

DRAFT

Sportsman (401)

Maneuver Descriptions

And

Suggested Downgrades

**Purpose:** The purpose of this guide is to furnish an accurate description of each maneuver of the Sportsman(401) pattern sequence. Study of this guide by the competitor will help him learn exactly what is expected, while study by the judge will help them decide precisely how well the competitor meets these expectations. The competitor or judge should refer to the AMA Judges Guide for general information regarding downgrades such as the “One Point Per 15 degree Rule”.

**Sequence:** Below is the listed sequence for Sportsman.. U, D, and T represent Upwind, Downwind and Turnaround, respectively.

### Sportsman Sequence

<u>Maneuver</u>	<u>Kf</u>
1. Takeoff Sequence (U)	1
ENTER BOX	
2. Straight Flight Out (U)	1
3. Half Reverse Cuban Eight (T)	2
4. Straight Flight Back (D)	1
5. Stall Turn without rolls (T)	2
6. Two Inside Loops (U)	2
EXIT BOX (upwind-free turnaround)	
ENTER BOX (going downwind)	
7. Two Point (2/2 pt) Roll (D)	2
8. Half Cuban Eight (T)	
9. Double Immelman without rolls (U)	2
10. Immelman Turn (T)	2
11. 45 Degree Down line (D)	1
EXIT BOX (downwind-free turnaround)	
ENTER BOX (going upwind)	
12. Vertical Up line (on center) (U)	1
13. Split "S" (T)	2
14. One Horizontal Roll (D)	1
15. Half Reverse Cuban Eight (T)	2
16. Cobra Roll without rolls (U)	1
EXIT BOX	
17. Landing Sequence (U)	1
<b>TOTAL K-factor</b>	<b>26</b>

## Maneuver Descriptions:

1. **Takeoff Sequence (U):** The takeoff maneuver will be scored in half point increments from 10 to 0. The model smoothly, not suddenly, accelerates to takeoff speed. When flying speed is reached it gently lifts off the ground and climbs at a gradual angle. The lift off should be within two (2) meters of center for maximum points. The aircraft must not deviate in track during takeoff but may change heading after lift off to maintain a straight track with the takeoff roll. The maneuver is complete when the model is approximately two (2) meters (6-1/2 feet) from the ground.

It is not necessary for the model to stand still on the ground with the engine running without being held before the takeoff begins. It is also not necessary for the model to reach 2 meters in the same distance as the takeoff role. The takeoff should not be downgraded for wing dips caused by air turbulence unless the wings are not immediately leveled.

Downgrades:

1. Model jumps from the ground.
2. Retouches the ground after becoming airborne.
3. Steep climb angle.
4. Gallops in elevation during climb.
5. Wings not level at any time.
6. Throttle not smoothly accelerated.
7. Model passes behind the judges line, scored zero (0) points.

2. **Straight Flight Out (U):** The model must be brought exactly parallel to the flight path and flown in an absolutely straight and level path for a distance of approximately 100 meters centered on the judges before starting the turnaround maneuver. (Distance does not have to be accurate.)

Downgrades:

1. Track of plane deviates left or right.
2. Does not hold constant altitude.
3. Gallops in yaw, roll, or pitch.

3. **Half Reverse Cuban Eight (T):** Model executes one-eighth (1/8) inside loop to a 45 degree up line, hesitates, does one-half (1/2) roll, hesitates, then performs five-eighths (5/8) inside loop back to level flight in opposite direction as entry.

Downgrades:

1. Loop segments not round with the same size and radius.
2. Model not at 45 degrees before and after half roll. Apply "One point per 15 degree Rule"
3. Changes in heading (track) in loop segments or after half roll.
4. Half roll not centered in 45 degree line.
5. No hesitations before or after half roll.
6. Over or under rotation of roll, one point per 15-Degree Rule.

4. **Straight Flight Back (D):** Immediately after the turnaround maneuver the model shall fly back along the same line as the outgoing path. “Straight Flight Back” need not be at same altitude as “Straight Flight Out”.

Downgrades:

1. Turns or wiggles during straight flight.
  2. Change in altitude.
  3. Gallops in pitch, yaw, or roll.
  4. Flight not along straight flight out path
5. **Stall Turn without rolls (T):** Model executes one-quarter (1/4) inside loop to an upward vertical track (up line), hesitates, performs a stall turn through 180 degrees to a downward vertical track (down line), hesitates, then recovers with another one-quarter (1/4) inside loop to level flight in the opposite direction. Exit altitude of maneuver need not be the same as entry altitude.

Downgrades:

1. Model not level at start and finish.
  2. Track does not become exactly vertical.
  3. Model track not vertical at start and finish of stall turn.
  4. Return path not parallel to entry path.
  6. Pivot radius greater than 1/2 wingspan.
  7. Pendulum movement after stall.
  8. Loop segments not round with same size and radius.
6. **Two Inside Loops (U):** Model pulls up and executes two (2) consecutive loops. All loops shall be round and superimposed.

Downgrades:

1. Loops not round.
2. Loops not superimposed.
3. Wings not level during loops.
4. Changes in heading(track) during loops.
5. Exit not same altitude and heading(track) as entry.

7. **Two Point (2/2 pt) Roll (D):** Model performs one-half (1/2) roll to level inverted flight, pauses, then performs another one-half (1/2) roll in the same direction to level upright flight. Center of maneuver is middle of inverted hesitation. Length of inverted hesitation is not a reason for downgrade as long as it exists.

Downgrades:

1. Model does not hesitate at inverted.
2. Roll rate not constant.
3. Over or under rotation of rolls, one point per 15-Degree Rule.
4. Change in altitude.
5. Changes in heading(track).
6. Roll rates not constant.

8. **Half Cuban Eight (T):** Model executes a five-eighths (5/8) inside loop to a 45 degree down line, hesitates, performs a half (1/2) roll, hesitates, then executes a one-eighth (1/8) inside loop to recover in level flight.

Downgrades:

1. Loop segments not round with the same size and radius
2. Model not at 45 degrees before and after prescribed roll
3. Changes in heading(track) during loop segments or after prescribed roll
4. Prescribed roll not on center of 45-degree line
5. No hesitations before or after prescribed roll.
6. Over or under rotation of roll, one point per 15-Degree Rule.

9. **Double Immelman without rolls (U):** Model pulls up into a one-half (1/2) inside loop to level inverted flight, hesitates, then pulls into a second one-half inside loop to return to the entry altitude to recover in level upright flight. The horizontal legs should be equal to the diameter of the half loops. The first half loop is initiated at a distance of half the loop diameter past the centerline.

Downgrades:

1. Half loops not of constant and equal radius.
2. Half loops not completed exactly above or below point of commencement of half loops.
3. Changes in heading during half loops and lines.
4. Entry and exit not at same altitude.

10. **Immelman Turn(T):** The model starts the Immelmann flying straight and level, pulls up into one-half (1/2) inside loop immediately followed by one-half (1/2) roll and finishes flying straight and level exactly 180 degrees from the heading at entry.

Downgrades:

1. Model not level at start or finish.
2. Model deviates left or right during half loop.
3. Half loop not completed exactly above point of commencement of half loop.
4. Half roll does not commence immediately after half loop.
5. Plane deviates from a straight line during roll.
6. Model does not finish in level flight.
7. Model heading does not finish exactly opposite the direction of entry.
8. Half loop not round.
9. Over or under rotation of roll, one point per 15-Degree Rule.

11. **45-Degree Down Line (D):** From level flight model pushes and executes a one-eighth (1/8) outside loop to a 45 degree down line, hesitates, performs a one-eighth (1/8) inside loop to recover in level flight. The center of this maneuver is the mid-point of the 45 degree line.

Downgrades:

1. Loop segments not round or have the same radius.
2. Dive Path (track) not 45 degrees. Apply one point per 15 degree rule.
3. 45 degree line not centered.
4. Track changes during 45 degree line.
5. Changes in heading (track) during loop segments

12. **Vertical Up Line (on center) (U):** From level upright flight model Pulls and executes a one-quarter (1/4) inside loop to a Vertical flight path (up line), hesitates, performs a one-quarter (1/4) outside loop to recover in upright level flight at a higher altitude. The vertical line is center of the maneuver. There is no length requirement for the vertical line

Downgrades:

1. Both one-quarter loop segments must be round and have the same radius.
2. Vertical flight path (track) not vertical
3. Vertical line offset right or left of center
4. Heading (track) changes

13. **Split “S” (T):** Model performs one-half (1/2) roll in level flight then immediately executes one-half inside loop to level flight in opposite direction as entry.

Downgrades:

1. Half roll not 180 degrees. Apply one point per 15 degree rule.
2. Half loop not started immediately after half roll.
3. Half loop not constant radius.
4. Changes in heading (track).
5. One-half (1/2) roll not in level flight.
6. Model heading (track) does not finish exactly opposite the direction of entry.
7. Wings not level during looping segment

14. **One Horizontal Roll (D):** Model rolls at a uniform rate through one (1) complete revolution in either direction. Center is inverted portion of maneuver.

Downgrades:

1. Changes in heading (track) during roll.
2. Changes in altitude during roll.
3. Roll rate not constant.
4. Roll not centered
5. Model does not perform exactly one roll, one point per 15-Degree Rule.

15. **Half Reverse Cuban Eight (T):** Model executes one-eighth (1/8) inside loop to a 45 degree up line, hesitates, does one-half (1/2) roll, hesitates, then performs five-eighths (5/8) inside loop back to level flight in opposite direction as entry.

Downgrades:

1. Loop segments not round with the same size and radius.
2. Model not at 45 degrees before and after half roll. Apply “One point per 15 degree Rule”
3. Changes in heading (track) in loop segments or after half roll.
4. Half roll not centered in 45 degree line.
5. No hesitations before or after half roll.
6. Over or under rotation of roll. Apply one point per 15-Degree Rule.

16. **Cobra Roll without rolls (U):** Model executes a one-eighth (1/8) inside loop to a 45 degree up line, hesitates, performs one quarter(1/4) outside loop to a 45 degree down line, hesitates, then performs one-eighth (1/8) inside loop to recover to level flight at the same altitude as entry. The one-quarter (1/4) loop is to be centered on the aerobatic box centerline.

Downgrades:

1. Up and down lines not 45 degrees. Apply one point per 15 degree rule.
2. Changes in heading (track).

3. Loop segments not round with same size radius.
4. Entry and exit not at same altitude.

17. **Landing Sequence (U):** The landing maneuver will be scored in half point increments from 10 to 0. The maneuver will start two (2) meters from the ground. The model flares smoothly to a nose high altitude, dissipating flying speed, and then smoothly touches the ground, within the landing zone. The maneuver should be considered complete once the plane has slowed below flying speed and rolled 10 meters or comes to a stop and no further downgrades shall be applied after that point. The landing zone shall be marked by lines placed perpendicular across the runway and spaced 30 meters apart. The width of the landing zone is normally the width of the runway but in no case shall exceed 30 meters. Landing is not a centered maneuver and there is no downgrade for displacement of the touchdown point left or right from center as long as the landing is in the landing zone. If the touchdown is within the runway but not in the landing zone it should be downgraded proportionate to the distance outside the landing zone. The Contest Director may designate any landing zone appropriate to the field if safety considerations dictate. If the landing zone is anything other than standard it should be thoroughly discussed with the pilots and judges before flying is started and no downgrade shall be applied due to the touchdown in the non-standard landing zone.

The landing will not be downgraded if:

1. Wing dips which are caused by air turbulence unless they are not immediately corrected.
2. The pilot “slips to a landing” to handle a crosswind condition in which case a wing will be low.
3. The model rolls to a controlled stop within 10 meters.
4. Displacement of touchdown point left or right as long as the landing is in the landing zone.

Downgrades:

1. Model passes behind the judges line, zero (0) points.
2. Model impacts the runway due to lack of flare.
3. Model bounces.
4. Changes in track.
5. Model ends on its back, zero (0) points.
6. Model lands outside landing zone.
7. If any undercarriage retracts before the landing is complete, zero (0) points.
8. Aircraft —porpoises and/or wanders during approach or flare.
9. Aircraft lands outside the landing area or runway, zero (0) points.
10. Aircraft touches down while not straight to runway and ground track.

