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COMMENTARY / THE CLASSIC INSTRUCTOR



The sideslip aligning with the runway.

The Lost Art of Slips

A misunderstood maneuver

BY STEVE KROG

WHEN DID YOU LAST perform a slip to land? I've found it to be a lost art among many pilots. When conducting flight reviews, I like to ask pilots to show me a 50-foot obstacle short-field landing. If flying an airplane without flaps, a slip becomes a necessity to perform this maneuver. And even some flap-equipped aircraft need to be slipped to perform the short-field landing.

Frequently, I'll get a questioning look followed by a comment stating, "It's been a while since I've done one of those." Slips are quite simple to do but are one of the more misunderstood maneuvers performed in an aircraft. Many fear them.

I've found the most common reason that pilots are uncomfortable performing a slip is that they were never properly taught the correct procedure for doing so. In addition, when the discussion of slips pops up in various online forums, the comments are often quite hilarious, doing an injustice to the simple slip.

WHAT IS A SLIP?

What is the true definition of a slip? It is an aerodynamic maneuver allowing the airplane to lose the most amount of altitude in the shortest amount of time without gaining excessive airspeed. It can also be used to adjust or realign the ground track of the aircraft. Thus, the forward slip and the sideslip, respectively. In the simplest of terms, slipping is cross-controlling the aileron and rudder inputs while maintaining a constant descent nose attitude.

A slip is quite simple to initiate and easy to practice. When teaching forward slips I like to have the student climb to a safe altitude, for example 2,000 feet AGL, and then perform a clearing turn to ensure there is no other traffic in our practice area. We'll then align our flight path with a straight stretch of road, simulating a runway.

Carburetor heat is applied, power is reduced to idle, and the final approach attitude and airspeed are established. The left aileron is then applied, lowering the left wing while simultaneously applying right rudder. Adjust the aileron and rudder inputs as needed to remain above the road and descending in a straight line. Keep the nose of the aircraft stable in the correct approach speed attitude. We'll continue this for approximately 500 feet before resuming level cruise flight.

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Returning to the normal approach attitude sometimes confuses a student the first few times it's performed. Simply remove your foot from the extended rudder pedal, while at the same time moving the stick or control yoke to neutral. The airplane instantly returns to the normal descent and/or approach attitude. It is not necessary to apply opposite rudder and aileron to re-establish a normal approach attitude.

While still at a comfortable safe altitude, I'll have the student try a slip applying right aileron and left rudder, adjusting the inputs as necessary to maintain a straight ground track over the road. Again, after 500 feet, return the controls to neutral and continue the approach descent for a couple more seconds. At this point I like to throw in the go-around procedures in preparation for working in the traffic pattern.

Slipping is cross-controlling the aileron and rudder inputs while maintaining a constant descent nose attitude.

There are several common pilot mistakes or misunderstandings that occur when performing the forward slip. The first is looking at the airspeed indicator when establishing and executing the slip. Make note that the pitot tube is not aligned with the relative wind during the slip. Rather, the air is moving at an angle over the tube, causing the airspeed indicator to provide erratic and incorrect airspeeds. If fixating on the airspeed, the pilot is most often going to fear the onset of a stall and lower the nose, creating excessive groundspeed. Now we're in a situation where we have multitudes of excess energy to dissipate before we can land the airplane, causing the pilot a great deal of apprehension if attempting to land on a short airstrip.



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The second mistake is looking at or over the nose of the aircraft and thinking it is too high, since it is in a somewhat awkward attitude. Until comfortable with the slip attitude, a pilot will most often lower the nose, again gaining excess energy and speed that must be dissipated before the aircraft can land safely.

A third mistake I've found, especially when conducting flight reviews, is failure to reduce the power to idle. An engine running at 1500 rpm in a descending slip configuration will again generate excess airspeed.

Remember, the primary purpose for the forward slip is to reduce altitude to land, either at a short airstrip or runway or when clearing an obstacle. If any of these three mistakes are made, the short-field landing cannot be performed comfortably and safely.

There is also a secondary purpose for the forward slip. Several years ago, the FAA added a new maneuver to both the sport pilot and private pilot curriculums. The maneuver is called a rapid descent, whereby the pilot must be able to descend at least 500 feet in the most rapid method possible while remaining within the aircraft design limitations.

The sideslip is similar to the forward slip in every step except for the amount of aileron and rudder deflection. Many of you are performing a sideslip every time you land your aircraft in a crosswind but never realized you were doing so. If you're flying a crosswind approach with the wing into the wind down, and applying opposite rudder to keep the airplane aligned with the runway, you're performing a sideslip.

When teaching the sideslip, I have the student align the aircraft with a road that is not in line with the wind and then establish the slip but keep the aircraft over the road. An even more dramatic way to see and understand the difference between a sideslip and a forward slip is to have the student fly parallel to the road and then establish the slip, moving the aircraft left or right to align the aircraft over the road. This will usually make a lasting impression on students, and they can then easily differentiate between the two types of slips they have to be able to perform for their checkride.

In southeastern Wisconsin, where I'm located, we have the luxury of four or five different private airstrips that I'm allowed to use for dual-training purposes. One of the strips has houses at both ends, and the owners prefer that we fly around rather than over them. This is an excellent situation to teach the need and benefit of both the side and forward slip. On final approach from either direction, we first must perform a sideslip to maneuver around the house and then align the airplane with the runway. Then a hard forward slip is needed to be able to land safely without running out of runway. The first one or two attempts can get quite interesting, but with a little help on the controls and a lot of verbal input, the student can usually perform a safe short-field landing. Inputs are critical in this situation. Lowering the nose even a fraction of an inch creates a 4 or 5 mph increase in airspeed causing us to waste the first 500 feet of runway dissipating that energy increase. After a half-dozen takeoffs and landings at this strip, the student has a deep and lasting understanding of both types of slips as well as energy management.



The forward slip used to eliminate excess altitude or clear an obstacle.

Another common error I encounter when conducting flight reviews is how the pilot handles the aircraft during and after a crosswind takeoff. Proper aileron and rudder inputs are used during the takeoff roll, but then after liftoff the pilot continues to hold the wing down while applying opposite rudder. I've asked the question why, and the answer is usually to keep the airplane aligned with the departure end of the runway. This is nothing more than a sideslip, making the aircraft perform quite inefficiently. Slips are used to dissipate altitude, not gain altitude. That poor little 65-hp Continental on your Cub or Taylorcraft struggles enough on a hot day. Don't make it worse by intentionally or unintentionally slipping the airplane during the climb-out.

Contrary to what is said on many of the various aviation forums, slips are not inherently dangerous. Perform them properly and you'll have added several new tools to your flying skills that will come in quite handy when you find yourself a bit too high while on final approach at your next pancake breakfast.

Practice some slips at a safe altitude to get comfortable with the feel of the aircraft configuration in a slip and then practice them in the pattern. You never know when a slip will be needed to fly safely. **EAA**

Steve Krog, EAA 173799, has been flying for more than four decades and giving tailwheel instruction for nearly as long. In 2006 he launched Cub Air Flight, a flight-training school using tailwheel aircraft for all primary training.