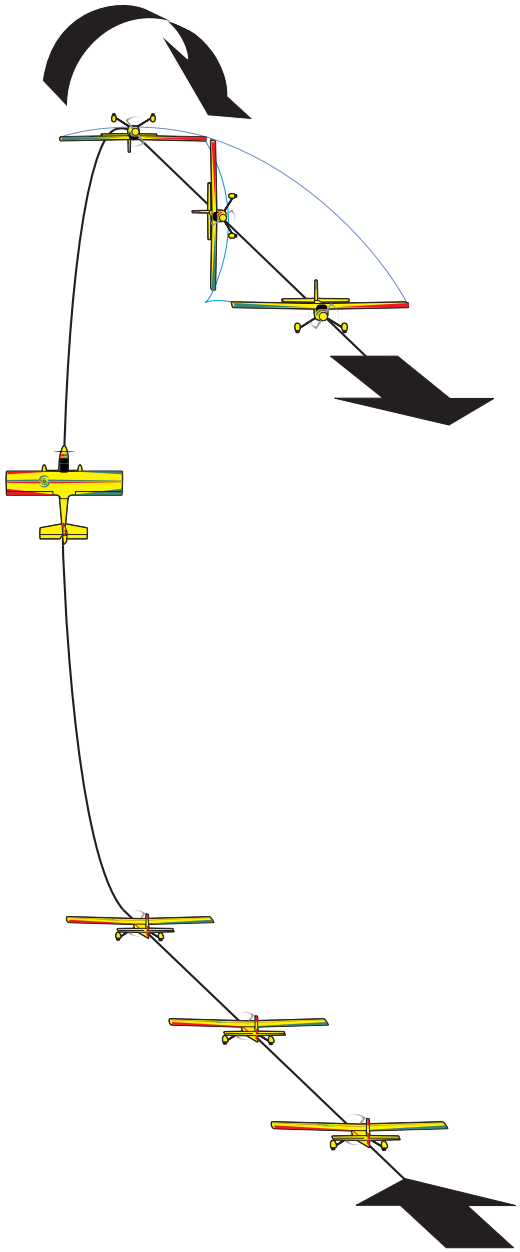
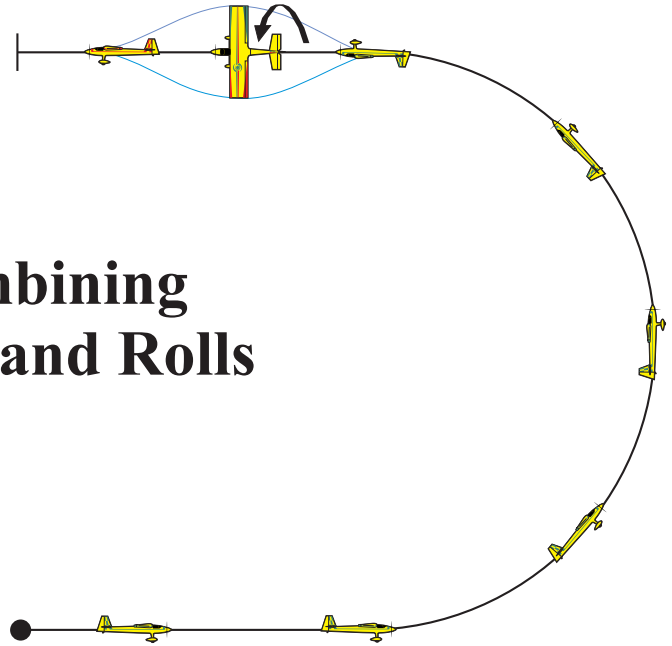
Immelmann Turnaround





Combining Loops and Rolls

Immelmann Turnaround

PHASE I

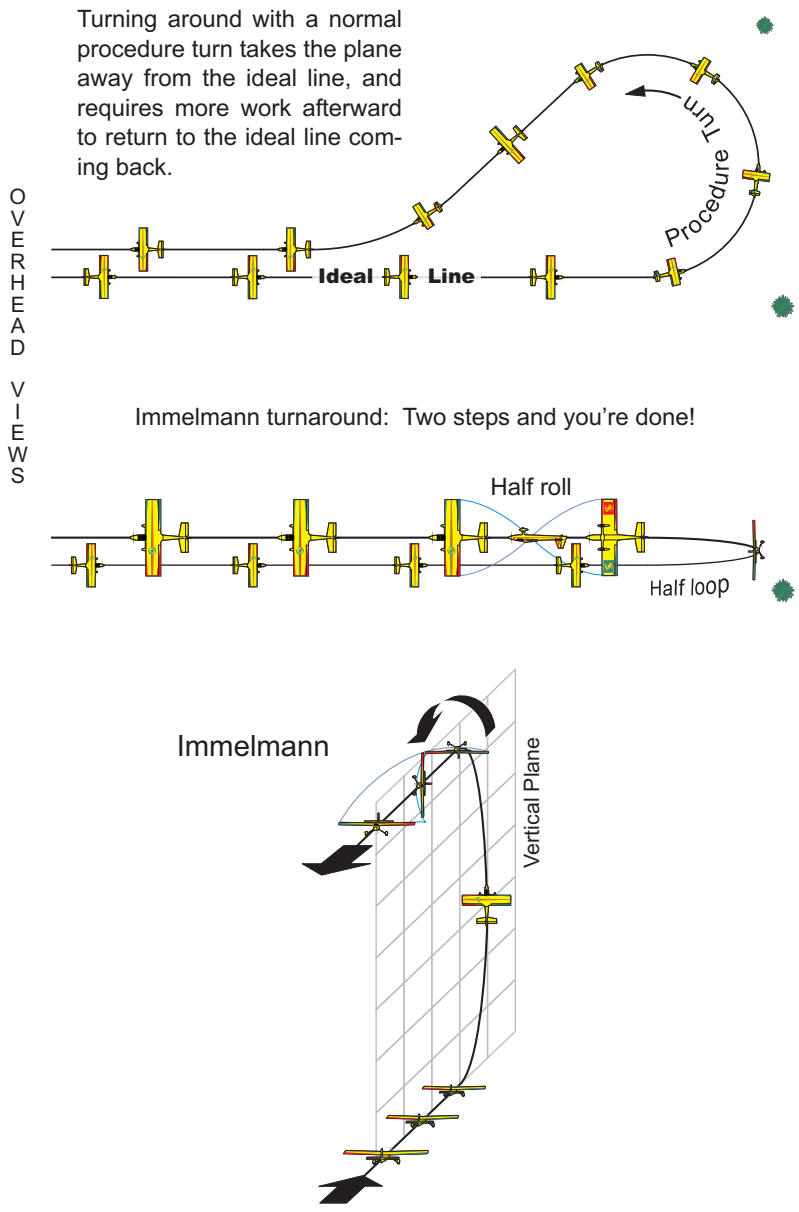
In this section: F-42 illustrates the basic *Immelmann* turnaround sequence that will make your flying easier overall.

Example: An ordinary left or right *procedure turn* moves the plane away from the ideal parallel line that you worked to establish prior to the turn. You then have to make several adjustments after the turn to reestablish that line coming back. As a consequence, you have less time to think about your next maneuver and end up feeling rushed. But the Immelmann allows you to do a 180° turnaround without changing your line of flight, albeit finishing higher.

F-43 stresses the importance of a wings level parallel line entry into the Immelmann and performing it further out to grant more time afterward to setup and prepare for the next maneuver at show center.

F-44 illustrates treating the Immelmann as two separate parts: A half loop, and then a half roll to upright, with a return to neutral between them to help ensure that the roll will be axial and not *barreled*.

F-45 illustrates the tendency to become slack toward the *amount* of up elevator used in the half loop, causing it to become so large and slow at the top that the plane cannot be rolled without wandering off heading (thus providing a wake-up call to the importance of applying consistent inputs)!

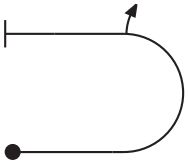


F-41 KPTR: When entered with the wings level, an Immelmann will effect a turnaround without changing your line of flight.

Immelmann Turnaround Sequence

PHASE I

The Immelmann is used in place of a procedure turn to turn around without deviating from the established parallel line it was entered on. An Immelmann is approached the same as any loop, with plenty of power and a wings level start, yet the elevator is neutralized near the top, followed by a quick (full aileron) half roll to upright.



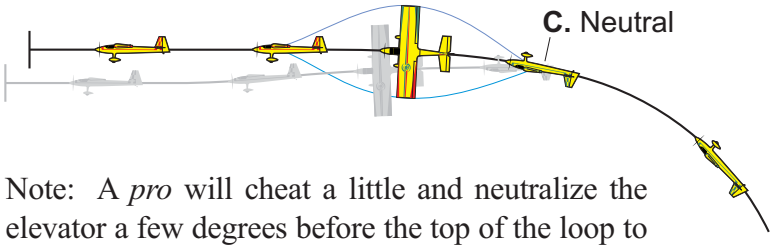
Sequence:

A. Wings level(!)
¾-full throttle setup.

B. Smoothly pull and hold in approx. half up elevator.

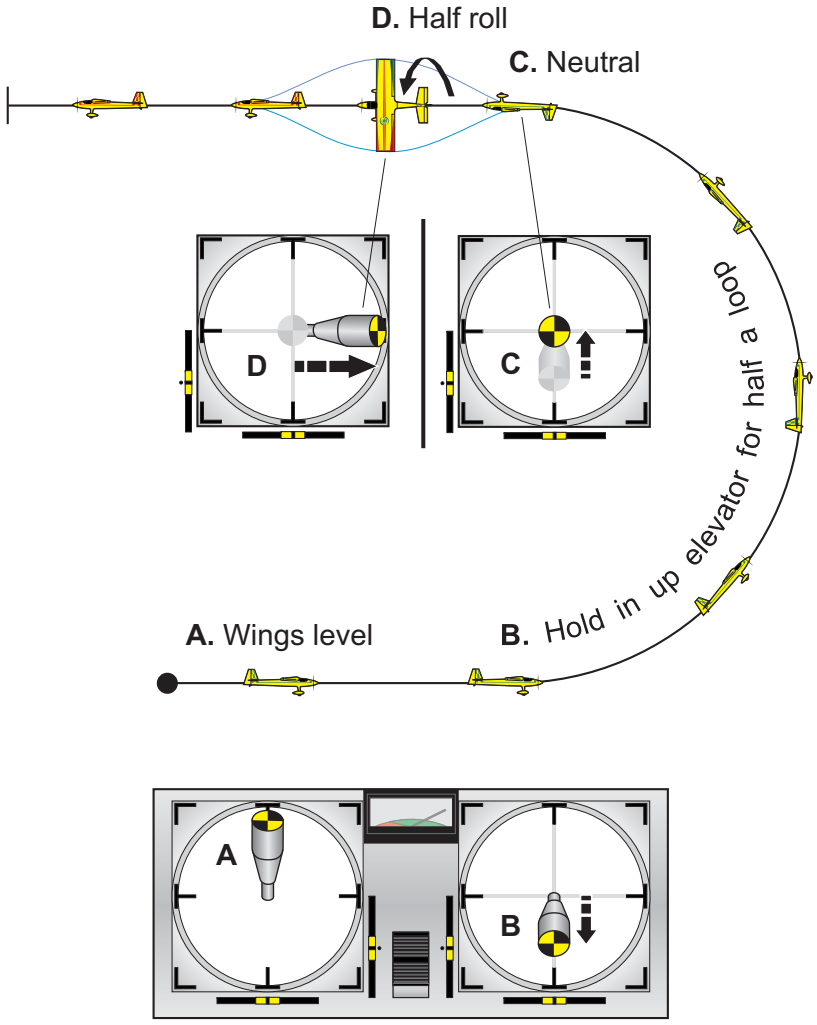
C. Quickly neutralize the elevator near the top of the loop.

D. Apply full aileron to roll upright. Quickly neutralize the aileron the instant the wings approach level.



Note: A *pro* will cheat a little and neutralize the elevator a few degrees before the top of the loop to help keep the half roll from dropping. However, such fine judgement does take time to develop.

Note #2: Applying full aileron helps to complete the roll quickly before it has a chance to lose any noticeable altitude or wander off heading.

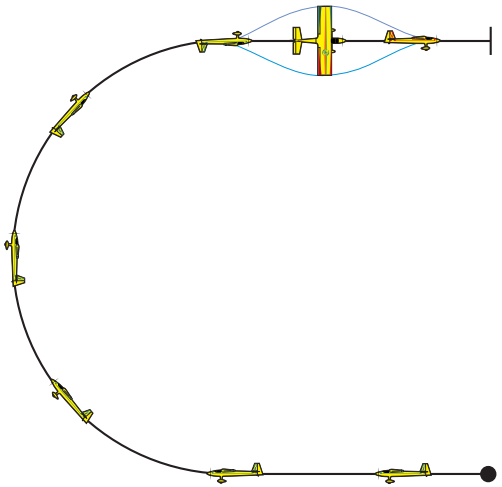


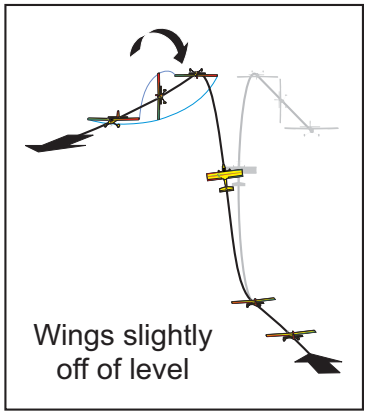
KPTR: *Smoothly* loop into an Immelmann with approx. half elevator, but *quickly* roll at the top with full aileron.

PHASE I

Turnaround Positioning Considerations

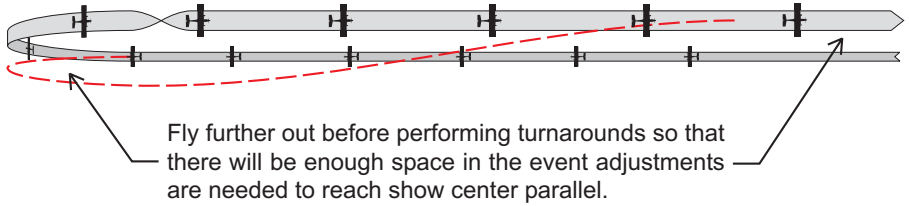
It becomes increasingly important to establish parallel lines to the runway when performing aerobatic turnarounds, since the line the plane is on when an Immelmann is started will be the line that the airplane returns on when it is completed. An entry started parallel to the runway should exit coming back parallel—assuming the wings were level at the start.





Reflection: If you're positioning well, yet you find that there is very little time to think between your maneuvers, you are probably performing the turnarounds too early and not leaving yourself enough room between the maneuvers. By flying further out before turning around you will buy some extra space and time to think.

Setup: Project the airplane as a *whole* to the desired target, then glance at the wings to be certain they are level, then loop.



KPTR: How and where you enter a turnaround has almost everything to do with where it's going to be heading afterward.

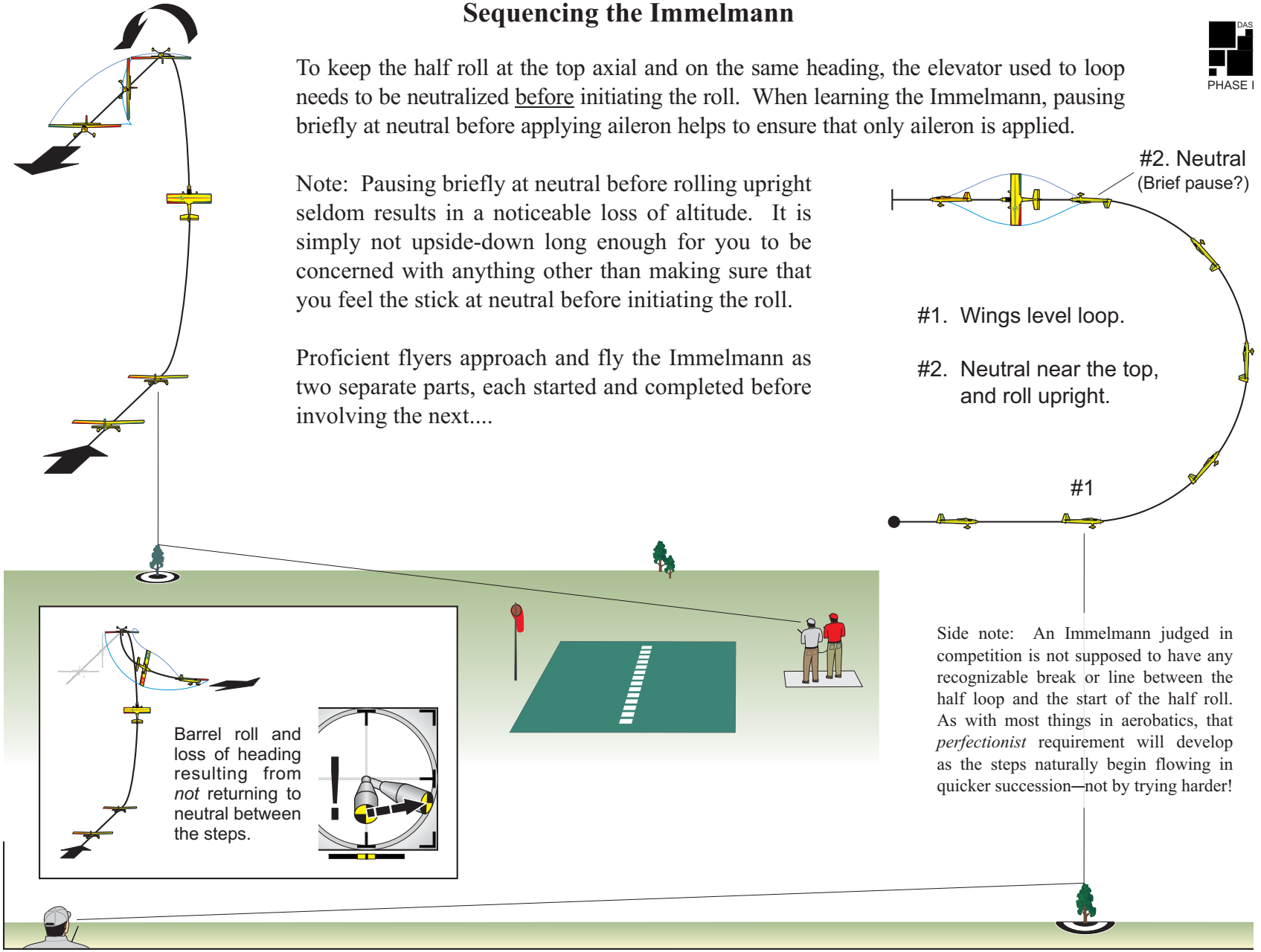
Sequencing the Immelmann

PHASE I

To keep the half roll at the top axial and on the same heading, the elevator used to loop needs to be neutralized before initiating the roll. When learning the Immelmann, pausing briefly at neutral before applying aileron helps to ensure that only aileron is applied.

Note: Pausing briefly at neutral before rolling upright seldom results in a noticeable loss of altitude. It is simply not upside-down long enough for you to be concerned with anything other than making sure that you feel the stick at neutral before initiating the roll.

Proficient flyers approach and fly the Immelmann as two separate parts, each started and completed before involving the next....



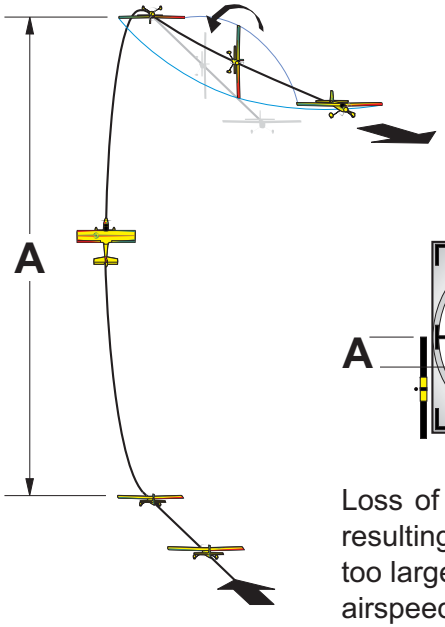
Side note: An Immelmann judged in competition is not supposed to have any recognizable break or line between the half loop and the start of the half roll. As with most things in aerobatics, that *perfectionist* requirement will develop as the steps naturally begin flowing in quicker succession—not by trying harder!

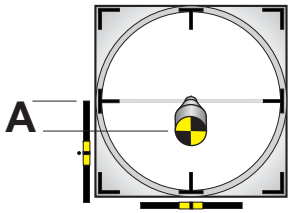
KPTR: Successful execution of the basic two part Immelmann hinges on a wings level loop and returning to neutral between the steps.

Controlling the Immelmann Versus Reacting to it

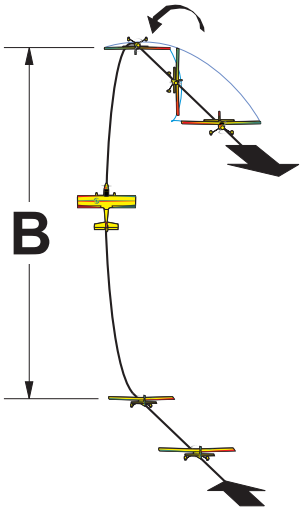
Reflection: When your Immelmann starts out well, but loses its heading during the roll, and you're sure that no elevator was combined with the roll, the half loop is most likely too large and there is not enough flying speed at the top to make it through the roll without wandering off heading. Note that this is especially common when a pilot has had so much success that he starts trying to overly finesse the half loop, and thus does not get into enough up elevator early enough.

Remedy: Target a slightly larger elevator input to fly a slightly tighter loop.

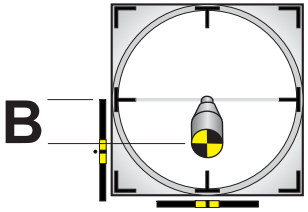




Loss of heading during the roll resulting from too little elevator, too large of a loop, and too little airspeed at the top.



Pull more elevator initially and reach the top earlier with more airspeed.



Conclusion: Since your inputs determine the *results,* that is where you should be looking to improve your proficiency.

KPTR: Look to correct the cause of the error, not to get better at *reacting* to its consequence!