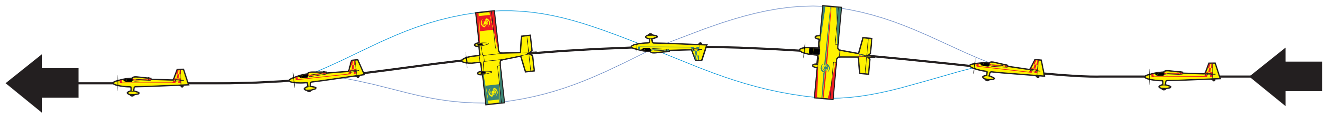
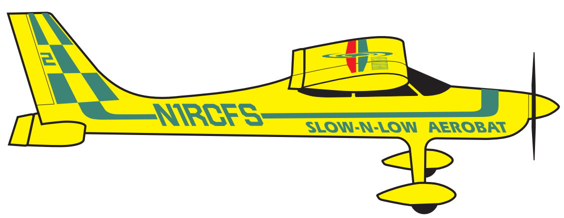
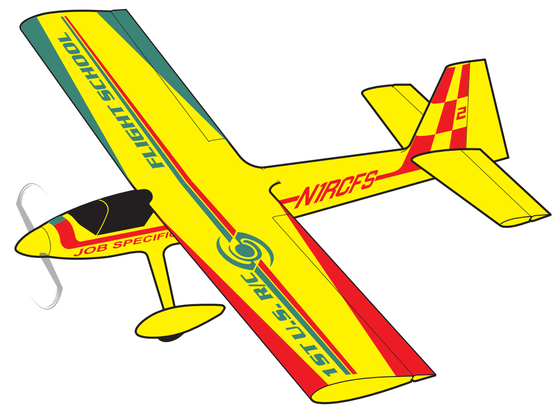
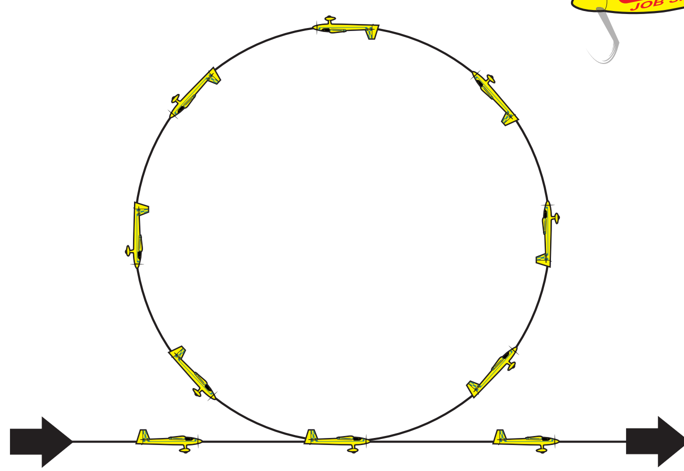
DAS
PHASE I



Sport Aerobatic Airplane Guidelines







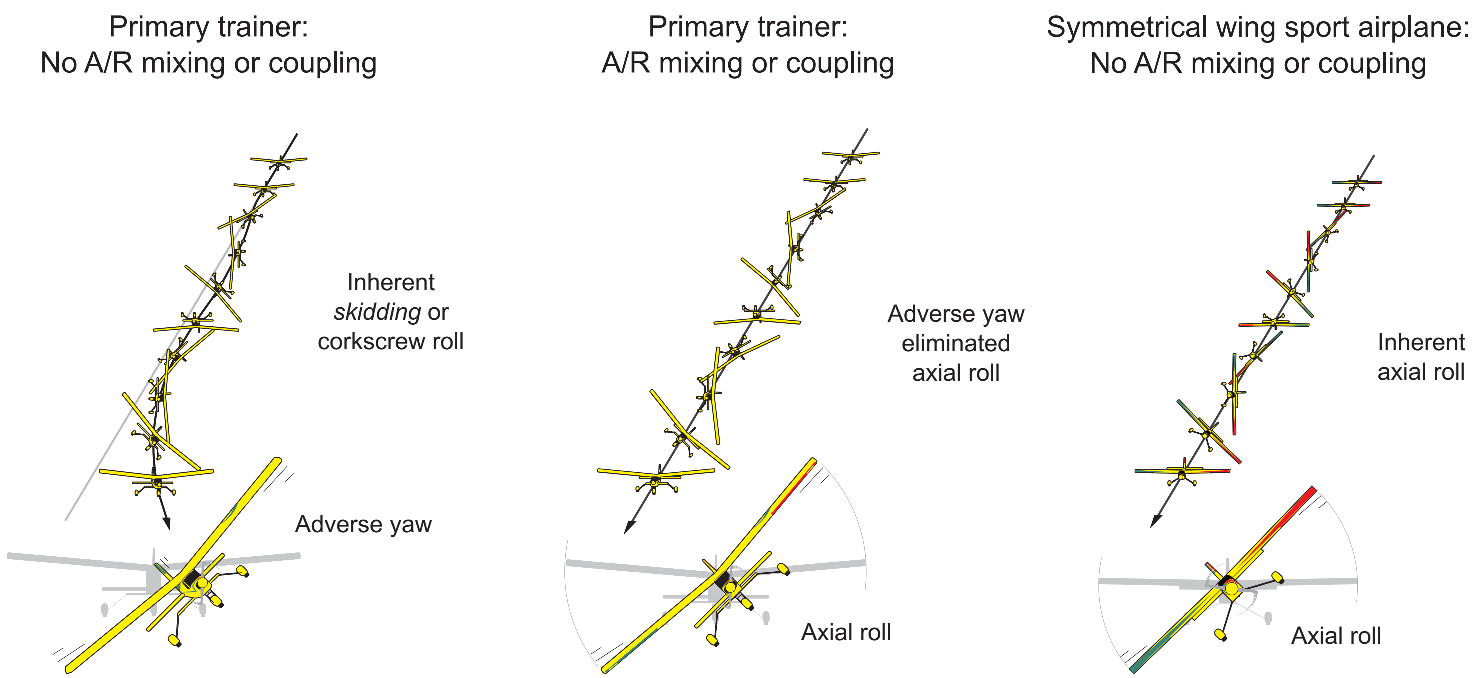
DAS PHASE I

Sport Aerobatic Training Airplane Considerations

In this section: Page A-2 outlines the general flight characteristics of a good sport aerobatic training plane. Note: All the maneuvers in this program can be performed with a flat-bottom high wing primary trainer that utilizes aileron/rudder (A/R) mixing or coupling to eliminate *adverse yaw* (see *One Week To Solo* manual). Otherwise, adverse yaw would hinder learning aerobatics in the same way it does learning to fly. Plus, many of the habits that would develop while working to overcome the sloppy responses would have to be discarded when transitioning to a symmetrical-wing sport model without adverse yaw.

Even though an A/R mixed primary trainer is far more capable of aerobatics than one without mixing, it is still a *positively* stable airplane. Meaning: the pilot has to work especially hard to get it to maneuver through unusual attitudes, i.e., it will seem to fight some of the maneuvers. For this reason, it is recommended that a true symmetrical-wing sport aerobatic model be used for maximum learning with less effort.

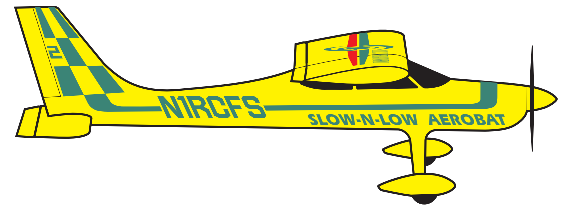
A-3 describes the design features (configuration) of a good sport aerobatic airplane, and points to the general pilot skills required to fly this type of model.



KPTR: Aerobatic success is achieved more easily and quickly with an airplane suited for aerobatics.

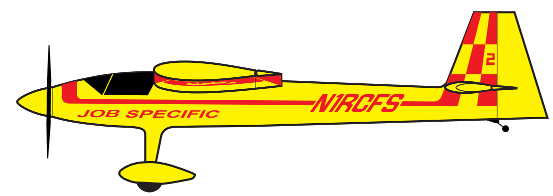
Sport Aerobatic Airplane Flight Characteristics

A sport aerobatic airplane is best suited for looping and rolling maneuvers. This type is more *neutral* than a primary trainer, meaning it maneuvers just about as well on its side or upside-down as it does upright. This type will involve more speed, yet still exhibit some *forgiving* characteristics, such as retaining some stability in the slower speed realms of flight, e.g., landing. In short, while this type is very aerobatic, it does not require any particularly special skills to be able to fly it.

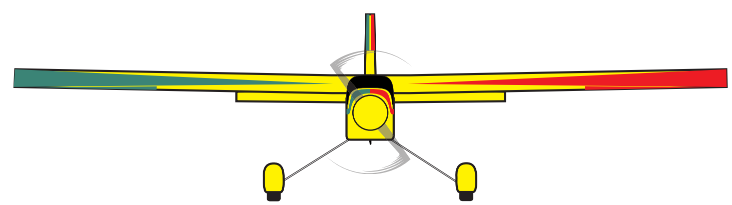


Specific aspects of this model's performance are:

- The airplane *stays* in the attitude (position) it's put in and mostly does only what you tell it to do.
- Therefore, this airplane requires you to more *accurately* control most aspects of flight. It's not harder to fly, it just does what you tell it–so you need to tell it the right things.
- This type also *tracks* more solidly (straighter) in flight, is less affected by wind, and therefore requires fewer corrections in normal flight (point A to B).
- The tradeoff for the increased performance capabilities of this airplane are slightly higher landing speeds — although, it is easier to control the touchdown location due to less *floating* compared to a primary trainer.



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



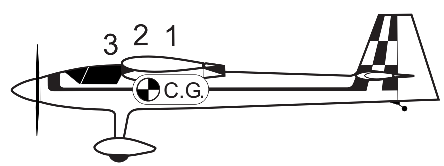
KPTR: A sport aerobatic airplane is best suited for looping and rolling maneuvers, and is inclined to *stay* in the attitude it's placed in.

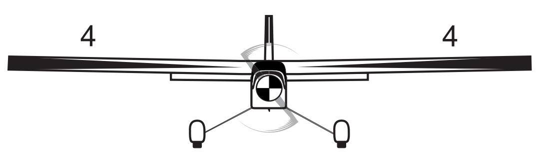
Sport Aerobatic Airplane Design Features

1. A *semi* or *fully-symmetrical* airfoil: The most significant feature dictating this airplane's performance is its semi or fully-symmetrical wing to enhance penetration and furnish the *neutral* flight characteristic suited for maneuvering well through unusual attitudes. A symmetrical wing typically necessitates higher speeds to maintain level flight. Therefore, when this type is slowed down, the *sink rate* is steeper than that of a primary trainer.

2. A *thicker* symmetrical airfoil will improve how slow a plane can be flown before stalling, and yet as power and speed increase, the capabilities of a plane sporting a thicker symmetrical airfoil increase dramatically.

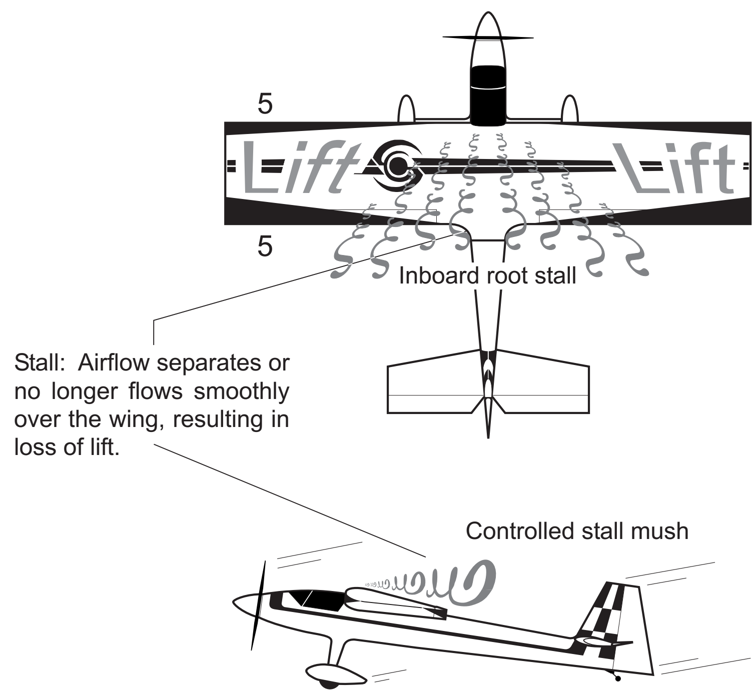
3. A lower *shoulder wing* location: A slight amount of *positive* (upright) stability will still exist with the wing positioned slightly above the Center of Gravity (C.G.). Yet, the wing placement on the top of the fuselage and relatively close to the C.G., produces flight performance closer to that of *neutral* stability, and the plane's tendency to stay in the attitude the pilot puts it in.





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

5. A *constant-chord* wing: While this plane is more aerobatic due to its symmetrical wing and lower overall wing placement, when put into a stall the constant-chord wing inherently first loses lift in the center *root* section, while the airflow remains smooth and thus continues to provide lift out toward the tips. Consequently, a pilot is able to experience this type's slow speed handling without encountering an unintentional *tip stall* or spin, i.e., this wing provides a forgiving *mushy* stall when flown too slow, yet remains controllable—to a point!



KPTR: The primary features of a good *sport* airplane are its constant-chord wing, thick symmetrical airfoil, and shoulder wing location.