

## **LEVEL 4 EXPERT** To Achieve Level 4, a Level 3 pilot must:

### 1. **Exhibit self control during any emergency or minor accident to lesser experienced fliers.**

This is not really a measurable parameter but it is important that a pilot at this level be willing and able to help less experienced pilots in the case of any event involving safety of members and spectators. Pilots at this level are expected to be more vigilant in this regard and are encouraged to keep safety first, even if that means landing in the corn rather than trying to guide a partially out of control model back onto the field where it might endanger others; or perhaps NOT flying if there is any doubt as to the flight worthiness of a model aircraft.

### 2. **Perform the following maneuvers during one flight/consecutive flights:**

a. **Double Immelman** The pilot should enter the maneuver from straight and level flight and should draw a line parallel to the flight line and at a constant altitude. The aircraft should pull a half loop (which should be one continuous radius without flat spots and with wings remaining level). Immediately upon reaching level inverted flight the pilot should execute a half roll to upright. The pilot should then draw another line as before but now flying in the opposite direction. The pilot should then push an outside half loop (again constant radius and wings level) immediately followed by a roll to upright. The pilot should then fly the final line of the maneuver in the same direction as the original entry line, once again straight, level and parallel to the flight line. The two half loops should be of equal radii with the result that the aircraft enters and exits the maneuver at the same altitude.

b. **Humpty Bump** To perform a Humpty Bump the pilot starts straight and level parallel to the flight line and then pulls up into a vertical up line. The pull up should be one continuous radius without flat spots during which the wings remain level. After establishing the up line, the pilot then pulls a half loop into a vertical down line. This half loop should again be one continuous pull with the aircraft ending in a direct downward path. The aircraft then should establish a down line before pulling once again back to straight and level. Finally a straight and level exit line should be established. This final  $\frac{1}{4}$  loop is judged similarly to all of the previous partial loops. The initial (entry)  $\frac{1}{4}$  loop and the final exit  $\frac{1}{4}$  loop should be of equal radius however the top  $\frac{1}{2}$  loop does not have to be of equal size, nor does the entry and exit altitude have to be similar.

c. **Avalanche** An Avalanche is simply a loop with a full positive snap roll at the top of the loop. In order to do this correctly the pilot should perform the following. The pilot should enter the maneuver from straight and level flight. The pilot will pull up into a half loop then complete a positive snap roll centered on the top of the loop and then complete the other half of the loop. The complete loop should appear circular to the observers and should be completed at the same point where it began both in respect to altitude and distance from the flight line.

d. **Inverted Spin** - three turns The pilot should enter from a straight and level inverted flight and should stall the aircraft on entry. The aircraft should be continuing on heading and without altitude change up to the entry to the spin. Ideally the nose should drop as the wing drops on one side, indicating proper spin entry. The pilot should complete the three spins with the nose of the airplane straight down or nearly so and should stop rotation and continue to fly straight down for a short distance to show control. The pilot should then push back to level inverted flight in the same direction as the plane was flying upon entry. A spin has not been executed if the aircraft appears to fly into a nose down attitude or if the plane makes a significant amount of wing rotation before the nose drops. This is considered a forced entry and is not acceptable.

e. **Slow Roll** The aircraft should enter from straight and level on a path parallel to the runway then execute a 360 degree roll. During the entire roll the aircraft should maintain altitude and heading. As in all maneuvers the roll should be smooth and continuous without noticeable pauses or changes in speed. The roll should end back at straight and level and on the same heading as the maneuver began and should be performed at a point centered in front of the pilot. The rate of roll should be approximately one roll per 3 seconds or slower.

f. **Vertical Up line with 2 point roll** The pilot should begin straight and level and pull into a vertical up line in one smooth continuous pull. After establishing an up line the aircraft should perform a two point roll by rolling 180 degrees then pausing before performing another 180 degree rolls in the same direction. The rolls should be smooth and continuous with a constant roll rate throughout each and similarly between the two  $\frac{1}{2}$  rolls. After finishing the rolls the aircraft should continue the up line far enough that the roll maneuver is centered on the up line. Once reaching the top of the maneuver the aircraft should push to level flight on the same heading as the maneuver started.

g. **Four point roll** The pilot should begin as always from straight and level flight and should finish with wings level and heading as well as altitude unchanged. The aircraft should roll at a constant rate between each of the roll "points" and should pause only briefly (long enough for the observer to note the pause) at each point. There should be 90 degrees of rotation between each point. Each 90 degrees of roll should take the same elapsed time to complete. The roll can be in either direction of rotation at the pilot's discretion.

h. **Knife Edge pass** The pilot should enter from straight and level then roll 90 degrees to an attitude where the wings of the aircraft are perpendicular (90 degrees) to the horizon. The aircraft should hold this attitude and its altitude for approximately the length of the runway. The aircraft should then roll back to level flight. As in all maneuvers the rolls into and out of the knife edge pass should be smooth and continuous. The aircraft should (ideally) trace a straight line parallel to the runway and maintain altitude and heading throughout the maneuver.

i. **Reverse Cuban eight** The pilot should once again begin this maneuver from a straight and level path parallel to the runway then pull into a 45° up line. Midway up this line the aircraft should roll to inverted. At the top the aircraft will perform a  $\frac{3}{4}$  inside loop ending in a 45 degree up line in a direction opposite the initial heading on entry. Midway up this line the pilot should once again roll to inverted. At the top of this line, the aircraft will pull a  $\frac{5}{8}$ ths loop to a wings level exit on the same heading which the maneuver started. All of the loop elements (entry  $\frac{1}{8}$ th loop,  $\frac{3}{4}$  loop and  $\frac{5}{8}$ th loop to exit) should be a constant radius and the wings should remain level. The result should be that the aircraft enters and exits at the same altitude.