Table of Contents

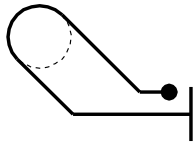
1.0 Criteria for Judging Aerobatic Figures

1.1 The AAC uses the international judging criteria as published in the CIVA Sporting Code Section 6, sub-section 6. These criteria are reproduced below in toto.

2.0 Additional Judging Criteria for Entry Figures

2.1 Additional judging criteria are included below for use in judging the Barrel Roll and Wingover used in the Entry Known sequence.

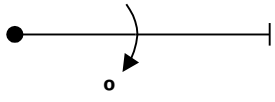
2.2 Family 10 - The Wingover.



The wingover requires a 180° turn placed at the apex of 45° climbing and descending sections. The bank angle at the apex should be 90° with the fuselage axis horizontal. The normal one (1) point off per five (5) degree of error applies. Variations and stops of the turn rate are penalized by 1 and 2 points off respectively. The K factor for a wingover is 8.

2.3 Family 11 – The Barrel Roll

The Barrel Roll is performed around an imaginary point on the horizon 20 degrees off the axis. The manoeuvre is flown with positive 'G' throughout so the nose of the aircraft will describe a perfect circle around this point on the horizon. When viewed from the ground, the aircraft appears to describe a corkscrew effect in the horizontal plane.



The Judges will be looking for:

a) Rate of roll should blend evenly with the circle described by the nose.

b) Initially, the nose should rise simultaneously with the change of heading and beginning of the roll.

c) At 90 degrees roll point the fuselage angle should be 20 degrees above the horizon, a 20 degree left or right of the original heading depending on direction of roll.

d) The highest altitude should occur at the 180 degree roll point, at which time the heading should be 40 degrees off original heading.

e) At 270 degrees roll point, the fuselage angle should be 20 degrees below the horizon and heading should have reduced back to 20 degrees from the heading prior to the start.

f) The manoeuvre is ended when original heading, altitude and zero bank is attained. At that point the aircraft will have displaced horizontally from the geographic starting point by approximately 100 to 200 metres in the direction of roll.

The K factor for the barrel roll is 15.

6. CRITERIA FOR JUDGING AEROBATIC FIGURES

6.1. Preface

6.1.1.1. The following is an expansion and clarification of the general principles for grading aerobatic figures stated in Regulation 5.1.2 . The final grade awarded to a figure has many facets, but the first and most important component in any grade is the geometry of the figure as compared to the true horizon and Aerobatic Box axes. Geometry is derived from two distinctly different entities: flight path and attitude.

6.2. Definitions

There are some words and phrases which are used consistently throughout the text in a very precise sense, and it is as well to define at the start the sense in which each is used:

6.2.1. Angle of attack

6.2.1.1. The angle at which the wings of an aeroplane meet the relative airflow.

6.2.2. Angle of incidence

6.2.2.1. The angle at which the wing is attached to the aeroplane.

6.2.3. Figure

6.2.3.1. Each individual component of a sequence, which may comprise one or more manoeuvres in combination; it starts and ends with a horizontal line.

6.2.4. Maneuver

6.2.4.1. Any one of the basic aerobatic movements, which may be combined to make a figure (e.g. an avalanche is one figure consisting of two manoeuvres -- loop and flick roll).

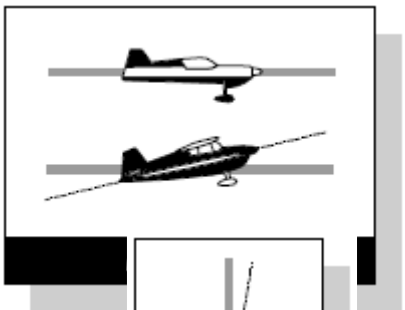
6.2.5. Score/Mark/Point

6.2.5.1. Marks are assigned (from 0 to 10) by judges, and may be devalued by various point values. The score is calculated by multiplying the judges' marks by the coefficients (K factors) and adding the products.

6.3. Flight Path And Attitude

6.3.1. Flight Path

6.3.1.1. Think of the airplane condensed into a single dot and watch the path this dot takes through the sky. This is the flight path, or track, of the aircraft's centre of gravity. Judging the flight path consists of comparing the observed path with fixed references such as the horizon or the X and Y axes of the Aerobatic Box. (Figure 1)



6.3.2. Vertical Attitude

6.3.2.1. Judging vertical lines is based on the attitude of the aircraft and not its flight path. When an aircraft's flight path, in a zero wind condition, is exactly 90 degrees to the horizon, the wings are being held at the correct angle to

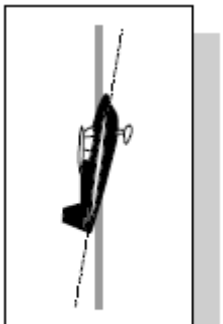


Figure 2

produce no lift. The aircraft's attitude while in this condition (zero lift) defines the proper judging criterion for vertical attitude. This is called the zero-lift axis.

a) When this zero-lift axis is vertical, the longitudinal axis of some aircraft may not appear to be vertical. (Figure2)

The Judge must determine the proper vertical attitude for each aircraft type according to its zero-lift axis. The best opportunity to make this determination is to observe practice flights and note the different aircrafts' vertical attitudes, both up and down.

b) An aid for judging the perfect vertical (zero-lift) attitude is to observe vertical rolls. During a truly vertical roll, the aircraft's wings will constantly be parallel to the horizon, something which is especially noticeable after 90 degrees of roll.

c) Be aware that aircraft types whose zero-lift axis does not pass through the tail will make a spiral with the tail during a perfect vertical roll. From the Judges' perspective, this spiral will look as if the tail is shifting off-axis from the zero-lift axis flight path.

6.3.2.2. When there is a wind of any kind, the observed flight path will be offset from perpendicular to the horizon by some degree. This wind effect must be completely ignored by the Judge, who must only evaluate the accuracy of the vertical attitude. (Figure 3)

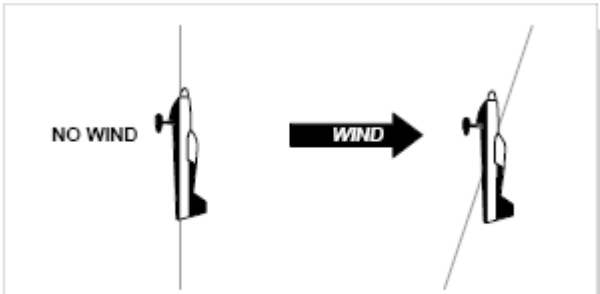


Figure 3

6.3.3. The 45 Degree Attitude

6.3.3.1. This is the vertical attitude plus or minus 45 degrees. In view of the difficulty in judging 45 degree lines accurately, scoring deductions should be applied with care. When flown into the wind, a perfect 45 degree line will appear to be steep while the opposite is true when flown downwind. (Figure 4)

6.3.3.2. As with the vertical attitude, this wind effect must be completely ignored by the Judge who must only evaluate the accuracy of the 45 degree attitude. The prescribed deduction is one (1) point per five (5) degrees of deviation from the correct geometry (0.5 points per 2.5 degrees).

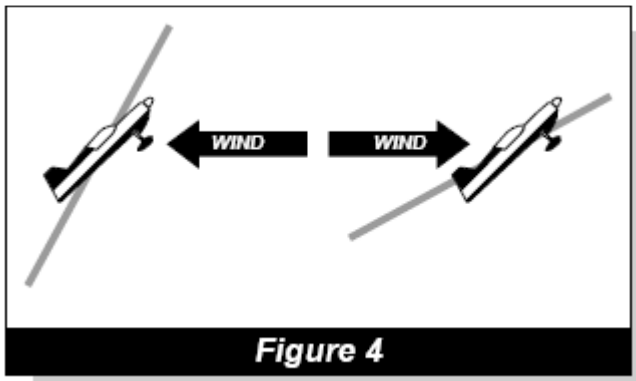


Figure 4

6.4. Grading

6.4.1.1. All transitions from one plane of flight to another should have a reasonable and constant radius. The size of that radius is not a grading criterion and higher grades are not to be given to "square, high-G" corners.

6.4.1.2. It should be assumed that a competitor is going to fly a perfect figure, so a Judge starts with a grade of 10. As the figure is performed, the Judge then begins to find faults (if any) with what he or she sees, and starts downgrading as the figure progresses. This system of grading is required by the rules as opposed to waiting until the figure is finished and assigning a grade based on overall impression. The latter causes the judging to be erratic and inconsistent.

6.4.1.3. Should a competitor fly a figure at a location, inside or outside the performance zone, such that the accuracy of the flight path or attitude cannot reasonably be determined, a downgrade of 2 points should be applied for each element of the figure that cannot be properly assessed.

6.5. Summary

6.5.1.1. Remember, it is the Judge's job to find fault: be a nit-picker. On the other hand, give a grade of 10 if you see a perfect figure - but if you are really being critical you won't see too many. Don't get in a rut. Guard against confining your grades in too narrow a range. If you watch carefully and grade consistently, you will find yourself giving an occasional 2, 3, or 4 on some sloppy figures that are not quite bad enough for a zero. You will also be giving an occasional 9 or 10 for the superlative figure with which you can find little or no fault. Take care not to grade on an overall impression of a flight. Be ready to award a low grade for a poor figure even if you have been grading other figures flown by that competitor with 8's and 9's.

6.5.1.2. On the other hand, when you see a competitor barely getting through the figures and you have been giving 4's and 5's, don't be afraid to award a 9 or 10 for the almost perfect 90 degree turn that you just saw.

6.5.1.3. Finally, and most importantly, only grade what you see. If you can't see anything wrong with a figure, don't deduct any points, even if you think there must be something wrong. Always give the competitor the benefit of the doubt.

6.6. Box Axes

6.6.1.1. Except in the Final Freestyle Programme, at the entry and exit of every figure the aircraft longitudinal axis must be exactly aligned with either the X- or Y-axis of the Aerobatic Box. Any angular deviations visible to the judge must be downgraded by one point per five degrees.

6.6.1.2. X-axis directionality:

a) The X-axis (or main axis) is parallel to the official wind. Any figure with entry and/or exit lines aligned on the X-axis must be flown with such entry and/or exit lines as drawn on sequence Forms B or C, into or away from the official wind, otherwise the figure will be marked HZ.

b) Except for figures from Families 2, 5 and 6: Any line segment within a figure, either straight or looping, drawn on the X-axis, must be flown in the direction drawn on sequence Forms B or C, into or away from the official wind, otherwise the figure will be marked HZ (Figure 5).

6.6.1.3. The Y-Axis (or secondary axis) is non-directional, i.e. the pilot is free to choose direction on the Y-axis when transiting from the X- to the Y-axis.

6.6.1.4. Any figure with both entry and exit lines aligned on the Y-axis must be drawn with parallel entry and exit lines.

6.6.1.5. Any figure with both entry and exit lines aligned on the Y-axis must be flown with the exit direction relative to the entry direction as drawn on sequence Forms B or C, i.e. in the same or the opposite direction, otherwise the figure will be marked HZ (Figure 5).

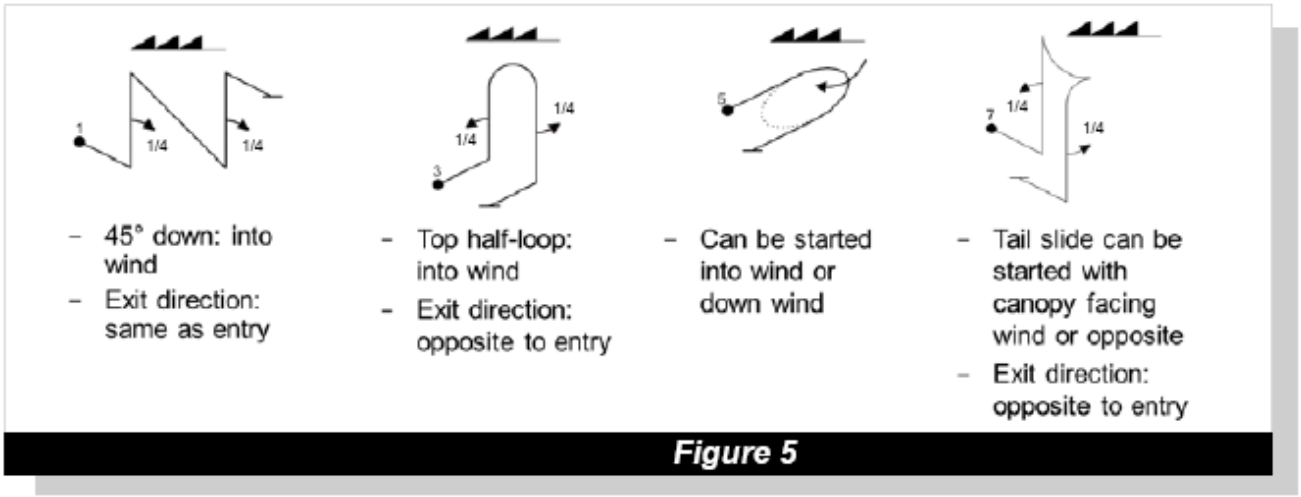


Figure 5

6.7. Wind Correction

6.7.1.1. There are two kinds of wind correction: correction for figure geometry (shape) and correction for Aerobatic Box positioning.

6.7.1.2. The competitor is required to make the shape of all loops and part-loops within a figure perfectly round as seen by the judge on the ground. Wind correction is required for loops and part-loops within figures so that the aircraft's flight path describes a constant radius circle or part circle. Remember, the Judge grades for the roundness of the flight path. Any deviation from perfect roundness must result in a reduction of the score for that figure.

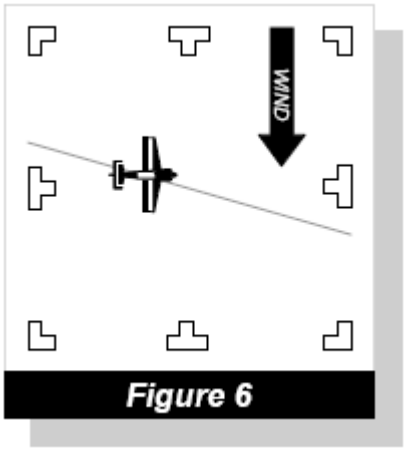


Figure 6

6.7.1.3. The competitor is also required to keep the aircraft within the Aerobatic Box. This becomes more of a problem when a wind is blowing at an angle to the X axis. (Figure 6)
The primary method of dealing with cross-box drift is to include a "wind corrector" figure in the sequence. A wind corrector is a figure which places the aircraft onto the Y axis. Because the Y axis is non-directional, the competitor can turn onto the Y axis in the direction which will allow an upwind position change before flying a subsequent figure which returns the aircraft to the X axis.

6.7.1.4. A well designed Free Program will always include at least one, and preferably more, wind corrector figures. Not every Known Compulsory or Unknown Program contains sufficient (or any) wind corrector figures, however, in this case, it is up to the competitor to keep the aircraft within the Aerobatic Box without benefit of a specific Y axis figure to accomplish it.

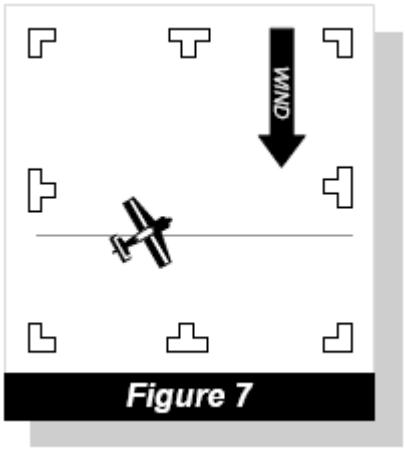


Figure 7

6.7.1.5. A common approach is to crab into the wind as done in navigational flight. (see Figure 7). Crabbing means that the aircraft's heading is at an angle to the competition axis (X or Y). The downside to this approach is that if this heading angle can be detected by the Judge, a deduction of one (1) point per five (5) degrees will be given.

6.7.1.6. It is possible for the competitor to correct for wind in such a manner that the attitude remains absolutely true to the correct geometry of the figure but the flight path has a sideways component. It goes beyond the scope of this document to provide a tutorial on how this may be accomplished, but what is clear is that if any yaw (heading) deviation or bank angle is visible to the Judge, the score

must be reduced at the rate of one (1) point for every five (5) degrees of deviation detected.

6.7.1.7. Please note, however: even if it is plainly evident that the aircraft has moved laterally within the Aerobatic Box, if the method of that movement cannot be detected by the Judge, no deduction for such correction must be made.

6.8. The Two Basic Components Of Aerobatic Construction: Lines And Loops

6.8.1. Lines

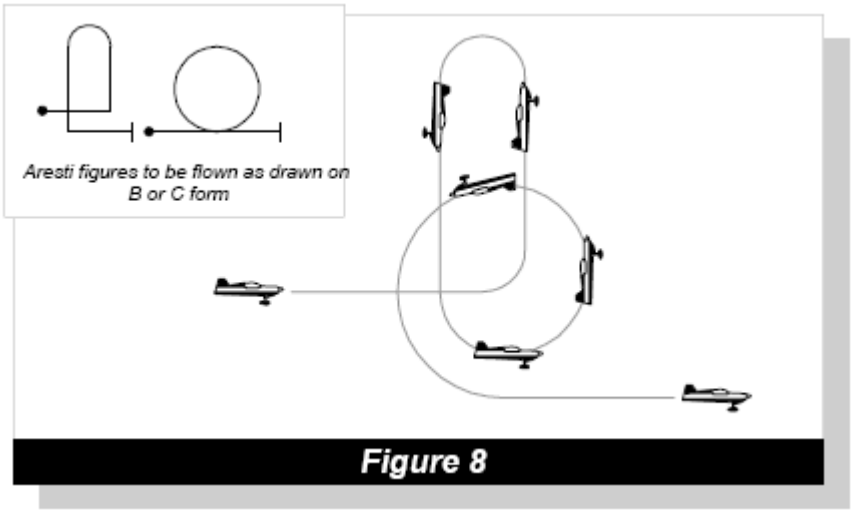


Figure 8

6.8.1.1. All lines are judged in relation to the true horizon and the Aerobatic Box's axes. Horizontal lines are judged on flight path, not attitude. Different aircraft at different airspeeds will employ different attitudes to maintain a horizontal flight path. (Figure 1) While maintaining a horizontal flight path, the aircraft's heading must remain parallel to the X or Y axis. The deduction for deviation in either axis is one (1) point per five (5) degrees from the correct geometry.

6.8.1.2. All figures begin and end on definite horizontal lines, and both must be present in order to earn a good grade. A competitor who rushes from one figure to another without showing this horizontal and well-recognizable line will be downgraded by one (1) point for each missing line in each figure affected. Therefore, leaving out the line between two figures will downgrade the preceding figure by one (1) point and the following figure by one (1) point. (Figure 8)

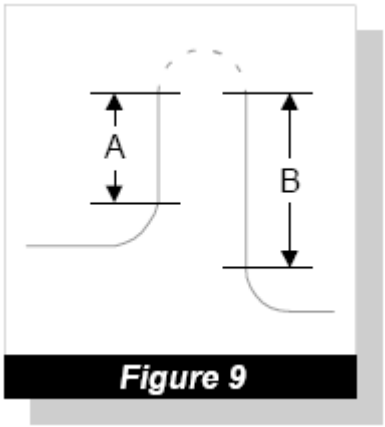


Figure 9

6.8.1.3. All lines that occur inside a figure have a beginning and an end which define their length. They are preceded and followed by part-loops. (Figure 9)

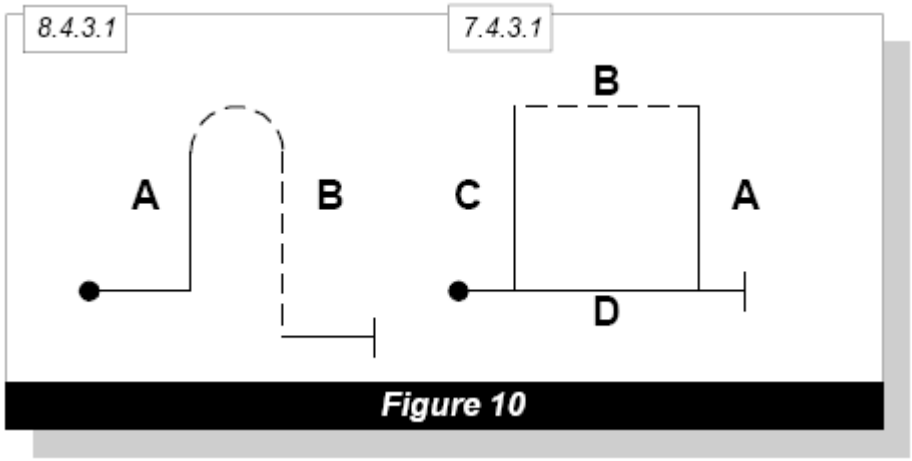


Figure 10

6.8.1.4. With the exception of Family 3 figures and some figures in Family 7, the criterion for the length of lines within a figure states that they do not have to be of equal length. Therefore, it is imperative that the judges become familiar with the specific criterion for the length of lines for each figure. For example, the lines in a "Humpty-bump" do not need to be of equal length, but all four lines in a "Square loop" must be of equal length. (Figure 10)

6.8.1.5. Whenever any kind of roll is placed on an interior line (except when any type of roll follows a spin), the lengths of the two parts of the line before and after the roll must be equal. Judges should take care to judge the symmetry of the length of lines in a figure using only the length of the lines and not by elapsed time taken to fly each segment. This difference in length versus elapsed time is most noticeable in figures where rolls are placed on up-lines. As the aircraft loses airspeed, the time it takes to fly a line after the roll will be greater than the time required to fly the line of the same length before the roll.

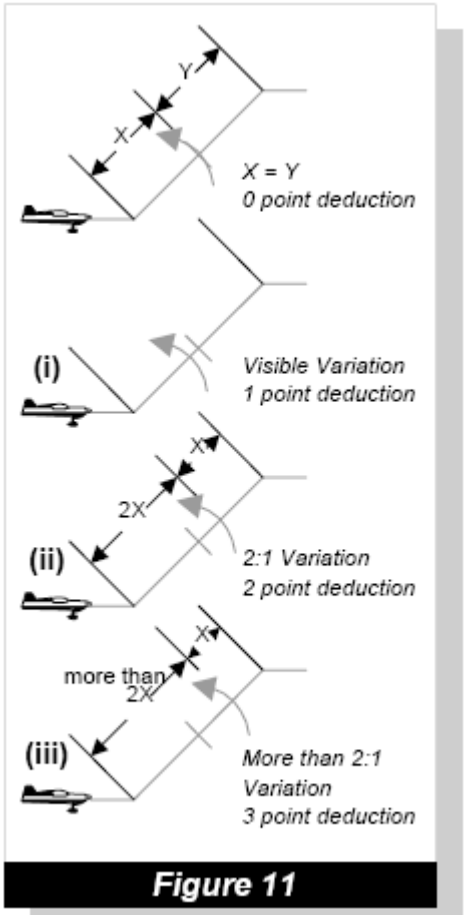


Figure 11

6.8.1.6. If within a figure two or more lines must be of the same length, an observed variation is penalised by reducing the grade in the following manner: (Figures 11 & 12)

a) a visible variation - 1 point deduction;
b) if the lengths vary by 1:2 - 2 point deduction
c) and so forth up to a 3 point deduction.
d) No line before or after roll, 4 point deduction.

6.8.1.7. The basis for judging line length is the first line flown. The absence of one of these lines before OR after a roll has to be penalised by 1 additional point. If there are no lines before AND after the roll, the total penalty is two (2) points only.

Example: The competitor is to fly a 45 degree up-line with a full roll on the line. However, the airplane is returned to level flight immediately after the roll. The deduction is 4 points: 3 points are deducted because the lines are of vastly different length and another 1 point is deducted because of the absence of one of the lines.

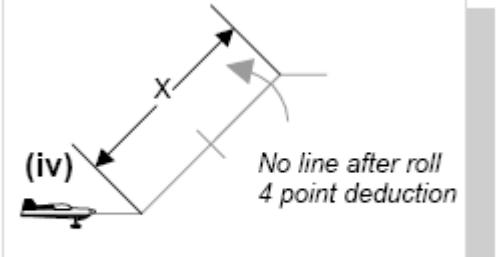


Figure 12

6.8.1.8. All 90 degree and 45 degree lines are preceded by the execution of a part-loop. Since we have in this part-loop a significant angle-of-attack, the aircraft's attitude in the part-loop will differ from its flight path. Therefore, when the aircraft's attitude reaches the desired line after transitioning from the part-loop, this difference between attitude and flight path will be carried on and will be the same as the angle-of-attack. For this reason, the only criterion for judging in that moment of reaching the desired line is to be the attitude of the aircraft and not its flight path. It would then be very illogical suddenly to change the criterion of judgement from the visible and straight line of attitude to the unrecognizable and curved line of flight path. Therefore, the judging of 90 degree and 45 degree lines can only be based on attitude, not flight path.

6.8.2. Loops and Part Loops

6.8.2.1. The loop is a figure from Family 7, but part-loops are integral to every other family so it is necessary to define some key elements before considering the other families.

a) A loop must have, by definition, a constant radius. It starts and ends in a well-defined line which, for a complete loop, will be horizontal. For a part-loop, however, such linesmay be in any other plane of flight and will be defined by the aircraft's attitude. As the speed changes during execution of a loop or part-loop, the angular velocity around the aircraft's lateral axis also has to change in order to keep the radius constant. Thus, the angular velocity can be an

aid for the Judge to gauge the radius -- especially when the angular velocity in the higher part-loop is seen to be faster, as this is a clear indication that the radius is smaller. This aid becomes more important when two part-loops are separated by a line between.

b) Part-loops are depicted either as round elements or as 'corner' angles. It should be note that any 'corner' angle drawn in the pictograms, such as in Figure 12, is always to be flown as a part-loop and must have a smooth, distinct and constant radius.

c) For any one figure having several internal part-loops depicted as round elements, all such part-loops shall have the same radius – with exception for all of Family 8.8 figures (double humpty bumps) for which the radius of the second part loop is not required to match the radius of the first one.

d) The radius of any part-loop depicted as a corner angle is not required to match the radius of any other part-loop in the same figure – with exception for all of Family 3 (combinations of lines) and Family 7.4 (whole loops) figures, which must keep a regular geometrical shape and therefore require all part-loops to have the same radius.

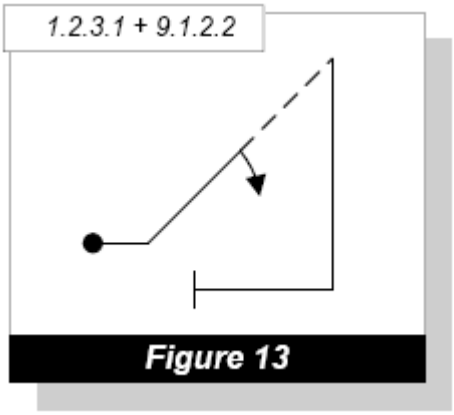


Figure 13

6.9. Aresti System (Condensed) Families

6.1.1. 6.9.1. Family 1 - Lines and Angles

6.9.1.1. Family 1.1 has been fully covered in the preceding section. Note that the figures in Family 1.2 and 1.3 are NOT performed as drawn in the Catalogue. (Figure 13)

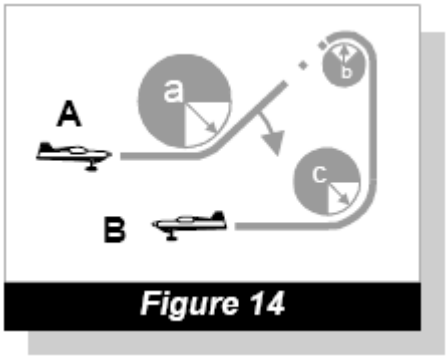


Figure 14

6.9.1.2. In each of these figures there are three (four in Family 1.3) looping components: e.g. a one-eighth loop, a three-eighths loop and a quarter loop. Rolls may be performed on the 45 degree line and/or the 90 degree line, with the part-lines before and after the roll being of equal length. The initial horizontal line and the line at the end of the figure may be flown at different altitudes.

6.9.1.3. Figure 14 shows Family 1.2.1 to 1.2.8 as flown. Radii a, b, and c may all be different and entrance altitude "A" can be different from exit altitude "B".

6.9.2. Family 2.1.1, 2.2.1, 2.3.1, 2.4.1 – Turns

6.9.2.1. Competition turns (Figure 15) are not to be confused with standard coordinated turns. In aerobatic competition, a turn is divided into three parts:

a) establishing the bank using a roll on heading;
b) the turn itself; and
c) a roll back to straight and level flight on heading.

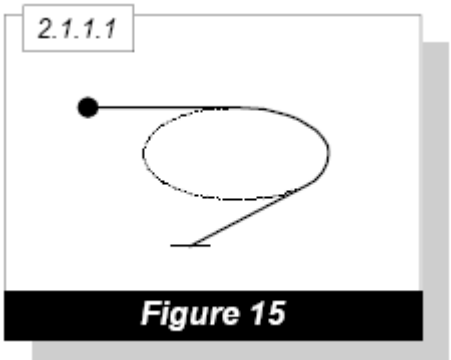


Figure 15

6.9.2.2. First, the roll to establish the bank. This must be a roll of between 60 and 90 degrees, it must be performed on the entry heading, and the aircraft must maintain a constant horizontal line.

6.9.2.3. Once the roll is completed and the angle of bank is established, the competitor immediately performs the turn. The turn must maintain the established angle of bank throughout. The aircraft

must also maintain horizontal flight. The rate of turn is constant throughout and is NOT wind corrected. Therefore, in wind, a 360 degree turn will not appear as a perfect circle.

6.9.2.4. As soon as the aircraft is on the exit heading, the competitor performs another roll at a rate equal to the entry roll. Again the aircraft must maintain a constant horizontal line.

6.9.2.5. Downgrades:

a) The angle of bank established by the initial rolling manoeuvre must be at least 60 degrees. Anything less is a one (1) point deduction for every five (5) degrees.

b) The angle of bank, once established, must remain constant. Any deviation is a one (1) point deduction for every five (5) degrees of deviation.

c) The rate of roll must be the same for the entry and exit rolls of this figure. Any deviation is a one (1) point deduction.

d) The aircraft must maintain a constant altitude throughout the figure. Any variation would be either one (1) point for every five (5) degrees of change or 1 point for every 100 feet.

e) The rate of turn must remain constant. Any change would be not more than a one (1) point deduction for each change. Note that the rate of turn may appear to change in a strong wind, when it really isn't changing. The Judge must always keep the wind in mind and give the pilot the benefit of the doubt if there is any question.

f) The aircraft must begin and end on the prescribed heading. Any deviation is a one (1) point deduction for every five (5) degrees of deviation.

6.9.3. Family 2 Other Figures - Rolling Turns

6.9.3.1. The rolling turn (Figure 16) is a figure that combines a turn of a prescribed amount with a roll or rolls integrated throughout the turn.

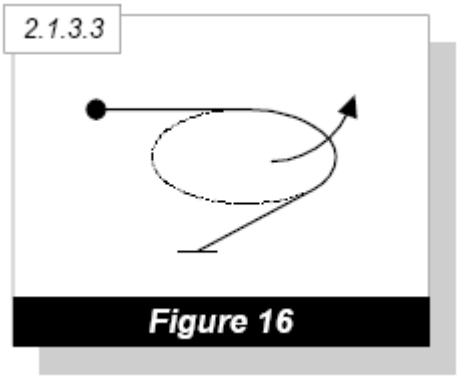


Figure 16

6.9.3.2. These rolls may be in the same direction as the turn and are called "rolls in" or "rolls to the inside". They can be rolls in the opposite direction of the turn and are called "rolls out" or "rolls to the outside". Or there can be rolls alternating in and out.

6.9.3.3. When we say that the rolls are integrated, we are saying that in addition to there being constant rate of turn throughout the figure, there is also a constant rate of roll throughout. Naturally, the one exception to this constant roll rate is the pause when reversing roll directions.

6.9.3.4. To help visualize the execution of this figure and facilitate a way for the Judge to determine a constant roll rate, let's look at an aircraft performing a 360 degree rolling turn with 4 rolls to the inside from upright (Figure 2.4.7.1). First, on the prescribed entry heading, the pilot executes a turn and simultaneously initiates a roll in the same direction as the turn. The judge will expect the aircraft to be inverted at 45, 135, 225, and 315 degrees and to be upright at 90, 180, 270 and 360 degrees. At these interim headings, the Judge will NOT downgrade using the one (1) point for five (5) degrees rule but will judge changes in the rateof roll, changes in rate of turn and changes in altitude (see downgrades below). At the end of the figure the aircraft must be wings level and on the prescribed heading.

6.9.3.5. When a rolling turn is performed with rolls alternating directions, the aircraft must change direction of roll at a wings level attitude. The position of the aircraft in the turn is still only used as an aid to determine if the pilot is varying the rate of roll or turn.

6.9.3.6. Downgrades: a) Performing more or fewer rolls than the catalogue description calls for results in the figure being graded HZ.

b) All rolls in a rolling turn are slow rolls. If a flick roll is performed, the figure is graded PZ.

c) Each stoppage of the rate of roll is a deduction of no more than two (2) points.

d) Each variation in the rate of roll is no more than a one (1) point deduction.

e) Each stoppage in the rate of turn is a deduction of no more than two (2) points.

f) Each variation in the rate of turn is no more than a one (1) point deduction.

g) Variations in altitude are deducted using either one (1) point for every five (5) degrees or 100 feet of altitude.

h) One (1) point for every five (5) degrees that the aircraft is not in level flight when reversing roll direction.

i) One (1) point for every five (5) degrees of roll remaining when the aircraft has reached its exit heading.

j) One (1) point for every five (5) degrees of turn remaining when the aircraft has completed its last roll.

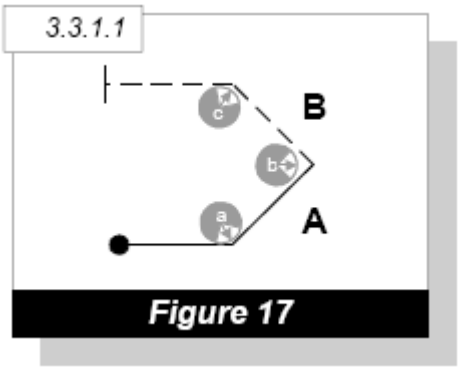


Figure 17

6.9.4. Family 3 - Combinations of Lines

6.9.4.1. The transition from level flight to 45 degree lines should be at a constant and reasonable 1/8 looping radius. All lines within the figure should be equal in length. All part-loops in Family 3 shall have the same radius (in Figure 17, radii a = b = c).

6.9.5. Family 5 - Stall Turns

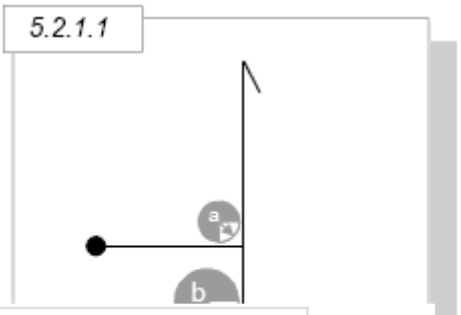
6.9.5.1. In its most basic form (Figure 18), the stall turn begins when the aircraft leaves horizontal flight and flies a quarter loop to establish a vertical climb. At the top of the vertical line, the aircraft pivots and establishes a vertical descent, with the figure ending as the aircraft is returned to horizontal flight.

6.9.5.2. The judging criteria are:

a) Vertical and 45° attitudes must comply with Section 6.3. Any deviation will result in a deduction of one (1) point per (5) degrees of error.

b) Any rolls must be centred on their underlying lines (Figure 19). For deductions see 6.8.1.6.

c) The lines may all be of different lengths.



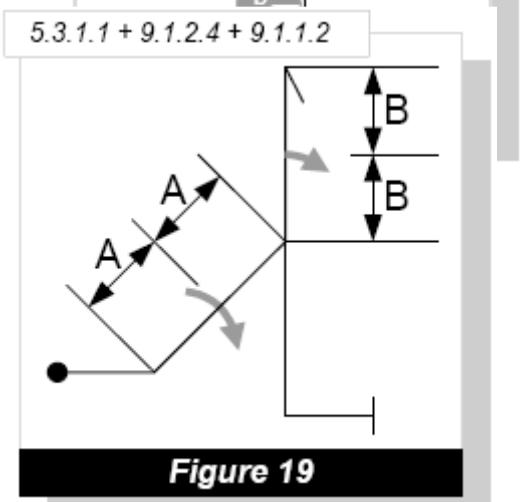
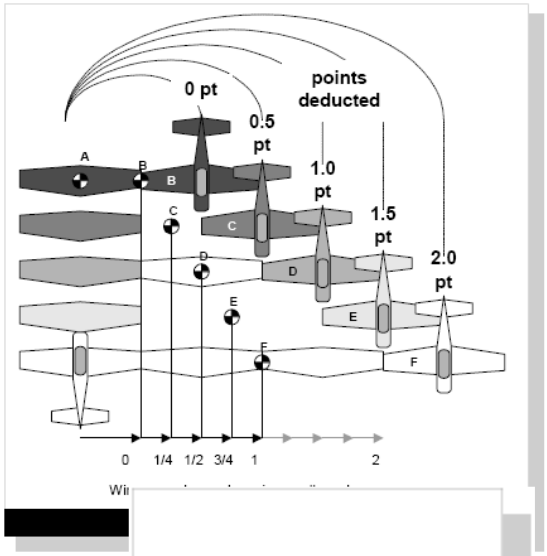


Figure 19

d) During the vertical climb or vertical descent, the wings must remain parallel to the horizon. There will be a one (1) point deduction per five (5) degrees of deviation of the vertical (yaw) axis from horizontal. This deviation is often referred to as "dragging a wing".

e) As the aircraft nears the point where it would stop climbing, it must pivot in a plane parallel to vertical. Ideally, the aircraft pivots around its centre of gravity. To avoid a deduction, the aircraft must pivot around an axis point which cannot not be farther away from its centre of gravity than its wingtips (1/2 wingspan, Pivot Point Range from A to B, Figure 20). The downgrade for this deviation (often referred to as "flying over the top") is one (1) point per half wingspan that the point of rotation exceeds the maximum allowed (Pivot Point B, Figure 20).



f) The rate at which the aircraft pivots around its vertical axis is not a judging criterion.

g) The wings must remain in the vertical geometric plane throughout the turnaround, and the aircraft's attitude before and after the turnaround must be absolutely vertical, with no pitch or roll. If there is movement around the roll axis, often referred to as "torqueing" (Figure 21), there is a deduction of one (1) point for each five (5) degrees off axis.

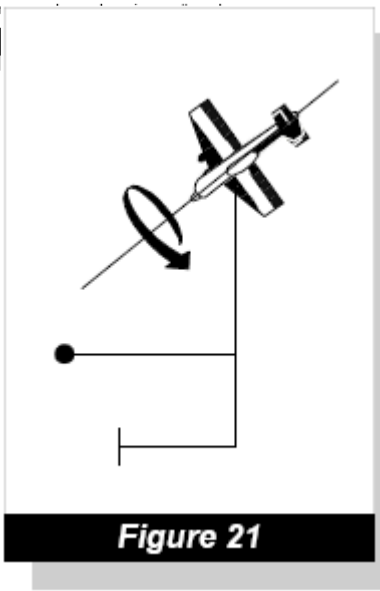
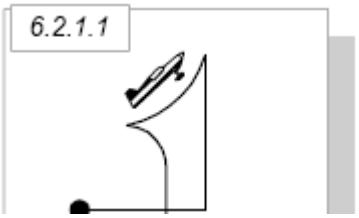


Figure 21

6.9.6. Family 6 – Tailslides

6.9.6.1. All the criteria of the Hammerhead apply to this figure except, of course, for the manoeuvre at the top of the vertical climb. At the point when the aircraft stops, it must slide backwards by at least a half fuselage length. If there is no slide of at least this length, the grade is PZ. The aircraft must slide in the vertical plane and not with the nose inclined towards the horizon. A slide of this type must be downgraded by the formula of one (1) point for every five (5) degrees of inclination.

6.9.6.2. Following the slide backwards, the aircraft must then tip over and fall through to a diving position. Often the nose will swing back or "pendulum" past the vertical after falling through. The figure is not to be downgraded for this, nor downgraded if it does not happen. It is a function of the length of the slide and the type of aircraft, and is not to be considered in grading the figure.



6.9.6.3. There are two types of tailslides: wheels-down (also called "canopy-up") and wheels up (also called "canopy-down"). The wheels-down tailslide is depicted in the Aresti diagram with a curved solid line at the top of the tailslide symbol. (Figure 22) The wheels-up tailslide is depicted in the Aresti diagram with a curved dashed line at the top of the tailslide symbol. (Figure 23)

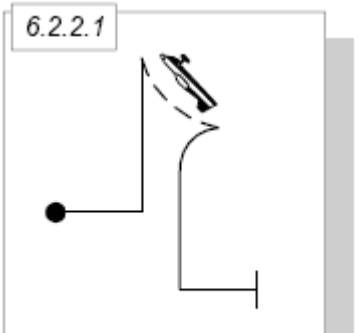


Figure 23

6.9.6.4. This figure must be watched carefully, as the aircraft can fall the wrong way, which is graded a hard zero (HZ), with the correct direction of flight and the proper aircraft attitude still maintained. Wings should stay level with the horizon throughout and not drop during the slide or the fall through. Watch for the aircraft torquing off the correct

plane of flight, which must be downgraded. Also watch for "cheating" on the vertical line up in the direction of the slide just prior to sliding (Figure 24). Any "cheating" on the up-line will most likely carry over into the backwards slide as well. Because the slide backwards must also be perfectly vertical, a second deduction would be taken if this deviation from vertical is visible. The altitude of the entry and exit horizontal lines need not be the same and the figure must not be downgraded if they are different.

6.9.6.5. When rolls are combined with Family 6 figures, there must be an equal length of line before and after the roll(s). In the vertical down line, the aircraft must attain a vertical attitude and establish a down line before starting the roll(s).

6.9.6.6. In summary, the aircraft should make a smooth and steady transition up to vertical flight, the wings should stay level in relation to the horizon, and the aircraft should come to a complete stop in this attitude. After sliding backward at least one half fuselage length, it should fall through in the appropriate direction without dropping a wing or the nose moving off axis, and recover on the same plane as that of entry. After completion of this, it should again project the 90 degree down line before transitioning into horizontal flight with a quarter loop of reasonable and constant radius.

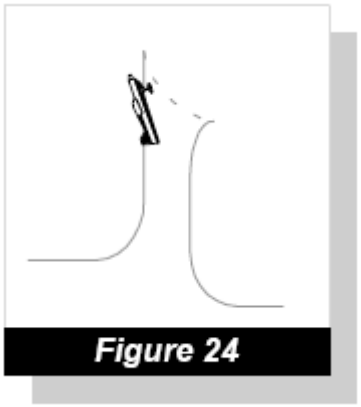


Figure 24

6.9.7. Family 7 - Loops, S's, and Eights

6.9.7.1. The size of a loop is not a grading criterion. It will vary according to the flight characteristics of the aircraft. A large loop is not graded any higher or lower than a small loop. But any variation to the radius will downgrade these figures.

6.9.8. Family 7.2 - Half-Loops With Rolls

6.9.8.1. The half-loops in this sub-family must be of a constant radius and wind-corrected to appear as a perfect half circle (see full loops discussion below).

6.9.8.2. When a half-loop is preceded by a roll or rolls, the half-loop follows immediately after the rolls without any visible line. Drawing a line requires a downgrade of at least two (2) points depending on the length of the line drawn. Should the half-loop begin before the roll is completed, the Judge must downgrade the figure one (1) point for every five (5) degrees of half-loop flown on which the roll was performed.

6.9.8.3. The half-loop followed by a roll is also flown with no line between the half-loop and roll. Again, drawing a line requires a downgrade of at least two points depending on the length of the line drawn. Should the roll begin before the half-loop is completed, the Judge must downgrade the figure one (1) point for every five (5) degrees of half-loop on which the roll was performed. (Figure 25)

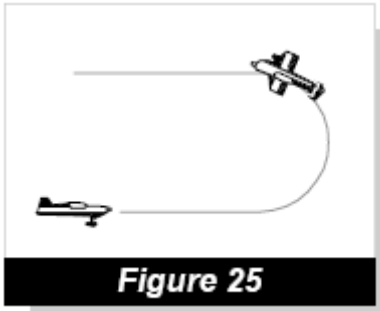


Figure 25

6.9.9. Family 7.3 - Three Quarter Loops

6.9.9.1. Sometimes referred to as "Goldfish", none of the part-loops in these figures are required to be of the same size. Entry and exit lines are judged with reference to the 45 degree attitude, not flight path. Any rolls on the 45 degree lines must be centred on that line. The lengths of the two 45 degree lines may be different, and the entry and exit altitudes need not correspond to the altitude limits of the loop. (Figure 26)

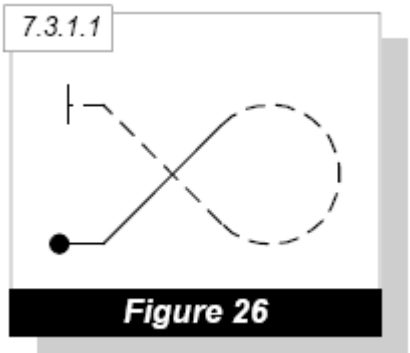


Figure 26

6.9.10. Family 7.4.1 - 7.4.2 - Full Loops

6.9.10.1. All full loops must appear perfectly round to the Judge. This means that they must be wind corrected to have a constant radius. This wind correction is only with regards to the roundness of the loop and not for the effect of any crosswind on the figure. Therefore, no deduction is given if the finish point is displaced relative to the start point in a direction perpendicular to the plane of the loop. Full loops must also begin and end at the same altitude or they will be downgraded. (Figure 27)

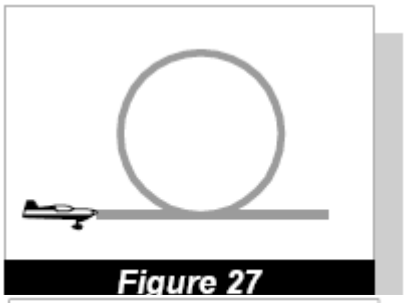


Figure 27

6.9.10.2. Loops must be flown with no visible crabbing and wings must be level at all times. The one (1) point for every five (5) degrees rule holds for both these cases.

6.9.10.3. If there is a roll or rolls at the apex of the loop, it must be centred in the loop and flown on the arc of the loop itself. Flying the roll on a line at the apex of the loop is at least a two (2) point downgrade. If the roll is not centred, it must be downgraded one (1) point for every five (5) degrees of the arc that it is off centred.

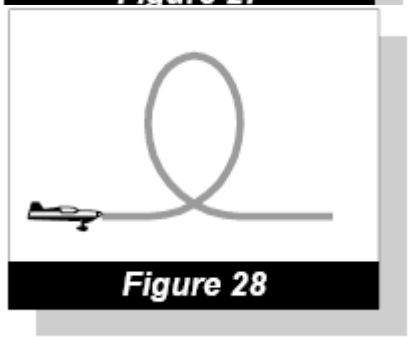


Figure 28

6.9.10.4. To better quantify deductions for irregularity of the radius of looping figures, the Judge divides the loop into quadrants. Any variation in the radius from one quadrant to the next can be downgraded a fixed number of points depending on the magnitude of the variation. The goal of each Judge is to develop a reproducible method to judge all loops with the same criteria.

6.9.10.5. In judging loops, a common error is for the vertical diameter of the loop to be larger than the horizontal diameter. This is often called an "L" shaped loop. (Figure 28) Less common are loops with a horizontal diameter greater than the vertical. This is called an egg-shaped or pumpkin-shaped loop. (Figure 29) Another common error is in varying the radius of the final quadrant performing an "e" shaped loop. (Figure 30)

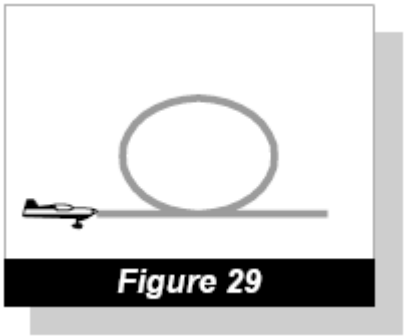


Figure 29

6.9.10.6. Whatever method is used, standard downgrades should be applied for each of these errors. Additional downgrades should be applied based on the magnitude of variation.

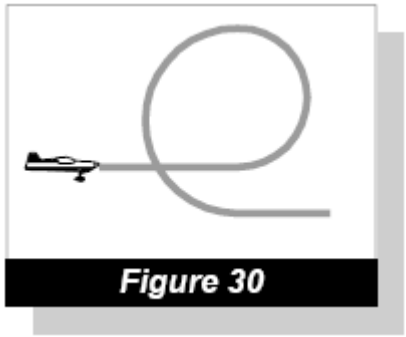


Figure 30

6.9.11. Family 7.4.3 - 7.4.6 - Square, Diamond and Octagonal Loops

6.9.11.1. Square, Diamond and Octagon loops are flown as hesitation loops with lines of equal length and partial loops with equal radii. All horizontal lines are judged on flight path and vertical and diagonal lines are judged based on aircraft attitude. As such, except in a windless condition, the judge should never expect to see these figures closed. They will always be driven by the wind. Square and Octagon loops are not considered complete until the last horizontal line is drawn equal to the length of the first line of the figure.

6.9.11.2. In Figure 31:

a) Radii a = b = c = d
b) Line Length A = B = C = D
c) Figure is not complete until D = A

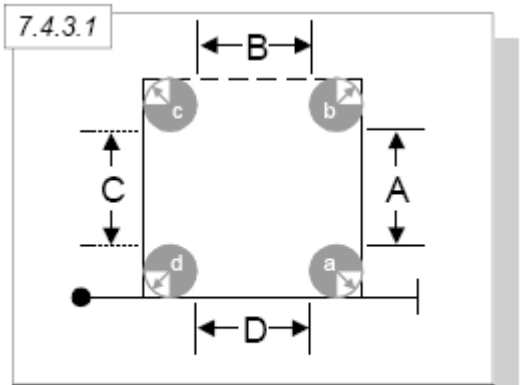


Figure 31

6.9.11.3. Where rolls are flown on the Square or Diamond loops, they must be centred on the line.

6.9.11.4. Aids for judging all hesitation loops are that a good performance will contain changes of angular velocity in all the partial loops, and variations of time taken to draw the length of each interior line, which also varies according to the aircraft's speed. The rhythm of all these partial loops is a help for judging. A frequently seen error in hesitation loops is for the aircraft to overshoot the partial loop and then have to bring the nose back to correct the attitude. This must be downgraded by one (1) point for every five (5) degrees.

6.9.12. Family 7.4.7 - 7.4.14 - Reversing Whole Loops

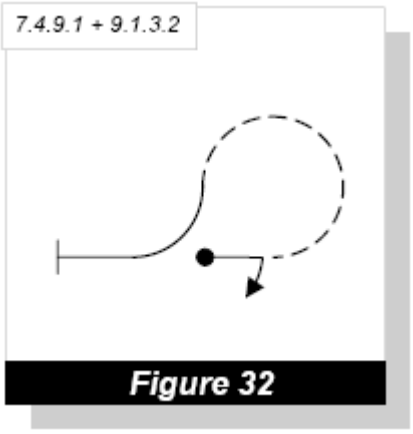


Figure 32

6.9.12.1. A reversing whole loop is a loop in which one quarter changes direction. As in half loops, rolling elements may be added on entry and exit lines (Figure 32).

6.9.12.2. Judging criteria for roundness are the same as for round loops (see 6.9.10): the reversing loop must be wind corrected with all partial loops having the same radii; the figure must begin and end at the same altitude.

6.9.12.3. The reversing loop must be a continuous looping figure with no line at the point where the pitch direction changes. Adding a line between the two partial loops is at least a two (2) point deduction depending on the length of the line.

6.9.12.4. Criteria for rolls on entry line and exit line are the same as for half loops (see 6.9.8).

6.9.12.5. Criteria for rolls at the apex of the loop are the same as for round loops (see 6.9.10).

6.9.13. Family 7.5.1 - 7.5.8 - Horizontal S

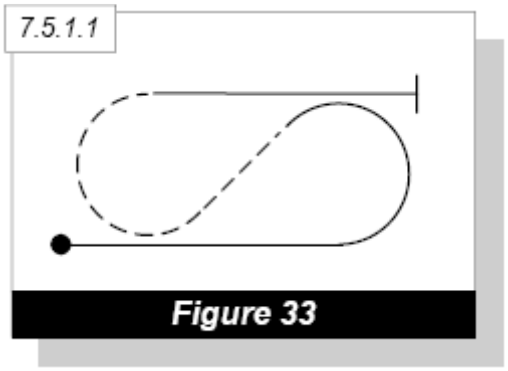


Figure 33

6.9.13.1. Both 5/8 loops must be of the same size and the line between them flown at exactly 45 degrees attitude. Extremities of the looping segments must be at the same altitude as the entry and exit lines (Figure 33).

6.9.13.2. Criteria for rolls on entry line and exit line are the same as for half loops (see 6.9.8).

6.9.13.3. Rolls may be performed on the 45 degree line, with the part-lines before and after the roll being of equal length.

6.9.14. Family 7.5.9 - 7.5.10 - Vertical S's

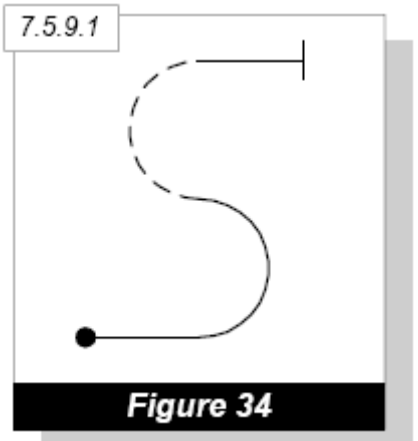


Figure 34

6.9.14.1. These figures are accomplished with two joined half-loops flown in opposite directions. (Figure 34) Look for both half-loops to be the same size and perfectly round. The half-loops should be a continuous looping figure when there is no roll between the half-loops. When a roll is performed between the half-loops, there is no line before or after the roll. However, the roll is flown on a horizontal line which begins as soon as the first half-loop is finished. As soon as the roll is finished, the next half-loop

must begin immediately. Adding a line at either of these points is at least a two (2) point deduction depending on the length of the line.

6.9.15. Family 7.8.1 - 7.8.8 - Horizontal 8's

6.9.15.1. The 5/8 and 3/4 loops must have the same radius, but the radius of the 1/8 loop between 45 degree and horizontal lines is not required to equal the radii of the loops of the Horizontal 8 itself. A common fault is to fly these part-loops with sharp corners as drawn in the catalogue symbol. This must be downgraded (Figure 35). The lines between the loops shall be flown at exactly 45 degrees attitude. This means that only if there is no wind will they intersect at the exact midpoint of the 8. Criteria for rolls on the relevant entry or exit line are the same as for half loops (see 6.9.8). Rolls may be performed on the 45 degree lines, with the part-lines before and after the roll being of equal length (for deductions see 6.8.1.6).

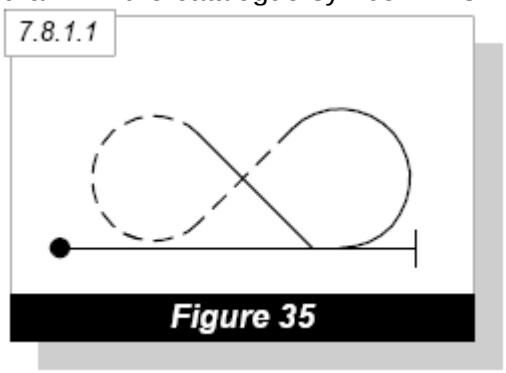


Figure 35

6.9.15.2. The start and finish of the figure and the bottoms (or tops if the figure is reversed) of the two loops must be at the same altitude. However, if there are multiple rolls flown on the last 45 degree line, that line may project above or below the looping portions and exit at a different altitude than the entry altitude of the figure.

6.9.16. Family 7.8.9 - 7.8.16 - Horizontal Super 8's

6.9.16.1. Besides possessing the unique characteristic of containing three 45 degree lines on which rolls may potentially be placed, these sub-families should be judged as 7.8.1 to 7.8.8 but with the addition of an extra 45° line.

6.9.16.2. The two 3/4 loops must have the same radius and occur at the same altitude. The entry and exit 1/8 loops must have a reasonable and constant radius, but are not required to be the same size as either the 3/4 loops or each other. Any rolls placed on any 45 degree line must be centred. The horizontal entry/exit lines must coincide with the top and bottom of the loops, except when the first or last 45 degree lines contain multiple linked, unlinked or opposite rolls, when they may be extended (not shortened) above or below the extreme of the ¾ looping segments. Shortening of a line, as in Figure 36, should be penalised by up to 2 points.

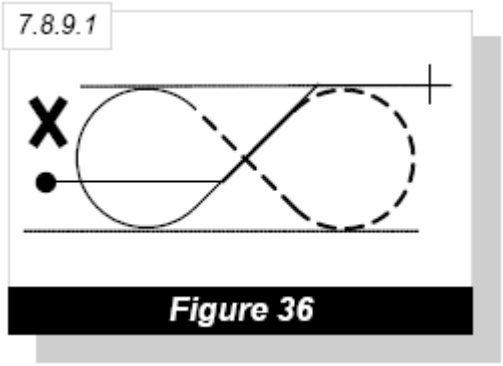


Figure 36

6.9.17. Family 7.8.17 - 7.8.22 - Vertical 8's

6.9.17.1. These figures are performed by flying two loops, one above the other. Sub-family 7.8.17-7.8.20 is composed of two loops, both above or both below the entry altitude. Sub-family 7.8.21 - 7.8.22 is composed of one loop above and one loop below the entry altitude. In either case the entry and exit altitudes must be the same.

6.9.17.2. These figures may be combined with various types of half rolls. When a roll is performed between the loops, there is no line before or after the roll. However the roll is flown on a horizontal line which begins as soon as the first loop is finished. As soon as the roll is finished, the next loop must begin immediately. Adding a line at either of these points is at least a two (2) points deduction depending on the length of the line. These figures are to be graded using the

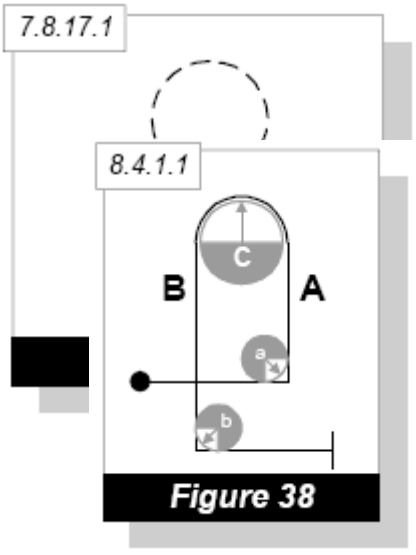


Figure 38

same criteria as full loops. Additionally, both loops must be of the same size. Unless there is a roll between the loops, they must be directly above one another. (Figure 37)

6.9.18. Family 8 - Combinations of Lines, Loops and Rolls

6.9.18.1. Although some of the figures in this Family appear to be exotic, there are no new judging criteria for these figures. These figures are combinations of horizontal, vertical and 45 degree lines as well as partial loops of varying degrees. The judging criteria for these lines and loops are unchanged. What is left to discuss are the judging criteria for the combinations of these lines and loops.

6.9.19. Family 8.4 - Humpty Bumps

6.9.19.1. These figures, whether vertical or performed with 45 degree lines, are judged as combination of lines and loops (Figures 38 and 39). In these figures, none of the part-loops are required to have the same radii. These part-loops must still have a constant radius from start to finish. This requires a change in angular velocity during the part-loop.

6.9.19.2. The lines in these figures may be of different lengths, and therefore the entry and exit altitudes of these figures can be different. Rolls on any of these lines must be centred.

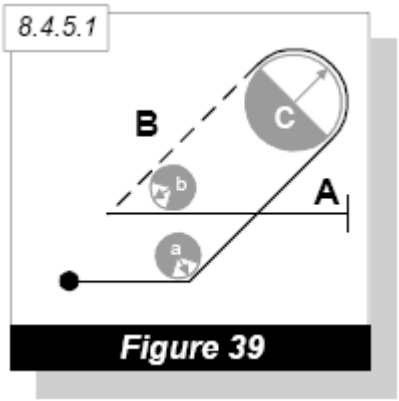


Figure 39

6.9.20. Family 8.5.1 - 8.5.8, 8.6.1 - 8.6.8, 8.7 - Half Cubans, P Loops, Q Loops

6.9.20.1. In these figures, none of the part-loops are required to have the same radii. The rolls on vertical and 45 degree lines must be centred. Horizontal rolls immediately preceding or following looping segments have the same criteria as in Family 7.2. Angles drawn in the pictograms, such as in Figure 40, are to be flown as part-loops.

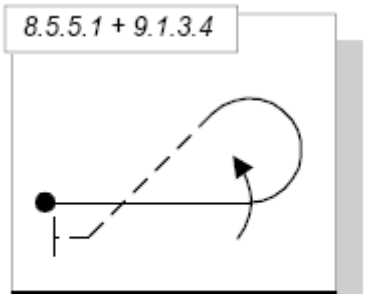


Figure 40

6.9.21. Family 8.5.9 - 8.5.24 – Teardrops

6.9.21.1. In these figures, none of the part-loops are required to have the same radii. The rolls on vertical and 45 degree lines must be centred. Angles are to be flown as part-loops (Figure 41).

6.9.22. Family 8.6.9 - 8.6.16, 8.10 - Reversing P Loops, Reversing 1¼ Loops

6.9.22.1. When 1/4, 1/2 or 3/4 loops depicted as round elements join each other in these sub-families, their radii must be equal and there is no line between the loops (Figure 42). A line drawn would be a minimum two (2) point deduction depending on the length of the line. The part-loop depicted as a corner angle shall have a reasonable and constant radius, but is not required to have the same radius as the other part-loops.

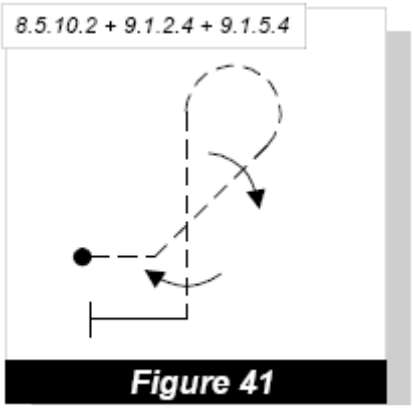


Figure 41

6.9.23. Family 8.8 - Double Humpty Bumps

6.9.23.1. These comprise of three vertical lines and two 180° looping segments (Figure 43).

6.9.23.2. In view of the markedly different speeds possible during the looping segments, none of the radii (a, b, c, d) have to be equal

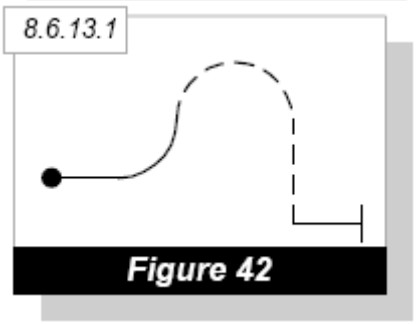


Figure 42

(but each must be internally constant). There is no requirement either for any relation between the vertical lines length. All other criteria for humpty bumps apply (see 6.9.19.2).

6.9.24. Family 9 - Rolls and Spins

6.9.24.1. Rolls may be performed on horizontal, 45 degree or 90 degree lines; on complete loops; between part-loops; between part-loops and lines; and following spin elements.

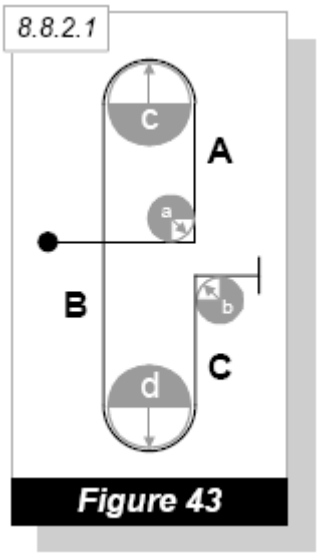


Figure 43

6.9.24.2. They may be 1/4, 1/2, 3/4 or a full 360 degrees in their rotation, up to two consecutive full rolls. Additionally, slow rolls may be flown in combination with turns as prescribed in Family 2 (Rolling Turns).

6.9.24.3. In all cases, the same criteria apply: the rate of roll must be constant throughout the roll(s). The aircraft should continue to project, during the rolling portion, the prescribed plane and direction of flight.

6.9.24.4. Multiple rolls may be linked, unlinked, or opposite:

a) When rolls are in continuous rotation, the tips of the symbols are linked by a small line. When flying linked rolls there is no pause between them. (Figure 44)

b) Unlinked rolls must be of different types, the two types being defined as follows:

i) Aileron rolls (slow rolls and hesitation rolls)

ii) Flick rolls (positive and negative)

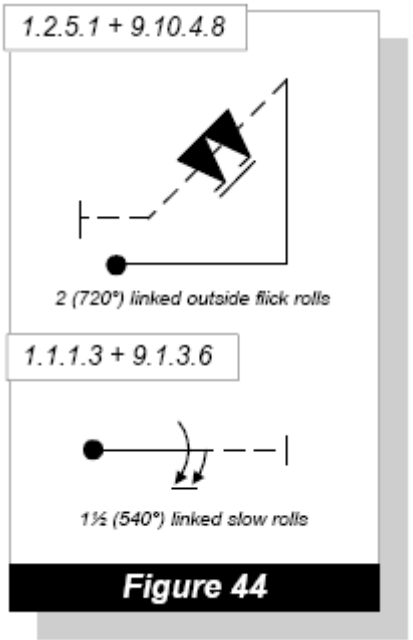


Figure 44

c) With unlinked rolls, no line links the symbols, though their tips are drawn pointing in the same direction (i.e., on the same side of the line). They must have a brief but perceptible pause between them and they are to be flown in the same direction of rotation. (Figure 45).

d) Opposite rolls may be either of the same or different type. In opposite rolls, the tips of the symbols are drawn on opposite sides of the line, indicating they are to be flown in opposite directions of rotation. The pilot may elect to fly the first roll in either direction, but the second roll must be opposite direction to the first. Opposite rolls, including those in rolling turns, should be flown as one continuous manoeuvre - the brief check between opposite rotations should be minimal. (Figure 46) If the two rolls are of the same type, they must be flown in opposite directions if they are not linked.

e) Either aileron or flick rolls may follow spin elements (Family 9.11 or 9.12). When a spin and a roll are combined on the same vertical down line they will always be unlinked; may be flown in either the same or opposite direction, as shown by the position of the tips of the symbols on the Form B or C; and the combination may not exceed two rotational elements. (For example, it would be illegal to combine two opposite direction aileron rolls with a spin element.)

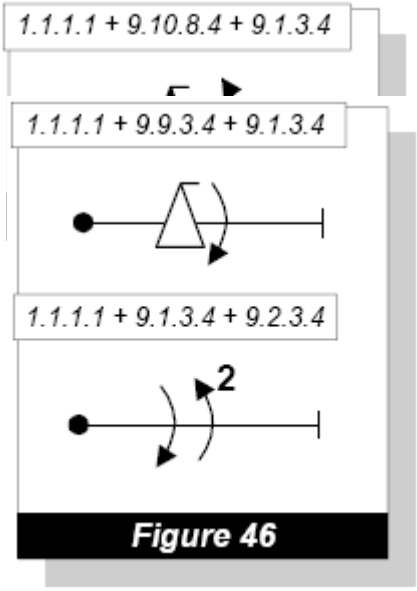


Figure 46

6.9.25. Family 9.1 - Slow Rolls

6.9.25.1. The penalty for varying the rate of roll is one (1) point per variation. Any stoppage in the slow roll that could result in its being considered a hesitation roll, would hard zero (HZ) the figure.

6.9.25.2. The finish of the roll must be as crisp and precise as possible. Coming to a slow finish in fact represents a change in the rate of roll and should be penalized accordingly.

6.9.25.3. The wings must stop precisely after the desired degree of rotation and not go past the stop point and then return. This is referred to as "bumping the point". A deduction of 0.5 point to one (1) point is given depending on the severity of the "bump".

6.9.26. Family 9.2 - 9.8 - Hesitation Rolls

6.9.26.1. For hesitation rolls, the second digit in the catalogue number indicates the number of points: Family 9.2 is 2-point rolls; Family 9.4 is 4-point rolls; and Family 9.8 is 8-point rolls.

6.9.26.2. These rolls are judged on the same criteria as the slow roll, only the aircraft stops rotation during the roll for a pre-stated number of times, i.e., 2, 4 or 8. The rate of the roll and the rhythm of the hesitations must be constant throughout with the aircraft projecting the pre-stated plane and direction of flight.

6.9.26.3. The pauses will be of identical duration and the degree of rotation correct between each pause: 180 degrees, 90 degrees, or 45 degrees. Each pause of a hesitation roll must be clearly recognizable in every case, but it is especially important that in poor visibility or at high height, the competitor pauses long enough to make them recognizable to the Judges. If a pause is not recognizable to a judge, the figure is graded a hard zero (HZ).

6.9.27. Family 9.9 - Positive Flick Rolls

6.9.27.1. Flick rolls represent one of the greatest challenges to judges, due to two factors: a) the "flicking" characteristics of different types of aircraft can vary considerably; and b), in properly executed flick rolls changes of pitch, yaw and roll rate occur very quickly. Judges must watch particularly carefully to determine the exact order in which events occur, especially at the initiation of the flick.

6.9.27.2. The judge must see two things to determine that a flick roll has been correctly initiated: a) the aircraft must display a rapid and clearly visible change of pitch attitude to put the wing close to the stall, and b) autorotation must be initiated by use of the rudder. Note that when a flick roll is initiated the angle-of-attack may be at or close to zero (e.g. in vertical and 45 degree lines) or significantly positive or negative if a looping figure is being flown; the pitch change to achieve critical angle-of-attack may thus be less in some circumstances and cannot be fixed. However, if both the required pitch change and actual autorotation are not clearly seen, the figure must be given a perception zero (PZ).

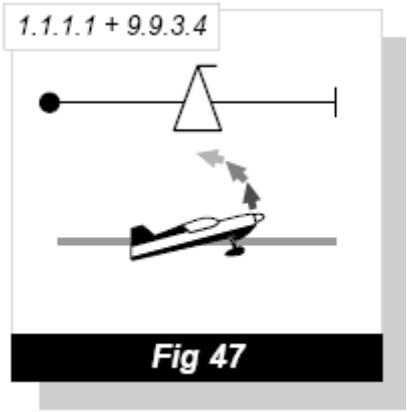


Fig 47

6.9.27.3. At the start of a positive flick roll, the aircraft must clearly and unambiguously pitch in the nose up / tail down sense, from the pilot's perspective, to put the wings near the critical angle-of-attack (Figure 47). If the aircraft pitches in the wrong direction, a hard zero (HZ) is given. Either shortly after or simultaneously with the pitch change the aircraft must yaw, initiating a stall of one wing and the rapid onset of autorotation. If the judge considers that a proper flick has not been initiated, then he must give a PZ. Provided the flick initiation criteria are satisfied, any roll that is observed before the autorotation starts must be downgraded by one (1) point per five (5) degrees of roll.

6.9.27.4. Throughout the flick the roll must be driven primarily by the rudder, and autorotation must be seen to continue. This can best be confirmed by the observed conical motion of the fuselage longitudinal axis, the largest displacement being at the tail which is furthest from the CoG. This should not be confused with the spiral motion of a tight barrel roll, wherein the centre of gravity of the aeroplane more noticeably follows a spiral flight path. However, the rate of rotation and the angle, relative to the flight path, of the conical fuselage rotation may vary between aircraft types, much as each type of aircraft has different spin characteristics. For all aircraft types, the criteria for stopping the flick roll are the same: autorotation must stop at the desired extent of roll, followed immediately by adoption of the attitude or flight path that conforms to the requirements of the underlying figure. A non-looping flight path that is displaced parallel to that prior to the flick is normal, and should not be downgraded. Downgrades for errors in the extent of rotation or the following flight path or attitude are penalised at the normal rate of one (1) point per five (5) degrees of error.

6.9.27.5. Flick rolls must be observed very carefully to ensure that the rotation is driven throughout by asymmetry in air flow induced by continued rudder application and that the competitor is not "aileroning" the aircraft around its longitudinal axis and thus without the conical fuselage motion. The movement of the aircraft's nose or tail departing the flight path prior to autorotation is a good clue to proper initiation of a flick roll, and conical motion of the tail is indicative that autorotation is continuing. A common error is for the aircraft initially to autorotate but to not stay in autorotation until the end of the figure, the roll becoming driven substantially by application of aileron; in this case a deduction of one (1) point for each five (5) degrees of rotation remaining when the autorotation ceases must be made. If autorotation ends with more than 45 degrees of rotation remaining, even if the roll is completed with aileron, the flick roll is awarded a numerical zero (0.0).

6.9.28. Family 9.10 - Negative Flick Rolls

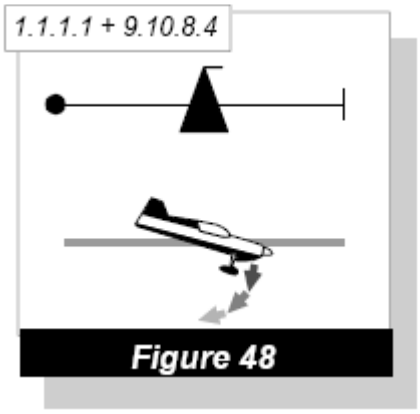


Figure 48

6.9.28.1. For negative flick rolls, all criteria stated for positive flick rolls apply except that the aircraft is in a negative rather than positive angle-of-attack during autorotation. Therefore, in a negative flick roll the nose and tail of the aircraft must initially move in the nose down / tail up sense, from the pilot's perspective, as the angle-of-attack is changed (Figure 48). This direction of motion must be observed very carefully, since it is the defining characteristic that differentiates a negative flick roll from a positive flick roll. As with positive flick rolls, if the nose moves in the wrong direction, it is not a negative flick roll and the figure must be given a hard zero (HZ). In all other respects relating to the characteristics of the rotation and errors to be observed, the criteria are the same as for positive flick rolls.

6.9.29. Family 9.11 and 9.12 – Spins

6.9.29.1. All spins begin and end with horizontal flight (Figure 49). In order to spin, the aircraft must be completely stalled in horizontal, level flight from a clearly visible horizontal line before the stall. When the aircraft stalls, the centre of gravity will drop from wings-level horizontal flight. It should be noted that an aircraft has forward momentum as the aircraft decelerates through stall speed.

6.9.29.2. This appearance is more pronounced when the figure is performed downwind, and is enhanced when performed into the wind. This change in appearance is not a grading criterion. (Figure 50).

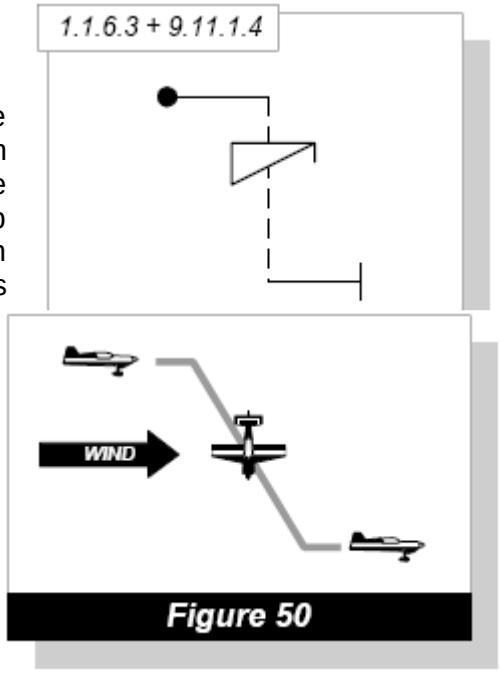


Figure 50

6.9.29.3. When the aircraft stalls, the nose will fall and at the same time the wing tip will drop in the direction of the spin. Failure to achieve this should be considered a "forced entry" and downgraded one (1) point per five (5) degrees of deviation.

6.9.29.4. After completion of the prescribed number of turns, the aircraft must stop rotating precisely on the pre-stated heading, then a 90 degree down, wings-level attitude must be seen. Grading criteria for the basic figure being flown then resumes. If a roll follows a spin, there should be a brief, but perceptible pause (similar to unlinked rolls) between the spin and the roll. Because there is no vertical line before the spin, there is no criterion to centre either a spin element alone or a spin-roll combination on the vertical down line. Be alert for early stopping of the stalled autorotation followed by "aileroning" to the pre-stated heading. In this case, a deduction of one (1) point for every five (5) degrees of "aileroning" must be applied. For example, in a one-turn spin the autorotation is observed to stop after 345 degrees of rotation and the ailerons are used to complete the rotation. The highest score this spin could receive is a 7.0.

6.9.29.5. No account is to be taken of the pitch attitude of the aircraft during autorotation, as some aircraft spin in a nearly vertical pitch attitude while others spin quite flat in conventional spins. Speed of rotation is also not a judging criterion.

6.9.29.6. If the aircraft never stalls, it is apparent that it cannot spin, and a PZ must be given. You will see "simulated" spins where barrel rolls or flick rolls are offered as spin entries. In both cases, the flight path will not be downward. In all of these cases, the figure will be given a PZ.

6.9.29.7. In all spins the grading criteria are:

a) A clean breaking stall in horizontal flight.

b) Fully-stalled autorotation.

c) Stopping on pre-stated heading.

d) Vertical down, wings-level attitude after stopping on heading.

e) A constant, reasonable quarter-loop radius back the horizontal flight.

f) The direction of a spin shall be determined from the roll component.

6.10. Positioning : Optimal Placement of Figures

6.10.1.1. Even though figures are flown within the performance zone, judges must still consider their positioning in relation to an optimum position where clarity of execution and geometry are at their greatest. This optimum position will vary depending on the aircraft’s height and the nature of the figure.

6.10.1.2. Consistently accurate flying is best assessed when the elevation of the judge’s sight line from the horizontal is reasonably constant. This means that when an aircraft is at the greatest height, it should be also at its furthest distance away from the judging position along the secondary axis. Consequently, when an aircraft is low, then it should be closer to the judges to give the same viewing perspective.

6.10.1.3. In even the best positioned sequence, however, some variations in the judges’ sight line elevation are inevitable. These different viewing angles also affect the optimum position for figures of different kinds. For example, looping shapes and 45-degree climbing or descending lines are much easier to judge accurately if the sight angle in relation to the horizon is small. Conversely, such figures are difficult to assess if flown high up and close to the front of the performance zone.

6.10.1.4. Further, such fine points as the accuracy of hesitations in an 8-point roll are much easier to judge when the figure is close to the judges and fairly low, rather than over a kilometre away at the rear of the performance zone – let alone outside it.

6.10.1.5. Consideration of all the parameters in the few short paragraphs of this section will enable a judge to make a clear decision about any figure that is clearly flown in other than its optimum position. Judging of the particular figure will be difficult, and such bad presentation should be reflected in the positioning grade for the sequence. It would be appropriate to deduct between 0.5 and 1 mark for any such misplaced figure, depending on the severity of the difficulty incurred.