from documentation.</p>
<p><b>Good</b> Changes made do not detract from overall effect, slight variation in colouring or markings.</p>
<p><b>Fair</b> Some obvious changes, noticeable differences from documentation presented. Items such as tail surface proportions, control surface size, dihedral angles.</p>
<p><b>Poor</b> Gross exaggerations from documentation presented.</p>

#### *Finish, Colour and Markings*

**Finish:** This is to include the sheen or reflective properties of the finish, weathering details, and the application of materials. For example; many WWI aircraft were painted with a brush and brush marks were easily seen even from a distance. If the documentation shows brush marks in certain areas, the model should also show this artifact. The Finish judge should consult with the Craftsmanship judge to ensure an item is not double downgraded, once by the Finish judge and once by the Craftsmanship judge.

**Colour:** It is the contestant's responsibility to authenticate the model colours by providing documentation such as colour photographs, published artist conceptions, paint chips, colour reference guides, or factory paint samples. Colour and hue of the model need to be checked against the colour reference provided in the documentation packet. The "sheen" or reflective properties may also be verified from these same samples, but will only be used for scoring the Finish qualities as previously described. Black, Flat Black, or natural aluminum do not need paint reference samples

Consideration should be given to the greater effort involved in reproducing multi-coloured finishes compared to model aircraft which feature only one or two basic colours.

**Markings:** This inspection verifies size and placement of markings to match the documentation. Ideally, the documentation would show the placement of all markings. However, if no documentation is available, a typical view showing that squadron's markings from references other than the aircraft modeled may be used to depict typical marking locations (these items need to be noted as TYPICAL MARKINGS for the judge in the documentation packet).

#### **The Process:**

The process used for judging Finish, Colour and Markings is based on the quality definitions below and the recommended range of scores is section 3.4.1 Static Scoring, page 17.

As a judge:

- Ask yourself "Is this Item Fair?"
- If so, ask yourself "Is it Good?"
- If so, ask yourself "Okay, but is it Excellent?" Few items are. If not, stop at Good.

## MAAC RC SCALE RULEBOOK - 2017

- If you feel that it really is Excellent then you can ask yourself if it warrants even more. And, if it does, you can deem it Superior and award the 10 without qualm.

In answering these questions, decide upon the score to be entered in each box of the score sheet.

If necessary, fine tune the score: A minor deduction (1/4 point) is typically given where a mismatch is noted but is minor. Moderate or major deductions (1/2 to 1 points) will be typical where the mismatch is readily apparent.

Make notes on deductions and issues with the model to assist the contestant in understanding the score and to guide the contestant in making improvements.

### 5.3.6 Finish, Colour and Markings Quality Level Definitions

<b>Finish, Colour and Markings Quality Level</b>
<b>Superior</b> Looks exactly like documentation presented, markings correct, colour matches, finish and/or weathering appropriate.
<b>Excellent</b> Minor discrepancies hardly noticeable differences from documentation.
<b>Good</b> Changes made do not detract from overall effect, slight variation in colouring or markings.
<b>Fair</b> Some obvious changes, noticeable differences from documentation presented.
<b>Poor</b> Gross exaggerations from documentation presented.

## *Craftsmanship*

### **Craftsmanship Quality:**

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

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

### **Craftsmanship Complexity:**

Judges should consider the overall complexity of the design awarding fewer deductions for small errors in more intricate shapes and structure. Special items of ingenuity may also be rewarded under this section. In essence, Judges are expected to approach each entry with the expectation that it is perfect, and deduct marks for imperfections. Judges need to be harsher with the deductions for simple aircraft and more forgiving of minor defects in complex aircraft.

In assessing both the above aspects judges should consult the competitor's declaration and check for any components that have not been made by the competitor and adjust the marks awarded accordingly. The points that are awarded must again reflect the standard of documentation presented.

### **The Process:**

The process used for judging Craftsmanship is based on the quality definitions below and the recommended range of scores is section 3.4.1 Static Scoring, page 17.

Inspect the model in detail in the areas listed below under Craftsmanship Inspection, making deductions as necessary:

As a judge:

- Ask yourself "Is this Item Fair?"
- If so, ask yourself "Is it Good?"
- If so, ask yourself "Okay, but is it Excellent?" Few items are. If not, stop at Good.
- If you feel that it really is Excellent then you can ask yourself if it warrants even more. And, if it does, you can deem it Superior and award the 10 without qualm.

In answering these questions, decide upon the score to be entered in each box of the score sheet.

If necessary, fine tune the score: A minor deduction (1/4 point) is typically given where a mismatch is noted but is minor. Moderate or major deductions (1/2 to 1 points) will be typical where the mismatch is readily apparent.

Make notes on deductions and issues with the model to assist the contestant in understanding the score and to guide the contestant in making improvements.

**5.3.7 Craftsmanship Quality Level Definitions**

<b>Craftsmanship Quality Level</b>
<p><b>Superior</b> Quality of reproduction of model is such that it is indistinguishable from prototype, all fine detail present.</p>
<p><b>Excellent</b> High degree of excellence in simulating the prototype but lacking in fine detail</p>
<p><b>Good</b> Definite attempt made to duplicate prototypical features, but to a lesser degree, i.e. inked panel lines instead of raised.</p>
<p><b>Fair</b> Well built, but definitely lacking in detail or shows model characteristics such as non-prototypical control horns.</p>
<p><b>Poor</b> Construction detracts from model, i.e. runs in paint, poor surface preparation.</p>

***Craftsmanship Inspection***

Inspect parting-line area of control surfaces for visibly unrealistic hinging, uneven fit, or gap on both top and bottom.

Inspect for inadequately disguised model-related disassembly sections in wings, cowls, empennage, etc., checking for poor fit or unrealistic appearance including large screw heads in conspicuous areas.

Inspect for “model” type exposed control horns, fittings and connections that are not scale.

Inspect for correct prototypical choice in hidden or exposed control arms or linkages to elevator(s), rudder(s), ailerons, etc., as depicted in the documentation.

Inspect quality of simulated metal-skin features for applicable three-dimensional panel lines, scale rivets (raised or flush), or fastener detailing. Verify approximate scale uniformity in size, spacing and correct three-dimensional effects of these features top and bottom.

Inspect for applicable fabric-covered surface sections in cosmetic appearance. Also verify “taping” appearance when applicable for fabric-covered surfaces.

Inspect for quality in rigging or connector detail on externally braced aircraft such as biplanes.

Inspect for quality in detailing any applicable small protruding pitot tubes, antennas, air scoops, hooks, pods, etc.

Inspect for quality in visible dummy engine detail including exhaust and stains where applicable.

Inspect for any unrealistic model damage anomalies regarding shrinkage, scuffing, scraping, peeling, tears, or gouges. Simulated wear such as realistic metal dents or exposed bare metal in painted regions for high-wear areas common to aircraft may enhance the model rather than be cause for downgrade.

Inspect for applicable window or canopy exterior detail quality insofar as framework and their resolution from the transparent window regions. Also verify overall exterior fit to airframe or adjoining multiple

canopy sections when applicable. A functional sliding canopy is not required, but the described cosmetic static appearance is.

Inspect for realistic quality detail features of the landing gear, which are generally additional to the basic machined, stamped, or wire drawn strut components. A downgrade is applicable only if the gear struts are void of realistic detail qualities independent of materials used. Typical off the shelf landing gear do not include items such as brake lines, tie down hooks, fill ports, scissors, drag links, or wheel covers (front and back) that match full size aircraft. These are the “extras” that a modeller can detail out to affect the craftsmanship score in this area.

Inspect applicable feature qualities of details such as wing tip and tail navigation lights, (etc.) for their realistic detailed appearance. Functional illumination is not a requirement for optimum score.

Inspect for unrealistic surface defects like wood grain, sanding marks, fillet defects, cracks, voids, pinholes, etc.

## **5.4 FLIGHT GUIDE FOR COMPETITORS AND JUDGES**

### **5.4.1 Flight Judging Guide**

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

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

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

Judges should be careful not to downgrade a contestant for the same error during any one manoeuvre. For example: jerky flying should only be downgraded once, not every time there is jerkiness during that manoeuvre.

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

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

After each flight, the Judges will record any non-standard event that causes downgrading or loss of flight points. As examples: Missed figures, figures flown out of order, out of flight time, flying behind the “Deadline”, missing dummy pilot or crash landing.

Of course in keeping with the spirit of this document, these are not meant to be rigid references for manoeuvres. The modeller can still substitute and justify any manoeuvres as flown by the prototype. The manoeuvre descriptions contained in this document are intended to stimulate variety and also give the judges a guide.

Competitors are expected to choose manoeuvres that best show the flight envelope of the prototype. Choice of an inappropriate manoeuvre that does not reflect the flight envelope of the prototype should result in that manoeuvre being downgraded appropriately by the flight judges. If you are not sure, ask the judges for clarification.

### **5.4.2 Overall Flight Realism Judging Guide**

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

Refer to section

3.4.3 Overall Flight Realism Score, page 25.

**SECTION 6: FORMS**

Included Are The Following:

- Static Score Sheet - Expert and Team Classes
- Static Score Sheet – Open and Standoff Classes
- Pilot’s Score Summary
- Pilots Spotters/Caller Card
- Pilot’s Flight Score – Judges Work Sheet
- Safety Inspection Form



## STATIC SCORE SHEET EXPERT AND TEAM CLASSES

Contestant Number

Pilot's Name: \_\_\_\_\_

Builder's Name (Team only): \_\_\_\_\_

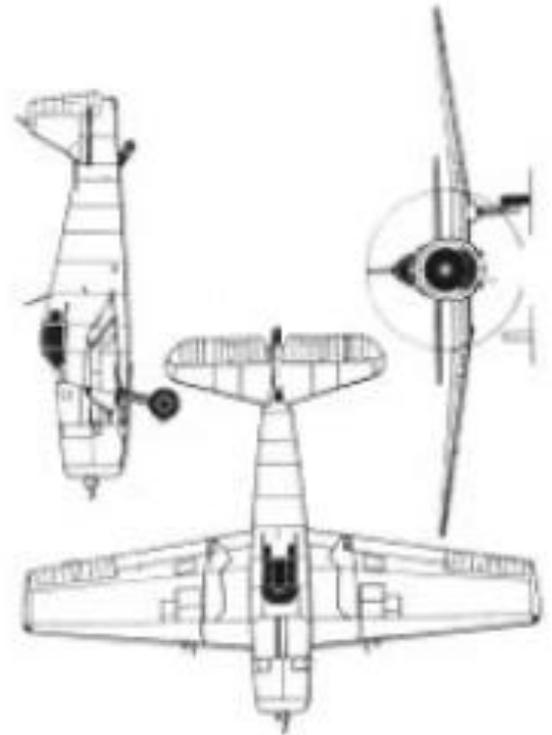
Model: \_\_\_\_\_ Colour: \_\_\_\_\_

**Competition Class**

Expert

Team

		Points Range		SCORE
<b>A</b>	<b>ACCURACY OF OUTLINE</b>		<b>0-40</b>	
1	General Appearance	0-4		
2	Fuselage	0-8		
3	Wing	0-8		
4	Tail Group	0-8		
5	Landing Gear	0-8		
6	Engine Cowl & Propeller	0-4		
<b>B</b>	<b>CRAFTSMANSHIP</b>		<b>0-30</b>	
1	Fuselage	0-8		
2	Wing	0-8		
3	Tail Group	0-8		
4	Landing Gear	0-6		
<b>C</b>	<b>FINISH, COLOUR, AND MARKINGS</b>		<b>0-30</b>	
1	Finish	0-12		
2	Colours	0-6		
3	Markings	0-12		
<b>TOTAL</b>				



Mark discrepancies on sketch

Judge's Comments

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Judges should note the reasons for downgrades. Use back of page if necessary.



## STATIC SCORE SHEET OPEN AND STANDOFF CLASSES

Contestant Number

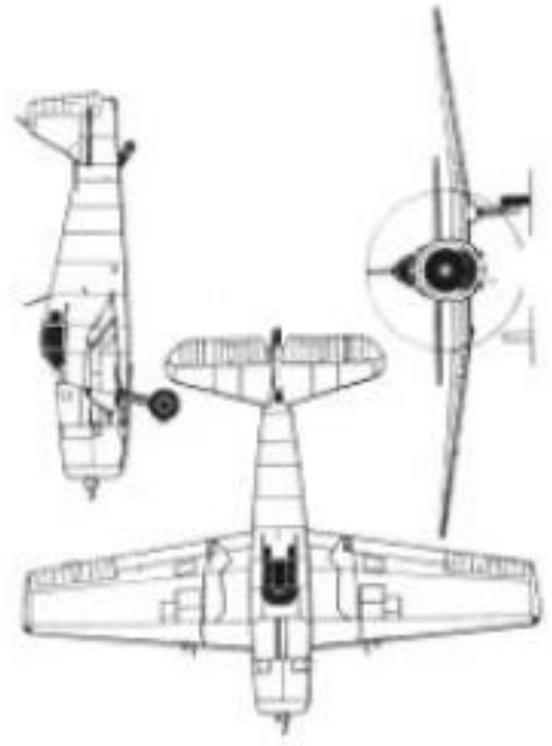
Pilot's Name: \_\_\_\_\_

Model: \_\_\_\_\_ Colour: \_\_\_\_\_

**Competition Class**

Open
  Standoff

		Points Range		SCORE
<b>A</b>	<b><i>ACCURACY OF OUTLINE</i></b>		<b><i>0-30</i></b>	
1	General Appearance	0-3		
2	Fuselage	0-6		
3	Wing	0-6		
4	Tail Group	0-6		
5	Landing Gear	0-6		
6	Engine Cowl & Propeller	0-3		
<b>B</b>	<b><i>CRAFTSMANSHIP</i></b>		<b><i>0-15</i></b>	
1	Fuselage	0-4		
2	Wing	0-4		
3	Tail Group	0-4		
4	Landing Gear	0-3		
<b>C</b>	<b><i>FINISH, COLOUR, AND MARKINGS</i></b>		<b><i>0-15</i></b>	
1	Finish	0-6		
2	Colours	0-3		
3	Markings	0-6		
<b>TOTAL</b>				



Mark discrepancies on sketch

Judge's Comments

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Judges should note the reasons for downgrades. Use back of page if necessary



## PILOT'S SCORE SUMMARY

Contestant Number

Pilot's Name: \_\_\_\_\_

Model: \_\_\_\_\_ Colour: \_\_\_\_\_

**MAAC Competition Class**

- |   |                                 |                                   |
|---|---------------------------------|-----------------------------------|
| <input type="checkbox"/> Fun Scale – Novice | <input type="checkbox"/> Open   | <input type="checkbox"/> Standoff |
| <input type="checkbox"/> Fun Scale – Expert | <input type="checkbox"/> Expert | <input type="checkbox"/> Team     |

	Round	Judge #1	Judge #2	Judge #3	Final Flight Score - Average
1	<i>Round 1</i>				
2	<i>Round 2</i>				
3	<i>Round 3</i>				
4	<i>Round 4</i>				
5	<i>Round 5</i>				
6	<i>Round 6</i>				

<b>Final Score</b>			
		Score	
Best Flight Score			
Add 2 <sup>nd</sup> Best Flight Score			
Add 3 <sup>rd</sup> Best Flight Score (if needed)			
Average Flight Score			
Add Static Score			
<b>TOTAL</b>			

**Notes:** \_\_\_\_\_

Refer to MAAC RC Scale Rulebook section 3.4.4 Final Score:

## RC Scale Spotter/Caller Card

### Spotter's Role:

A pilot/spotter pre-flight meeting to review the following is essential.

- Give full attention to the flight and **NOT** be distracted by phones, texting or other people.
- Assist during start-up by restraining/attending the plane before it taxies onto the runway.
- Advise the pilot of where other planes are located.
- Assist with communicating to other pilot's intentions for runway use ensuring response & o.k.
- Guide the pilot out of harms way.
- Advise the pilot where the aircraft is in relation to runway and other obstacles.



MAAC Ref.- [MSD 07 - Duties of potters and Helpers](#) - [MAP 04 - Duties of a Spotter](#) [MAP 05 - Duties of a Helper](#)

<i>1. Take Off</i>	Notes:
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9. Landing	
10. Realism	

## RC Scale Spotter/Caller Card

### Spotter's Role:

A pre-flight meeting of with the spotter to review the following is essential;

- Give full attention to the flight and **NOT** be distracted by phones, texting or other people.
- Assist during start-up by restraining/attending the plane before it taxies onto the runway.
- Advise the pilot of where other planes are located.
- Assist with communicating to other pilots intentions for runway use ensuring response & o.k.
- Guide the pilot out of harms way.
- Advise the pilot where the aircraft is in relation to runway and other obstacles.



MAAC Ref.- [MSD 07 - Duties of potters and Helpers](#) - [MAP 04 - Duties of a Spotter](#) [MAP 05 - Duties of a Helper](#)

<i>1. Take - Off</i>	Notes:
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9. Landing	
10. Realism	



# MAAC RC Scale

- PILOT'S FLIGHT SCORE -  
Judge's Work Sheet

Contestant  
Number

Round #

Aerobatic  Non-Aerobatic

Pilot's Name: \_\_\_\_\_

Model: \_\_\_\_\_

Colour: \_\_\_\_\_

Symbols Feedback		Manoeuvre	Score	Comment
Too High ↑	1	Take Off		
Too Low ↓	2			
Heading Off ↗	3			
Altitude Entry ≠ Exit ≠	4			
Too Close ←	5			
Too Far →	6			
Off Centre X	7			
Too much Angle +	8	Traffic Pattern		
Too Little Angle -	9	Landing		
Symmetry ○	10	Realism in Flight		
Symbols are used to point out major		<b>TOTAL</b>		
source of downgrades.				

**Note:** Landing Pattern will be either civilian consisting of a rectangle with four 90 degree turns, or a military with two 180 degree turns.

Judge No: \_\_\_\_

Initial: \_\_\_\_\_



# MAAC RC Scale

- PILOT'S FLIGHT SCORE -  
Judge's Work Sheet

Contestant  
Number

Round #

Aerobatic  Non-Aerobatic

Pilot's Name: \_\_\_\_\_

Model: \_\_\_\_\_

Colour: \_\_\_\_\_

Symbols Feedback		Manoeuvre	Score	Comment
Too High ↑	1	Take Off		
Too Low ↓	2			
Heading Off ↗	3			
Altitude Entry ≠ Exit ≠	4			
Too Close ←	5			
Too Far →	6			
Off Centre X	7			
Too much Angle +	8	Traffic Pattern		
Too Little Angle -	9	Landing		
Symmetry ○	10	Realism in Flight		
Symbols are used to point out major		<b>TOTAL</b>		
source of downgrades.				

**Note:** Landing Pattern will be either civilian consisting of a rectangle with four 90 degree turns, or a military with two 180 degree turns.

Judge No: \_\_\_\_

Initial: \_\_\_\_\_



## RC SCALE SAFETY INSPECTION FORM

**Contestant  
Number**

Owner/Pilot: \_\_\_\_\_ Date: \_\_\_\_\_

Aircraft: \_\_\_\_\_ Engine: \_\_\_\_\_

**Airworthiness Inspection:** This inspection is being performed by the “Owner/Pilot” who is familiar and experienced with this particular model. While the ultimate responsibility for the safety and airworthiness of this aircraft rests solely with the Owner and/or Pilot, all items listed below must be checked and approved in the presence of the event safety inspector for the aircraft to be accepted for flight at this event. The aircraft must have been flown a minimum of six times prior to the event. All of the equipment and hardware used in the construction must be sturdy enough for the tasks they were intended. After any type of major repair the aircraft must be re-inspected. It is the right of the event safety inspector to refuse approval for flight.

<b>1. General Appearance</b> – overall appearance free of damage, warps, loose covering etc.	
<b>2. Propeller</b> – secure and free of cracks or other visible damage (no metal props).	
<b>3. Engine</b> – securely attached, muffler motor mount etc. secure no visible damage.	
<b>4. Kill Switch</b> – except for glow and electric engines (ask if able to kill engine with radio).	
<b>5. Wings</b> – attachment secure, hinges secure test by tugging on them, control rod stiffness, control horns secure and some sort of keeper on the clevis.	
<b>6. Rudder</b> - attachment secure, hinges secure test by tugging on them, control rod stiffness, control horns secure and some sort of keeper on the clevis.	
<b>7. Elevator</b> - attachment secure, hinges secure test by tugging on them, control rod stiffness, control horns secure and some sort of keeper on the clevis.	
<b>8. Tail Surfaces</b> – surfaces firmly attached with no cracks or damage, tail wire braces secure	
<b>9. Canopy or Wind Screen</b> – secure	
<b>10. Hatches and Covers</b> – secure	
<b>11. Wheels and Landing Gear</b> – secure	
<b>12. Batteries Fully Charged</b> – ask	
<b>13. Demonstrate Failsafe Operation</b> – Engine should go to idle	

Signed Owner/Pilot: \_\_\_\_\_ Date: \_\_\_\_\_

M.A.A.C./AMA #: \_\_\_\_\_

Witnessed and Authorized for Flight: \_\_\_\_\_ Date: \_\_\_\_\_

NOTES:

**CONTEST DIRECTOR`S GUIDE**

This section has been removed is published as a separate document

**SECTION 7: SUMMARY OF RULE BOOK CHANGES**

1. - This set of rules was extensively revised from the previous set of rules for RC Scale, which was published in 2008.

2. - In 2015 the changes were too extensive for detail in this section.

<b>Revision</b>	<b>Index #</b>	<b>Explanation</b>	<b>Date</b>
3.	3.3.13	Added incapable of inverted flight. Spotter/Caller Card revised to MSD docs.	Sept. 2016