

# Transmitter Handling Tips to Maximize Precision & Proficiency

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2-fingers on the control stick (thumb on top, index finger on the side for support) naturally enables pilots to more precisely control their inputs.

A proper airplane/radio setup is certainly a distinct advantage, but nothing has proven to facilitate better flying during 1st U.S. R/C Flight School training courses as effectively as using 2 fingers on the control sticks and increasing spring tension in the radio to improve a pilot's ability to precisely control the helicopter's movements. The following article addresses optimum transmitter handling techniques while providing context to the proper uses of programmable exponential to help further optimize your airplane's handling.

## Introduction

While individual opinions vary regarding the "best" transmitter handling techniques, it's safe to say that few people have objectively compared them all. Rather, most pilots simply continue to use (and promote) whatever they have become accustomed to. But if you could compare all the different techniques, you would quickly discover that certain methods promote greater consistency and therefore faster learning.

For example, whenever a driving situation demands greater control and accuracy, automobile drivers naturally put both hands on the steering wheel. Pilots are similarly able to more precisely control their inputs and thus their flying when using both their

thumbs and index fingers on the control sticks. Using two fingers on the controls has certainly proven instrumental during 1st U.S. R/C Flight School courses to produce the best results in the shortest amount of time. It's important to note that this technique mainly applies to "precision" flying, e.g., procedure turns, precision aerobatics, landing, etc.. 3D stunt flying, on the other hand, involves an entirely different approach to transmitter handling, not to mention, flying techniques, and equipment setups.

While some of these transmitter handling techniques may feel strange at first if you did not start out this way, you should know that most pilots find them relatively easy to adopt when they prove to help get the job done with a lot less effort.

## Cause and Effect

Traditionally, most people learn to fly by trial-and-error or at the side of a recreational flyer/instructor usually with very little pre-flight preparation. As a result, most pilots are conditioned to merely "reacting" to whatever the plane does. Hence, little thought is given to how they fly, or whether they are flying correctly. As a consequence, most flyers make many more control inputs than what is required when the maneuvers are flown optimally.



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Learning then slows dramatically when pilots reach their saturation point from having to make countless additional split-second decisions during their flights. A higher quantity of inputs also increases the likelihood of errors and a different result each time a maneuver is performed. These issues tend to be further magnified for pilots who fly with only their thumbs on top of the control sticks due to the unsupported thumb's natural tendency to jerk or snap the controls (especially when the pilot is anxious or excited, e.g., flying a new and/or expensive airplane, flying in windy conditions, landing, etc.).

Therefore, reactive thumbs-only flyers' skills often plateau because their lack of consistency prevents them from making the correlation between their inputs and the responses of the airplane needed to cement a solid foundation on which to build.

Not unlike like the golfer who can't keep his head down during his swing, but fantasizes that a new set of clubs will improve his game, many pilots end up looking to equipment to try to improve their flying. Specifically, they will often employ large amounts of radio exponential (expo) in an attempt to dampen the consequences of making too many inputs and jerking the controls.

## The Exponential Tradeoff

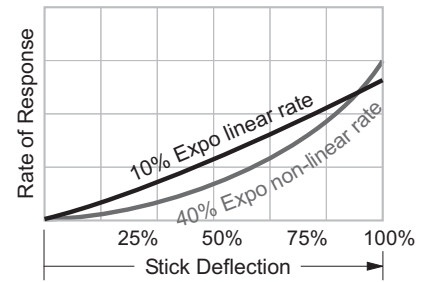
While it's true that large amounts of expo has the potential to make flying smoother, it does not address poor technique and causes some predictability and therefore consistency to also be sacrificed. Explained: Anyone who has ever driven an older car with slop/play in the steering knows how much harder one has to work just to try to keep the car going straight. That's because the slop or lag in the steering response makes it more difficult to correct deviations while they are yet small -- prompting the operator to make larger corrections that often result in getting more response than was needed.

Pilots who attempt to mask poor technique with large amounts of expo run into the same problems as the operator of an old car with an irregular control response. That is, in addition to sacrificing a direct correlation between control inputs and flight response and thus predictability, the sluggish (a.k.a., "wet noodle") control response enables deviations to become larger before the corrections take effect, thereby prompting larger correction inputs that increase the potential for over-controlling and the need for additional corrections. While it's true that there are pilots who can fly precision despite using lots of expo, it takes extraordinary amounts of practice before being able to do so.

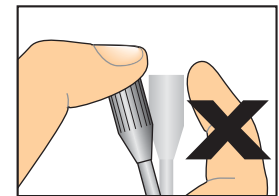
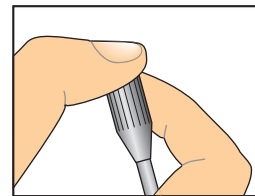
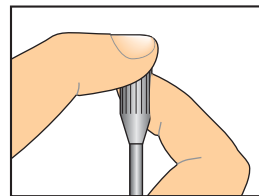
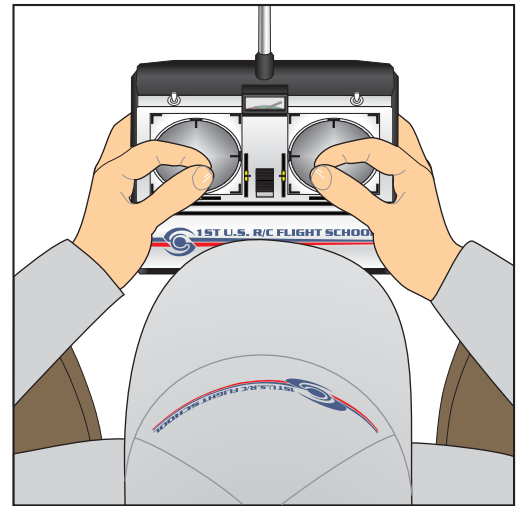
Flying with less expo, on the other hand, is more comparable to driving a newer car with tighter steering. I.e., It's easier to keep the car going precisely where you want because the steering wheel corresponds directly to the response of the car and thus your inputs have an immediate effect on correcting deviations while they are still minute. Furthermore, the direct correlation between the steering wheel and the response of the car is more predictable and thus enables driving to become routine and eventually automatic.

Pilots flying with less expo similarly experience a more direct correlation between their inputs/intentions and the response of the plane. The experience of flying a more "honest" airplane thus enables them to fly with greater precision and consistency. So, while good equipment and a reasonable amount of expo are certainly helpful, nothing helps as much as flying an honest airplane and applying the proper inputs in the first place!

Thumbs only pilots typically need large amounts of expo to soften the consequences of making jerkier inputs. 2-finger pilots are naturally smoother, thus able to fly with less expo and therefore feel more connected to the helicopter. The tradeoff for maintaining a precise correlation between the control inputs and the response of the heli with less expo is you must be able to accurately control the size and pace of your inputs.



To more precisely control the size and pace of your inputs and therefore also reduce over-controlling, place your thumbprints on top of the control sticks and the tips of your index fingers on the side of the sticks near your thumbs for added support. To further improve your feel the neutral stick position, the type of control inputs you make, and to reduce the likelihood of applying unintentional inputs, increase the stick tension in your transmitter as high as possible.



Increased stick tension and the 2-finger technique reinforce the correlation between control inputs and the response of the helicopter used to develop the consistent control and timing required to fly with precision. Always guard against taking any fingers off of the sticks and subsequently jabbing the controls without any ability to control the size and type of inputs made.

## 2-Finger Advantage

More than 1500 pilots of all skill levels have attended 1st U.S. R/C Flight School. During that time, a flight training system has been developed resulting in a 99% solo success rate and more than 3/4 of the aerobatic students returning for more advanced training. However, even if everything else remained the same, the flight school would not be here today if not for the 2-finger technique in which pilots place their thumbs on the top of the sticks and the tips of their index fingers on the side of the sticks to steady their thumbs. If this is new to you, first get a comfortable grip on the transmitter,

then place your thumbs on top of the sticks, then bring the tips of your index fingers to the side of the sticks near your thumbs while allowing your remaining fingers to come to rest wherever they are comfortable. Note that you'll continue to control the inputs with your thumb on top of the stick, and your index finger is simply there for additional support.

In the same way that two hands on a steering wheel improves control, supporting your thumb and the stick with your index finger will naturally enable you to apply smoother inputs, resulting in greater consistency and

less over-controlling, especially in pressure situations. Most importantly, your ability to precisely manage the size and pace of your control inputs with 2-fingers on the sticks reduces the need for lots of expo. Consequently, you're able to maintain the direct correlation between your control inputs and the response of the plane that is so vital to developing the precise inputs and timing required for precision flying.

Furthermore, pilots using the 2-finger technique enjoy the additional confidence that comes from feeling more connected to the airplane. That is, rather than the plane just responding to inputs, there is the sense that it is responding in ways that more closely match your exact inputs and intentions!

### **Enhancing Feedback**

Increasing the stick tension in your radio as high as possible will significantly help minimize over-controlling and improve consistency by improving your feel for the types of control inputs you apply. You're also

less likely to accidentally apply unintended inputs along with your intended inputs. In fact, 1st U.S. R/C Flight School has found these benefits to be so substantial that it installs stiffer after-market springs into all of its radios.

Pilots must always guard against the bad habit of taking their fingers off of the control sticks, resulting in a tendency to take jabs at the controls and thus making it impossible to fly with consistency or precision. For obvious reasons, this tends to occur more often when using a transmitter strap or tray. Furthermore, when the transmitter is supported by a strap or tray, the pilot's grip on the transmitter will tend to move around when applying inputs, thus making it harder to determine where the sticks are positioned since there's no consistent grip-point to gauge the movements from. Consequently, over-controlling and applying unintended inputs (typically blamed on wind or radio glitches) occurs more frequently when using a strap and especially when

using a tray. So if you must use a transmitter strap or tray, try to maintain a fixed grip on the transmitter to provide a base from which to better gauge the position of the controls, while also helping to steady your inputs and therefore reduce over-controlling when tense or excited.

### **Conclusion**

"Practice makes perfect" applies only when it's correct practice. The 2-finger technique, not getting carried away with exponential, increased stick tension, and maintaining a fixed grip on the transmitter enables pilots to more quickly make the correlation between their actions and the response of the plane that leads to a better understanding of proper control and a solid foundation on which to build. Consider that, not unlike driving a car, when the control inputs are applied correctly to start with, the need for additional corrections may not even exist. It's then that a pilot is able to stay ahead of the airplane and join the ranks of elite pilots who control what a plane does rather than merely reacting to it. Good luck!