Altitude Control and Throttle

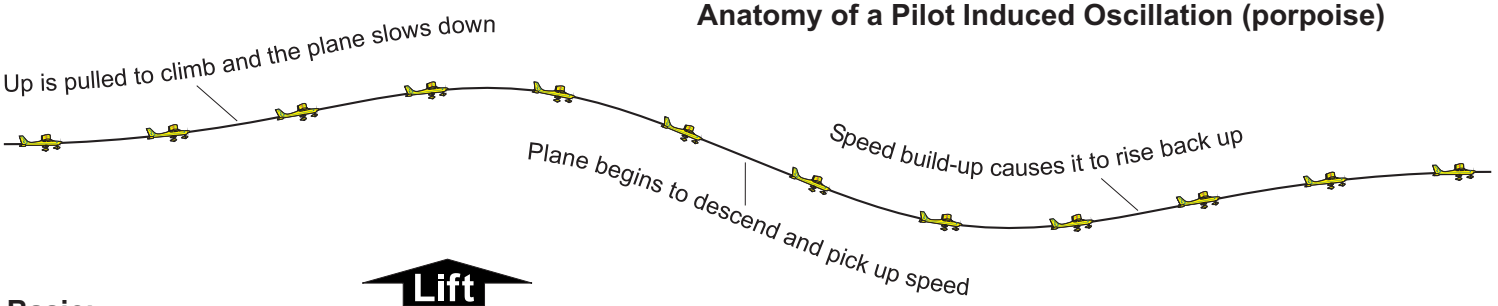
Emergency Recovery

Altitude Control and Throttle Basics

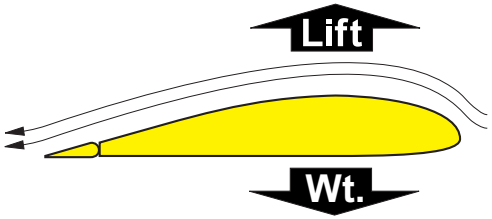
In this section: A-14 illustrates using throttle/speed to control altitude. Note: The ideal speed to fly a trainer plane at when learning to fly is approx. 1/3rd throttle. Approx. 1/3rd throttle produces enough flying speed to maintain level flight, yet is slow enough to allow the novice time to think. Most importantly, at this flying speed the student pilot is learning to control the plane close to the airspeed he'll also be landing at. To properly effect altitude changes, speed is increased above 1/3rd throttle to climb, and decreased below 1/3rd throttle to descend.

Note #2: At 1/3rd throttle, the elevator shouldn't be used to climb or descend as one might think at first. If elevator alone is used to climb for example, the plane will decelerate uphill. As the plane slows, gravity will take over and cause it to descend and porpoise. Compare the old full-scale saying, "If you want to go down, keep pulling up!"

Anatomy of a Pilot Induced Oscillation (porpoise)



Basic:



When wing lift equals weight = level flight

1. A flat-bottom airfoil with a curved top side surface produces upward lift as air flows over it. (Ideal on a trainer for sustaining level flight at slower speeds.)

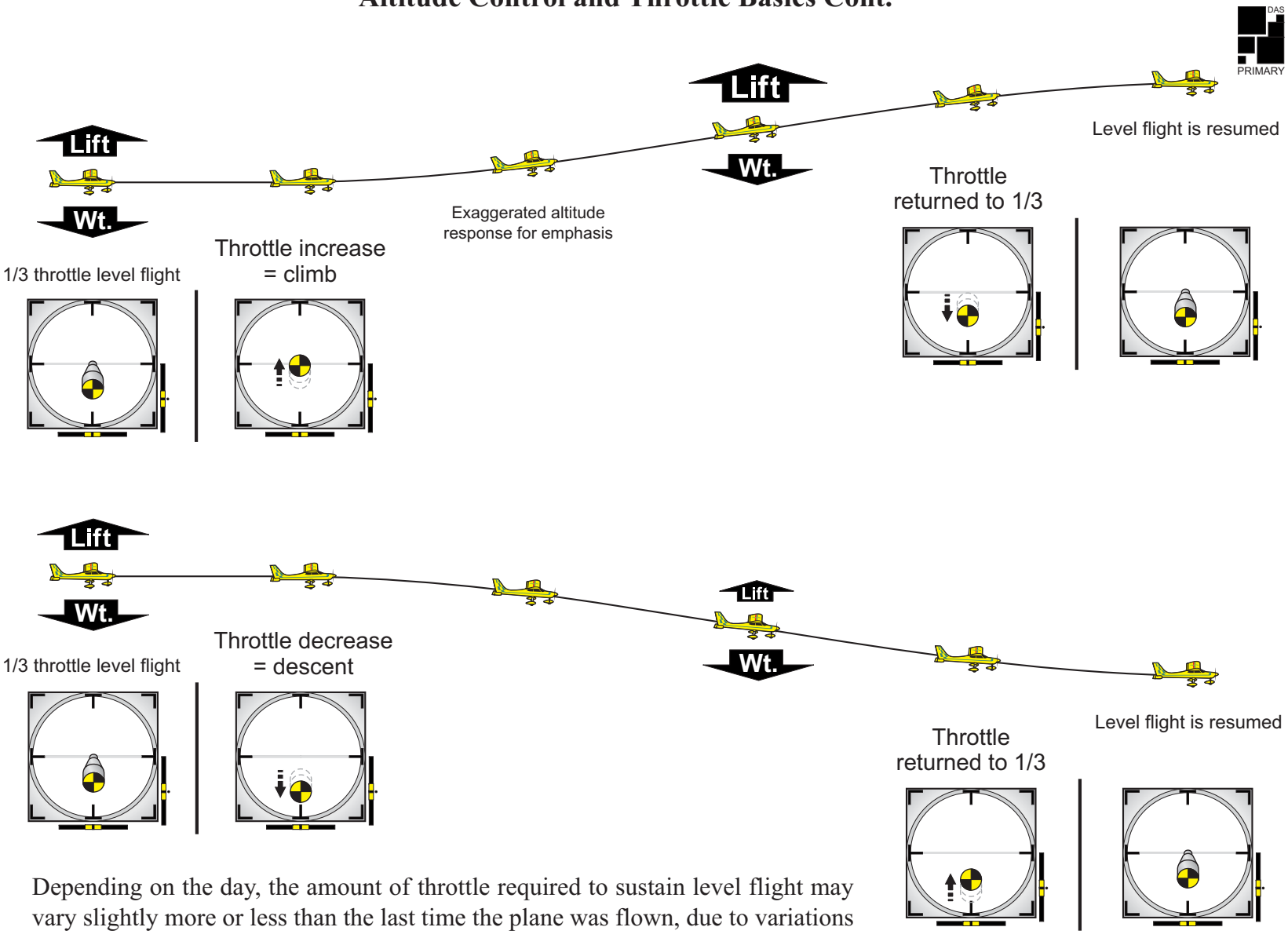
2. The speed of the airflow over the wing effects how much lift the wing produces.

3. When the speed of the airflow over the wing exceeds what's needed to produce lift equal to the plane's weight, excess lift is produced and the plane rises up.

4. When the speed of the airflow is slower than what's needed to sustain level flight, the plane descends.

KPTR: Approx. 1/3 throttle, i.e., a little below half, is the ideal throttle position for novice flight training.

Altitude Control and Throttle Basics Cont.



Depending on the day, the amount of throttle required to sustain level flight may vary slightly more or less than the last time the plane was flown, due to variations in temperature, humidity, etc.. In other words, each day the throttle should be close to 1/3, but not necessarily fixed right at.

KPTR: Increasing the throttle above 1/3 produces a climb, and reducing it below 1/3 produces a descent.

DAS
PRIMARY

Recovery Scenario

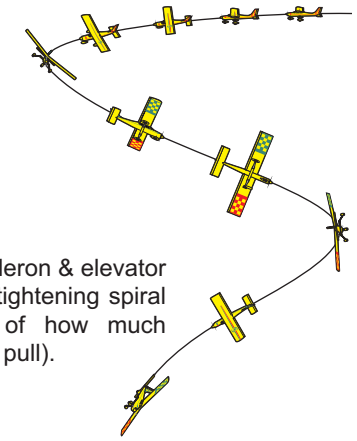
The throttle is <u>not</u> used to pullout after a temporary loss of control. An airplane should be flown (right control stick) out of trouble, and then if a person felt he needed more altitude, the throttle would be increased.

As a rule, the first thing to do in a recovery situation is neutralize the controls! To quote a line used in the School, "If you don't like what the plane is doing, stop what you're doing!"

Neutralizing the controls prevents further aggravating things and buys the pilot more time to evaluate and take the appropriate action — usually leveling the wings and then pulling out with the elevator.

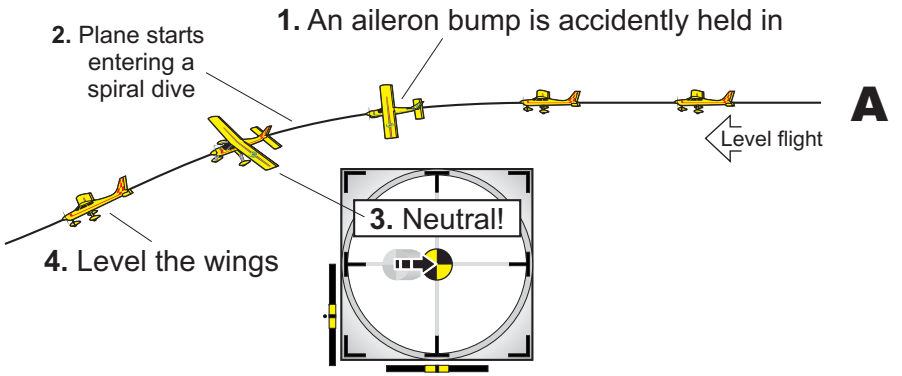
It can take years to develop the skills needed to recover from all sorts of unusual attitudes, thus a novice flyer needs to avoid entering these situations in the first place.

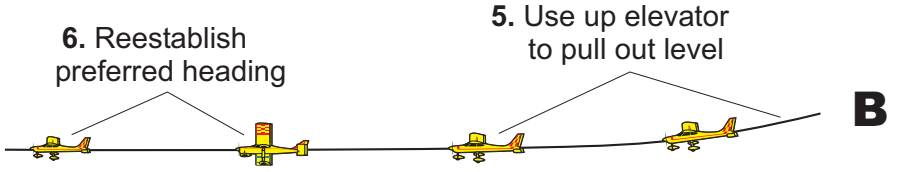
Worth repeating again and again: It's hard to get into serious trouble as long as you don't hold in the aileron!



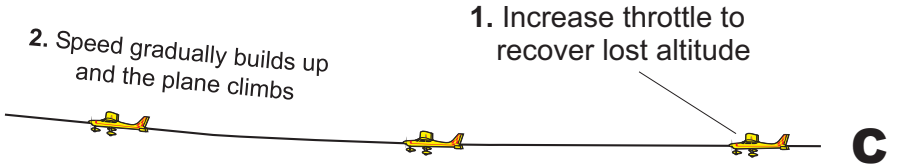
Holding in aileron & elevator produces a tightening spiral (regardless of how much elevator you pull).

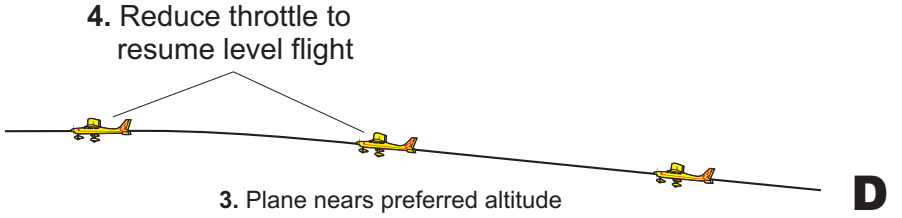
Recovery part one:





Recovery part two:





KPTR: The first thing to do when confused and/or out of control is neutral the controls!