



## STEVE KROG

COMMENTARY / THE CLASSIC INSTRUCTOR



# It's the Little Things

Pay attention to the details and relax

BY STEVE KROG

**SEVERAL DAYS AGO**, I received a call from John, a frustrated private pilot from out of state. He first explained he was a low-time pilot with less than 150 hours and had earned a tailwheel endorsement within the past 12 months.

John had just flown his newly restored J-3 Cub for the first time and encountered some difficulty. He stated the takeoff was uneventful, as was the short test flight, but the landing had scared him. No damage was done to the airplane, but his description of the landing made it sound as if it qualified for *America's Funniest Home Videos*.

The landing involved some rather significant bounces followed by some wing dips and waggles. When the aircraft had finally come to a stop and the dust was beginning to settle, he assessed the situation and found that little damage had been done to the aircraft, but his ego and self-confidence were badly shaken. John wanted to know if I would fly with him for a couple of hours to do an evaluation as well as offer some direction. I agreed, and John and I set up some time to go Cub flying.

*Above: Establish a diagonal line of sight when taking off or landing rather than trying to see over the nose of the aircraft.*

### THE TAKEOFF

The first thing I prefer to do on a flight like this is conduct an evaluation of what the pilot does or doesn't do when taking off, flying the traffic pattern, and then landing.

After conducting the pre-takeoff checklist, we taxied into position on turf Runway 18, which is 2,000 feet long by 200 feet wide making for an excellent training runway. I asked John to treat me as a first-time passenger and explain everything he was doing, which he did. The first thing I noted was where and what he visually focused on. He was looking over the nose, which blocks visibility, and hoping for the best. Once he corrected that, he had a diagonal line of sight established and could proceed.

Control stick position was the next discussion point. Many are taught to push the control stick all the way forward before adding full power. This may work satisfactorily on a heavier tailwheel aircraft, but it can cause serious directional control problems on a lighter airplane like the

J-3 Cub. Directional control for the first four or five seconds while on the ground roll is maintained by the steerable tail wheel being firmly in contact with the runway surface. The full power prop blast over the elevators with the stick full forward reduces the download on the tail wheel, losing tail wheel steering effectiveness. In a crosswind, this could make for a very interesting series of S-turns on takeoff, or worse.

Within a few seconds after applying full power, the load on the elevators can easily be felt. Then the control stick can be moved forward allowing the tail to lift off the ground. Directional control effectiveness is now maintained by the rudder and the flying tail.

The next most common error is raising the tail too high, usually as an attempt to see

**A positive angle of attack is required for a smooth liftoff. Allow the tail to lift, but keep the aircraft in a tail-low attitude with a positive angle of attack. When the wings are generating enough lift to fly, the airplane will gracefully separate from the runway and begin the climb-out.**

over the nose of the aircraft. Doing so in a Cub as well as in numerous other light tailwheel aircraft positions the wings in a neutral angle of attack extending the takeoff roll. The runway could be 10,000 feet long and the airplane won't fly in this configuration.

A positive angle of attack is required for a smooth liftoff. Allow the tail to lift, but keep the aircraft in a tail-low attitude with a positive angle of attack. When the wings are generating enough lift to fly, the airplane will gracefully separate from the runway and begin the climb-out. There is one exception to this rule in my opinion, and that is when dealing with a crosswind, especially a gusty crosswind. When flying in those conditions I like to raise the tail higher, setting up a neutral angle of attack until I have liftoff speed

plus 10 mph. Should a lull between gusts be encountered you'll have an airspeed safety margin to deal with the gusts.

Relaxed calf muscles and proper foot positioning on the rudder pedals are important during the takeoff. Sitting in the front seat of a J-3, I can casually

drop my arms and feel the amount of rudder pressure being applied by the student. In John's case, his foot placement was correct, but he was pushing so hard on both rudder pedals that I couldn't move either one with my hands. If encountering this situation, take a long deep breath, wiggle your toes around in your shoes, and do the same with your hand on the control stick. Relaxed muscles lead to much smoother coordinated control inputs.

Stiff, rigid calf muscles lead to slow but over correction when making rudder inputs as needed to keep the airplane aligned with the centerline during the takeoff roll. Tapping and releasing the rudder, sometimes in rapid succession, will keep a pilot from over correcting on takeoff.



*Proper foot position on the rudder pedals is critical to smooth rudder inputs.*



*Keep the control stick all the way back with the elevators in the "up" position as smooth power application is made on the takeoff.*



*As full power is applied, ease the stick slightly forward. Note the elevators are in the down position helping the tail to become airborne.*

One other error I find quite common among new tailwheel students is the act of pushing on the opposite rudder after making a rudder input. Pushing on the right rudder during the takeoff doesn't mean that you have to push an equal and opposite amount of left rudder after releasing the right rudder. This situation usually creates a series of S-turns on the runway causing more apprehension on the part of the student, not to mention the nerves of a flight instructor.

When teaching tailwheel takeoffs, I have the student taxi onto the runway and align the aircraft with the centerline (or approximate centerline on a turf runway) and come to a stop. Then look down the runway using a diagonal line of sight. If the nose of the aircraft is 12 o'clock, then look between the 10-11 or 1-2 o'clock positions and focus on something on the runway edge that intersects that diagonal line of sight. On a 75-foot-wide lighted runway, this is equal to about two runway lights ahead of the airplane. Maintaining that focus forward of the airplane throughout the takeoff roll allows your peripheral vision to tell you if you need left or right rudder application.

#### THE LANDING

Evaluating John's approach and landing, I anticipated his inputs and found my expectations to be true. His downwind leg had

proper horizontal separation from the runway, and his altitude control was near perfect. Power reduction followed by the descending left turn onto the base leg was normal. But at the midpoint of the base leg, I could feel his anxiety building. Gently dropping my hands to touch his toes, I found him again pressing extremely hard on both rudder pedals. Then I placed one finger on top of the control stick and was unable to move it. Chuckling, I told John to try and relax by taking a long deep breath while wiggling his fingers and toes, relaxing leg and arm muscles.

We spent nearly one hour doing nothing more than normal takeoffs followed by standard approaches and three-point (or near full stall) landings. After 10-12 landings John began to relax, allowing him to feel the airplane and control inputs. Once over that hump his takeoffs and landings were quite good.

Then we transitioned to wheel landings on turf and a hard surface with and without a crosswind. Another hour later John's anxiety was under control, and he was feeling confident in making the airplane do what he wanted it to do.

The final exercise of the day was to practice correcting for low approaches, high approaches requiring an aggressive

slip to land, and unexpected bounces when touching down. John's recognition of a low approach was right on, and he added power as needed to safely conduct the approach and landing. He also was comfortable slipping the airplane to compensate for approaches that were too high, although he had never slipped an airplane as aggressively as we did. A J-3 will lose altitude rapidly in a slip, and the general rule of thumb is that a Cub will run out of rudder before running out of aileron in an aggressive slip. Together we tried this several times to raise both his comfort and confidence level.

The biggest mistake made is pushing the stick forward after the bounce. This only causes the second bounce to be even more aggressive and will usually lead to aircraft damage or exiting the runway in an undesirable direction or method. There are two correct methods, in my opinion, for dealing with a good big bounce on landing. The first is to add full power and go around, giving yourself time to get over the anxiousness of a bad landing and then concentrate on making a good approach and smooth landing on the next attempt. The second method is adding moderate power to help level off the aircraft while gaining some additional air-speed/forward momentum. Then reduce the power and re-establish the desired landing configuration. I only recommend the second method if there is more than adequate runway available ahead, and if you've had some experience with bounces. Certainly, the go-around is the safer of the two.

By day's end, John was feeling much more relaxed and comfortable in the Cub. He felt good about his accomplishments and was ready to head home and put them into practice when flying his Cub.

It's always the little things that help make for a good takeoff, flight, and landing. Learn to relax those arm and leg muscles for smooth coordinated inputs. And most important, enjoy each flight to the fullest while also being your own toughest critic of your flying skills. *EAA*

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**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.