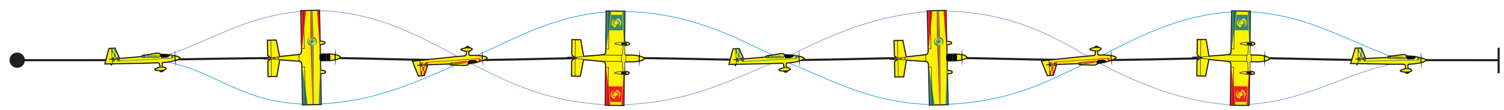
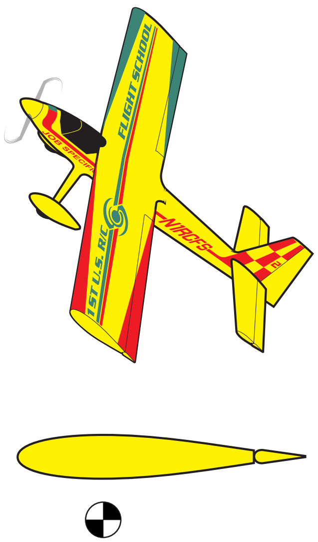
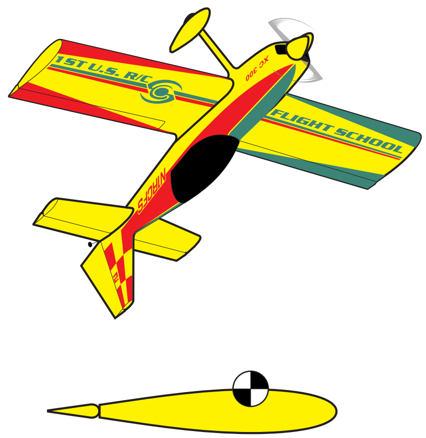
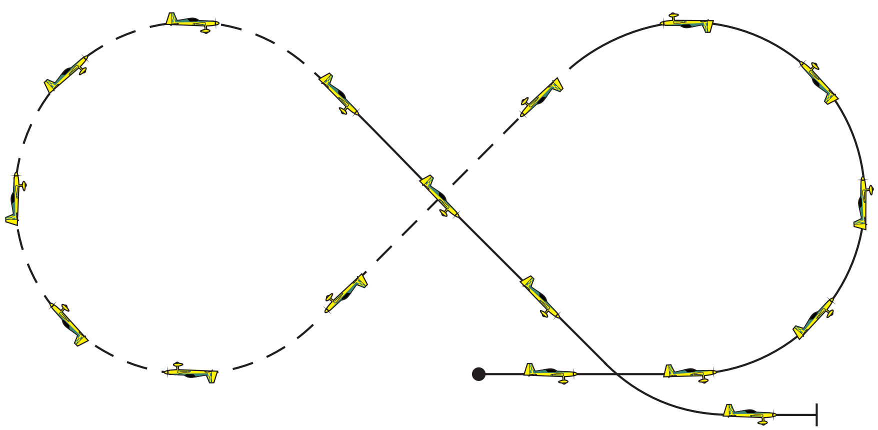
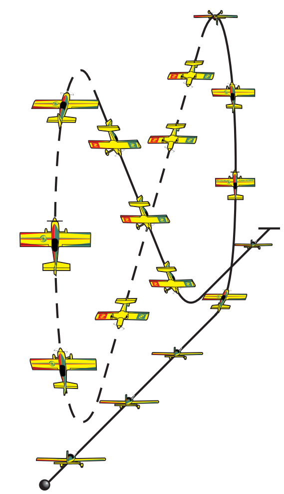




Intermediate Aerobatic Airplane Guidelines



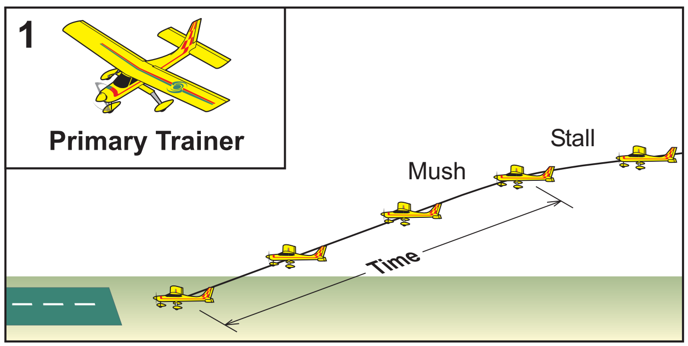


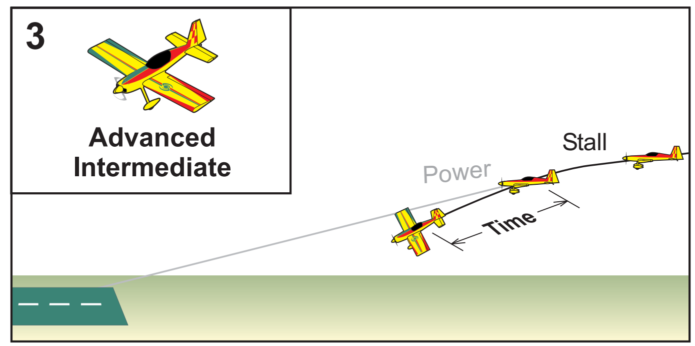


Intermediate Aerobatic Training Airplane Considerations

In this section: Page A-2 outlines the general flight characteristics of a good intermediate aerobatic training airplane. As a general rule, the higher the performance capabilities of an airplane, the better suited it will be for flying precision aerobatics. However, the pilot's ability to land it must also be considered.

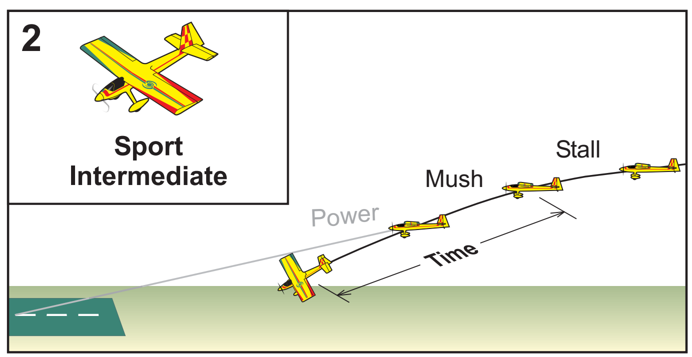
A-3 describes the airplane design features that deliver ideal intermediate aerobatic performance together with decent landing qualities. This is an important consideration because as the forgiving qualities of previous planes are forfeited for higher performance, the potential for *tip stalls*, i.e., a wing abruptly dropping during slow speed flight or when the elevator is over-controlled, becomes greater. Since "slow" is a relative term depending on one's confidence, making the informed right airplane choice may ultimately hinge on understanding how much time each type typically affords the pilot to recognize and correct a stall before getting too slow on approach to landing.





Compare: A highly stable *primary trainer* flown too slow or stalled could likely be kept that way, mushing all the way to the ground without dropping a wing.

A *sport intermediate* airplane is prone to giving the pilot less time to recognize a stall and add some power before a wing drops.

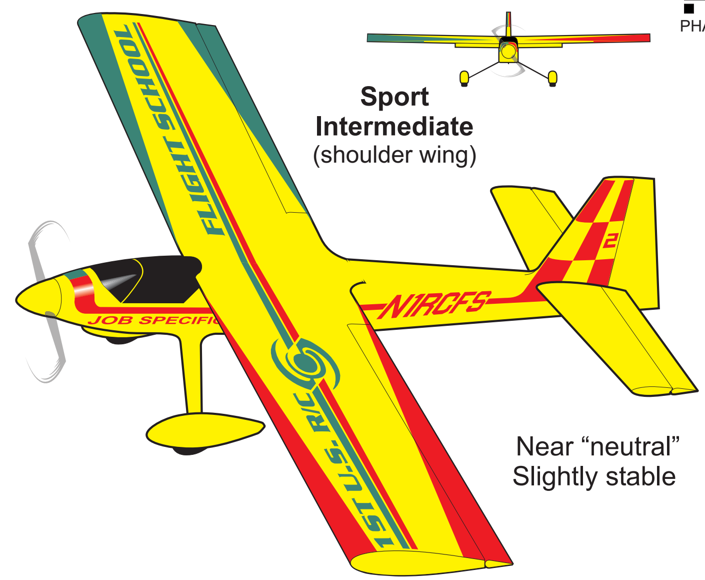


An *advanced intermediate* plane requires more power and lowering the nose at the first sign of a stall mush to prevent it from tip stalling moments later!

KPTR: The higher the performance capabilities of an airplane the more you will have to be on your toes during landing.

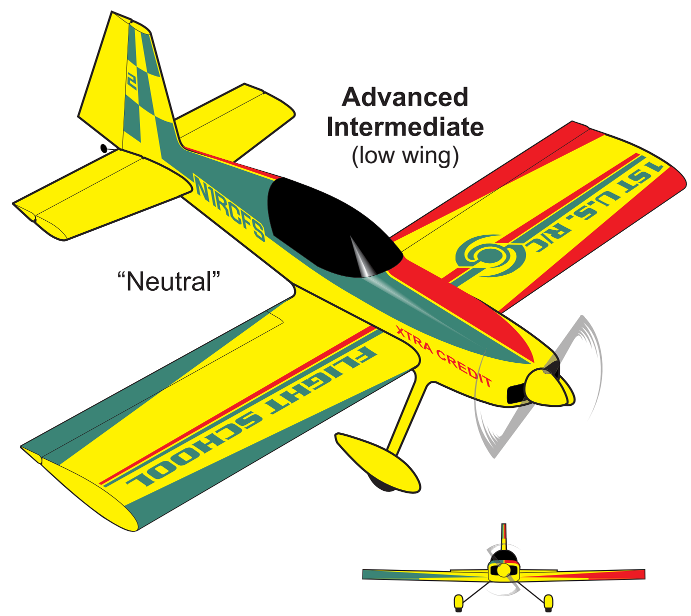
Intermediate Aerobatic Airplane Flight Characteristics

Note: As a rule, how responsive a model is in flight is dictated by the control throws, regardless of whether the model is small, large, high, or low performance. After setting the control throws to the manufacturer's recommendations, the primary features dictating each model's performance, and therefore the skill requirements, are the wing's shape, airfoil, and location on the fuselage.



Nearly all airplanes with symmetrical wings, little dihedral, and ample power are suitable for intermediate aerobatic flying. Airplanes with these features are near or completely “neutral”, meaning they maneuver just about as well on their side and upside-down as they do upright, and when trimmed correctly, are inclined to stay in any attitude the pilot places them in.

A *sport intermediate* category airplane, while highly aerobatic, still exhibits a slight amount of *positive* stability, and thus requires less effort on the part of the pilot to fly normally. However, the very existence of positive stability requires a slightly more vigorous technique to maneuver it aerobatically—making this a good basic aerobatic trainer since it will tend not to exaggerate over-controling. Put another way, the somewhat heavier inputs one typically applies when learning can actually work out being close to what is normally required. As such, a sport aerobatic airplane is ideal for pilots learning new maneuvers and inputs.



An *advanced intermediate* category plane exhibits *neutral* stability, which frees it up to be more maneuverable, but also requires the pilot to control all aspects of flight with greater finesse! Inclined to do precisely what it is told to do, this airplane is more capable of performing precise maneuvers as long as the inputs are true, otherwise it will easily go along with inaccurate inputs also (quickly turning a decent maneuver into a sloppy mess). In other words, there's less margin for error. Therefore, an advanced intermediate airplane is ideal for the pilot comfortable with his maneuvers, and is now looking for even greater precision.

KPTR: *Sport* airplanes are easier to fly, but harder to fly precisely.
Advanced airplanes are more precise, yet require more attention.

Intermediate Aerobatic Airplane Design Features

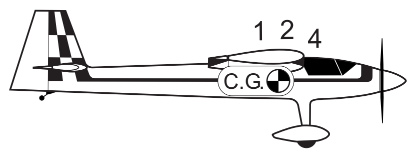
1. A *fully-symmetrical* airfoil is the most significant feature dictating the performance of these airplanes. It is what suits them to flying well in any attitude (e.g., inverted), and contributes to the overall *neutral* state that makes them more open to doing whatever the pilot wants.

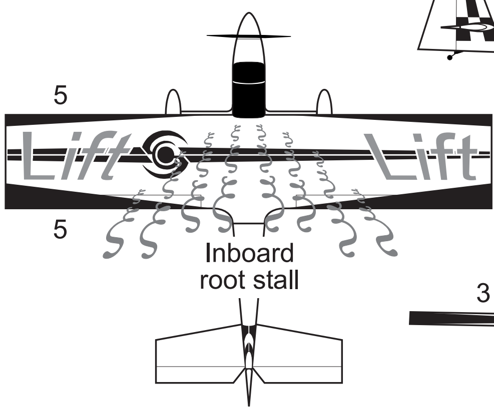
2. A *shoulder* or *low wing* location places the wing closer to the airplane's center of gravity (C.G.), directly impacting the neutral stability condition that causes a plane to stay in the attitude it is put in. **2.1. A shoulder wing** position slightly above an airplane's C.G. causes the plane to be slightly stable. That is, helping it to be somewhat forgiving when flown upright, at slow speeds, and during *inside* maneuvers. **2.2. A low wing** position very near a plane's C.G. causes the plane to be completely *neutral*, and open to doing whatever the pilot tells it to do—whether upright or inverted—and is thus able to perform a wider variety of precise maneuvers in capable hands.

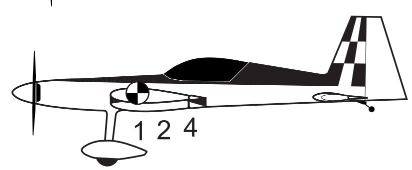
3. Little or no dihedral also contributes to neutral stability by keeping the overall wing layout closer to the C.G..

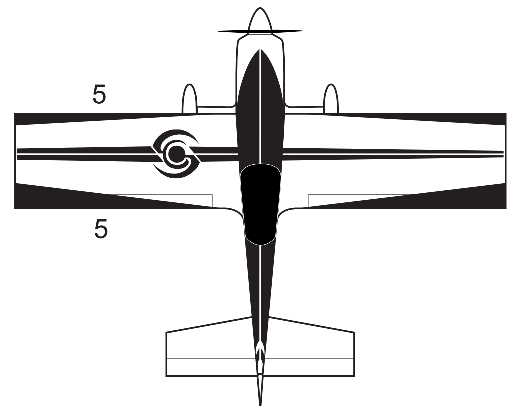
4. A thicker airfoil expands the *flight envelope* of a plane by generating a lot of wing lift at slower speeds, while also affording more behaved high speed performance.

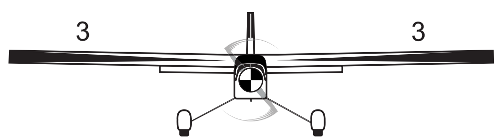
5. A constant-chord wing is the critical feature behind these airplanes, while very aerobatic, retaining somewhat predictable and manageable stall characteristics: When stalled, either from being turned too tight or flown too slow, a constant-chord wing inherently loses lift in the center *root* section first, while (for a time) the airflow remains smooth and thus continues to provide lift out toward the tips. Consequently, a pilot is able to experience a stall without the airplane immediately entering an unintentional tip stall, snap roll, or spin.

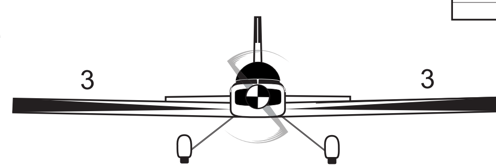




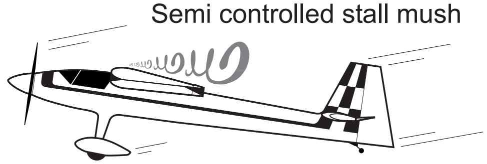








Semi controlled stall mush



Side note: Due to the wide flight envelope permitted by the wing, these airplanes offer several levels of performance, i.e., like several planes in one — depending on the speed they are flown at, and the amount of control surface travel one chooses to set them up with.

KPTR: A good intermediate airplane features a thick constant-chord symmetrical wing.