

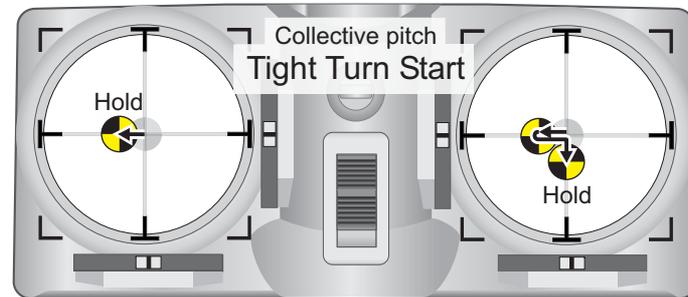
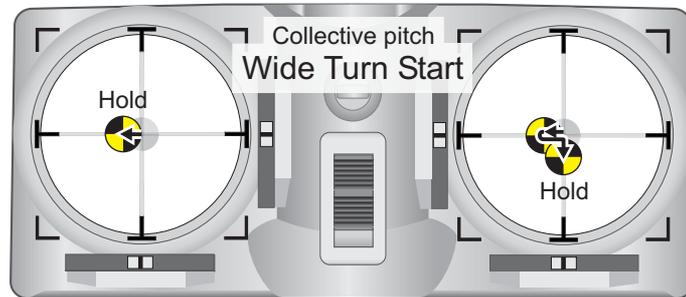
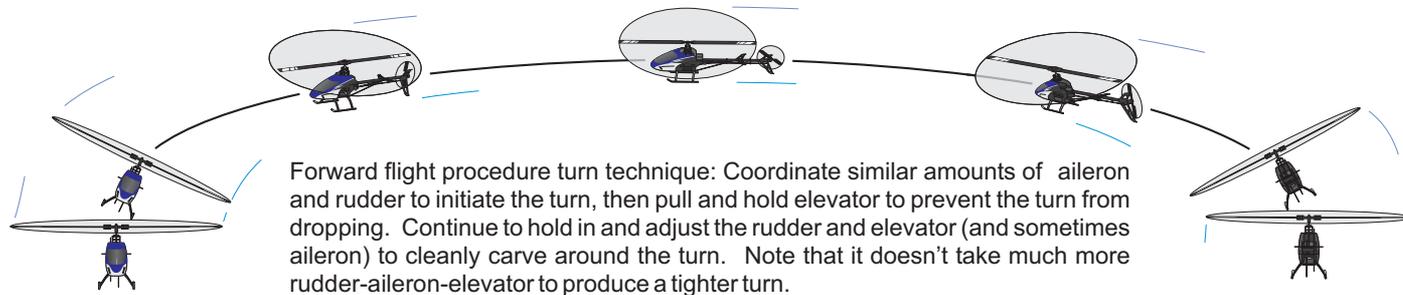
## Basic Procedure Turns

The first turn every heli pilot learns is a pirouette using the rudder to point the nose in a new direction while hovering. These turns are usually limited to 90 or 180 degrees so they are over with before needing very many adjustments. Executing a forward flight 180 degree procedure turn using the aileron to bank the heli and holding in rudder and elevator to carve around the turn is much more intricate and requires techniques very different from those used to hover:

First of all understand that the rudder is held in throughout a procedure turn and that the amount largely determines how wide or tight the turn will be. I.e., proficient pilots commit to holding a small rudder input when intending to perform a wider turn, or a slightly larger rudder input when intending to perform a tighter turn. The bank angle then goes hand in hand with the rudder input. For example, holding a small rudder input requires a shallower bank (smaller aileron input) to

gently curve around the turn without skidding, whereas a slightly larger rudder input requires a steeper bank to cleanly carve around the turn. The bank angle then determines how prone the heli is to losing altitude and thus how much elevator is required to keep the turn level, i.e., the steeper the bank, the more inclined the heli is to dropping, and thus the more elevator you'll need to pull to keep the turn level, and vice-versa.

Altogether, the first step is to establish moderate to high speed forward flight, then initiate a procedure turn by coordinating small amounts of rudder and aileron, followed by pulling elevator. The rudder is held in and adjusted to cleanly carve around the turn without skidding while the elevator is adjusted to keep the turn level. The turn is then completed by removing the rudder and elevator while applying opposite aileron to return to level.



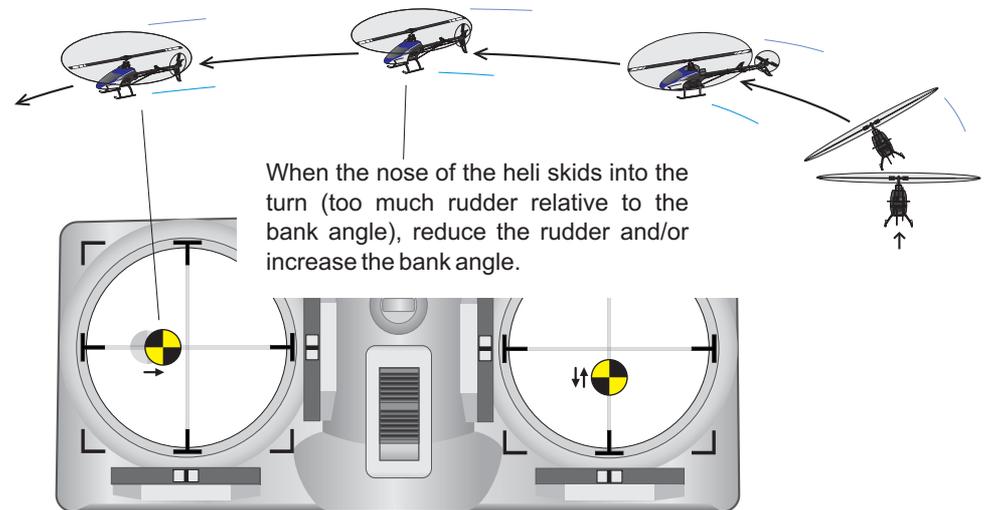
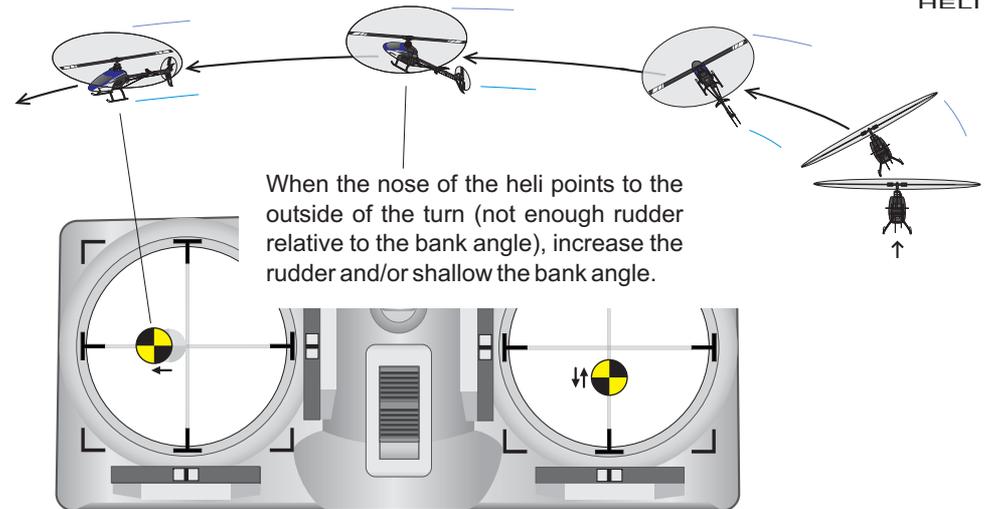
## Fine Tuning Procedure Turns

In order to cleanly carve around the turn without skidding, pilots must learn to fine tune the amount of rudder they're holding and/or fine tune the bank angle. For example, when the nose of the heli points to the outside of the turn (not enough rudder relative to the bank angle), the solution is to add more rudder and/or shallow the bank angle. Or, when the heli skids into the turn (too much rudder relative to the bank angle), the solution is to lessen the rudder and/or steepen the bank. There's no magic solution for quickly learning to coordinate these inputs. Depending on the setup and other factors, it takes practice to develop this skill. Although, a good understanding going into your sim practice will start you out well ahead of the curve.

The amount of forward speed also has an influence on the size of the turn and the adjustments required, e.g., a faster turn uses more space whereas a low speed turn is more compact. Forward speed is controlled by the length of time between initiating the movement and applying the opposite counter elevator bump that stabilizes the movement. I.e., forward speed will remain low when the counter bump is applied immediately after initiating the movement, whereas a higher forward speed is achieved by waiting a bit longer after initiating the movement to allow the speed to build before applying the counter bump (along with increasing throttle).

While all procedure turns require some elevator, without a lot of momentum, slower speed turns rely more on power adjustments to maintain level flight, whereas higher speed turns rely primarily on using the elevator to correct altitude changes. Bottom line, correct altitude changes during a turn with elevator, but if attempts to arrest a descent with the elevator don't produce immediate results, add more power.

Note: If you pull too much elevator during a turn and cause the heli to lose forward momentum, you'll have to push forward elevator to lower the nose and reestablish forward movement while adding power to prevent a loss of altitude.



KPTR: When the heli skids away from the turn, increase rudder, and when it skids into the turn, decrease rudder.