IJMC Scale Jet Classes

2022

Rulebook and Judges Guidelines

Revision incorporating changes approved at the 2022 AGM

Pavel Lapshov, IJMC Technical Advisor

THIS 2022 EDITION INCLUDES THE AMENDMENTS APPROVED BY AGM 2022.

These amendments are marked by emboldened letters and numbers.

INDEX

Note1: Within this document reference to the male gender implies both male and female
Note2: This rulebook can also be used for Jet European Masters or Jet Continental Masters if the need arises

CONTEST CLASSES

1.0.1 Weight classes

Two official IJMC Scale Jet Contest Classes have been established, determined by weight limit only:

(a) 15.0 kg Class: for jet models with a max dry weight of 15.0 kg *(excluding propulsion batteries for EDF powered models)*

(b) 20.0 kg Class: for jet models with a max dry weight of 20.0 kg *(excluding propulsion batteries for EDF powered models)*

(c) An identical scoring system will be used for both weight classes and the competition will be held with the two classes intertwined.

(d) No contestant is allowed to enter a jet model in more than one class and the chosen class must be stated on the Contestant's Declaration Sheet before the official start of the competition. No change of class is allowed once the competition has started. No jet model is allowed to enter a competition with more than one pilot so one model is not allowed to compete with two different pilots.

(e) An additional award, the Team Trophy, will be given to the highest scoring entry in either weight class which comprises a team of 2 (pilot and constructor) where the pilot is not the constructor of the model. The constructor must be present at the event and both team members must be of the same nationality as defined by rule 1.0.3. To be eligible for the Team Trophy, both team members must have registered and signed the appropriate box on the Contestant Declaration Sheet (see rule 6.0.1 (d)).

(f) To encourage first time contestants, another additional award, the Best Newcomer award, will be given to the highest scoring newcomer (regardless if he's selected by wildcard or through the national selection method, see next chapter). To be eligible for the Best Newcomer award, the contestant must have registered and signed the appropriate box on the Contestant Declaration Sheet (see rule 6.0.1 (d)).

(g) Two further awards will be given to the highest scoring entry in either weight class for best vintage jet (prototype first flight before or during 1964) and for best modern jet (prototype first flight during or after 1965). The trophies will be donated by Aviator Watches.

1.0.2 Number of contestants

In a Jet World Masters, each country is permitted a maximum of six entries in the competition. There will be complete freedom of choice for each country in respect of the distribution of the number of entries between the two weight classes, i.e. a country may enter six 15.0 kg class contestants and no 20.0 kg class contestants through to no 15.0 kg class contestants and six 20.0 kg class contestants or any combination falling between these two extremes.

Wildcards for two additional contestants per country will be issued. These additional contestants are subject to the following limitation: it must be a first time entry at a JWM ever (a so called rookie).

1.0.3 Nationality of contestants

(a) All contestants must be from the country/nation they are representing, and passports or other ID may be required as proof of this by the Contest Director, or the IJMC. People wishing to compete for National teams other than the country of their citizenship then the following rules (b) to (e) will apply:

(b) They must apply in writing to the IJMC Council for permission.

(c) They must have resided for two years in the country in whose team they wish to compete and must provide the IJMC with documentary proof of the period of residence.

(d) They must obtain the agreement of their National Team to their membership of that country's team.

(e) On returning to their country of citizenship an individual will immediately qualify for consideration for membership of that country's team, without the need for a period of residency. The IJMC has to be informed in writing of such changes in circumstances. The permission to represent the country of residency expires twelve calendar months after permanent return to the country of citizenship of the individual.

(f) In future, National Teams will be recognised by exactly the same criteria as those used by the International Olympic Committee (IOC). However, “Grandfather Rights” will be allowed by the IJMC to recognise National teams that would not be accepted by the IOC but who have competed in the past in IJMC competitions. For example, the IJMC will continue to recognise separate teams from England, Scotland and Northern Ireland. “Grandfather Rights” will be retained forever.

(g) The IJMC will only recognise the National flags and insignia that are recognised by the IOC and those flags of National teams exercising “grandfather rights”.

GENERAL REGULATIONS

2.0.1 Definition of 'Jet' models eligible for IJMC Scale Jet Competitions.

(a) The contestant's model shall be a replica of a heavier-than-air, fixed-wing, man-carrying aircraft that was built and flown successfully, and was powered only by 'jet' propulsion. This includes full-size ducted-fans.

(b) The contestant’s model shall be powered solely by ducted-fan (regardless if internal combustion or electric) and/or gas-turbine engine(s). All other forms of propulsion are forbidden.

2.0.2 Builder of Model rule

The contestant does NOT have to be the builder of the model.

2.0.3 Airworthiness

The contestant is responsible for the airworthiness of the jet model he enters. He will state on the Contestant’s Declaration Sheet that he has personally test flown his jet model successfully and safely before the start of the competition.
In the event, that static judging start before the opening ceremony (see rule 2.0.16), the competition starts with the first competitor on the table. Therefore, the draw of starting order must be done before.

There is no right of any competitor to have a training flight if the program (schedule) is tight, the organiser should at least allow short safety and trim flight for every competitor.
The competition has precedence over training flights.
The Contestant's Declaration Sheets must be collected and checked by the organizers, prior to official opening ceremony or before the competition begins.

2.0.4 General Characteristics

Except for the max dry weight restriction, all characteristics apply to both weight classes.

Maximum dry weight of the model (excluding fuel *and excluding propulsion batteries for EDF powered models):*

15.0 kg Class:	15.0 kg
20.0 kg Class:	20.0 kg

0.5% weight tolerance is allowed (75g in 15.0 kg Class and 100g in 20.0 kg Class).

Wing loading:	no restrictions
Max. surface area:	no restrictions
Motive power:	no restrictions

The weighing of the models will be done in a controlled environment to avoid any effects of wind. Every model must be weighed after the first flight in the exact configuration as at Round 1 take off. De-fuelling is allowed but no batteries (except batteries for motive power) or any other part of the model may be removed between the flight and the weighing of the model. All this must happen under supervision of the Organisers. If a model does not meet the weight criteria for the class entered, the flight will score zero. The Organisers are encouraged to pursue weight checks after further flights on any model close to the limit.

Note 1: The organiser must provide scales with a resolution of 5 gram. In order to check the accuracy, he must also provide calibration weights of 1kg and 5kg for use throughout the competition so that scales can always be checked and scale calibration certificates will not be required. The scales used in the competition should be calibrated at the 15.0 kg and 20.0 kg limit and made available to the contestants at least one day before the start of the competition.

Note 2: The upper limits must comply with legal limits required by the country hosting the event.

2.0.5 Competition Programme

The Competition Programme is divided into two equal scoring parts, the Static Judging and the Flying Judging. Additionally, a system of bonus points is added as an incentive to diversification and originality. The final score shall be the total points awarded in the two scoring parts, normalised to 1500, and the bonus points, calculated per section 7. The maximum points attainable is made up as follows:

Static points: 1500 max
Flying points: 1500 max
Bonus system points: **100** max

2.0.6 Judges

(a) A minimum of **nine (9)** judges is required to run the competition: The Judges Representative, 3 Judges for the Static part and 5 Judges for the Flying part. **A reduction of flight judges from 5 judges to 3 judges is possible in exceptional cases.**
Judges are selected by the IJMC Board for approval at the IJMC Annual General Meeting (AGM) from the list of current IJMC recognised judges.

The IJMC holds a list of recognised judges. Every member country has the right to propose judges using the Judge Nomination Form which is downloadable from the IJMC website. To be admitted to the Jet World Masters, judges must be from a nation which has paid the current IJMC affiliation fee and be approved at the IJMC AGM.

The **three** top scoring countries from the previous Jet World Masters competition have the fundamental right to have one judge from their country. In addition the organising country also has the right to have one judge.

(b) At the discretion of the organisers, generally for reasons of timing of the event, EITHER flying should start no sooner than two hours after static has commenced with each model having been static judged before flying OR static judging should start no sooner than three hours after the commencement of flying round 1 with every model having been flown before static judging.

(c) As soon as practical after each contest flight of rounds one and two (and three in the event of two flight lines being used), the points awarded will be made available to the contestants for inspection, allowing sufficient time for them to adjust their manoeuvre schedules for the next contest flight if they should wish to do so. No points awarded for the third round flights (or fourth round flights in the event of two flight lines being used) will be made available until the publication of the final results.

(d) Contestants are not permitted to discuss scores awarded with judges during the contest, except as provided in section 2.0.14 (Protests). However, after scores have been published, the Contestants may ask about their faults and accept guidance from the judges on the correction of these.

(e) During static ('fidelity to scale and craftsmanship') judging, any prior or special knowledge of the prototype possessed by a judge shall be discounted, and the model shall be assessed solely on the documentation submitted by the contestant.

(f) During static judging the judges are to totally disregard all internal parts of the ductwork and propulsion system that are contained within the model.

(g) Only the ‘Static’ judges are allowed to confer and to harmonise the scores awarded to the contestants. Other than in the case of scores in 5.0.4 for for Smoothness, Speed and Flight presentation, the ‘Flying’ judges may not harmonise the scores, as the high and low scores are removed for each manoeuvre.

(h) One of the judges must be appointed ‘Chief Judge’ before the start of the competition.

2.0.7 Coefficients

Where a coefficient (K) is stated, the points awarded shall be multiplied by the coefficient to give the total scores for that section. Fractions, in tenths of a point, may be used in determining static points, but flying points shall only be judged to the nearest half point, except for Overall Realism scores which will be judged to the nearest 1/10th of a point.

2.0.8 Remarks

(a) All models shall become airborne in the manner of their prototype, except as in (b).

(b) Models of seaplanes are permitted to use wheels or wheeled dollies for take-off, in the absence of suitable water surface conditions. Deviation from scale, through inclusion of permanently attached wheels, skids or similar non-prototype devices in the model structures shall, in this case, not be taken into consideration in scoring of 'fidelity to scale' points.

(c) No parts of a model may be exchanged, removed, added or repositioned between Static and Flying judging, whichever comes first, except for fuel, receiver antennas, and forward-facing pitot tubes or other devices that the flying judges or Contest Director consider could be dangerous in the event of an accident. Bombs, drop tanks, missiles, other ordnance, external parts etc., that are presented attached to the aircraft during the first phase of judging must remain on the model during the second phase regardless of the order of judging. Models will be photographed to check that this rule is observed and disqualification may result if this rule is broken. For the avoidance of doubt, the Organisers shall arrange for the models to be photographed as presented during the first phase of judging. External stores like bombs, tanks, etc. may be jettisoned in flight between manoeuvres if announced (see also rule 2.0.8 (g). These stores must be presented for static judging, but may be replaced before flying by simpler and repairable examples of a similar shape, colour, size and weight. All sets should be presented at the initial weight check.

(d) Parts of the propulsion system, or airframe, that are damaged during the contest may be repaired or replaced with similar parts, and this may result in the model being weighed again, to ensure that it still complies with the weight criteria. The contestant must advise the CD, before any further contest flights are made, if any parts of the model are replaced, repaired or exchanged during the contest, which may increase the total weight of the model, or affect other regulations, in particular that concerning airworthiness (2.0.3).

(e) Reciprocating engines, where used, must be effectively muffled. The muffling system should be engineered within the confines of the outline of the model. External mufflers or engines, or parts thereof, will result in down marking in the static judging section, unless these are scale representations of those on the full-size prototype. The Contest Director retains the right to prohibit excessively noisy models with reciprocating engines from taking part in the contest.

(f) No explosive devices may be dropped or activated, and rockets, or any other explosive devices may not be jettisoned during flight, or taxiing manoeuvres.

(g) Parts loss during flight. If any part unintentionally separates from (comes off) the aircraft during flight (that was attached to the aircraft at the start of the contest flight), then the scoring stops and the contestant must land immediately. The points awarded for the manoeuvres that were completed before the part loss will stand. If a part separates from the aircraft during one of the two mandatory and six optional scoring manoeuvres, then no points will be awarded for this manoeuvre. However, 'Overall Realism' points will still be awarded, in proportion to the amount of the flight completed. Any intentional drop of stores (tanks, bombs or other external stores) must be called to the attention of the judges prior to the drop.

(h) The way practice flights are organised is entirely in the hands of the contest director. However, once the official flying has started, competitors will no longer be allowed to perform any practice or demonstration flights with any kind of model at the competition site until the final round has been terminated. Exception: proof of safety flights imposed by the arbitration panel.

(i) The model should be presented in static as if it were in normal flying configuration with landing gear in the down position. Only items operable from within the cockpit are allowed to be displayed. This includes all control surfaces, all lift enhancing devices (flaps, slats etc.) and all other aerodynamic devices (speed brakes, spoilers etc.). This also includes opening canopies, landing gear and gear doors. All these items may be positioned by hand only, the radio system may not be used. In addition, the following devices may not be operated or demonstrated during any part of the static judging (this list is not exhaustive): Lighting system(s), Sound system(s), Inspection panel(s, Maintenance panel(s), Gun access panel(s), Refuelling panel(s), Access stair(s), Tail hook(s), Emergency generator(s), Ram Air Turbine(s) etc.

2.0.9 Number of Models

No contestant is allowed to enter more than one jet model, the class of which must be nominated on the Contestant's Declaration Sheet before the official start of the competition. No change of class is allowed once the competition has started. No jet model is allowed to

enter a competition with more than one pilot so one model is not allowed to compete with two different pilots.

2.0.10 Number of helpers

Each contestant is permitted a maximum of two helpers/assistants during the flying part of the contest, both in the 'Starting Area', and in front of the 'Safety/No-score' line. However the CD may, at his discretion, allow additional helpers/assistants, particularly in the case of multi-engine or gas turbine powered models, for safety reasons. No helper/assistant may touch the transmitter after the contestant has announced take-off. The official timekeeper is responsible for ensuring that helpers do not touch the transmitter during flight. If this occurs the whole flight is scored zero.

2.0.11 Radio Equipment

Only 2.4 GHz radio is acceptable and all R/C equipment must comply with statutory regulations of the country that the event is being held in. Rate gyros are allowed for improved scale realism, however any mechanical or electrical automatic pilot devices, which allow pre-programmed manoeuvres, flight patterns or flight schedules, are strictly prohibited.

2.0.12 Safety for Jet World Masters contests.

(a) All R/C transmitters expected to be used during the contest must be checked by the organisers, prior to the contest, to ensure that they are transmitting on 2.4 GHz. There will be no transmitter compound during the contest.

(b) Any unauthorised transmission during the contest will result in automatic disqualification of the offender from the contest, and render him liable to further penalties. Operating the model with the radio equipment (2.4 GHz) switched on, is NOT considered an unauthorised transmission.

(c) During the whole time of the official flight, the pilot with his transmitter must stay on the ground within the area designated for this purpose. The contestant will be notified if the model is flying outside the permitted area.

2.0.13 Starting order

(a) Before the start of the competition, the organiser and the IJMC Board, will conduct a draw to determine the flying order, by country, in which the first flying round will be flown (each contestant from each country in turn). The flying order in each class must be constituted separately. The team managers from each country will be free to decide the order in which their individual pilots will fly. The flying order, thus established, will determine the order in which the competitors will be static judged. No changes to the flying order will be accepted once the competition has commenced, except by approval of the organisers and the IJMC Board, to ensure the safe and efficient running of the competition.

(b) The order of the second flying round will be the same as that of the first flying round. The final round however will be flown in ascending order with regard to the preliminary classification following the best flight score from either round one or two, without normalisation (three rounds in the case of two flight lines where a rotation between rounds will ensure that all competitors will be judged twice on each line). This allows the tension to build up towards the end of the competition and offers similar weather conditions to the top contestants.

2.0.14 Protests

(a) Before the start of the competition the CD will organise and appoint an 'Arbitration Tribunal', which will consist of 3 persons:
•A representative of the event organiser/host association

•A member of the IJMC Board (or an IJMC representative selected by the IJMC Board if all the attending IJMC Board members could have an 'interest' in the protest result)
•A representative of the contestants, who will be elected by a vote of all pilots at the Briefing at the start of the competition. This elected representative cannot be later involved in a protest as a protester.

(b) Only Contestants or Team Managers may submit a protest.

(c) All protests must be made in writing (evidences may be presented in any digital format), and handed to the Contest Director with a protest fee, which shall be the same amount as the contestant's entry fee. The IJMC Chairman (or other IJMC Board member) shall hold this protest fee for the duration of the protest.

(d) The CD shall ensure that the Tribunal reaches a decision within reasonable time of any protest being made, and before any final results are released, or prize giving commences.

(e) No other person(s) shall be present at the arbitration discussions, except for the protester, the contestant being protested against, and any language translators required.

(f) The Tribunal will first hear from the Protester, and afterwards may request a response from the Contestant being protested against, if necessary.

(g) If the arbitration panel upholds the protest (in favour of the protester) then the protest fee will be returned to the protester in full and the protest with all evidences must be presented for Team Managers. If the arbitration panel does not find in favour of the protester, then the protest fee will retained by the IJMC.

(h) The Arbitration Tribunal's decision is final, and cannot be appealed against.

(i) Protests must be submitted within 3 hours following the last contestant's official flight.

(j) In the event of any disputes or protests regarding translations of these rules into other languages, the 'English' version shall be the definitive version.

2.0.15 Weather Conditions

In case of bad weather conditions (e.g.: rain, snow, strong winds or wind direction changes, etc.) during the flying part of a Jet World Masters competition, a meeting will be held which will be attended by each nation's Team Manager and the Contest Director. A vote will be taken by all of the Team Managers on whether flying should continue, and the decision will be carried by the majority vote. If voting is equal, then the Contest Director has the casting (deciding) vote. Any Team Manager, and the Contest Director, has the right to activate (call) this meeting to discuss weather conditions. The Contest Director also has the right to award any contestant a 're-flight', if weather conditions should become dramatically worse, or change, during a contest flight. (See 5.0.1(b))

2.0.16 Start of the competition

The JWM competition officially starts with the opening ceremony. All competitors have to be present by this time and all competition models have to be ready and assembled in the preparation Hangar. Later arrival or later readiness of the model will result in a disqualification. Exceptions will be resolved by the IJMC Board on a case by case basis carefully reviewing the circumstances. If there are more than 50 competitors in all classes by the official closing date entered in JWM, the organisers may start static judging one day before day of opening ceremony.

STATIC JUDGING

4.0.1 Proof of Scale

(a) Proof of scale is the responsibility of the contestant.

(b) Name of entry - the exact name and type designation of the subject aircraft shall be indicated on the entry form, on the 'proof of scale' documentation and on the Contestant's Declaration Sheet.

(c) The scale to which the model is built is optional, but must be stated on the entry form, on the 'proof of scale' documentation and on the Contestant's Declaration Sheet.

4.0.2 Scale Documentation

Models will be placed in a "ready box", prior to formal Static Judging, for preliminary checks to be made. During formal Static Judging a Timekeeper will ensure compliance with Rule 4.0.3. To be eligible for static points the contestant must submit the following minimum documentation to the judges:

(a) **Three identical copies of an accurate published 3-view scale drawing of the full-size aeroplane.** Unpublished drawings by the contestant or other draughtsman are only acceptable if they are certified in writing as accurate in advance of the contest, by an authoritative source (such as the respective National Scale Committee or equivalent), the builder of the original aircraft, or other competent authority.

(b) **A maximum of 12** differing photographs, or published printed reproductions, of the full-size aircraft, including at least one of the actual subject aircraft being modelled. At least one of these must show the prototype aircraft on the ground to allow the landing gear assembly to be judged.

(c) Proof of the colour match is required. This may be presented in the form of colour chips and colour photos. If proved by photos, a maximum of 2 additional photos allowed.

(d) Photographs must be considered to be more important than 3-views, and will take precedence over three-view drawings for verifying scale outlines.

(e) If the judges suspect that the information supplied in the presented documentation has been manipulated, the Contest Director should be informed immediately by the spokesman for the static judges. The Contest Director will then decide how to proceed.

(f) If the contestant presents only partial or excessive documentation, the static score points will be awarded in proportion to the documentation supplied.

(g) If the contestant presents no documentation at all, the static judging cannot be performed, and the static score will be zero.

(h) In the event that there is conflicting evidence in the documentation presented, it is the responsibility of the contestant, before judging commences, to indicate to the static judges which documents they are to ignore.

(i) The complete documentation should be submitted in triplicate prior to the static judging. After the static judging is finished, one copy of the documentation will stay with the static judging panel until the end of the competition.

(j) Any tampering to the documentation can result in disqualification of the offending contestant.

(k) Documentation format: A4 size, landscape with hinge on long side (calendar format)

A full set of documentation must be available for each judge.
For proof of the colours, the colour chips and 2 additional photos must be available in a separate document.

The order of the photos should follow the evaluation criteria. Beginning with the views (side-, front-, top view). Drawings may also be used, One photo/drawing per page.

On the following pages the photos to prove: Basic Colour and Colour Scheme, Markings, Surface, Scale Details, Cockpit.

The size of the photos/drawings must be as big and of a quality to make a judgement possible. Small and low quality photos may result in lower scores.

Requirements:
A maximum of 12 photos (excluding drawings and paint schemes) allowed for static documentation. A Minimum of three photos must show the side, front and top view of the original. At least one photo (side view) must show the original standing on it's undercarriage and at rest

To support the photos additionally, drawings may be attached.

A sufficient number of photos of the aircraft type are necessary to allow the main views to be verified.

Proof of the colour match is required. This may be presented in the form of colour chips and colour photos. If proved by photos, a maximum of 2 additional photos are permitted.

All parts of the aircraft which are not firmly attached to the airframe (e.g. bombs, drop tanks, rockets etc.) but are not shown on the photos of the views must be documented elsewhere. e.g. by means of appropriate photos. Conversely, the same parts that are shown on the photos of the views need not be present on the model and can be omitted.

Documentation shall be sufficient to verify the model as presented for Static Judging. Any item not verified will result in loss of points; Examples: 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.

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

Any items that will not be on the model when it is flown, e.g. *chocks, tie-downs, ordnance that will not be carried in flight, or other "dioramic" features, may not be presented during Static.
***chocks or similar items to fix the model on the static table are allowed.**

4.0.3 Static judging of 'Fidelity to Scale and Craftsmanship'

(a)	**Side View (left or right) Accuracy**	**K10**
(b)	**Front View Accuracy**	**K10**
(c)	**Top View Accuracy**	**K10**

(d)	**Basic Colours and Colour Scheme Accuracy**	**K10**
(e)	**Markings Accuracy**	**K10**
(f)	**Surface Accuracy**	**K10**
(g)	**Scale Details Accuracy**	**K10**
(h)	**Cockpit Accuracy**	**K5**
(i)	**Craftsmanship**	**K10**
(j)	**Overall realism**	**K15**

For all Items (a) to (j), each judge decides for himself from which distance he wants to judge, including touching. The judges are not permitted to measure any part of the model.

A maximum of 15 minutes is to be spent on the static judging of every model. (In case of two judges panels: Items (a) to (d) - 7 minutes, item (e) to (j) - 8 minutes.) The watch should be stopped when the model is repositioned. The Judges may ask the contestants questions about the model and the full-size original.

The model should be placed on a table for preference a turntable that is adjustable in height. The background should be in light colour, white preferred.

A maximum of 3 persons belonging to the team of the contestant (and including the contestant) are allowed in front of each of the judging tables.

4.0.4 Static points and Coefficient

(a) Each section in 4.0.3 shall be awarded points from 0-10 in 1/10 point increments by each judge and these points shall then be multiplied by the appropriate K factor (shown in 4.0.3). The scores of all judges will be added together to give the total static points. The design of the score sheet shall ensure that the two panels of 3 static judges are paired consistently throughout the process of static judging.

(b) The static points can only be used in the final classification of the contest after the model has commenced at least one official flight (i.e. after the model has left the ground).

(c) The maximum number of points possible, after applying the K factors, is 3000 points.

4.0.5 Normalisation of Static Score

After static judging is completed, the static points are normalised to 1500. This means that the top static score is always the maximum of 1500. The following formula applies to the other scores:

$Px = Sx/Sw*1500$

Px: Normalised static score awarded by judges
Sx: static raw score of competitor x
Sw: top static raw score (winner)

Further information on the static part of the competition can be found under section 9: judge's guidelines to static judging.

4.0.6 Release of Static Scores

Until all competitors have cleared Static Judging no static scores will be made available **until released by the chief Judge and**, in any event, they will not be released until, at the earliest, completion of the second flying round.

FLYING JUDGING

5.0.1 Official Flights

(a) Each contestant will be called to fly three rounds in the case of one flight line and four rounds in the case of two flight lines. Organisers will have the option of one or two flight lines, with the two flight lines option being dependent on the availability of suitable runways and a total of 16 judges to ensure the requirements of Rule 2.0.6 (a) are met. Each contestant must execute an official flight within the required time limit (see 5.0.2) on each occasion to be eligible for flight points for that flight. In the case of one flight line and three flying rounds, the best two flight scores will count towards the final classification, the lowest scoring flight being discarded. In the case of two flight lines and four flying rounds, the best three flight scores will count towards the final classification, the lowest scoring flight being discarded. If less than the total number of rounds - required for the number of flight lines - are flown, due to adverse weather etc., no flight scores will be discarded, i.e. all flight scores will count towards the final classification. The organisers will endeavour to complete the required number of flying rounds.

(b) If a contestant is unable to start or complete a flight and, in the opinion of the Contest Director, the cause is outside the contestant's control (e.g. sudden adverse weather or safety reasons) the C.D. may, at his discretion, allow the contestant a re-flight. The C.D. shall decide when the re-flight shall take place. If there is any doubt, the contestant should be allowed a re-flight as soon as possible. Then if the reason for the re-flight was subsequently considered not valid the protest procedure should be invoked. This will avoid delaying the closure of the competition to accommodate late re-flights. It will also allow re-flights to be made in similar weather conditions to the original scheduled flight.

(c) An official flight commences at the earliest of the following:

- The contestant signals to the timekeeper that he is commencing to start his engine(s).
- Two minutes after the contestant is instructed to start his flight by the Timekeeper.

(d) An official flight is scored and will count towards the final classification as from the moment the model has left the ground.

(e) In each flying round, only one attempt at an official flight is allowed (i.e., as soon as the model has left the ground, the flight counts for that round).

(f) In each flight, only one attempt is allowed for each manoeuvre after the start of the manoeuvre has been called.

(g) The organisers must make the airfield available for local familiarisation flying for two days before the start of the competition.

5.0.2 Flying Time

(a) All contestants will be given at least 10 (ten) minutes warning before they are instructed to start their flight.

(b) The contestant will then be instructed to start his flight.

(c) Timing of the flight will start when the official flight commences (see 5.0.1 (c)).

(d) Contestants with single-engine models will be allowed 12 (twelve) minutes to complete the flight, while an additional minute will be allowed for each extra engine in the case of multi-engine models.

(e) No points will be awarded for any manoeuvre that is not completed at the end of the time allowed. 'Overall Realism' points will be awarded, in proportion to the amount of the flight completed.

(f) An additional 3 (three) minutes of flight time is allowed for non-aerobatics aircraft.

(g) The flying judging and flying time stops at completion of manoeuvre (c): Circuit, Approach and Landing.

5.0.3 Starting Time

(a) No limit is imposed on the starting time, only the flying time as defined under 5.0.2 is taken into account.

(b) If the engine(s) stop(s) before the model is airborne, the engine(s) may be restarted but the timing continues. Should this happen during the take-off roll, the score will be in proportion of the amount of the manoeuvre completed before the engine stopped. The subsequent take-off after restart will not be scored again.

5.0.4 Flight Schedule

Each contest flight will consist of 2 mandatory manoeuvres and 6 optional manoeuvres, and will also be awarded points for 'Overall Realism'.

Take-off (mandatory)	K = 10
Option 1	K = 10
Option 2	K = 10
Option 3	K = 10
Option 4	K = 10
Option 5	K = 10
Option 6	K = 10
Circuit, approach and landing (mandatory)	K = 15
Overall Realism:	
Smoothness	**K = 5**
Speed	**K = 5**
Flight presentation and selection of variety of turning manoeuvres	**K = 5**

Note 1: The six optional manoeuvres shall be chosen, one from each of the groups defined in 5.0.6 and entered on the scoring sheet by the contestant in the order in which he chooses to fly them. In flight 2 the contestant cannot choose the same set of optional manoeuvres like in flight 1. This means, in flight 1 the option manoeuvres are completely different compared to flight 2. Flight program of flight 3 can be same or different as flight 1 and 2. If flight 1 was not flown, in flight 3 the contestant cannot choose the same set of optional manoeuvres like in flight 2. If any manoeuvre of any performed flight scored "0" this manoeuvre is considered selected.

Note 2: Taxiing is not considered to be a manoeuvre and is NOT included in the judgement of Overall Realism.

Note 3: Other than in the case of scores for 'Overall Realism', the 'Flying' judges may not harmonise the scores, as the high and low scores for each manoeuvre are not counted. All mandatory and optional manoeuvres are to be judged independently by each judge. Judges

are allowed to confer and to harmonise scores only for 'Overall Realism'. The judges may not allow any bias in their scoring due to contestant's lobby, model type, appearance, design, or engine (gas-turbine, ducted fan or electric ducted-fan).

Note 4: All flying manoeuvres must be judged while having in mind the performance of the full size prototype. The aim of the scale flight schedule is to recreate the flight characteristics and realism of the full size aircraft. Judges must therefore not confuse this scale competition with an aerobatics competition. This means that the requirements of "realism" and being "in keeping with the prototype" have to prevail in all judging manoeuvres.

NB: SEE ATTACHMENT NO. 1 TO THE RULEBOOK FOR DIAGRAMS & FULL DETAILS OF ALL MANOEUVRES

5.0.5 Mandatory manoeuvres (all types)

(a) **Take-off** - The model shall leave the runway after the judge's centreline and climb away on a constant heading and climb angle appropriate to the prototype for a duration of minimum five seconds, "End " is called before entering the circuit. During this time, if fitted, the landing gear retraction sequence must be initiated. Judging commences when "Start" is called and the brakes are released at the beginning of the take-off run, the taxi out prior to take-off is not judged.

Errors:

- *Model is touched after start is called (zero marks)*
- *Model veers off runway direction on take-off*
- *Take-off distance is not in keeping with the prototype*
- *Speed unrealistic or acceleration too rapid*
- *Lift-off not smooth*
- *Climb rate and nose attitude during climb not in keeping with the prototype*
- *Nose attitude during climb not in keeping with the prototype*
- *Flaps not used if applicable*
- *Landing gear sequence not initiated if applicable*
- *Climb-out track not the same as the track of the take-off run*
- *Climb out too short*
- *Failure to call Start and/or End*

(b) **Circuit, Approach and Landing** - Beyond the runway and at an appropriate height the model approaches the judge's centreline at which point "Start" is called and the model performs a circuit and landing in the manner of the prototype aircraft, extending the gear during the downwind leg and using all installed means (landing gear, flaps and drag inducing equipment if fitted) to restrict the speed to a safe minimum as normally achieved during the height reduction turn into a landing approach before touching down on the runway centreline before the judge's centreline and braking to a halt after a straight deceleration at which point "End" is called and judging and flight timing stops. The taxi back will not be judged. Retractable landing gear (where fitted) to be extended during the downwind leg of the circuit, and flaps, spoilers, speed brakes etc., are to be extended as per the full-size prototype and weather conditions.

Errors:

- *Flight not completed within allocated time, at which point judging stops*
- *Manoeuvre does not commence parallel to the runway on the upwind leg*
- *Variation of altitude during first crosswind pass and before the downwind leg*
- *Circuit is not centred on the judge's centreline*
- *Downwind track not parallel to runway axis*
- *Landing gear not extended on downwind leg*
- *Altitude changed before appropriate descent point*
- *Descent not smooth and continuous*

- *Model does not adopt a landing attitude appropriate to subject type*
- *Model bounces on touch down*
- *Model does not come to a gradual and smooth stop after landing*
- *Model touches wing tip on the ground during landing*
- *One gear leg collapses after touch down = 20% penalty (same if one gear not extended*
- *during approach)*
- *Two or all gear legs collapse after touch down = 50% penalty (same if two or all gear legs*
- *not extended during approach)*
- *Failure to call Start and/or End*
- *Landing run not straight*
- *Manoeuvre too far away, too close, too high or too low*

Note: All landings ending with the model on its back will be regarded as a crash landing and scored zero.

5.0.6 Optional Manoeuvres

(a) Only the optional manoeuvres, which are described below in this rulebook, are allowed.

(b) Taxiing manoeuvres are not regarded as an option and will NOT be considered in the 'Overall Flight Realism' section.

(c) Non-aerobatic type aircraft are not permitted to choose the dedicated aerobatic options listed below. Aerobatic type aircraft are not permitted to choose the dedicated non-aerobatic type manoeuvres listed below.

(d) Each manoeuvre may only be nominated once for each contest flight.

(e) The six optional manoeuvres shall be chosen one from each of the groups defined below. They may be flown in any order but that order must be defined in advance of the flight and flown in the same order as filled in on the scoring sheet.

(f) Dropping of stores (tanks, bombs or any other external stores) cannot be chosen as an optional manoeuvre. However, it is allowed if called (for example to clean up the airframe after straight flight and before starting any of the aerobatic optional manoeuvres). It will be considered in the 'Overall Realism' section (see 5.0.7 (b)). The contestant must inform the judges of any intentional external stores drop; otherwise rule 2.0.8 (g) will apply.

(g) The grouping of manoeuvres will be re-assessed at every IJMC AGM and will be decided at least 12 months before a Jet World Masters competition.

<u>Group 1</u>

(11) Horizontal Figure of Eight (non aerobatic only) - Beyond the runway and at an appropriate height "Start" is called and the model approaches in straight and level flight at a safe height (1), then makes a one-quarter circle turn in a direction away from the judges (2), followed (3) by a 360° circle turn (3a, 3b, 3c) in the opposite direction. This is followed (4) by a three-quarter circle turn (4a, 4b) in the same direction as the first turn, completing a figure-of-eight, parallel to the runway centreline and at a constant altitude. "End" is called well after the judge's centreline. The manoeuvre ends on the same altitude and heading as the start, and should be centred on the judge's centreline.

Errors:

- *Entry into first circle not at right angles to original flight path*
- *Circles are of unequal size*
- *Circles misshapen*
- *Constant height not maintained*
- *Intersection not centred on judge's centreline*

- *Entry and exit paths not contiguous and parallel with runway*
- *Overall size of manoeuvre not realistic for prototype*
- *Model flight path not smooth and steady*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(12) **Cuban 8 with two 1/4 rolls (aerobatic only) -** The model approaches parallel with and well beyond the runway in level flight at a safe height. "Start" is called and, after passing the judge's centreline, the model pulls up into 5/8th's of an inside loop and continues heading downward at 45 degrees, inverted. The model performs two quarter rolls on the judge's centreline to upright on the 45-degree downline, followed by a 3/4's inside loop to 45 degrees down inverted. The model then executes two quarter rolls on the judge's centreline of the 45-degree downline to upright flight, recovering through a 1/8th loop to straight and level upright flight on the same track, heading and altitude as at the start of the manoeuvre.
Errors:

- *Manoeuvre not performed in a constant vertical plane that is parallel with the judges line*
- *Loops are not in keeping with the prototype*
- *Loops are not the same size*
- *Quarter rolls are not centred on judge's centreline - aircraft should be in knife-edge at crossover point*
- *45 degree descent path not achieved*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Inappropriate use of throttle*
- *Size and speed of loops not in manner of prototype*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Failure to call Start and/or end*
- *Manoeuvre too far away, too close, too high or too low*

(13) **Cuban Eight (aerobatic only)** - Beyond the runway and at an appropriate height "Start" is called the model approaches parallel to and well beyond the runway (1). After passing the judges' centreline, the model pulls up (2) into approximately 5/8 of an inside loop and continues heading downward (3) at 45°, inverted. The model performs a half roll at the intersection (on the judges' centreline), followed (5) by another approximately 3/4 inside loop to 45° inverted (6). The model then executes a half-roll to normal flight (7) on the judges' centreline, and then recovers (8) to straight and level flight on the same track, heading and altitude as the start.

Errors:

- *Manoeuvre not performed in a constant vertical plane that is parallel with the judges line*
- *Loops not in keeping with the prototype*
- *Loops not the same size*
- *Half rolls not centred on judge's centreline*
- *45° descent path not achieved*
- *Model does not exit manoeuvre at same height as entry*
- *Entry and exit paths not contiguous and parallel with runway*
- *Inappropriate use of throttle*
- *Size and speed of loops not in manner of prototype*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(14) **Combination Immelman/Split-S (aerobatic only)** - *parallel to and well beyond the runway "Start" is called the model approaches in straight and level flight at a safe height and approximately 75 meters after it has passed the judges centreline it pulls up into a half inside loop and immediately executes a half roll to normal attitude. After straight and level flight of approx.150 meters, the model performs a half roll to inverted, and an immediate half inside loop downwards to recover into level flight on the same heading and altitude as at the start.*

Errors:

- *Track of the half loop not in a vertical plane*
- *Half loops not accurately semi-circular*
- *First roll start too late, second roll starts too early*
- *Excessive height loss in the rolls*
- *The size of half loops not equal*
- *Track veers during the rolls*
- *Entry and exit paths not contiguous and parallel with runway*
- *Manoeuvre not centred on judge's centreline*
- *Size of manoeuvre and speed not in manner of the prototype*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(15) Immelman – Variable Geometry wing (aerobatic only) - parallel to and well beyond the runway at a safe height "Start" is called the model commences the manoeuvre at a safe height with wings swept back and performs a half inside loop upwards, starting at the judges centreline. During the half loop the wings are to be swept forward. On completion of the half loop the aircraft then immediately executes a half roll to resume normal level flight, on a reciprocal track parallel to that at the start. Note: this option is only available for aerobatic models equipped with Variable Geometry wings.

Errors:

- *Half loop is not semi-circular*
- *Plane of the half loop not vertical or parallel with the runway*
- *Half loop not centred on judges centreline*
- *Half loop is not in keeping with the prototype*
- *Inappropriate use of throttle*
- *Model inverted for too long or too short a time*
- *Roll starts too early or too late*
- *Excessive height loss in the roll*
- *Track veers during the roll*
- *Model does not resume straight and level flight on the opposite track to entry*
- *Manoeuvre not flown parallel with the runway*
- *Size and speed of manoeuvre not in the manner of the prototype*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(16) Horizontal Derry Eight (aerobatic only) - the model approaches in straight and level flight, parallel to and beyond the runway at a safe height "Start" is called and the model makes a one-quarter circle horizontal turn in a direction away from the judges. After the end of this quarter circle immediately turn the model about 3/4 rolls in the direction of the turn. The model continues to enter a 360-degree circle horizontal turn in the opposite direction. The model will stop rolling when upright and banked in the direction of the turn. After the end of this 360-degree circle turn immediately the model rolls about 3/4 in the direction of the turn. The model continues to roll to enter a 270 degree horizontal circle turn in the same direction as the first turn. The model will stop rolling when upright and banked in the direction of the final turn reaching horizontal flight before the judge's centreline after which "End" is called. The manoeuvre ends on the same altitude and heading as the start, and should be centred on the judge's centreline.

Errors:

- *Entry into first circle not at right angles to original flight path*
- *Circles are of unequal size*
- *Circles misshapen*
- *Constant height not maintained*
- *Intersection not centred on judge's centreline*
- *Entry and exit path not contiguous and parallel with runway*
- *Entry and exit path not parallel with judges line*

- *Overall size of manoeuvre not realistic for prototype*
- *Model flight path not smooth and steady*
- *Manoeuvre too far away, too close, too high or too low*
- *Failure to call Start and/or End*
- *Inappropriate roll rates*

(17) Cobra Roll (aerobatic only) - parallel to and well beyond the runway at a safe height the model approaches in straight and level flight, pulls up into a 45 degree climb and executes a half roll to inverted. It then completes a 1/4 inside loop into a 45 degree dive, executes a half roll to upright, and recovers to level flight at the same altitude and heading as the start. The highest point of the 1/4 inside loop should be on the judge's centreline.

Errors:
- *Manoeuvre not performed in a vertical plane that is parallel with the runway*
- *Quarter loop is not centred on judge's centreline*
- *45 degree climb and descent paths not achieved*
- *Half rolls not centred in climb and descent part of figure*
- *Entry and exit path not contiguous and parallel with runway*
- *Model does not exit manoeuvre at same height as entry*
- *Inappropriate use of throttle*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(18) 360° ascending circle (all types) - The model approaches parallel with and beyond the runway in level flight at a minimum height of 5 meters, "Start" is called and at the centre the model pitches up and performs a gentle 360 degree ascending circle, in a direction away from the judges. The manoeuvre terminates on the judge's centreline by resuming straight and level flight on the same track and heading as at the start of the manoeuvre.

Errors:
- *Rate of ascent not constant*
- *Ascent too steep*
- *Circle misshapen*
- *No significant height gain*
- *Model exits at excessive height*
- *Circle not centred on judge's centreline*
- *Entry and exit paths not parallel to the runway*
- *Failure to call Start and/or end*
- *Manoeuvre too far away, too close, too high or too low*

(19) 360° ascending circle with gear retraction (all types) - The model approaches parallel with and beyond the runway in level flight at a minimum height of 5 meters "Start" is called with the undercarriage already deployed, at the centre the model pitches up and performs a gentle 360 degree ascending circle, in a direction away from the judges, during which the gear is retracted. The manoeuvre terminates on the judge's centreline by resuming straight and level flight on the same track and heading as at the start of the manoeuvre.

Errors:
- *Gear not fully extended before commencement of manoeuvre is called*
- *Rate of ascent not constant*
- *Ascent too steep*
- *Circle misshapen*
- *No significant height gain*
- *Gear not fully retracted during ascent*
- *Model exits at excessive height*
- *Circle not centred on judge's centreline*
- *Entry and exit paths not parallel to the runway*

- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

Group 2

(21) **Procedure Turn (non aerobatic option only)** - the model approaches parallel to and beyond the runway in straight and level flight at a safe height and "Start" is called well before the judge's centreline, the model then makes a one-quarter circle turn in a direction away from the judges followed by a 270 degree turn in the opposite direction. The manoeuvre ends on the same altitude and on a reciprocal heading to the start. The transition from the one-quarter circle turn to the 270 degree turn should be on the judge's centreline.

Errors:
- *Entry into the 270° turn not at right angles to original flight path*
- *270° turn not at a constant radius*
- *Angle of bank through the turns not appropriate to the prototype aircraft*
- *Constant height not maintained*
- *Transition not centred on judge's centreline*
- *Entry and exit path not contiguous and parallel with runway*
- *Overall size of manoeuvre not realistic for prototype*
- *Model flight path not smooth and steady*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(22) **Chandelle (non aerobatic option only)** - the model approaches parallel to and beyond the runway in straight and level flight at a safe height, "Start" is called and at the judge's centreline turns away to perform a 180 degree climbing turn in a direction away from the judges. During the first 90 degrees of the turn the model simultaneously climbs and rolls into the turn. During the second 90 degrees the model continues climbing while gradually lowering the nose and rolling away from the turn. At the end of the manoeuvre the model attains a level upright attitude on a reciprocal heading but significantly higher than at the start of the manoeuvre.

Errors:
- *Approach and departure not parallel to runway*
- *Approach and departure not horizontal*
- *Climb rate not constant*
- *Turn rate not constant*
- *Turn not 180 degrees*
- *Manoeuvre does not start and finish on the judge's centreline*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(23) Positive 'G' Roll (aerobatic only) - the model approaches in level flight and parallel to the runway at a safe height, "Start" is called and the model performs a 360 degree roll away from the judges while simultaneously pitching up, describing a gentle helical flight-path reaching inverted flight on the judge's centreline, and resuming level flight, again parallel to the runway but further away than on the entry track and at entry height.

Errors:
- *Rate of roll not constant*
- *Rate of pitch not constant*
- *Style of roll not typical of the prototype*
- *Roll not centred on judge's centreline*
- *Entry and exit at different heights or speeds*
- *Entry and exit path not contiguous and parallel with runway*
- *Attitude at exit is not the same as attitude at entry*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(24) **360 degree Wing-extending Turn – Variable Geometry wing (aerobatic only)** - the model approaches parallel to and beyond the runway at a safe height with wings swept back, "Start" is called before it enters a 360 degree circle, commencing by turning away from the judge's on the centreline. The model adopts a rate of bank appropriate to the wing configuration and a constant altitude. While executing the 360 degree circle the wings are extended and the model decelerates to recover to straight and level flight on the same heading and altitude as the start. The rate of turn should be in keeping with the prototype.

Errors:
- *Circle not centred on judge's centreline*
- *Constant height not maintained*
- *Entry and exit paths not contiguous and parallel with runway*
- *Lack of speed reduction during wing extension*
- *Overall size of manoeuvre not realistic for prototype*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(25) Half Reverse Cuban Eight (aerobatic only) - "Start" is called as the model approaches parallel to and well beyond the runway straight and level at a safe height and pulls to a 45 degree upline, performs a half roll on the judges' centreline then pulls through a 5/8th's inside loop to resume straight and level flight at the entry height on a reciprocal track.

Errors:
- *Manoeuvre not performed in a vertical plane that is parallel with the judge's centreline*
- *Loop portion of the manoeuvre not circular*
- *Half roll not centred on judge's centreline - model should be in knife-edge at this point*
- *45 degree ascent path not achieved*
- *Entry and exit paths not contiguous and parallel with runway*
- *Inappropriate use of throttle*
- *Size and speed of manoeuvre not in the manner of the prototype*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(26) **Half Cuban Eight (aerobatic only)** - "Start" is called as the model approaches parallel to and well beyond the runway straight and level and at a safe height. After passing the judges' centreline, the model pulls up into a 5/8th's inside loop and continues inverted downward at 45 degrees performing a half roll to upright on the judge's centreline pulling out to resume straight and level flight at the entry height on a reciprocal track.

Errors:
- *Manoeuvre not performed in a vertical plane that is parallel with the judge's centreline*
- *Loop portion of the manoeuvre is not circular*
- *Half roll is not centred on judge's centreline - model should be in knife-edge at this point*
- *45 degree descent path not achieved*
- *Entry and exit paths not contiguous and parallel with runway*
- *Inappropriate use of throttle*
- *Size and speed of manoeuvre not in the manner of the prototype*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(27) **3 consecutive rolls right–left–right or opposite (aerobatic only)** - The model approaches parallel to and beyond the runway at a safe height and at a constant rate performs three consecutive rolls, the second being on the judge's centreline where it will appear inverted and rolling in the opposite direction from the first and third, and resumes straight and level flight on the same track and heading as at the start of the manoeuvre after which "End" is called.

Errors:
- *Rate of rolls not constant*

- *Style of rolls not typical of the prototype*
- *Second roll not inverted as it passes the judge's centreline (i.e. manoeuvre was not centred)*
- *Entry and exit at different heights or speeds*
- *Model does not resume straight and level flight on same track as entry*
- *Rolls not horizontal*
- *Hesitation between each roll*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(28) **Touch and Go (all types)** - With all installed means (landing gear, flaps and drag inducing equipment if fitted) to restrict the speed of the model to a safe minimum, as normally achieved during the landing height reduction turn, already deployed "Start" is called far out on the downwind leg and, the model turns into a landing approach before touching down on the runway centreline shortly before the judge's centreline. After an accelerating run of not less than 5 meters the model accelerates and takes off followed by a climb on the take-off heading and climb angle appropriate to the prototype for a minimum of 5 seconds, during which the landing gear sequence is initiated before calling "End" and entering the circuit. During the climb the "cleaning up" process should be initiated in the style of the prototype aircraft.

Errors:

- *Landing gear etc. not extended in a manner appropriate to the full-size prototype*
- *Descent not smooth and continuous*
- *Speed too high during descent*
- *Model does not adopt landing attitude appropriate to the prototype*
- *Model bounces on touch down*
- *Touchdown not on runway centreline*
- *Should model be unable to take off manoeuvre and rest of flight to be scored zero*
- *Model veers off runway direction on ground roll*
- *Ground roll too short*
- *Acceleration too rapid*
- *Lift-off not smooth*
- *Climb out too short*
- *Flaps etc. not used if applicable*
- *Nose attitude during climb not in keeping with the prototype*
- *Landing gear sequence not initiated if applicable during climb out*
- *Failure to call Start and/or End*
- *Climb-out track not in line with take-off run*
- *Manoeuvre too far away, too close, too high or too low*

Group 3

(31) **Flight in straight line max 5m (non aerobatic only)** - "Start" is called and the model approaches parallel with and beyond the runway in straight flight and makes a low fly-by of 5 - 10 seconds, at a safe height.

Errors:

- *Track not straight*
- *Height not constant*
- *Manoeuvre not centred on judge's centreline*
- *Start and/or end not called in straight and level flight*
- *Manoeuvre too short in time*
- *Model's flight not smooth and steady*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Failure to call Start and/or End*

- *Manoeuvre too far away, too close, too high or too low*

(32) **Straight flight at low speed (non aerobatic only)** - "Start" is called and the model approaches parallel with and beyond the runway at a safe height in straight flight having previously deployed all installed means (landing gear, flaps and drag inducing equipment if fitted) to restrict the speed to a safe minimum as would be achieved during a landing approach, for a duration of 5 - 10 seconds.

Errors:
- *Installed speed reduction equipment not deployed before start is called*
- *Track not straight*
- *Height not constant*
- *Speed varies during manoeuvre*
- *Start and finish not called in straight and level flight*
- *Manoeuvre not centred on judge's centreline*
- *Entry and exit paths not contiguous and parallel with runway*
- *Manoeuvre too short in time*
- *Model's flight not smooth and steady*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*
- *Installed speed reduction equipment retracted before end is called*

(33) **Positive 'G' Roll with landing gear extended (aerobatic only)** - nearly identical to the positive 'G' roll but executed at a moderate speed with the landing gear extended. The model approaches in level flight and parallel to the runway at a safe height, with the landing gear already extended before "start" is called and performs a 360 degree roll away from the judges while simultaneously pitching up, describing a gentle helical flight-path reaching inverted flight on the judge's centreline, and resuming level flight, again parallel to the runway at the same height but further away than on the entry track. Gear remains extended until after "end" is called.

Errors:
- *Landing gear not extended prior to start of manoeuvre*
- *Rate of roll not constant*
- *Rate of pitch not constant*
- *Style of roll not typical of the prototype*
- *Speed with landing gear extended too high or not typical of prototype*
- *Roll not centred on judge's centreline*
- *Entry and exit at different heights or speeds*
- *Entry and exit tracks not parallel to each other*
- *Attitude at entry is not the same as attitude at exit*
- *Gear retracted before "End" called*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(34) **2 point roll (aerobatic only)** - "Start" is called and the model approaches parallel with and beyond the runway in straight and level flight at a safe height at a constant rate and, in the manner of the prototype, performs two half rolls, hesitating at the midpoint then resuming straight and level flight on the same height, heading and altitude.

Errors:
- *Rotation rate of half rolls differ*
- *Style of half rolls not typical of the prototype*
- *Interval between each half roll not centred on judge's centreline*
- *Lack of discernible hesitation between each half roll*
- *Start and finish not called in straight and level flight*
- *Entry and exit at different heights or speeds*
- *Entry, and exit paths and line of half rolls not contiguous or parallel with runway*

- *Style of roll not nominated*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(35) **Two turn Spin (aerobatic only)** - The model approaches parallel with and well beyond the runway at a suitable height in straight and level flight, reducing power to idle and simultaneously raising the nose, the model decelerates into an upright stall on the judge's centreline, and commences a spin through two turns to recover to level flight on the same track as the initial flight direction after which "End" is called.

Errors
- *Incorrect use of the throttle or flight controls at point of stall.*
- *Forced spin entry, not clean and positive.*
- *Not a true spin but a spiral dive which is a tight vertical barrel roll which would score a zero. In a true spin the descent path will be close to the C of G of the model.*
- *Not two complete turns.*
- *Start of spins not centred on judge's centreline.*
- *Model does not resume straight and level flight on same track as entry.*
- *Entry and exit paths not parallel with the runway.*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(36) **Reverse Cuban Eight (aerobatic only)** - "Start" is called and the model approaches parallel with and well beyond the runway at a safe height, straight and level, and pulls up to a 45 degree upline, performs a half roll on the judge's centreline then pulls through a 3/4 inside loop to a 45 degree upline performing a half roll on the judge's centreline followed by a 5/8 inside loop to resume straight and level flight at the entry height and on the original track.

Errors:
- *Manoeuvre not performed in a constant vertical plane that is parallel with the runway*
- *Loops are not in keeping with the prototype*
- *Loops are not the same size*
- *Half rolls not centred on judge's centreline - model should be in knife-edge at crossover point*
- *45 degree ascent paths not achieved*
- *Inappropriate use of throttle*
- *Size and speed of loops not in manner of prototype*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(37) **Loop with roll on top (aerobatic only)** - "Start" is called and the model approaches upright, parallel with and well beyond the runway. After passing the judge's centreline, the model performs a loop, with one integrated roll over the top 60 degrees exiting to straight and level upright flight on the same track, heading and altitude as at the start of the manoeuvre.

Errors:
- *Plane of loop not vertical and/or parallel with the runway*
- *Loop not in keeping with the prototype*
- *Inappropriate use of throttle*
- *Size and speed of manoeuvre not in the manner of the prototype*
- *Manoeuvre not centred on the judge's centreline with the model upright on the centreline of the loop*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(38) **Overshoot (all types) -** with all installed means (landing gear, flaps and drag inducing equipment if fitted) to restrict the speed of the model to a safe minimum, as normally achieved

during the landing height reduction turn, already deployed "Start" is called far out on the downwind leg and, the model turns into a landing approach but before touching down on the runway centreline at a height of approximately 3 meters, aborts the landing and applies full power. The model then accelerates and climbs out on a constant heading and angle appropriate to the prototype for a minimum of 5 seconds during which time the landing gear sequence is initiated before calling "end" and entering the circuit. During the climb the "cleaning up" process should be initiated in the style of the prototype aircraft.

Errors:

- *Landing gear not extended in a manner appropriate to the full-size prototype*
- *Altitude changed before appropriate descent point*
- *Descent not smooth and continuous*
- *Speed too high during descent*
- *Model does not adopt landing attitude appropriate to the prototype*
- *Abort of landing more than 3m above ground*
- *Climb rate incorrect (not appropriate to the prototype)*
- *Nose attitude during climb not in keeping with the prototype*
- *Flaps not used if applicable*
- *Landing gear retraction sequence not initiated if applicable*
- *Exit path not contiguous and parallel with runway*
- *Climb out too short*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

Group 4

(41) **Flight in Triangular Circuit (non aerobatic option only) -** The model approaches parallel with and beyond the runway at a safe height in level flight before "Start" has been called. Approximately 100 meters after passing the judge's centreline, the model turns through 120 degrees (away from the judges). It then flies straight and level for approximately 200 meters, turns 120 degrees in the same direction as before, then continues straight and level for a further 200 meters approximately. It then makes a final 120 degree turn in the same direction as before, and flies straight and level (parallel to the runway), completing an equilateral triangle, recovering with the model at the same altitude and heading as at entry. The manoeuvre does not end until the triangle is completed after which "End" is called.

Errors:

- *Model changes height*
- *Rate of turn at corners not constant*
- *Angular differences between the 3 corners*
- *Sides of triangle are not straight*
- *Sides of triangle are not equal in length*
- *Sides of triangle are too short*
- *Correction for drift not properly made*
- *Triangle not centred on judge's centreline*
- *Entry and exit paths not contiguous and parallel with runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*
- *Triangle not centred on judges centreline*
- *Manoeuvre too far away, too close, too high or too low*

(42) **Flight in Triangular Circuit dirty configuration (non aerobatic only) -** The model approaches parallel with and beyond the runway at a safe height in level flight with the undercarriage, speed brakes and flaps deployed before "Start" is called. Approximately 100 meters after passing the judge's centreline, the model turns through 120 degrees (away from the judges). It then flies straight and level for approximately 200 meters, turns 120 degrees in the same direction as before, then continues straight and level for a further 200 meters approximately. It then makes another 120 degree turn in the same direction as before, and

flies straight and level (parallel to the runway), completing an equilateral triangle, recovering with the model at the same altitude and heading as at entry. The undercarriage etc. must not be retracted until the manoeuvre ends when the triangle is completed and "End" is called.

Errors:

- *Undercarriage not deployed before "Start" is called*
- *Model changes height*
- *Rate of turn at corners not constant*
- *Angular differences between the 3 corners*
- *Sides of triangle are not straight*
- *Sides of triangle are not equal in length*
- *Sides of triangle are too short*
- *Correction for drift not properly made*
- *Triangle not centred on judge's centreline*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Undercarriage retracted before "End" has been called*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(43) **Lazy 8 (non aerobatic only) -** The model approaches parallel with and beyond the runway at a safe height in level flight. "Start" is called before it reaches the judges and after passing the centre it starts a smooth curving climbing turn of constant radius away from the judges. At the apex of the turn the bank should not exceed 60º and the model should be on a heading at 90° to the runway. The model then starts a descending turn as the bank comes off and at 225° from the start begins a straight section at the same height as at the entry to cross the centreline at 45° towards the judges to begin a 270° climbing and diving turn away from and then back towards the judges to cross the centreline at 45° with the wings level and at the same height as at the entry. A final turn of 45° exits the manoeuvre parallel to the runway in straight and level flight.

Errors:

- *Insufficient climb achieved*
- *Insufficient bank achieved*
- *Climb and descent curves not equal throughout manoeuvre*
- *Apex of climbing turns not of equal height*
- *Manoeuvre not symmetrical about judges' centreline*
- *Crossover not on judge's centreline*
- *Arcs misshapen*
- *Start and finish positions not as indicated*
- *Overall size of manoeuvre not realistic for subject aircraft*
- *Model flight path not smooth and steady*
- *Apexes of turns not coincident with a model heading of 90 degrees*
- *Wings not level at the crossover*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*
- *Wings not level at the crossover*

(44) Split "S" (aerobatic only) - after calling "Start" the model approaches parallel with and well beyond the runway at a suitable height in straight and level flight, reducing power, performs a half roll to arrive in the inverted position at the judge's centreline, and then immediately makes a half inside loop downwards, and resumes normal level flight on a reciprocal track to that at the start calling, "End" after passing the judge's centreline and establishing straight and level flight.

Errors:

- *Roll starts too early or too late*
- *Track veers during half roll*
- *Excessive height loss in the roll*

- *Model inverted for too long before commencing half loop*
- *Inappropriate use of throttle*
- *Plane of the half loop not vertical or on line*
- *Half loop not centred on judge's centreline*
- *Half loop is not in keeping with the prototype*
- *Entry and exit paths not parallel with runway*
- *Size of manoeuvre and speed not in manner of the prototype*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(45) **Immelman Turn (aerobatic only)** - parallel to and well beyond the runway and at a safe height "Start" is called and the model approaches in straight and level flight, starting at the judge's centreline it pulls up into a half loop immediately executing a half roll at the top to resume level upright flight, on a reciprocal track to that at the start. "End" is called having establishing straight and level flight following completion of the roll.

Errors:
- *Entry not parallel to with runway*
- *Plane of the half loop not vertical or on line*
- *Half loop not centred on judge's centreline*
- *Half loop not in keeping with the prototype*
- *Inappropriate use of throttle*
- *Roll-out not immediate on completion of half loop*
- *Excessive height loss in the roll*
- *Track veers during the roll*
- *Size and speed of manoeuvre not in the manner of the prototype*
- *Entry and exit paths not parallel with runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(46) **8 point roll (aerobatic only)** - The model approaches parallel with and beyond the runway at a safe height in level flight. After "Start" is called it rolls at a constant rate through eight 45° elements, hesitating at each of the seven equally spaced intervals, passing through inverted on the judge's centreline and resumes straight and level flight on the same heading and altitude before "End" is called.

Errors:
- *Rate of rolls not constant*
- *Style of roll not typical of the prototype*
- *Roll not centred on judge's centreline*
- *Entry and exit at different heights or speeds*
- *Model does not resume straight and level flight on same track as entry*
- *Style of roll not nominated*
- *One or more of the quarter rolls deviate from 90 degrees*
- *Intervals between each part of roll different*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(47) **Slow roll (aerobatic only)** - parallel to and beyond the runway "Start" is called and the model approaches in straight and level flight and rolls at a constant and slow rate through one complete revolution appearing inverted on the judge's centreline and resumes straight and level flight on the same heading and altitude, taking 3 - 5 seconds to execute the slow roll. This manoeuvre should be performed horizontally. "End" is called having establishing straight and level flight following completion of the roll. Contestants to nominate combat or airshow style.

Errors:

- *Rate of roll not constant*
- *Style of roll not typical of the prototype*
- *Roll not centred on judge's centreline*
- *Entry and exit at different heights or speeds*
- *Entry and exit paths not contiguous and parallel with runway*
- *Style of roll not nominated*
- *Roll rate too fast*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(48) **Slow Flight in "dirty" configuration (all types)** - the model approaches in straight and level flight parallel to and beyond the runway at a safe height in a "dirty" configuration with the landing gear and all other drag inducing equipment already deployed. "Start" is called and the model will fly at just above landing speed for a minimum duration of 10 seconds, centred about the judge's centreline after which "End" is called before "cleaning up" the drag inducing equipment.

Errors:
- *Landing Gear not extended*
- *Flaps, airbrake(s) and/or spoiler(s) not extended if applicable*
- *Model does not fly a straight course parallel to the runway centreline*
- *Model gains or loses height*
- *Manoeuvre not centred on judge's centreline*
- *Manoeuvre too short in time*
- *Entry and exit paths not contiguous and parallel with runway*
- *Model's flight not smooth and steady*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

Group 5

(51) 360 degree Horizontal Circle (non aerobatic option only) - Parallel to and beyond the runway "Start" is called and the model approaches in straight and level flight at a safe height before entering a 360 degree circle, commencing by turning away from the judges on their centreline. The model adopts an angle of bank and rate of turn appropriate to the prototype to recover to straight and level flight on the same heading and altitude as at the start. "End" is called after resuming straight and level flight.

Errors:
- *Circle not centred on judge's centreline*
- *Constant height not maintained*
- *Entry and exit paths not contiguous and parallel with runway*
- *Overall size of manoeuvre not realistic for prototype aircraft*
- *Bank angle and rate of turn not realistic to prototype aircraft*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(52) 2 half rolls, one in each direction (aerobatic only) - The model approaches parallel with and beyond the runway at a safe height in level flight, After "Start" is called, it rolls at a constant rate through two half rolls changing direction of rotation between the first and second half rolls hesitating, inverted, at the interval on the judge's centreline and resumes straight and level flight.

Errors:
- *Rate of half rolls differ*
- *Lack of discernible hesitation between each half roll*
- *Style of roll not typical of the prototype*
- *Half rolls not centred on the judge's centreline*

- *Entry and exit at different heights or speeds*
- *Either of the half rolls deviates from 180 degrees of rotation and/or roll rate varies.*
- *Entry and exit paths and line of half rolls not contiguous or parallel with the runway*
- *Style of roll not nominated*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(53) Normal Vertical Roll (aerobatic only) - parallel to and well beyond the runway "Start" is called and the model approaches at a safe height in straight and level flight pulling up into a vertical full roll on the judge's centreline and recovering to level inverted flight on a reciprocal path before half-rolling to upright before "End" is called.

Errors:
- *Rate of roll not constant*
- *Style of roll not typical of the prototype*
- *Vertical Roll not centred on judge's centreline*
- *Vertical Roll more or less than 360 degrees*
- *Roll not vertical*
- *Quarter loops not of equal radius*
- *Entry and exit paths not parallel with runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(54) Two (consecutive) Axial Horizontal Rolls in the same direction (aerobatic only) - parallel to and beyond the runway and at a safe height "Start" is called and the model approaches in straight and level flight before it rolls at a constant rate through two complete consecutive rotations disposed symmetrically about judge's centreline resuming straight and level flight on the same heading before "End" is called.

Errors:
- *Rate of rolls not constant*
- *Style of rolls not typical of the prototype*
- *Rolls not level and centred on judge's centreline*
- *Entry and exit at different speeds*
- *Entry and exit paths not contiguous and parallel with runway*
- *Rolls not horizontal*
- *Hesitation between rolls*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(55) Inverted Normal Axial Horizontal Roll (aerobatic only) - parallel to and beyond the runway the model approaches at a safe height in straight and level inverted flight. "Start" is called and it rolls at a constant rate through one complete rotation appearing upright at the judge's centreline, and resumes inverted straight and level flight on the same heading not resuming upright flight until after "End" has been called.

Errors:
- *Model not inverted at start of manoeuvre (zero scored)*
- *Rate of roll not constant*
- *Style not typical of the prototype*
- *Roll not centred on judge's centreline*
- *Entry and exit at different speeds*
- *Entry and exit paths not contiguous and parallel with runway*
- *Roll not horizontal*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(56) Victory Roll (with rolling exit) (aerobatic only) - parallel to and well beyond the runway and at a safe height "Start" is called and the model approaches in straight and level flight and before reaching the judge's centreline it pulls up to a climbing flight path at approx. 45 degrees for 2-3 seconds, followed by a complete 360 degree roll on the judge's centreline. After another 2 - 3 seconds the model makes a half roll to inverted, pulls to resume inverted level flight followed by a half roll to upright attitude on the same track and heading as entry.

Errors:

- *Manoeuvre not performed in a constant vertical plane that is parallel with the runway*
- *Climb angle not constant*
- *Roll rate is too high*
- *45 degree climb path not achieved*
- *Model rolls by more or less than 360 degrees*
- *360 degree roll not centred on judge's centreline*
- *Climbing half roll omitted (manoeuvre scores zero)*
- *Entry and exit paths not parallel with runway*
- *Exit not as described*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(57) 360 degree descending circle (all types) - Commencing from straight and level flight at height, parallel with and beyond the runway, "Start" is called and from the judge's centreline the model performs a gentle 360 degree descending circle, in a direction away from the judges, at a low throttle setting. The manoeuvre terminates on the judge's centreline at a maximum height of 5 meters, resuming straight and level flight on the same path as entry until after "End" has been called.

Errors:

- *Rate of descent not constant*
- *Descent too steep*
- *Throttle setting not constant or low enough*
- *Circle misshapen*
- *No significant loss of height*
- *Model does not descend to 5 meters or below*
- *Circle not centred on judge's centreline*
- *Entry and exit paths not parallel with the runway*
- *Failure to call Start and/or End on approaching and having completed the circle*
- *Manoeuvre too far away, too close, too high or too low*

(58) 360 degree descending circle with gear extension (all types) - Commencing from straight and level flight at height, parallel with and beyond the runway, "Start" is called and the model performs a gentle 360 degree descending circle, in a direction away from the judges, at a low throttle setting while deploying the undercarriage. The manoeuvre terminates at a maximum height of 5 meters, resuming straight and level flight on the same path as entry with the undercarriage kept fully extended until after "End" is called.

Errors:

- *Rate of descent not constant*
- *Descent too steep*
- *Throttle setting not constant or low enough*
- *Circle misshapen*
- *Undercarriage deployment not as defined*
- *No significant loss of height*
- *Model does not descend to 5 meters or below*
- *Circle not centred on judge's centreline*
- *Entry and exit paths not contiguous or parallel with the runway*
- *Failure to call Start and/or End during straight and level flight*
- *Manoeuvre too far away, too close, too high or too low*

Group 6

(61) **Wing over max 45° bank angle (non aerobatic only)** - The model approaches in straight and level flight on a line parallel with and beyond the runway and "Start is called. After passing the judge's centreline the model pitches up into a smooth climbing turn away from the judges. At the apex of the turn, the model should track 90 deg. to the runway and the bank angle should be appropriate for the subject aircraft. The height gain should be appropriate to the capability of the subject aircraft. The model then continues on a mirror image of the entry flight path and recovering to straight and level flight when reaching the judge's centreline at the same height but on the opposite heading to the entry and on a line parallel to the runway but displaced away from the judges and passing the judge's centreline before "End" is called.

Errors:

- *Start and finish positions not as indicated*
- *Insufficient climb achieved*
- *Bank angle exceeds 45° and/or not appropriate for subject aircraft*
- *Climb and descent angles not equal throughout manoeuvre.*
- *Model does not fly a smooth and symmetrical arc.*
- *Entry and exit paths not parallel with runway*
- *Overall size of manoeuvre not realistic for prototype*
- *Model flight path not smooth and steady*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(62) Flight in Rectangular Circuit (non aerobatic option only) - Parallel to and beyond the runway "Start" is called as the model approaches the judge's centreline in straight and level flight at an appropriate height from which point the model flies a rectangular circuit approximately 300 meters long with crosswind legs of approximately 150 meters and 90 decree banked turns at the four corners to resume straight and level flight on the same heading and at the same altitude as entry calling "End" after passing the judge's centreline.

Errors:

- *Model changes height during manoeuvre*
- *Rate of turn at corners not constant and in keeping with prototype aircraft*
- *Angular differences between the 90 degree turns*
- *Sides of rectangular circuit not straight*
- *Opposite sides of rectangular circuit not equal in length*
- *Sides of rectangular circuit are too short*
- *Correction for drift not properly made*
- *Rectangular circuit not centred on judge's centreline*
- *Entry and exit paths not contiguous and parallel with runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(63) Two Axial Horizontal Rolls, one in each direction (aerobatic only) - commencing from straight and level flight, parallel to and beyond the runway at an appropriate height "Start" is called and the model rolls at a constant rate through one complete rotation and, centred on the judges, immediately rolls in the opposite direction at the same constant rate, resuming straight and level flight on the same heading before calling "End".

Errors:

- *Rate of rolls not constant*
- *Style of rolls not typical of the prototype*
- *Rolls not centred on judge's centreline*
- *Either roll not a complete 360 degrees*
- *Entry and exit at different heights or speeds*
- *Entry and exit paths and line of rolls not contiguous and parallel with runway*
- *Rolls not horizontal*

- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(64) One Inside Loop (aerobatic only) - commencing from straight and level flight at a safe height, parallel to and well beyond the runway the model executes a 360° circle in a vertical plane centred on the judge's centreline, and resumes level flight at the same altitude, and on the same track and heading as it started.

Errors:
- *Plane of loop not vertical*
- *Loop not round or in keeping with the prototype*
- *Inappropriate use of throttle*
- *Size and speed of manoeuvre not in the manner of the prototype*
- *Manoeuvre not centred on the judge's centreline*
- *Entry and exit paths not contiguous and parallel with runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(65) Derry Procedure Turn (aerobatic only) - the model approaches in straight and level flight, parallel to and beyond the runway at a safe height "Start" is called and the model makes a one quarter circle horizontal turn in a direction away from the judges. After the end of this quarter circle immediately turn the model about 3/4 rolls in the direction of the turn. The model continues to enter a 270 degree circle horizontal turn in the opposite direction. The model will stop rolling when upright and banked in the direction of the turn reaching horizontal flight before the judges' centreline after which "End" is called. The manoeuvre ends on the same altitude and on a reciprocal heading to the start.

Errors:
- *Entry into the 270 degree turn not at right angles to original flight path*
- *270 degree turn not at a constant radius*
- *Variations in roll rate*
- *Constant height not maintained*
- *Transition not centred on judges centreline*
- *Entry and exit paths not contiguous and parallel with runway*
- *Overall size of manoeuvre not realistic for prototype*
- *Model flight path not smooth and steady*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(66) 4-Point Roll (aerobatic only) - commencing from straight and level flight, parallel to and beyond the runway at a safe height "Start" is called and the model rolls at a constant rate through four complete quarter rotations centred on the judges, hesitating at each of three equally spaced intervals, to resume straight and level flight on the same heading and at the same height as entry before "End" is called. This manoeuvre should be performed horizontally.

Errors:
- *Rate of roll not constant*
- *Style of roll not typical of the prototype*
- *Roll not centred on judge's centreline*
- *Entry and exit at different heights or speeds*
- *Entry and exit paths and that of the roll not contiguous and parallel with runway*
- *Style of roll not nominated*
- *One or more of the quarter rolls deviates from 90 degrees*
- *Hesitations between each quarter roll of different lengths*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(67) **Inverted flight (aerobatic only)** - The model approaches parallel with and beyond the runway at a safe height in straight and level inverted flight, “Start” is called before entering a fly-by for a duration of 5-10 seconds. Upright flight is not resumed until “End” has been called.

Errors:
- *Model not fully inverted before “Start” is called and/or rolled to upright before “End”*
- *Track not straight*
- *Height not constant*
- *Start and finish not called in straight and level flight*
- *Manoeuvre not centred on judge’s centreline*
- *Manoeuvre too short in time*
- *Model's flight not smooth and steady*
- *Entry and exit paths and line of inverted flight not contiguous or parallel with the runway*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

(68) **Extend and Retract Landing Gear (all types)** - commencing from straight and level flight, parallel to and beyond the runway at an appropriate height “start” is called and, at reduced speed in straight and level flight the landing gear is extended in front of the judges. The model then turns away from the judges and completes a circuit at constant height, retracting the landing gear when again on track in front of the judges, soon after which the model climbs away with increased power on a constant track and climb angle for approximately 5 seconds, parallel to the runway.

Errors:
- *Model speed too high for landing gear extended*
- *Landing gear not extended or retracted in full view of the judges*
- *Speed and sequence of extension and retraction not realistic*
- *Model unstable when landing gear is extended and/or retracted*
- *Change in attitude with landing gear extended not in keeping with the prototype*
- *Misshapen circuit or height not constant*
- *Circuit not centred on judge’s centreline*
- *Entry and exit paths not contiguous and parallel with runway*
- *Manoeuvre lacks scale realism (e.g. climb-out)*
- *Failure to call Start and/or End*
- *Manoeuvre too far away, too close, too high or too low*

5.0.7 Overall Realism

(a) The judges will award points for overall realism, flight speed, smoothness and accuracy throughout the whole flight (the taxi will not be judged). They will also take into consideration such things as use of the permitted air space and the extent to which the flight style of the model is in keeping with that of the prototype aircraft. The judges will also take into consideration the realism of the reversing and turning manoeuvres between ‘scoring’ manoeuvres. Judges are allowed to confer and to section should b scores only for ‘Overall Realism’.

(b) Dropping of stores (tanks, bombs or any other external stores) is allowed if called (for example to clean up the airframe after straight flight and before starting any of the aerobatic optional manoeuvres). The judges will consider it when awarding points for Overall Realism. The contestant must inform the judges of any intentional external stores drop before their flight commences; otherwise rule 2.0.8 (g) will apply.

Judges always keeping in mind the likely characteristics of the full size prototype. The following aspects of the contest flight are marked here: the jet model's speed, the height and the overall smoothness of the flight. The realism of the turning/reversing manoeuvres (between scoring manoeuvres) is also taken into account here.

Realism in flight aspects shall be discussed by all flight judges after completion of the flight. It should also be remembered that modern aircraft can and should fly high performance

manoeuvres, where older aircraft are flown with a softer flight style. The judges should attempt to arrive at an agreed score for this item.

The following aspects of the contest flight are marked here:

- Smoothness. **The jet model should be well trimmed and show no signs of instability.** The overall smoothness and manner of piloting should be consistent with flight dynamics of the prototype during air show. **Judges should assess the smoothness of control taking into account the prevailing weather conditions.**

- Speed. A factor to be judged subjectively is the jet model's speed. The speed must be true to scale, which means that horizontal manoeuvres are not normally flown at full throttle and that there is a noticeable difference in engine performance between horizontal manoeuvres and vertical manoeuvres. Vertical manoeuvres that are descending should be performed at reduced throttle.

-Selection of variety of turning manoeuvres. Turning manoeuvres between optional manoeuvres should be diverse and provide a better flight presentation at all with minimum free straight flight.

These three Realism categories, new for 2022, mean the judges must take a broader view of the overall flight and reward it subjectively into three features using their own experience and judgement. These are the only categories were flying judging scoring harmonisation may take place.

5.0.8 Positioning of Manoeuvres

The manoeuvres must be performed in a position, and at a height, which will allow them to be seen clearly by the judges. Any manoeuvre causing the judges to elevate their line-of-sight above 60 degrees to the horizontal is to be avoided as this may result in this part of the flight not being judged. If, at any time during a flight, the complete model passes behind the imaginary Safety/No-Score line then a zero mark will be awarded for that manoeuvre and a warning would be issued. If this occurs on a second occasion during the same flight, the judges or the Contest Director will instruct the pilot to land immediately, the rest of the flight scoring zero. 'Overall Realism' points will be awarded in proportion to the amount of the flight completed.

If hazardous manoeuvres endanger safety, the Flight Line Director, the Judges or the Contest Director may request that the model is landed as soon as is safely possible, and the rest of the flight scoring zero. 'Overall Realism' points will be awarded in proportion to the amount of the flight completed.

5.0.9 Flight points and Coefficients

(a) Each mandatory and optional manoeuvre will be awarded points from 0-10 in 1/2 point increments by each of the judges during every official flight. Overall realism will be awarded points from 0-10 in 1/10 point increments. The points awarded for each manoeuvre shall then be multiplied by the appropriate K- factor (as in 5.0.4). In the case of five flying judges, then the lowest and highest scores awarded for each manoeuvre shall not be counted. The maximum possible flying points per flight round, after applying the K factors is 3000 points.

(b) In the case of one flight line and three flying rounds, the best two flight scores will count towards the final classification, the lowest scoring flight being discarded. In the case of two flight lines and four flying rounds, the best three flight scores will count towards the final classification, the lowest scoring flight being discarded. In the event that less than the total number of rounds (required for the number of flight lines) is flown, due to adverse weather etc., all flight scores will count towards the final classification.

(c) The flight score of a contestant for a round shall be the points awarded by the judges normalised as in 5.0.10. The final flight score that counts toward the final classification shall be the average of the normalised flight scores. Averaging is done as follows: in the case of the two best flights out of three rounds the two best normalised flight scores are added and divided by two and in the case of three out of four rounds the three best normalised flight scores are added and divided by three.

5.0.10 Normalisation of Flight Score

All flight scores for each round will be normalised as follows:

The highest flight score for the round will be awarded 1500 points. The remaining flight scores for that round will then be normalised to a fraction of the 1500 points in the ratio of actual score divided by the highest score for the round.

The following formula applies:

Px= Sx/Sw*1500, where

Px= normalised flight score of competitor x recorded in results list
Sx= flight raw score of competitor x
Sw= flight raw score of the winner of the round.

Further information on the flying part of the competition can be found under section 10: judge's guidelines to flying judging.

BONUS POINTS SYSTEM

6.0.1 Introduction of Bonus Point System

(a) The Bonus Points System was introduced in 2008 to give reward incentives to contestants who enter an older prototype subject and to contestants who enter an original prototype subject.

(b) The Bonus Points System is divided in **three** sections: a Vintage Bonus with a maximum of 25 points, an Originality Bonus with a maximum of 50 points and a **Rookie Bonus with a maximum of 25 points, making a total of 100 points** attainable. This maximum of **100** points is to be added to the final attainable total score of 3000 points (but only if an official flight is scored).

(c) The Bonus Point System is fully objective and allows every contestant to calculate the available bonus for the subject he chooses.

(d) The chief static judge (or documentation judge) is responsible for verifying the number of bonus points, which will be filled in the appropriate cases on the Contestant's Declaration Sheet.

(e) If you have any doubts to the number of bonus points applicable to your subject, please contact the IJMC Board well in time with your personal assessment (if necessary, giving reasons) for confirmation or a ruling (e-mail addresses available on http://www.ijmc.net). This avoids discussions during the competition.

6.0.2 Vintage bonus (25 points max)

The vintage bonus allows contestants to choose older prototype subjects without being at a disadvantage. The date of the first flight as published on http://en.wikipedia.org determines the vintage. The date used will be that of the first flight of the original aircraft whether the model is of the original aircraft, of a restored aircraft, or of a replica. The most points are awarded to a pre 1940 model (25 points) and for every year the date of first flight is later, 1 point less is awarded, so we end up at 1 point for a 1964 first flight and zero points for any year thereafter.

Pre 1940	**25 points**
1940	**25 points**
1941.	**24 points**
1942.	**23 points**
.	**.**
.	**.**
1962	**3 points**
1963.	**2 points**
1964.	**1 points**
As from 1965	**0 points**

6.0.3 Originality bonus (50 points max)

(a) The originality bonus encourages contestants to break the trend of similar models. The most points are given to the model that appears for the first time. The more a subject has been classified in the last two editions of the Jet World Masters (two classes together), the less bonus points it will get. A subject presented for the first time will receive a 50 point's bonus and this will be reduced by 4 points for each appearance. Official designations will be used to establish whether a subject is similar or not. Variants are considered similar. Again, the designations on http://en.wikipedia.org will be determining. Example 1: an L-39 is similar to any other L-39 variant but is different from an L-159. Example 2: an F-16 is similar to any F-16 variant but is different from the F-16XL. In case of discussion, the chief static judge will decide. Note that two seater versions of a single seater and vice versa are considered similar.

(b) A list of classified models in the two last Jet World Masters will be published on http://www.ijmc.net so each contestant will be able to calculate this bonus for his chosen subject even before going to the next JWM.

13 models and more	**0 points**
12 models	**2 points**
11 models	**6 points**
10 models	**10 points**
.	**.**
.	**.**
3 models	**38 points**
2 models	**42 points**
1 model	**46 points**
0 models	**50 points**

6.0.4 Rookie bonus (25 points max)

(a) **The Rookie bonus encourages new contestants to participate at the Jet World Masters. All participants according to 1.0.2 who take part as a pilot in a Jet World Masters for the first time are entitled to the Rookie Bonus (25 points).**

FINAL SCORING AND CLASSIFICATION

7.0.1 Final placing

Final scores, classification and places for the 15.0 kg class and for the 20.0 kg class shall be determined as follows:

Addition of the normalised static points scored in section 4 (max 1500 points), the normalised flying points scored in section 5 (max 1500 points) and the Bonus System Points in section 6 (max 75 points).

Static score:	max 3000 normalised to 1500	=	max 1500
Normalised final flying score: (3 rounds) best 2 rounds	$\frac{\text{max 1500 + max 1500}}{2}$	=	max 1500
Normalised final flying score: (4 rounds) best 3 rounds	$\frac{\text{max 1500 + max 1500+ max 1500}}{3}$	=	max 1500
Vintage Bonus:		=	max 25
Originality Bonus:		=	max 50
Rookie Bonus:		**=**	**max 25**

Maximum total points achievable (Static 1500 + Flying 1500 + **Bonus 100**) **= max 3100**

Note: the Static points and the Bonus points are only awarded to contestants having performed at least one official flight (i.e. the model must have left the ground).

7.0.2 Nations Trophy

The Nations Trophy classification is determined as follows: from each Nation/Country, the final total points of the three highest-ranking contestants (regardless of weight class) are added up. It is not necessary to have three contestants; a Nation/Country is classified as soon as one of its contestants obtains a final score.

DEFINITIONS

8.0.1 Approach

The ‘approach’ describes the position and attitude of the jet model entering a manoeuvre.

8.0.2 Departure

The ‘departure’ describes the position and attitude of the jet model leaving a manoeuvre.

8.0.3 Standard Attitude

The ‘standard attitude’ means that the model is flying in a horizontal position in the longitudinal and lateral axes.

8.0.4 Horizontal

All manoeuvres should be oriented to a horizontal line, even if the runway or surrounding terrain is not horizontal. Exceptions to this are explained in the manoeuvre descriptions.

8.0.5 Parallel to Runway-Centreline

In many of the manoeuvre descriptions the term 'parallel to the runway centreline' is used. This means that the aircraft should be travelling parallel to an imaginary line running down the centre of the Contest Runway.

8.0.6 Centre Line

In many of the drawings and descriptions the term 'centre line' is used. The organisers should mark this with a high, brightly coloured, post or flag, about 150 meters directly in front of the flight judge's centreline.

JUDGES GUIDELINES TO STATIC JUDGING

9.0.1 Judges

(a) The judges should have the chance to make a short visual inspection of all, or the majority, of the contest models before static judging starts, to allow them to assess the average quality of the models. This will help the judges to achieve the correct balance between the points awarded to the best and worst models. Also jet models that are not in the contest can be used for judging practice.

The overview will be done in an informal way as a walk through the hangar before the actual static judging takes place.

(b) The 'Static' judges are allowed to confer and to harmonise the scores awarded to the contestants.

(c) One of the judges must be appointed 'Chief Judge' or judges' spokesman before the start of the competition.

(d) After the static judging of each model is completed, the judges' spokesman is to keep the score sheets, until they are passed to the organisers for final classification of the competitors. If the judges' spokesman finds very large differences between the scores given to the same competitor, he may discuss this with the other static judges.

(e) If the static judges identify any defects in any contest model that might endanger flight safety, the Contest Director is to be informed before that model makes any flight.

9.0.2 Scoring

(a) Each section to be judged will be awarded marks between 0 and 10, using increments of a tenth a mark. The Judges should utilise the full scoring range. Generally, each error should be counted, and the score should be reduced by at least 1/10 point for each mistake.

(b) The static judges must decide if the errors are big or small. Big errors cause larger deductions. Each judge scores individually, but the judges have to use the same standard for each jet model.

(c) If a score is missing in the score sheet, all score sheets concerning this model must be returned to the static judges. If the score cannot be determined, it must be replaced by the average of the scores given by the other 2 judges.

9.0.3 Auxiliary materials

The judges are not allowed to use any auxiliary devices for scoring. Measuring any parts of the jet model is not allowed.

9.0.4 Judging time

(a) **A maximum of 15 minutes is to be spent on the static judging of every model. (In case of two Judges' panels: Items (a) to (d) - 7 minutes, item (e) to (j) - 8 minutes.)** *The Organisers are responsible to monitor this time limit. The watch should be stopped when the model is repositioned. The Judges may ask the contestants questions about the model and the full-size original.*

(b) However, in the event of a low standard model or inadequate documentation, the judges can shorten the judging of Scale Accuracy time. This time should be used to judge the different following sections of the 'fidelity to scale' as described in the IJMC Jet Class rules 4.0.3. The Contest Director is not allowed to shorten, or lengthen the judging time.

9.0.5 Competitors

(a) Before static judging of each model commences, the competitor may have a short time to explain his documentation to the judges. During the time when the model is being judged, the competitor is not allowed to talk to the judges, unless the judges ask questions. In this case the competitor must answer these questions immediately.

(b) The competitor has to follow the judges' requests, such as repositioning the model on the judging table, or adjusting gear door or flap positions etc. as long as this is feasible without making use of the radio.

(c) After static judging of all the models is completed, the competitor is allowed to ask the judges for errors that were found, but the competitor is not allowed to ask about points awarded.

9.0.6 Distance

The static judging has to be carried out at the distances set out in the current IJMC Jet Class rules section 4.0.3.

9.0.7 Proof of Scale

Judging should be performed in the following order: first the jet models **one side view, then the front views and, finally, the top view** should be compared with the documentation.

9.0.8 Side view Accuracy

The outline and shape will be compared, especially the outline, shape and size of the fuselage, the cockpit canopy, the air intakes, the vertical stabiliser, and the engine intake/exhaust outlet. The correct position and size of the wing, the stabiliser assembly, including the fin/rudder size. Position and angle of the landing gear, the landing gear doors and the size of wheels and rims, the cockpit canopy, and the shape, size and position of bombs, external fuel tanks or other external stores are to be examined. The angles between different parts are to be checked. The angle of incidence of the wing and the elevator unit are to be examined also any possible washout of the wing. If any control surfaces, or openings, are only painted on the model, points are to be subtracted in proportion to the loss of realism.
If no photos are available exactly from the side, the side accuracy can be achieved by taking several photos from different angles. But the maximum number of photos remains the same.

9.0.9 Front view Accuracy

Here the outline and shape, including all details, will be compared, especially the outline, shape and size of the fuselage, the cockpit canopy, the air intakes, the horizontal and vertical

stabilisers, and the engine intake/exhaust outlet. The wing's thickness and taper, the stabiliser's thickness and taper, position and angle of the landing gear, the thickness of the wheels and the track are to be examined. Attention is to be paid to speed brakes, etc. The dihedral of the wings and the horizontal stabiliser unit are to be checked. If any control surfaces, or openings, are only painted on the model, points are to be subtracted in proportion to the loss of realism.
If no photos are available exactly from the front, the accuracy can be achieved by taking several photos from different angles. But the maximum number of photos remains the same.

9.0.10 Top view Accuracy

Here the outline and shape, including all details, will be compared, especially the outline, geometry, shape and size of the fuselage, the wings and control surfaces, the stabiliser unit and control surfaces, the cockpit canopy, the air intakes and the engine nozzle/exhaust outlet. The size and angle of the wing and the elevator unit are to be checked. Attention must be paid to 'sawtooths' or notches on the wings and stabilisers. If any control surfaces, or openings, are only painted on the model, points are to be subtracted in proportion to the loss of realism. **If no photos are available exactly from the top, the accuracy can be achieved by taking several photos from different angles. But the maximum number of photos remains the same.**

9.0.11 Basic colours and colour scheme Accuracy

The colours of the model will be compared to the documentation provided. **The accuracy of the basic colours, the colour scheme and the means by which it is achieved, whether by printing, transfers, masking or airbrush spraying**, the level of difficulty of obtaining the colours will not be considered by the judges.

Colour accuracy should be proved by as direct a method as is feasible for the subject modelled ***(with colour chips or max 2 additional photos)*.**

The overall surface and individual areas of the model must be checked in respect of a matt, semi-gloss or glossy finish compared to the photographs of the full size subject.

9.0.12 Markings Accuracy

The judges will check the accuracy of markings and lettering in placement, size and quality in comparison with the documentation provided. The style and shape of the markings are to be checked. This includes, for example, the accuracy of national emblems, national registration, labels, warning notes, maintenance instructions, etc.

9.0.13 Surface Texture and Realism

This aspect relates to the smoothness or undulation of the surface panels **(whether drawn, scored, etc.)**, flush or proud edges of maintenance hatches, panel line gaps, realism of hatch catches, realism of rivets, screws **(cross, slot, other)** and other fasteners, thickness of trailing edges, control surface gaps etc. compared to the documentation supplied. Visible opening or fixing devices (hatch catches), poor fit of hatches, poor fitting wings unrealistic hinges etc. should all result in loss of points. Authentic weathering and staining should be documented.

9.0.14 Scale Detail Accuracy

The accuracy of for example, angle of attack probes, pitot tubes, antennas, NACA inlets, air and exhaust vents, grilles, hatches, brake pipes, handles, landing gear springing, footsteps, navigation and landing lights, bomb racks, control cables, control

horns tanks, fairings radiators, struts, cooling gills, mass balances etc., are to be checked according to the documentation supplied.

9.0.15 Cockpit Accuracy

The judge~~s~~ will review the physical detail and attention to individual features. The score awarded will depend on the level of detail, shallow or deep drawn etc, rather than by comparison with documentation for the accuracy of it's representation

9.0.16 Craftsmanship

The model aircraft should be checked for quality of workmanship, with particular reference to the accuracy, correct gaps at hinge line of control surfaces, close fit where non-scale joints are used for assembling the model aircraft and access hatches required for model aircraft operation. Judges should award higher marks for more intricate shapes and structure. The points that are awarded must reflect the standard of documentation presented. Non-scale Items such as switches, control horns, etc. should not be visible. If flight controls (one or more) are outside and visible and if gear doors (one or more) are missing scoring will be a downgraded.

9.0.17 Overall realism

The judge must consider to what extent he feels he is observing the full size subject aircraft or whether a model airplane is presented. The texture and appearance of the surface of the model aircraft should be a good reproduction of the prototype.

JUDGES GUIDELINES TO FLYING JUDGING

10.0.1 General

(a) The Flight Judges will be seated alongside the landing area in a line parallel to the runway. This axis will be referred as the "judge's line".

(b) The direction of the wind should have no consequence on the judgement of the manoeuvres, unless stated in the manoeuvre details. The competitor may decide if he wants to fly the manoeuvres either downwind or upwind, so there will be no judging for the wind direction.

(c) If one judge does not see a manoeuvre, his score will be replaced by the arithmetical average of the other judge's scores. The judges will not confer and the average score will be calculated by the organiser from the judges' individual scores.

(d) The organiser should arrange some judge calibration flights, performed by pilots & models that are not entered in the contest, to allow the judges to practice before the contest starts. The manoeuvres shown by the demonstration pilots should be from those included in the IJMC Jet Class competition rules. If no demonstration flights are possible, the judges are allowed to discuss the general standards of the first 3-5 contest flights, but the judges' scoring of these must remain independent of each other.

(e) Each manoeuvre will be awarded points between 0 and 10, using increments of half a point (except Overall Realism which will be awarded points between 0 and 10, using increments of 1/10 of a point). The judges are required to utilise the full scoring range.
In the event of any judge awarding a zero score for any manoeuvre the chief judge must be advised and should carry out a check for unanimity with the other judges.

10.0.2 Manoeuvres

(a) Generally, all scoring manoeuvres are to be placed equally about the judges' centreline, unless described differently in the manoeuvre details.

(b) The height and positioning of individual manoeuvres should be proportional to that expected in a full size display typical of each prototype. Unless specified otherwise, manoeuvres that are carried out in a horizontal plane should commence on a flight path that is between 45 to 60 degrees elevation to the judges. Judges should down-mark manoeuvres as too high, too low, too far away, or too close if they consider the positioning to be so.

(c) Turning or reversing manoeuvres are the parts of the contest flight between each of the scoring manoeuvres, as stated on the score sheet. Turning or reversing manoeuvres like Split S, Immelmann Turn or Reversal are not scored but can be taken into account in the 'Overall Realism' section. Attention is to be paid to smooth flying movements and realism. Also the positioning of these reversing and turning manoeuvres and the symmetry about the centreline may be taken into consideration. The competitor is free to fly any type of turning/reversing manoeuvre.

(d) The 'Start' and 'Finish' of all scoring manoeuvres must be announced by the contestant, or his helper. This announcement must be audible to the judges. Other words for "Start" like "Now" and "Beginning" can be used as long as they cannot create confusion. Likewise, other words for "Finish" like "Complete" and "End" can be used.

(e) If the competitor's helper touches the transmitter at any time after the take-off has been announced by the competitor, then scoring stops with the last completed manoeuvre before the offence and the remainder of the flight is scored zero. 'Overall Realism' points will be awarded, in proportion to the amount of the flight completed.

(f) After the start of a manoeuvre is announced, the competitor may only make one attempt at the manoeuvre. If the first attempt is not successful, the score for this manoeuvre will be zero. Any further attempt will not be judged.

(g) The order in which the optional manoeuvres are flown must be marked on the score sheet prior to the flight, and any manoeuvre flown out of order will be marked zero.

(h) If the flight is stopped before all the manoeuvres on the score sheet are completed, then only the manoeuvres completed will be judged. 'Overall Realism' points will be awarded in proportion to the amount of the flight completed. The competitor will be informed as to which manoeuvres were scored.

(i) The manoeuvres must be performed in a position, and at a height, which will allow them to be seen clearly by the judges. Any manoeuvre causing the judges to elevate their line-of-sight above 60 degrees to the horizontal is to be avoided as this may result in this part of the flight not being judged. If, at any time during a flight, the complete model passes behind the imaginary Safety/No-Score line then a zero mark will be awarded for that manoeuvre and a warning would be issued. If this occurs on a second occasion during the same flight, the judges or the Contest Director will instruct the pilot to land immediately, the rest of the flight scoring zero. 'Overall Realism' points will be awarded in proportion to the amount of the flight completed.

(j) If hazardous manoeuvres endanger safety, the Flight Line Director, the Judges or the Contest Director may request that the model is landed as soon as is safely possible, and the rest of the flight scoring zero. 'Overall Realism' points will be awarded in proportion to the amount of the flight completed.

*(k) Flight speed **and smoothness**: this is a factors to be judged subjectively. The speed must be realistic, which means that horizontal manoeuvres are not normally flown at full throttle and that there is a noticeable difference in engine performance between horizontal manoeuvres and vertical manoeuvres. Vertical manoeuvres that are descending are normally performed at*

a reduced throttle setting. **The overall smoothness and manner of piloting should be consistent with flight dynamics of the prototype during air show. Judges should assess the smoothness of control taking into account the prevailing weather conditions.**

(l) All flying manoeuvres must be flown in a similar manner to the performance of the full size prototype. The aerobatic manoeuvres will be flying in a display performance. The display performance means typical airshow within the flight envelope performance of the full size prototype. The style of presentation is free choice of competitors.

(m) Taxi realism is no longer judged!

(n) If any part unintentionally separates from (comes off) the aircraft during flight (that was attached to the aircraft at the start of the contest flight), then the scoring stops and the contestant must land immediately. The points awarded from previously completed manoeuvres will still be awarded. If a part separates from the aircraft during one of the three mandatory and five optional scoring manoeuvres, then no points will be awarded for this manoeuvre. However, 'Overall Realism' points will still be awarded, in proportion to the amount of the flight completed. Any intentional drop of stores (tanks, bombs or other external stores) must be called to the judges prior to the drop.

(o) The model has to be flown in the same condition as it was presented for static judging, except for changes permitted as in rules 2.0.8(c) and (d), and 5.0.7(b).