Ace of Aces International RC Contest

OFFICIAL RULEBOOK

Version 2026

As its name implies, this contest is designed to find the best RC Scale builder/flyer in the world. It is aimed at the contestant who is already considered somewhat of an expert in this field. Only after one has gained considerable RC flying experience may they be invited to fly in the Ace of Aces event.

THE "PRIME DIRECTIVE"

The philosophy which governs the rules of Ace of Aces is a world class competition with fairness, fun and top level judges, pilots and builders. The rules in this document have been carefully refined to give the contestant a free hand to choose a subject appealing to him; be it aerobatic or non-aerobatic, civilian, or military, ancient, or modern. Quality alone, in building and flying, will determine the outcome. **All competitors will conduct themselves with professionalism and integrity in all aspects of related to the Ace of Aces.**

2026 Ace of Aces Classes

Hoover Class - Pro-Prop/Jet
Gabreski Class - Unlimited Prop/Jet
Yeager/Anderson Class - TEAM Prop/Jet
Richthofen Class - Expert Prop/Jet
Haverland Class - EDF

(Your allowed to enter three (3) classes, plus EDF)

PART 1 - GENERAL RULES

1. The contest is open to any model of any heavier than air, man carrying, fixed wing, aircraft ever built and flown. If a pilot was visible in the full-scale aircraft, then an appropriately sized scale pilot figure must be visible in the model aircraft, during the flying portion of the contest. ***If a pilot figure is not in place during the flying rounds, 10% of the flight score will be deducted.***

2. First and foremost, ALL AMA Safety Guidelines are followed to the letter. However, other than the "Current" weight limits imposed by the A.M.A., there are no restrictions upon the design, size, or power of the model. We offer a provision for a **"backup aircraft".** A backup aircraft may be used, **only,** if the primary entry is damaged, **before** it has scored in 2 maneuvers and if there is slot for it to be static judged, if required, without extending the static judging time past 5:00 PM the last day of judging. This luxury will be available on a first come basis.

3. A pilot or builder may enter ***three (3) classes plus EDF in Ace of Aces,*** provided there is room in the "other" class to accommodate the additional entry. However, the SAME airplane may NOT be entered in more than one class OR flown by two different pilots.

4. The contest is divided into 2 parts: Static Judging and Flight Judging. The potential scores for each are to be the same, giving no weight to one part over the other. The only exception: Pro-Prop/Jet classes do not get Static Judged other than the presentation of one image of the full-scale aircraft being modeled.

5. Builder of the Model Rule* **For Expert and Team**
The Ace of Aces contest will not succumb to the philosophy of the highest static points that money can buy." No rule can eliminate cheating. The rules are made for the guidance of the honest contestant. Violation of the B.O.M. Rule will result in disqualification from this and future AOA competition. The Pro-Prop, Pro Jet, Unlimited & EDF Classes are exempt from the Builder of the Model rule. The B.O.M. Rule is defined as follows:

> *** BUILDER OF MODEL DEFINITION**
> The "Builder of Model" shall have satisfied the requirements of RC Sport Scale if the modeler has constructed the airframe from materials and available prefabricated components such as fiberglass cowl(s) and fuselage(s), foam cores, canopy or plastic molded exterior details, wheels, etc. All final assembly and finishing of the aircraft shall also be performed by the same individual. Other commercially

advertised products and hardware independent of the airframe (visible or not) requiring machining or welding to assure reliable safety or operation of the scale model aircraft such as engine accessories and landing gear may be commercially acquired by the modeler. No other airframe construction may be commissioned in this manner. Highly prefabricated and "boned out" models purchased from any source are allowed, ***but NOT assembled or painted models.***

6. Models of Multi engine aircraft may be entered using less than the scale number of engines if 50% of the scale number of engines is represented by model engines. For example, a B-24 Liberator may fly on only 2 engines if the other 2 "dummies" are not readily distinguishable as "dummies" at a glance. An F-4 Phantom can use one engine in a bifurcated duct, so that from outside appearance, the model has 2 engines.

7. Dual transmitters are not permitted, unless combined as technology used by the radio manufacturer.

8. Rate Gyros are allowed and highly suggested.

9. Any Contestant proven to be, cheating in any manner, will be banned from all future AOA competitions. Specific protests may be lodged with the Chief Judge. He and a CD will decide on site based upon the information available to them.

10. In the interest of safety, up to 100 sq. inches of high visibility material may be added to the model after static **judging has been completed.** It is suggested that this material be applied in a scale like manner.

11. CLASSES: AOA will have a variety of classes to compete in. There will always be an EXPERT class, where the builder and pilot are the same person. There will be a TEAM class, a category where there is a designated pilot and a builder, and both are allowed to perform work on the model. To be accepted as a **TEAM** entry, both the builder and the pilot must be present at the event.

Masters/Expert Class - entered as Expert Class for 2026 AOA. .5 Bonus Points on Static to proven self-designed aircraft. Masters Class is one where the builder has drawn his own plans and has engineered and constructed the entire model himself. It is not intended to be a "community" project nor one that has been designed and constructed by a team of people! A Masters Class builder may choose to enter his airplane in the Expert class, but an Expert entry must remain in the Expert division. Mass produced models, meaning models produced in a factory, will not be allowed in the Masters Class. If the contestant feels he has an exception to the rule, the Contest Director will be most happy to discuss the situation and perhaps issue an exemption. There is also a Pro-Pro, EDF, Unlimited, TEAM and Masters all divided into prop and jet classes.

a) **Pro :** Class is subdivided into 2 classes: Pro-Prop and Pro-Jet. Aircraft in this category should be AOA worthy. A picture or artist rendition of your color scheme must be presented to the Judges.

b) **TEAM:** Class will be static judged by the same rules as Masters, Expert and Champions Classes. The premise of the TEAM is for a "Builder" who needs a pilot to fly their aircraft. The builder and pilot must be present at the event.

c) Unlimited: Class will be static judged by the same rules as Masters, Expert and Team, with ONE major exception. There is "NO" Builder of the Model Requirement!It does not matter, we do not care who, or what firm, may have built the model.

d) **EDF Class:** This class is for electric ducted fan models. The EDF Class is open to ANY Ace of Aces participant regardless of the classes he is already flying in and is open to anyone else who feels qualified to fly at the event. We will allow as many entries as we can fit. Therefore, we must adhere to a first come first serve basis. At the moment if appears that the number of participants can be between 20 & 24.

e) **Masters:** Class is one where the builder has drawn his own plans and has engineered and constructed the entire model himself. It is not intended to be a "community" project nor one that has been designed and constructed by a team of people! A Masters Class builder may choose to enter his airplane in the Expert class but, an Expert entry must remain in the Expert division. Mass produced models, meaning models produced in a factory, will not be allowed in the Masters Class. If the contestant feels he has an exception to the rule, the Chief Judge will be most happy to discuss the situation and perhaps issue an exemption.

12. REPAIRS: In a case where a model is damaged during a competition flight round, any parts may be replaced with new parts, from any source, as long as the new parts duplicate the overall general scheme as the original. The intent of this rule is to offer a way for the contestant to remain in the event. However, a purple wing on an aluminum airplane will be met with some severe resistance! No more than 50% of the model may be replaced.

PART 2— STATIC JUDGING RULES

Static Judging:

As previously mentioned, AOA is a contest for the best of the best, although each year will welcome new participants, it is expected that all participants be familiar with the rules concerning static judging and that they are prepared and familiar with those rules when they present their models to the judges. Please be familiar with new scoring and score sheets. Incomplete and poorly prepared documentation books will result in downgrades by the judging team, last minute gathering of documentation will not be accepted. Only published three views are acceptable. Photographs are acceptable for color documentation but must be images of the full-scale aircraft after which the entry is modeled. Commercially available color chips are preferred providing they are accompanied by a published reference stating where and what color was used. Any deviation from the provided three views by the model must be pointed out and a reason given for the change or will result in a down grade.

1. The Static Judging portion of the competition will take place prior to flying. The flying rounds may commence prior to the conclusion of Static Judging, but only with those entries that have already been Static Judged.

2. Four areas are evaluated on the presented model:
Accuracy of Outline, Finish - Color - Markings, Craftsmanship and Realism. Realism is a score for the overall impression the model creates in terms of looking real or like a toy airplane.

3. As shown upon the static judging sheets 1000 points will be available, see static judging sheets for all areas to be judged and points available. Static scores will be normalized.

4. Judging distance for all categories, except craftsmanship, shall be 15 feet maximum. Any judge may examine the aircraft from ZERO feet but may not touch it.

5. A documentation package used to evaluate the model is required. If no documentation package accompanies the model, judging will not be performed.

6. For Pro-Prop/Jet classes, the only documentation required is ***a single*** "Published" item that shows the color scheme which must be a actual or fantasy scheme of a full-scale aircraft. "Squadron Mates" are allowed, i.e. the squadron identifier, ID number or tail codes may differ from the proof presented. This "Proof" may be the artwork from a plastic kit, an artist's rendition found in a book or a photo of the actual full-scale aircraft. Electronic proof or a printed rendition must be shown to the judge.

Contents of the documentation package:

A ***published*** (3) or more view of the aircraft. These specific views, at a minimum, are TOP, SIDE and FRONT. Additional views may be included.

a) Size is not limited. If no 3-view is available, a sufficient number of photos of the aircraft type are necessary to allow the three main views to be verified. Pictures of any model airplane are not allowed in documentation. Contestant generated, or altered, views are NOT allowed unless differences or errors have been discovered during the building or finishing process. In that case, altered views must be submitted for approval, with appropriate photographic backup, and then signed off by the Chief Static Judge.

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

c) Proof of the **color** match is required. This may be presented in the form of color chips, color photos, paint manufacturer's chart or an artist's rendition. Color chips or paint samples should be supported by a written description or color/pattern layout drawings.

d) In cases of very obscure subjects, e.g. where only one aircraft was built, a description of the colors is sufficient. Since it is very difficult and sometimes impossible to document more than one side or view of a subject aircraft there will be no loss of points for failure to show the colors and markings of the "other side or bottom" of the airplane.

e) If color chips are used, they must be from a published source such as FS595A or paint manufacturer. Contestants may **NOT** create their own color chips.

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

7. Documentation shall be sufficient to verify the model is as presented for static judging. Any item not verified may cause 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 insufficient to prove the color scheme appearing on the model being judged, the **Markings** score will be downgraded.

8. Contestants are cautioned against presenting conflicting data in their package. In cases where, for example, a color painting is shown for color layout, and it conflicts in detail with a photo provided of the same aircraft, the photo will have ascendancy.

9. 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 presented in the manner shown on the 3-view presented to the judges.

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

11. Scale props/spinners may be included for static judging.
However, the flight spinner must be approximately the same size and shape as the static version, and it must be exactly the same color. The overall shape of the flying spinner may be blunted or rounded for safety reasons. Aircraft not incorporating a spinner should utilize a rounded safety nut.

12. With the **following exceptions**, no items displayed on the model during static judging may be removed or changed prior to the flying rounds.

a) Pitot tubes, radio masts, or radar antenna may be removed.
b) Droppable stores or ordnance may be substituted but must be the same size, shape and color as those presented for static judging.

13. The model's engine may not be mounted in the same position as in the full-scale airplane. Therefore, the static score will not be downgraded for visible engine parts, such as a cylinder head, carburetor or muffler, or for openings to aid engine cooling provided that the installation was made to be as inconspicuous as the subject allowed.

14. Portions of the cockpit detail visible in the 3-view will be judged for outline at 15 feet. Cockpits should have some substance. The entire cockpit area will be judged for **craftsmanship**, but the fidelity to scale will be overlooked. Ace of Aces aircraft should not have a platform sitting across the cockpit area with a simple pilot bust glued to it! Along with cockpit interiors, the interiors of wheel wells, flaps and hatches, if visible, will also be judged for **craftsmanship**, from ZERO feet. These areas are **NOT** judged for detail or scale fidelity

15. Upon completion of scoring a model, the judges will hand their score sheets to the Chief Judge who must sign the sheets before they can go to tabulation. If a score appears out of line, he may request a consultation with the static judges and may authorize another judging session before tabulation.

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

PART 3 - FLYING RULES

1) A minimum of four rounds shall be flown if conditions allow.

2) In cases where conditions prevent any flying, Static Judging shall determine the result. Any ties will be broken first by the Outline and Realism total, followed by the addition of one half the craftsmanship score. For Pro-Prop/Jet, All Judges will cast a Vote for class winners.

3) **Time limit for each flight is 15 minutes**, inclusive of starting time and any required explanations or demonstration. Any maneuver started after the time has expired will score zero.

4) Crossing the "deadline" during any part of the flight will incur a warning and downgrade of two points will be asset. A repeat of crossing the "deadline" will lead to disqualification and the contestant must land.

5) If the contestant is delayed after the clock is running (e.g. delayed take off, or landing, due to adjacent flight-line traffic) the clock is to pause for the duration of the delay.

6) The flight plan shall consist of 10 maneuvers, producing max score of 1000, consisting of 5 mandatory and 5 optional. The 10th score will be for realism for the entire flight. Maximum score for each maneuver is listed on new score sheets.

7) Except for the **high speed and low speed** passes, the contestant may **complete all his maneuvers/scale operations in any order he chooses;** but he must follow the flight plan he has submitted to the Judges. The 2 fly pasts may be done at any time but must follow each other. **IF** a maneuver is called out of sequence, the entire flight will not receive a Zero. ***The Flight Judge will assess a 2-point penalty to that maneuver only and inform the pilot that he is out of sequence, allowing him to get back on sequence.***

   a) The only maneuver allowed to be inserted between the slow speed and high-speed passes will be an ordinance or wing tank drop in the interest of cleaning up the aircraft for the high-speed run. This "drop" must be done in the opposite direction of the Slow Speed pass and immediately following it.

   b) If multiple runways are made available, the contestant may choose which he prefers for either takeoff or landing. That is, the aircraft may take off from one runway but land on another.

8) **OPTIONS**: It is the intent of Ace of Aces to require models to be flown in a "display-type" flight. To ensure this, certain restrictions apply to nominated options:

   a) Aircraft having any aerobatic capability may "**NOT"** select "straight flight out/procedure turn/straight return" or "flight in a triangular pattern" as a nominated option. However, non-aerobatic types may perform them. ***A Military or Airshow "Break" is an allowed maneuver, keeping the same altitude through the entire maneuver*.** No "on the ground" mechanical options may be performed as a separate scoring maneuver. However, they may be added to "enhance" the presentation. A list of "Flying Maneuvers" are listed later in the rule book.

b) Operations like the following, or similar to the following, may be incorporated as part of some maneuver, or performed independently, but may not be nominated for a scored option: Smoke System, Light Systems, Canopy Movement, Individual Engine Run-ups, Brakes, Pilot Movement, Folding Wings, Flaps, Speed Brakes, Slats and similar devices. **This will enhance your realism scoring**.

c) The contestant may perform any additional operation he chooses, to enhance his demonstration, within the time allowed, but no points will be scored.

9) Contestant is allowed to choose different options in succeeding rounds.

10) The option "Touch and Go" will count as two options (see Judging Guide).

11) Maximum flight score is 1000 points normalized to 1000.

12) If 4 or more rounds are flown, the contestant's flight score will be the average of the best 3.

13) If 3 rounds are flown, the best 2 will be averaged. If 2 rounds are flown, both flights will be averaged.

14) Total contest score will be the sum of the static score and the flight score.

15) In the event of a tie, the model with the highest aggregate flight score of all rounds shall have ascendancy. If this results in a tie as well, the static score will be added to the aggregate flight score. If further tie breaking is needed, the craftsmanship points will be added as well. Then the Judges get to vote.

16) Only under extreme weather conditions will the flying portion of the contest be canceled; and then, **only by the decision of the Contest Committee.**

17) To be eligible for any special awards, the model **must** have at least one flight score, including a take-off.

PART 4 - FLIGHT - JUDGING

Only maneuvers listed in the rule book will be allowed to be used during the contest, **there will be no exceptions or additions at the last minute**, it is very difficult if not impossible to judge a maneuver that is new to the flight judging staff, even with a thorough explanation by the contestant there is always the question as to if the description is accurate.

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

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

As a basis for further guidance, let us compare the "Pattern Aerobatics" model against the scale replica of a full-size aircraft. The scale model is not by definition a flying *machine* in the same way as a pattern model.

The designer of the pattern model, having no physical limitations to his application of aerodynamics to RC models, has free reign. He can make adjustments to cure any unwanted tendency. Airfoils, moments, dihedral, and a host of other considerations can all be tuned individually to achieve a "perfect" flying machine.

On the other hand, consider the scale model. To a great degree, its design is "locked-in." Yes, a few things can be adjusted, like wing loading, C.G. position, and force arrangements, but many other factors cannot be changed.

The only type of scale model, perhaps, that could be expected to compare in flying accuracy with the pattern model would be a model of a purpose-built aerobatics-only subject, such as the popular Extra. For this type of subject, a high standard of flying finesse could be justifiably demanded. But consider this: how good would a scale Fokker Triplane be as a pattern model? Clearly, it would be useless.

Yet, here is a contestant with a model of a flying *machine* and he is going to fly it, in competition. Furthermore, one of the most important, perhaps ***the*** most important aspect of scale modeling is that the contestant shall have free choice to build a model of an aircraft. Moreover, he must be able to be "competitive" with whatever choice he makes. This free choice is at the very core of scale modeling, but it poses a serious dilemma for the judge. By what yardstick can its flying performance be judged? Obviously not by the same criteria as a machine designed for flying alone.

A thousand other examples could have been named in lieu of the Fokker. But the point is the same; any scale model *can only be* judged by the yardstick of the subject chosen. For instance, in the case of a full-size Fokker, nine landings out of ten may have resulted in a ground loop or a nose-over. The ground crew merely righted it and life went on. Having no effective throttle control, and with a design that violated every rule of ground-handling we know of, the pilot had little chance.

Therefore, the *sophisticated* scale judge will bear these inherent factors in mind. The Fokker model pilot who made a *perfect* approach, and actual touch-down, rolled a few feet then nosed-over, may have done as good a job as was possible to do. Neither the judge nor any pilot on the field could have done better. Would it be "fair" to apply a Zero score? We don't believe so. For the same reason, a judge should consider making small allowances for a narrow-tracked taildragger. If he doesn't, soon the only competitive subjects will be tricycle geared jets. Nobody wants this to happen.

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

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

REALISM - Realism will be an important part of this contest! The Contestant should be armed with "proof" that the subject aircraft is capable of or routinely performed the operation or maneuver. Also, the size of aerobatic maneuvers performed by a contestant should reflect the capabilities of the aircraft modeled. For example, it would be expected that a loop performed by a J-3 Cub would be smaller in diameter than one performed by a P51 Mustang if both were modeled to the same scale. The speed at which maneuvers are performed also must reflect the capabilities of the prototype.

Consideration should be given in all aerobatic maneuvers to the forces that would be exerted on the full-scale counterpart. Exceedingly small or tight maneuvers with unnecessarily high rates of roll, pitch or yaw do not simulate the performance of the majority of full-scale aircraft and should be downgraded accordingly.

Speed - Flying aircraft overlie fast or slow will result in downgrade of score on category of speed and realism.

Finally, the contestant should acknowledge that the smoothness or gracefulness of the flight presentation will have a large impact on its realism. The judge should consider himself to be a passenger in the model and assess these maneuvers in terms of the effect they would have on his well-being.

MANDATORY MANEUVERS (IMPORTANT) - Unless specified otherwise, ALL maneuvers are expected to be centered on the judges the pilots are flying in front of. However, if the maneuver is called at a specific location, say to the left or right of the judges, it will be judged accordingly. This is NOT a license to describe HOW the maneuver is to be flown, only its placement. Other than explaining a maneuver or placement of a maneuver to the judges, no other conversation is appropriate before takeoff.

As in the past, there are 4 mandatory maneuvers, plus a score for "Realism", and five optional maneuvers. All aircraft, regardless of class, must fly 9 maneuvers and get a realism score.

The 5 mandatory maneuvers are:

1) Takeoff
2) Fly-Past High Speed (Between 3- and 20-feet altitude)
3) Fly-Past Slow Speed (Between 3- and 20-feet altitude)
4) Landing
5) Realism - 3 categories (see score sheet)

1) TAKEOFF - Takeoff should be into the wind, as much as possible, and should begin with a ground run on the centerline followed by a gentle lift-off with a climb angle consistent with that of the prototype. Takeoff is completed when the model makes first turn. A "stop or near stop" is not a requirement; the model may turn onto the runway and takeoff in one smooth motion typical of full scale aircraft.(Pilots are not to be positioned behind the model or out on the runway during takeoff or landing.) The model may not be touched after "Takeoff has been called. If it must be, Takeoff will score zero *OR* the contestant's one "attempt" must be called. For maximum points, the model does not have to take off in front of the judge. However, breaking ground at one extreme end of the field, if there was enough room to prevent it, may prevent a perfect score.

Errors:
Model is touched by pilot or helper after advancing throttle to takeoff power. Model

swings on take-off run [a slight swing should not be the cause of loss of points on light aircraft types with conventional (tail wheel) gear if it is corrected promptly.] Model becomes airborne too soon. Model jumps off ground. Model climbs too steeply after takeoff. Model drops a wing badly during takeoff. **Veering or off the centerline will be a deduction.**

2) FLY-PAST (High Speed)
The model shall fly straight along a path parallel to the runway, no closer than the centerline of the runway and **no farther than 20 feet from the far edge**, at an altitude between **3 and 20 feet**. Direction shall be the same as that used for takeoff. The model shall be flown at its maximum flying speed at the **fly-past altitude for at least 300 feet**. Important: It is the **Spotter's / Caller's** responsibility to watch for traffic in the vicinity.

Errors:
Flight path is not parallel to runway. Straight and level flight at a constant altitude is not maintained during the minimum time required for the maneuver**. Altitude Not between 3 and 20 feet and 20 feet from the edge of the runway.**

3) FLY-PAST (Low Speed)
This utilizes the same parameters as for the high-speed pass, and flown in the same direction, but flown at a minimum, SAFE, flight speed. For Example, the aircraft would typically be flown in a high drag configuration, but with sufficient throttle to maintain a constant altitude and heading.

Errors:
Flight path is not parallel to runway. Straight and level flight at a constant altitude is not maintained during the minimum time required for the maneuver.

(Note: Allowance should be made for slower types of light aircraft that should not be downgraded for slight corrections in gusty wind conditions or minimum change in high and low speeds)

Altitude is not between 3 and 20 feet and 20 feet from the edge of the runway. The maneuver is offset to the right or left of the judges. Insufficient speed differential between high and low speed passes. Model "coasts" (from a higher altitude or speed) through the maneuver and speed decreases throughout.

4) LANDING
The judging of the landing maneuver begins when the model *begins final approach.* The approach and touchdown **on the centerline** count for half of the landing score, the roll out after touchdown counts for the other half of the score. The landing maneuver is complete when the model has slowed sufficiently to make a safe, controlled turn off the runway.

If the roll out is wavy, bounces, ground loops, etc., or the model noses over, the second part of the score will be downgraded leaving the mark for "approach" unaffected. If the model flips upside down, the second half of the maneuver will score zero, again leaving the approach score unaffected. Example: A perfect approach and touchdown, **on the runway's centerline** followed by a flip over (score: 5) In the event a landing gear malfunction occurs, the roll out portion of the score will be based on the judge's assessment in terms of saving an imaginary crew. This landing would be called an "Emergency Landing" and with a perfect approach and a "Safe" landing, a score of 10 points may still be earned.

Emergency landings may be judged only if the model lands on, or adjacent to, the active runway. Higher scores will be awarded to aircraft that touch down a third of the runway away from the judge as opposed to landing "long", causing the judge to get up from his seat to see the actual touchdown.

MULTI-ENGINES:
Multi engine option will be limited to only those models utilizing gas, glow or turbine engines only! Electric engines being so reliable there is no skill involved in the operation of them.

To be eligible to claim a multi-engine option, the model must have the same number of operating engines as the prototype. Also, the displacement of the engines must differ, or agree, per the prototype. Exception: Reciprocal engine aircraft with aux. jet pods. Jet pods may be dummies. Example: Neptune, B-36, C-123 etc. Judges will look for various throttle settings during the flight. Performing this option will not result in an automatic 10 score.

Errors:
For maximum score, all engines should be running from beginning of takeoff until landing maneuver is completed.

FLAP OPERATION (MANDATORY, NOT AN OPTION)
If the prototype had flaps, then the model must incorporate their use in the same manner as the prototype. Flaps may or may not be used for take off and MUST be used for landing. A minimum angle of 30° of flaps is to be used for landing. For maximum points during Landings, the flaps should be lowered on the base or final leg of the traffic pattern. In addition to the landing, the flaps will also be used during the Slow Fly-By, Touch-and-go or an Overshoot, and points will be deducted from the realism score if the contestant fails to use them.

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

Errors:
Failure to cycle the flaps prior to takeoff or failure to operate flaps when required.
Model exhibits violent trim change during flap operation.

RETRACTS DEMONSTRATION:
To obtain maximum points the gear **"MUST"** be used during the flight in a prototypical fashion during the take-off, slow fly by, landing, (Touch and go, and missed approach if the aircraft qualifies for those maneuvers. ***In addition, the pilot must perform a gear pass***.

1. Flight pass straight and level flight parallel to the edge of the runway.
2. Aircraft begins the maneuver with the gear up and an altitude between 3' and 20'. At a speed slow enough to be easily observed. **(Flaps may be used to slow the aircraft down slow enough for optimal viewing)**
3. Pilot calls beginning and extends the gear early enough to complete the extension sequence before getting to the judges. Then the gear is retracted while maintaining a level and heading.
4. The gear must operate at a prototypical speed and not slam in either direction.
5. The doors must sequence correctly, **open and close completely**.

BOMB DROP - Bombs should be carried and dispensed in the same manner as the prototype. For bombs carried internally, bomb bay doors should open, bombs should drop and doors should close for maximum score and hitting the **"Target Zone"**. The model must perform a bomb run in the manner of the prototype. For example, if the model is a dive bomber, the dive is the "bomb run." A contestant is permitted to substitute an expendable bomb or bombs for the flight presentation as long as the number, size, shape and coloring are the same as those used for Static Judging. For maximum score, the bomb or bombs should contact the ground in the **"Target Zone"** approximately in front of the judges.

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

TORPEDO DROP - For maximum points a torpedo drop should be performed as a part of a torpedo run at low altitude. Actual altitude of the model at release would depend on its scale, but it should be low enough to enable the torpedo to strike the ground in a relatively flat attitude. Release should be performed with the model in a level attitude, and in the **"Target Zone".**

Errors:
Model is too high at release. Release is not preceded by a straight run. Release is too early or too late. **Torpedo is released prematurely or misses the "Target Zone".**

TANK DROP
Jettsonable fuel tank(s) should be carried in the manner of the prototype. The drop should be performed with the model in level flight in clear view of the judges. For maximum score, the drop tanks should contact the ground in the **"Target Zone"**.

Errors:
Tank(s) not securely attached to model, has visible oscillation in slipstream prior to release. Tank does not fall clearly away from model at release. Model is not in level flight at release. **Drop Tanks are released prematurely or misses the "Target Zone".**

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

Errors:
Parachute fails to open. Chute does not fall clear of aircraft. Chute is emitted from the aircraft in a manner not typical of the prototype. Parachute(s) not properly sized to aircraft. **Parachute is released prematurely or misses the "Target Zone".**

BRAKING PARACHUTE
*Landing Enhancement ** Does NOT get a separate score*
A braking chute should extend upon or immediately prior to initial contact with the ground and remain attached until the model comes to a complete stop. For maximum impression, the chute must appear to work with the brakes and bring the aircraft to a stop before the end of the runway.

AGRICULTURAL SPRAYING OR DUSTING
This scale operation is for models of aircraft used for crop spraying or dusting only. The contestant should be prepared to document that the prototype aircraft was used for this purpose. Since the manner in which this operation was performed by full scale aircraft may differ according to aircraft type and/or crop being covered, the contestant should describe to the judges his intended presentation. Generally, the aircraft will make a low pass down the runway centerline and visibly perform its spraying or dusting mission on command by the contestant. The maneuver should begin and end on the same heading and with the wings level.

Errors:
Model does not release visible spraying/dusting material. Maneuver is not presented in full view of the judges. Model follows erratic course during operation.

Model changes heading during operation.

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

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

OPTIONAL FLIGHT MANEUVERS
ALL MANEUVERS TO BE SELECTED FROM THE FOLLOWING LIST

All maneuvers, whether mandatory or optional, are listed and Fully Described IN THIS Ace of Aces Rulebook, as well as in the current AMA competition rulebook. The rulebook is available at AOA Facebook/Website and WWW.ModelAircraft.Org The maneuvers are described in the section titled "Radio Control Flight Judging Guide", Sub-Section: Radio Control Sport Scale (Sportsman & Expert) Unless authorized prior to the event, the following are the only maneuvers that may be elected as Optional Flight Maneuvers.

ONE each of any maneuver listed:

Straight Flight Out, Procedure Turn & Straight Return *(This is ONE Maneuver and is for non-aerobatic aircraft only)*	
Chandelle	Immelmann Turn
One Roll (Continuous)	4-Point Roll - **9.2 K Factor in Rnd 3 & 4 only**
Slow Roll	Inverted Pass - **9.2 K Factor in Rnd 3 & 4 only**
Stall Turn	3-Turn Spin - **9.2 K Factor in Rnd 3 & 4 only**
Wing-Over	One Pylon Lap Demo
Split S	Knife-Edge Pass - **9.2 K Factor in Rnd 3 & 4 only**
Touch & Go	Loop (Inside or Outside)
Overshoot	Cuban 8 (Or Reverse, Full/half) **9.2 K Factor for Full in Rnd 3 & 4 only**
Spin: Normal or Inverted	Descending 360
Std. Traffic Pattern	Military Traffic Pattern
Military Break	Air Show Break

PROTO TAXI OUT AND BACK is NOT ALLOWED!!
Due to Flight Line Safety concerns, this option has been discontinued at Ace of Aces.
STRAIGHT FLIGHT OUT, PROCEDURE TURN, STRAIGHT RETURN *(one option)*
(Non Aerobatic and training type aircraft only) The model begins this maneuver directly in front of the judges, making a straight run for at least four seconds, then executes a 90-degree turn away from the spectator line followed immediately by a 270 degree turn to the original path. It then flies in a straight line to the original starting-point. During the entire sequence, altitude is to be constant.

Errors:
Altitude varies. Heading changes during straight runs. Radius of 90-degree & 270-degree turns dissimilar. Model does not make full 90-degree or 270-degree turns.

INSIDE LOOP
The model commences this maneuver in level flight. It then gains airspeed with a shallow dive (if the full-scale aircraft was capable of an inside loop directly from level flight, the dive is omitted) and pulls up into as round a loop as was possible for the prototype to manage. The throttle may (but need not) be reduced for descending portion. The loop is complete when the aircraft resumes level flight at the same altitude as the loop (minus any initial dive) was begun. Center of loop must be directly in front judges.

> **Errors:**
> Wings are not level throughout the maneuver. Position at conclusion of maneuver is different in altitude or distance from pilot. Loop not centered properly.

OUTSIDE LOOP
Starting in level flight, the model noses down to perform a smooth, round, outside loop which is completed when the model regains its starting altitude and exits in level flight on the same heading as the entry. Or the maneuver may be initiated from the Inverted position and then upward. The throttle should be closed during the downward portion of the maneuver and open during the climbing portion.

> **Errors:** Maneuver does not begin and end in level flight. Exit altitude is not same as entry altitude. Model does not begin and finish on same heading. Loop is not round. Wings do not remain level. Throttle is not closed while descending.

STALL TURN
The model starts in level flight, noses up to a near vertical attitude, at which point the throttle is closed and the airplane yaws through 180 degrees, then dives and recovers to straight and level flight, on a heading in the opposite direction to the entry and at the entry altitude. The contestant needs to specify if the turn will be to the left or to the right.
Errors: Model does not assume the correct attitude. Throttle is not closed. Model turns in the wrong direction. Model does not exit the maneuver on the correct heading. The model does not exit the maneuver at the entry altitude.

CHANDELLE
This maneuver is an exaggerated climbing turn where the aircraft changes direction by 180 degrees. Depending on the type of aircraft performing the maneuver, the model may begin with a shallow dive to pick up speed. The nose should come up and the aircraft should complete a climbing turn, away from the flight line. Maximum climb and bank occur at approximately midpoint during the change in direction. Max bank angle may be from 45 to 60 degrees. Entry speed should be sufficient to prevent visible slipping or skidding and maintain the same turn rate throughout the maneuver. The degree of bank angle and rate of climb are constantly changing as the speed continues to decline through the maneuver.

As the 180-degree point is reached in the turn where the aircraft is traveling in the opposite direction from its entry, the wings are brought level for completion of the maneuver. At that time, the aircraft will be flying at quite a reduced speed as compared to its entry speed.

> **Errors:**
> Same turn rate not maintained. Aircraft skids or slips. The model does not establish a notable climb rate. Model does not finish with wings level on a heading opposite to that entered.

STRAIGHT INVERTED FLIGHT
The model approaches the runway, parallel to it and at least 20 feet outside the centerline. When approximately 150 feet away from the judges stand, the pilot will invert the model and keep the aircraft in straight, level, and inverted flight for a distance of 300 feet. After 300 feet or so, the model is returned to the upright position and the maneuver is called complete.

Errors: Model is put into the inverted position too early or not while parallel to the flight line. Model waivers in heading or altitude. Maneuver is completed too soon.

IMMELMANN TURN
The model performs the first half of an inside loop and when inverted performs a half roll to resume straight and level flight on the opposite heading. Some aircraft types would be expected to commence the maneuver by executing a shallow dive at full throttle in order to pick up the necessary speed.

Errors:
Wings are not level during half loop. Model is climbing or diving during half roll. Roll is begun too early or too late. Exit heading is not 180 degrees from entry heading.

WINGOVER
Model starts in level flight and noses up to a near vertical attitude at which time it is flown through a 180-degree arc using rudder to end up in a near vertical dive. The model pulls out of the dive at the same altitude as the entry on a parallel path, but on a 180-degree opposite heading.

Errors: Model not level at start. Model rolls left or right during pull-up. Wings are not perpendicular to the ground during the 180 ° turn. Throttle not closed during dive. Return path not parallel to entry. Recovery not at same altitude as entry. Model does not fly straight and level to complete the maneuver.

SPLIT-S (REVERSAL)
From straight and level flight, the model may or may not pitch up slightly, the throttle is reduced, and performs a half roll to inverted followed by the second half of a loop, down to straight and level flight on a heading opposite to that of the entry.

Errors:
Model changes heading during half roll. Wings are not level during half loop. Model does not exit from maneuver on the exact opposite heading to entry.

ROLLS, ROLLS, ROLLS
There are 3 styles of Rolls that may be performed.

1) A Roll with a Break
2) A Roll without a Break and a Slow Roll
3) A Roll without a break means that the maneuver is a continuous roll, about an axis, with no hesitation through its 360 degrees of travel.

Some examples are a Military Roll, Victory Roll, Axial Roll, Barrel Roll and Snap Roll. Rolls with an interruption, or break, include a Two Point Roll, and the Four- or Eight-Point Roll.
The Slow Roll is done for the approximate length of the flight line. At Ace of Aces, only ONE Roll without a Break, Other Than a Slow Roll, may be performed. An unlimited number of rolls with breaks, like2 or 4-point rolls, may be performed.

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ROLL
From straight and level flight, the model rolls at a constant rate through one complete rotation and resumes straight and level flight on the same heading. Light aircraft types would be expected to execute a shallow dive at full throttle before the maneuver. The contestant should nominate what type of roll he will perform, i.e.. Axial, slow, etc. Usually, the aircraft will commence the roll from a shallow climb and exit the roll in a shallow dive. Some higher performance aircraft may perform a roll beginning and ending in level flight.

Errors:
Rate of roll not constant. Deviation in heading during, Loss or gain in height.

FOUR-POINT ROLL
The model starts in level flight, then assumes a slight climb, makes a quarter-roll in a nose-up attitude, makes another quarter-roll bringing it to a level inverted position. It then makes another quarter roll, slightly diving, then makes the last quarter-roll into level upright flight. Each point is held for approximately 1 second. Some specialized acrobatic prototypes may be capable of a 4-point roll during which the aircraft is always level.

Errors:
Points held too long or too short. Altitude at finish different from beginning. No arc (trajectory) during maneuver. Wings not level or vertical at points.

SNAP ROLL – INSIDE (9.2 K Factor in Rnd 3 & 4 Only)
Model begins in level flight and as the nose is pulled up to the point where the wing will stall, rudder is applied to roll the model in the desired direction. The nose of the model should break the line of flight in a direction towards the pilot's cockpit, indicating that a stall has occurred. While most models will roll faster in a snap roll than in an aileron-induced roll, roll rate should not be a factor in judging. The roll should stop precisely when the model is again upright, and the maneuver should be completed in straight and level flight. Snap rolls may be performed vertically or on a 45-degree climbing or diving flight path, but such maneuvers should always begin and end in straight and level flight.

Errors:
Model does not begin and end in straight and level flight. Wing does not stall during roll. Roll is not terminated precisely after 360-degree rotation. Model does not exit from maneuver on the same heading as entry.

SNAP ROLL - OUTSIDE (9.2 K Factor in Rnd 3 & 4 Only)
This maneuver should be performed in a similar manner to the inside snap roll except that, as the break occurs, the nose of the model moves away from the direction of the pilot's cockpit indicating that a stall was induced by the application of down elevator.

Errors:
Same as inside snap roll.

BARREL ROLL
Aircraft is pulled 10 degrees off heading and rolled around an imaginary point on the horizon describing an arc around that point without crossing through it.

Errors:
Roll rate is not constant. Model does not finish maneuver on same heading and/or altitude as entry. Maneuver is not centered in front of the judges.

ONE LAP PYLON OR SPEED RUN DEMONSTRATION
Models performing this maneuver must be models of pylon racers or long-distance race aircraft. Models of aircraft which raced over a closed course (pylon racers) shall perform one lap of a simulated triangular racecourse. One leg of this shall be parallel to the runway.

Errors:
Model does not fly straight and level during the designated straight legs of the maneuver. Model does not make a pass parallel to the runway. Models of pylon racers do not perform turns in the manner of race aircraft (model yaws noticeably when banked, model gains or loses excessive altitude in turns.)

SPIN
The number of turns to be performed shall be noted on the judges' score sheets. The contestants may choose any whole number. The entry shall be from straight and level flight parallel to the runway. Power shall be reduced, and the model should remain on heading in a slightly nose high attitude until it stalls and commences to spin. The model should auto-rotate through the prescribed number of turns and recover on the same heading at a lower altitude. The rate at which the model rotates in the spin will depend on its size and type, but judges should be alerted to observe models which are performing a spiral dive rather than a true spin.

Errors:
Entry not from level flight parallel to runway. Does not perform the prescribed number of turns. If the number is greater or less than the "called" number, by more than one turn, a zero score should be given. Does not recover on a same heading as entry. Wings not level during recovery. A spiral dive rather than a true spin shall be scored zero.

INVERTED SPIN
Same description and errors as for *Spin,* but the model commences the spin, and recovers, in the inverted position.

CUBAN EIGHT
The model pulls up into an inside loop and after completing half the loop, heads inverted downwards 45-degrees, does a half roll followed by another half inside loop to the inverted downwards 45-degree heading, does another half roll and pulls out into straight flight at the same altitude as the entry and on the same heading. A light aircraft type would be expected to execute a shallow dive at full throttle in order to pick up speed before commencing the maneuver. Throttle may be closed at the top of each loop and reopened during each descent. (One Half of a Cuban Eight or Reverse Cuban Eight is also permitted)

Errors:
Maneuver is not performed in a constant vertical plane or is executed endwise. Loops are of unequal diameter. Half-rolls are not executed at the correct point in the maneuver. Model does not exit from the maneuver at the same height as entry.

DESCENDING 360
The model passes in front of the judge at an altitude greater than 100 feet and performs a gentle, descending 360-degree circle, away from the flight line, with a reduced throttle setting. The aircraft should finish the maneuver in front of the judges, at an altitude no lower than 3 feet, but as high as 20 feet. Throttle should be advanced, and the aircraft continues on a straight path, parallel to the flight line.

Errors:
Model is banked too sharply and performs a high-speed circle of small diameter; model finishes maneuver at too high altitude or throttle was not reduced enough to allow the gentle descending 360 that the judges are looking for.

OVERSHOOT
Model should commence by flying a final base leg followed by a turn onto a normal final approach at low throttle, using flaps and lowering landing gear if applicable, until it reaches a point immediately opposite the judges at a height of five feet or less. At this point throttle is applied gradually, and the model climbs straight ahead to resume level flight.

> **Errors:**
> Model does not commence maneuver with the correct landing approach. Model does not use flaps (if applicable.) Model does not climb away smoothly. Model simply dives or dips towards runway and climbs away. Flying along and then just stabbing at the runway will result in a severe downgrade.

TOUCH AND GO
This maneuver shall be judged as a landing followed immediately by a takeoff, each half being scored separately. A total maximum point is 20. After a smooth and gradual descent on a straight path to the runway, the model lands and slows to below flying speed, **on the centerline**. All wheels may, but need not, be in contact with the runway. Contact must be maintained for at least 25 feet. Following this, the model must accelerate and take off on the same heading as entry. If this maneuver is done immediately prior to the landing, the landing gear or flaps do not have to be retracted.

> **Errors:**
> Same as Takeoff and Landing but with this addition: model bounces once and becomes airborne. Model bounces on landing. Model deviates left or right while rolling on ground. Model fails to slow down to an "un-airborne" condition. Model stops on ground. Changes in heading during the takeoff run. **Not on the centerline**.

STANDARD TRAFFIC PATTERN APPROACH TO LANDING
The Primary Objective is to fly a rectangle shaped maneuver. The model begins on an upwind heading directly over the centerline of the runway. After passing in front of the judges it should continue, straight and level and at a constant altitude for approximately 200 feet before making a turn away from the flight line on to the crosswind leg. A second turn begins a downwind leg with the model flying at a constant altitude and again passing in front of the judges. A third turn towards the flight line begins the base leg during which the model may begin its descent. A fourth turn, into the wind, should line the model up with the runway centerline, and straight descending flight should continue. Traffic Pattern is complete when the model is at 10 feet of altitude, at which a landing maneuver begins. Note that in some cases the third and fourth turns are joined to become one continuous 180 degree turn. When retractable landing gear or flaps are used, they should be deployed at appropriate points of the pattern.

> **Errors:**
> The upwind and downwind legs are not parallel to the runway. 1st turn not 90 degrees. The model does not reduce speed during the downwind leg. The gear/flaps are not deployed at appropriate points in the pattern or are deployed flying at an inappropriate rate of speed. The model does not make a smooth, constant descent during the base and final legs of the pattern. Model not lined up with centerline after turn to final.

MILITARY TRAFFIC PATTERN
Commences with an upwind pass down the runway with a 90 degree turn away from the judges followed by a 270 degree turn to final. Traffic pattern ends at 10-foot altitude. An alternate military pattern commences with a low entry approach on the far side of the runway followed by a "Military Break", a climbing, 90-degree pitch out away from the judges culminating with a 270 degree turn to final. As before the traffic pattern ends at 10-foot altitude.

Errors: Excessive use of throttle during the approach. Varying turn rate and glide path especially during the final turn.

Entering of a Model:

In keeping with the ”Best of the Best" theme all models and modelers are expected to be seasoned and ready to compete on arrival to the event, although last minute tweaks are acceptable, the inability of an entered model to make it to the flight line and at least attempt a flight does little more than take up a position that someone else could have used and makes the flight boards a nightmare for the judges. If an entered model does not at least become airborne the modeler and model will not be allowed to compete in that class, the following year. This will be done to open the contest to new participates and to allow the participant to have more time to prepare for future contests. Although last minute mechanical failures do occur such instances will be considered on a case-by-case basis by the Chief Judge. Modelers wanting only to have their models staticed should make this known to the Chief Judge prior to the contest. **Initial test or "maiden" flights will not be allowed at the event and the contestant will be required to attest to the fact that the model has a minimum of three (3) successful flights before the event. Contestants will be required to show aircraft to be entered by picture or video to Marvin Alvarez or Curtis Switzer two weeks prior to event.**

Aircraft Attempts:

Aircraft "Attempt" Note that the "attempt" rule (allowing a second attempt at a flight) is operative *only during any “ONE” round* of the competition. An "attempt" occurs if the model does **not become airborne**. If the model does not become airborne at its first attempt, the Contestant will have 1 hour to fix aircraft. If aircraft is fixed you will be inserted into the flight order to complete your round. All flights will be judged on same day as the class the contestant is flying in. The flight is official, and no attempt may be called **if the model becomes airborne**, regardless of subsequent events. ***Please Note: Only One (1) "attempt" can be used the entire competition per Aircraft. To be eligible for an attempt your plane or you should be present on the flight line either before or at the time of your turn to fly to call the attempt having to announce it’s your turn or have people come find you just so you can say I’m taking an attempt is not acceptable and failure to do so will result in a zero for that round.***

Pilots who don’t have their aircraft on the flight line ready to go when it’s their turn to fly may automatically receive a zero for that flight. Please be ready to fly in your lineup position or get with the Chief Flight Judge immediately if you can’t make your designated flight position.