

# VMAA Trophy Scale Aerobatics event

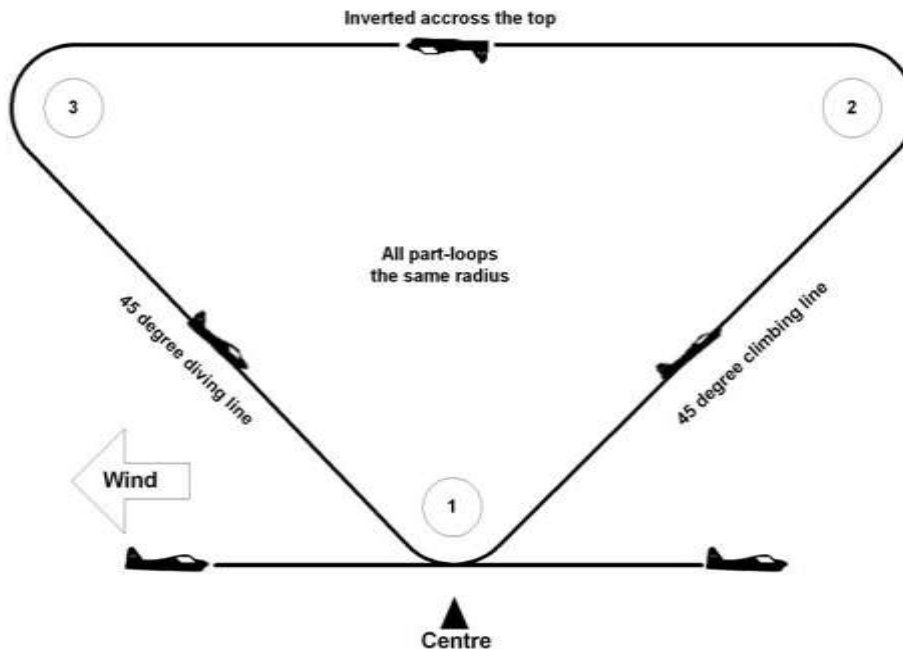
1	Upwind	Triangular Loop, no rolls
2	Downwind	Two Rolls, one each in opposite directions
3	Upwind	Saw Tooth
4	Downwind	Inverted Flight with 1 & ½ rolls in and out
5	Upwind	Cuban Eight with ½ roll at each center
6	Downwind	Slow Roll
7	Upwind	Stall Turn
8	Downwind	One Loop, with one full roll at the top
9	Upwind	Two-turn Spin

## Description of the 'Known Schedule' Maneuvers

He who makes the least mistakes wins!

### 1 Triangular Loop, no rolls

From a straight and level line of flight, at the centerline, the model part-loops to a 45° climb. Flies a straight line. Part-loops through 135° to a straight inverted horizontal line. When at an equal distance past the centerline, part-loops through 135° to a 45° dive. Flies a straight line. Part-loops through 45° at the centerline to recover in straight and level flight.



#### Downgrades:

Climbing and diving legs not at 45°

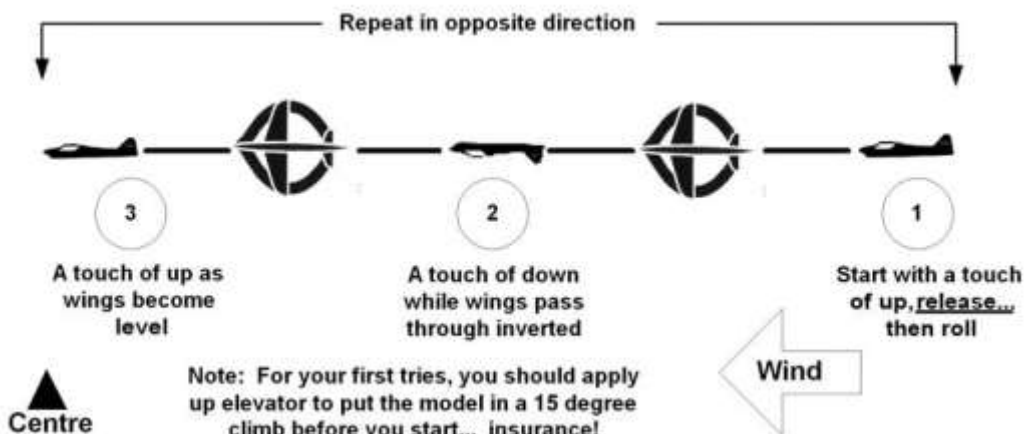
Changes in heading (Corkscrewing in and/or out)

Entry and exit part-loops not at the same point

All part-loops not the same radii (bottom part-loop should 'look just a little tighter' than the top two, simply because the model is not changing direction for as long!)

### 2 Two Rolls, one each in opposite directions

From a straight and level line of flight, the model rolls through 360° in either direction, then immediately rolls 360° in the opposite direction to recover in a straight and level exit line.



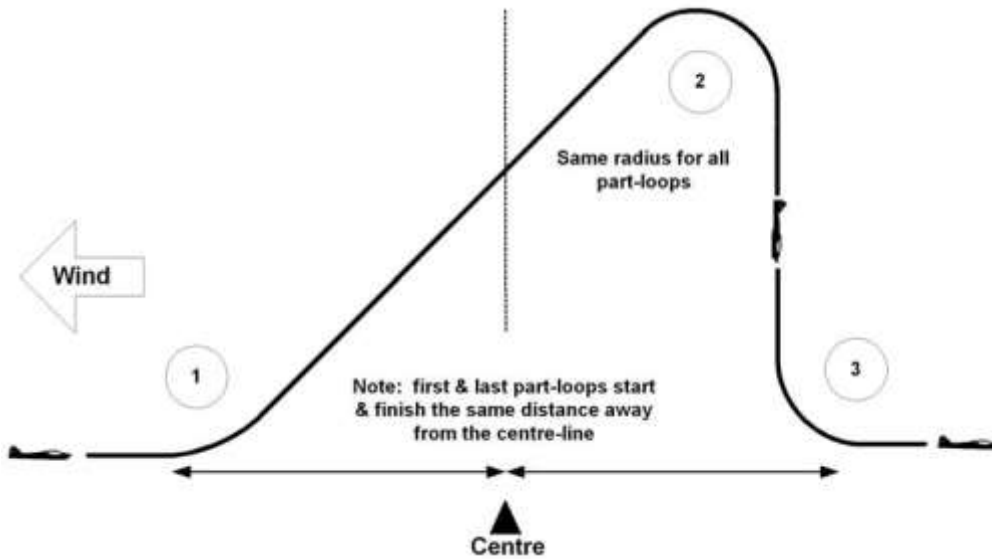
#### Downgrades:

Entry and exit lines not at the same height and/or heading  
Changes in heading or altitude  
Roll rate not constant for both rolls

Second roll does not start promptly after the first roll  
Rolls not exactly 360°  
End of first roll not at the centerline

### 3 Saw Tooth

From a straight and level line of flight, model part-loops to a 45° climb. Flies a straight line. Model part-loops 135° to a vertical diving line. Flies a straight vertical down-line. Model part-loops 90° to recover in a straight and level upright line of flight.

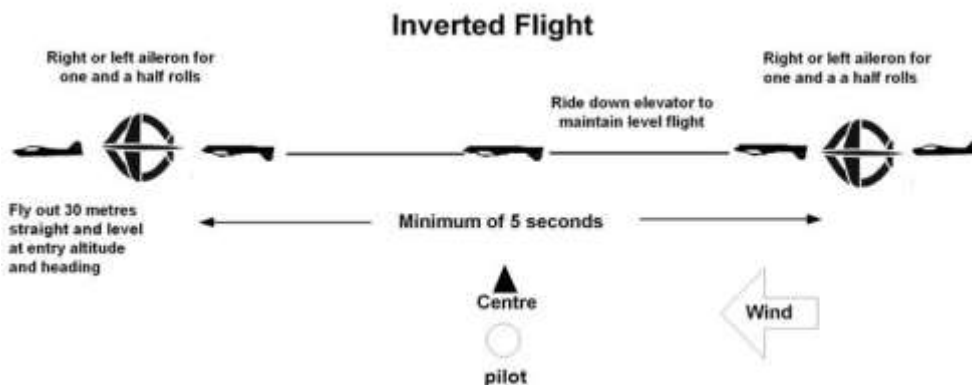


**Downgrades:**

- Entry and exit lines not at the same height
- Changes in heading
- All part-loops not the same radius
- Centerline not at mid-point of the total manoeuvre width (should be half-way between the beginning of first part-loop and the end of last part-loop)

### 4 Inverted Flight, with 1 & 1/2 rolls in and out

From a straight and level line of flight, the model rolls 540° either way through one and a half rolls, flies a straight and level inverted line for 3 to 5 seconds, then rolls 540° either way through one and a half rolls to recover in straight and level flight.

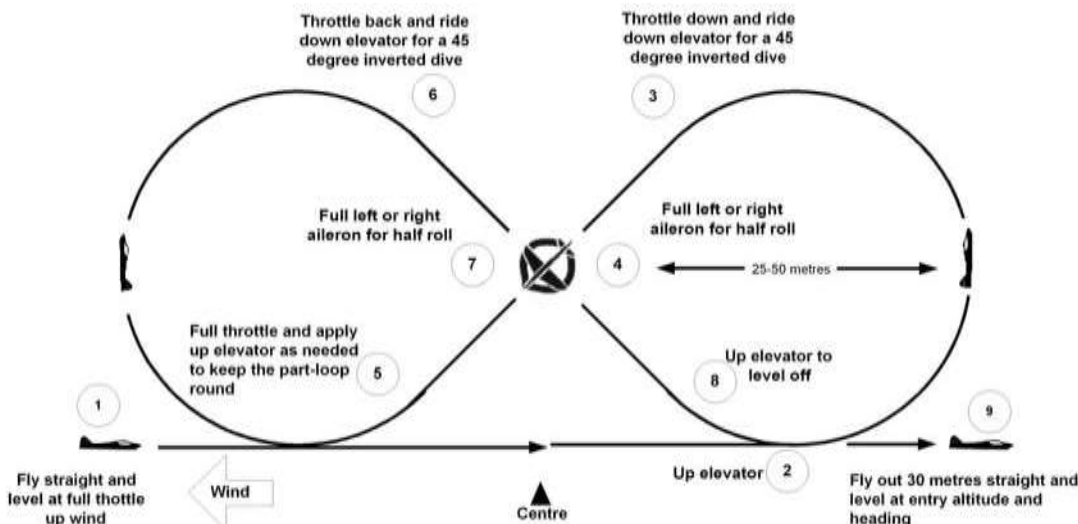


**Downgrades:**

- Changes of heading and altitude
- Roll rate not the same for both rolls,
- Changes of roll rate within a roll
- Centerline not at mid-point of the inverted line

### 5 Cuban Eight, with a half roll at each center

The model is flown straight and level past the centerline, then pulls up to perform a part-loop of 225° to a 45° inverted dive. Flies a straight line, performs a half-roll and continues the now upright straight diving line. Model pulls through a part-loop of 270° to a 45° inverted dive. Flies a straight line, performs a half-roll and continues the now upright straight diving line. Model pulls through a 45° part-loop to recover in a straight and level line of flight.

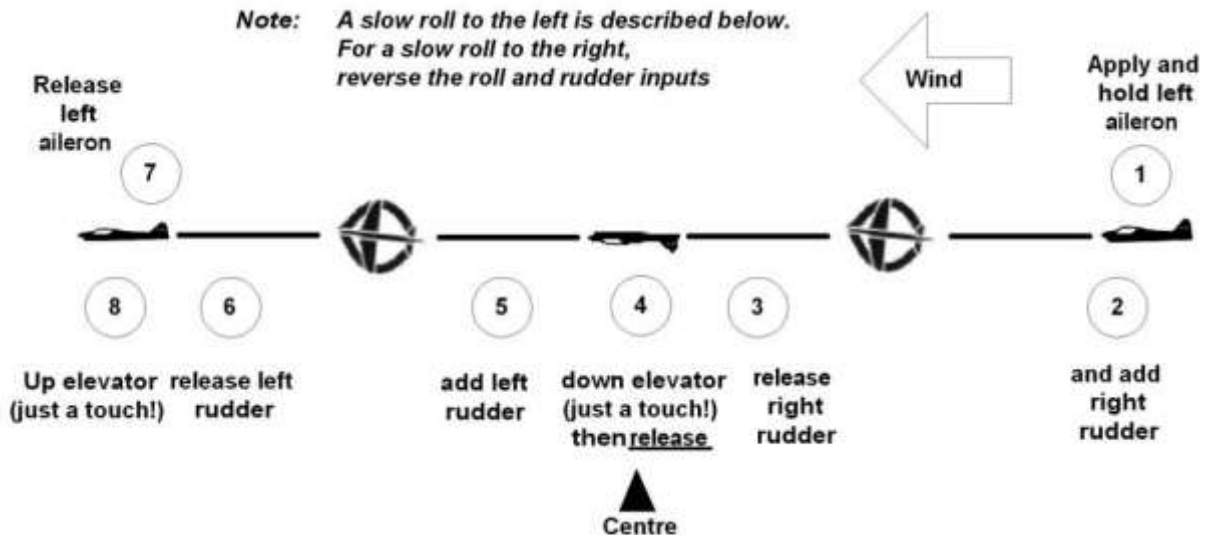


**Downgrades:**

- Part-loops not round, and not the same size
- Changes of heading during loops, straight lines and half rolls
- Half rolls not at the centerline, and not at the mid-points of the 45° diving lines
- Entry and exit lines not the same heading and/or altitude

## 6 Slow Roll

From a straight and level line of flight, the model rolls slowly through 360°, and recovers in a straight and level line of flight.

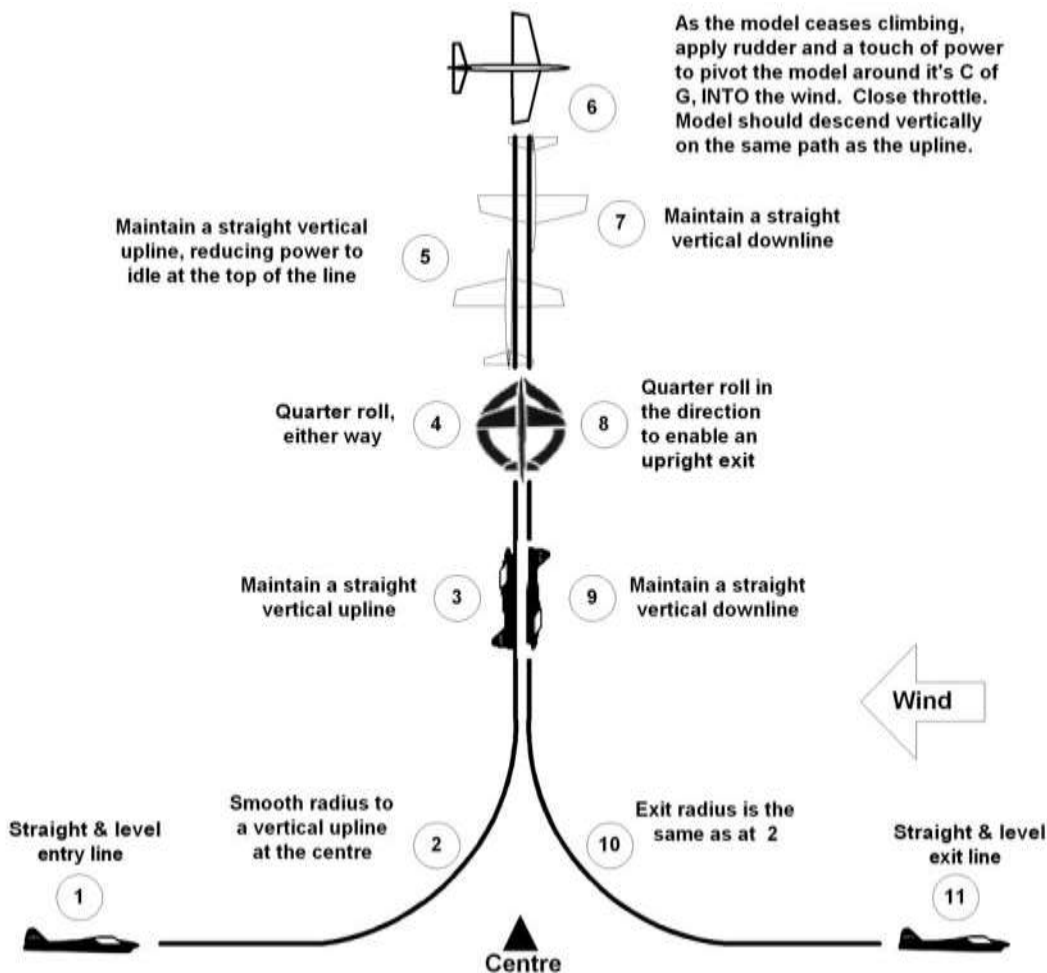


### Downgrades

- The roll is completed in less than four seconds
- Changes of roll rate
- Changes of heading and/or altitude during the roll
- The roll is not exactly 360°
- Entry and exit lines at a different heading and/or altitude

## 7 Stall Turn with Quarter Rolls

From a straight and level line of flight, the model is pulled through a 90° part-loop, establishes a straight vertical up-line, performs a quarter roll, maintains the up-line, powers down, performs a 180° rotation about the model's c of g, establishes a straight down-line, quarter-rolls, maintains the down-line, pulls through 90° and finishes with a straight and level line of flight.

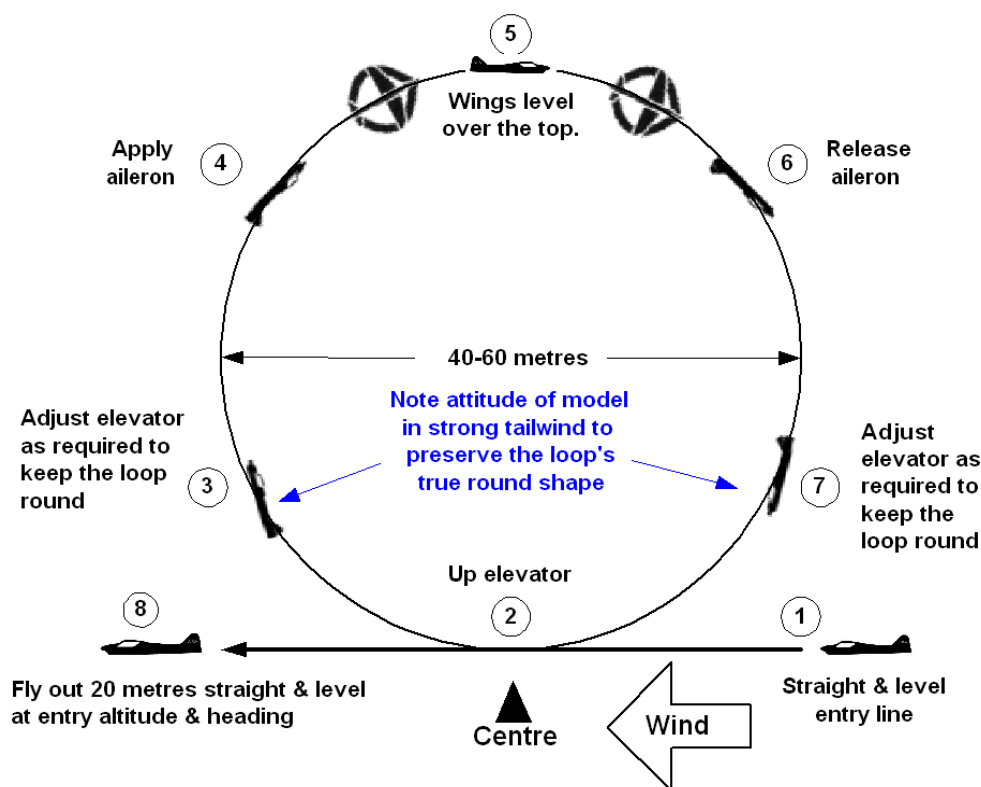


### Downgrades:

- Entry and exit lines not at the same height and/or heading
- Quarter-loops not the same radius
- Rolls not in the centre of the vertical lines
- Vertical lines not truly vertical
- Rolls not at the same height
- Rolls not the same roll-rate
- Vertical lines not of equal length
- Model does not rotate about its' centre of gravity, and does a wing-over
- Model flops forward or backwards scores zero
- Pendulum motion after the stall-turn
- Phew!

## 8 One Loop with one full roll at the top

From a straight and level line of flight, the model pulls through one loop and recovers in a straight and level exit line of flight. At the top of the loop, the model is rolled either way through 360°.



### Downgrades:

Loop is not round

Entry and exit lines at a different heading and/or altitude

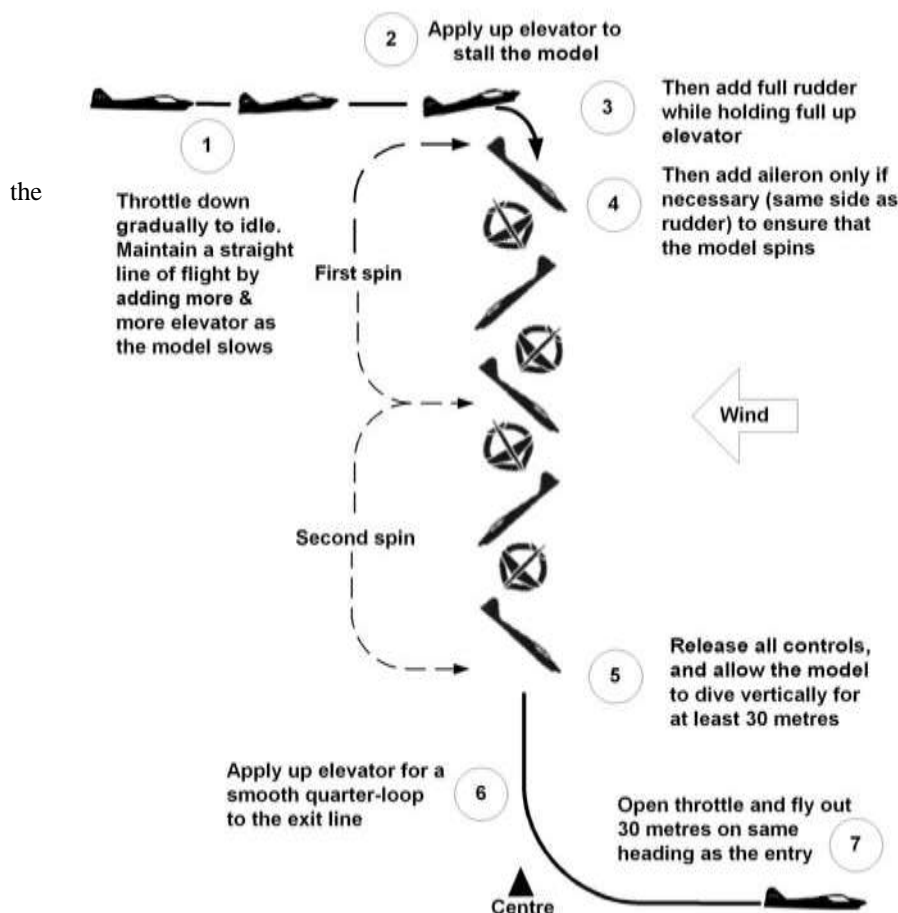
Roll is not centered at the top of the loop

Changes of heading during the loop and/or roll

Roll rate not constant

## 9 Two-Turn Spin

From a straight and level line of flight, at reduced power the model is held in a nose-high attitude until at the centerline, the model stalls and starts to spin. After two rotations, the model is flown on a near-vertical down-line for a few seconds, and is pulled gracefully through 90° to recover in a straight and level exit line of flight which is the same heading as the entry line.



### Downgrades:

There is no downgrade for the model drifting with wind as it stalls and during the spin.

BUT there is a 1 point per 15° downgrade if the model is allowed to start weather-vaning into any crosswind at the stall entry

Wings not level during entry and exit lines

Model climbs during the entry line prior to the stall

Exit line different heading to the entry line

Model does more or less than two spins... one point downgrade per 15° of error

Model not allowed to dive long enough for the model to be seen to have been over or under rotated

Wing-over at entry

Spiral Dive

Snap Roll at entry