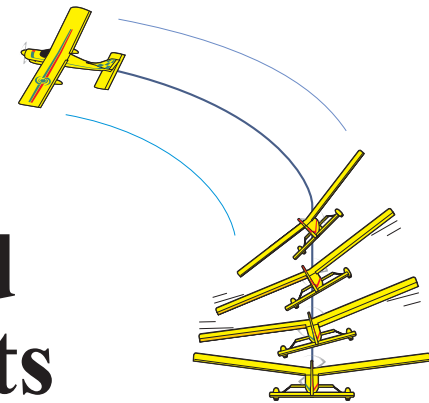
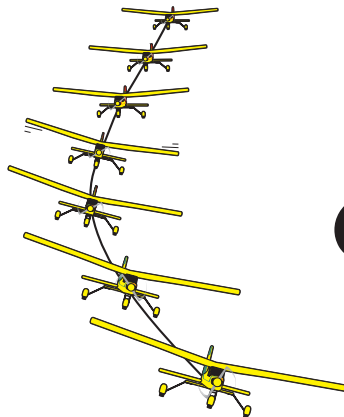


# Ground School

## Basics of Turning an Airplane



## Straight Lines and Course Adjustments

## Altitude Control





## Basics of Turning an Airplane

In this section: Page A-2 illustrates the correct uses of aileron and elevator in a turn.

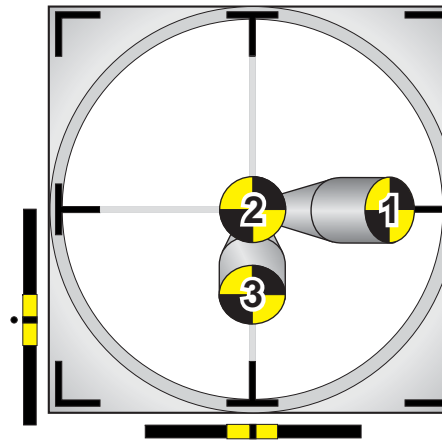
Note: Most beginning R/C pilots will initially attempt to turn *reacting* to the airplane. By definition, reactors need to see a mistake before it occurs to them that they made one. For example, reactors tend to start their turns holding in some aileron and watching the wings bank. As the bank steepens and the plane starts to lose altitude, they then become completely focused on the elevator and trying to pull out of the dive — all the while continuing to hold in the aileron. The result is an ever steepening bank, an increasingly tighter spiral, and confusion about why it's going down when they are pulling up? *Knowing* how to fly all but eliminates this traditional trial and error approach to turning.

A pro-active pilot begins his turn applying a smooth but brief aileron input to bank the wings, the aileron input is neutralized to avoid entering a spiral, and then up elevator is pulled to begin turning and to keep the turn level.

A-3 illustrates how varying the amount (size) of the initial aileron input and degree of bank effects the width of a turn, as well as how much up elevator will be needed to keep the nose from dropping during the turn.

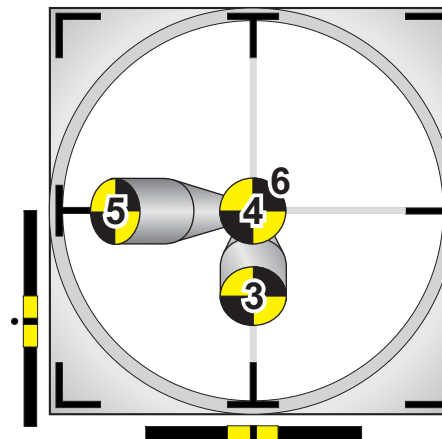
A-4 & 5 illustrate how the *neutral* control stick position provides a great reference to gauge and repeat the correct input amounts for consistent left and right turns.

### Full Turn Inputs



Start:

1. Bank smooth.
2. Return to neutral (to avoid spiraling).
3. Pull up elevator and hold.



Correction (Stop):

4. Neutralize the elevator to stop turning.
5. Level the wings smoothly.
6. Return to neutral.

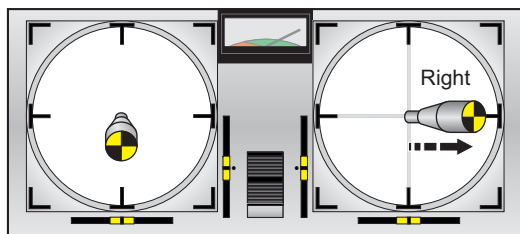


The full turn inputs follow a T pattern.

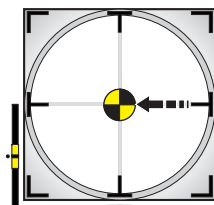
# Basics of Turning an Airplane



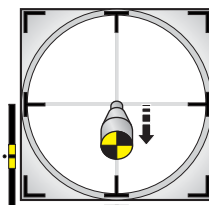
## Turn Start



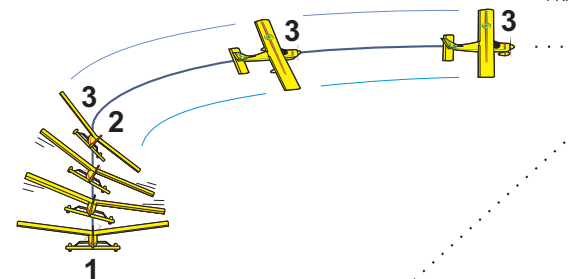
**1. Bank**  
Smoothly apply aileron to bank the wing in the direction of the intended turn.



**2. Neutral**  
Quickly neutralize the aileron input to stop the wing from banking further.

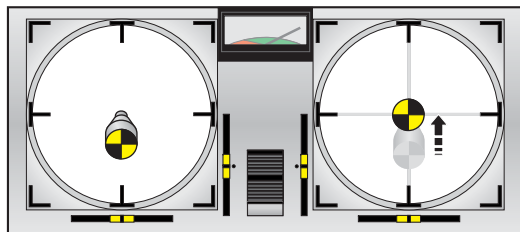


**3. Turn**  
Immediately pull up elevator and hold it in to pull the nose into a turn and to keep the nose from dropping throughout the turn.

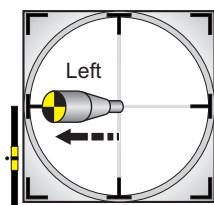


180 degree level turn example

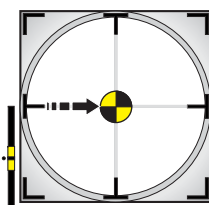
## Turn Correction



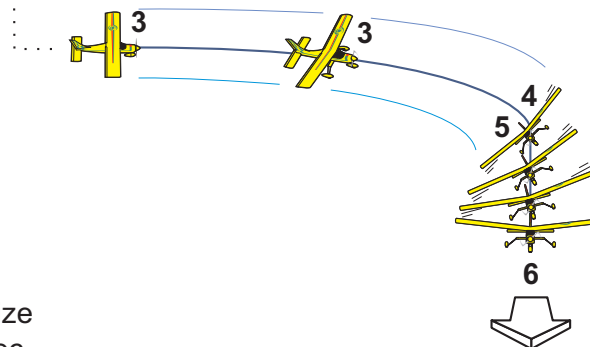
**4. Neutral**  
Neutralize the elevator to stop turning.



**5. Correct**  
Smoothly apply aileron *opposite* the direction of the turn to return the wings to level.

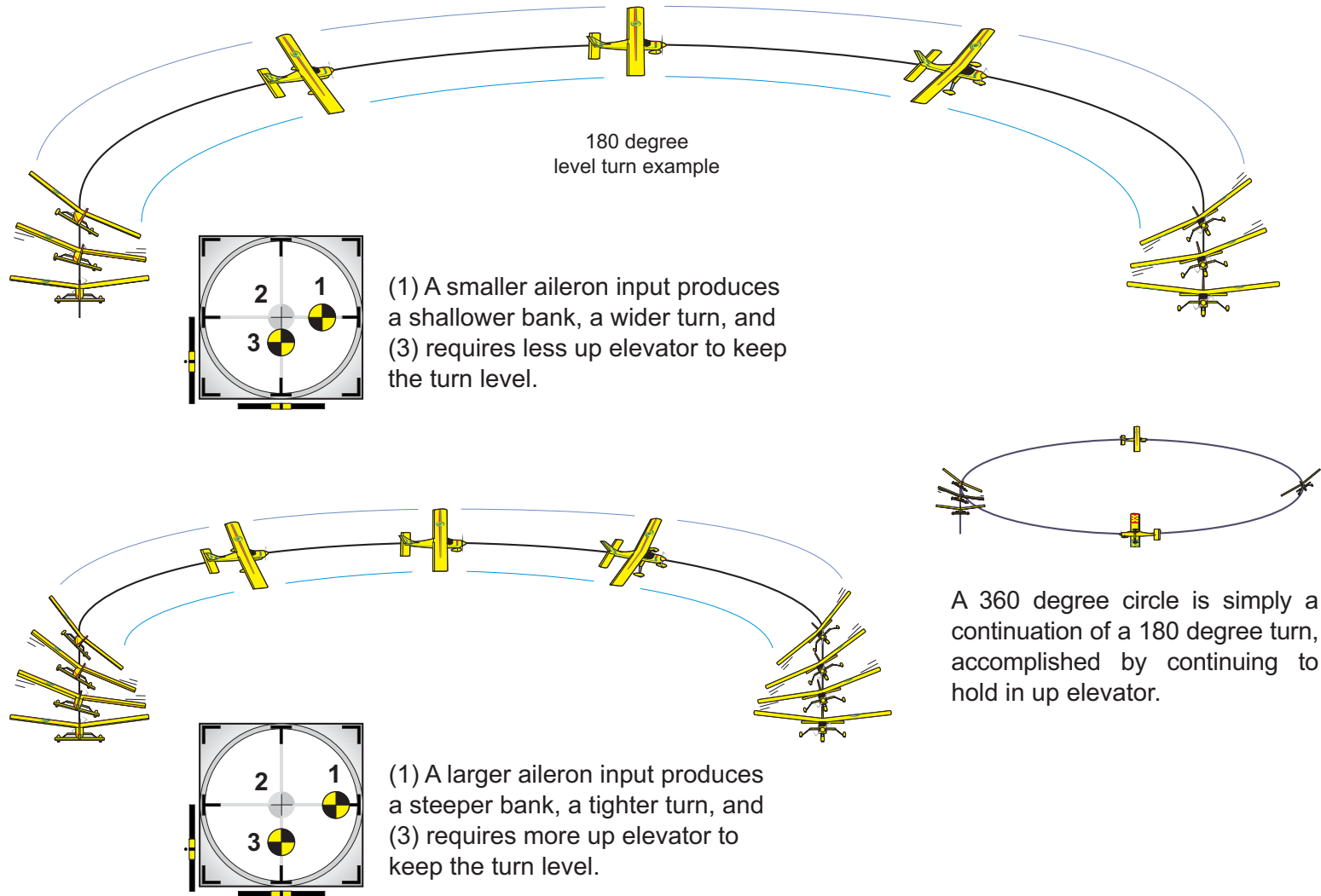


**6. Neutral**  
Quickly neutralize the aileron correction at the moment the wings are level.



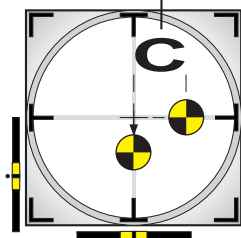
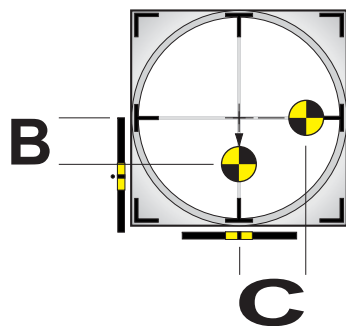
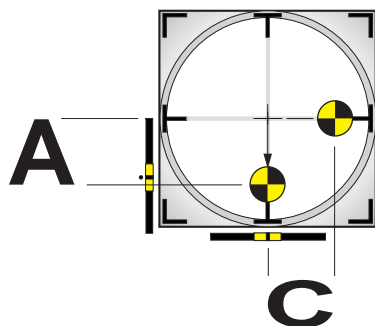
## Basics of Turning an Airplane: Controlling the Plane v/s Reacting to it.

The size (amount) of the aileron input determines how wide or tight a turn will be, and how much up elevator will be needed to keep the turn level.

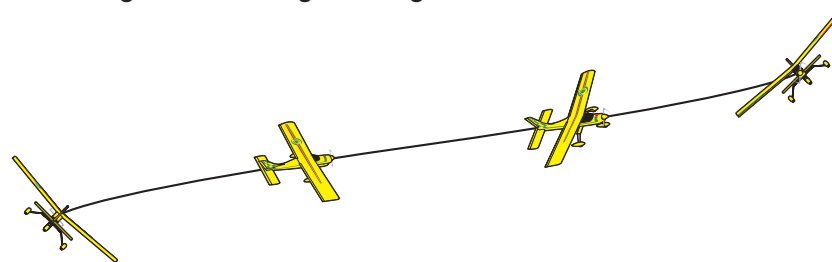


## Neutral as a Reference

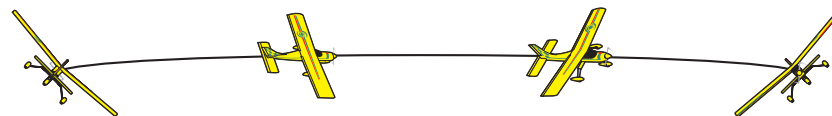
Starting from and returning to neutral between inputs provides a distinct point from which to gauge exactly how large each input is—therefore making correct amounts easier to repeat, and incorrect amounts easier to modify correctly.



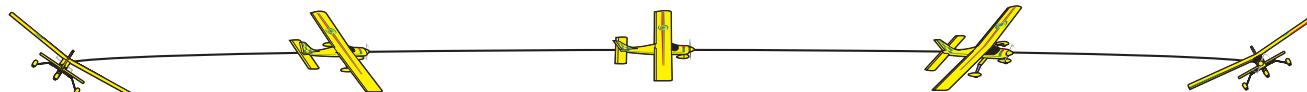
**Example A:** Too much up elevator results in a climbing turn for the given degree of bank.



**Example B:** The same aileron input and bank are repeated, but attention is placed on applying less up elevator from neutral, and a level turn is produced.

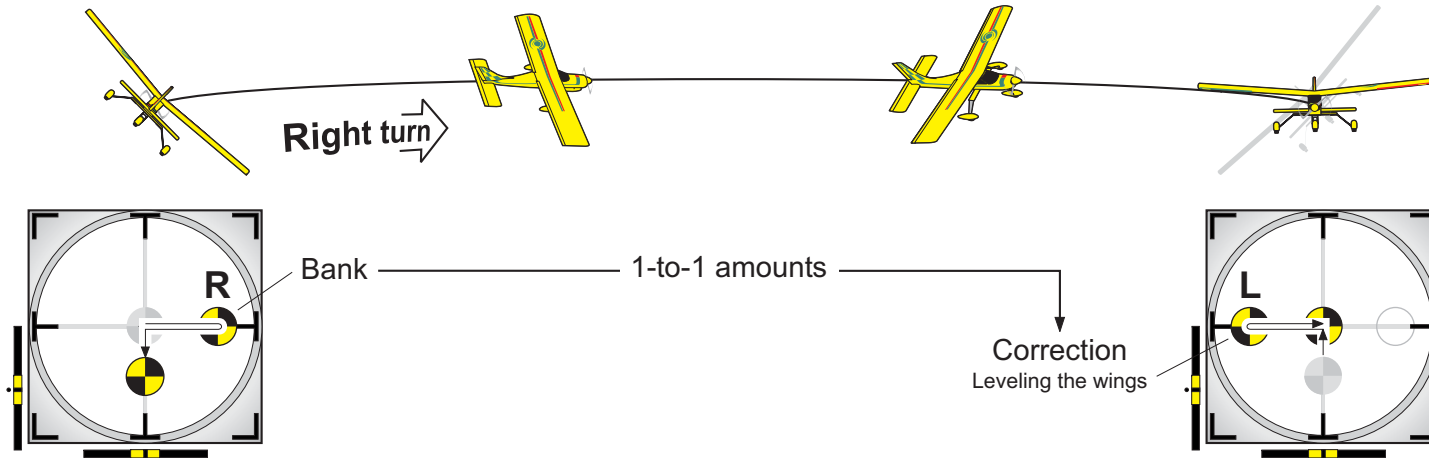


**Example C:** If the first turn or two were tighter than you prefer, reducing the size of the aileron input you apply from neutral will result in a shallower bank and a wider turn.



## Summary of Turning an Airplane Consistently

Whether turns are started left or right, the input patterns are the same. Finishing a turn consistently simply requires an opposite aileron input that matches the input applied to bank the wings initially.



Summary: The inputs come first and determine the turn result. Good pro-active turn inputs produce consistently good turns. This understanding will prove especially crucial to turning your plane successfully whenever it is hard to see.

