

## Phase III Advanced Aerobatics Introduction



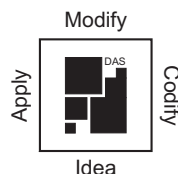
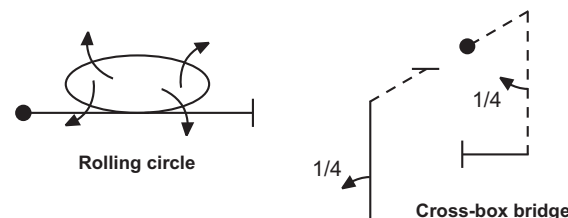
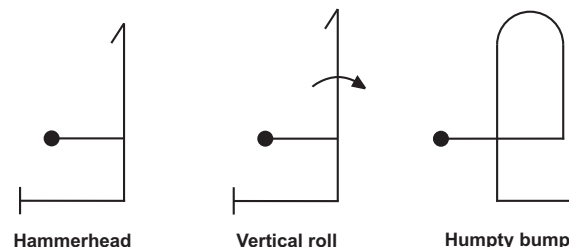
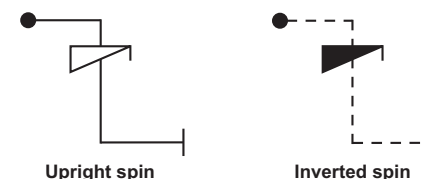
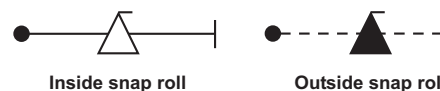
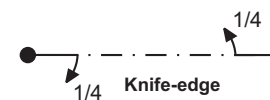
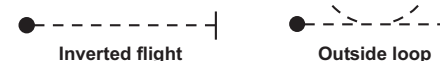
There are many exciting reasons to learn to fly advanced aerobatics, but the most compelling are the challenges and personal rewards. If you are like most, your learning curve was initially steep through basic looping and rolling maneuvers—but even though you were motivated, it went flat relatively quickly with practice alone. Advanced aerobatics can be done by anyone who has a desire to learn and is proficient at basic aerobatics. With a little help, aspiring advanced aerobatic pilots can reap the benefits of a good foundation and progress into *snappier* aerobatics and *vertical* maneuvers!

This book builds upon 1st U.S. R/C Flight School's *Basic* and *Precision Aerobatics* programs by inserting the finishing touches to slow rolls and featuring the individual maneuvers that are the basis of advanced aerobatics:

- Inverted flight • outside maneuvers • knife-edge flight
- inside and outside snap rolls • upright and inverted spins
- hammerheads • vertical rolls • humpty bumps • rolling turns • cross-box maneuvers (perpendicular to the runway) to reposition the airplane further away or closer in to the runway's extended centerline.

No doubt, these maneuvers present some great flying challenges, but the rewards of learning them are some of the greatest that can be had in the sport.

Aresti:



See *Sport* or *Precision Aerobatics* for basic Aresti symbol explanations.



## Outline of Instruction - Advanced Aerobatic v/s Stunt Pilot

Given the heavy emphasis on 3D *stunt* flying today, it needs to be clarified that “3D” and “flying advanced aerobatics” are not the same thing and have almost nothing in common. 3D flying utilizes huge control throws, radio capabilities, and excesses of power to perform stunts that seem to defy the laws of aerodynamics for *show*. Whereas, flying aerobatics is all about developing the precise airplane control to master the laws of aerodynamics, and most importantly, experiencing steady advancement and satisfaction each time you fly.

The appeal of 3D is that spectacular stunts are possible without necessarily requiring that a person improve his piloting technique or address his bad habits. Nor is it the type of flying that exposes his attempts to a clear-cut good or bad critique. However, most 3D stunts are so difficult, take for example the *torque roll*, that those who have chosen to make it their signature maneuver usually dedicate a summer or more to almost exclusively practicing that one maneuver.

Studies have shown conclusively what 1st U.S. R/C Flight School learned years ago, that as much as 90% of success in any sport is due to mental factors! In short, to succeed one must be motivated to succeed. For most people repetitive practice of the same things leads to staleness, a loss of motivation, and sometimes declining performance. Since there are only a handful of 3D stunts, the vast majority of pilots who emphasize 3D can be observed frequently resorting to taking risks and tinkering with and acquiring new equipment to stimulate their interest.

Those who are successful advanced aerobatic pilots tend to be good planners, are motivated by personal achievement rather than receiving approval of others, genuinely enjoy flying, and are not content to stay at one skill level very long. The appeal of flying aerobatics is that aerobatics can be learned relatively quickly with good instruction, and when one has learned the advanced maneuvers, the ways that they can be combined and rearranged are practically infinite — with each new success then providing the motivation to pursue even higher standards of skill performance.



## About the Manual - Training Notes



The design objectives that make up this flight training manual are: To organize in sequence the steps necessary for the advancing pilot to constructively practice, and provide a source of proven information laid out in a way that can be quickly accessed while studying at home or practicing on a simulator or at the flying field — hence, each page can stand on its own, and most pages display a summary Key Point To Remember (KPTR) to aid retention.

Instructor’s practice note: It is important to note that if a pilot does not show improvement within 3 or 4 attempts in a specific area, there is no need for additional practice until the solution is identified. Continuing to repeat the error will just make correcting it that much more difficult later on. Advancing pilots tend to assume that any difficulties that arise learning advanced maneuvers will require advanced remedies. In truth, it is just the opposite: The success of any maneuver, even advanced ones, hinges on good fundamentals! The more complex the maneuver is the easier it is to overlook this. Thus, anytime that your attempts are failing or inconsistent, go back to stressing basics: Possibly you are not entering the maneuver with the wings level, not entering your loops with the same amount of elevator, or prematurely thinking about your next step while neglecting what you need to do to get there. Remember, advanced techniques primarily help to perfect—or are in addition to—maneuvers that you are already routinely performing.

A note about radio *Exponential*: Airplanes set up to achieve the extreme control surface deflections needed to perform 3D stunts commonly require large amounts of “*expo*” to make them controllable when not doing 3D stunts. However, using expo also means sacrificing the correlation of control inputs and airplane response that is so important to developing the consistent timing required to fly advanced aerobatics. Therefore, if you wish to have a 3D setup incorporating large amounts of expo, we suggest that you put all your 3D settings on one switch. You could even go as far as to dedicate one model memory to 3D settings and calling it “---3D”, and maintain a conventional “linear” control setup favorable to flying aerobatics on another model memory and calling it “---LKD”, for the way the plane will feel “locked” with your control inputs when you fly it.

Control stick tension note: After years of testing, no amount of programming has proved as effective at improving consistency and quality of flying as much as increased stick tension!



## Advanced Visualization: A Crucial Success Factor

The first step before practicing any new maneuver or maneuver component should be to acquire the correct understanding of the technique for flying it. This is vitally important during the initial learning phase because, without the correct understanding, practice will develop incorrect skills that will become increasingly difficult to change.

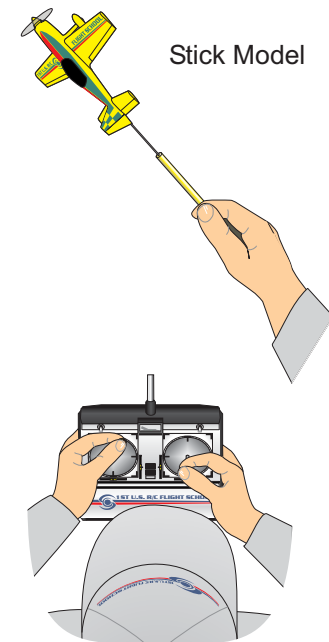
*Visualization* is a highly effective technique to help improve one’s understanding and therefore training success. While visualization does not take the place of physical practice, it does significantly improve performance when combined with physical practice. Both research and practical experience have shown that a training schedule of 25% physical practice and 75% mental preparation is more effective than 100% physical training — what is typically referred to as the “quality over quantity” approach.

To be effective, visualization has to involve more than having a pretty good idea of what to do or thinking in vain generalities like, “I need to keep the roll level.” Effective visualization is simulating the experience of flying the maneuvers in one’s mind: Visualizing the positions of the throttle and the flight controls throughout the maneuvers are all part of effective visualization. This is made much easier using a small hand-held model plane or facsimile. (Stick planes are posted at [www.rcflightsschool.com](http://www.rcflightsschool.com))

1st U.S. R/C Flight School has found that the following 3-step process of visualization works best to prepare students for maximum success in the air:

- First we will walk through the technique for flying the maneuver using study materials and a stick model.
- Next the student will maneuver the stick model emphasizing the position of the control surfaces throughout the maneuver.
- Then the student will visualize the maneuver while working the transmitter controls.

Effective visualization can be done in slow motion or real-time—preferably both, and in that order. Visualization can be done anytime, anywhere, and is most effective when done several hours before, and then again shortly before and immediately after flying.



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Utilize the  Check boxes to keep track of your progress and current areas of practice.



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Training Sequences: Each includes a slow roll, 4-point roll, single and double avalanche, hammerhead, humpty bump, P loop, some with upright spins. Progressive sequences add outside loops, outside snaps, vertical rolls and snap rolls, various roll combinations, rolling turns, some with inverted spins.

- Training Sequence 82 (Cubans, spin)
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