LAZY EIGHT

Bulletin #20

Reason for the name:

The Lazy Eight is NOT a "lazy" maneuver. The maneuver is called a LAZY EIGHT because the extended longitudinal axis will trace a an "infinity sign" that is an eight lying on it's side – a "lazy" eight.

Maneuver description and analysis.

The maneuver is commenced from straight and level flight with the aircraft aligned perpendicular to the 90 degree reference point. The outside directional references may be horizon points or section lines (street patterns). Section lines are generally easier for the pilot to judge the continuously changing aircraft heading.

Power is set for the manufacturer's recommended entry speed, or in the absence of manufacturer's recommended entry speed, at the airplane design maneuvering speed.

Point 1

The aircraft is pitched up and a very slow roll rate is established.

Point 2

The aircraft reaches it's maximum pitch attitude, and a shallow bank of approximately 15 degrees.

Point 3

The pitch attitude is lowered and bank increased to approximately 30 degrees. Contrary to popular belief, the pitch attitude at this point is not the normal approximately zero pitch cruise attitude. This is because the aircraft is momentarily in level flight slightly above the 1g stall speed.

The typical attitude at the 90 degree point is about 5 to 10 degrees nose up. The evaluation of correct attitude at this point is that the altimeter will stop at the 90 degree point.

Due to left turning tendencies, significant right rudder is applied, and some left roll input to maintain the desired bank angle.

Point 4

The pitch attitude is lowered and bank angle is maintained. The notion that reducing bank angle to approximately 15 degrees at this point will result in a symmetrical maneuver is not supported by aerodynamic truth. Please see the attached trigonometrical analysis of forces which assume a mild 1.5 g climb entry due to pitch up, and 0.8 g descent due to pitch down.

This analysis does not include the additional effect of acceleration and deceleration on rate and radius of turn. This effect also necessitates a steeper bank at reduced g while accelerating to produce maneuver symmetry.

Therefore bank should at least maintained until roll out on the 180 degree heading.

Left rudder is gradually added to offset the effects of acceleration, and pitch is adjusted to achieve a smooth return to the entry altitude at point 5.

Point 7

The maneuver continuing to the left is essentially the same as to the right except that at point 7 less right rudder will be required for coordination.