

**OFFICIAL AMA
MODEL AIRCRAFT
REGULATIONS
1951 - 1952**

PROVISIONS FOR ISSUANCE: Under authority of the National Aeronautic Association. American representative of the Federation Aeronautique Internationale, world-wide governing body for all sporting aviation, the following model aircraft classifications and regulations are hereby prescribed by the Academy of Model Aeronautics.

**CONTROL LINE
PRECISION ACROBATIC REGULATIONS**

These Regulations were drawn up by the Control Line Acrobatic Rules Committee, Roy E. Mayes, Chairman, and shall continue in their recommended status until further announcement by the AMA Contest Board.

GENERAL: All pertinent AMA Regulations covering the flyer, the model and flight shall be applicable, except as specified below.

ENGINE CLASSIFICATION: Engines shall be of the reciprocating internal combustion type and of the jet type. Models shall be classified by piston displacement of the reciprocating internal combustion engine, or largest engine if a multi-motored model is flown, as follows:

CLASS A: .000-.200 cu. in. piston displacement of engine

CLASS B: .201-.300 cu. in. piston displacement of engine

CLASS C: .301-.500 cu. in. piston displacement of engine

CLASS D: .501-.650 cu. in. piston displacement of engine

Class D also includes all jet engines.

Sixty percent of the actual piston displacement of four stroke cycle engines shall be used for competition classification purposes.

Jet engines used shall have an internal cross-sectional area of the tail pipe (s) of no more than 1.25 square inches at the point of minimum cross section. If desired, two or more of the above-listed classes may be combined, so long as the displacement limits given are observed. When classes are combined, contest announcement shall list events using the letter designations of the classes combined. (Example: If three events are scheduled, and Classes A and B are to be combined, events shall be listed Class AB, Class C and Class D; if all classes are to be combined, the event should be designated Class ABCD; etc.).

CONTROL MECHANISM: All lines and connections used to control flight shall be steel wire or metal lines of equivalent strength in good condition and free of kinks and rust. The entire control mechanism, including control handle (device), control line(s) and model shall withstand a pull-test equal to at least 15 times the flying weight of

the model. Control line(s) should not exceed 70 feet in length, nor be less than 52 1/2 feet in length, measured from- the hand of the operator in flight position to the fore and aft centerline of the model.

TAKE-OFF GEAR: The main take-off gear shall consist of wheel(s), permanently affixed to the model, which permit model to take off and land in a normal manner. Tail skid(s) may be used. Take-off gear may be retractable.

SAFETY PROVISIONS: All attachments of the equipment to be used in flight shall be secure, so as to eliminate hazard to spectators. The Contest Director and/or his assistants shall be the sole judge(s) as to the safety of the models.

NUMBER OF FLIGHTS: Contestant shall be permitted three attempts to make two official flights. All official flights are to be considered as attempts. No more than two official flights shall be permitted each contestant. After a contestant has been notified that a flight area is available for official flying, he shall be given three minutes in which to get his model airborne in cases where one engine is used to power the model. In cases of multi-motored models, two minutes for each additional engine shall be given in which to get the model airborne. Failure to accomplish this shall result in the contestant's giving way to the next contestant and the charging of an attempt to him.

DURATION OF FLIGHTS: An eight-minute flight limit shall be given each contestant in cases of models powered by one engine, including the three-minute limit for starting as specified above. (Example: Three-minute starting time, plus five-minute maneuvering time equals eight-minute duration limit of flight.)

Time allowed for starting additional engines in cases of multi-motored models shall be added to the eight-minute duration of flights. (Example: Three-minute starting time for first engine, plus two minute starting time for second engine, plus five-minute maneuvering time equals ten-minute duration limit of flight.) Judging is to begin following a raised arm signal by the contestant. Maneuvers accomplished after the eight-minute limit (or time allowed for multi-motored models) shall receive no points and shall cause the loss to the flyer of his flight pattern points.

SCORING: Scoring shall be based on the appearance of the model and the maneuvers executed in flight. The contestant's point score for competition purposes shall be the average of the scores given by no less than two judges. Flight points shall include those accumulated during the better of the two official flights permitted.

APPEARANCE: Models shall be judged for appearance complete and ready to fly, including all equipment and attachments to be used in the accumulation of flight points. Graded scoring between one and ten points shall

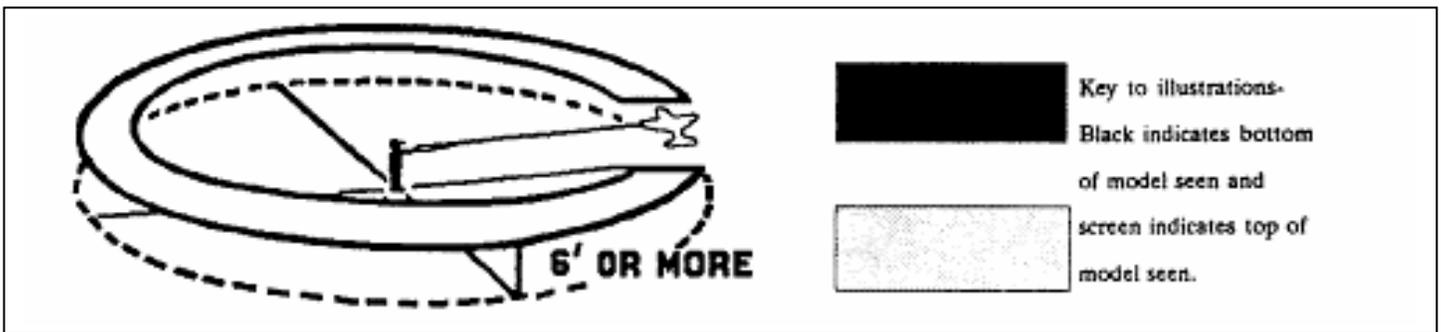
be used, depending upon the degree of excellence of realism, workmanship and finish. No more than four points shall be given for any of these three items, and all contestants shall receive at least a one-point total. At least one contestant shall receive a ten-point total. The points so obtained shall then be multiplied by eight to obtain appearance points, which will therefore range from a minimum of eight to a maximum of 80. The resulting appearance points are to be added to the contestant's flight points for scoring purposes. It is suggested that the appearance rating should be done by separate judges; not the judges who are scoring the flying.

FLIGHT PATTERN: Maneuvers shall be accomplished in the order listed below under "Precision Flight Points." The contestant shall notify the judges prior to the flight as to the specific maneuvers he wishes to omit. If the listed

circle. Failure to become airborne within the 3 minute limit will constitute an attempt.

2. TAKE-OFF: A Sloppy take-off is judged when the airplane is out of control or wobbles and bounces into the air. A Rough take-off is judged in cases where the airplane is instantly airborne and climbs too steeply with not too much control or where plane leaves the ground, then touches wheels again with a bounce. A Smooth take-off is judged when the take-off is under full control, smooth and stable at all times, with the climb at a gradual angle representing the climb of a real airplane. Take-off gear must be permanently affixed to the model. Model must R.O.G.

- Sloppy – 1
- Rough – 3
- Smooth – 5



maneuvers remaining are attempted or accomplished in the proper sequence, the contestant shall be awarded 25 "flight pattern" points. All of these 25 points are to be given the contestant, even if after attempt or accomplishment of one or more maneuvers in the proper sequence an unpreventable reason, such as a crash or failure of the engine to run or to run smoothly, prevents completion of the pattern. No flight pattern points are to be given, however, when the flyer neglects to attempt a maneuver, omits one, accomplishes one in other than the proper sequence, or attempts maneuvers after 8 minutes (or time allowed for multi-motored models).

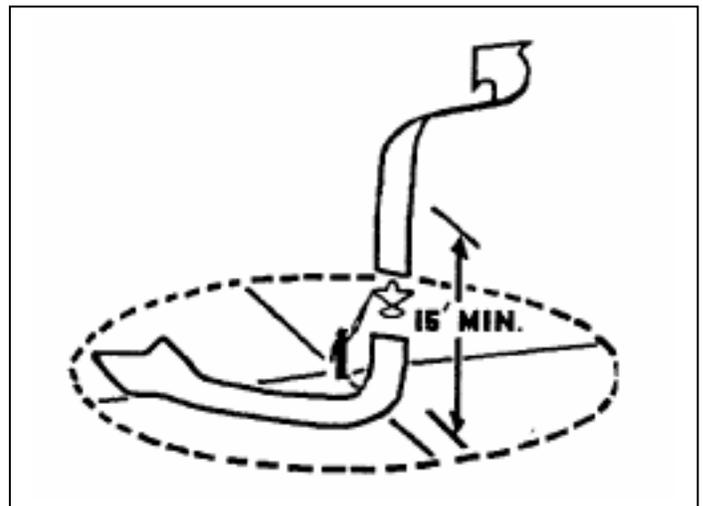
PRECISION FLIGHT POINTS: These are to be given, as provided for below, when the maneuvers are accomplished on the first attempt and in the proper sequence. No more than one attempt shall be made by the flyer for each maneuver, which should be preceded by at least one full lap of normal level flight. The illustrated flight paths shown in these regulations shall be used as the basis for judging maneuvers.

MANEUVERS

1. STARTING: Take-off within one minute from starting time. The time allowed to obtain points for getting the plane airborne within 1 minute starts when the contestant or mechanic begins cranking the engine. The contestant has a total of 3 minutes to get the plane into the air from the time the handle is placed in the center of the flight

2. LEVEL FLIGHT: 2 laps at 6-ft. altitude. (Altitude used must be between 6 and 10 feet and a constant altitude should be maintained, and varies over 4 feet in altitude. Wavy-when plane is not too stable and varies over 2 feet in altitude. Smooth-very stable and varies less than 2 feet in altitude.

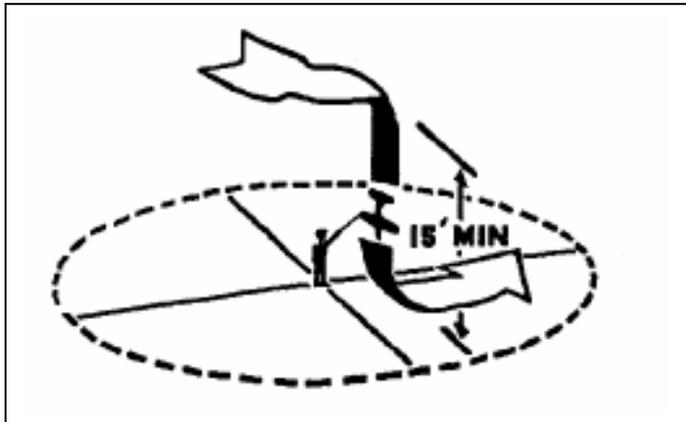
- Rough - 1
- Wavy – 3
- Smooth – 5



3. CLIMB: At least 15 feet measured vertically with a precise change of direction into and out of maneuver. A Climb-model climbs at an angle no less than 60 (degrees

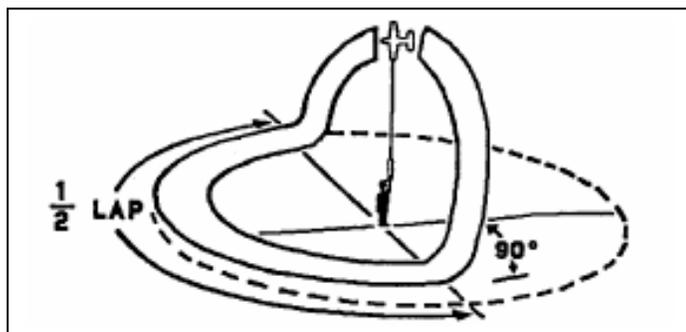
for at least 15 feet or mushes badly going into or out of maneuver. A Steep climb-plane climbs at a 90 degree angle for at least 15 feet, but mushes or wobbles slightly going into or out of maneuver. A Vertical climb-plane climbs at a 90 degree angle for 15 feet with no mush or wobble going into or out of the maneuver. Past vertical-see steep climb. All climbs will begin at the normal level flight altitude and level off from climb on the same side of flight circle that the climb was started from. Crossing over the top of the circle will lose all climb points.

- Climb – 3
- Steep Climb – 7
- Vertical Climb - 10



5. DIVE: At least 15 feet measured vertically with a precise change of direction into and out of maneuver. A Dive- plane dives at an angle no less than 60 degrees for at least 15 feet or mushes badly going into or out of maneuver. A Steep dive- plane dives at a 90 degree angle for at least 15 feet, but mushes or wobbles slightly going into or out of maneuver. A Vertical dive- plane dives at a 90 degree angle for 15 feet with no mush or wobble going into or out of maneuver. Past vertical-see steep dive. Dive must start and end on the same side of the flight circle. Crossing over the top of the circle and entering dive will lose all dive points.

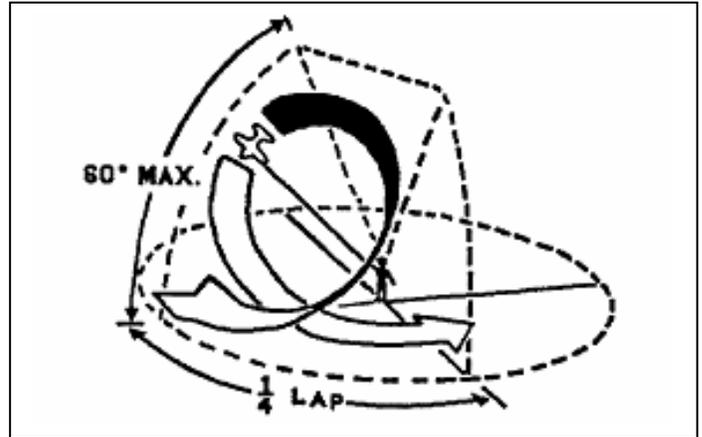
- Dive – 3
- Steep Dive - 7
- Vertical Dive –10



6. WING-OVER: Vertical climb and dive model passing directly over flyer's head, cutting the ground circle in half. Poor- a 60 degree climb and dive or the model mushes and wobbles badly on entry or pull out. Fair - a 90 degree

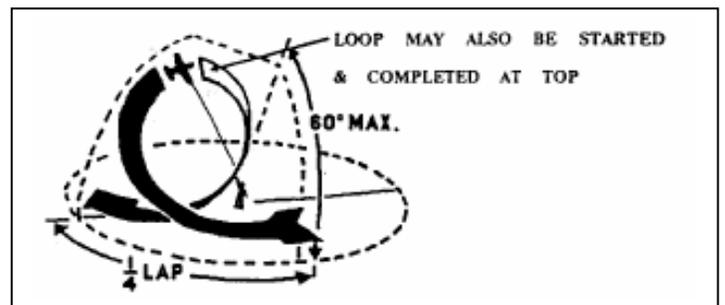
climb and dive, but mushes slightly on entry or pull out. Excellent-a 90 degree climb and dive with sharp entry and pull out without mushing. Start and finish at approximately 6 ft. altitude.

- Poor – 5
- Fair – 10
- Excellent -15



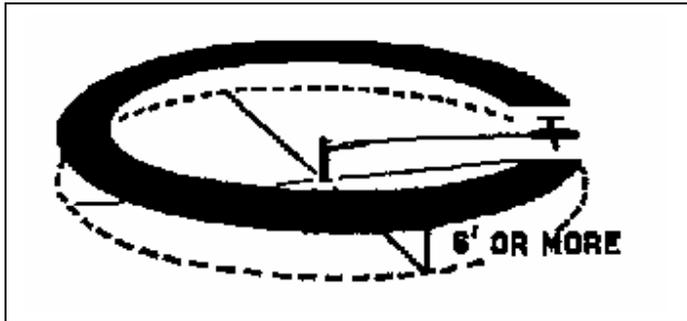
7. CONSECUTIVE INSIDE LOOPS: Entire series should be done within 1/4 lap with control line(s) at an angle of 60 degrees or less to the ground at all times during maneuver. Loops should be judged for roundness and smoothness. If they are not round or if ship wobbles or mushes, they are not executed smoothly. Also, they should all be done at the same spot without the plane moving forward or backward from the position of the first loop. All loops should be the same size as the first one for maximum points.

- 1st Loop – 10
- 2nd to 5th incl – 5 each
- 2 points shall be deducted for each loop not smoothly executed.



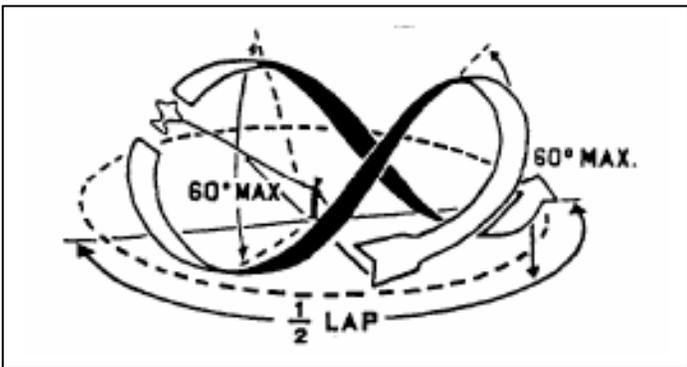
8. CONSECUTIVE OUTSIDE LOOPS: Entire series should be done within 1/4 lap with control line(s) at an angle of 60 degrees or less to the ground at all times during maneuver. Loops may be entered from inverted or normal flight, so long as complete loops are made. Outside loops should be judged the same as inside loops. Special attention should be given the first outside loop in watching its altitude. All loops should be the same size as the first one for maximum points.

1st Loop - 10
 2nd to 5th incl - 5 each
 Three points shall be deducted for each loop not smoothly executed



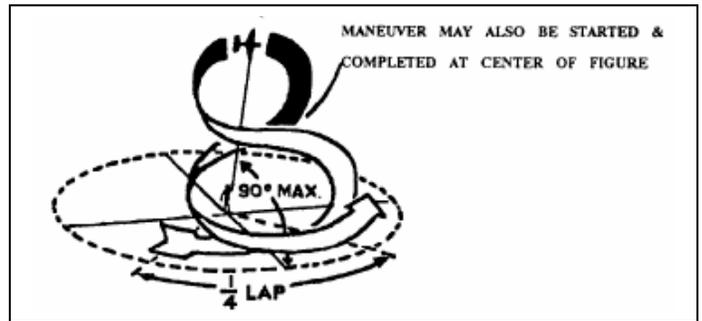
9. INVERTED FLIGHT: Must start and end with model in normal upright position. Flight direction must be opposite to that of take-off. Model should be flown at a 6-foot altitude. Immediately upon becoming inverted, the model should attain a 6ft. altitude and the judging of the laps should begin. Inverted flight laps should be judged the same as for level flight for the first two laps. After 2 complete laps are flown at approximately 6ft. altitude, recovery should be made. A smooth recovery below 45 degrees altitude without mush or wobble would rate 10 points. Below 45 degrees, but with a mush or wobble rates 7 points. Above 45 degrees or with a bad mush or wobble rates 3 points.

1st Lap: Rough - 3; Wavy - 7; Smooth - 10
 Recovery: Rough - 3; Wavy - 7; Smooth - 10
 Maximum points possible - 30



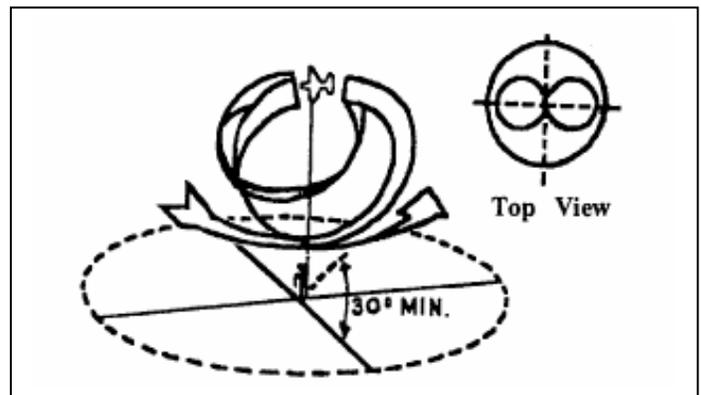
10. HORIZONTAL FIGURE EIGHT: Should be done within 1/2 lap, with control line(s) at an angle of 60 degrees or less to the ground at all times during maneuver. Both ends of the horizontal eights should be round circles of the same size. At the point of intersection, model should be in a vertical position. Any figure eight that has mushing, wobbling, unequal sized ends or plane not in vertical position at intersection will be given minimum points.

1st Eight - 20
 2nd to 3rd - 10 each. Five points shall be deducted for each eight not smoothly executed



11. VERTICAL FIGURE EIGHT: Control line(s) should not exceed an angle of more than 90 degrees to the ground. Vertical eights are judged the same as horizontal eights with the exception that the model should be in a horizontal position at point of intersection. Vertical eights may be started at bottom or center and may have the inside loop part on either the top or bottom. Either part may be done first.

1st eight - 20
 2nd and 3rd - 10 each. Five points shall be deducted for each eight not smoothly executed



12. OVERHEAD FIGURE EIGHT: Center of 1st eight figure to be directly over flyer's head. Control line(s) should not be at less than a 30 degree-angle to the ground at any time during the maneuver. Over-head eights are judged the same as the other eights with the exception that the model should always point in the same direction at the top of each circle. Special attention should be given to the 30 degree minimum angle.

1st eight - 20
 2nd and 3rd - 10 each. Five points shall be deducted for each eight not smoothly executed

13. SQUARE LOOP: Horizontal flight portion of maneuver should consume at least 1/4 lap. Corners should have a radius of approximately 5 feet. Angle of control line(s) to ground should not exceed 60 degrees at any time during maneuver. Square loop definition is self-explanatory, however, the maneuver must be started from right-side-up horizontal flight and the first corner will be a climb. Watch for 60 degree maximum altitude.

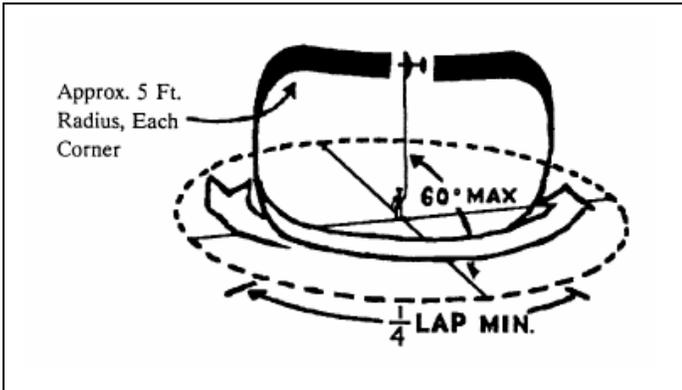
1st Corner – 5

2nd Corner – 5

3rd Corner – 10

4th Corner – 20

Corners with greater than the approximate 5 foot radius specified - 0



14. LANDING: A model will be considered as having made a nose-over landing if, at any time during the landing, it goes up on its nose even though it may not flip over on its back. Should the tail drop back to the ground, the landing is still considered as being a nose-over. Rough landing- A landing where the model bounces more than one time, drags a wing tip, or ground loops. Bounce landing- A landing where the model lands fairly smooth but bounces once without leaving the ground more than a few inches. Smooth landing- A landing with no bounce or roughness and the model rolls to a smooth stop.

Nose-over – 1

Rough – 5

Bounce – 10

Smooth – 15

Belly landing (gear retracted) – 0

SPECIAL POINTS TO REMEMBER: Contestants may fly as many laps as desired for warm-up and testing. When ready to start the flight pattern, a raised arm signal must be given the judges. It is up to the contestant to give this signal long enough to ensure the judge's seeing it. Holding the signal during the entire level flight maneuver is suggested. There must be at least one level lap between maneuvers. If your ship flies fast, it is suggested that you do several laps between maneuvers in order to give the judge time to complete his scoring.