

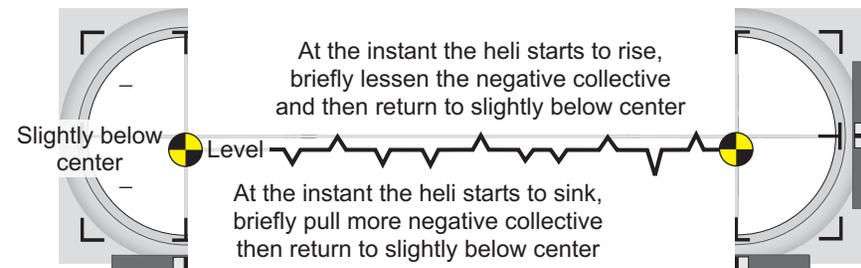
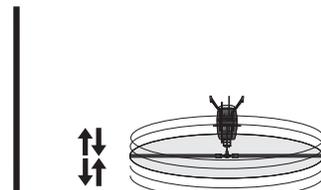
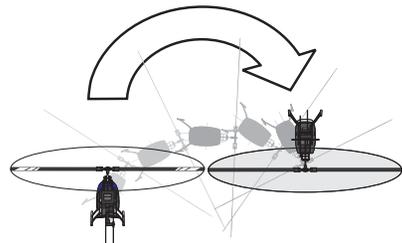
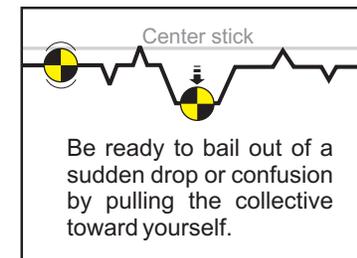


Inverted Stationary Hover: Collective/Altitude Control

Learning to maintain an inverted tail-in hover is where a simulator is worth its weight in gold! For example, all but one of the controls are reversed, and a sim will allow you to develop some competence with them individually before putting them all together. If you practiced the basic aerobatic maneuvers up to this point, you're already familiar with pulling negative collective to prevent a loss of altitude when the heli is inverted. So, use a sideflip to roll inverted, aiming to stop as close as possible to level, then pull the collective slightly past center to start hovering. The sole objective at this point is to correct altitude changes by briefly bumping more or less negative collective, i.e., when the heli sinks, pull more negative collective, and when it climbs, reduce the negative collective. Note that there won't be any need for positive collective while hovering inverted, rather, unwanted climbs are corrected by reducing the negative collective closer to center stick (zero thrust) and letting the weight of the heli bring it lower.

As a rule, the consequence of correcting an altitude deviation late is that a larger adjustment is then needed, thus increasing the potential for over-controlling. Therefore, keep your fingers nimble or moving in order to be ready to respond to the needs of the moment. I.e., Don't get lulled into thinking that you've found the "sweet spot" and can take a timeout from making throttle adjustments, because before you finish the thought, the heli will have started climbing or descending.

Learning to manage the collective while inverted takes a lot of practice. However, your ability to respond to sudden drops, especially in pressure situations, can be greatly improved by identifying a *safe word* or two that will help you remember to "pull" negative collective when the heli is dropping toward the ground. For example, the author teaches "belly bail" to help pilots remember to pull the collective toward themselves when it sinks close to the ground. What words you come up with aren't as important as just having something, rather than nothing, to quickly fall back on when things become hectic.



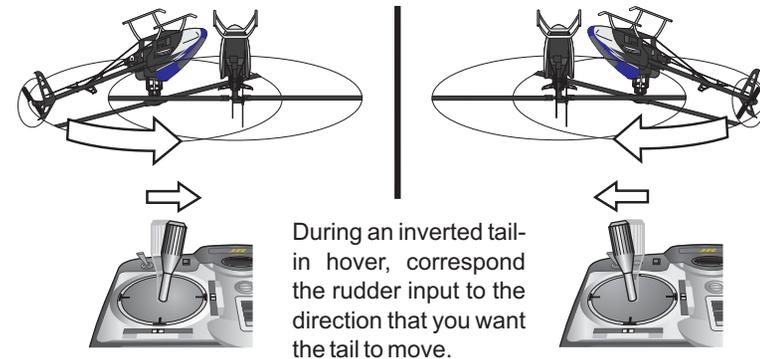
Inverted Stationary Hover: Aileron, Elevator, and Rudder Control



By now you understand that a heli banks and rolls the same direction whether upright or inverted. So, after becoming proficient at inverted altitude control, it should feel natural to start correcting side movements with tiny aileron bumps. Continue to practice aileron corrections until you can keep the heli from moving left or right for a reasonable period of time or as long as possible with aileron corrections alone. Next, concentrate on correcting forward and backward movements with tiny elevator bumps. The elevator is reversed when inverted, so if the nose rises up, pull it down to level, and if it drops, push it up to level. Probably due to the habits ingrained during upright hovering, elevator control when inverted tends to be the most challenging part of learning to hover inverted. Hence, you should spend a significant amount of time working on just elevator corrections (“pull the nose down” - “push the nose up”) until you feel reasonably proficient. Then, start phasing in aileron corrections with your elevator and collective adjustments.

Now it’s time to address the reversed tail response when inverted. In a nutshell, whereas you watched the body or pointed the nose when upright, look to correct the tail when inverted, i.e., when the tail moves

during a tail-in inverted hover, correct by corresponding the rudder to the direction that you want the tail to move. This skill actually develops fairly quickly. It will, however, take considerable time for it to become automatic. When you progress into nose-in inverted hovering, the approach is the same, but you’ll have to transfer your mind’s eye behind the heli and then apply the rudder where you want the tail to move. You can also input a tiny bump to test the direction when you feel there isn’t time to think. Remember, if things get hectic, concentrate on the right stick to reestablish a stationary hover, then correct the body with rudder.

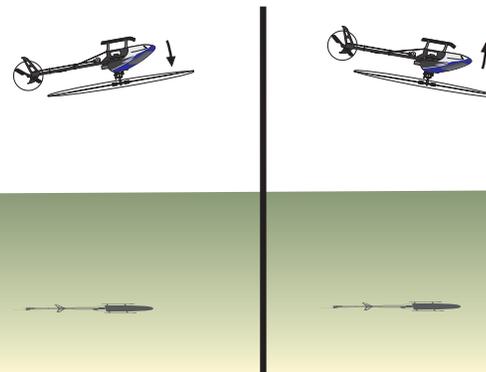


Inverted tail-in hover



Regardless of orientation, anytime the nose rises up causing the heli to move rearward, pull it back to level with a small brief elevator bump.

Aileron corrections work the same whether the heli is upright or inverted.



When the nose lowers causing the heli to move forward, push it back up to level with a small brief elevator bump.