



# **Control Line Competition Rules**

## **SECTION G - 2**

### **CONTROL LINE SPEED**

## G.2 CONTROL LINE SPEED

### G2.1 APPLICABILITY:

All pertinent M.A.A.C. regulations (see sections titled Sanctioned Competition, Records, Selection of Champions, and General) and the General Control Line rules shall apply, except as specified below.

#### GENERAL:

A Control Line Speed model is a model airplane powered by internal combustion reciprocating or jet engine(s). A Jet Speed model obtains its forward motion entirely from the reaction caused by the exhaust gases of its internal combustion engine(s). Rockets are excluded. Supercharging or Turbocharging, whether it be engine driven or by gaseous boosts of any type shall also be prohibited. Only naturally aspirated engines shall be allowed in the Speed events.

14.1 The “builder of the model” rule shall not apply to any CL Speed event for any age grouping.

### G.2.2 ENTRY PARTICIPATION REQUIREMENTS:

2.1 Junior entrants must fly their own models unless they meet the requirements for a proxy flyer. Others may operate the starting equipment.

2.2 An Open entrant may either fly his entry, or start and regulate the engine and launch the model. Others may operate the starting equipment. If the entrant elects not to fly the model, the designated pilot must show a valid M.A.A.C. license and be in the same age group as the entrant; (or if the pilot is younger, he must have the Event Director’s approval). The Director must assure himself that the younger pilot is capable of safely flying the aircraft. If the entrant elects not to fly the model, he shall clearly indicate to the officials that he is going to perform the starting function and give the name of his designated pilot for the attempt.

The entrant may not change his elected function after the starting time for the attempt has begun. There are no restrictions on using different pilots on different attempts.

The provision above takes precedence over the Proxy Flying and Team Entry paragraphs of the Sanctioned Competition section of the regulations. These provisions do not apply to contestants who are flying for Individual, Category, Team, or Club Championship points; such contestants still are required to fly their own entries except in the case where they are eligible for a proxy flyer.

### G.2.3 CLASSIFICATION OF CONTROL LINE SPEED MODELS:

Models powered by reciprocating engine(s) are classified by total piston displacement of engine(s) as follows. There is only one (1) classification for models powered by jet engine(s).

Classification:	Displacement:
1 / 2 A	.000 - .0504 cu inch
A	.0505 - .1525 cu inch
B	.1526 - .3051 cu inch
D Open	.3052 - .6500 cu inch
1 / 2 A Profile Proto Junior	.000 - .0504 cu inch
1 / 2 A Profile Proto Senior / Open	.000 - .0504 cu inch (Provisional)

Note: *Juniors are not permitted to fly Formula "40" or D Speed.*

3.1 If desired, two or more classes may be combined, so long as the displacement limits given are observed. When classes are combined, such combinations shall be specified in the sanction applications, and shown in contest announcements. Example: If three events are scheduled and classes 1/2 A and A are to be combined, the events should be listed Class 1 / 2 AA, Class B and Class D; if classes B and D are to be combined, events should be listed Class 1 / 2 A, Class A, and Class BD: and so on. Regulations for classes 1 / 2 A, A, B, D and Jet follow immediately. Special conditions for Proto models follow in paragraph 18. See separate sections for .21 Sport Speed and Formula "40".

#### G.2.4 MODEL DESIGN AND CONSTRUCTION:

There are no wing loading, power loading or cross sectional requirements. The method of "hold down" construction for holding two parts of the model together shall be considered acceptable if in the Event Director's opinion it is deemed to be at least as strong as the methods illustrated. (See Figure No. 1)

4.1 Number of models: Each contestant shall be allowed two models per event. A competitor may interchange various parts as he wishes providing the resulting complete model conforms to the rules of the contest.

Each contestant is allowed to use the two models in any combination, utilizing at most four attempts, to make at most three official flights. Only the two models that were processed at the time of entry will be permitted. Each model must have the same M.A.A.C. number(s)

and must be identifiable by distinguishing marks or characteristics so that they can be differentiated for pull test requirements.

#### G.2.5 ENGINE RESTRICTIONS:

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

5.2 No restrictions are placed on the design of the engine(s) used for Jet Speed, except that the total internal cross sectional area of the tailpipe(s) at the point of minimum cross section shall not be greater than 1.25 square inches. Afterburners are not permitted, but augments tubes and / or other ducting devices that do not make use of combustion may be used.

5.3 Control Line Speed models are exempt from any muffler requirement and noise standard, or limit contained in the General Rule Book, or Control Line General section of this book, or in any other document.

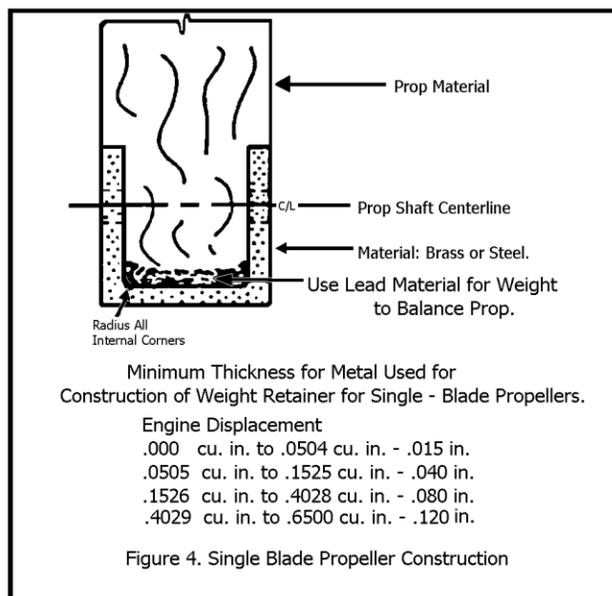
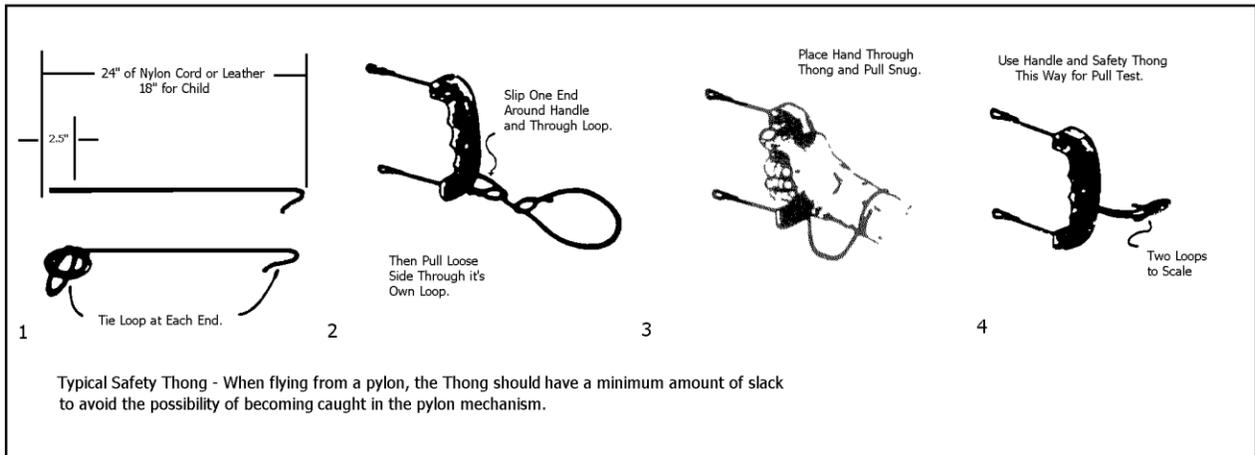
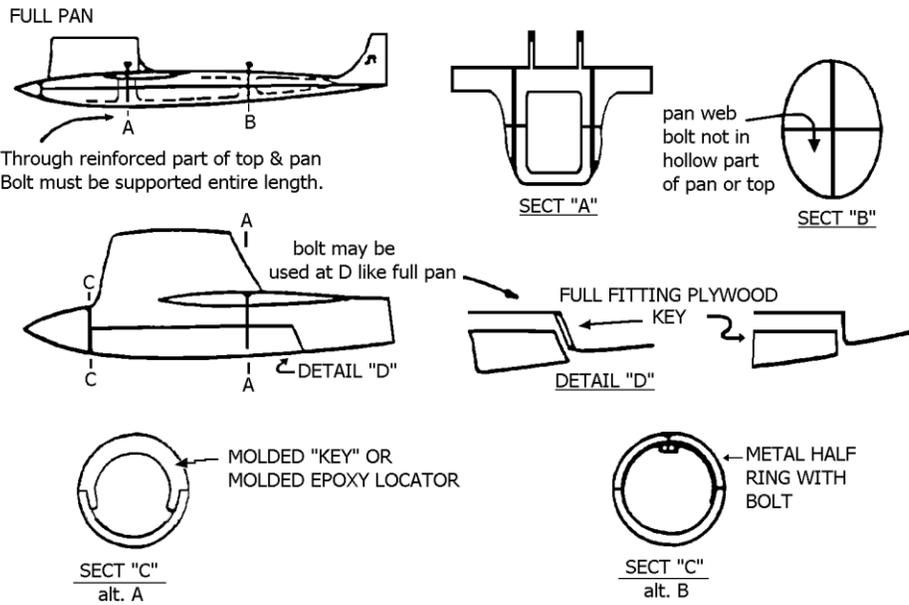
5.4 1 / 2A Profile Proto is restricted to "open face" exhausts for all age classes. The "21" Sport Speed, Senior / Open Formula "40", Open D, Junior / Senior 1/ 2A, Junior / Senior B Speed events are restricted to constant diameter exhaust extensions ("minipipes") which are to be at most six inches long when measured from the centre line of the exhaust system to the end of the exhaust extension. No tuned or untuned megaphone or expansion chamber exhaust extensions shall be allowed in these events.

Open 1 / 2A, Open A, and Open B are the only Speed events without exhaust extension restrictions.

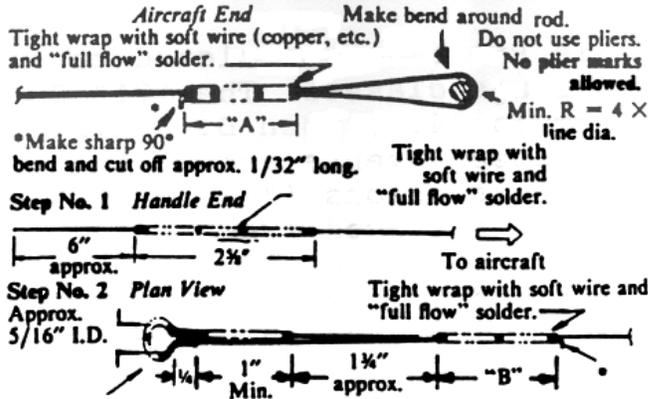
5.5 Juniors may elect to use the Open class exhaust restrictions when flying at contests when their class is combined with the Open class, or if they elect to fly in the Open age group at a contest that does not have a separate entry Junior category. National Junior records may be set only when Junior class exhaust restrictions are followed. (Juniors may, however, apply for Open records using Open class exhaust restrictions.)

5.6 Engine Use Restrictions. Once an engine (i.e., crankcase, piston and sleeve or jet head and tailpipe) has been used by a contestant to make an official attempt in an event, the same engine cannot be used then be used by another competitor in that same event in the contest. This does not restrict the number of different engines that a contestant may use to make his attempts in an event, nor does it mean that engine commitment by a competitor must be made at the time of processing as is the practice in FAI. Engine commitment does not apply to a given contestant until an engine has been used by him to make an official attempt.

*This rule is solely intended to prevent the same engine from being used by more than one (1) contestant in a given event at a given contest.*



**FIG. NO. 1—SINGLE LINE AND ALTERNATE TWO-LINE CONSTRUCTION**



After wrapping in step No. 1, from loop to approx. 5/16" I.D., starting 1/4" from end. Bend loop down approx. 45° from horizontal

Class	Dim. "A"	Dim. "B"
1/2 A	1/2"	1"
A	1"	1 1/2"
B	1 1/4"	2"
C	1 1/2"	2"
D & Jet	1 1/2"	3"

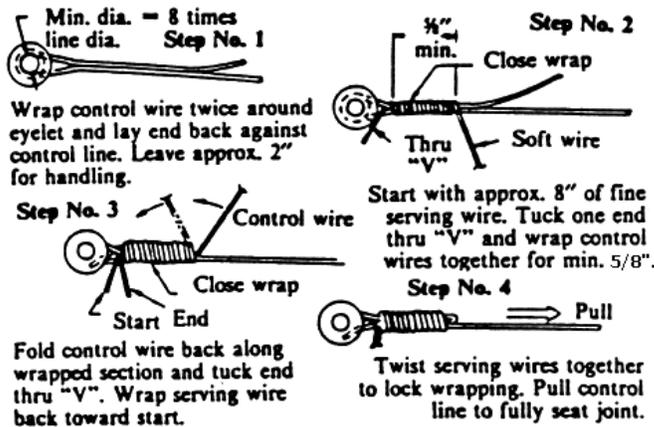
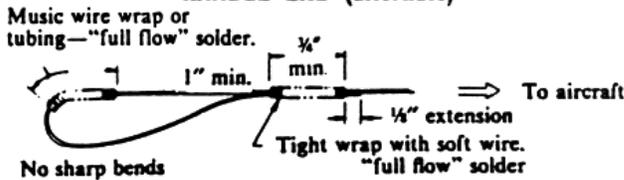
Step No. 3 (Installation at handle end)

Note: sweat solder all joints. No rust or corroded (black) spots allowed. Neutralize acid with baking soda.



Wrap 8-10 turns with soft wire hold doubled section of line in slot. Tie loose ends.

**FIG. NO. 1A—SINGLE LINE CONSTRUCTION, HANDLE END (alternate)**



**Figure 2. Two-Line Construction**

## G.2.6 CONTROL LINE SPECIFICATIONS AND PULL TEST:

As per the chart, lines of braided or stranded construction will not be allowed in any CL Speed event. The line sizes stated in the chart are applicable regardless of the model's weight.

- 6.1 When a crossbar is used on a Speed handle to engage the pylon fork, the line length is measured from the front of the bar to the airplane centre line. The safety thong must still be used, and the pull test requirement is as per the chart.
- 6.2 A 32G pull is two pounds pull per aircraft ounce. A 48G pull is three pounds pull per aircraft ounce.
- 6.3 If one line of a two-line system should fail the pull test, both lines shall be impounded.
- 6.4 Non enclosed jet engines on Jet Speed models shall receive an engine mount pull test of 35 pounds. This shall be accomplished while the pull test scales are still attached to the control handle, immediately following the airplane pull test. The engine must be gripped and the pull applied in a manner that does not allow any horizontal or vertical pressure to be applied to the lines (s) at the wing tip bearing point (s). This may be accomplished by grasping the tailpipe and/or head with hands spaced equidistant from the wing tip bearing point (s), and with a "twist" to the grip as necessary to keep the wing horizontal.

## G.2.7 CONTROL HANDLE:

Handles providing for easy adjustment of the overall length of control lines are prohibited in all Speed and Proto Speed events.

## G.2.8 COMPETITION FLYING:

8.1 From a pylon. The Contest Director shall provide a substantial fixed pivot-post or pylon from which all official speed flights shall be controlled. The pylon shall be between elbow and shoulder height, preferably adjustable, and equipped with a freely revolving yoke hand rest for centering the flight path. During the entire period when official timing is being made, and for at least three laps immediately preceding, the contestant shall keep his wrist (defined as within three inches of the wrist bone), or his hand holding the control handle or control handle device, on the hand rest between the forks. "Wrist" or "hand" does not apply if a crossbar on the handle is used to engage the pylon fork on the side opposite the airplane. (See paragraph titled "Control Line Specifications and Pull Test" for measuring line(s) if crossbar is used.)

CLASS	LAPS	LINE LENGTH	LINE DIAMETER MIN.		MINIMUM BUTTON DIA.	MAXIMUM WEIGHT WITH FUEL	PULL TEST
			1 LINE	2 LINE			
1 / 2A	5	47' – 5 5/8"	0.014	0.010	0.112 / 0.080	10 oz.	40G
1 / 2A Prof. Proto	10	42' – 0"	-	0.010	0.080	9 oz.	32G
A	7	60' – 0"	0.020	0.016	0.125	22 oz.	48G
B	6	70' – 0"	0.024	0.020	0.125	32 oz.	48 G
D	6	70' – 0"	0.031	0.024	0.156 / 0.125	47 oz.	48 G
JET	6	70' – 0"	0.031	0.024	0.156 / 0.125	47 oz.	48 G
FORM. .40	14	60' – 0"	-	0.020	0.125	34 oz.	48 G
.21 SPORT SPEED	7	60' – 0"	-	0.018	0.125	26 oz.	40 G

8.2 Without a Pylon. When a pivot-post or pylon is not provided, or when weather conditions do not permit their use, a six foot diameter ring is to be marked at the centre of the flight circle within which the flyer shall remain while the flight is being timed. Such flights will not be considered for record purposes.

8.3 Whipping. Whether flying from a pylon or without, any attempt by the flyer to shorten the effective length of the control line(s), or touch the line(s) between the control handle (device) and the model shall constitute a foul. Except as specified in 9.4, it shall be mandatory at every sanctioned meet for one official, with field glasses, to be assigned the duty of watching the flyer to determine if he is leading (whipping) the model. Any attempt to whip the model more than is necessary to get it safely airborne shall constitute a foul, disqualifying the flight. Two such fouls in an event shall disqualify all flights in that event. This shall apply to all classes in the Speed event.

8.3.1 At any time during the clocking, any excessive vertical movement of the monoline handle stem shall constitute an attempt to shorten the effective length of the line (see 9.3). Excessive movement of the tip of the stem from a straight line formed by the stem and the flying line at any time during the flight shall not be allowed. *This is a judgment call by the official with the field glasses. The monoline system was designed to control the model by twisting the line, not by raising and lowering the control device. Although it will take a considerable bend to actually shorten the line enough to effect the timed distance, excessive movement at the tip of the stem causes a bend of the flying line at that point, and repeated bending at this point can greatly weaken the line.*

8.4 In any contest where speed is not required to be flown from the pylon, only two stop watches shall be required to record the flight, and no field glasses are required. The average of the two watches shall be used for scoring purposes.

#### G.2.9 TIMING OF FLIGHTS:

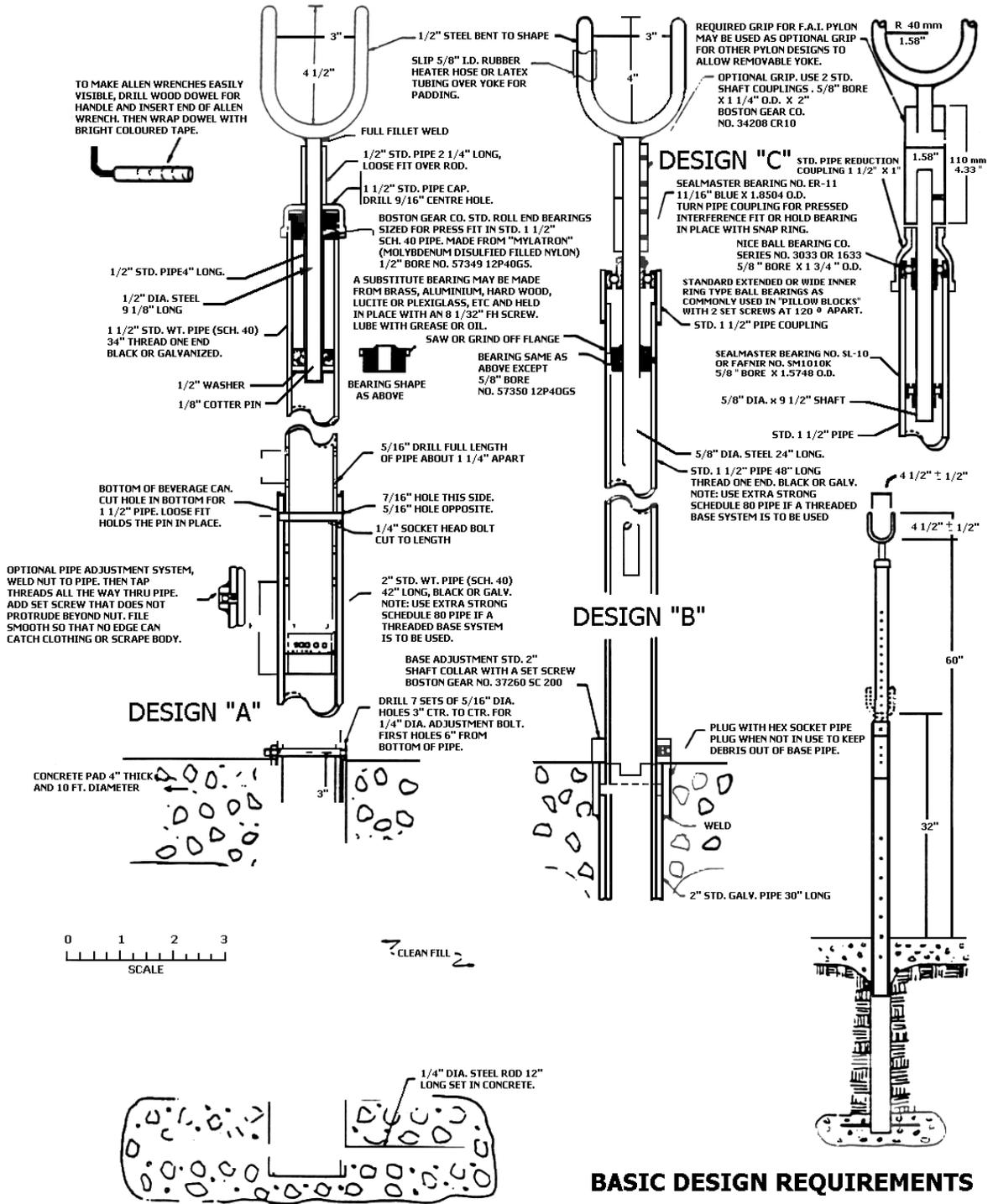
Except as specified in 9.4, in at least three timers, equipped with stopwatches having one – tenth second or finer graduations, shall time flight in unison from a point on the opposite side of the circle from the timing pole or marker. Timing shall start immediately after the third complete has been flown from the pylon according to “Competition Flying From a Pylon”.

If the flyer so chooses, he or his pit crew may give a prearranged signal to the timers as to when to start the three preliminary laps before timing starts; if this is done, timing shall start after at least three full laps in the pylon have been completed following the prearranged signal to the timers (in accordance with “Competition Flying From a Pylon”). The reference for counting laps and starting watches is when the model passes the timing pole or marker.

#### SCORING OF FLIGHTS:

The best official flight by each competitor in an event, in terms of miles per hour, shall be used for competition and record scoring. The average of the three watches shall be used for scoring. Records shall be recognized only when no more than .2 second variation exists between any of the three watches. If the watches do not read within this required tolerance, and a record has been broken, the flyer may request that another attempt be permitted. In the case where no record is broken, or if the flyer does not elect to take another attempt, the average of the two watches that are within .2 seconds of each other shall be taken for scoring purposes, disregarding the results of the third watch. If the two of the three watches are *not* within .2 seconds of each other, the flyer has the right to ask for another attempt, with the previous flight being cancelled, or to request that the average of the three watches be used for scoring.

# SUGGESTED PYLON FABRICATION METHODS



## BASIC DESIGN REQUIREMENTS

Pylon fabrication methods are optional. However, it is recommended that the design be capable of the minimum and maximum yoke heights shown and that the fork be within the limitations given. The pylon shall be capable of withstanding a 150 pound horizontal pull on the yoke when it is at the maximum height position.

10.1 To separate the competitors in the case of a tie, the average of the competitor's two best flights will be taken. In the case of the two best flights still producing a tie, the average of the best three flights will be taken to determine the winner.

10.2 To compute the score in mile per hour for 1 / 2A Speed, use the formula: Velocity equals  $1016.79 / (\text{time in seconds})$ .

#### G.2.11 OFFICIAL FLIGHT:

An official flight occurs when the model has successfully completely the timed distance in accordance with these regulations, and an official timing (clocking) has been recorded.

#### G.2.12 NUMBER OF FLIGHTS:

Each contestant shall be allowed four attempts for three official flights.

#### G.2.13 ENGINE STARTING TIME:

The maximum time allowed for starting engines shall be three minutes from the time the initial propeller turning sequence begins (or air is applied to the intake of a jet engine) until the engine is running under its own power. The model may land and take off as many times as the flyer wishes within the allowed starting time as long as the attempt is not automatically terminated for any of the reasons stated under the "definition of an attempt".

#### G.2.14 DEFINITION OF AN ATTEMPT:

An attempt is the purpose of trying for an official flight within the allowed starting time. An attempt also refers to failure to achieve an official flight during the starting time allowed. An attempt is declared when a foul is called as described in other paragraphs. An attempt is declared when the starting time has elapsed.

- 14.1 An attempt is automatically terminated and no further starting time is allowed when any of the following takes place: a part of the model is lost during the flight (this does not include propellers, but does include wheels and / or tires); a removable takeoff gear does not fall free of the model as it gets airborne but does fall free later during the flight and is not retained by the required safety line; the engine loses all or part of a propeller, and the engine continues to run and at excessive rpm ("shaft run" or "scream out") but the model does not become or remain airborne.
- 14.2 If the engine throws part of the propeller, but does not run at excessive rpm (does not "shaft run" or "scream out") after becoming airborne but without completing an official clocking, the Event Director shall inspect the model before allowing the attempt to continue. At any time after a model has become airborne it then comes in

contact with the ground or another obstacle while under power, resulting in an engine cutoff (not a shaft run) the Event Director shall inspect the model before allowing the attempt to continue. This shall also be done when a jet model makes contact with the ground, causing the engine to shut off. This inspection time shall not constitute a part of the “starting time”.

- 14.3 In the case of a large number of contestants and short flying hours, the Contest Director may elect to add further restrictions to the flying procedures in order for more flights to be flown in a given time. Example: allow only two minutes from time the flyer is called to fly until his starting time begins, or a similar rule to speed up the contest. If any such procedures are to be used, they must be announced prior to the start of competition and preferably in contest advertisements.

**G.2.15 DISTANCE OF TIMED COURSES:**

For competition and record purposes, the model must complete the following distances.

CLASS	DISTANCE	NO. LAPS
1 / 2A	1 / 2 Mile	5
1 / 2A Proto	1 / 2 Mile	10
A	1 / 2 Mile	7
B	1 / 2 Mile	6
D	1 / 2 Mile	6
Jet	1 / 2 Mile	6
.21 Sport Speed	1 / 2 Mile	7
Formula .40	1 Mile	14

**G.2.16 TIMING POLE – HEIGHT MARKER:**

A pole or reference marker shall be provided outside of the flight circle for timing and fudging flights. Elevations of 15 feet for Classes 1 / 2A, A and B and 20 feet for Class D Open and Jet are to be clearly marked for reference purposes. Maintenance of flight in excess of the above heights, as specified for the various classes, for more than 1 / 2 lap shall constitute a foul.

**G.2.17 PROTO SPEED:**

All speed regulations for the size of class of model shall be applicable except for the additions and modifications following.

17.1 Design of Proto Speed Model. Proto Speed models need not be to scale; however, the design must resemble that of a full scale airplane. Models must have a profile fuselage, rudder or butterfly tail, and a clear cockpit or cabin in proportion to the total model. No pod and boom, fuselages, flush or prone cockpits, or flying wing designs will be permitted unless they are scale models of full scale aircraft. The model must be colourfully painted or colourfully trimmed so as to not permit clear – finished models. Models must satisfy the Control Line General profile definition.

17.2 1/2A Profile Proto Specifications.

- (a) Minimum wing span, 14” (12” for biplanes)
- (b) Minimum wing area, 45 square inches
- (c) Minimum fuselage length, 12 inches.
- (d) Must have clear canopy.
- (e) Must have fixed landing gear, with minimum of two main wheels permanently attached.
- (f) Main wheels must have a minimum diameter of 7 / 8 inches.
- (g) The landing gear must include at least two main wheels of equal diameter, which are laterally separated from each other by a distance of at least two wheel diameters.
- (h) Engines equipped with exhaust extensions of any kind are not permitted.
- (i) Models must have an exposed two – line control system.
- (j) Models must have a side-mounted engine, and a fully exposed tank mounted on the outboard side of the fuselage. The tank may not form a fairing behind the cylinder head, but a fairing behind the tank is permitted.

17.3 Launching (Proto). Models shall take off from the ground or runway under their own power.

17.4 Timing of Flights (Proto) shall be the same as for the respective size class of Control Line Speed as follows.

17.4.1 The timers shall be located on the opposite of the circle from the launch point (180 degrees from launch point). The timing mark is an imaginary straight line going from the timers and passing through the pylon to the point where the model is launched. Sighting references for counting laps and terminating the clocking is as the model passes behind the pylon. The flyer may select his launching location.

17.4.2 Proto Speed will be timed from the instant the model is released for takeoff. The contestant will be allowed a maximum of 1 – 1 / 2 laps in which to get the model airborne before he is required to fly from the pylon as specified under “Competition Flying From a Pylon”. However, any attempt to whip the model more than what is necessary to get it airborne during the first lap and one half shall constitute a foul, disqualifying the flight. Any such whipping to

get the model safely airborne must cease immediately when the model becomes airborne and is in a normal attitude.

17.5 Scoring of Proto Flights. The best official flight by each competitor in an event, in terms of miles per hour (mph), shall be used for competition and record scoring. The average of the three watches shall be used for scoring. Records shall be recognized only when no more than .4 second variation exists between any of the three watches. If the watches do not read within this required tolerance, and a record has been broken, the flyer may request another attempt, and the flight with the discrepancy shall be cancelled and another attempt permitted. In the case where no record is broken, or if the flyer does not elect to take another attempt, the average of the two watches that are within .4 second of each other shall be taken for scoring purposes, disregarding the results of the third watch. If no two of the three watches are within .4 second of each other, the flyer has the right to ask for another attempt, with the previous flight being cancelled, or to request that the average of the three watches be used for scoring.

17.6 To separate the competitors in the case of a tie, the average of the competitor's two best flights will be taken. In the case of the two best flights still producing a tie, the average of the three best flights will be taken to determine the winner.

#### G.2.18 RECORDS:

Flyers establishing or surpassing a national speed record shall be required to make a supporting or verification flight within 5 MPH of the record flight on the same day as the record setting flight before it can be recognized for record purposes. Basis for this supporting flight shall be as follows.

18.1 After a record is broken during the contest, the flyer shall be granted three attempts to make a supporting flight within 5 MPH of the record flight. The flyer has the option of making the supporting flight immediately after the record flight or at any time during the same day; however, the flyer should not be permitted to delay the contest while he makes preparations for the supporting flight, but he should be worked into the starting line as soon as is reasonable. All supporting flight attempts shall be subject to the same starting restrictions as official contest flights (see Engine Starting Time G.2.13).

18.2 Any official flights attempted during the contest after a record is broken shall be deemed attempts to satisfy the requirement of a supporting flight. The first three official flights flown or the first four attempts shall be considered the contest flights. This shall also hold true for multi – day contest when the same event can be flown on more than one day.

18.3 In the case where a flyer breaks the record on his third official flight (or fourth attempt) during the contest, he would then be allowed a maximum of three attempts after the contest to make a satisfactory supporting flight.

18.4 If the flyer's first or second attempt for a supporting flight is within the five MPH required, no further attempts shall be given for the supporting flight.

18.5 If the flyer has made another official flight during the contest which was within the required five MPH, he will be required to use this as the supporting flight for record purposes.

18.6 If the supporting flight is faster than the record flight, it will become the record flight and the other the supporting flight. Under no circumstances can the record resulting from a supporting flight be over five MPH than an official contest flight. If the supporting flight was flown after contest hours and exceeded the contest record flight, the “after hours” flight can be used only for record purposes; it cannot be used as an official contest flight for scoring purposes.

18.7 M.A.A.C. records for FAI (F2A) 0.15 cubic inch speed shall be considered only when the flights have been made according to the FAI Sporting Code or those special rules in effect for FAI Selection Finals; they must also meet the requirements of the supporting flights as described in this section.

18.8 Fuel Restrictions:

All fuel shall be provided by the contest management.

The fuel formula for glow engines shall consist of 10 percent Nitromethane, 70 percent Methanol, and 20 percent lubricant.

The fuel formula for pulse jet engines shall be 80 percent methanol, and 20 percent propylene oxide.

#### G.2.19 CONTROL LINE FORMULA “40” SPEED:

19.1 Applicability. All pertinent M.A.A.C. regulations (see sections titled Sanctioned Competition and General), the General Control Line Rules and the CL Speed rules shall apply, except as specified below.

19.2 Formula “40” Description. This event is intended to be a common ground for competition between monoline speed fliers and two–line racing flyers (and other two–line pilots) using an engine size that is rapidly becoming the most highly developed, and most commonly used of all model airplane racing engines. Because of the requirement for two lines and fixed landing gear, it is hoped that newcomers will also enter this event. Formula “40” is limited to Open class flyers. Juniors are not permitted to fly Formula “40”.

19.3 Engine Restrictions. Engine displacement is as per the chart. No tuned or untuned megaphone or expansion chamber exhaust extensions shall be allowed. Constant diameter type exhaust extensions are allowed, but only if the overall length as measured from the centre line of the cylinder along the centre line of the exhaust system does not exceed six inches. There are no additional engine restrictions other than those which appear in the CL Speed section. “Open face exhausts are, of course, permissible.

19.4 Formula “40” Model Design and Construction. There are no wing loading, power loading or cross – sectional requirements. The method of “hold–down” construction for holding two parts of the model together shall be considered if in the Event Director’s opinion it is at least as strong as the methods illustrated in the CL Speed section. Models shall have a fixed landing gear with a minimum of one wheel.

19.5 Launching. Models shall take off from the ground or runway under their own power, and unassisted (no hand launching or dollies).

19.6 Size, Construction, and Length of Control Lines. Size and length to be as per chart. Lines shall be constructed as described in the General Control Line section. Lines of braided or multi-strand construction will not be allowed. No single line control systems are allowed. A 40G pull test is required.

19.7 Formula “40” flight timing shall be from a standing start for 14 laps. The flight timing procedure shall be the same as for 1 / 2A Profile Proto.

19.8 Flight Elevation shall be a maximum of 15 feet. Maintenance of flight in excess of 15 feet for more than one half lap shall constitute a foul.

19.9 Scoring of Flights shall be the same as for 1 / 2A Profile Proto.

## G.20 CONTROL LINE .21 SPORT SPEED

20.1 **Applicability.** All pertinent MAAC regulations, general Control Line rules and the Control Line Speed Rules shall apply, except as specified below.

20.2 **Engine Restrictions.** Any engine from .198 to .2135 cubic inch displacement may be used. Open exhaust of a minipipe may be used. The minipipe cannot be longer than six (6) inches from center line of engine bore to end of pipe. The inside diameter of the pipe shall be of constant size.

### 20.3 Model Design and Construction

3.1 Models are to be of standard configuration. No asymmetrical designs allowed.

3.2 There may be no more than one (1) inch differential between the lengths of the left and right wing.

3.3 The minimum distance between the leadouts at the wing tip shall be no less than .200 inches.

3.4 The model can be designed with or without the use of a metal speed pan. Profile fuselage models are permitted.

20.4 **Propellers.** Only standard two-blade propellers are permitted. No single blade propellers will be allowed.

20.5 **Size, Construction, and Length of Control Lines.** Size and length as per chart. Lines shall be constructed as described in the General Control Line section. Lines of braided or multistrand construction will not be allowed. No single line control systems are allowed. A 40G pull test is required.

20.6 **Flight Timing.** The model shall be timed for seven (7) laps (1/2 mile) after three (3) complete laps are flown in the pylon.

20.7 **Flight Elevation** shall be fifteen (15) feet.

20.8 **Flight Scoring.** The best official flight by each competitor, in terms of miles per hour, shall be used for competition and record scoring. The average of the three (3) watches shall be used for scoring.

G20.9 **Records** shall be recognized only when no more than .2 second variation exists between any of three (3) watches. If the watches do not read within this required tolerance, and a record has been broken, the flier may request another attempt, the average of the two (2) watches that are within .2 second of each other shall be taken for scoring purposes, disregarding the results of the third watch. If no two (2) of three (3) watches are within .2 second of each other the flier has the right to ask for another attempt, with the previous flight cancelled, or to request that the average of the three (3) watches be used for scoring.

CL 21 Sport Speed								Pull Test
Class Engine Size (cubic inch)	Max. Model Weight	Minimum Line Length	Required Minimum Diameter of Each Line					
			Single Strand			Multi-Strand		
			1 Line	2 Lines	3 Lines	2 Lines	3 Lines	
21 Sport Speed .000 - .1525	26 oz.	60 feet	-	.018"	-	-	-	40G

### G21 Control Line Sport Jet Speed

21. Applicability. All pertinent MAAC regulations, general Control Line rules, and Control Line Speed rules shall apply, except as specified below.

#### 21.2 Engine Restrictions

21.21 The allowed engines are the Dyna-Jet, Sport Jet, and the O.S.II

21.22 It is required that the engine shall be in stock condition internally. No material may be removed or added to the engine, except as follows:

21.23 Engine head. The last three fins on the head may be machined to a diameter of .020 less than the fin in front in order to receive a mounting strap or ring. Holes may be drilled into the head for purpose of engine mounting. The fins must be exposed. Engine cowling is not allowed. Streamlined fairings in front of the engine cannot be attached to the head. Valve face may be lapped as required for routine maintenance.

21.24 Flowjector. Any type of flowjector is allowed.

21.25 Metering Jet. Any type of metering jet may be used, and may be located anywhere between the tank and flowjector.

21.26 Tailpipe. A stock tailpipe with ignition plug in place must be used. (A starting probe may be used.) Repaired tail pipes are allowed, provided that stock dimensions are adhered to. The front surface of the tailpipe (combustion chamber screw ring), and the lock ring may be lapped.

21.27 Reed valve. Any commercially available reed valve may be used.

21.28 Interchanging of parts between the above listed engines is permissible.

21.29 Fuel delivery to the engine shall be by suction only, no pressure fuel feed is allowed.

#### 21.3 Model Design and Construction

21.31 Any design configuration and construction method is allowed as long as it is deemed safe by the contest management.

21.32 The control system shall be mounted external to the normal aircraft

contours. This includes the bellcrank, leadouts, control lines, pushrod, and elevator horn.

21.33 The maximum weight of the model, including fuel, shall be 47 ounces.

#### 21.4 Lines and Pull Test

21.41 The model must be flown on two single strand solid steel control lines of .022 minimum diameter. The distance between the centre of the model and the centre of the control handle grip shall be a minimum of 60 feet.

21.42 The controls must be connected using either scissor type connectors to the leadouts, or directly to the bellcrank using monoline style buttons mounted to the bellcrank.

21.43 The model and entire control system and handle shall receive a 48g pull test.

#### 21.5 Fuel

21.51 The fuel shall be the standard MAAC formula: 80% methanol, and 20% propylene oxide.

#### 21.6 Flight Timing, Elevation, and Scoring

21.61 The model shall be timed for seven (7) laps (1/2) lap after three complete laps are flown in the pylon.

21.62 Flight elevation shall be 15 feet.

21.63 The best official flight by each competitor in terms of miles per hour shall be used for scoring.