

Fly Safely!

PRICE 50¢

RADIO CONTROL MANEUVERS

AMA/RENAUD RESEARCH LIBRARY

CONTROL LINE

All pertinent AMA Regulations for Gas Models—Control of the flyer, the model and the flyer, except as specified.

PRECISION ACROBATIC REGULATIONS
control system of the model... attachment to the model... of kinks, rust, etc., regardless... equipment has already withstood... Judges' opinion will be final in regard to a model or equipment. Swivels will be their authority to disqualify a model for flight. Swivels will be unsafe for flight. Swivels will be unsafe for flight.

FILE COPY

RUBBER-POWERED
which shall be capable of... at the... of position... in the... of... from... of... and... from... of... with... at the

WING OVER

HORIZONTAL ROLL
24. RADIO CONTROL SCALE
All AMA and FCC regulations... applicable in this event

24.1a. GENERAL. All AMA... covering the R/C flyer, his plane and... as noted below.
24.1b. SAFETY REQUIREMENTS. Consideration... shall be given to the safety of the aircraft in the following:

CUBAN EIGHT

7. TOWLINE GLIDERS
7.2 A-1 SPECIFICATIONS
glider is a non-powered... towed into the air from... tensile line. There are... for such... are... on the

Section F/F
GAS MODELS—FREE FLIGHT
5.4 SEAPLANE MODELS
floats or pontoons... which shall be capable... model shall be capable... in the take-off position... or pontoons immersed... TOTAL WEIGHT... shall be limited to... not more than 7 1/2... REQUIREMENTS... Section... required for A... SPECIFICATIONS... Championship Nordic A-2... of Rule Book.

8. INDOOR MODELS—RUBBER-POWERED

Official Model Aircraft Regulations

Governing Sporting Model Aviation in America

1987

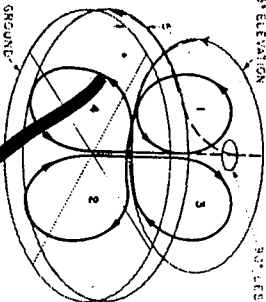
Issued under NAA-FAI Franchise



by the Contest Board

ACADEMY OF MODEL AERONAUTICS

1239 VERMONT AVENUE, N.W. WASHINGTON, D.C. 20005



Errors: Entry is not within 2 feet of 45° elevation point. Loops are rough or not of equal size. Paths connecting loops are not properly horizontal or vertical according to the maneuver sketch. Bottoms of lower loops are not at 4-6 feet height. Tops of upper loops are

not 3-7 feet below the 90° point over the flyer's head. Loops are not properly tangent to form a square pattern. Model recoveries before it has flown vertically through the clover pattern. When the model makes a smooth realistic approach, touches down smoothly with no bounce, and comes to a stop without having touched any part of the model to the ground other than the landing gear. Two or 3-point landings are permissible.

Maximum 40 points. Minimum 0 points.
Errors: An error is scored anytime the model bounces or touches any part of the model to the ground other than the landing gear. Crash, flip-over, belly or upside-down landing receives no score. Any unusual circumstances surrounding the above errors which may cause an error not within the pilot's control will be judged accordingly.

PRECISION AEROBATIC SCORE SHEET

Name _____ Contestant or AMA No. _____

	POOR	Fair	GOOD	EXCELLENT	SCORE
Workmanship	4	6	8	10	8
Realism	4	6	8	10	8
Finish	4	6	8	10	9
Originality	4	6	8	10	10
Starting (within 1 Min.)	20	30	40	50	5
Take-off	10	20	30	40	32
Reverse Wing Overs	10	20	30	40	35
Inside Loops (3)	10	20	30	40	40
Inverted Flight (2 laps)	10	20	30	40	28
Outside Loops (3)	10	20	30	40	32
Inside Square Loops (2)	10	20	30	40	30
Outside Square Loops (2)	10	20	30	40	35
Triangular Loops (2)	10	20	30	40	22
Horizontal Eights (2)	10	20	30	40	40
Horizontal Square Eights (2)	10	20	30	40	38
Vertical Eights (2)	10	20	30	40	35
Hourglass Figure	10	20	30	40	25
Overhead Eights (2)	10	20	30	40	32
Four-leaf Clover	10	20	30	40	28
Landing	0	10	20	30	25
Flight Pattern					25
TOTAL					542

21.16 NOTE: Illustrations are for counterclockwise flight and are reversed for clockwise flying.

22. RADIO CONTROL PATTERN EVENT REGULATIONS

22.1 OBJECTIVE: To control by radio a model airplane so that various planned maneuvers may be accomplished. The criterion is the quality of performance, not the mechanism of control. R/C competition is based on the excellence of performance of the model's maneuvers, compared to similar maneuvers performed by a full-sized plane. Maneuvers shall be judged according to the AMA Radio Control Judges Guide.

22.2a GENERAL REQUIREMENTS: Models may be of the reciprocating internal combustion engine-powered type with no limit on engine size or length of run, or of the towline glider type, with no limit on length of towline. No model may weigh more than 15 pounds gross weight ready for take-off. Engine displacement limit is .61 cubic inches, total.

22.2b SAFETY REQUIREMENTS:

- 1. All models must pass a general safety inspection by the Event Director or his representatives before they are allowed to compete.
- 2. Any flying over a controlled spectator area shall be cause for immediate disqualification of that flight.
- 3. Dangerous flying of any sort, or poor sportsmanship of any kind, shall be grounds for disqualification of the contestant involved.
- 4. All planes entered must have rounded prop spinners, or some sort of safety cover on end of propeller shaft (such as a rounded "acorn nut").
- 5. Knife-edge wings are not allowed.

22.3 All radio equipment and operation must conform to the regulations of the F.C.C. (AMA membership card and F.C.C. license of each entrant shall be checked at every sanctioned meet.

22.4 GENERAL: The Radio Control Pattern Event shall be divided into three classes, based on three primary aerodynamic axes of control: Yaw, Pitch and Roll. Note: Primary controls—Rudder, Elevators, Ailerons; Auxiliary controls—any non-primary controls.
a. No radio equipment limitations or requirements in any class.
b. Engine control is permissible in all classes, by any means—trimmable, proportional, selective positioning, etc.—operable simultaneously with, or independent of, other control.
1. Class I—Planes controlled about the Yaw axis, by Rudder Control only. No auxiliary aerodynamic controls are permitted (flaps, spoilers, etc.); no auxiliary non-flight controls are permitted (brakes, steerable wheels, etc.) Trim of obtainable control is permissible only if obtainable with the basic actuator used for Rudder control—no additional servos, actuators or devices are permitted. Rudder control permissible by any means—selective positioning, proportional, etc.
2. Class II—Planes controlled about the Yaw and Pitch axes, by Rudder and Elevator control only. Rudder and elevator control permissible by any means, simultaneously independently or otherwise. Auxiliary non-flight controls (brakes, steerable wheels, etc.) are permitted without limitation or restriction. Auxiliary aerodynamic controls (flaps, spoilers, etc.) are not permitted.
3. Class III—Planes controlled about the Yaw and Pitch and Roll axes, by Rudder, Elevator and Aileron control, with no limitations or restrictions on primary aerodynamic control, auxiliary aerodynamics controls or auxiliary non-flight controls.

22.5 A Class I plane may be entered in either of the other classes, at the option of the flyer, and a Class II plane may be entered in class III. Scores for all three classes shall be listed separately. Contestant shall be permitted to enter in only one of the three categories listed in Para. 4 (22.4 GEN.). A plane is considered "entered" when it has completed an Official Flight.

22.5a. Two (2) airplanes allowed, to be labeled "one" and "two." The contestant may choose to enter either plane at the beginning of the meet and shall continue to use such plane unless, and until, said plane shall be damaged to the extent that it cannot be readily repaired. Contestant then may, upon notification to the Contest Director, substitute plane number two for the balance of the meet with no penalty. Under no circumstances will contestant be allowed to re-submit plane number one after it is taken out of competition. No substitution of parts between one plane and the other will be permitted other than engines and radios. That is to say, the wing off of one airplane may not be used on the other airplane in the event number one should sustain only wing damage.

22.6 NUMBER OF FLIGHTS. There shall be no limit on the number of flights (other than that imposed by time available). Contest officials shall make every reasonable effort to insure that all contestants receive equal opportunity to fly.

22.7 OFFICIAL FLIGHT. A flight is considered official if two maneuvers, other than take-off and landing, have been judged. An attempted maneuver yielding zero points is still considered "judged."

22.8 TIME LIMIT:
A Class I contestant is allotted a total of nine minutes.
A Class II contestant is allotted a total of eleven minutes.
A Class III contestant is allotted a total of eleven minutes.

In all classes the contestant must commence this flight within the first three minutes. When he fails to commence within the three minutes time limit, and is so informed by the judge, he must immediately clear the area for the next contestant. No engine restarts are permitted after the first maneuver—engine restarting is permitted only within the first three minutes of allotted time and only prior to scoring of the second maneuver.

22.9 The highest score for the total of two best flights shall be the winner. Maneuver points from repeat flights may not be added to earlier flights. Each flight is complete in itself. In case of ties, the best flight scores of the contestants concerned shall be used to determine the winner (if only two flights have been scored during the normal contest time, the highest single flight score of the contestants concerned shall determine the winner). There is no minimum number of flights which must be scored.

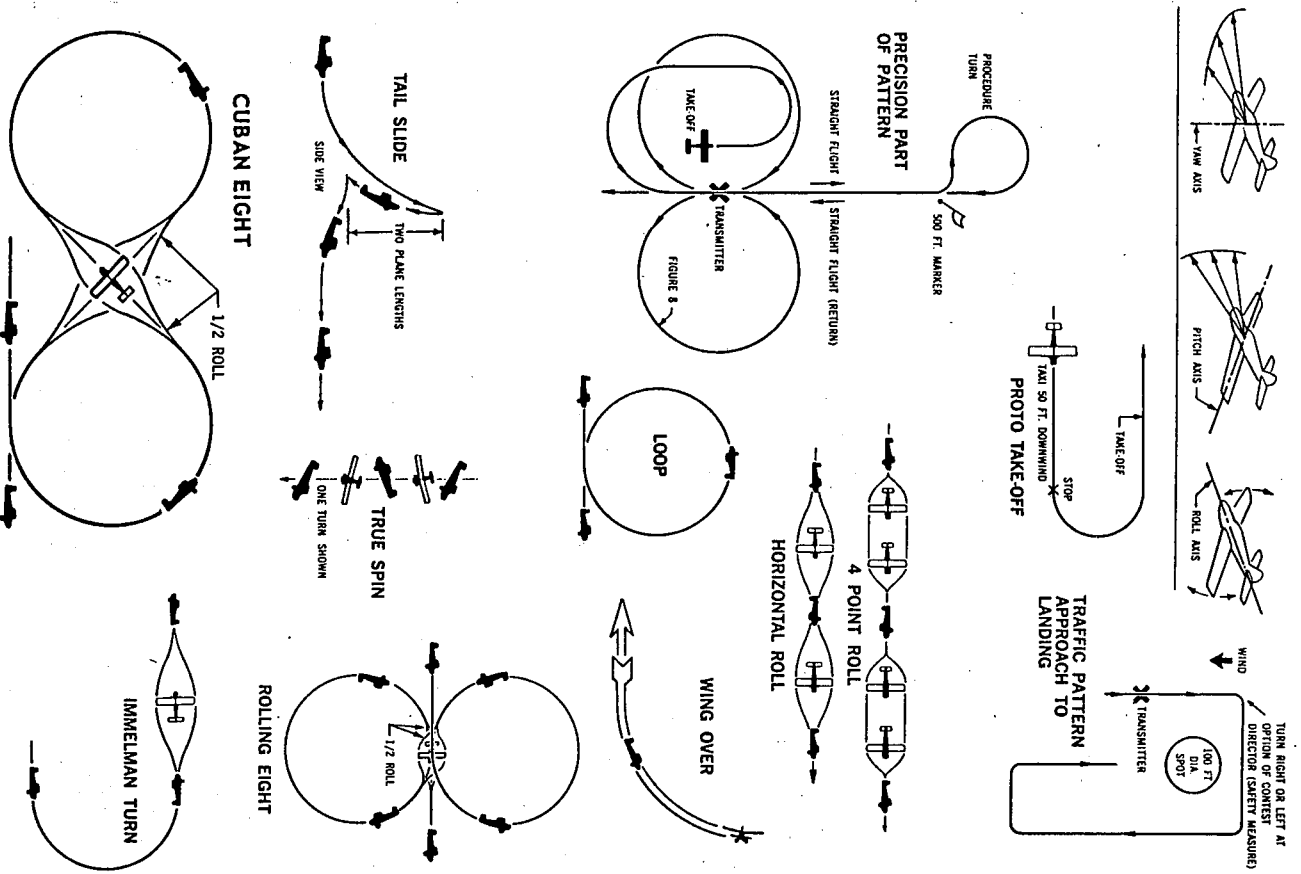
22.10 POINT SYSTEM: A point system shall be used to score maneuvers. Each maneuver shall be judged on a scale of zero to five.

22.11 FLIGHT PATTERN: The contestant must fly his entire flight according to the established Flight Pattern and in the order listed. The contestant may waive any maneuver except those numbered 2 through 6. Maneuvers performed out of order will not be judged.

REQUEST CHARTER FORMS & DETAILS FROM HQ

Model clubs across the nation are chartered by AMA. These clubs are eligible for special insurance and other AMA benefits. In many areas, model flying sites are provided by civil government, military or business co-operation, with participation requiring club membership as proof of responsibility.

RADIO CONTROL MANEUVERS-



The contestant must call out each maneuver before he attempts to perform it. ALL THREE CLASSES WILL USE THE SAME FLIGHT PLAN. (Except for maneuvers 9a, 9b).

MANEUVERS:

1. *Proto Take-off:* Model will be taxied rear-laterally downwind at least 50 feet from point of engine start, stopped, then turned at least 120 degrees into the wind and takeoff made on this heading.
2. Deleted. Continue with No. 3.
3. *Straight Flight:* Approximately upwind from directly over transmitter to marker 500' away. Judge will announce arrival over marker. (Judges may reduce distance in windy weather.)

Note: On maneuvers 3-6, maintain constant altitude for top points.

4. Procedure Turn, 90 degrees left, starting just beyond marker, followed by immediate 270 degree right turn.
5. *Straight Return Flight* from marker to directly over transmitter.
6. *Figure Eight:* Axis perpendicular to wind. Smooth equal circles, crossing over above the transmitter.
7. *Touch and Go:* While traveling in a straight line, plane must land and take off again. In the judges opinion the plane must be completely unairborne, but must not come to a stop on the ground.
8. *Wing Over:* 180 degree change in direction, with level recovery at same altitude as entry.
- 9a. *Three Continuous Horizontal Axial Rolls:* Straight level recovery on same heading as entry.
- 9b. Class I and Class II planes may substitute three continuous barrel rolls for the above.
10. *Immelman Turn:* Half loop followed by half roll at top. Level recovery at higher altitude than entry.
11. *Three Continuous Inside Loops:* Smooth, round, equal sized, all at the same altitude. Straight and level recovery.
12. *Four Point Roll:* One complete axial roll with a pause in the roll and a short but obvious straight flight at each 90 degree point of the roll.
13. *Three Continuous Outside Loops:* Smooth, round, equal sized, all at the same altitude. Straight and level recovery.
14. *Cuban Eight:* Horizontal eight performed by means of two delayed Immelman turns. See diagram.
15. *Three Turns True Spin* (not spiral dive). Model must enter spin from a stalled attitude. Three complete turns, recovery on same heading as entry.
16. *Inverted Figure Eight:* Smooth equal circles, cross over transmitter. No restriction as to how inverted flight starts, however entry and recovery must be inverted.
17. *Rolling Eight:* One inside loop followed by a half roll immediately followed by another inside loop followed by a half roll. Entry and recovery on the same level. Maneuver creates a vertical eight with one loop above and the other below the entry-recovery axis.
18. *Tail Slide:* Under moderate power the model is allowed to stall in a vertical attitude. After a controlled slide downward on the tail, the model recovers normal flight at the same level from which the initial stall was entered.
19. *Vertical Eight:* Level entry, one complete inside loop, followed immediately by one complete outside loop, directly below, with

level recovery at the same altitude as the entry. The complete maneuver is an eight in the vertical plane.

20. *Traffic Pattern Approach to Landing:* Fly upwind over transmitter, turn 90 degrees (right or left at the option of the Contest Director—safety considerations will determine which) fly straight 100', turn 90 degrees downwind, start to descend and fly as far as the contestant feels is necessary to make a safe approach. All turns must be made at a safe altitude. Judges are required to give zero points for this maneuver if in their opinion turns are made at unsafe altitudes. Turn 90 degrees cross wind, finally turn up wind onto the final leg. Maneuver is over when plane is within 6' of ground.
 21. *Landing Perfection:* Smooth and realistic approach, smooth and realistic landing with no bounce—full points—graduated to minimum points for extremely rough approach, rough landing with bounce but without nose-over due to poor control. (Might be due to poor surface conditions.) Mandatory zero points for nose-over, intentional dive in, or landing not within clear view of Judges.
 22. *Spot Landing:* The spot shall consist of a circle 100' in diameter. For landing within this circle will award points equal to those earned in the landing perfection.
 23. *Proto Taxi to Hangar:* After touching down, model is brought to a complete stop, then taxied over realistically and brought to a stop with the main landing gear within a 3' circle designated as the "hangar". Said "hangar" to be outlined close to the start line for the proto takeoff.
- 22.12 **FIELD PROCEDURE:** The procedures listed below are suggested, and may be altered by the Event Director to fit local conditions.
- 22.13 All R/C contestants shall be set up in "pits" at spot assigned by Event Director, so they will be under his immediate control.
- 22.14 There will be no testing of transmitters or receivers during the flying period. Transmitters may be impounded at discretion of Event Director. Any person causing interference will suffer immediate disqualification. The Event Director will provide a monitor receiver for check for interference.
- 22.15 The flight order shall be determined by position of contestants' signatures on a *single Flight List* held by Event Director or his representative. This list shall include all classes and frequencies. Contestant shall have his name on list only once at any one time; names may be moved to bottom of list on request, but trading of positions with other contestants is not allowed. When a contest is to be continued on a following day, the Flight List shall carry over from day to day.
- 22.16 Event Director shall carry out following procedure:
- a. Numbers 1, 2, and 3 on Flight List shall be on flight line with their models, equipment, and one helper if desired. No 1 is contestant flying or ready to fly. No. 2 is next man to fly, etc.
 - b. The No. 1 man shall have 3 minutes from completion of preceding flight in which to prepare model for the start of his flight. Failure starts are permitted within the 3 minute limit. Failing to start flight within this limit, contestant must immediately remove his plane and equipment to the pit. It shall be responsibility of Event Director or his representative to notify Director of start and end of 3-minute period.
 - c. Numbers 4, 5, and 6 on the Flight List shall have their planes and equipment in a ready box located near the flight line. As soon

as a flight is completed, the No. 4 man becomes No. 3 and shall be requested to move his model and equipment onto the flight line. If he is not on hand to do so, he shall be dropped from the Flight List, and the List advanced to fill his place. The Event Director or his representative shall be responsible for notifying contestants when they are to move to ready box or flight line.

- 23.17 When technically possible and when judges and space are available, it is strongly recommended that two or more flights be flown simultaneously, under the following conditions:
- Separate take-off and landing areas sufficiently spaced cross wind from each other to minimize engine noise and flight path interference.
 - Contestants flying simultaneously shall carefully check receiver and transmitter operation before take-off, to be sure no interference between them is possible.
 - Contestants flying simultaneously must be

23. RADIO CONTROL PYLON RACE REGULATIONS (SOLO)

23.1 OBJECTIVE. The purpose of this event is to cover the prescribed course at the highest possible rate of speed. Race results will be posted in miles per hour.

GENERAL:

- 23.2 All AMA and FCC regulations concerning the R/C Flyer, his plane and equipment shall be applicable to this event, except as noted herein.
- 23.3 There shall be no limitations on the type of equipment fitted to the plane, or the number of controls.
- 23.4 The contestant shall be allowed only one entry in the R/C Pylon Event, but this may, in addition to any entries he might have in the R/C Pattern Event or R/C Scale Event. The same plane may be entered in more than one event if it meets all of the model requirements of each of the events entered.

MODEL REQUIREMENTS:

- 23.5 This event shall be flown on the basis of a single category only, and only one set of records will be kept by the AMA. However, to allow for individual preferences and available equipment, models with the following specifications may be flown in the maximum engine displacement of 200 cubic inches, with a minimum wing area of 89 square inches for each .01 cubic inches of Example: 045-186 sq. in.; 1548 sq. in.; 16-570 sq. in.; 19-722 sq. in. Total area of delta wings will be used and area.
- 23.6 AMA license number shall be displayed prominently on the upper right wing panel and the lower left wing panel.
- 23.7 Radio control frequency shall be displayed on each side of the fuselage.
- 23.8 Racers may not use drop-off or dolly landing gear, but must carry such gear with them. Retractable gear is acceptable provided that it is lowered for landing.

SAFETY REGULATIONS:

- 23.9 Considerations of safety for spectators, contestants, and other persons are of the utmost importance in this event, and the following safety provisions must be observed.
- 23.10 All models must pass a General Safety Inspection by the Event Director or his representatives before they are allowed to compete.
- 23.11 Any flying over a controlled spectator area will be cause for immediate disqualification of that flight.

no more than three positions apart on the Flight List. Event Director or representative shall, where possible, select contestants at top of Flight List so that contestants flying on compatible frequencies are on flight line together.

d. Should a contestant oppose flying simultaneously with someone else, he may cancel his turn and re-sign at the bottom of the Flight List.

23.18 OFFICIALS. An Event Director, a Dispatcher-Recorder and Judges are the essential officials for an R/C Event. If possible, the Dispatcher-Recorder should have at least two helpers.

23.19 Each flight should be judged by at least two judges, with their scores averaged to give final score for the flight. It is suggested that each maneuver be scored immediately after it is performed. Judges shall score maneuvers individually and without consultation between them. There should be enough judges available to establish a rotational procedure which will average out variations in judging.

23.12 Dangerous flying of any sort, or poor maintenance of any kind, shall be grounds for disqualification of the contestant involved.

23.13 All planes entered must have rounded prop spinners, or some sort of safety cover on end of propeller shaft (such as a rounded "acorn nut").

23.14 Knife-edge wings are not allowed.

COURSE:

23.15 The course shall be at least 1/2 mile (.528) long, and shall be indicated by each end with crosses (hereafter called Markers) ground or by vertical pylons. Where possible, the course shall be in line with the prevailing wind. Markers must be in line with the prevailing wind. Markers must be in line with the prevailing wind. Markers must be in line with the prevailing wind.

23.16 A Start-Finish line at right angles to the course shall be provided at the downwind end of the course, 100 ft. upwind from the downwind marker.

23.17 The pit area and Ready Line of those waiting their turn to fly shall be at least 200' to one side of the centerline of the course. Pit and/or spectator areas should not be on the side of the course that is used by the planes on their upward leg. If the layout does not permit this arrangement, an additional 100' setback must be used.

23.18 The meter who is flying may place his equipment at any point within a 100' radius at the Start-Finish line.

23.19 Spectators must be kept at least 300' each side the centerline of the course, and the same or greater distance beyond the upwind Marker. No spectators shall be allowed downwind of the course. Pit and/or spectator areas should not be on the side of the course that is used by the planes on their upward leg. If the layout does not permit this arrangement, an additional 100' setback must be used.

RACE PROCEDURE:

- 23.20 If the Pylon Race is being run during a meet where other R/C events are also in progress, it is suggested that the Pylon events operate from the same flight line as those in the other events, to preclude possibility of interference.
- 23.21 All flights shall be R/C with release at the Start-Finish line unless the Event Director certifies that ground conditions do not allow this, in which case hand-launch may be used. Hand-launched flights are not eligible for AMA record recognition.
- 23.22 Each flight will be timed from the instant model is released for ROG take-off (or is

hand-launched), will continue for 5 complete laps (a lap being considered as one trip each way between the two Markers), and lock as the plane passes the Starting Line.

23.23 All lads shall be flown counterclockwise with turns to the left.

23.24 Flyer will have 3 minutes from time he is called to get his engine started, equipment turned on and checked, and the plane released for ROG (or hand-launched).

23.25 Flight time shall be 4 minutes, and plane must be landed within this time, or the flight cannot be counted.

23.26 If the model fails to fly outside the Markers, it must be recited the missed Marker, or the flight will not be scored.

24. RADIO CONTROL SCALE REGULATIONS

24.1 GENERAL. All AMA and FCC regulations covering the R/C Flyer, his plane and equipment should be applicable in this event, except as noted below.

24.1a. SAFETY REQUIREMENTS:

Considerations of safety for spectators, contest personnel, and other persons are of the utmost importance in this event, and the following safety provisions must be observed.

- All models must pass a General Safety Inspection by the Event Director or his representatives before they are allowed to compete.
- Any flying over a controlled spectator area will be cause for immediate disqualification of that flight.
- Dangerous flying of any sort, or poor maintenance of any kind, shall be grounds for disqualification of the contestant involved.
- All planes entered must have rounded prop spinners, or some sort of safety cover on end of propeller shaft (such as a rounded "acorn nut").
- Knife-edge wings are not allowed.
- There will be two weight classifications: Class I: Models which weigh no more than 15 lbs. Gross weight, ready for flight, except for fuel.

Class 2: Restricted to multi-engine models which weigh from 15 lbs. to not more than 20 lbs. Gross weight, ready for flight, except for fuel.

Maximum wing loading permitted in Class 2 will be 35 ounces per sq. ft. Contestant must affirm to the Contest Director that model has been successfully flown prior to the contest. Wing area measurement will include that portion of the horizontal wing contour in or on the fuselage.

7. Maximum vertical displacement of the engine(s) will not exceed 1.25 cu. inches. The use in the Scale Event of single engines which are larger than .61 cu. inches displacement, but not larger than 1.25 cu. inches, will be covered by the AMA Insurance at sanctioned AAA or larger meets only.

24.2 There shall be only one category for R/C Scale. There are no limitations on the radio or mechanical equipment used by the contestant.

24.3 Contestant will be allowed only one entry in R/C Scale. This is in addition to any entries he may make in the R/C Pattern or R/C Pylon Race Events. The same plane may be entered in more than one event if it meets all of the model requirements of each of the events entered.

24.4 QUALIFICATION FLIGHT: The Contest Director may, but need not, require RC Flying Scale models to make a qualifying flight before

23.27 Two or more planes may be flown at a time. If the equipment allows this and there are sufficient Judges and Timers. If this is done, there should be a Timer for each plane in the race, and preferably a Marker Judge to keep track of each plane.

23.28 The Marker Judge shall give no signal unless the plane has failed to round the Marker, in which case he will wave a flag.

OFFICIALS:

23.29 In addition to the Event Director, there shall be a Timer who also functions as a lap counter, and a Judge at the far Marker to check that all turns are legal. The Timer shall act as Marker Judge at the starting point. A Recorder should be available to keep records.

Scale Judging takes place. The flight will consist of the following maneuvers from the Flight Plan:

- Unassisted R.O.G.
- Figure Eight
- Landing Perfection

In order to qualify, the flyer must have a minimum total score of 3. Qualifying scores will be recorded, and in the event no further flights are made, shall be used in calculating contestant's official score. Flights will be 3 minutes, time beginning upon release of model. Three minutes will be allowed to start the flight. Additional time will be allowed for extra engines as indicated in section 24.1. Any damage to the model caused by the Scale Judging flight shall be disregarded by the Scale Judge during Scale Judging and shall not count against the contestant. Refer to Flight Plan rules for flight scoring and judging instructions.

24.5 SCALE JUDGING shall be done according to the provisions of the unified Flying Scale Regulations, Regulation 25.

24.6 SCALE OPERATIONS. The following operations must be accomplished in flight. The operations chosen must have actually been used by the prototype aircraft.

(a) Multi-engines. 20 Points will be scored each engine in excess of one. To obtain maximum points engines must be of equal displacement unless engines of the prototype aircraft were of different sizes, in which case the model engines may vary proportionately. Extreme variation from scale engine sizes will be heavily penalized. Extra engines must also run the full length of the flight to be eligible for maximum points. Score will be reduced proportionately depending on length of time running.

- Retract and extend landing gear. Maximum—20 points (Gear must be retracted immediately after takeoff and extended for landing.)
- Extend and retract flaps. Maximum—10 points

Flaps will be extended before commencing taxi maneuver and used during takeoff. They will again be extended before the touch and go and/or landing. At conclusion of taxi maneuver they will be retracted.

- Drop bombs. Maximum—5 points (Bombs must be carried and dropped in the same manner as the prototype.)
- Agricultural spraying or dusting. Maximum—5 points
- One lap pylon speed demonstration (for specific pylon racer types only) or speed

20.2 It will be required that all models are to be flagged after they pass the number 1 pylon and not before. There will be no flagging at the number 2 and 3 pylons unless a pylon is cut. There will be no pilot's helpers at any of the pylons.

20.3 At the number 2 and 3 pylons the official flagman will stand close proximity to the pylons they are judging. Sufficient personnel are not available to act as flagmen for each entrant, one flagman can be used at each of the number 2 and 3 pylons. He will use an appropriate method to notify a missed pylon to the flight controller.

20.4 A Maximum of 4 planes per pilot will be allowed.

20.5 A three minute time limit for the engine will be allowed. A 6 minute flight time will be the maximum endurance of any flight. Any over that will be disallowed and not counted.

20.6 All laps are to be flown counter-clockwise with turns to the left.

20.7 No minimum altitude required for racing.

20.8 There will be no recircling of missed pylon. One unintentional missed or cut pylon will be allowed. If a second pylon is cut the contest will have to perform an extra lap. If a third pylon is cut this will be allowed. If a 4th pylon is cut two extra laps will be required. If any pylon is cut during the make up laps the contest flight will be disqualified.

20.9 All cut pylons will be unintentional cuts. Any intentional cut will result in disqualification of that flight. An intentional cut pylon is where the model missed the center of the pylon by more than 20 feet inside the prescribed course.

20.10 Making one insurance lap in all races is recommended.

NOTE: The guide for these rules is patterned after official NAA 1949 specifications for 190 cubic inch class racing airplanes. The source of reference was, NATIONAL AIR-RACE SKETCHBOOK by Buchli and Gann, published in 1949 by Floyd Clymer.

RAND NOW OFFERS RELAYLESS GGI

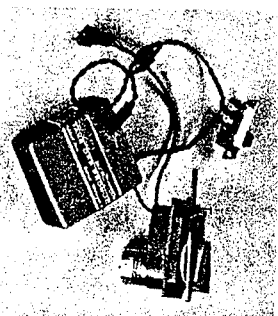
RAND'S GG PAK INCLUDES A PRE-WIRED HARNESS, BATTERIES AND ELECTRONIC SWITCHING CIRCUIT ENCASED IN A SPECIAL GG ACTUATOR.

RAND'S GG PAK is compatible with most relay and relayless receivers! If used with relays, you get increased reliability since only 8 Ma are carried by the relay instead of full motor current. For the first time, you can remove the relay from your receiver and operate it relayless. This means no more worry with the problems of dirt and vibration that are sources of trouble with relays.

A NEW POWER-PACK of nickel cadmium batteries has been matched especially for this unit by the engineers of G.E. It utilizes the latest self-sealing vented cylindrical cells, — a feature that reduces the chance of damage from overcharging. This 3 cell 600 Ma pack is spot-welded together for added reliability. The beauty of this system is that it permits the power-pack also to operate the receiver.

The motor in the actuator has been selected for lowest drain of 3.6 volts. It draws on average 350 Ma, so the system will operate continuously for about 1 1/2 hours. Faster throttle control, resulting in less flight disturbance.

THE GG PAK has been designed to offer you the most reliable, light, compact and convenient unit available. All this for a total installation weight of approximately 6 oz. By the way, we think the GG PAK is an excellent choice for the beginner. We are sure all of you will be as excited as we are with the results.



6040 COMPLETE GG PAK \$29.90

PAKETS - ORDER DIRECT

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8909 HUBBELL DETROIT, MICHIGAN

4-1/2 INCH WING SPAN SCALE

An alternate model size limitation is a minimum of 2 3/4" ft. for a scale model of a 190 cubic inch racer. The scale will be determined by the model's wing span and average chord as compared to the full size racer's dimensions.

The minimum scale of 2 3/4" ft. is to allow the entry of unorthodox scale models of 190 cubic inch racers that do not fit into the wing span requirement previously set forth. Model Scale will be 3 7/8" ft.

22. RACING NUMBER AREA LETTERS

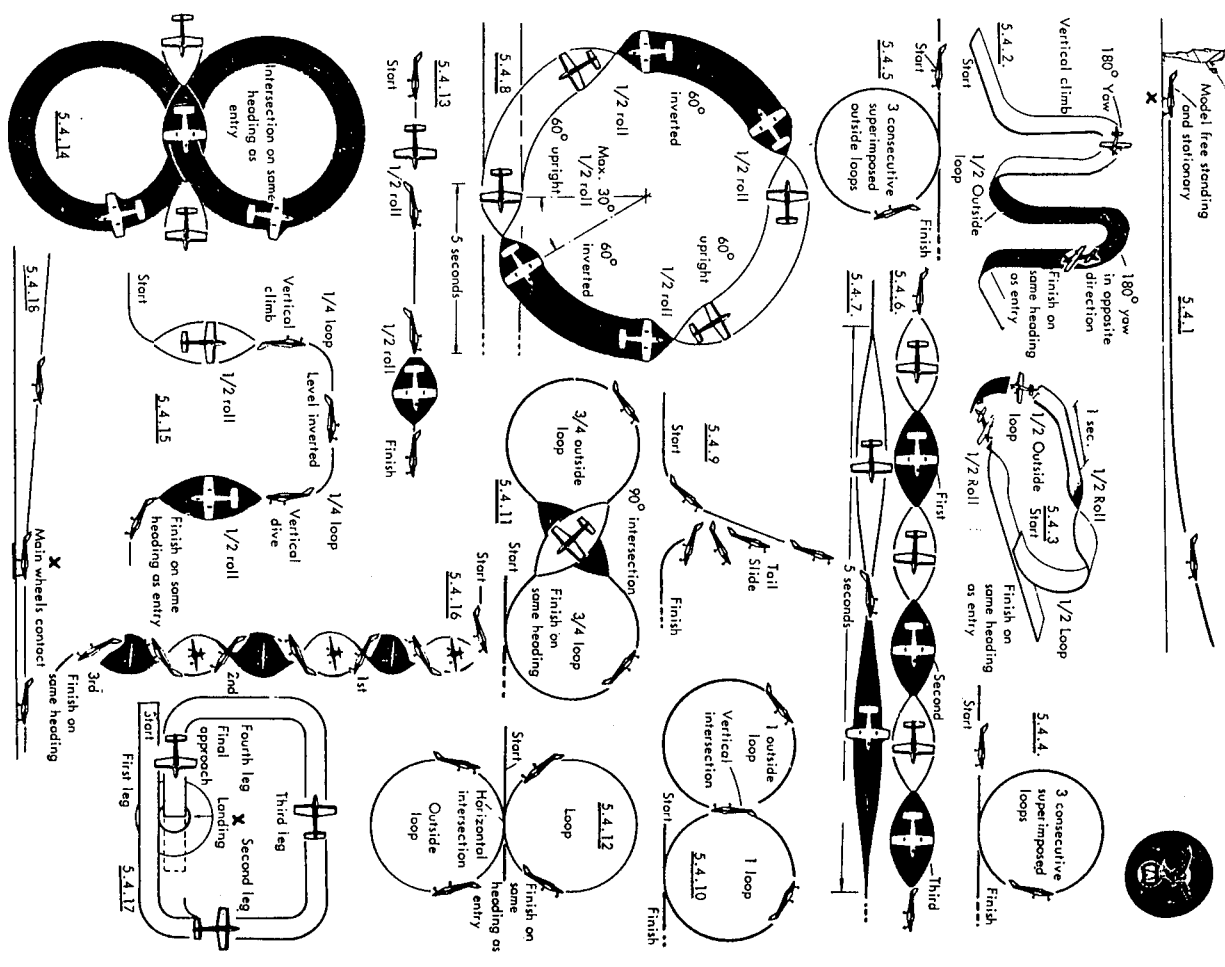
There will be a set of a minimum height of 1/2 inch following all racing numbers with the bottom racing number letter on the wing optional.

The assigned letters are as follows:

- A—Northern California
 - B—Central California; Hawaii
 - D—Southern California
 - E—Nevada; Utah; Arizona
 - O—Oregon; Washington; Idaho; Alaska
 - Colorado
 - Montana; Wyoming; South Dakota; North Dakota; Nebraska; Kansas
 - H—New Mexico; Oklahoma; Texas; Arkansas; Louisiana
 - J—Maine; New Hampshire; Vermont; Massachusetts; Rhode Island
 - K, L, M—New Jersey
 - P—Ohio; Pennsylvania; West Virginia
 - Q, R—Maryland; Virginia; North Carolina; Delaware; Washington, D.C.
 - S, T—Tennessee; Mississippi; Alabama; Georgia; Florida; South Carolina
 - U, V—Missouri; Illinois; Indiana; Kentucky
 - W—Minnesota; Wisconsin; Michigan; Iowa
- An example of this number is 76E or 14C.
- National Miniature Pylon Racing Association
 Secretary—Treasurer: Gil Hoffman
 613 Donner; Las Vegas, Nevada

F.A.I.

Radio Control Manoeuvres



Maneuver Drawings Courtesy of Aeromodeller Magazine