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## **INTRODUCTION**

It is the purpose of this rule book to provide modellers with a uniform set of rules of the various categories of pylon racing. Because of the diversity of events, this rule book has been published in loose leaf form in order that changes, omissions or insertions can be made easily.

This means that its contents are constantly open to change via the Pylon Committee. Any changes will be published in the MAAC Magazine Pylon Column and will be available through MAAC Headquarters.

Please let the committee know of your opinions if you think changes or additions are necessary. If any Contest Director feels compelled to make minor adjustments to the rules to accommodate local conditions, this may be done, but these changes are to be noted when advertising the contest.

Included within the rule book is a race procedure guide. This guide is intended to assist Contest Directors and competitors with some of the problems that may occur during the operation of a race. The race procedure guide is to be followed whenever possible in order to prevent conflicts.

1996 Pylon Committee

## **MAAC PYLON RACING PROCEDURE GUIDE**

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## **INTRODUCTION**

The intent of this rule book and procedure guide is to standardize the contest procedures used throughout the country. The operation of an R/C Pylon contest requires more organization and manpower than any other event. The Contest Director, therefore, must assume a greater amount of the responsibility to assure a successful meet.

The procedures outlined in the text to follow should be used. The following guidelines are compiled from many years of racing experience stemming from the members of the MAAC Pylon Committee and from the NMPRA.

Although these procedures are strongly recommended to be followed at all times, it is realized that conditions or locale may require some deviation.

### 1.0 **SAFETY**

- 1.1 Consideration of safety for spectators, contest personnel, and other contestants is of the utmost importance in this event. Any unsportsmanlike conduct or hazardous flying over a controlled spectator area will be cause for immediate disqualification of that flight, and may be cause for disqualification for the contest. Flying below the height of the pylons is not permitted and may also be a cause for disqualification.
- 1.2 The pit and spectator areas must be at or outside the minimum distances described in this rule book. The ready area for the heat following the one in progress shall not be within the boundaries of the course. Landing of aircraft between #2 and #3 pylons will only be permitted under special circumstances, and at the discretion of the C.D.
- 1.3 Walking across the race course during the race is strictly forbidden. If an aircraft crashes during the race, no one shall be allowed to investigate the site until the race is over and all pilots have landed. Contestants who violate the foregoing shall be disqualified. The practice of walking across the course while a race is in operation is extremely unsafe and distracting to course officials and contestants.

1.4 If radio problems are being experienced, the pilot must land the aircraft immediately. The starter or C.D. has the authority to disqualify a contestant from any heat, or from the contest, for unsafe flying or radio problems which may endanger contestants and spectators. The decision of either official is final.

1.5 If flutter is detected on an aircraft in flight, it is compelling to immediately land the model. The C.D. or starter must insist that the contestant land the model if not already being done so voluntarily. The model in question must be inspected by the C.D. before it can be flown again at the contest.

1.6 If any aircraft sustains damage, the C.D. will inspect the repaired model and decide whether it can be flown again at the contest.

1.7 Alcoholic beverages are not permitted on the race course. Any pilot or

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## 2.0 **SAFETY INSPECTION**

2.1 All aircraft to be entered in an event, including backup models, must be inspected for the following safety items before the contestant is eligible to compete. This safety check shall be done by a member of the contest committee at the time of registration.

2.2 Short pieces of fuel tubing will be used to secure all clevises to prevent them from becoming disconnected in flight.

2.3 Throttle shut-off or compliance with idle capability will be visually inspected and may be functionally tested at any time during the contest.

2.4 All bolts holding the engine to the mount, and the mount to the firewall, must be in place and secure.

2.5 Receivers and battery packs shall be protected against vibration in accordance with the radio manufacturer's recommendations.

2.6 Washers will be used on all screws holding the servos to the mounting trays and also on screws holding the tray to the hardwood rails. Servos mounted directly to hardwood rails must also have washers on the mounting screws. Combination washer-screw sets are also acceptable for either application.

- 2.7 A keeper or collar must be on all pushrods that have a right-angle 'L' bend that connects them to the servos or control horns. 'Z' bends are also acceptable. A clevis used at both ends of a pushrod is not acceptable unless one clevis is soldered at one of the ends.
- 2.8 All control surfaces will be firm on the hinge line without excess slop in the assessment of the safety inspector.
- 2.9 Critical structures on the aircraft shall be inspected for stress cracks, i.e., wing centre section and wing dowels, firewall area, landing gear blocks, tail surface mounting to fuselage.
- 2.10 All aircraft registered, including backup models, shall be inspected for compliance to the specific racing event's rules as outlined in this Rule Book.
- 2.11 Workmanship must be of satisfactory standards. Contest committees are empowered to refuse permission to fly, or to disqualify any aircraft which in their opinion is not up to reasonably safe standards in either materials, workmanship, detail design, radio installation, or condition as a result of damage.

3.0 **REGISTRATION AND MATRIX**

- 3.1 The contest committee should make available to anticipated contestants, a notice of race and a pre-registration form several weeks prior to the contest. The notice should tell of any local deviation from normal event rules or procedures.

Note:

Pre-registration by out-of-town contestants is highly recommended. This courtesy can make a C.D.'s job much easier when making up the matrix. It prevents last minute additions to, and redrawing of, the matrix. All that is required is the contestant's name and radio frequency.

- 3.2 A matrix should be used to organize the contestants into heats and rounds. Two sample matrices are found in Appendix I of this Rule Book. Only one backup aircraft is allowed to be entered, and it must be registered on the same frequency as the primary aircraft. Once a contestant elects to fly the backup

aircraft, it must be used for the rest of the matrix schedule. Fly-offs are no exception, and are considered only an extension of the original matrix.

- 3.3 Re-drawing of the matrix due to a high attrition rate is allowed only if the majority of the pilots are in agreement. A formal request for a re-draw may be made by any contestant, but the C.D. shall reserve the right to decide whether there is sufficient attrition to warrant a pilots' vote.

4.0 **PILOTS' BRIEFING**

- 4.1 The C.D. and starter shall brief all contestants prior to starting racing. Following is an outline of points that should be mentioned along with any discussion of the general procedures outlined in this Race Procedure Guide.

- 4.2 Stress that all contestants should keep safety in mind at all times. Explain any procedural aspects that may be uniquely applicable to the particular contest site.

- 4.3 Point out where the ready box is located and transmitter impound procedures. A transmitter impound should be used and all radios must be held there when pilots are not racing or waiting in the ready box.

- 4.4 Designate an area for engine testing where noise will not interfere with communication to the pit and spectator areas.

- 4.5 Inform callers to stay with their pilots while aircraft are being landed so that landing traffic may be organized and any obstructions can be avoided on final approach.

- 4.6 Point out hazards that the flying field has which may affect the contestants during the race or in landing and take off.

- 4.7 The C.D. should make clear the circumstances by which a contest will be declared official and prizes awarded. As a guideline, C.D.'s should attempt to achieve a minimum of five rounds for a contest to be considered official.

- 4.8 The C.D. should clearly define any other specifics for the contest such as star

5.0            **STARTING PROCEDURES**

- 5.1            Each competitor may have only one helper in each race, who has the responsibility of holding the aircraft and releasing it on the signal from the starter. The helper may then assist the pilot during the race by telling when to turn #1 pylon, and by informing the pilot of other aircraft positions on the course, the number of laps completed, etc.
- 5.2            After selecting the starting positions by a random draw, or in the case of Formula I by Scale Judging, each helper shall identify their aircraft to the #1 cage and shall receive some visual confirmation of identification.
- 5.3            The starter shall ask each pilot to turn their radio on and demonstrate that the control surfaces are functional.
- 5.4            The contestants will have 90 seconds to start and adjust their engines before the race begins. The starter must wait for the entire 90 seconds to expire. Immediately upon expiration, the starter will drop the starting flag briskly in approximately ½ second intervals. Order of takeoff shall be determined by handicap judging as described below. Aircraft shall be flagged off the line at one-half second intervals (i.e., approximately as rapidly as the starter can drop the flag four times in succession), with the aircraft closest to the starter, lane 1, taking off first. An alternative two flag system may also be used where lanes 1 and 3 leave on the first flag and lanes 2 and 4 on the second (the 1,3-2,4 start versus the 1,2,3,4 start).
- 5.5            All lap counters shall start their watches on the drop of the first flag only.
- 5.6            As outlined in 5.4 above, the order of start is to be staggered at approximately ½ second intervals except in the case of fly-offs where a racehorse start will be used. All aircraft will begin the race on the drop of one flag.

6.0            **RACE OPERATIONS**

- 6.1            At the #1 pylon, there will be one (1) chief judge (optional) and an official signaller (flagman)/judge for each entrant. The chief judge will be positioned in close proximity to the pylon. The signaller/judge will be positioned

perpendicular to the direction of the course on the left hand side of the pylon as looking towards number one pylon from the start line and no more than 15 feet (4.5 m) away from the pylon. A light system (refer to 10.10 and following) or mechanical signalling system is preferred, but in the absence of such, flagmen, each with a distinctly coloured flag, can be used.

- 6.1.1 All models are to be signalled **at the moment they reach the #1 pylon and not before**. If using flags, the flags should be at the ready position when the models have reached midway between pylons #3 and #1. There will be no signalling at the #2 and #3 pylons unless a pylon is cut. There will be no pilot's helpers at any of the pylons.
- 6.1.2 At the #2 and #3 pylons, the official judge will stand in close proximity to the pylon they are judging. The judge will use an appropriate method to notify a missed (cut) pylon to the flyer in question.
- 6.1.3 The Starter shall check that all pilots are in position and ready to control their aircraft before flagging the airplanes off the line.
- 6.1.4 A maximum of 90 seconds will be allowed for starting and adjusting the engine. Any contestant not ready to have their airplane released at the end of the 90 seconds, or whose airplane was released at a point later than the drop of the corresponding flag, will be eliminated from the heat.
- 6.1.5 If an aircraft is released prematurely at the start of a heat, a one lap penalty (i.e. equivalent to a cut having taken place) will be applied.
- 6.1.6 All laps are to be flown counter-clockwise with turns to the left.
- 6.1.7 The minimum altitude for racing is the height of the pylons. Continued flying below the height of the pylons shall be cause for disqualification from the heat and repeated flying below the height shall be cause for disqualification from the contest.
- 6.1.8 If a pylon is cut, that lap will not be counted. Two pylon cuts constitute disqualification from that heat.
- 6.1.9 Flying outside of the designated course limits will constitute a cut.

- 6.1.10 If a pilot receives two cuts during a heat or is disqualified for unsafe flying, the pilot must pull up and out of the race course immediately after being personally notified by the starter or designate. Failure to do so is grounds for automatic disqualification from the contest. Unless a pilot is experiencing radio problems, the aircraft should not be landed until the remaining aircraft in the heat have finished racing.
- 6.1.11 In the event of contact between two models on the ground during the takeoff roll or in the air, the contestants involved are required to land immediately and each shall receive one point. The starter's decision regarding a mid-air having occurred is final and there will be no re-flying of the heat.
- 6.1.12 Contestants are urged to fly an insurance lap after being notified by the starter that they have finished the race. A problem exists in lap counting if the pilot cuts on the 10th lap. Delay in communication of the cut to the starter can cause this problem and the pilot will fly only ten laps when required to fly eleven laps. The insurance lap helps out the race officials by eliminating arguments and confusion after the race.
- 6.1.13 Re-flying of any heat is strongly discouraged due to the associated time constraints on the contest schedule and the volunteer course officials. If, in the opinion of the C.D., a re-fly is necessary (course equipment failure during the heat or an error by course officials), it shall be scheduled at the end of the round and all pilots that were air-borne will take part in the re-fly. Alternatively, re-flys can be scheduled to be flown after the matrix has been completed and before any fly-offs, but the re-fly shall be allowed only if the outcome could affect the top three placings.
- 6.1.14 Immediately after landing, the pilot of the winning aircraft of each heat or fly-off shall present his model to the C.D. or designate to be checked for compliance to the legal minimum weight requirement for the specific event.
- 6.1.15 The maximum number of airplanes in any heat shall not exceed four.
- 6.1.16 The starter is empowered to "black flag" any pilot whose flying is perceived by the starter as erratic and dangerous. This decision is entirely at the discretion of the starter, and it is not subject to protest. The starter or designate will notify the pilot in question and upon being "black-flagged", a pilot must immediately land the airplane.

6.1.17 All contestants must be given an equal number of opportunities to race.

6.2 **Racing Course Specifications**

The triangular course will be laid out as follows: the course is 10 laps with an individual lap length of 1/4 mile (0.4034 km). Total distance travelled is 2-½ miles (4.023 km; 13 200 ft.; 4023.36 m). Pylons should be a minimum of 12 feet and not exceed 15 feet in height. The race starts at the start-finish line.

All takeoffs shall be ROG. No mechanical device shall be used to assist the aircraft. The race is terminated at the start-finish line 10 full laps later. The race course specifications may be modified in the interests of safety or to suit existing field conditions if safety is not compromised. See Appendix II for an illustration of the Formula I Pylon Racing Course.

6.3 **Scoring**

6.3.1 For a contest based on heats of four airplanes, points shall be awarded after each race as follows:

- 4 points for first place,
- 3 points for second place,
- 2 points for third place,
- 1 point for fourth place.

Note: Not all heats may actually have four aircraft involved, but first place still receives 4 points, second place 3 points, etc.

For a contest based on heats of three airplanes, first place will receive 3 points, second place 2 points, and third place, one point. First place always receives 3 points, independent of the actual number of airplanes flying in the heat.

6.3.2 The winner of the event is the contestant who has accumulated the most points after the conclusion of all heats.

6.3.3 If time permits, and there is no frequency conflict, ties shall be broken by a fly-off race. Otherwise, the best single race time shall be considered in determining final places.

## OFFICIAL MAAC PYLON EVENTS

### 7.0 **FORMULA I PYLON RACING**

#### 7.1 **General**

7.1.1 To run multiple plane races that will recapture the spirit and thrills of the great air races of the past and present, and that will be interesting for spectators as well as challenging for the contestants.

7.1.2 All MAAC regulations covering the R/C flyer, aircraft and equipment, shall be applicable to this event, except as noted herein. There shall be no limitations on the type of equipment fitted to the plane, or the number of controls. The contestant shall be allowed two entries in this event. The second model may be used only if the first model is not flyable. Contestants may have someone else fly their model in competition if they so desire. However, if this is done, the owner and the pilot shall be entered as a team, and a pilot of a model may not fly for more than one team or entry. Both the owner and the pilot shall have current MAAC sporting licenses.

7.1.3 Consideration of safety for spectators, contest personnel, and other contestants is of the utmost importance. Any unsportsmanlike conduct or

#### 7.2 **Aircraft Specifications**

Models must be a replica of the 190 cu. in. class of full size Formula I racing aircraft.

The Builder of the Model Rule shall not apply to the Formula I event. hazardous flying over a controlled spectator area will be cause for immediate disqualification of that flight, or possible disqualification from the contest (see rule 1.1).

#### 7.2.1 **Wing**

The minimum area specified below must be used, including that area displaced by the fuselage but not including fillets or stall strips. Flaps are permitted, but the wing area is to be calculated with flaps retracted.

- 7.2.1.1 Minimum area shall be 450 square inches (2903.22 cm<sup>2</sup>).
- 7.2.1.2 The wing shall be at least one inch (2.54 cm) thick at the centerline. Thickness may be measured with wing on or off the aircraft. If the wing is not removed for measurement, a "no-go" gauge set at 7/8 of an inch (2.22 cm) shall not "go" less than three inches (7.62 cm) from the wing centerline. The wing, from the centerline (and/or outside of fillet) to tip, must have a straight line taper on both top and bottom surfaces. (However, the wing may have a convex taper).
- 7.2.2 **Fuselage**
- 7.2.2.1 At the pilot's cockpit, a minimum depth of seven inches (17.78 cm) and a minimum width of 3 ½ inches (8.89 cm) is required.
- 7.2.2.2 Note: Fillets are not considered part of the fuselage.
- 7.2.2.3 The engine shall be cowled at least to the extent that no more than the cylinder and head fins project beyond the fuselage outline. The exhaust side of the cowl may be shaped to clear exhaust exit.
- 7.2.3 **Engine**
- 7.2.3.1 Maximum total nominal displacement shall be .4030 cu. in. (6.60 cc). Engines must be production units assembled from factory available production parts. Engines and parts must have been produced in quantities greater than 500 and all must be available through normal retail outlets in the U.S.A. or Canada. Alterations shall be limited to catalog listed parts produced in quantities greater than 500 units and available commercially to anyone from the manufacturer of the engine being altered. Engines may only be altered by removing parts or material from parts; no material or parts may be added, except as noted in the following paragraphs under this section.
- 7.2.3.2 The "engine" is defined as the complete unit, ready to run, needing only prop, fuel, and starting voltage, except that the glow plug, venturi, shut-off, exhaust extension, gaskets, head and crankcase bolts, drive washer, front washer, and prop nut need not be considered part of the production unit. These parts are not subject to the rules regarding quantity or source because engine manufacturers may or may not produce these parts which help make up the complete production engine.

- 7.2.3.3 Rear exhaust engines may use an adapter not over 1-1/2 inches (3.8 cm) long (measured along centerline and from face of piston) followed by a constant inside diameter pipe which increases the total length of the complete extension to not over five inches (12.7 cm) as measured from face of piston to extreme exhaust end.
- 7.2.3.4 Side exhaust engines may use a curved adapter not over 2-1/2 inches (6.35 cm) long (measured along centerline and from face of piston) followed by a constant inside diameter pipe which increases the total length of the complete extension to not over five inches (12.7 cm) as measured from face of piston to extreme exhaust end.
- 7.2.3.5 Any part of the exhaust extension may continue outside of the cowl.
- 7.2.3.6 Any competitor at a contest may have another competitor's engine inspected for compliance with the rules by posting \$25.00. The engine will be inspected by the C.D. and someone selected by the C.D. If declared legal, the owner is not disqualified and gets the \$25.00 for his trouble. If declared illegal, the owner is disqualified and the protestor gets the \$25.00 back.
- 7.2.3.7 At the C.D.'s own discretion, an engine inspection may be made prior to the trophy or award presentation without posting the \$25.00 fee.
- 7.2.4 **Engine Shut-off**
- Pilots must be able to shut off the engine by radio control with the aircraft in the upright position, on ground or in the air, without affecting flight path in any direction, upon official command. The engine must stop within five seconds of command.
- 7.2.5 **Muffler**
- Not Applicable.
- 7.2.6 **Propeller**
- Only fixed pitch, two blade design propellers of either wood or composite resin continuous fibre construction may be used.

7.2.7

**Spinner**

A rounded spinner of at least two inches (5.08 cm) diameter is required.

7.3

**Landing Gear**

At least two wheels, 2 1/4 inches (5.72 cm) in diameter or larger, must be used. Where applicable, a third wheel, of any size may be used. A positive means of steering on the ground shall be provided. (A movable rudder fulfils this requirement). Retractable landing gear shall not be permitted.

7.4

**Weight**

Planes shall be weighed immediately after an official flight, with whatever amount of fuel remains and before being returned to the pit or ready area. Weight at this time shall be not be less than five lbs. (2.268 kg) nor more than 6-1/2 lbs. (2.948 kg).

7.5

**Race Procedures**

Race procedures as per MAAC Race Procedure Guide

7.6

**Course**

The Formula-1 course shall be used in all races.

7.7

**Racing Numbers and Letters**

Racing numbers and letters may be obtained from MAAC Headquarters. The use of these is highly recommended, but not mandatory. The numbers are located on the upper left and lower right hand wing panel facing toward the left side. The numbers will be at least three inches (7.62 cm) high and shall be right side up when the model is in a left bank. There will be an area letter of a minimum height of one-half inch (12.7 mm) following the racing number.

7.8

**Registration Numbers**

- 7.8.1 Registration numbers are the entrant's MAAC numbers. If the entrant desires he may use the last two or three numbers and the initial of his last name such as 360M instead of 3360.
- 7.8.2 The registration number is to be placed on the upper right and lower left wing panel. The minimum height of the numbers on the wing will be two inches (5.08 cm). The letter C will precede the registration numbers.
- 7.8.3 An alternative method is to place registration numbers of a minimum of one inch (2.54 cm) high, and preceded by the letter C, along each side of the fuselage behind the trailing edge of the wing.

7.9 **Flight Requirements**

The following is required for Formula I:

- 7.9.1 Before attempting to enter a competition, the pilot must have flown the aircraft before two witnesses who are members of MAAC and demonstrated the following manoeuvres before them:
- 7.9.2 Takeoff at full throttle directly into the wind without veering more than 10 feet (3 m) from either side of a straight line on the ground.
- 7.9.3 Pull-up from straight and level flight at maximum air speed and RPM into a full up elevator loop.
- 7.9.4 Make a dive at a 30° angle for at least a length of 500 feet (152.4 m).
- 7.9.5 Make a 180° turn at full air speed and maximum RPM without any appreciable loss of altitude or control.
- 7.9.6 Make three laps of a simulated race course at normal racing altitudes, making the turns at full speed as in a race.

7.10 **Handicap System - Formula I**

- 7.10.1 Handicap judging shall be conducted as follows: All the aircraft will be lined up, including backup aircraft, in the same line. An experienced team of up to three judges then rearranges the aircraft in the line in such a way that the aircraft which in their judgement should rank highest in respect to scale fidelity, workmanship, and excellence of appearance is pulled forward out of the original line and the aircraft which should rank lowest in these respects is pushed back, away from the original line. All aircraft presented for handicap judging shall be placed into one of four groups. Group one includes those models which display superior workmanship, appearance, and fidelity to scale. Proportionately, the lower ranking models will be placed into groups two, three, or four. Group four shall contain those models ranking lowest of all and shall include any model which does not display a cowled engine or wheel pants. Any wing tip scrapes or other superficial flaws due to previous flights which do not permanently affect the overall appearance of the aircraft should be disregarded. Starting order is determined by group ranking, i.e., any model placed in group one will take off before a model from group two - and so on. Aircraft competing from the same group shall toss a coin or draw lots to determine starting position. If there is a "best finish" award, it would be from those aircraft judged as "ones" and would have priority over all others in relation to take-off position.
- 7.10.2 It is the contestant's responsibility to supply judges with a three view scale drawing of a 190 class airplane that has been flown (any three view drawing taken from any publication will be considered acceptable) and/or at least two photographs that show the aircraft clearly.

8.0 **CANADIAN 500 PYLON RACING**

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## 8.1 **General**

The basic intent of these rules is to produce a group of "500" racing aircraft which are as close in performance as possible. The objective of the Can 500 race is to stage a closely contested race which is not dependent on aircraft performance and which serves to foster greater participation in pylon racing events at the entry level. Any violation of spirit, intent or technical aspects of these rules shall be cause for immediate disqualification by the C.D.

Any unsportsmanlike conduct or hazardous flying can be cause for immediate disqualification by the C.D. Consideration of safety for the spectators, contest personnel and contestants shall take precedence over all other interests.

## 8.2 **Aircraft Specifications**

The intent of these specifications is to equalize aircraft performance by standardizing basic aircraft design limits and engine parameters. The aircraft shall be of conventional design with forward wing and aft empennage. Acceptable empennage includes those of a vertical stabilizer atop a horizontal stabilizer, "Mid-tail" designs, "T-tail" designs and "V-tail" designs.

### 8.2.1 **Wing**

The minimum wing area shall be 500 square inches (3226 cm<sup>2</sup>). The wing thickness shall be a minimum of 11.25 percent of the chord for no less than 47 ½ " of the wing span. The wing must be of constant chord design. The overall span shall be a minimum of 50 inches and a maximum of 52 inches. No tapered wings of any type are allowed. The wing must have two equally sized functional ailerons, one on each side.

### 8.2.2 **Fuselage**

The fuselage shall be rectangular in cross sectional shape with no more than 1/4 inch (6 mm) radius on any corner. The firewall shall be a flat surface of no less than 2-1/4 inches (5.72 cm) by 2-1/4 inches (5.72 cm), and may have a 1/4 inch radius at the each of the four corners, but rounding of the edges is not permitted. There shall be no cowling of the engine or mounts. No wing fillets are allowed.

### 8.2.3 **Engine**

The engine shall be any commercially available, stock, front intake, side exhaust, of maximal 0.403 cu. in. displacement, with a throttleable R/C carburettor (see 8.2.4), and capable of holding an idle. The idle must permit the aircraft to sit unattended, stopped, on a normal grass flying field for at least 20 seconds, and then be throttled up to full rpms. Engines and parts must have been produced in quantities greater than 500 and must be available through retail outlets in Canada and the U.S.A. No modification is permitted except that screws, bearings, glow plugs, gaskets, prop washers and the prop nut may come from any source. Backplate type radial engine mounts of alternative manufacture may be used provided they displace the same volume as the stock backplate assembly. Should repairs be necessary only Original Equipment Manufacturers (O.E.M.) replacement parts may be used as specified for the engine in use, with the exception of the aforementioned parts.

### 8.2.4 **R/C Throttleable Carburetor**

A throttleable R/C carburetor permitting metering of both fuel and air over the entire range of engine speed from idle to full speed shall be used and must be original equipment from the engine manufacturer for that particular engine. The maximum allowable throat diameter of the carburetor shall not exceed 9 mm.

### 8.2.5 **Muffler**

The stock muffler that comes with the engine is the only muffler that may be used and must have a single exhaust outlet. Flow-through mufflers and tuned pipes of any type are not permitted. **No** modifications to the muffler are permitted except that the muffler may be tapped for a pressure fitting to supply pressure to the fuel system.

### 8.2.6 **Propeller**

Any commercially available wood propeller, sanded on one side for balance purposes only may be used. The prop hole may be enlarged if necessary.

Commercially-produced, compression moulded, continuous fibre plastic/composite propellers are also acceptable.

8.3      **Pressure Systems**

Fuel pressure systems are allowed using muffler pressure only. No fuel pumps of any type are allowed.

8.4      **Controls**

The aircraft must be equipped with a radio having at least three separate control functions to independently operate the engine's throttleable carburetor, elevator, and ailerons.

8.5      **Landing Gear**

The main gear of the aircraft shall be fixed and have no less than two wheels measuring at least 2-1/4 inches (5.7 cm) in diameter. Wheels must be at least eight (8) inches apart measured parallel to the wing span. Landing gear shall be conventional tricycle or tailwheel/skid design. Strut fairings and wheel pants are not permitted.

8.6      **Weight**

Minimum aircraft weight shall be 3-1/2 lbs. (1.59 kg) measured immediately after the heat.

8.7      **Fuel**

Fuel with a maximum nitromethane content of 15 percent shall be supplied by the contest organizers.

8.8      **Race Procedures**

Race procedures as per MAAC Race Procedures Guide, Sections 1 through 6 and Section 7.12, Operation of the Race.

8.9

**Course**

Either the Formula I course (608 ft. x 100 ft. - 2½ mile course) or the short course (475.5 ft. x 100 ft. - 2 mile course) may be used for this event. Acceptable pylon courses are illustrated in Appendix II.

9.0 **UNLIMITED 500 PYLON RACING**

9.1 **General**

The basic intent of these rules is to produce a group of high-performance, unlimited 500 racing aircraft. Any violation of spirit, intent or technical aspects of these rules shall be cause for immediate disqualification by the C.D.

Any unsportsmanlike conduct or hazardous flying can be cause for immediate disqualification by the C.D. Consideration of safety for the spectators, contest personnel and contestants shall take precedence over all other interests.

9.2 **Aircraft Specifications**

The aircraft shall be of conventional design with forward wing and aft empennage. Acceptable empennage includes those of a vertical stabilizer atop a horizontal stabilizer, "Mid-tail" designs, "T-tail" designs and "V-tail" designs.

9.2.1 **Wing**

The minimum wing area shall be 500 square inches (3226 cm<sup>2</sup>). The wing thickness shall be a minimum of 11.25 percent of the chord for no less than 47 ½" of the wing span. The wing must be of constant chord design. The overall span shall be a minimum of 50 inches and a maximum of 52 inches. No tapered wings of any type are allowed. The wing must have two equally sized functional ailerons, one on each side.

9.2.2 **Fuselage**

The fuselage shall be rectangular in cross sectional shape with no more than 1/4 inch (6 mm) radius on any corner. The firewall shall be a flat surface of no less than 2-1/4 inches (5.72 cm) by 2-1/4 inches (5.72 cm), and may have a 1/4 inch radius at each of the four corners but rounding of the edges is not permitted. There shall be no cowling of the engine or mounts. No wing fillets are allowed.

### 9.2.3 **Engine**

The engine shall be any commercially available, stock, front intake, side exhaust, of maximal 0.403 cu. in. displacement. Engines and parts must have been produced in quantities greater than 500 and must be available through retail outlets in Canada or the U.S.A.. No modification is permitted except that screws, bearings, glow plugs, gaskets, prop washers and the prop nut may come from any source. Backplate type radial engine mounts of alternative manufacture may be used provided they displace the same volume as the stock backplate assembly.

### 9.2.4 **Engine Shut-off**

Engine shut-off or reduction in rpm sufficient for landing must be achievable by radio control without affecting normal flight characteristics.

### 9.2.5 **Muffler**

The stock muffler (silencer) that comes with the engine is the only one that can be used. No flow-through mufflers or tuned pipes of any type are allowed. **No** modifications to the muffler are permitted except that the muffler may be tapped for a pressure fitting to supply pressure to the fuel system.

### 9.2.6 **Propeller**

Any commercially available wood propeller, sanded on one side for balance purposes only. The prop hole may be enlarged if necessary. Commercially-produced, compression moulded, continuous fibre plastic/composite propellers are also acceptable.

### 9.3 **Pressure Systems**

Fuel pressure systems are allowed using muffler pressure only. No fuel pumps of any type are allowed.

### 9.4 **Controls**

The aircraft must be equipped with a radio having at least three separate control functions to independently operate the engine shut-off, elevator, and ailerons.

9.5 **Landing Gear**

The main gear of the aircraft shall be fixed and have no less than two wheels measuring at least 2-1/4 inches (5.7 cm) in diameter. Wheels must be at least eight (8) inches apart as measured parallel to the wing span. Landing gear shall be conventional tricycle or tailwheel/skid design. No strut fairings or wheel pants are permitted.

9.6 **Weight**

Minimum aircraft weight shall be 3-1/2 lbs. (1.59 kg) measured immediately after the heat.

9.7 **Fuel**

Fuel with a maximum nitromethane content of 15 percent shall be supplied by the contest organizers.

9.8 **Race Procedures**

Race procedures as per MAAC Race Procedures Guide, Sections 1 through 6 and Section 7.12, Operation of the Race.

9.9 **Course**

Either the Formula I course (608 ft. x 100 ft. - 2½ mile course) or the short course (475.5 ft. x 100 ft. - 2 mile course) may be used for this event. Acceptable pylon courses are illustrated in Appendix II.

## 10.0 **O-40 PYLON RACING**

### 10.1 **General**

The intent of these rules is to provide high speed excitement for the expert pilot with a close performance level for all fliers.

### 10.2 **Aircraft Specifications**

Models must be semi-scale or recognizable replicas of full scale propeller-driven aircraft that have competed in closed course speed record, or cross-country racing. No deltas and/or tailless type aircraft shall be allowed.

In the case of unusual or little known designs, the flier shall produce documentation to identify that such a design did exist.

#### 10.2.1 **Wing**

Thickness shall be at least one inch thick at the centerline. The wing area shall be at least 400 square inches. If the wing is not removed from the airplane, a "no-go" gauge set at 7/8" shall not "go" less than three inches from the wing centerline. The wing, from the centerline (and/or outside of fillet) to tip, must have a straight line taper on both the top and bottom surfaces. The wing may have a convex taper.

#### 10.2.2 **Fuselage**

The fuselage must be at least three (3") inches wide. At the deepest point, the fuselage must be at least six (6") deep ( including windshield, canopy, pilot's head, or headrest). The width and depth points do not need to be taken at the same point. Fillets, non-scale protuberances, or fins are not to be part of the measurement. Cross-sectional contours at the height and width measurements and at stations determining the likeness to the original aircraft shall maintain the integrity of the contours in the original aircraft. The only exception permitted shall be in the engine compartment for maintenance purposes. Removable cowls, if used, must allow the engine head and cylinder to protrude at least three-quarters (3/4") inch, not including the glow plug, and require the muffler to protrude at least one-half its diameter for its entire length. Cross sectional contours at the cheek cowls and canopy must have a minimum of five-eighths (5/8") inch radius on their outermost surfaces.

10.2.2 (A one and one-quarter inch diameter ball should fit inside, tangent to the outer surface.)

10.2.3 **Engine**

The engines used in this event shall be commercially available, front intake, side exhaust muffler equipped as supplied by the manufacturer for the use with that engine. The engines must be available through normal retail outlets in Canada or the U.S.A. Total displacement shall not exceed .403 cu. in. displacement.

10.2.4 **Carburetor**

10.2.4.1 An R/C carburetor or venturi shall be used with a maximum inside diameter of 9mm. Carburetors or venturis may be modified. Fuel system pressurization is limited to muffler pressure only.

10.2.4.2 The pilot must be able to shut off his engine by radio control utilizing a dedicated operable servo. The engine must shut down within 5 seconds of receiving a command.

10.2.5 **Muffler**

The engine must be equipped with a stock expansion chamber muffler as provided by the manufacturer for the engine being used. A single outlet must not have an inside diameter greater than .312". Flow- through mufflers, tuned pipes, and mini-pipes are not permitted.

10.2.6 **Propeller**

Only wooden two-bladed, fixed-pitched propellers shall be permitted.

10.2.7 **Spinner**

A rounded spinner or rounded prop nut may be used.

10.3        **Pressure Systems**

The only modification permitted is the tapping of the muffler for a pressure fitting directly to the fuel tank.

10.4        **Controls**

The aircraft must be equipped with at least four separate control functions to independently operate the fuel shut-off, elevator, ailerons and rudder.

10.5        **Landing Gear**

The landing gear must be fixed and resemble that of the prototype machine as to location on the airframe and the number of wheels used. The minimum diameter of the wheels shall be 2.250". A positive means of steering shall be provided with a dedicated operable servo. A moveable rudder fulfills this requirement.

10.6        **Weight**

Ready to fly weight, less fuel, shall be four pounds minimum and six pounds maximum. Weight is to be measured at the completion of each heat.

10.7        **Fuel**

The fuel shall be commercially available, containing not over 15% nitro methane, and shall be supplied and dispensed by the hosting organization. The dispensing operation shall include draining the tank of any existing fuel and then filling from the supply container when the pilot brings the plane to the ready box.

10.8        **Race Procedures**

Race procedures as per MAAC Race Procedure Guide.

10.9            **Course**

The Formula-1 course shall be used in all races for the Q-40 event.

10.10          **Registration Numbers**

Registration numbers may be the last two or three digits of the entrant's MAAC number, or a designated "pylon number" from the MAAC office. If the members' MAAC numbers are used, the entrants' first initial of his/her last name must be placed after the numbers.

11.0            **GENERAL PYLON INFORMATION**

In the event of a conflict arising between the general rules and the rules of a specific event, the rules as written in the specific event shall take precedence.

11.1            **Pylon Officials**

11.1.1        **Contest Director**

Duties are to make sure all officials are on hand and briefed in their duties. Responsible for scheduling the races and having correct contestants at the starting line. Has the ultimate authority on all matters pertaining to the contest.

11.1.2        **Recorder**

Duties involve recording results and recording names of all pylon officials.

11.1.3        **Starter**

Identifies aircraft to the signallers via phone or walkie-talkie system. Starts the race with the drop of a flag, informs the flyers of pylon infractions during the race, and signals the end of the race with a checkered flag.

11.1.4        **Starting Timer**

Operates the 90 second starting watch. Supervises the draw for starting positions. The foregoing can be consolidated with the position of Starter.

11.1.5 **Lap Counters**

Keep track of the laps with the use of visual flip cards or other appropriate mechanism. During the optional qualification heats, they also time the contestant they are responsible for, just as occurs in the normal race. During the race, they must watch the pylon judges for course infraction signals, and not count the lap when the contestant is given the cut signal or receives a lap penalty for some other infraction. If cuts/infractions are not being posted via a light system, the lap counters will relay this information to contestants by appropriate means such as flip cards. Any two infractions will eliminate the contestant from the heat.

11.1.6 **Pylon Judges**

Pylon judges report any pylon cuts to the starter or designate who in turn will relay the information to the lap counters. If a light system and cut signalling system is used at pylon #1 (see 10.10), the need for directly reporting to the starter or designate can be minimized or even obviated. It is then the responsibility of the lap counters to monitor the cut board at pylon #1.

11.1.7 **Signalling at Number 1 Pylon**

The signallers/judges will turn a light on, or hold open a shutter, for a few seconds, the moment the plane comes abreast - 90° to the course and even with the pylon. If flagmen are used, they will drop a distinct flag when the plane is abreast the pylon.

11.1.8 **Sideline Judge**

Any aircraft flying over the pit area or spectators must be reported to the starter.

11.1.9 **Pit Assistants**

Help fuel up the entries with appropriate fuel. Help organize the ready pit area so contestants are ready for each heat. Help the C.D. inform contestants when they are to fly.

11.2            **Equipment List**

- Pylons
- Hard Hats
- Ear Protectors
- Stop Watches
- 100 ft. (50 m) tape
- Field phones or megaphone
- Set of numbers to draw from hat (1-4)
- Flags:            - Checker for start/finish  
                         - Black for unsafe flying
- Light system (or flags) for flagging turns
- Clip boards and pencils
- Recording forms
- Copy of matrix schedules for Pylon Racing
- Copy of Rules for Event(s) to be Flown
- Fuel if supplied
- Aircraft measurement gauges
- Four sets of flip cards or equivalent for Lap-counters

11.3            **The Qualification and Familiarization Heat:**

**(Contest Director and Contestant Information)**

Before the matrix schedule is drawn, a C.D. may wish to have all the contestants fly a qualification heat. The Qualification Heat serves the following purposes:

- 11.3.1            The contestants and officials have a chance to familiarize themselves with the operation of the race.
- 11.3.2            Eliminate those pilots who do not have the skill to safely fly the race.
- 11.3.3            No points are awarded for these heats; a satisfactory time on the stop watch is the objective for the pilots.

11.4            **Instructions to Pylon Contestants**

Find out when you race; be ready to move into the takeoff area with your fuelled aircraft. Your helper/caller can make the draw for your starting position. The caller will identify your aircraft to the #1 pylon signaller. The request to start your engine will be given. When 90 seconds has expired, you will be flagged off in your starting order. Fly the course until you are told to land. Upon landing, and once your engine is shut-off, turn off your transmitter, return your aircraft to the pit area. Remember to place your transmitter in the impound, checking that is off. Fuel up and be ready for the next round.

11.5        **Infractions**

Infractions of the course include the following: a cut pylon, release of an airplane in advance of the flag, flying over the pit or spectator areas and flying below the height of the pylons. If you have two cuts or are disqualified for hazardous flying, you must climb to a higher, safe altitude and hold until the race is over; you will receive a score of zero for that heat. Repeated hazardous flying (i.e. over the pit or spectator areas, or below the pylons) shall be cause for disqualification from the contest.

11.6        **Remember**

11.6.1      Be at the starting line when required.

11.6.2      Start your engine, and take off and land, only when told to do so.

11.7        **Scoring**

Every contestant will have an equal number of chances to fly and will accumulate points as follows in a contest based on heats of four airplanes:

- 1st place - 4 points
- 2nd place - 3 points
- 3rd place - 2 points
- 4th place - 1 point

Some heats may have only two or three aircraft. First place always gets four points, etc., regardless of how many aircraft were involved in the race.

Note: For a contest based on heats of three aircraft, scoring begins with 3 points for first place, etc.

11.8        **Operation of the Race**

See the individual event rules and Section 6, Race Operations.

11.9        **Mid-Air Collisions**

See Race Operations, rule 6.2

11.10            **Light System**

The following light system is suggested as a preferred system to that of mechanical shutters or flagmen at the #1 pylon.

11.10.1        At the #1 pylon, there will be placed a pylon cage with a light system containing lights which are individually activated and equal to the number of entrants in each race. The lights must be clearly distinguishable, one from the other, by the entrants and their helpers when activated during a race. The lighting system will be placed perpendicular to the direction of the course on the right hand side at the pylon when looking toward the start/finish line and as close as possible to the pylon, or alternatively, the #1 pylon flag may be mounted directly on the cage. Each light will be individually controlled by race assistants during the running of the race. The race assistants can undertake the duties of both pylon judge and signaller.

11.10.2        The race assistants will activate their signal lights when the model which has been assigned to their particular light reaches the #1 pylon and not before.

11.10.3        At each pylon there will be a pylon judge responsible for recording cuts made by models. The starter or designate shall be notified as soon as possible following a cut, and shall relay the information to the lap counters and notify the contestant as soon as possible. With a lighting system, it is possible to post the cuts through the light system at the number 1 pylon. Recognition of cuts having occurred then becomes the responsibility of the pilot/caller and the lap counters. There will be no pilot's helpers at any of the pylons, or on the side lines.

11.11            **The Start**

Staggered starts (either 1,3-2,4 or 1,2,3,4) should be used with the exception of fly-offs where a race horse start should be used.

11.12            **The Contestant Director's Decision is Final**

In the event of a dispute, or if there is a question of interpretation of the rules, the C.D.'s decision is final.

11.13        **Unsportsmanlike Conduct**

Unsportsmanlike conduct can be grounds for immediate disqualification by the C.D. All disputes should be directed to the C.D. alone.

11.14        **Landing Control**

11.14.1      Areas for landing as designated by the C.D. for normal and emergencies should be strictly used.

11.14.2      Landings should only be made at the instruction of the starter, except for flame-outs or emergencies.

12.0

### **HOW TO BELONG TO THE PYLON COMMITTEE AND HOW TO CHANGE THE PYLON RULES**

The pylon rules are changed through the pylon committee. Any MAAC member may be a member of the Pylon Committee. Simply ask to be placed on the committee at your "Annual Zone Meeting" or write to the Pylon Chairman and ask how to be put on the committee.

Rule changes are then suggested to the committee for consideration. A majority vote by the committee then decides on rule changes. The committee chairman then presents them to the Board of Directors for final approval at the "Annual General Meeting" of MAAC.

13.0

### **CANADIAN FAST TIME RECORDS**

Fast Time Records may be applied for through MAAC Headquarters in the following manner:

Eligibility Requirements for a record time:

- (1) The record holder must be a MAAC member.
- (2) The contest must be flown according to the rules of the current MAAC Pylon Rule Book.

If local deviations from the event rules are made and those deviations still meet, in every way, those minimum standards set out in the event's official written rules, then the contest and any contestant shall be eligible for a fast time record subject to the remaining qualifications as set out in this section.

- (3) The record holder must have flown a back-up time on the same day within 5.0 seconds of the record time.

A sample application form and a sample record award are attached as Appendix III.

## **CANADIAN 500**

### **Canadian Fast Time**

1. A record holder must have flown the record time at a MAAC sanctioned contest in Canada.
2. Rules 1, 2 and 3 of section 13 must also be met.

## **UNLIMITED 500**

### **Canadian Fast Time**

1. A record holder must have flown the record time at a MAAC, AMA, or NMPRA sanctioned contest in Canada or the Continental U.S.A.
2. The contest must be flown according to the rules of the sanctioning organization which, if outside Canada, are functionally equivalent to the Unlimited 500 class.
3. Any record attained in the United States must be supported by:
  - (I) The Application For National Fast Time must be filled out and signed by the Contest Director.
  - (ii) Any fast time recorded in the U.S.A. must be supported by an NMPRA bulletin or the AMA (Model Aviation) publication showing the time for the Canadian competitor from the contest which the fast time has been claimed.
4. Rules 1 and 3 of section 12 must also be met.

## **FORMULA ONE**

### **Canadian Fast Time**

1. A record holder must have flown the record time at a MAAC, AMA, or NMPRA sanctioned contest in Canada or the Continental U.S.A.
2. The contest must be flown according to the rules of the sanctioning organization.

3. Any record attained in the United States must be supported by:
  - (I) The Application For National Fast Time must be filled out and signed by the Contest Director.
  - (ii) Any fast time recorded in the U.S.A. must be supported by an NMPRA bulletin or the AMA (Model Aviation) publication showing the time for the Canadian competitor from the contest which the fast time has been claimed.
4. Rules 1 and 3 of section 12 must also be met.

### **FAI (F3D) PYLON**

#### **Canadian Fast Time**

1. The record holder must fly the record time at any F3D contest held anywhere in the world as long as the following criteria are met:
  - (I) The contest must be run in strict accordance with present FAI (F3D) rules.
  - (ii) That the contest must be sanctioned by the National Aeroclub of the country where the contest is held, and that the National Aeroclub is a member in good standing of the FAI.
2. Rules 1 and 3 of section 13 must also be met.