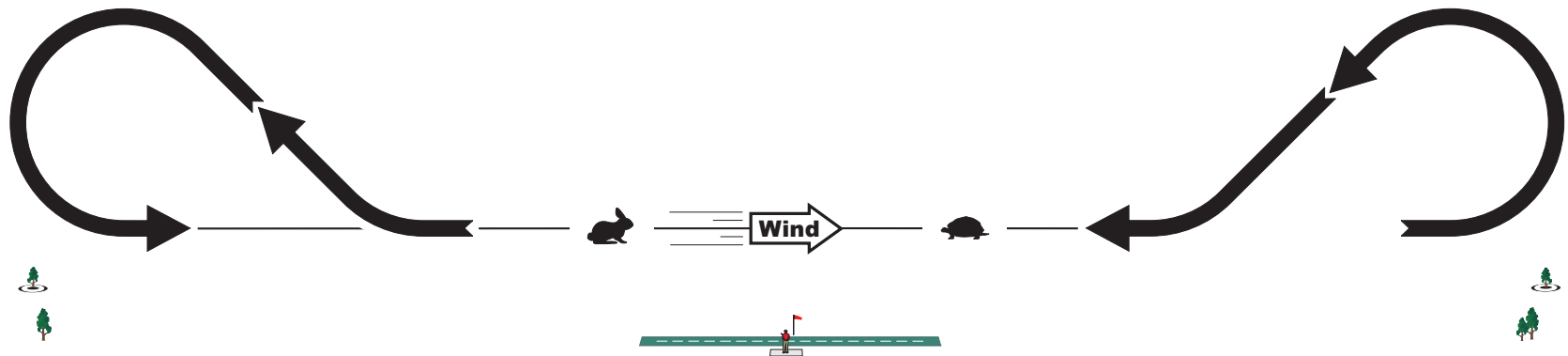
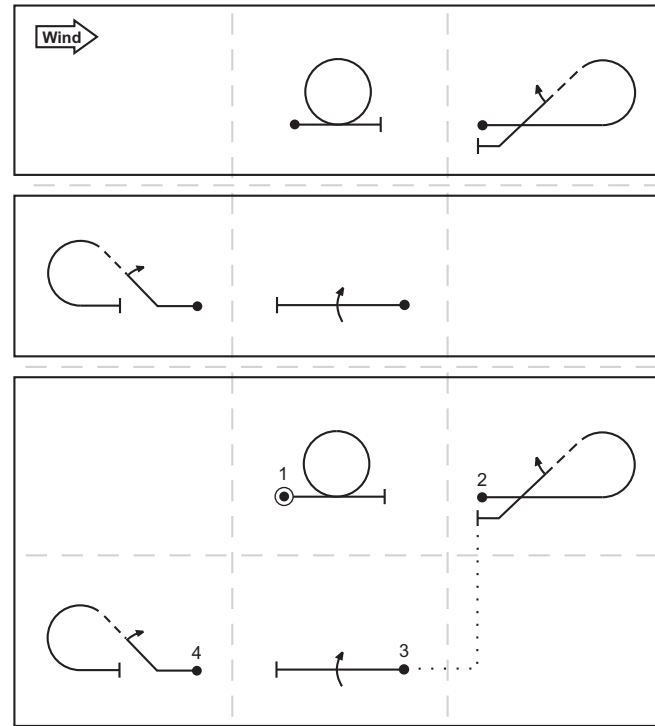




# Aerobatic Sequence Practice Outlines





## Increasing Your Initial Practice Effectiveness

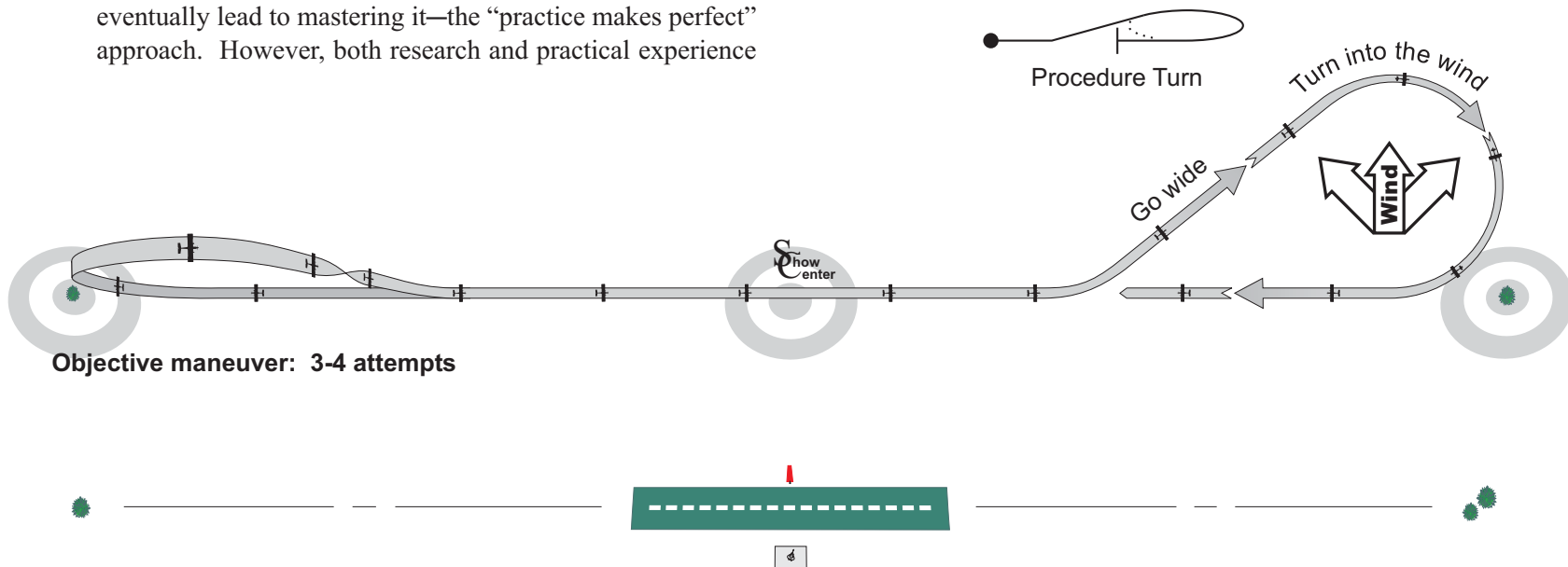
There are 4 primary ways to ensure, and in most cases, accelerate the success of all pilots. In order of importance:

1. Planning.
2. Crawl-walk-run (progressive building-block objectives).
3. Concentrated practice time.
4. Pushing one's skill envelope (occasionally to make previous areas of practice seem easier when returned to).

Planned practice flights establish explicit goals that, in the process of pursuing, make flying more interesting and fun (while preventing the leisure practice of mistakes that can lead to bad habits). While it is normal for individuals to feel that the way they approach practice is the “best” or “right” approach, the fact is that some practice methods prove better than others. For example, a commonly held belief is that the repeated practice of any one thing will eventually lead to mastering it—the “practice makes perfect” approach. However, both research and practical experience

have shown that during the initial learning phase of any new flight skill, optimal learning occurs when the skill is practiced generally no more than 3 to 4 attempts in a row. After the initial learning phase, *change* needs to be introduced or the pilot begins to suffer either staleness and a lack of focus, or “paralysis by analysis” and a decline in performance and enjoyment.

Practice note: When practicing a skill such as rudder at one end of the flying field, the most efficient way to turn around for each attempt is to go wide of the turnaround ground target and turn into the wind. Turning around into the wind results in a smaller diameter turn that is therefore easier to position, less time consuming, and less demanding.

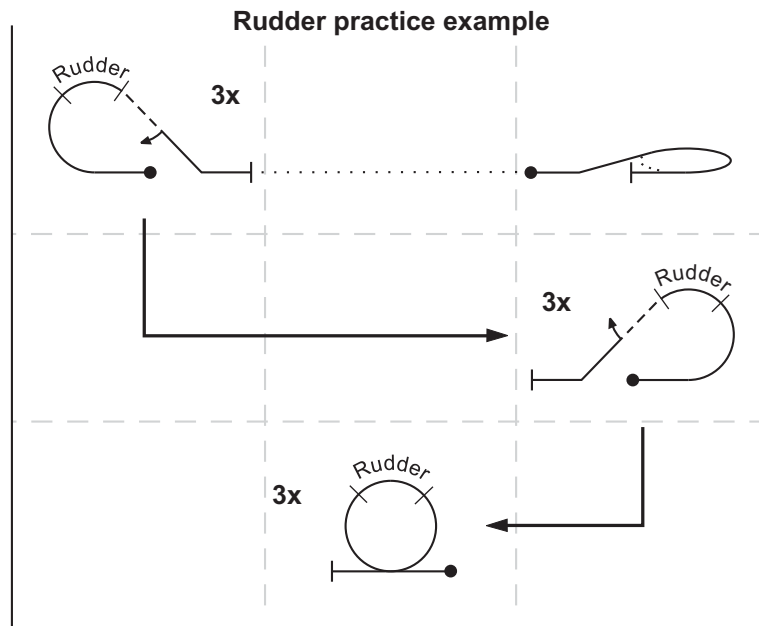


## Maintaining Your Practice Effectiveness



The “change” necessary to maintaining high practice effectiveness after the initial learning phase of a particular skill can be changing the location or direction of the maneuver you are practicing. Here again, with each new situation, practice it exclusively no more than 3 to 4 attempts for optimal learning.

Indeed, the best practice methods prepare the learner for future objectives, as well as enhance immediate success. Not only does repositioning the particular skill that you are working on tend re-fresh your focus, you are also setting the stage for flying a sequence of maneuvers from one end of the flying field to the other.



Most people assume that if they could focus on one task, they would master it earlier if they didn’t have to think about anything else. However, that has not proved to be the case. 1st U.S. R/C Flight School students continually demonstrate that beyond the initial learning phases, long-term retention and the awareness to detect the final touches to perform maneuvers really well, doesn’t really begin until a pilot is practicing his refinements in the context of a *sequence* of maneuvers (attributable to the keener awareness of cause-and-effect that develops when flying one maneuver after another).

The ability to string together a series of individual maneuvers into a well executed sequence surely represents the ultimate expression of piloting skill. Phase I taught the process of performing a continuous aerobic sequence of several or more maneuvers. Now, possessing the knowhow and ability to use rudder (Phase II), you will be able to fly a continuous sequence in any condition!

When you’re ready to assemble your refined maneuvers into a continuous sequence, start by practicing a pair or *set* of maneuvers 3 to 4 times in a row. Then repeat the process with a new set of maneuvers. Then practice following up the first set with the second (see section cover). Continue practicing new sets of maneuvers, and then adding them to your greater sequence.

Note: There is more information in this program than anyone can recall from a few readings. Therefore, it would benefit you to take this manual and its practice outlines with you to the flying field every time you fly.

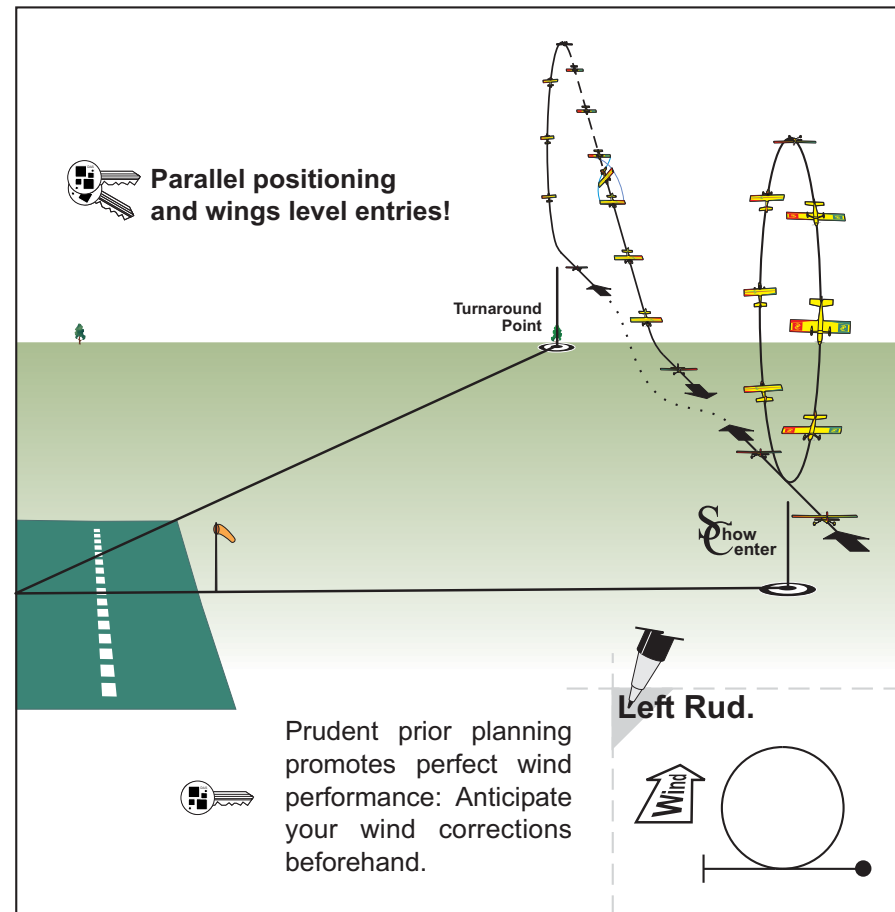
KPTR: Begin building an aerobic sequence by practicing a pair of maneuvers, then another pair, then all four in sequence, etc..

## Question Where to Begin

An Intermediate practice schedule should attempt to take advantage of the conditions at that time. For example, an ideal 1st U.S. R/C Flight School Intermediate Aerobatics course will begin with rolls and symmetry of loops and lines practice, as a warmup to P-factor rudder corrections when conditions are calm or the wind is parallel with the runway. However, more often than not a x-wind exists, and then out of necessity the training will center on wind corrections. Note: Rudder, i.e., using the left stick, has to be practiced on a regular basis for the learner to be successful. On the other hand, periodic practice of rolls and symmetry of loops and lines does not seem to affect the success of the learner one way or the other. Therefore, a typical Intermediate practice schedule focuses heavily on rudder, with roll and symmetry practice providing a change of pace from time to time.

Thus, the question at the start of each day should be, "Is it a P-factor or x-wind dominant day?" By asking, the primary nature of your flights can be anticipated. As to any difficulties that may spring up, take it from one who has trained more than 1200 students, the difficulties that pilots experience are seldom issues of ability, but lapses in planning and prioritization!

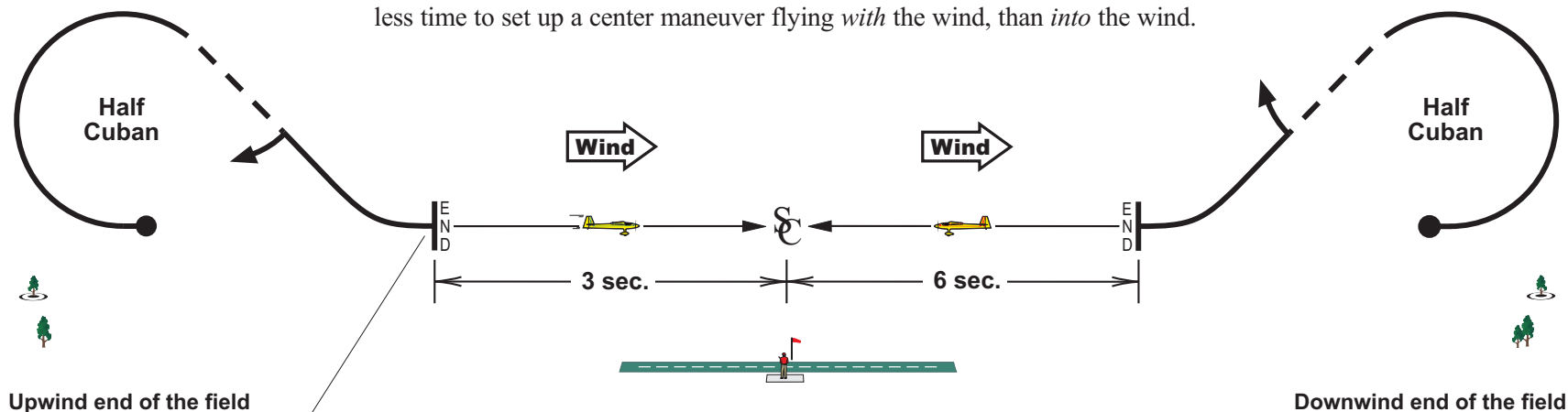
So remember: The success of every maneuver hinges on fundamentals, such as the position and quality of the maneuver's entry. Refinements only help to perfect otherwise sound maneuvers. If you stumble with any refinement, temporarily leave it out until you can once again perform the basic maneuver soundly. And then, while maintaining good basics, attempt to reintroduce it.



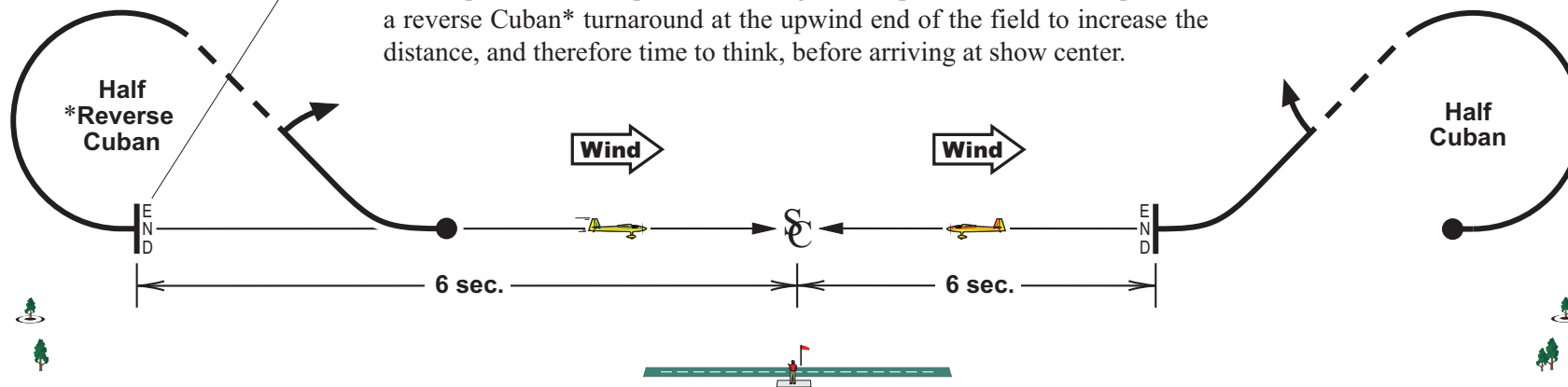
Post script: You shouldn't shy away from practicing rudder in strong x-winds. While a strong x-wind might be something for a reactor to avoid, it can actually help make learning to use the rudder easier for you: First, you won't ever have to question whether to correct wind or P-factor. Second, the larger inputs a person is prone to making when initially learning to use the rudder, may be perfectly suited to what is needed to correct a strong x-wind anyhow!

## Finer Points: Flying a Balanced Sequence

If regular half Cuban turnarounds are performed at both ends of the flying field with the wind paralleling the runway, you will end up with noticeably less time to set up a center maneuver flying *with* the wind, than *into* the wind.



To compensate for the plane's faster (ground) speed *with* the wind, perform a reverse Cuban\* turnaround at the upwind end of the field to increase the distance, and therefore time to think, before arriving at show center.

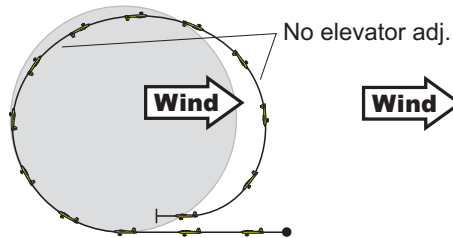


Note: A balanced and parallel sequence is maintained by choosing the right turnarounds for conditions and using rudder in the maneuvers to prevent deviations. When a maneuver is completed and found to no longer be parallel, unless the deviation is very slight, aileron and elevator should be used to make small turns to get back on course.

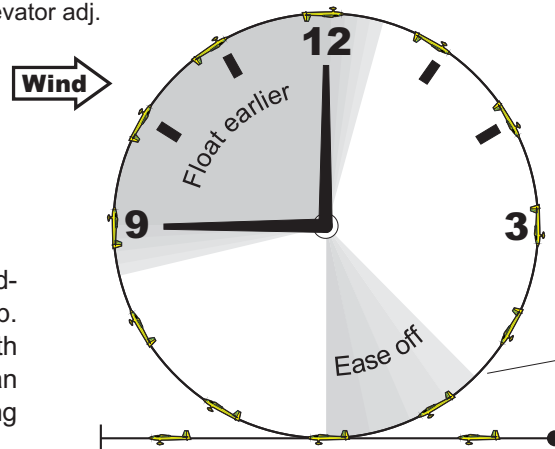
Do not attempt to use the rudder to turn the plane! Rudder is effective at preventing deviations, but quite ineffective at turning the plane, and any attempt to do so becomes a lengthy ordeal that leaves little time to prep for the next maneuver—whereas using the more effective ailerons and elevator will quickly get you back on course.

## Finer Points: Anticipating Wind and Round Loops

Variations to the normal *float* technique may be needed when a loop is performed in a significant wind to keep the loop round and to finish it where it was started.



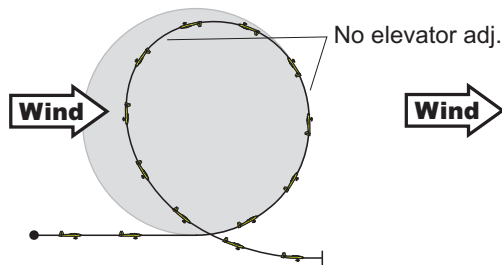
A loop begun *into* a significant head-wind will tend to elongate over the top. Therefore, the float should be both started and finished a little earlier than usual, to prevent the loop from being blown downwind.



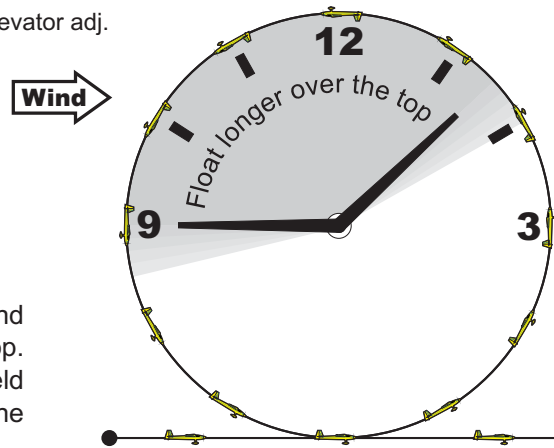
Furthermore, a loop begun into a significant wind will tend to tighten or *pinch* toward the end due to increasing wing lift and elevator effectiveness heading back into the wind. Hence, loops into the wind typically require a slight easing off of the elevator approaching the bottom.

Proficient flyers don't make a lot of corrections to fly well, they have learned what it takes to fly without needing a lot of corrections altogether!

Training side note: If you were one of the vast majority in the sport whose practice primarily consists of trial and error and correcting mistakes, you too would probably find that radio expo. can help make a plane easier to control, esp. around neutral. However, the tradeoff is that expo. also masks the lessons a pilot needs to experience to learn where he is deficient. Consequently, a person flying with expo. experiences short term help, but over the long term his practice is deficient. A pilot learning without large amounts of expo., who learns to correct his mistakes, benefits from a more solid foundation in everything he does. As a skillful driver, can you imagine a car having a duller response through the first few inches of steering wheel travel compared to the rest of the travel, and being told that giving up some control would make you a better driver? You know better!



A loop begun *with* the wind will tend to *pinch* extra-ordinarily over the top. Therefore, the float should be held longer over the top to drive the plane longer into the wind.

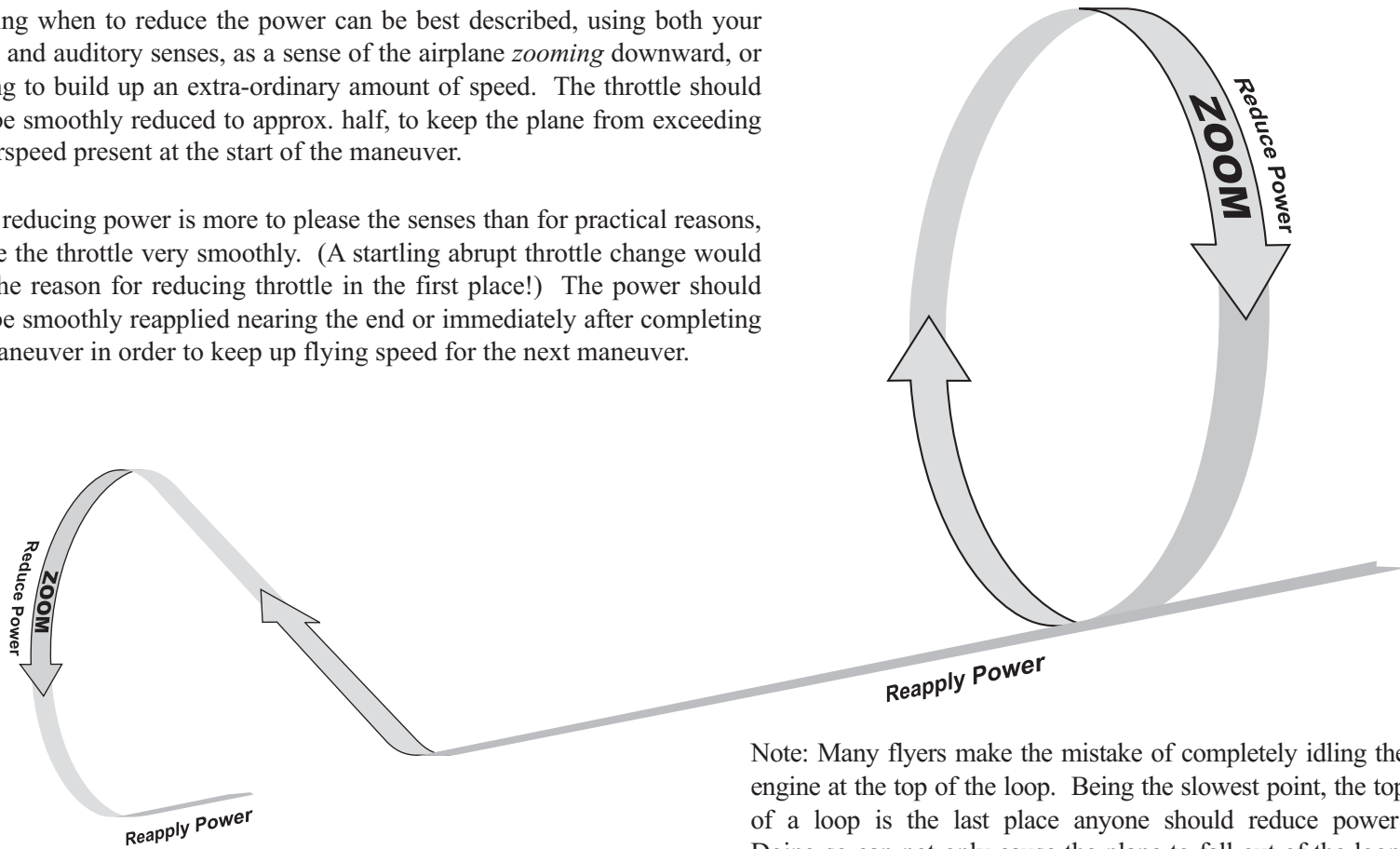


## Finer Points: Throttle Reductions

Partly reducing the throttle after the plane has gone over the top of a loop in order to maintain a more constant airspeed throughout the loop, is the final touch to make good maneuvers even more pleasing to fly and to watch.

Gauging when to reduce the power can be best described, using both your visual and auditory senses, as a sense of the airplane *zooming* downward, or starting to build up an extra-ordinary amount of speed. The throttle should then be smoothly reduced to approx. half, to keep the plane from exceeding the airspeed present at the start of the maneuver.

Since reducing power is more to please the senses than for practical reasons, reduce the throttle very smoothly. (A startling abrupt throttle change would ruin the reason for reducing throttle in the first place!) The power should then be smoothly reapplied nearing the end or immediately after completing the maneuver in order to keep up flying speed for the next maneuver.



Note: Many flyers make the mistake of completely idling the engine at the top of the loop. Being the slowest point, the top of a loop is the last place anyone should reduce power! Doing so can not only cause the plane to fall out of the loop, it increases the likelihood of the plane straying off its heading. Maintaining power over the top both helps to keep the loop rounder and tracking straighter.

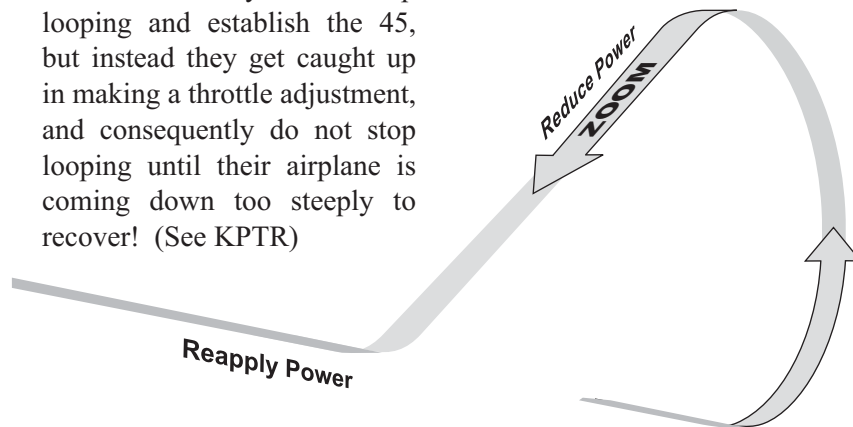


## DAS System of Precision Aerobatics Conclusion

Whenever a throttle reduction is deemed necessary, target a specific throttle position (e.g., half), commit to it, and then focus on completing the maneuver.

Understand that when gravity is accelerating a plane, the faster air passing through the propeller causes the rpm's to remain high even after reducing power to half throttle, and as such an audible change may not be obvious. Attempting therefore to base throttle adjustments on the sound of the engine, and not the stick position, typically causes pilots to pull the throttle back further than what is needed, and spend so much time messing with the throttle that the rest of the maneuver suffers.

Cautionary note: Airplanes are regularly put into the ground when pilots reach the point in a Cuban where they need to stop looping and establish the 45, but instead they get caught up in making a throttle adjustment, and consequently do not stop looping until their airplane is coming down too steeply to recover! (See KPTR)



When I think of students of the 1st U.S. R/C Flight School DAS System, I think of a statement made by a past AMA President that went like this:

*“80% of the average R/C flyers spend 70% of their average flight bringing the airplane back from somewhere they hadn't intended it to be!”*

Your foundation of knowing what, how, and why you do what you do, establishes you as unique/elite in the R/C community.

Whether you are in this sport as a hobby, for fun, or for the satisfaction, you are a cut above. Enjoy!

Instructor

KPTR: Regularly review Phase II to keep from joining the ranks of flyers who are unwittingly trying to put the finishing touches on their otherwise deficient maneuvers!