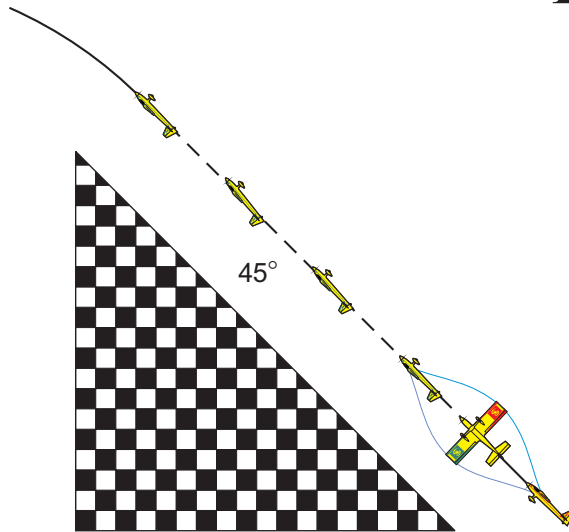
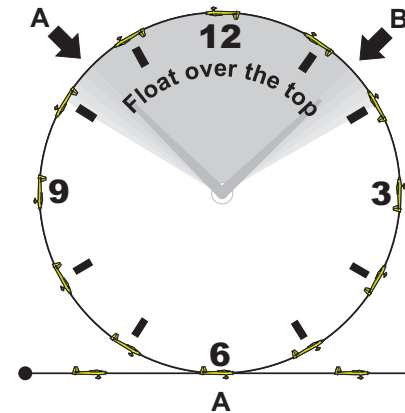


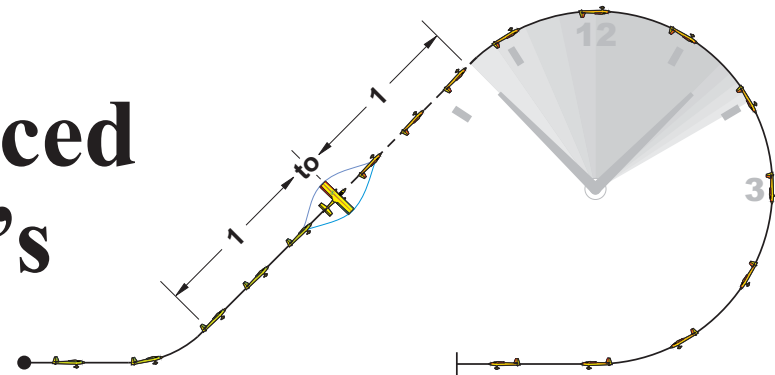
Symmetry of Loops and Lines

Round Loops
Float Over the Top



**Holding
True 45's**

**Balanced
45's**





Symmetry of Loops and Lines: The Controller's Approach

In this section: D-32 illustrates the influence of gravity on a loop and the tendency of a loop to tighten or “pinch” toward the top, because understanding where the pinch is likely to occur is paramount to doing something about it.

D-33 & 34 illustrate targeting specific points in the loop to initiate smooth elevator adjustments to *float over the top* and fly a symmetrical round loop. Your foreknowledge of the control inputs required and where to typically target those adjustments (before a deviation from round has a chance to occur) will not only result in your quickly achieving routine round loops, but your *float* technique will compliment many other looping maneuvers as well.

D-35 & 36 illustrate applying the constant radius float technique and the refined roll technique to Immelmann and reverse Immelmann turnarounds.

D-37 through D-40 apply the float technique to half Cuban 8 turnarounds, and identify when it is necessary to push elevator during the slower sections of the 45 degree up and downlines to hold precise 45's when the plane is most susceptible to the effects of gravity.

D-41 illustrates how the combination of floating the tops of loops and not allowing the plane to drop prematurely out of the 45's buys more time to fly lines of equal length before and after the half rolls on the 45's. (Developing the proper timing to maintain precise 45's, together with using the same loop inputs, will all help to ensure that your Cubans routinely exit at the same altitude).

D-42 & 43 summarize the refinements of floating over the top of loops and centering the half rolls along the 45's, along with what adjustments to make if the exit altitudes of your Cubans turn out not to be the same as the start.

Summary: By building in refinements one at a time, each receives the majority of your attention and thus develops more rapidly—ultimately leading to a level of routine bordering on automatic and allowing you to start thinking about adding rudder corrections.