



SCHEMATIC MANEUVER DIAGRAMS

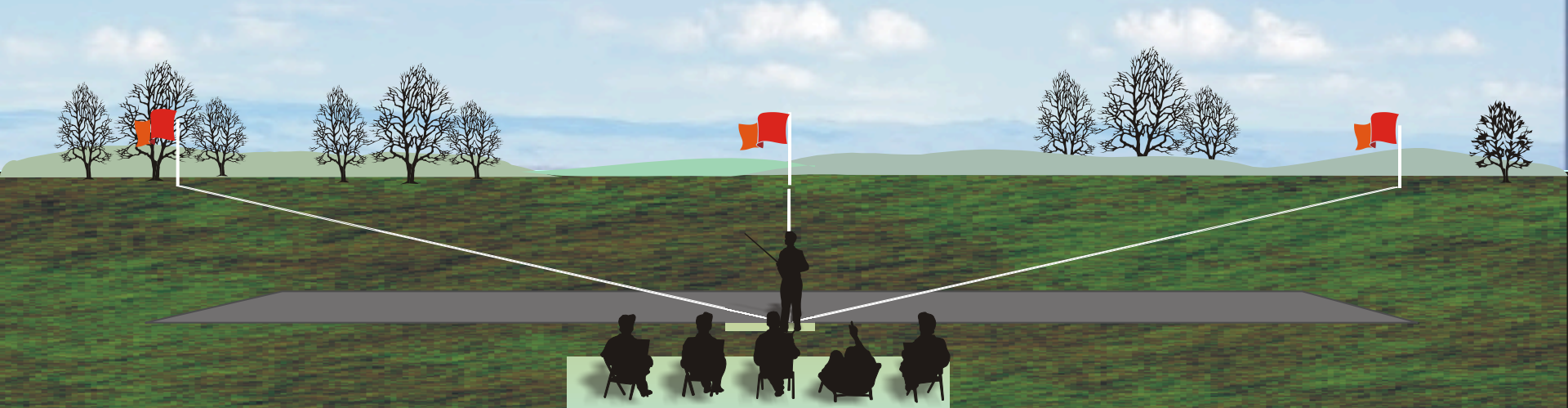
AMA Sportsman 401

2020 - 2021



General Judging Guide

- The competitor or judge should refer to the AMA Judge's Guide for general information regarding downgrades such as the "One Point per 15 degree Rule".
- All aerobatic maneuvers are started and ended by a horizontal line. When no line is flown between two (2) scored maneuvers, the upcoming maneuver should be downgraded by two (2) points.
- Turnaround maneuvers are never required to exit at the same altitude as the entry
- Turnaround maneuvers are always required to be exited on a track that is a reciprocal heading (180 degrees) to the entry track.
- Center maneuvers will always exit at the same track as the entry track
- Unless specifically stated otherwise, all maneuver geometry is to be judged by track
- The only portions of maneuvers where track does not apply are the entries to the stall turn and the spin.
- Although the 15 degree rule applies universally, judges are expected to be more critical of horizontal and vertical tracks than those at off angles, such as 45 degree lines.
- Start of the takeoff, landing and box entry must be called out by the competitor or his caller to avoid downgrades. There is no downgrade for not calling takeoff and landing completions or box exit.



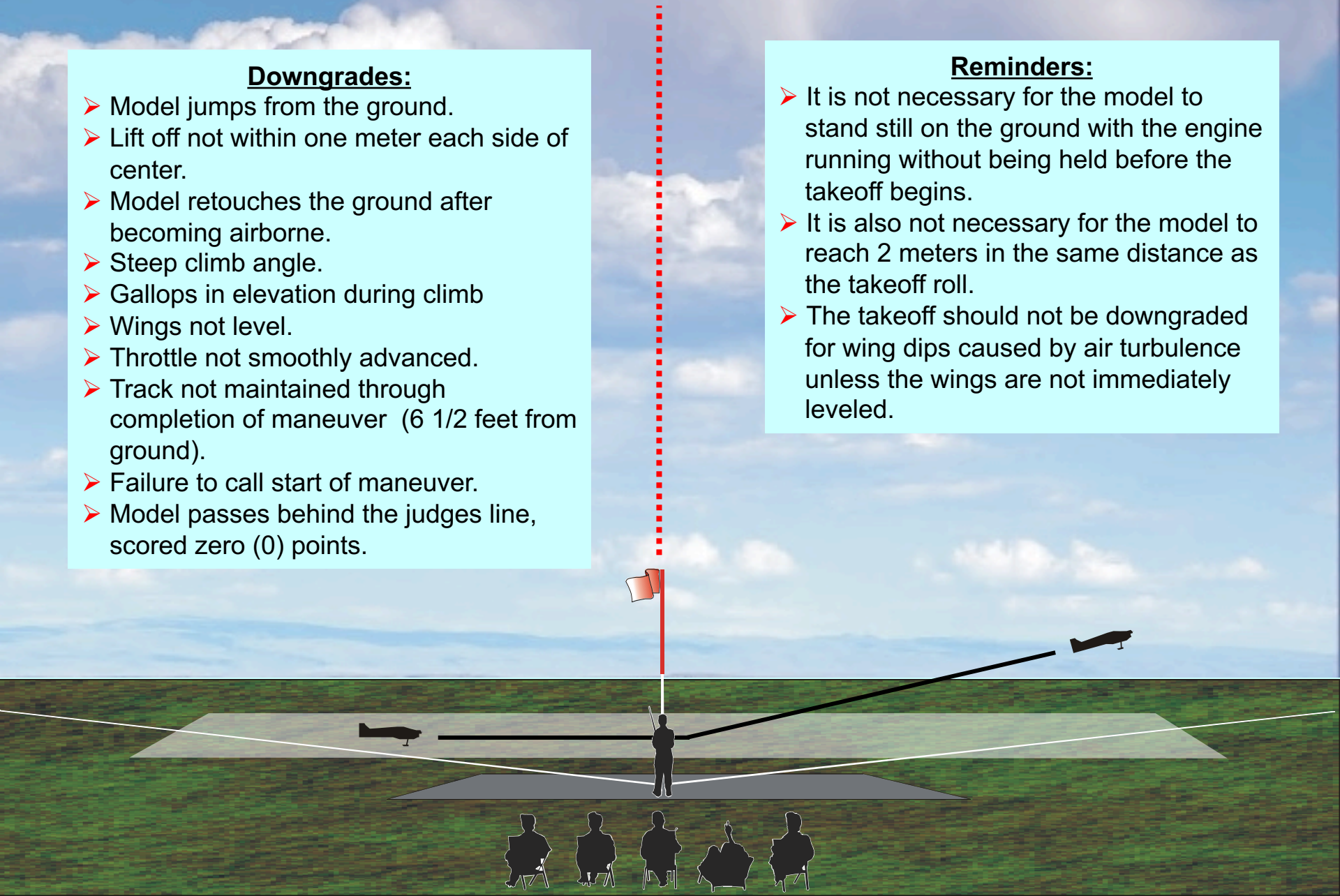
401-1 Takeoff (U)

Downgrades:

- Model jumps from the ground.
- Lift off not within one meter each side of center.
- Model retouches the ground after becoming airborne.
- Steep climb angle.
- Gallops in elevation during climb
- Wings not level.
- Throttle not smoothly advanced.
- Track not maintained through completion of maneuver (6 1/2 feet from ground).
- Failure to call start of maneuver.
- Model passes behind the judges line, scored zero (0) points.

Reminders:

- 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 roll.
- The takeoff should not be downgraded for wing dips caused by air turbulence unless the wings are not immediately leveled.



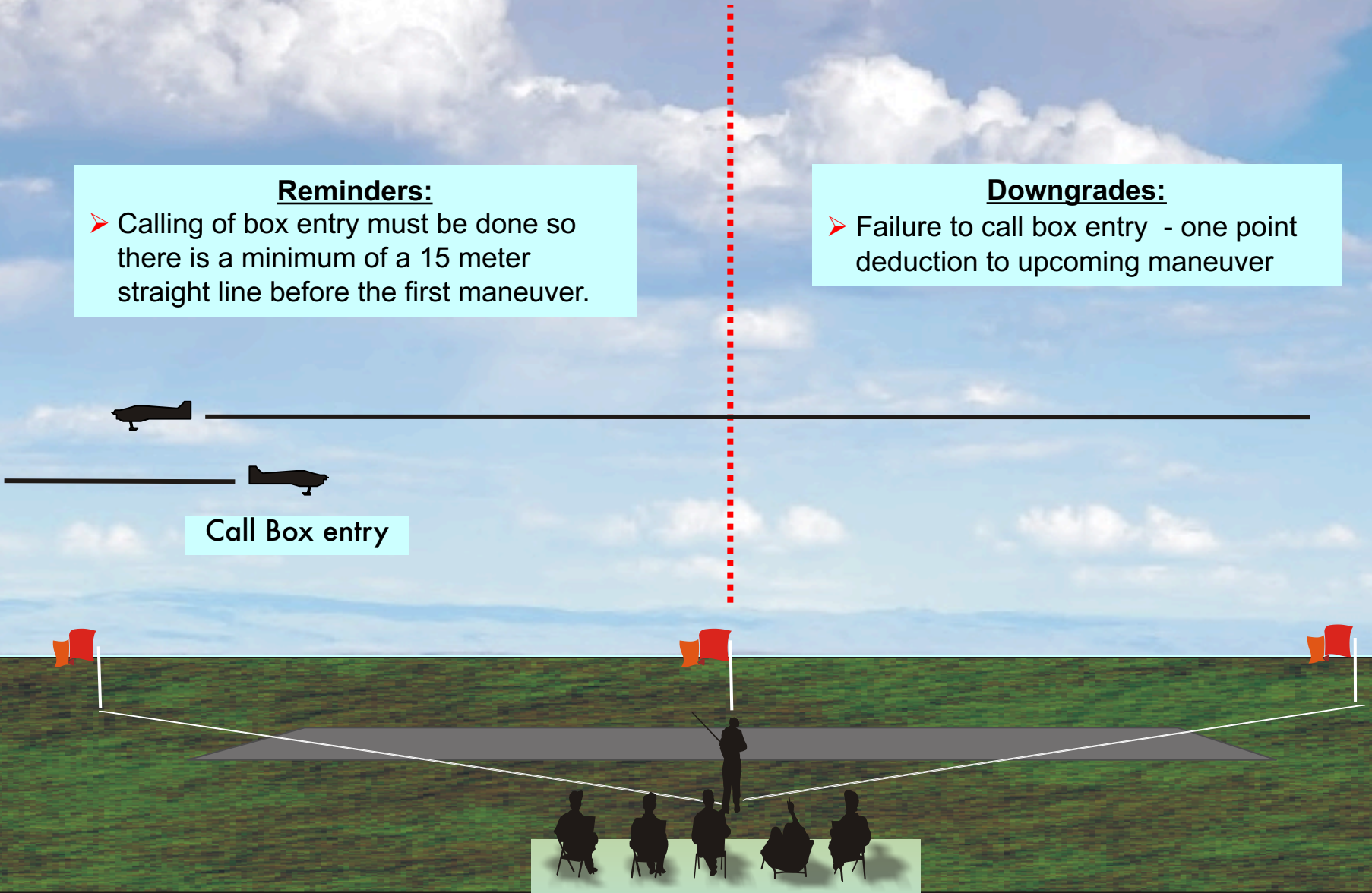
Un-Scored Trim Pass after takeoff (D)

Reminders:

- Calling of box entry must be done so there is a minimum of a 15 meter straight line before the first maneuver.

Downgrades:

- Failure to call box entry - one point deduction to upcoming maneuver



401-2 Straight Flight Out (U)

Maneuver Description:

- From upright, fly a straight line parallel to the flight 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:

- Track of plane deviates left or right “One Point per 15 Degree Rule”.
- Does not hold constant altitude.
- Gallops in yaw, roll, or pitch.



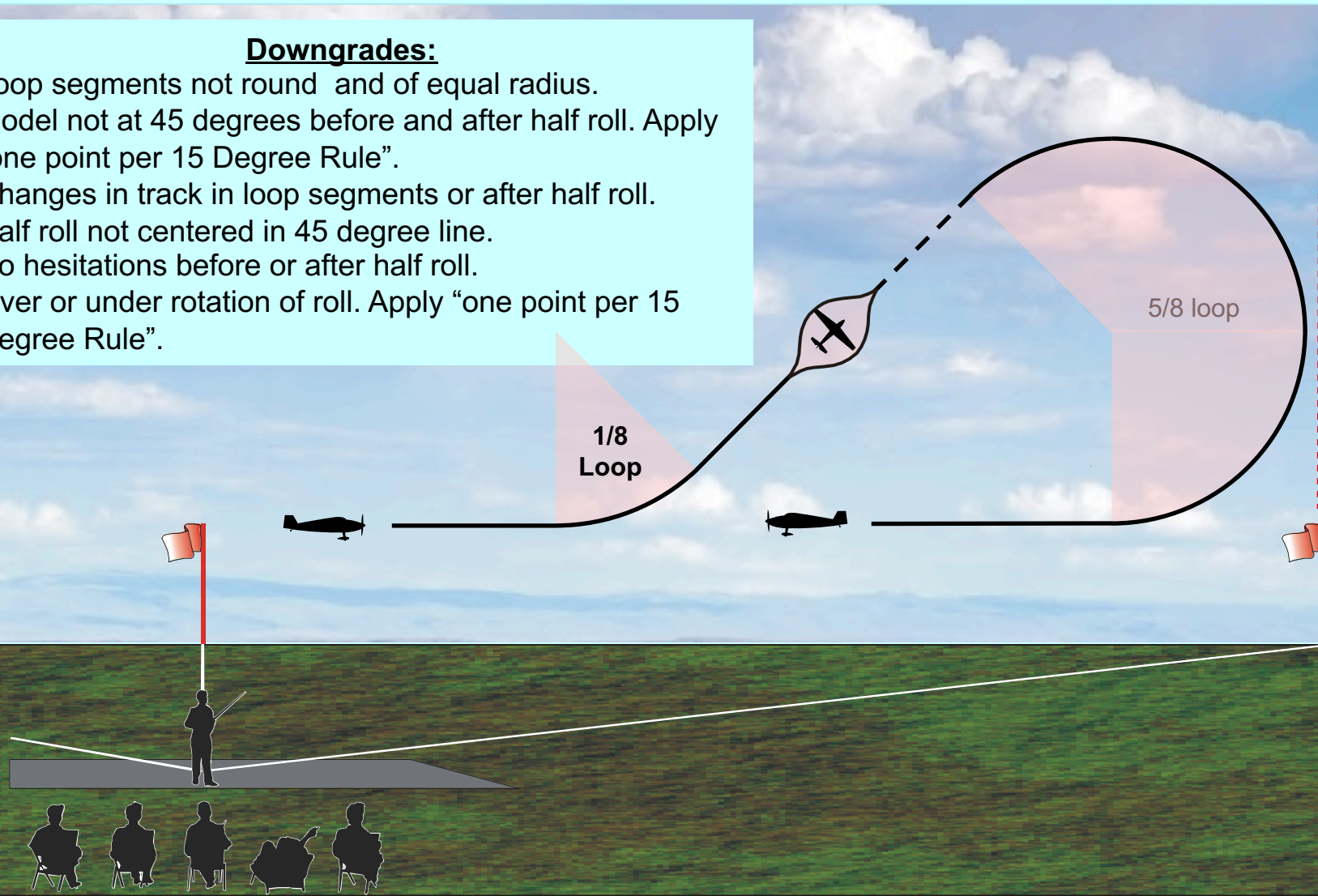
401-3 Half Reverse Cuban Eight (T)

Maneuver Description:

From upright pull a one eighth $1/8$ inside loop to a 45 degree up line, hesitate, perform a one half $(1/2)$ roll, hesitate, perform a $(5/8)$ inside loop back to exit upright.

Downgrades:

- Loop segments not round and of equal radius.
- Model not at 45 degrees before and after half roll. Apply “one point per 15 Degree Rule”.
- Changes in track in loop segments or after half roll.
- Half roll not centered in 45 degree line.
- No hesitations before or after half roll.
- Over or under rotation of roll. Apply “one point per 15 Degree Rule”.



401-4 Straight Flight Back (D)

Downgrades:

- Track of plane deviates left or right. Apply “one point per 15 Degree Rule”.
- Does not hold constant altitude.
- Gallops in pitch, yaw, or roll.
- Return path not parallel to the flight path.

Maneuver Description:

- 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”.



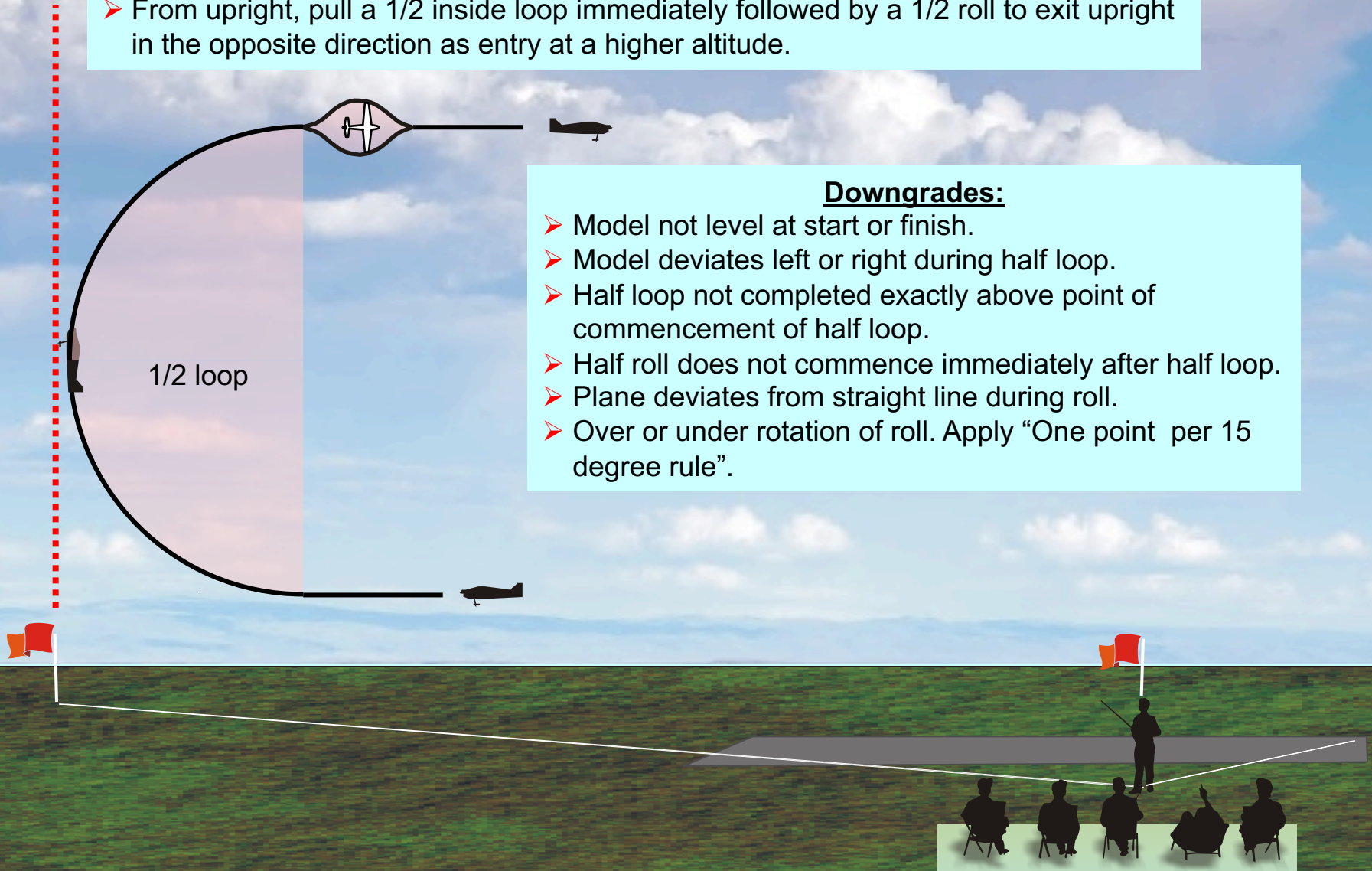
401-5 Immelman Turn (T)

Maneuver Description:

- From upright, pull a 1/2 inside loop immediately followed by a 1/2 roll to exit upright in the opposite direction as entry at a higher altitude.

Downgrades:

- Model not level at start or finish.
- Model deviates left or right during half loop.
- Half loop not completed exactly above point of commencement of half loop.
- Half roll does not commence immediately after half loop.
- Plane deviates from straight line during roll.
- Over or under rotation of roll. Apply "One point per 15 degree rule".



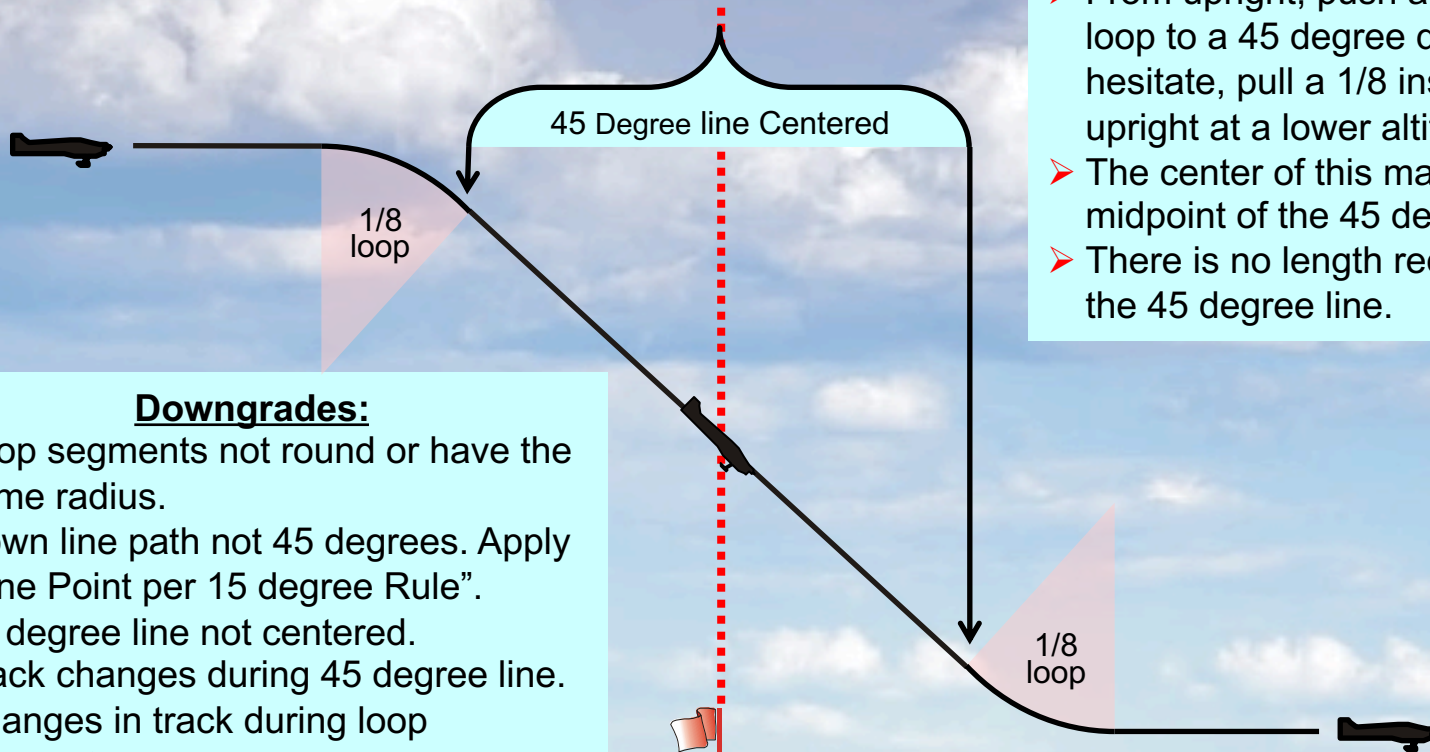
401-6 45 Degree Down Line (U)

Maneuver Description:

- From upright, push a 1/8 outside loop to a 45 degree downline, hesitate, pull a 1/8 inside loop to exit upright at a lower altitude.
- The center of this maneuver is the midpoint of the 45 degree line.
- There is no length requirement for the 45 degree line.

Downgrades:

- Loop segments not round or have the same radius.
- Down line path not 45 degrees. Apply "One Point per 15 degree Rule".
- 45 degree line not centered.
- Track changes during 45 degree line.
- Changes in track during loop segments.



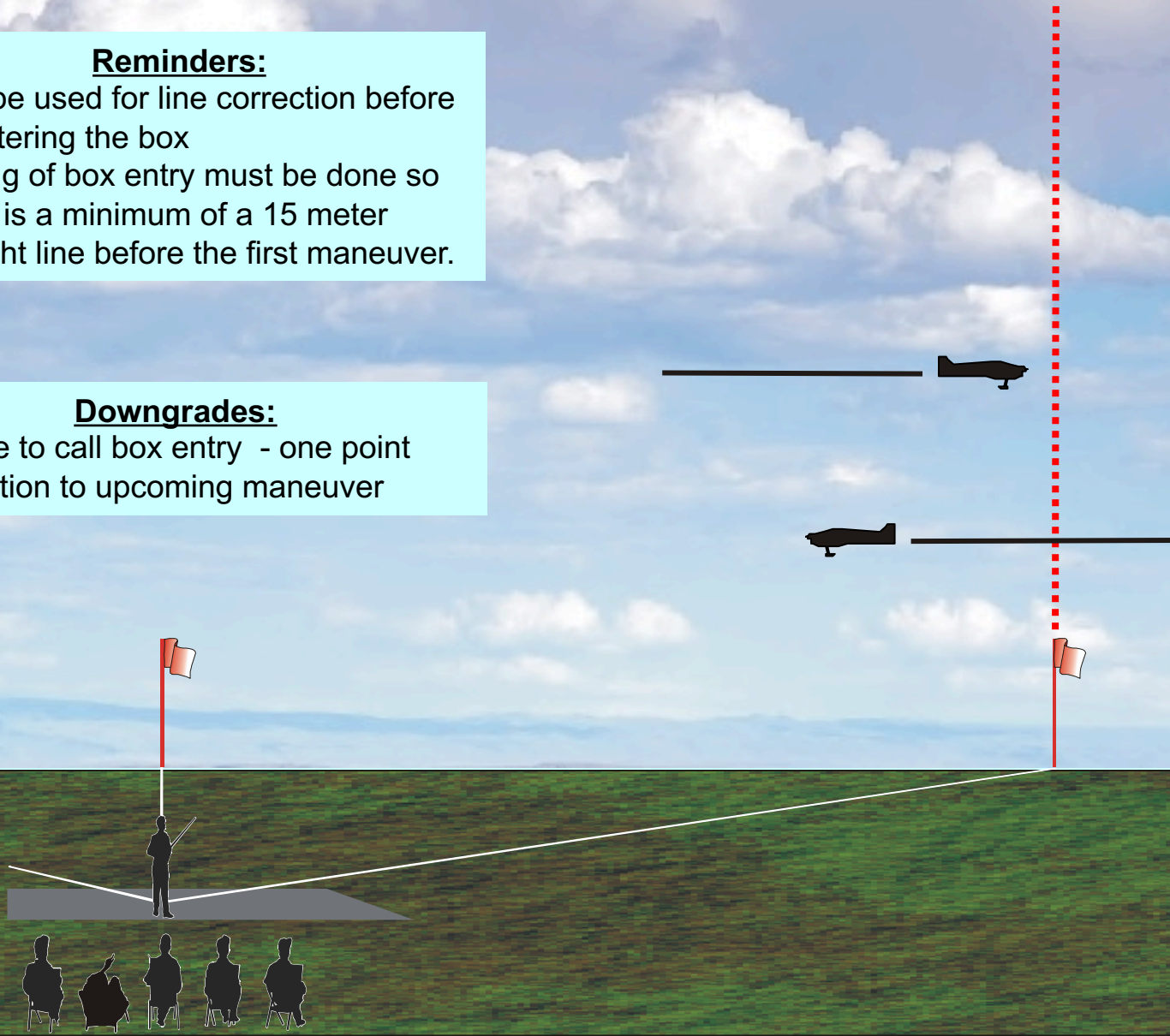
Box Exit and Re-entry

Reminders:

- Can be used for line correction before re-entering the box
- Calling of box entry must be done so there is a minimum of a 15 meter straight line before the first maneuver.

Downgrades:

- Failure to call box entry - one point deduction to upcoming maneuver



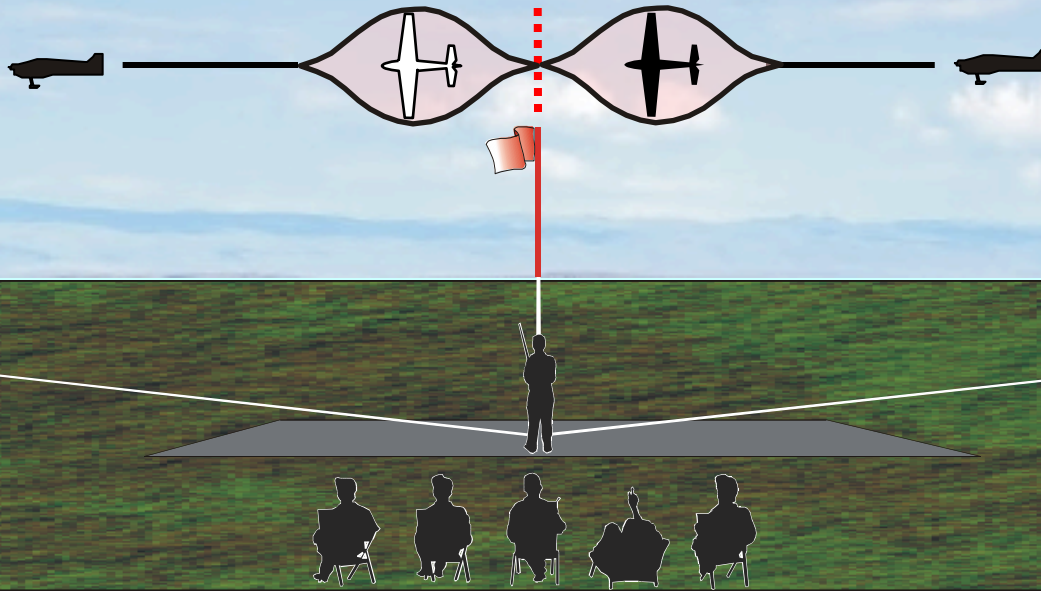
401-7 One Horizontal Roll (D)

Maneuver Description:

- From upright, perform a roll at a uniform rate through a complete revolution in either direction to exit upright.
- Center is the inverted portion of maneuver.

Downgrades:

- Changes in track during roll.
- Changes in altitude during roll.
- Roll rate not constant.
- Roll not centered.
- Model does not perform exactly one roll. Apply "One Point per 15 Degree Rule".



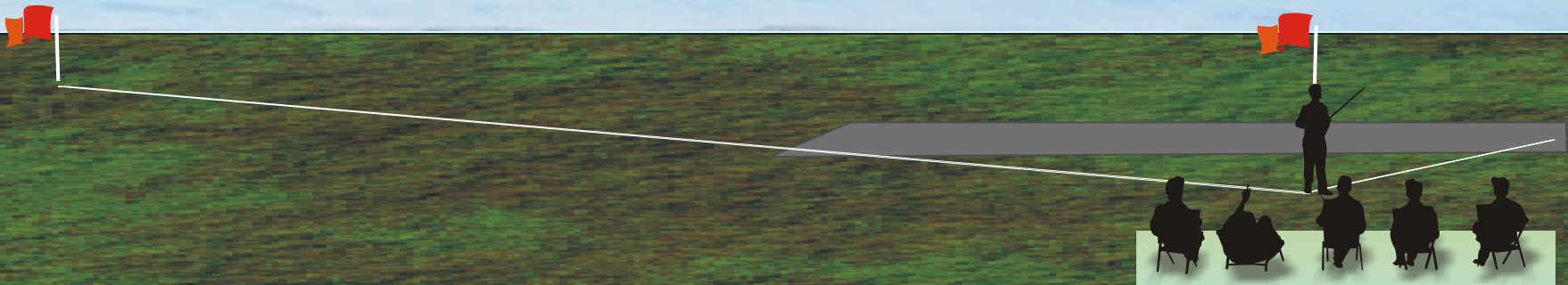
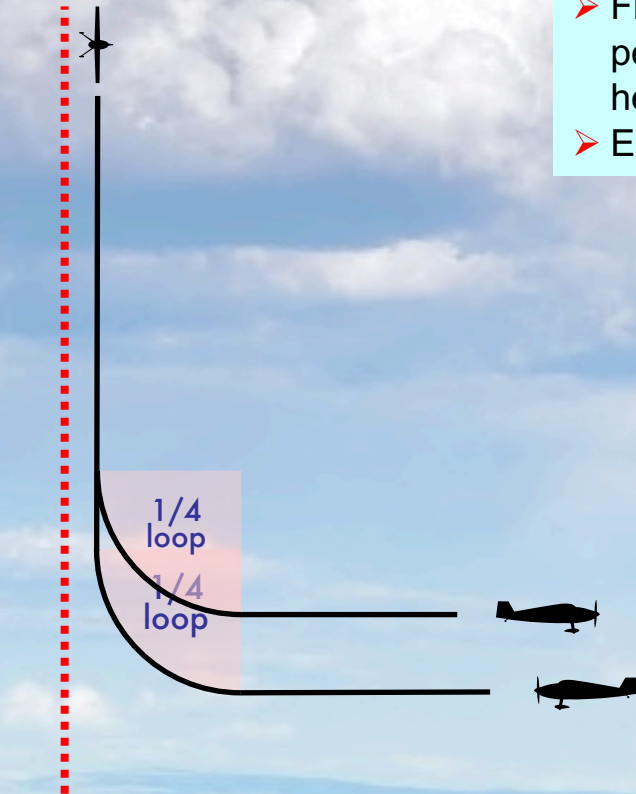
401-8 Stall Turn without Rolls (T)

Maneuver Description:

- From upright, pull a 1/4 inside loop to a vertical up line, hesitate, perform a stall turn through 180 degrees to a vertical down line, hesitate, pull a 1/4 inside loop to exit upright.
- Exit altitude of maneuver need not be the same as entry altitude.

Downgrades:

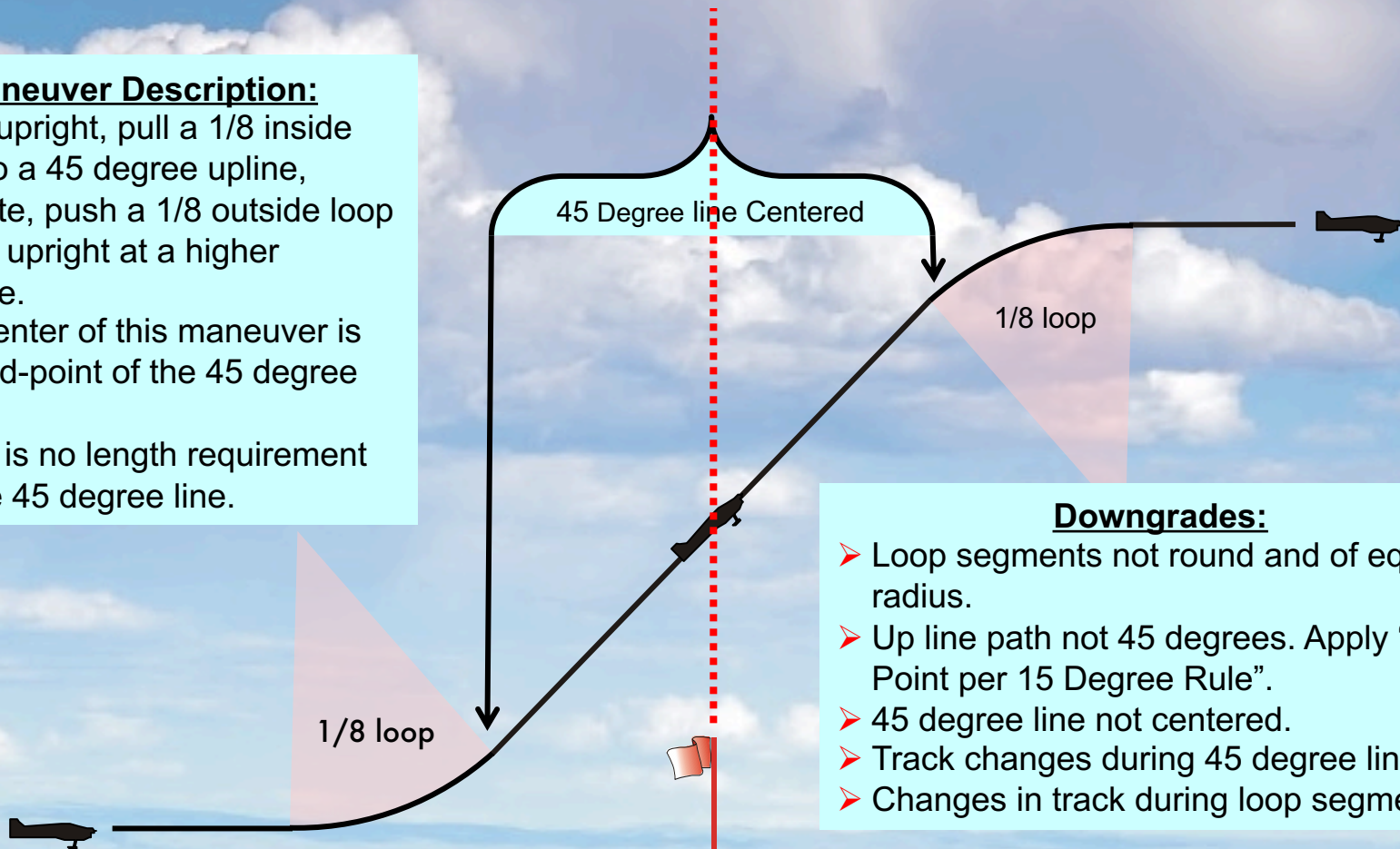
- Model not level at start and finish.
- Upline and downline tracks are not vertical.
- Model not pitched to vertical at start and finish of stall turn.
- Pivot radius greater than one half wingspan.
- Pendulum movement after stall.
- Loop segments not round with same size and radius.



401- 9 45 Degree Upline (U)

Maneuver Description:

- From upright, pull a 1/8 inside loop to a 45 degree upline, hesitate, push a 1/8 outside loop to exit upright at a higher altitude.
- The center of this maneuver is the mid-point of the 45 degree line.
- There is no length requirement for the 45 degree line.



Downgrades:

- Loop segments not round and of equal radius.
- Up line path not 45 degrees. Apply "One Point per 15 Degree Rule".
- 45 degree line not centered.
- Track changes during 45 degree line.
- Changes in track during loop segments.

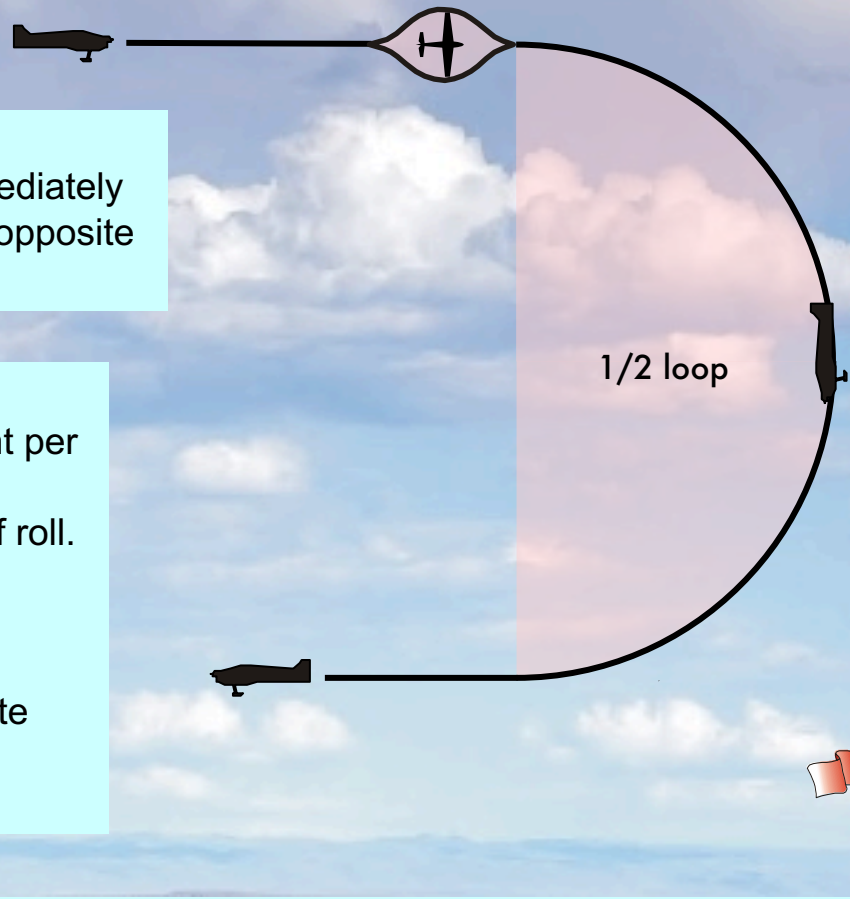
401-10 Split "S" (Half roll, half loop from top) (T)

Maneuver Description:

- From upright, perform a 1/2 roll, then immediately pull a 1/2 inside loop to exit upright in the opposite direction as entry but at a lower altitude.

Downgrades:

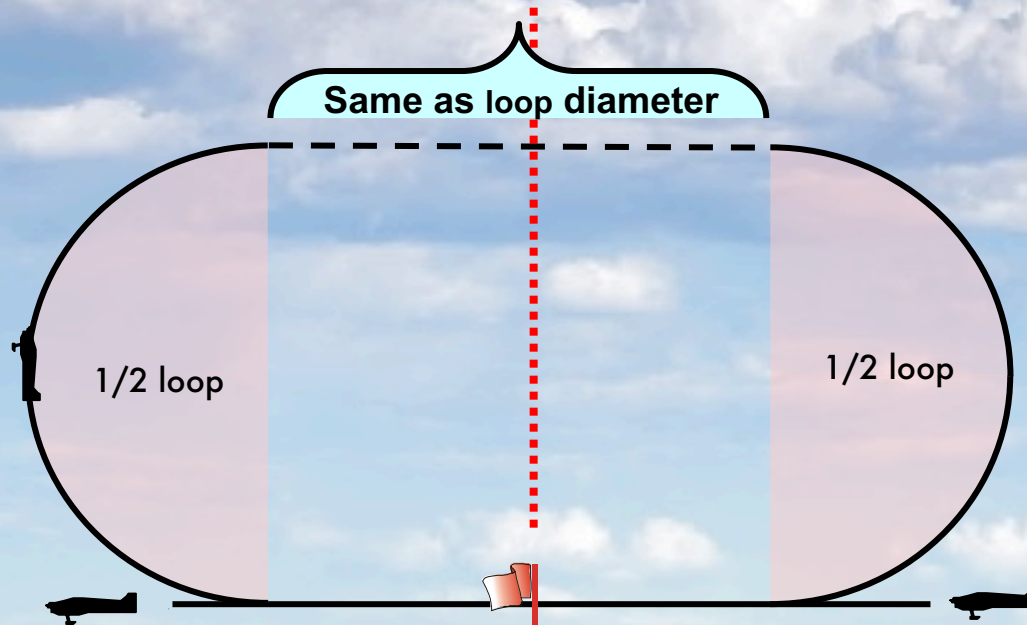
- Half roll not 180 degrees, Apply "One Point per 15 Degree Rule."
- Half loop not started immediately after half roll.
- Half loop not constant radius.
- Changes in track.
- 1/2 Roll not in level flight.
- Model track does not finish exactly opposite the direction of entry.
- Wings not level during looping segment.



401-11 Double Immelman without Rolls (D)

Maneuver Description:

- From upright, pull a 1/2 inside loop to level inverted flight, hesitate, pull a 1/2 inside loop to exit upright at the entry altitude.
- The horizontal legs should be equal to the diameter of the half loops.
- The first one half (1/2) loop is initiated at a distance of one half (1/2) the loop diameter past the centerline.



Downgrades:

- Half loops not of constant and same radius.
- Half loops not completed exactly above or below point of commencement of half loops.
- Changes in track during half loops or lines.
- Entry and exit not at same altitude.



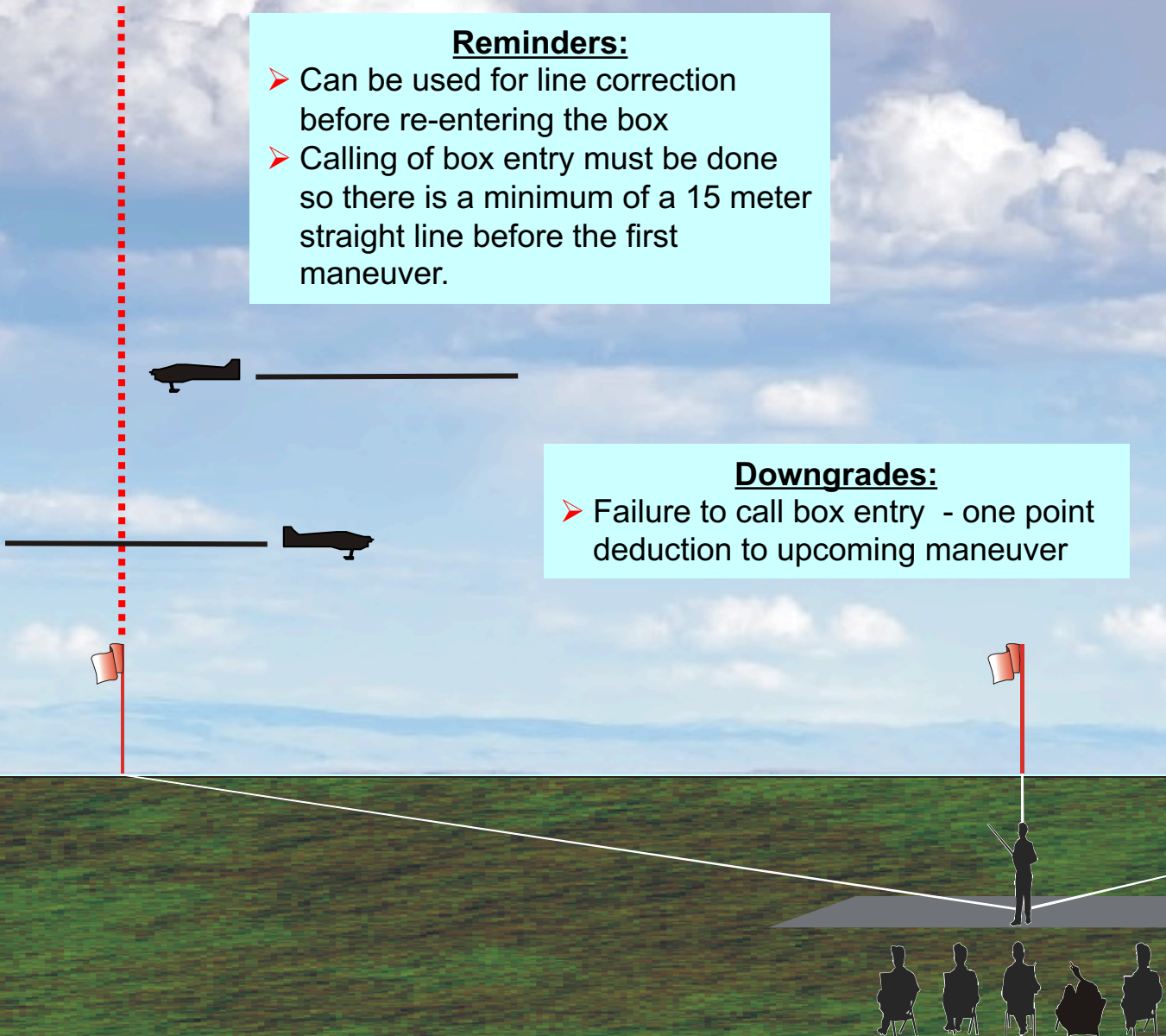
Box Exit and Re-Entry

Reminders:

- Can be used for line correction before re-entering the box
- Calling of box entry must be done so there is a minimum of a 15 meter straight line before the first maneuver.

Downgrades:

- Failure to call box entry - one point deduction to upcoming maneuver



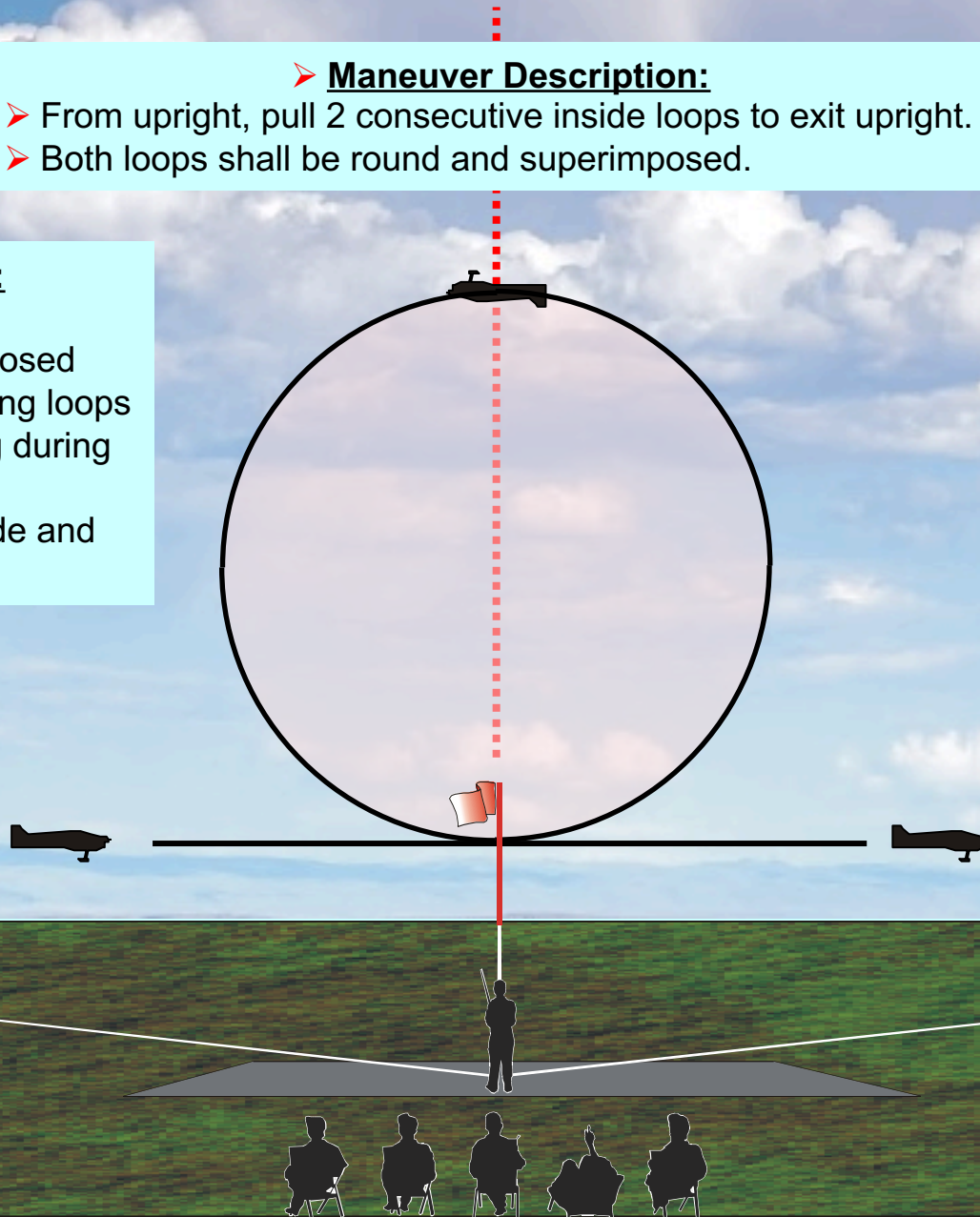
401-12 Two Inside Loops (U)

➤ Maneuver Description:

- From upright, pull 2 consecutive inside loops to exit upright.
- Both loops shall be round and superimposed.

Downgrades:

- Loops not round
- Loops not superimposed
- Wings not level during loops
- Changes in heading during loops
- Exit not same altitude and track as entry.



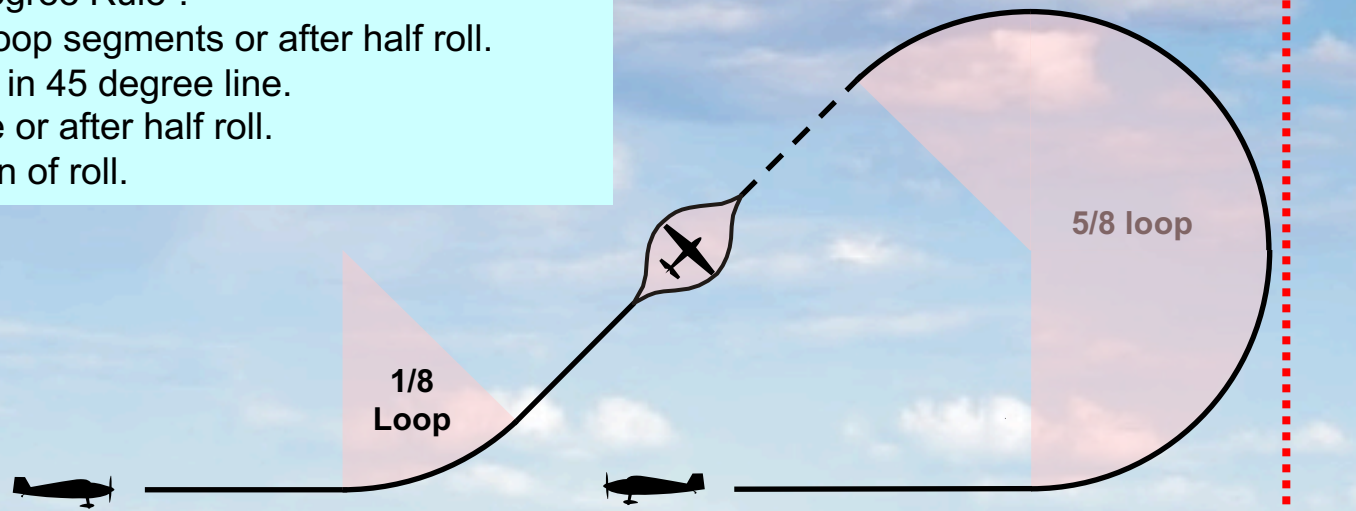
401-13 Half Reverse Cuban Eight (T)

Maneuver Description:

- From upright, pull a $1/8$ inside loop to a 45 degree upline, hesitate, perform a $1/2$ roll, hesitate, pull a $5/8$ inside loop to exit upright.

Downgrades:

- Loop segments not round with the same size and radius.
- Model not at 45 degrees before and after half roll. Apply "One Point per 15 Degree Rule".
- Changes in track in loop segments or after half roll.
- Half roll not centered in 45 degree line.
- No hesitations before or after half roll.
- Over or under rotation of roll.



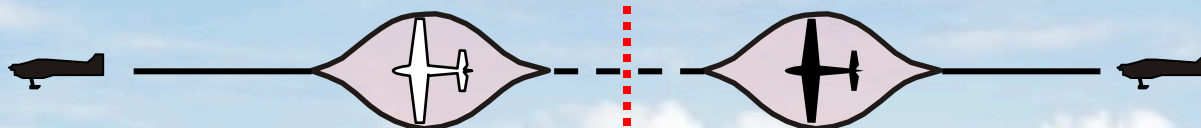
401-14 2 Point (2 of 2) Roll (D)

Maneuver Description:

- From upright, perform a 1/2 roll to level inverted flight, hesitate, perform a second 1/2 roll in the same direction to exit upright.
- Center of maneuver is the middle of inverted hesitation.
- Length of the inverted hesitation is not a reason for downgrade if it has a visible length.

Downgrades:

- Model does not hesitate at inverted.
- Roll rate not constant.
- Over or under rotation of rolls.
- Change in altitude.
- Changes in track.
- Roll rates not constant.



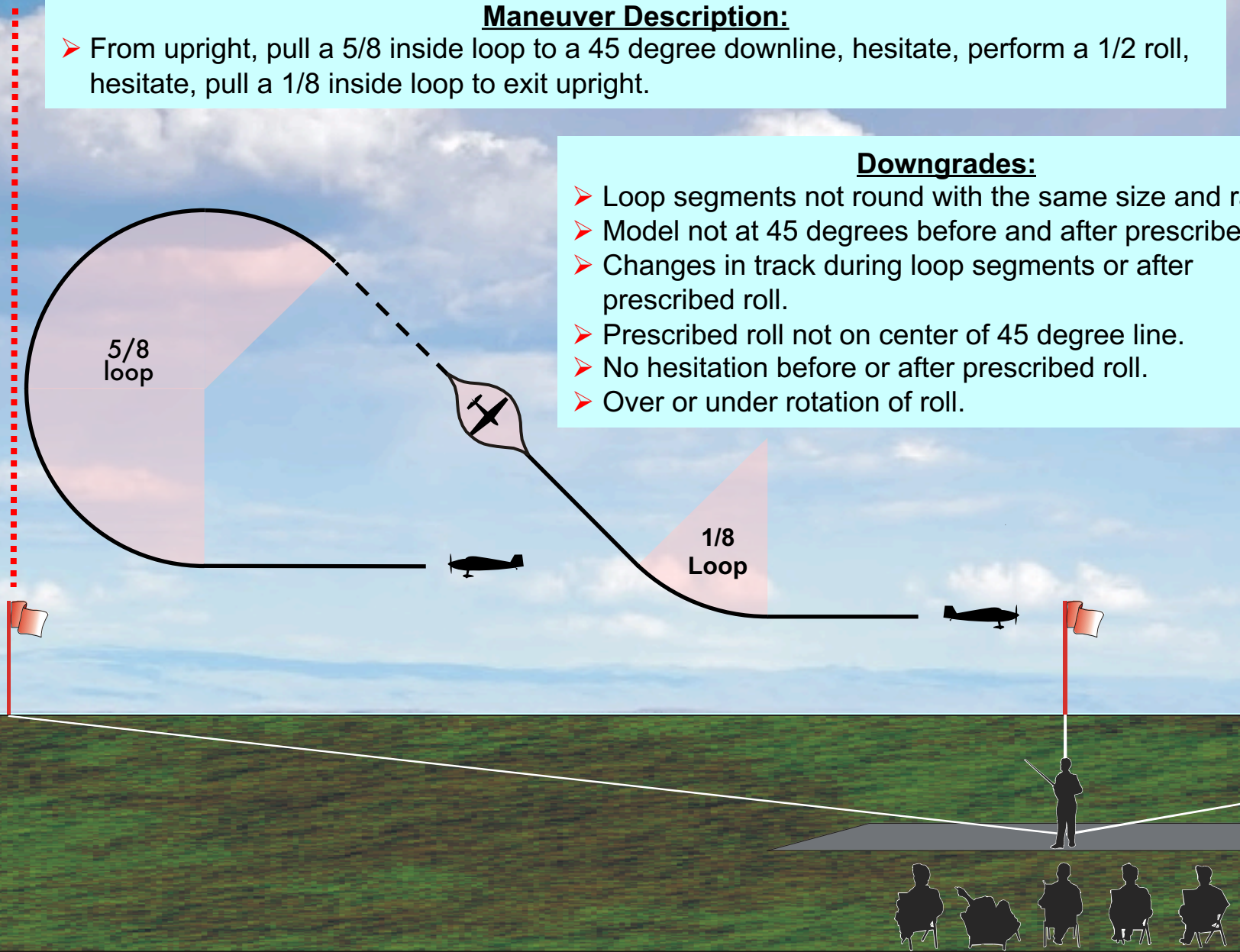
401-15 Half Cuban Eight (T)

Maneuver Description:

- From upright, pull a 5/8 inside loop to a 45 degree downline, hesitate, perform a 1/2 roll, hesitate, pull a 1/8 inside loop to exit upright.

Downgrades:

- Loop segments not round with the same size and radius.
- Model not at 45 degrees before and after prescribed roll.
- Changes in track during loop segments or after prescribed roll.
- Prescribed roll not on center of 45 degree line.
- No hesitation before or after prescribed roll.
- Over or under rotation of roll.



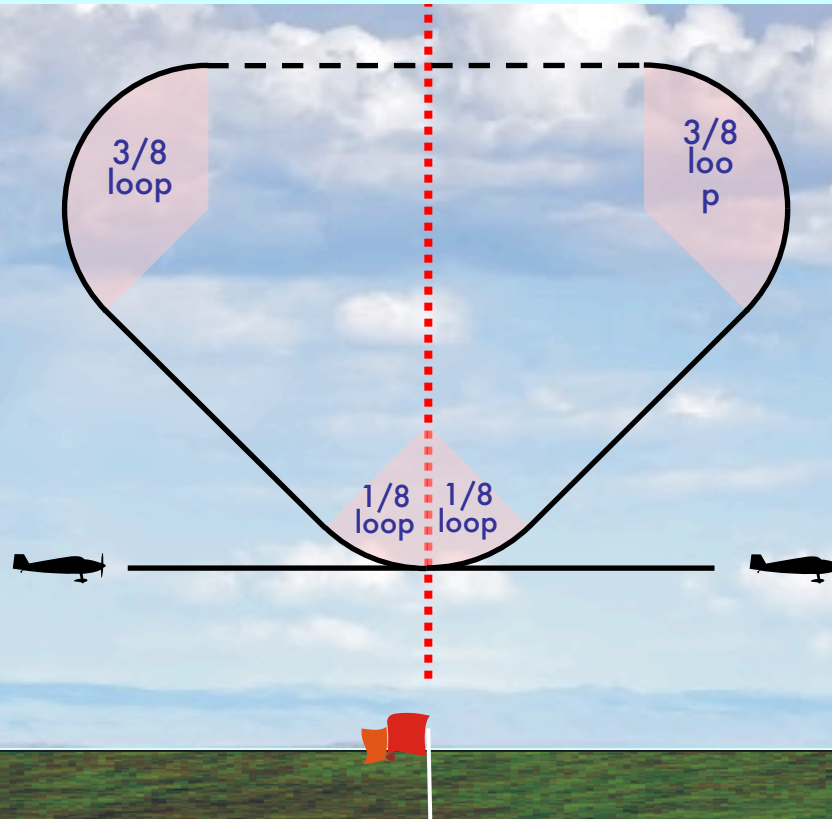
401-16 Triangle loop, non rolling (from bottom) (U)

Maneuver Description

- From upright, at center pull through a 1/8 loop to a 45-degree up track, hesitate, pull through a 3/8 loop to level inverted flight, hesitate, pull through a 3/8 loop to a 45-degree down track, hesitate, pull through a 1/8 loop to exit upright.

Downgrades:

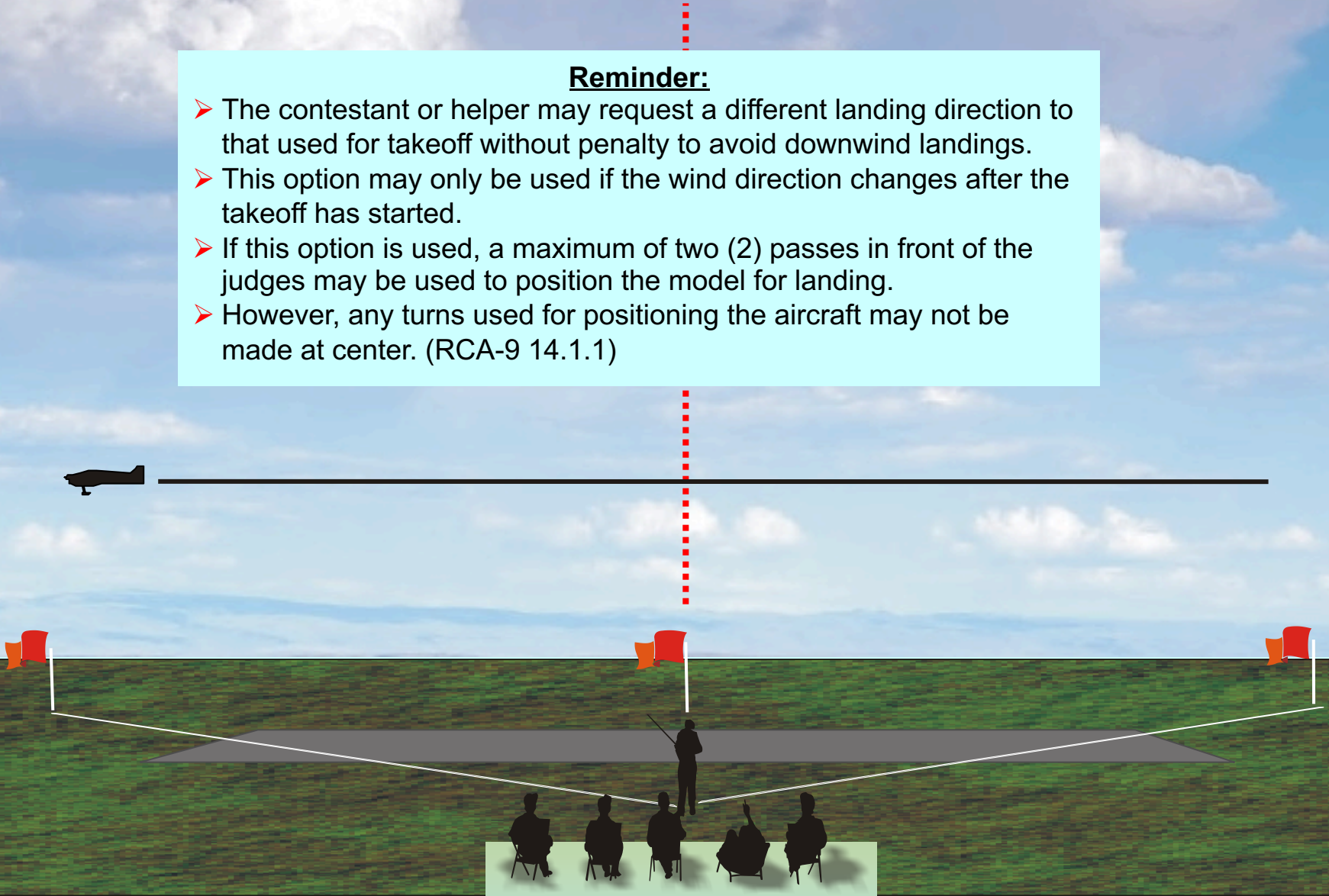
- Loop segments not round and of equal radius.
- Up and downline track not 45 degrees. Apply "One point per 15 Degree Rule".
- Upline and downline not of equal length.
- Wings not level during loop segments.
- Changes in track during loop segments.
- Apex of triangle not centered.
- Exit not at same altitude and track as entry.



Un-Scored Pass, landing setup (D)

Reminder:

- The contestant or helper may request a different landing direction to that used for takeoff without penalty to avoid downwind landings.
- This option may only be used if the wind direction changes after the takeoff has started.
- If this option is used, a maximum of two (2) passes in front of the judges may be used to position the model for landing.
- However, any turns used for positioning the aircraft may not be made at center. (RCA-9 14.1.1)



401-17 Landing

The landing will not be downgraded if:

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

Reminders:

- Landing begins when the model is approximately two (2) meters (6-1/2 feet) from the ground.
- 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.

Downgrades:

- Model passes behind the judges line, zero (0) points.
- Model impacts the runway due to lack of flare
- Changes in track.
- Model ends on its back, zero (0) points
- Model lands outside landing zone
- If any undercarriage retracts before the landing is complete, zero (0) points
- Aircraft “porpoises” and/or wanders during approach or flare.
- Aircraft lands outside the landing area or runway, zero (0) points.
- Aircraft touches down while not straight to runway and ground track.
- Failure to call beginning of maneuver.

Landing zone is 30 m long and normally the width of the runway BUT not more than 30 M wide.
Landing is not a centered maneuver and there is no downgrade for displacement of touchdown point left or right of center.

