



Academy of Model Aeronautics

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EXHIBIT A RULES CHANGE PROPOSAL FORM

PROPOSAL NO. RCA 18-10
(To be inserted by Headquarters)

RECEIVED DATE 3/15/17
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REVISE DATE _____

VERSION NUMBER _____

RULES CHANGE PROPOSAL FORM

Send to: AMA Headquarters, 5161 East Memorial Drive, Muncie, IN 47302

A copy will be forwarded to the appropriate Contest Board Chairman.

The current issue of Competition Regulations must be used.

PROPOSAL TYPE (Check One): Basic Cross Indicate Original Proposal Number _____

Urgent/Safety/Emergency Interpretation

General Section Executive Council Outdoor Free Flight Indoor Free Flight CL Speed

CL Racing CL Navy Carrier CL Aerobatics CL Combat CL Special Events RC Aerobatics

RC Scale Aerobatics RC Pylon Racing RC Helicopter RC Soaring Scale Electric

Special Events RC Combat

Brief summary of the proposed change. Replace the section of the scoring rules for large contests commonly known as “Matrix” with a more equitable and fair method of determining finalists that is in accordance with Section 13.0 of the rules that requires equal exposure to judges so that scores may be normalized for each round flown (Matrix does not meet this basic requirement).

Exact wording proposed for the rule book. (List paragraph numbers where applicable. Example: Change “quote present rule book wording” to “exact wording required”).

Replace Sections 13.1 through 13.3 with the following:

13.1: In each class, only completed rounds in which all entrants in that class have flown, or have had official opportunity to fly under the rules set forth in Paragraph 10, shall be counted. Individual classes competing at the same event may, at the discretion of the Contest Director, fly differing numbers of rounds to determine the winner. In all classes, the winner shall be the only flight score when only one (1) round is flown; the highest total of the best two (2) flight scores when two (2) or three (3) rounds are flown; the highest total of the best three (3) flight scores when four (4) rounds are flown; and the highest total of the best four (4) flight scores when five (5) or more rounds are flown. Points from repeat flights may not be added to earlier flights. Each flight is complete in itself. In case of ties, the best non-scored flight of the contestant shall be

used to determine the higher placement. For all AMA classes, all judges scores are to be included in the tabulation of scores regardless of the number of judges used in a normal, or finals round.

13.2: Pilot Groups and Seeding:

The pilots shall be grouped by seeding the top 16 competitors using their finishing positions at prior years District Championships and Nationals, irrespective of class. The Event Director shall determine the seeding using this, and any other means they deem appropriate. The final seeding is ultimately subject to the Event Director's discretion. The seeding of the pilots shall be published and made available upon request no later than the end of the Pilot's Meeting held the day prior to the start of competition.

Each pilot group shall be populated as follows:

Pilot Group A: Seed #1, Seed #8, Seed #9, Seed #16.
Pilot Group B: Seed #2, Seed #7, Seed #10, Seed #15.
Pilot Group C: Seed #3, Seed #6, Seed #11, Seed #14.
Pilot Group D: Seed #4, Seed #5, Seed #12, Seed #13.

The remaining entrants shall be evenly divided among each group, keeping the total number of pilots in each group as even as possible.

13.3: Site Assignments and Flight Order

13.3.1: When the number of registered contestants (not pre-registrants but the number who actually show up and check-in to fly) is 24 or less, the field shall be split into 4 seeded groups of approximately equal size per 13.2 (Groups A, B, C, & D), with two groups flying on one line at each site simultaneously (Sites 1 & 3), and the judges rotating between the sites between each round. In this format, 5 judges should be used at each site, 10 total per day. The pilot group pairings shall rotate each day as follows:

Day 1 – Groups A & C on Site 1, Groups B & D on Site 3
Day 2 – Groups A & C on Site 3, Groups B & D on Site 1
Day 3 – Groups A & C on Site 1, Groups B & D on Site 3

The flight order for each group shall be drawn at random prior to the start of competition and assigned A1, A2, A3, etc. The flight order for each line shall be created by merging each pair of groups as follows using Groups A & D as an example: A1, D1, A2, D2, A3, D3, A4, D4, etc. The flight order shall be changed each round by moving an appropriate number pilots from the top of the flight order to the bottom of the flight order so that the same pilot will not fly first more than once. The number of pilots rotated each round shall be fixed and not vary during the preliminaries.

This format yields full equal exposure of all pilots to the judging sets at the end of each day (every 2 rounds). Preliminaries scoring shall be conducted in accordance with 13.0 and 13.1.

The highest scoring 8 pilots will advance to a 4 round final, weather permitting. Finals scoring shall be in accordance with 13.0 and 13.1. No qualifying scores shall be included in the finals score totals.

If weather or other scheduling issues were to develop that limited the number of preliminary flights completed to less than 6, the finalists would advance per 13.1 at the completion of any multiple of 2 rounds (to be determined by the Event Director). If it were not possible to advance to a finals (for any reason), a legitimate National Champion would be selected based on the Normalized preliminary standings at the completion of any multiple of 2 preliminary rounds.

13.3.2: When the number of registered contestants (not pre-registrants but the number who actually show up and check-in to fly) is more than 24, the field shall be split into 4 seeded groups of approximately equal size per 13.2 (Groups A, B, C, & D), with two groups flying on two lines at each site simultaneously (Sites 1 & 3).

In this format, 3 judges should be used at each site, 12 total per day. The pilot group pairings shall rotate each day as follows:

Day 1 – Groups A & B on Site 1, Groups C & D on Site 3

Day 2 – Groups A & C on Site 1, Groups B & D on Site 3

Day 3 – Groups A & D on Site 1, Groups B & C on Site 3

The flight order for each group shall be drawn at random prior to the start of competition and assigned A1, A2, A3, etc for Group A; B1, B2, B3, etc for Group B, and so on. The flight order shall be changed each round by moving an appropriate number pilots from the top of the flight order to the bottom of the flight order so that the same pilot will not fly first more than once. The number of pilots rotated each round shall be fixed and not vary during the preliminaries.

This format yields full equal exposure of all pilots within each group to a judging set at the end of each round. Preliminaries scoring shall be conducted in accordance with 13.0 and 13.1.

Sample flight operations for Day 1 on Site 1:

Each site has 2 flight lines, Line 1 and Line 2. Group A is paired with Group B for the day. Group A flies Round 1 on Line 1; Group B flies Round 2 on Line 2. When they complete their respective rounds and the judges have a break, Group A moves to Line 2 to complete Round 2 and Group B moves to Line 1 to complete Round 1. The judges do not move between rounds. At the completion of the second set of flights both Group A and Group B will have flown Round 1 and Round 2 in front of the same set of judges. *(Note-this is how the Masters Preliminaries are currently organized.)*

The scores from each group (A, B, C, & D) will be Normalized in accordance with 13.0 and only compared to scores from within the same group, determining the preliminary placing within each group. Scores will not be compared across groups, fulfilling the requirement of equal exposure in 13.0. The highest scoring 3 pilots from within each group (12 total - 3 from A, 3 from B, etc.) will advance to the finals.

The finals will consist of three rounds flown with scoring conducted in accordance with 13.0 and 13.1 to determine final placing. No qualifying scores shall be included in the finals score totals.

If weather or other scheduling issues were to develop that limited the number of preliminary flights completed to less than 6, the finalists from each pilot group would advance per 13.1 at the completion of any number of rounds (to be determined by the Event Director). It is not possible to select a legitimate National Champion in this format without completing at least a one round final. Given the ability to select finalists at the end of any single round and progress to an abbreviated final, the likelihood of not being able to complete the contest and determine a National Champion due to weather (or other) issues would be extremely remote. However, in this remarkable circumstance the National Champion would be selected by totaling the pilots normalized scores per 13.1.

13.3.3: At the conclusion of the preliminaries the final placing of all pilots within each group will be posted in accordance with 13.1.

A composite placing of all non-finalist pilots qualifying position (across all groups) will be posted by totaling the pilots normalized scores per 13.1. *(Note-this is how the Masters non-finalists finishing order is currently tabulated.)*

Logic behind proposed change, including alleged shortcomings of the present rules. State intent for future reference.

The current method for organizing the preliminaries in the Masters Class as the US Nationals does not meet the basic requirement set forth in Section 13.0 for equal exposure to judges so that scores may be properly normalized in accordance with Section 13.2. This proposal addresses that shortcoming and meets all of the requirements set forth in the basic rules.

One of the justifications for using Matrix is the inaccurate claim that equal exposure of pilots to judging sets is not possible when a large turnout of pilots occurs. While equal exposure to ALL of the judges is not possible due to the constraint that a common set of judges is not available for the entirety of the preliminaries, it IS possible to have equal exposure within the individual Pilot Groups (A - D). Additionally this can be accomplished without making ANY changes to how the contest is organized and executed. In fact, this proposal ONLY changes how the scores are calculated during the preliminaries; it does NOT require any changes in how the pilot groups are seeded and rotated. Additionally it allows for the fair and accurate selection of pilots for a finals at the end of any single round flown,

while following ALL of the tenets of equal exposure that are necessary to properly normalize and compare scores at the end of each round.

Another issue with Matrix is that it is fraught with inaccurate results that sometimes places a lower scoring pilot within a group into the finals ahead of another pilot (in the same group) with a higher 4 of 6 round total in head to head competition over 6 rounds. This unintended result is due to several issues. One is the improper requirement that one qualifying score be used from each day, with the fourth score coming from the highest unused score from each day. There is no basis for this approach in the rule book, nor is it used at any contests flown during the year. Another issue is the supposition that by treating each day as a separate “contest” you can compare scores flown in front of different judges each day. This is an incorrect assumption as mathematical calculations must share a common basis for comparisons to be considered valid. Several years ago the Contest Board attempted to address this issue by adopting a point accumulation system based on relative ranking within each days “contest”. However, as can be seen in the attached figure (based on the 2013 Nats Masters Preliminaries), the point ranking system doesn’t resolve the issue.

Table 1, Column Q shows the accumulated point total (calculated using the current rules) of the pilots in Group A. This is the scoring approach currently used to select the finalists as outlined in 13.3. Table 1, Column P shows the normalized, best 4 of 6 score total resulting from the group pairings over the 3 days of the preliminaries:

Day 1 - A & B, Day 2 - A & C, Day 3 - A & D.

Note that the relative point accumulation system used placed Pilot # 423 ahead of Pilot # 413, with Pilot # 423 advancing to the finals, even though Pilot # 413 had a higher 4 of 6 round point total than Pilot # 423 in head-to-head competition over 3 days. Also note in Round 2 the compression of the scores (everyone scored well) resulting in high relative ranking points received (e.g. a 979 normalized score resulted in 8 points) for flights that scored well compared to the reference basis (the highest score for the round). In contrast, in Round 3 a normalized 977 resulted in only 3 points. The result is misleading and imprecise data that is not representative of the pilots performance. Scoring margin is an inherent element of characterizing performance over an interval. Using a relative ranking system

discards the performance margin and should only be used to indicate the final placing position after the event in concluded, not as a primary selection criterion.

Also note that using the normalized best 4 of 6 point total Table 1, Column P) based on each day being it's own separate "contest" does not work either as it yields results with the incorrect margin and finishing order for 2 of the top 4 pilots (Table 1, Column R).

Table 2 shows the normalized scores (with equal judging exposure) for the Group A pilots after a 6 flight, 3 day preliminary using the best 4 of 6 scoring total as per 13.0 and 13.1 ("4 mini-contests"). I submit that the proposed scoring approach show in Table 2 represents the "Truth" that ANY comparison of an alternative scoring system should be performed against as it is EXACTLY how scores are calculated at contests flown across the country during the contest season. As you can see it yields somewhat different results both in finishing order and scoring margin as compared to that shown in Table 1 (the finishing order for 2 of 4 of the pilots within Group A were reversed).

New event test data/information (new events only), please provide what testing of this new event has taken place to include number of participants and number of contests.

Not Applicable – Not a new event.

Effect, if any, on current AMA records.

Not Applicable – None.

Note: The Contest Board Chairman may, in coordination with the submitter of the proposal, at any time prior to submitting a proposal to the Contest Board for Final Vote, edit proposal wording to increase clarity and to avoid ambiguity provided the proposal intent is not changed.

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