

Control Line Competition Rules

SECTION G . 5

CONTROL LINE PRECISION AEROBATICS

Please see the US A.M.A. Control Line Precision Aerobatics Rules

at

<https://www.modelaircraft.org/files/CLPrecisionAerobatics2017-2018.pdf>

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G.5A CONTROL LINE PRECISION AEROBATICS

MAXIMUM ENGINE SIZE	MAXIMUM MODEL WEIGHT	REQUIRED MINIMUM DIAMETER OF EACH LINE			PULL TEST
		1 LINE SOLID	2 LINE SOLID	2 LINE MULTISTRAND	
0.000 – 0.510	None	.014	.008	.008	5 lbs.
.511 – .1525	None	.014	.008	.012	15 lbs.
.1528 - .4000	None	.014	.012	.015	30 lbs.
.4001 - .4600	None	.014	.012	.015	30 lbs.
.4601 - .6500	none	.016	.014	.018	45 lbs.
REQUIRED LINE LENGTH FOR ABOVE CHART 25' – 70'					

5A.1 General. No restrictions are placed on design of Aerobatic models except that they shall meet the specifications for these regulations. All pertinent regulations covering the flyer, the model and the flight shall be applicable except as hereinafter specified.

5A.2 Control Mechanism.

- (a) Line length shall be at least 25', but no more than 70'.
- (b) Line diameter shall be as specified in the chart.
- (c) The entire control mechanism from the handle to and including the model, shall be capable of withstanding the pull – test of 100lbs. per cubic inch of engine displacement.

5A.3 Landing Gear. The landing gear may consist of any combination of permanently affixed wheel(s) and / or skid(s) which allow the model to take off and land under its own power in normal manner.

5A.4 Number of Flights. Contestants shall be allowed three attempts to make two official flights. Each attempt period shall be of three minutes duration. A contestant may make as many starts as necessary, as long as the three-minute time period has not been exceeded. If a second takeoff is made during the three-minute period, the first takeoff score will be cancelled and a new score made. A flight will be termed official if a maneuver is attempted after takeoff. Therefore, contestants should take advantage of the warm-up period allowed immediately after takeoff.

5A.5 Preparation for Flight. Contest officials should provide adequate pit area and contestants should be ready to fly upon being called. Models should be judged for appearance when they are brought forth for first flights. A cursory inspection with consequent arbitrary scores for appearance is not considered to be a sufficient effort on the part of the judges.

5A.6 Duration of Flights. Eight minutes total elapsed time is allowed from the time the contestant starts flipping the propeller (after receiving a signal from the judges that the time period has commenced) to start, take-off, complete the flight pattern and land. No maneuver, including the landing, will be scored after the eight minutes allowed have elapsed. No restriction is placed on maneuvers a contestant may wish to practice, between completion of the pattern and landing. However, a contestant may be disqualified, or points may be deducted from his total score if he indulges in any manner of unsafe flying during this free period.

5A.7 Scoring. Scoring shall be based on the appearance of and the degree of perfection with which maneuvers are performed. The contestant's flight point score for competition purposes shall be the average of the scores given by not less than two judges. Flight points used shall be those accumulated during the better of the two official flights permitted. A contestant should be permitted to attempt his second official flight when it is his turn, even though other contestants may not have completed first flights. Scores should not be withheld from contestants. Preferably, scores should be posted as soon as possible after each flight is completed, for all to see.

5A.8 Appearance. Models shall be judged for appearance complete and ready to fly. After model has been judged, nothing will be removed or added to the model which in the judge's opinion changes in any manner the appearance of the model from the way it was when presented for appearance judging.

However, during an attempt for official flight after the contestant has begun to crank the engine, if it becomes necessary to remove the propeller spinner for change of propeller, etc., then it is permissible to leave off the spinner for that particular flight. Any damage to the model after judging or changes that may be made as a result of such damage, will not be cause for loss of appearance points. Appearance judging will take place just before the contestant's flight. Judges should exercise prudence in assigning points and reserve excellent point values for those models, which are decidedly above average.

5A.9 Flight Pattern.

(a) Maneuvers shall be accomplished in the order listed below under “Maneuvers”. The contestant shall notify the judges prior to the flight as to the specific maneuvers he wishes to omit, in order that the judges will not be confused as to what maneuver is to follow. Twenty-five flight pattern points shall be awarded a contestant who successfully completes the entire pattern as listed below. Omitting any maneuver, either intentionally or otherwise, or completing a maneuver out of its proper order shall result in loss of flight pattern points. A crash or failure to complete the pattern due to engine failure shall also result in loss of flight pattern points.

(b) Flight will become official upon attempt to perform any prescribed maneuver after take – off. At least two laps of level flight shall precede each maneuver including landing. Judges should not require more than two level laps between maneuvers due to the time limit imposed by these regulations. Level flight at an altitude of from 4 to 6 feet will be considered normal level flight regardless of height of flyer. The portions of certain maneuvers, which require normal flight elevation, must be accomplished between 4 to 6 feet for maximum points. Flyers and judges alike should note that maneuvers should be flown and judged in relation to two or three reference points, depending upon the particular maneuver. For example, loops should be performed with bottom tracks of 5’ elevation, and the top track at 45 degrees elevation of the lines. The vertical eight should also have the approximate 5’ lower track elevation, and the top of the figure (s) should not be more or less than 90 degrees from horizontal, or directly over the flyer’s head. All flyers should be attempting the same angular dimensions.

(c) Hand Signal. A hand signal must be given to indicate the contestant’s desire to make his flight official. The flight will become official after the hand signal. Therefore, contestants should take advantage of the warm-up period allowed immediately after “takeoff and level flight”.

APPEARANCE POINTS	POOR	FAIR	GOOD	EXCELLENT
Workmanship	4	6	8	10
Realism	4	6	8	10
Finish	4	6	8	10
Originality	4	6	8	10

Minimum=16

Maximum=40

Appearance points are added to the contestant’s flight points for Scoring purposes.

5A.10 Maneuvers

(a) Starting: Takeoff within one minute from the time the contestant or mechanic begins to flip the propeller. Starting within one minute receives full points. Starting after one minute receives no points. Maximum: 5 points. Minimum: 0 points.

(b) Takeoff and Level Flight: A correct takeoff consists of the model rolling smoothly along the ground for a distance of not less than 15', then rising smoothly into the air with a gradual climb to, and a smooth level-off at normal level flight attitude. Model continues on for two smooth laps of normal level flight to point of original level-off. Maximum: 40 points. Minimum: 10 points. *Errors:* Model bounces or becomes airborne too soon. Take-off, climb or level-off is not gradual and smooth. Level-off and normal level flights are not within 4-6 feet altitude.

(c) Reverse Wingovers: (One requested) – Correct reverse wingovers are judged when model starts from normal level flight, makes a vertical climb and dive, passing directly over the flyer's head, cutting the ground circle in half and recovers in an inverted position at normal flight level. The model continues for half a lap inverted, to the starting point, then makes a vertical climb and dive over the centre of the circle from inverted and recovers in normal level flight. Maximum: 40 points. Minimum: 10 points. *Errors:* First half: Model starts at other than normal level flight, wobbles or mushes going into climb. Model does not cross directly over flyer's head. Model does not cross circle in a straight line. Model wobbles, mushes or recovers at other than normal flight level in an inverted position. Model does not cut circle in same position and direction in second part of maneuver. Second half: Scored same as first half, reversing the entry and recovery positions.

(d) Consecutive Inside Loops: (3 requested) - Correct loops are judged when the model starts from normal level flight and makes a series of three smooth, round loops, all done in the same place with the bottoms of the loops being normal level flight altitude and the tops of the loops with the line (s) at 45 degree elevation. The model then continues for another half loop, recovering inverted and descending to normal flight level, flying one lap before being judged for Inverted Flight. Maximum: 40 points Minimum: 10 points. *Errors:* Loops are round and irregular (i.e., egg-shaped, hexagonal, etc.). Bottoms of loops are not at 4 – 6 foot height. Tops of loops vary more than 2', plus or minus of the 45 degree elevation point. Second and third loops vary more than 2' from the path of the first loop.

(e) Inverted Flight: (Two laps) – Correct inverted flight is judged when the plane makes two smooth, stable laps at normal level flight altitude. Maximum: 40 points Minimum: 10 points. *Errors:* Altitude is not 4 – 6 feet. Altitude varies more than 2'.

(f) Consecutive Outside Loops: (3 requested) - Correct loops are judged when model starts from inverted position at normal level flight and makes a series of three smooth, round loops, all done in the same place, with the bottoms of the loops being at normal level flight altitude and the tops of the loops with the line(s) at 45 degree elevation. The model then continues for another half loop, recovering in normal flight. *Errors:* Loops are rough and irregular (i.e., egg – shaped, hexagonal, etc.). Bottoms loops are not at 4 – 6 foot height. Tops of loops vary more than 2', plus or minus of the 45 degree elevation point. Second and third loops vary more than 2' from the path of the first loop.

(g) Consecutive Inside Square Loops:(two requested) – Consecutive square loops are judged correct when the model starts from normal level flight and flies a square course consisting of two loops, each with four turns of approximately 5' radius and straight, equal

length segments, with bottom segments at normal level flight altitude and top segments at 45 degree elevation. Maneuver begins and ends with model in level flight at point of start of first turn. Maximum: 40 points. Minimum: 10 points. *Errors:* Model wobbles or mushes on turns. Lower altitude is not 4 – 6 feet. Upper altitude is not within 2' of the 45-degree elevation point. Turns are not precise and exceed 7' radius. Sides of loops are not equal. Second loop is not in the same flight path of the first loop.

(h) Consecutive Outside Square Loops: (two requested) – Consecutive outside square loops are judged correct when the model starts from level flight at 45 degree elevation and flies a square course (starting with a vertical dive) consisting of two loops, each with four outside turns of approx. 5' radius and straight, equal length segments, with bottom segments at normal level flight altitude and top segments at 45 degree elevation. Maneuver begins and ends with model in level flight at point of start of first turn. Model recovers into normal level flight within a quarter lap. Maximum: 40 points. Minimum: 10 points. *Errors:* Model wobbles or mushes on turns. Lower altitude is not 4 – 6 feet. Upper altitude is not within 2' of the 45-degree elevation point. Turns are not precise and exceed 7' radius. Sides of loops are not equal. Second loop is not in the same flight path of first loop.

(i) Consecutive Inside Triangular Loops: (two requested) – Correct triangular loops are Judged when the model starts from normal level flight, turns 120 degrees, proceeds in an upward and backward direction to an altitude of 45 degrees elevation, turns 120 degrees and flies downward to make another 120 degree turn into normal flight altitude, returning to the starting point of the first turn, and flies an identical second loop in the same flight path. All corners must be smooth, precise and of approx. 5' radius. Maximum: 40 points. Minimum: 10 points. *Errors:* Models starts wobbly or exceed 7' radius. Peak of second turn is not within 2ft. of the 45-degree elevation point. Sides are wobbly and not equal in length. Second loop is not in the same flight path of the first loop.

(j) Horizontal Eights: (two requested) – Horizontal eights are to be entered at the intersection point of the circle and exit at the same point. Either the inside or outside loop may be flown first, at the pilot's discretion. Correct eights are judged when the model makes two eights, each consisting of two round circles or loops of the same size, tangent to each other, and in a horizontal line. The model must enter the eight from normal flight and be vertical at the intersection point of tangency of the circles. The eights must be symmetrical. At the top of each circle the model must be at the 45-degree elevation point; bottoms of circles must be at normal flight attitude. Maximum: 40 points. Minimum: 10 points. *Errors:* Model is not vertical at entry. Model at top of circles is not within 2' of 45-degree elevation point. Bottoms of circles are not within 4 – 6 foot height. Loops are not round and equal in size. Point of intersection varies. Second eight is not in the same position as the first.

(k) Square Horizontal Eights: (two requested) – The eight is to be entered at the intersection point of the squares, and exit after completion of two eights are made from the same point. Either the inside or outside loop may be flown first, at the pilot's discretion. Correct eights are judged when the model starts a vertical climb at the same point. The maneuver is repeated to form two eights. Tops of loops must be at 45 degree elevation, bottoms of loops must be at normal flight height, and all corners must be smooth, precise and of approx. 5' radius. Maximum: 40 points. Minimum: 10 points. *Errors:* Corners exceed 7' radius, sides are not square and equal in length. Loops are not equal size. Sides are not square horizontally or vertically. Tops of loops vary from the 45-degree elevation point

more than 2'. Bottoms of loops are not within 4 – 6 foot height. Point of intersection varies. Second eight is not in same position as the first.

(l) Vertical Eights: (two requested) – Vertical eights are entered at the point of 45 degree elevation and exit from the same point. The inside loop must be flown first. Correct eights are judged when the model makes two eights, each consisting of two round circles or loops of the same size, tangent to each other, and in a vertical line. The model must enter the eight in inverted flight and be horizontal at the intersection point or tangency of the circles. The eights must be symmetrical and the bottoms of the eights at normal level flight attitude. Top of figure shall not be more or less than 90 degrees from horizontal or directly over the flyer's head. Maximum 40 points. Minimum: 10 points. *Errors:* Model is not horizontal at entry. Entry is not within 2' of 45 degree elevation point. Tops of eights more or less than the 90 degree point. Bottoms of eights are not at 4-6 feet height. Loops are not round and equal in size. Point of intersection varies. Second eight is not in same position as the first.

(m) Hourglass Figure: (one requested) – An hourglass will be judged correct when the model starts from normal level flight, makes an abrupt, smooth turn at 120 degrees into inverted climb, turns 120 degrees into level flight at an altitude not more or less than the 90 degree point above the flyer's head, flies level a distance half the total climb, turns 120 degrees, dives at an inverted angle to complete the hour – glass shape and recovers with a 120 degree turn at a point directly below the upper left hand corner of the figure into normal level flight. Flight paths of the climb and dive cross at the 45-degree elevation point. The maneuver consists of two triangles, one directly above the other, with segments of each triangle of equal length. Maximum: 40 points. Minimum: 10 points. *Errors:* Model starts at other than normal level flight of 4 – 6 foot height. Turns are rough and wobbly or exceed 7' radius. Top of figure is at an elevation more or less than 90 degree from horizontal. Triangle segments are not equal in length. Termination of dive is not directly beneath point where the climb terminated. Recovery is not at normal flight altitude.

(n) Overhead Figure Eights: (two requested) – Overhead eights are to be entered at the intersection point of the circles directly over the flyer's head, and exit from the same point. The inside loop must be flown first. Correct overhead eights are judged when the model makes two eights, each consisting of two round circles of the same size, with the intersection or point of tangency directly over the flyer's head. The model must enter the eights with a vertical climb through the centre of the circle, and must always point in this direction at the centre of the eights. The eights must be symmetrical and the model at the lowest point of each circle must be at a point of 45-degree elevation. Maximum: 40 points. Minimum: 10 points. *Errors:* Model is not vertically overhead for entry or intersection of all loops. Low points of circles are not within 2' of the 45-degree elevation point. Loops are not round and equal in size.

(o) Four – Leaf Clover: (one requested) – A correct four – leaf clover is judged when the model starts from a 42 degree elevation point, performs an inside loop, flies level a distance equal to the diameter of the loop, completes three – fourths of an outside loop, climbs vertically a distance equal to the diameter of the first loop, completes three – fourths of another outside loop, flies inverted a distance equal to the diameter of the first loop and completes three – fourths of an inside loop. As the tangency point between lower left and lower right loops is reached, the model climbs vertically through the four - leaf clover and recovers into normal level flight. Maximum: 40 points. Minimum: 10 points. *Errors:* Entry is not within 2' of 42-degree 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 loops are not 3 – 7 feet below the 90-degree point over the flyer's head. Loops are not properly tangent to form a square pattern. Model recovers before it has flown vertically through the clover pattern.

(p) Landing: A correct landing is judged 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 three 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.

(q)

Precision Aerobatic Score Sheet:

CONTESTANT NAME and M.A.A.C. NUMBER					
APPEARANCE POINTS	POOR	FAIR	GOOD	EXCELLENT	SCORE
Workmanship	4	6	8	10	
Realism	4	6	8	10	
Finish	4	6	8	10	
Originality	4	6	8	10	
Within 1 min. Start	-	-	-	5	
Take - Off	10	20	30	40	
Reverse Wing - Over	10	20	30	40	
Inside Loops (3)	10	20	30	40	
Inverted Flight (2 laps)	10	20	30	40	
Outside Loops (3)	10	20	30	40	
Inside Square Loops (2)	10	20	30	40	
Outside Square Loops (2)	10	20	30	40	
Triangle Loops (2)	10	20	30	40	
Horizontal Eights (2)	10	20	30	40	
Horizontal Square Eights (2)	10	20	30	40	
Vertical Eights (2)	10	20	30	40	
Hourglass Figure	10	20	30	40	
Overhead Eights (2)	10	20	30	40	
4 – Leaf Clover	10	20	30	40	
Landing	10	20	30	40	
Flight Pattern Completed	-	-	-	25	

