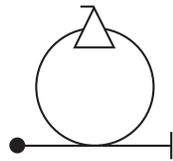
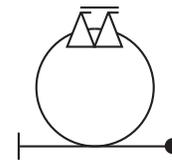


Inside Snap Roll



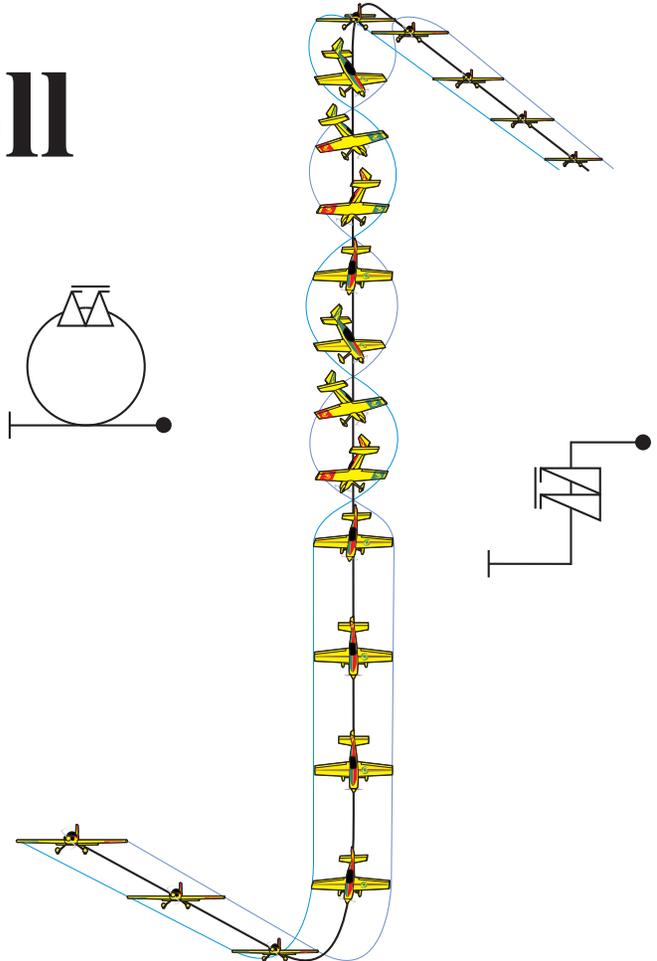
Avalanche

(Snap roll(s) at top loop)



Upright Spin

Flat Spin



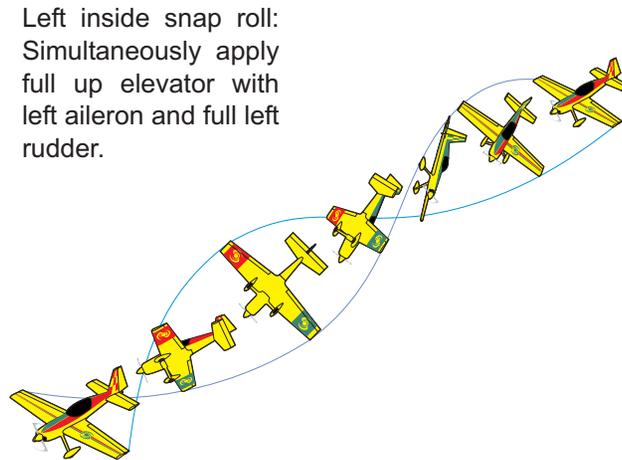
(Positive) Inside Snap Roll

The primary benefit of learning hesitation and slow rolls is a sense of satisfaction of a job well done. The introduction of *snap rolls* will add excitement and enlarge the scope to be able to exchange regular rolls with snap rolls. To initiate an inside snap roll, all one has to do is abruptly pitch the airplane beyond critical angle of attack with full up elevator (putting the airplane in an *accelerated stall*), while simultaneously applying full rudder and aileron in the same direction. The stalled (unloaded) wing breaks the hold of the airflow and permits the airplane to do the rapid rotation about all three axes that is uniquely the snap roll—what Europeans quite descriptively call, a “flick” roll.

Speed can diminish rapidly during snap rolls, and thus you will need a lot of power to carry the maneuver through without undue altitude loss. Most airplanes snap better to the left with torque and slipstream, whereas right snaps tend to develop slightly slower. Initiating the snap roll inputs and the snap must be very quick, otherwise the airplane will barrel roll and veer off course before stall is reached.

There are several directions that snap rolls can be performed. To make them easier to recall, target what corners to put the sticks in for each.

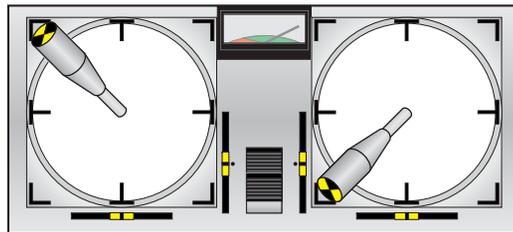
The direction of rotation notes whether it is a left or right snap, and *pulling* elevator distinguishes it as an “inside” snap—irrespective of whether the plane is upright, vertical, or inverted.



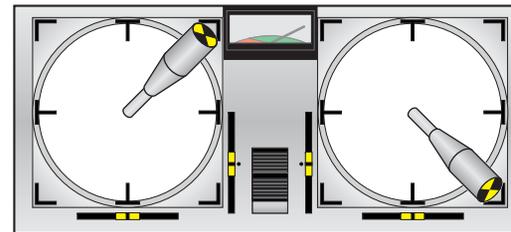
Left inside snap roll:
Simultaneously apply full up elevator with left aileron and full left rudder.

To stop a snap, simply neutralize the controls. However, note that the snap roll will continue a bit further in the split second that it takes to neutralize the controls and for the airflow to reattach. Therefore, one must start neutralizing the controls a split second before the point that you actually want the snap to stop.

Left Inside Snap Roll



Right Inside Snap Roll



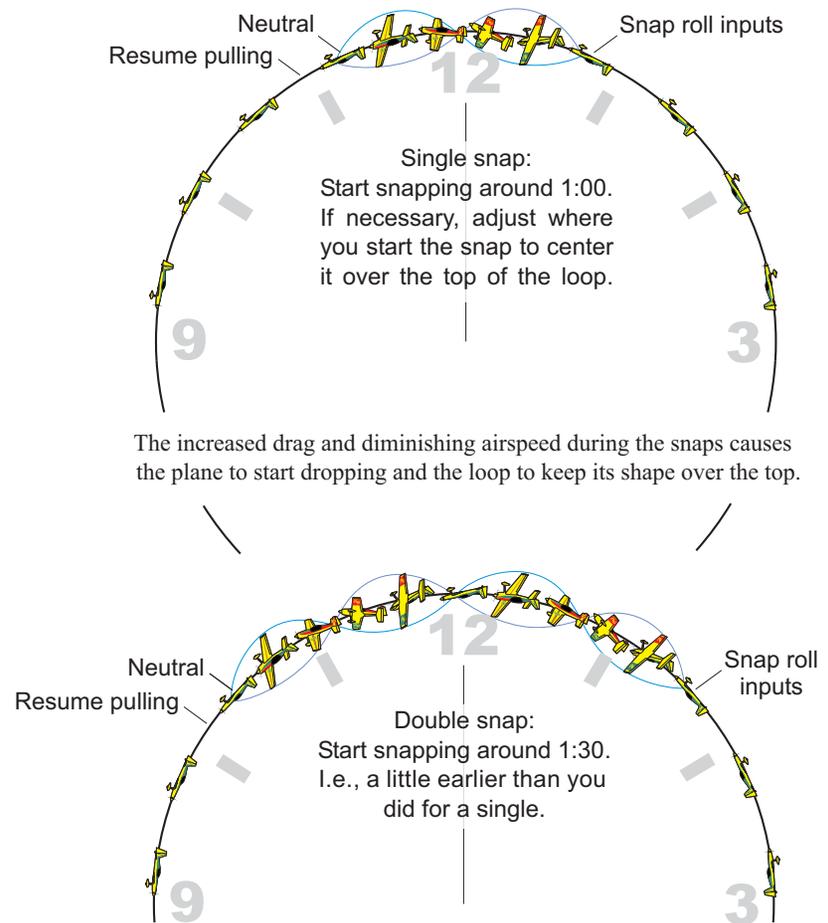
Avalanche: Inside Snap(s) at the Top of a Loop

Throwing the sticks into the corners for indeterminate amounts of time and to cover up blown maneuvers gets stale pretty quickly. Aerobatic pilots typically perform snap rolls as part of larger maneuvers. While a snap can stand on its own, 1st U.S. R/C Flight School teaches snap rolls at the top of loops. This method has proven to produce the best results in the shortest time and therefore gives a huge psychological boost to the student: Anxiety diminishes with the altitude gain, and the plane is decelerating approaching the top of the loop, which increases the time to get ready for the snap(s). And, since snaps happen quickly, if the pilot over-rotates his attempt at 1 snap, and accidentally does 1½, he'll simply fly away upright.

A snap at the top of a loop, or *avalanche* as it is called, is made up of three parts: The first part of the loop, the snap roll, and the second part of the loop. And, one should keep in mind that the better each part is performed, the easier the next part will be. A certain distance is traveled after starting the snap to the time it is completed. Therefore, the snap is started a little *before* the top of the loop—with the plane snapping through the top—and centered overall, say, around 1:00, snapping through to 11:00.

Stopping a single snap roll with the wings level (inverted) and in good shape to resume the loop hinges on good input timing: If you over or under-rotate the snap, adjust the length of time that you hold in the snap roll inputs. (Trying to stop a single snap roll by only watching the wings is a sure way to get behind the airplane.) Double snaps provide more time to anticipate when to neutralize the controls, and thus some trainees find them easier.

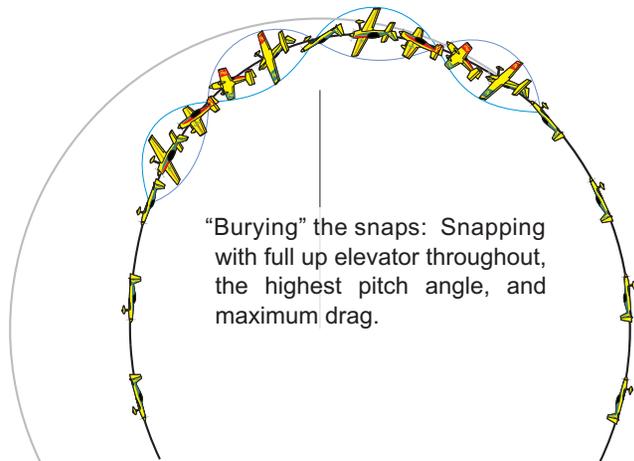
The snap(s) must be stopped with the elevator at neutral before beginning to pull out of the loop, or the plane will remain stalled and spin out of the loop. In training, a brief pause at neutral after the snap(s) all but eliminates the early problem of over-rotating due to rushing to pull out.



Accelerated Snap Rolls

When performing snap rolls as part of larger maneuvers, minimizing the speed loss during the snaps will improve control afterward: If the airplane decelerates so rapidly during a double snap avalanche that it falls out of the loop, it

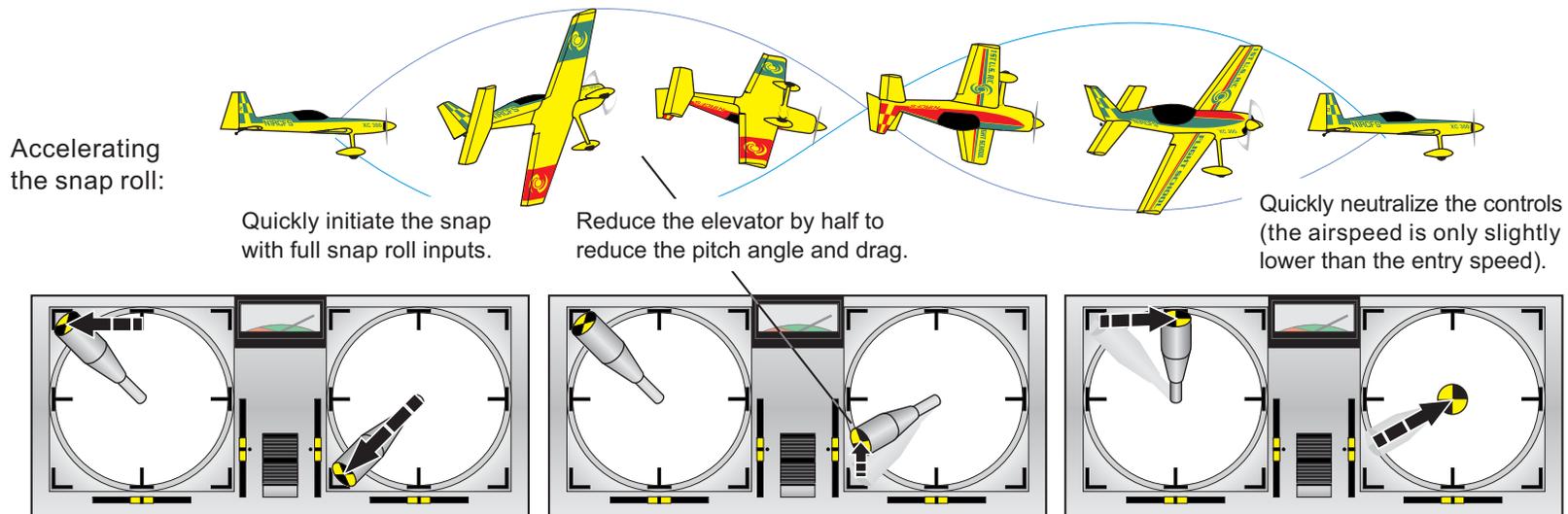
will be necessary to reduce the elevator and the pitch angle while snapping to reduce drag and maintain the proper shape of the maneuver—a technique known as “accelerating” the snap rolls.



1. Use full up elevator to get the plane stalled (break the airflow’s hold on the wing) and snapping as quickly as possible, because any delay before the stall is reached will result in the airplane veering off course. Without going into the lengthy details of *auto-rotation*, know that once the snap has started, it doesn’t take as much elevator to keep it snapping.

2. As soon as the plane starts to snap, reduce the elevator to half, and then direct all your attention to stopping the snaps at the point the maneuver calls for. The speed and control after should be considerably greater compared to “buried” snaps with full elevator throughout.

When there is cause to accelerate a single snap, e.g., a low entry speed, you will find that the only way to initiate, accelerate, and stop the snap fast enough is to apply the inputs in one continuous coordinated movement.



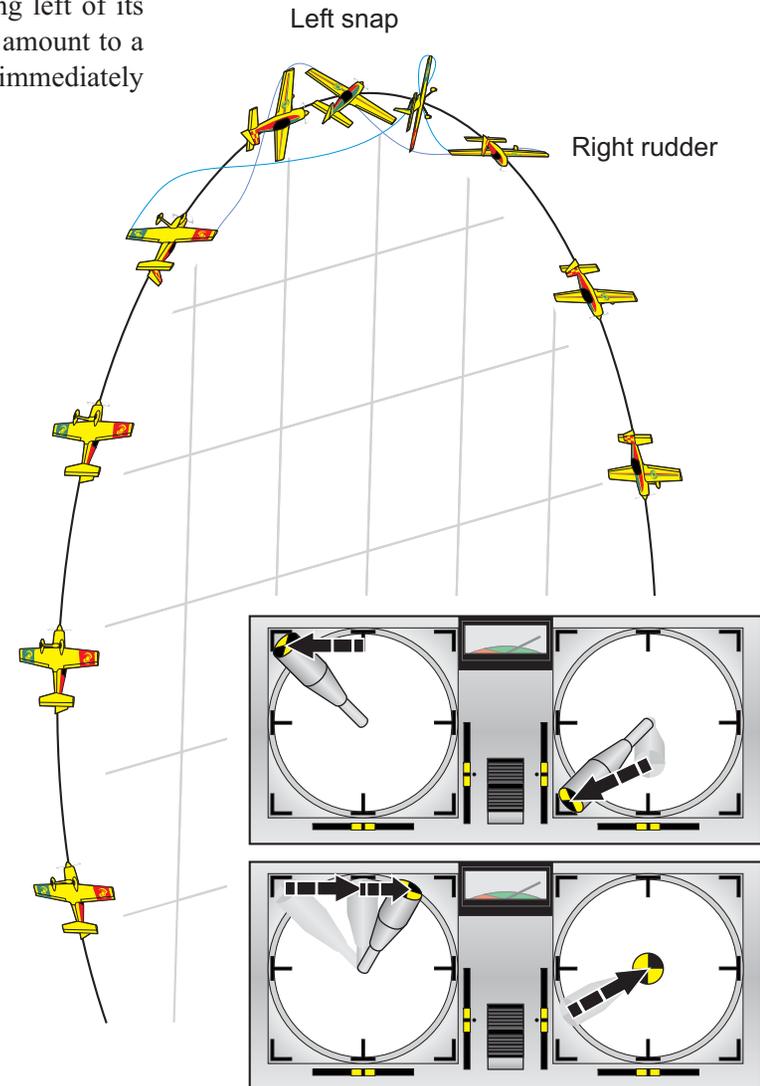
Snap Roll: Opposite Rudder Heading Correction

In the time, albeit brief, that it takes the wing to achieve critical angle of attack while initiating a snap roll, a plane tends to turn a little before it snaps. Consequently, if the snap is to the left, the plane will exit the snap heading left of its original course. Although the deviation is typically not great, it can amount to a noticeable deviation if not corrected early. Applying *opposite* rudder immediately after the snap corrects this deviation before it becomes an issue.

A snap roll both develops and rotates slower at lower airspeeds. The tendency for the airplane to change course at the start of the snap(s) is therefore greater over the slower top of an avalanche than when the airplane is rapidly picking up speed on a down-line for example. Anticipating this, quickly apply opposite rudder (opposite the snap roll) immediately after stopping the snap(s). The amount required to do the job will have to be worked out in practice. Each time, commit to a specific rudder input, say, 1/2", and then adjust the amount until you find what works best for your airplane. Of course, this is all moot if the pilot is thinking more about the rudder and subsequently over-rotates the snap. Prioritize stopping the snap, and then correcting the heading with rudder.

In training, stopping the snap, pausing to make sure everything is at neutral, and then inputting opposite rudder is initially taught. A *snap master* stops his snaps by returning the controls to neutral, except the rudder, which passes right through neutral into opposite rudder. That technique develops naturally as the familiar sequence of executing a snap roll begins to flow in rapid succession—not by rushing!

Immediately after inputting opposite rudder, start *smoothly* taking it out. Note that if the rudder is taken out too quickly, the tail may wag and possibly cause a deviation.



KPTR: Quickly input opposite rudder after a snap to reestablish the original heading, then smoothly return it to neutral.