

# **2020 Basic Known Guide**

## **IMAC Judge's Training**



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- Ty Lyman: Rules | Layout – IMAC Chief Judging Instructor

- 1) Loop.
- 2) Half Cuban,  $\frac{1}{2}$  roll on 45 degree downline.
- 3) Hammerhead / Stall turn.
- 4) 360 degree Aerobatic Turn.
- 5) Humpty Bump,  $\frac{1}{2}$  roll on vertical downline.
- 6) Reverse Shark's Tooth,  $\frac{1}{2}$  roll on 45 degree upline.
- 7) Aileron Roll.
- 8) Diagonal Humpty Bump,  $\frac{1}{2}$  roll on 45 degree downline.
- 9) Immelmann - Half inside loop,  $\frac{1}{2}$  roll on top.
- 10) 1  $\frac{1}{2}$  Turn positive spin.

<b>B</b>	Contest:		
	Date:	Program: <b>2020 Basic</b>	Known

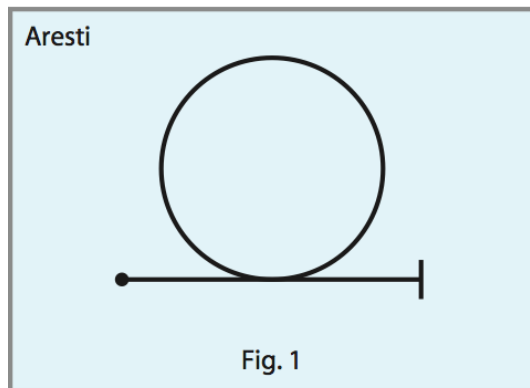
INTERNATIONAL MINIATURE AEROBATIC CLUB

wind direction

Fig 1	7.4.1.1	10	10
Fig 2	8.5.6.1 9.1.4.2	10 4	14
Fig 3	5.2.1.1	17	17
Fig 4	2.4.1.1	6	6
Fig 5	8.4.1.1 9.1.5.2	13 4	17
Fig 6	1.2.3.1 9.1.2.2	12 6	18
Fig 7	1.1.1.1 9.1.3.4	2 8	10
Fig 8	8.4.14.1 9.1.4.2	12 4	16
Fig 9	7.2.2.1 9.1.3.2	6 4	10
Fig 10	1.1.6.3 9.1.1.6	10 3	13
Total K = 131			

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## Figure 1: Loop

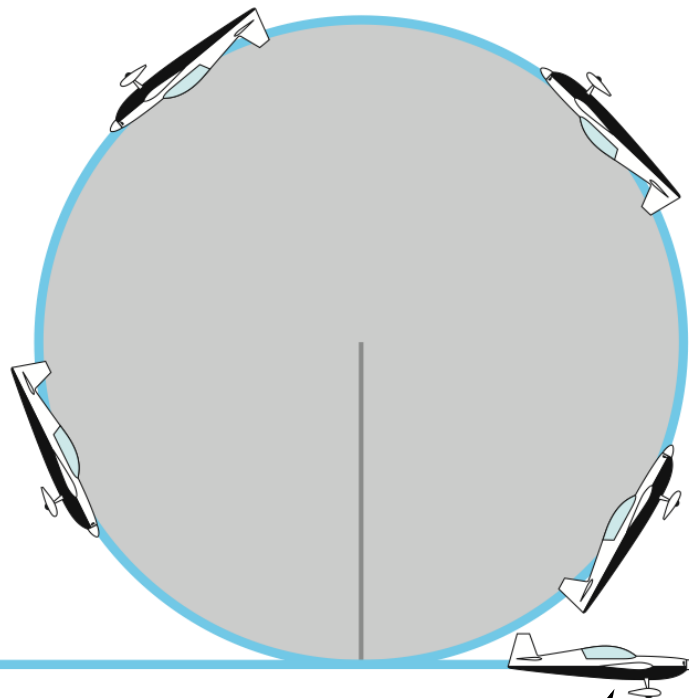


### 10.1.1 SCA-11

An attempt begins when the pilot or caller makes a vocal declaration such as “In the box,” “Entering,” or similar such statement indicating the pilot is starting the sequence. A vocal signal is mandatory to initiate the attempt.

### 6.2 SCA-27

Judging the first figure of a sequence begins at the moment the aircraft departs from its wings-level, horizontal flight path.



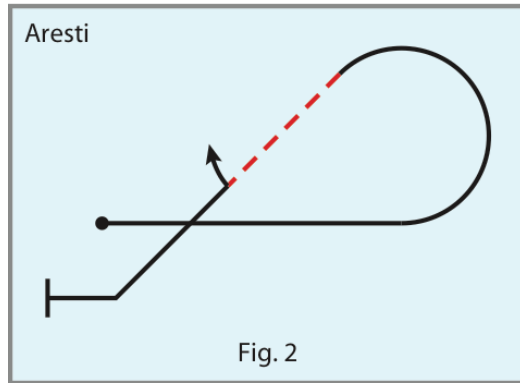
## Judging Criteria:

- Loop must have constant radius (it must appear round as seen by judges).
- Begins and ends on wings-level horizontal line.
- Figure must be wind corrected.
- Any variation in radius is a 1 point deduction **per occurrence**.
- Any flat spot is a 1 point deduction **per occurrence**.
- ½ Point deduction per 5 degrees deviation from wings-level, track, horizontal entry & horizontal exit.

### 6.2 SCA-27

The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for next figure begins.

## Figure 2: Half Cuban

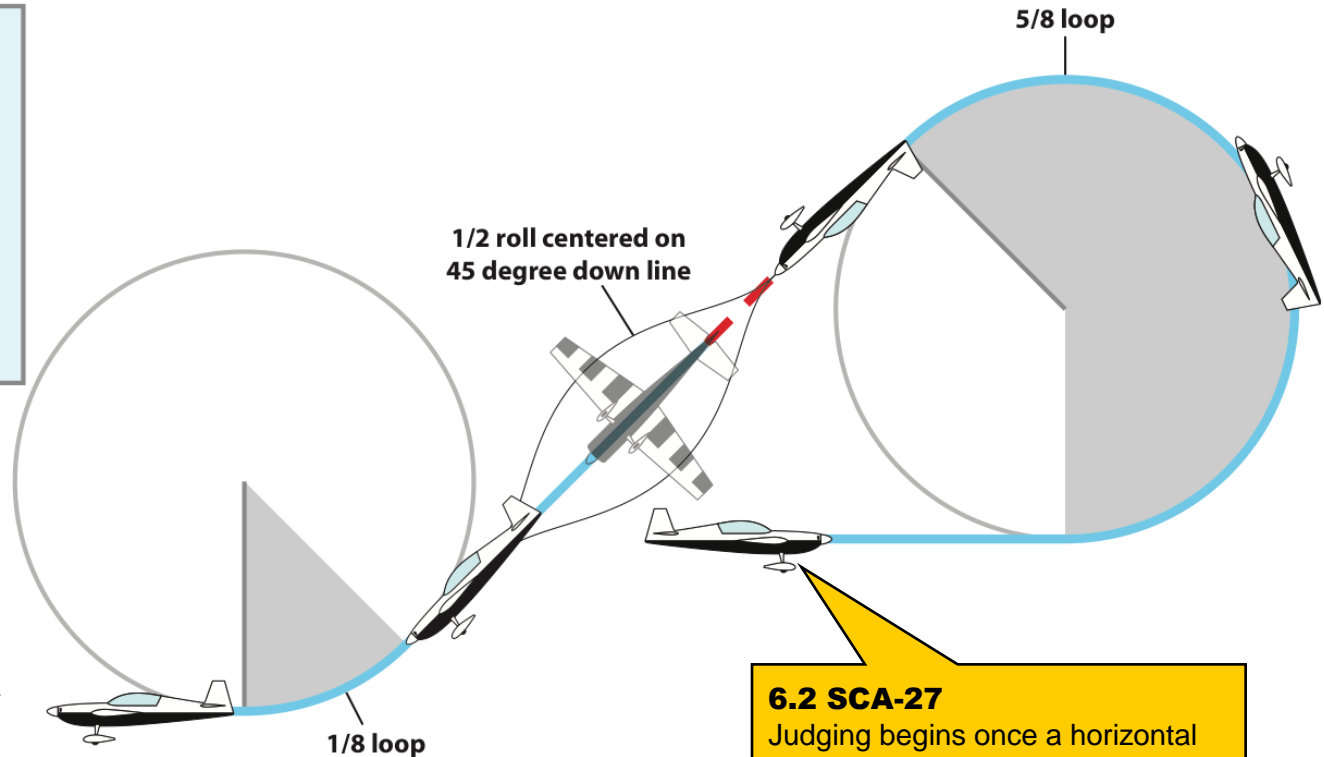


### 6.2 SCA-27

The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for next figure begins.

### Judging Criteria:

- Figure must be wind corrected.
- The radii of the 1/8 and 5/8 loops do not have to be equal.
- Length of 45° down-line not specified.
- Must have line before and after half roll.
- Half roll on 45° down-line must be centered and can be in either direction. The roll rate must be constant. 1 point deduction for each roll rate change.
- Entry and exit altitudes may be different.
- ½ Point deduction per 5 degrees deviation from wings-level, track, 45° line, horizontal entry & horizontal exit.
- There must be a distinct horizontal line between figures 1 and 2. 1 point deduction from each figure for omitted line.

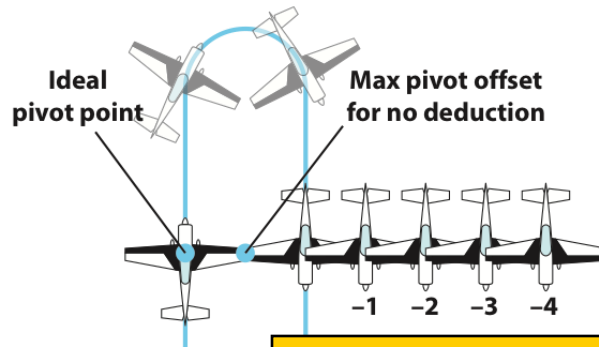
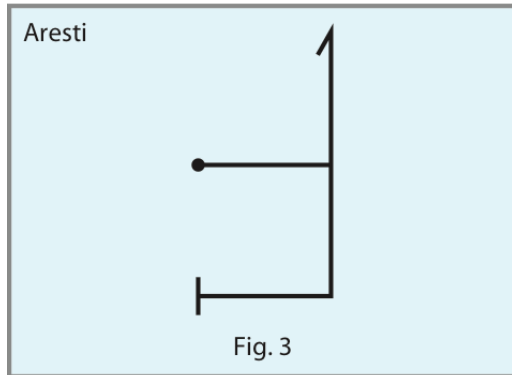


### 6.2 SCA-27

Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.

Note: The "SCA" numbers refer to the page number of the associated rule in the small format rule book.

## Figure 3: Hammerhead (Stall Turn)



1 point deduction per additional 1/2 wingspan offset. A pivot offset greater than 4 wingspans (cg to cg) is a flyover and the figure must receive a zero.

### 6.2 SCA-27

Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.



1/4 loop

### 6.2 SCA-27

The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for next figure begins.



1/4 loop

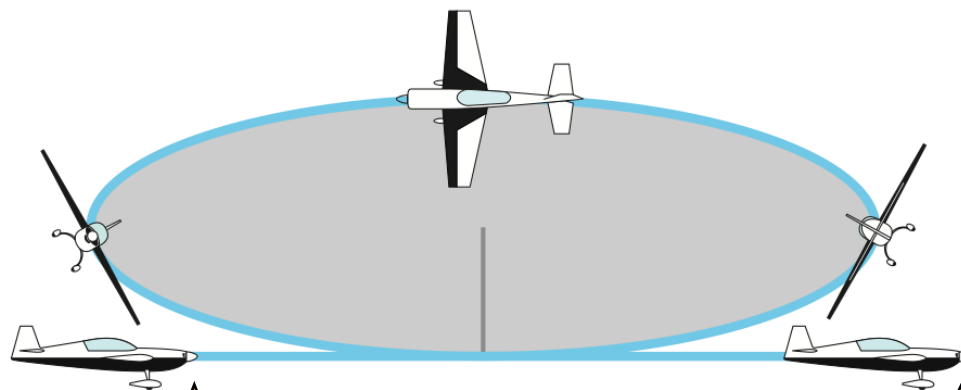
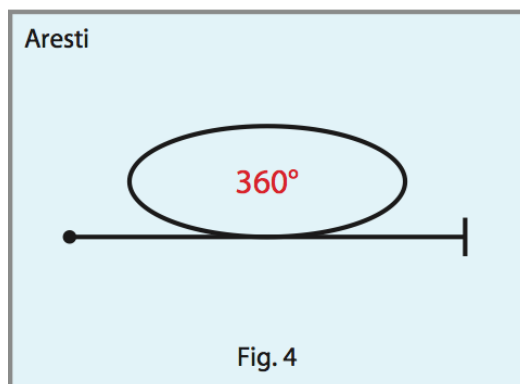
## Judging Criteria:

- Figure must be wind corrected except for the pivot (stalled portion).
- Entry and exit altitude may be different.
- Entry and exit radii may be different.
- Up-line and down-line may be different lengths.
- As the aircraft nears the point where it would stop climbing, it must pivot in a vertical plane (pitch axis). Deduction of 1/2 point per five degrees for not pivoting in a vertical plane (pilots may pivot in either direction).
- There must be no rotation around the pitch or roll axis.
- 1/2 Point deduction per 5 degrees deviation from wings-level, track, vertical up-line, vertical down-line, horizontal entry & horizontal exit.
- 1/2 Point deduction per 5 degrees of pendulum after the hammer.
- Any visible downward slide **before** the pivot starts will zero the maneuver.
- Must be a distinct horizontal line between figures 2 and 3. 1 Point deduction from each figure for omitted line.

Note: The "SCA" numbers refer to the page number of the associated rule in the small format rule book.



## Figure 4: 360° Turn



### 6.2 SCA-27

Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.

### 6.2 SCA-27

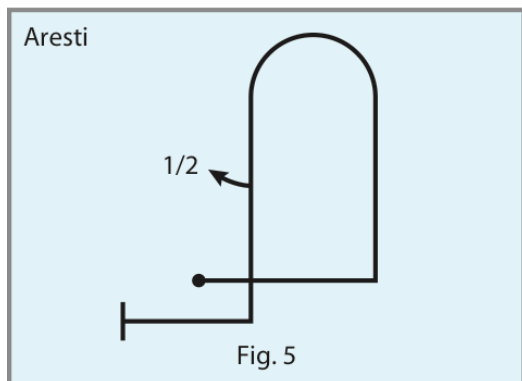
The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for the next figure begins.

## Judging Criteria:

- Figure begins and ends on a wings-level horizontal line.
- Aircraft must establish the bank angle prior to initiating the turn; complete the turn; roll back to wings level flight.
- Bank angle must be between 60° and 90°. Any less or more is a deduction of ½ point per 5 degrees.
- Entry and exit roll rate must be the same. 1 point deduction if different.
- Once established, the bank angle must remain constant, any deviation is a deduction of ½ point per 5 degrees.
- Turn must have constant radius throughout (must be wind corrected), any variation in turn radius is a 1 point deduction per occurrence.
- ½ Point deduction per 5 degrees deviation from wings-level, track, horizontal entry & horizontal exit.
- Must be a distinct horizontal line between figures 3 and 4. 1 Point deduction from each figure for omitted line.

Note: The “SCA” numbers refer to the page number of the associated rule in the small format rule book.

## Figure 5: Humpty bump



### Judging Criteria:

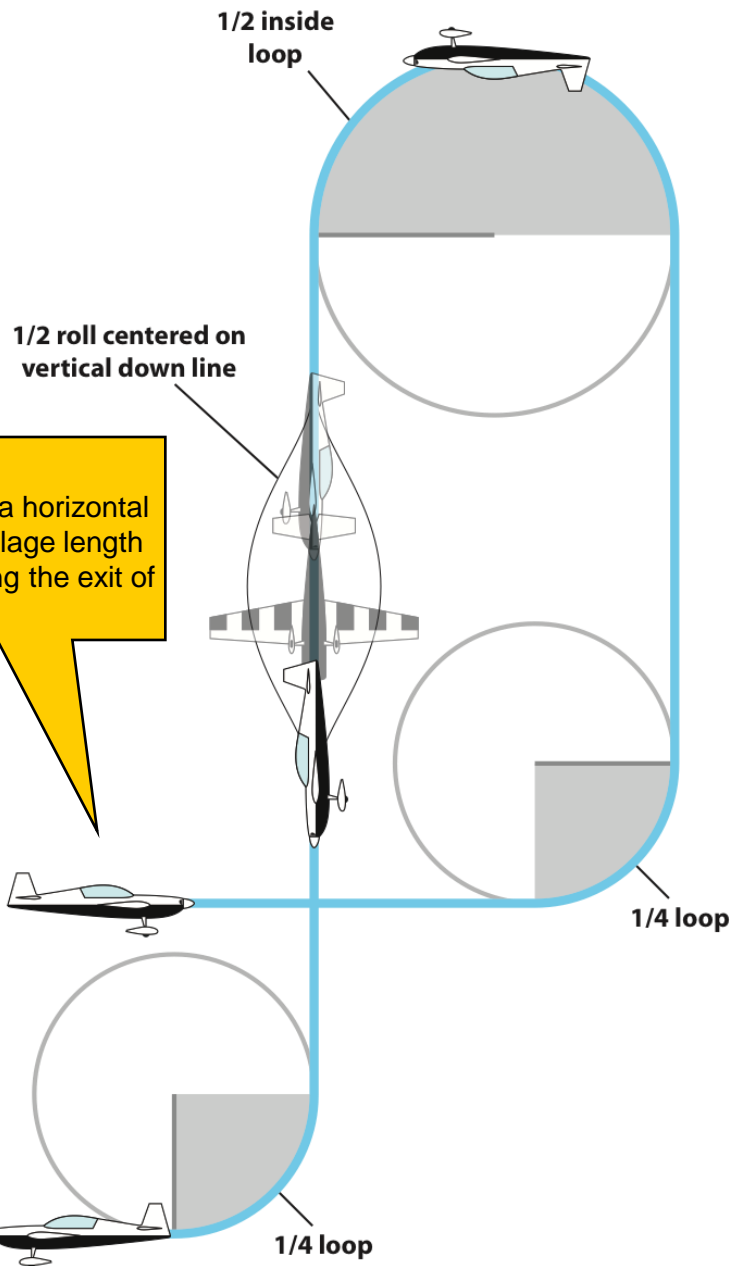
- Figure must be wind corrected.
- Entry and exit radii may be different with no deduction.
- Length of vertical up-line and vertical down-line may be different; entry and exit altitude may be different.
- Top  $\frac{1}{2}$  loop must be “pull” (inside) and may be different from the entry and exit radii.
- $\frac{1}{2}$  Aileron roll must be centered on vertical down-line.
- $\frac{1}{2}$  Point deduction per 5 degrees deviation from wings-level, track, vertical up-line, vertical down-line, horizontal entry & horizontal exit.
- Must be a distinct horizontal line between figures 4 and 5. Deduction of 1 point from each figure for omitted line.

#### 6.2 SCA-27

Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.

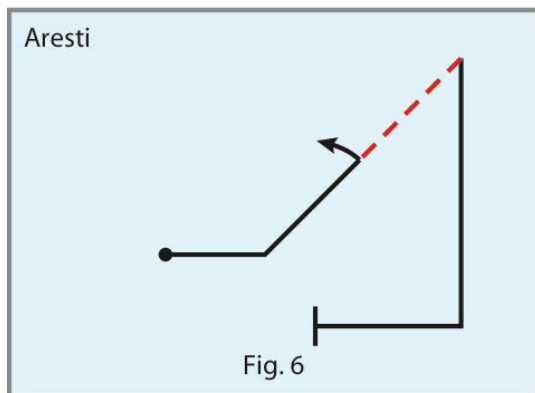
#### 6.2 SCA-27

The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for next figure begins.



Note: The “SCA” numbers refer to the page number of the associated rule in the small format rule book.

## Figure 6: Reverse Shark's Tooth

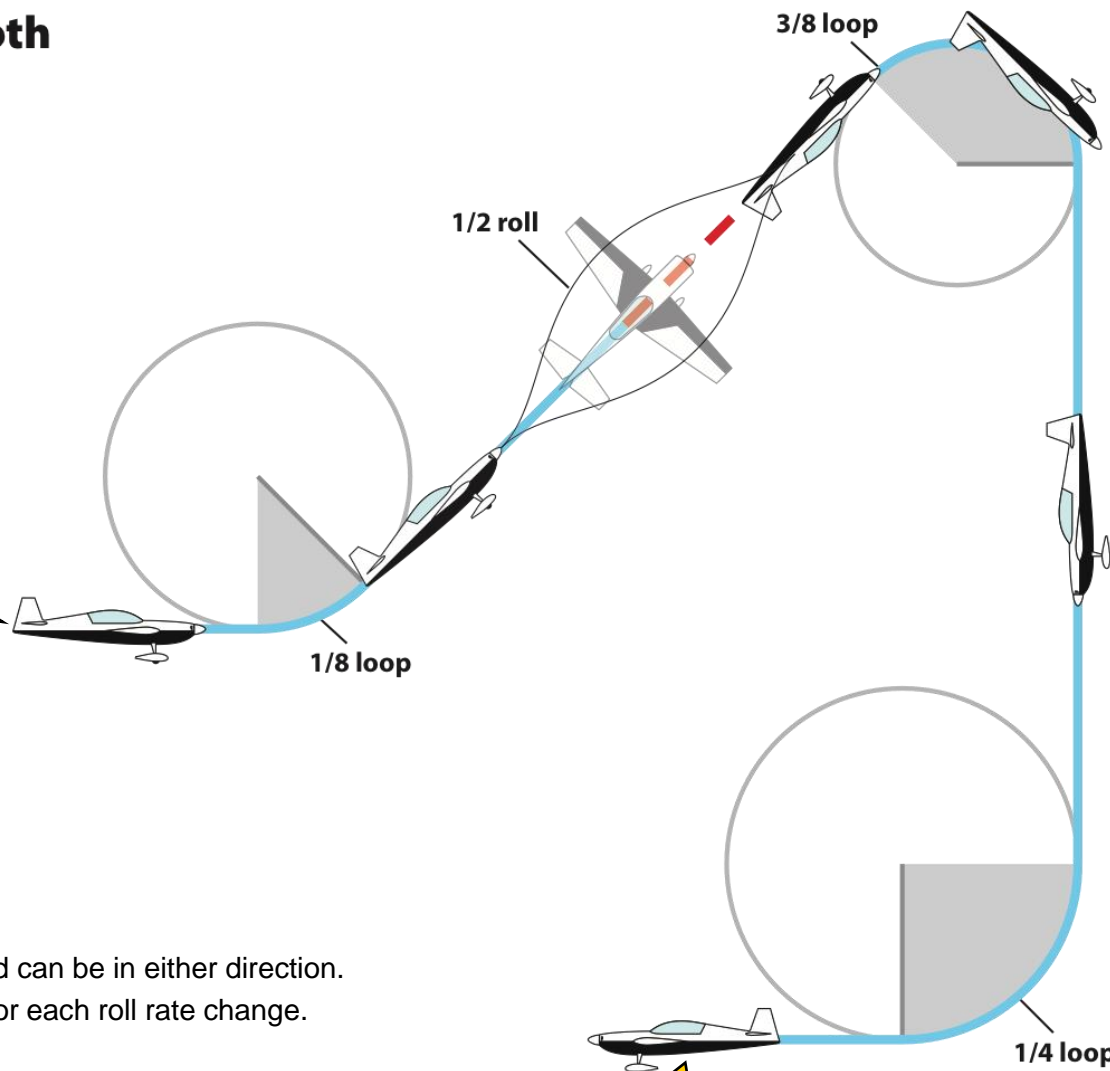


### 6.2 SCA-17

Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.

## Judging Criteria:

- Part loop radii do not have to be equal.
- All lines and part loops must be wind corrected.
- Entry and exit altitudes may be different.
- $\frac{1}{2}$  Roll on 45 degree up-line must be centered and can be in either direction. The roll rate must be constant. 1 point deduction for each roll rate change.
- Must have a line before and after half roll.
- $\frac{1}{2}$  Point deduction per 5 degrees deviation from wings-level, track, vertical up-line, 45 degree up-line, horizontal entry & horizontal exit.
- Must be a distinct horizontal line between figures 5 and 6. 1 point deduction from each figure for omitted line.

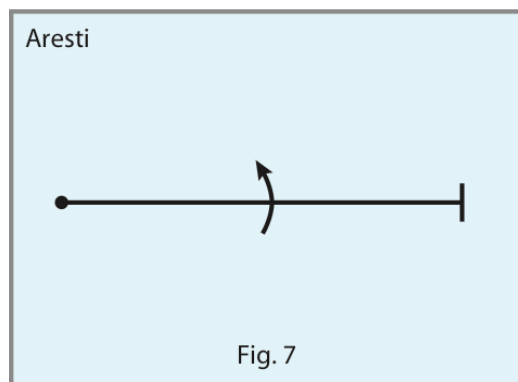


### 6.2 SCA-17

The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for next figure begins.

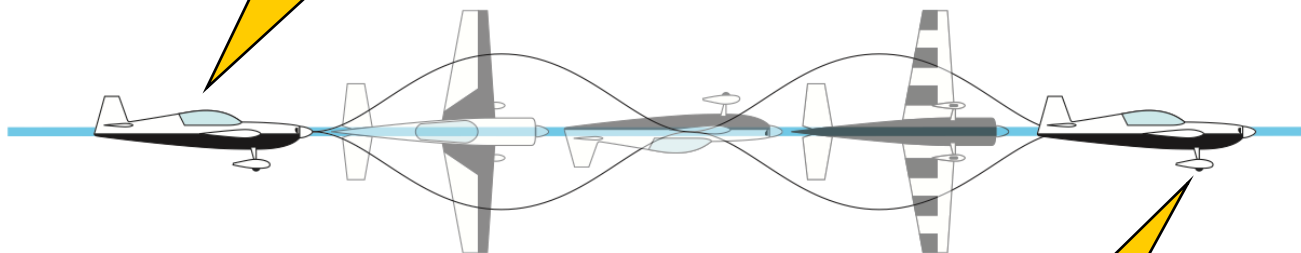


## Figure 7: Full Roll



### 6.2 SCA-27

Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.



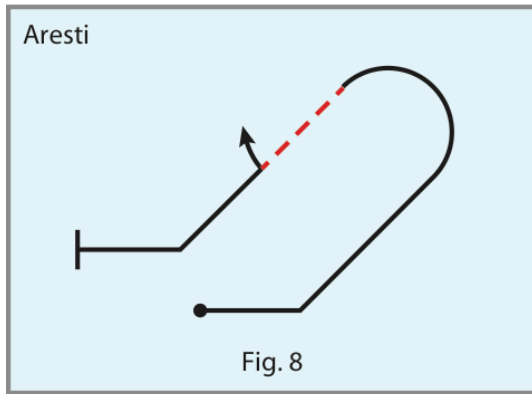
## Judging Criteria:

- Figure must be wind corrected.
- Full roll must be of a constant rate (pilot's choice of direction).
- 1 Point deduction for each roll rate change.
- Aircraft track must remain horizontal before and during roll.
- ½ Point deduction per 5 degrees deviation from wings-level, track, horizontal entry, & horizontal exit.
- Must have a distinct horizontal line between figures 6 and 7. 1 Point deduction from each figure for omitted line between figures.

### 6.2 SCA-27

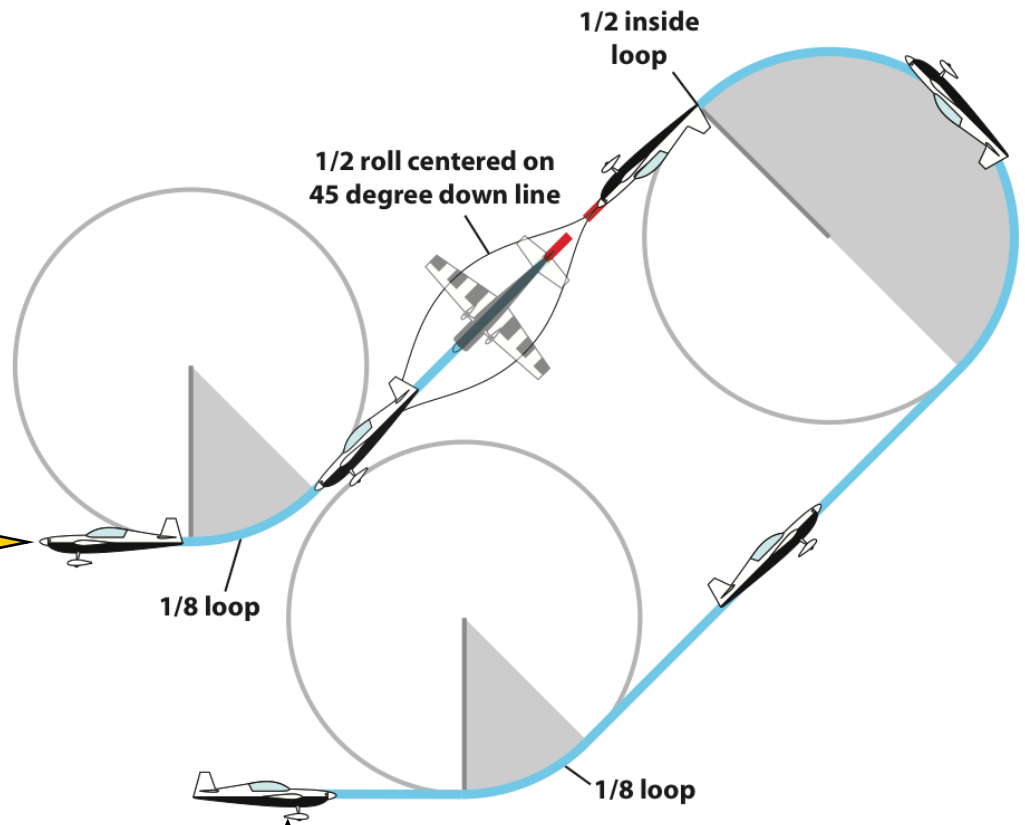
The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for next figure begins.

## Figure 8: Diagonal Humpty Bump



### 6.2 SCA-27

The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for next figure begins.



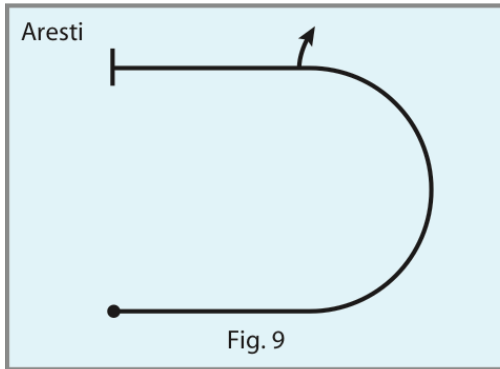
### 6.2 SCA-27

Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.

## Judging Criteria:

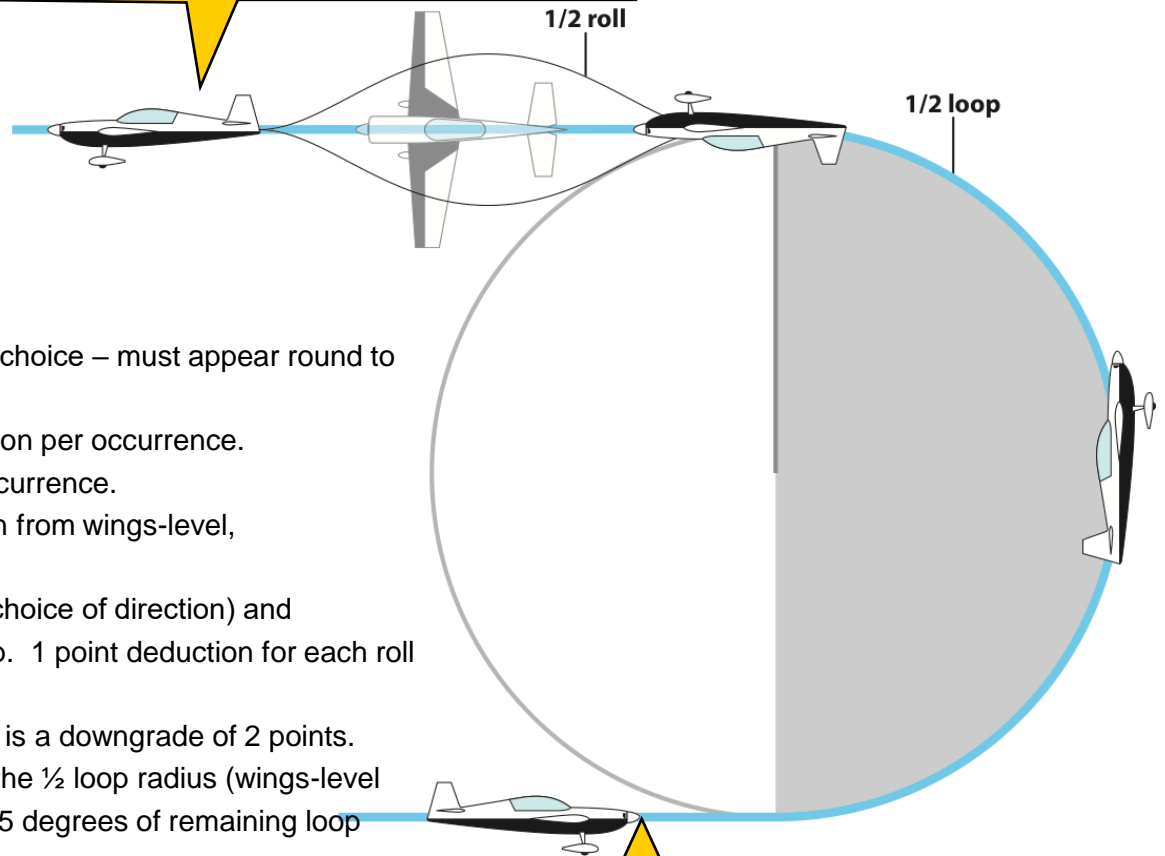
- Figure must be wind corrected.
- Entry and exit radii may be different with no deduction.
- Length of 45° up-line and 45° down-line may be different, entry and exit altitude may be different.
- Top half loop must be “pull” (inside) and can be different from the entry exit radii.
- 1/2 aileron roll must be centered on 45° down-line.
- 1/2 point deduction per 5 degree deviation from wings level, track, 45° up-line, 45° down-line, horizontal entry, & horizontal exit.
- Must be a distinct horizontal line between figures 7 and 8, deduction of 1 point from each figure for omitted line.

## Figure 9: Immelmann (Half inside loop with half roll exit)



### 6.2 SCA-27

The figure is complete at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length. Judging for next figure begins.



### 6.2 SCA-27

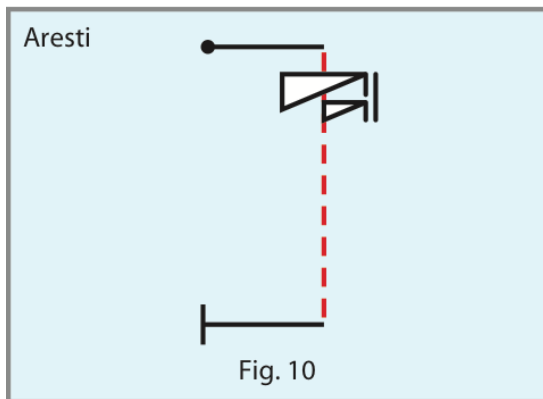
Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.

## Judging Criteria:

- Figure must be wind corrected.
- $\frac{1}{2}$  Loop must be constant radius of pilot's choice – must appear round to judges.
- Any variation in radius is a 1 point deduction per occurrence.
- Any flat spot is a 1 point deduction per occurrence.
- $\frac{1}{2}$  Point deduction per 5 degrees deviation from wings-level, track, horizontal entry & horizontal exit.
- $\frac{1}{2}$  Roll must be of a constant rate (pilot's choice of direction) and completed immediately after  $\frac{1}{2}$  inside loop. 1 point deduction for each roll rate change.
- Drawing a line between  $\frac{1}{2}$  loop and  $\frac{1}{2}$  roll is a downgrade of 2 points.
- Aircraft starting  $\frac{1}{2}$  roll prior to completing the  $\frac{1}{2}$  loop radius (wings-level horizontal) is a downgrade of  $\frac{1}{2}$  point per 5 degrees of remaining loop radius.
- Must be a distinct horizontal line between figures 8 and 9, deduction of 1 point from each figure for omitted line.

Note: The "SCA" numbers refer to the page number of the associated rule in the small format rule book.

## Figure 10: Vertical downline with 1-1/2 turn spin entry



### 6.2 SCA-27

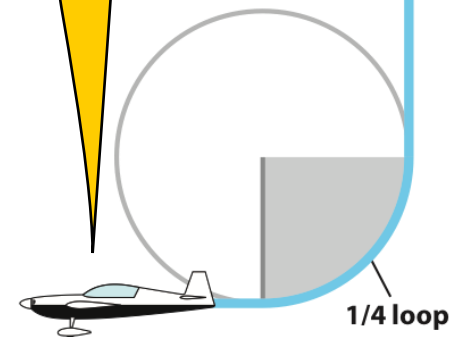
Judging begins once a horizontal flight path of one fuselage length is established following the exit of the previous figure.

## Judging Criteria:

- Must be a distinct horizontal line between figures 9 and 10, deduction of 1 point from each figure for omitted line.
- Figure must be wind corrected (EXCEPT just prior to the stall and during autorotation).
- Entry flight path should remain constant and not be influenced by pitch attitude changes required to generate the stall.
- When the aircraft stalls, the nose and the wing must simultaneously drop in the direction of the spin. Failure to achieve this should be considered a “late entry” and downgraded ½ point per 5 degrees of deviation.
- Spin can be in either direction but 1 ½ turns must be in same direction with no hesitation.
- 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 somewhat flat in conventional spins.
- If the aircraft never stalls, it is apparent that it cannot spin, and a zero (0) must be given.
- Immediately after 1 ½ turns are completed a 90° wind corrected down vertical line must be seen. 1 Point deduction for an omitted vertical line.
- ½ Point deduction per 5 degree deviation from wings-level, track, vertical down-line, horizontal entry, & horizontal exit.

### 6.2 SCA-27

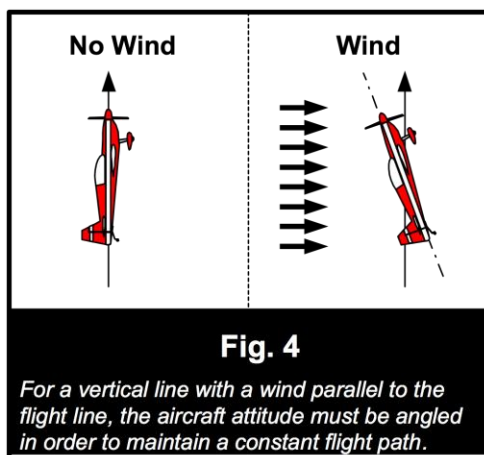
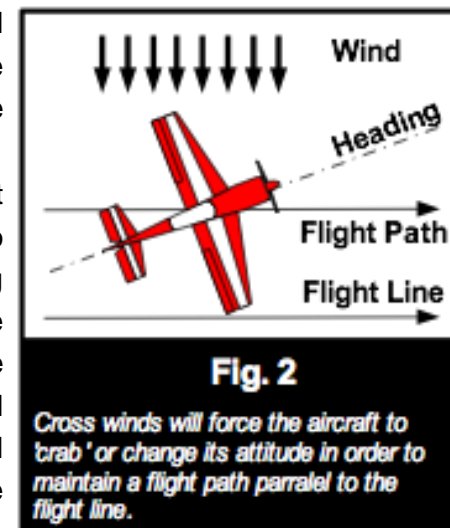
The figure and sequence are complete; judging ends at the moment the aircraft returns to a wings-level, horizontal flight path of one fuselage length.



Note: The “SCA” numbers refer to the page number of the associated rule in the small format rule book.

## 5.3. Wind Correction

- The competitor is required to make the shape of all maneuvers perfect regardless of the wind conditions. Loops and partial loops must be round, vertical lines must be perpendicular to the horizon and horizontal line parallel to the X or Y-axis. For 45-degree lines, judges must make an allowance for the aircraft's position relative to their own.
- Judges shall ignore any aircraft change of attitude required to maintain a correct flight path. At the same time, the usual 0.5 point deduction per 5 degrees of deviation shall be applied to anything that is not related with wind correcting. For instance, when the wind is blowing parallel to the flight path, the pilot flying a vertical line might use its elevator to change the aircraft's attitude in order to maintain a straight vertical flight path. This change of attitude shall not be downgraded. On the other hand, any bank angle of the wing in the roll axis should be downgraded using the standard rule of 0.5 point deduction per 5 degrees. The judges shall only downgrade for induced pilot corrections and disregard any sudden attitude changes due to wind bumps. Always give the competitor the benefit of the doubt when not sure.



- The only maneuvers that are not to be wind corrected are the ones involving a stalled condition, such as a Stall Turn (otherwise known as "Hammerhead"), Tail Slide, spin and snap roll(s) (also known as a "flick roll"). During the period of time that the aircraft is in a stalled, or near stalled condition, any wind drift shall be disregarded by the judges and not downgraded.
- Wind correction shall be used throughout the aerobatic airspace. Any drift observed on any line (horizontal, 45 degrees or vertical) shall be downgraded using the 0.5 point deduction per 5 degrees rule. For instance, in the case of a Stall Turn performed with a severe crosswind, the vertical line will start directly after the  $\frac{1}{4}$  loop. This is the first point of reference to be used for the up-line. The flight path on the way up is 15 degrees off compared to the perfect vertical up line; the downgrade should then be 1.5 points.

When the aircraft starts its Stall Turn, it is in a stalled condition and no downgrade shall be applied for wind drift during that time. Once the rotation is complete, a new reference point shall be established for the perfect vertical downline. If the flight path on the downline is 20 degrees off, the downgrade should then be 2 points.

## Sound Score Judging Criteria (SCA-5 GR 5.1 Scale Aerobatic Sound Limits)

Judges will evaluate each individual sequence flown in its entirety for overall sound presentation. Each judged Known and Unknown sequence, shall have one “figure” added to the end of the score sheet after individually judged maneuvers. This figure shall be known as the Sound Score. The Sound Score will have a K value dependent on the class flown. The K value of the sound score added for the Basic class is 3K.

The sound presentation will be scored on a scale of 10 to 0 with 10 denoting “Very Quiet,” and 0 denoting “Very noisy.” Whole points will be used for scoring. This sound score will then be multiplied by the K value for the individual class and included in the total flight score for the sequence. Note that each judge’s score is independent of the other(s) and no conferencing on the sound score is required.

If a pilot receives a sound score of three (3) or less for the same sequence from two or more judges, the pilot will be notified of the problem and will be requested by the Contest Director to adjust or modify the aircraft in order to reduce the sound level prior to the next round. If that pilot, after notification, again receives a sound score of three (3) or less for the same sequence from two or more judges, that pilot will be disqualified from further competition at that contest.

## Pilot/Panel Judging Criteria (Basic Class):

(SCA-5 GR 3.2) There is no requirement for the Basic class pilot to have an airplane that has flown in full scale aerobatics competition. As such, there is also no requirement to have either a pilot or instrument panel.



## Airspace Control Score Judging Criteria: (SCA-14 SA Official F&J Guide 4.3)

The following standard will be used for assessing the pilot's performance in maintaining control and awareness of the aerobatic airspace and placing figures in the airspace in a manner that allow the figures to be optimally judged.

- The HIGHEST standard for Airspace control:

The pilot that exhibits a significant ability to control the location of the aircraft inside the Airspace, relative to the Judges, resulting in a tight footprint and locates the aircraft that it can be optimally judged at all times should receive a TEN (10).

- The LOWEST standard for Airspace control:

The pilot that exhibits a poor ability to control the location of the aircraft inside the Airspace, relative to the Judges, resulting in an excessively large footprint and has the aircraft consistently so far away as to be difficult to properly judge. This pilot exhibits a very poor Airspace control and should receive a zero (0).

Pilots exhibiting Airspace control within the range of these two standards will be graded with a range of possible scores from ten (10) to zero (0) in whole point increments.

K factor for the Airspace Control Scores for Basic class is 3K.