



STEVE KROG
COMMENTARY / THE CLASSIC INSTRUCTOR



Attitude Flying

A lost art

BY STEVE KROG

LAST WEEK WE BEGAN working with a CFI candidate. He has earned his private and commercial pilot certificates and instrument rating at other flight schools outside of our area. The young man is bright, focused, and earnestly working on his CFI ticket. He will become a good and safe flight instructor.

A bad weather day forced us to focus the entirety of the lesson on ground school discussion. We talked through various maneuvers, how to orally explain them on the ground, how to demonstrate and explain the maneuvers in the air, and how to critique the maneuvers post-flight. All was going well at this point, and the CFI candidate seemed to have a good grasp of the maneuvers and how to explain them.

I then asked the candidate to explain attitude flying and sight picture beginning with the takeoff, proceeding through the climb, level flight, coordinated turn, and then the descent and approach to land. He looked at me and asked what I meant by attitude flying.

At first, I thought he was joking, but I quickly realized he had no idea what I was talking about. He then commented that at no time in

his previous training could he remember being taught what the sight picture meant, nor had he dealt with attitude flying.

Knowing, understanding, and practicing attitude flying could easily save your life someday. That is why we heavily stress it. Sadly, emphasis on it is becoming a lost art among new pilots.

Attitude flying is something we teach to every student beginning with the first training flight. Every pilot should become familiar with the airplane they are flying. Regardless of the aircraft in which you are training, you should know where to position the nose of the aircraft in relation to the horizon for every attitude power setting being flown.

As a qualified GA pleasure-flying pilot, could you safely complete a takeoff without reference to any instruments, especially the airspeed indicator? What about a V_X or V_Y climb to 500 feet? Or a continued V_Y climb to approximately 1,000 feet? If asked to perform a 500-foot per minute descent without reference to instruments, could you do so? Many cannot.

A stabilized approach descent and airspeed are critical to setting up a safe landing. Could you fly the approach and landing without reference to any instruments?

If you answered “no” to any of these questions, it might be time to plan some attitude flying practice.

When teaching a student to make a safe takeoff, I like the student to confirm that the airspeed indicator is alive. Thereafter, every input is done by feel supported by visual reference.

In a tailwheel aircraft, the beginning of the takeoff roll requires the elevator be held in the full nose-up position. As groundspeed

increases, you can feel the load or pressure on the elevator. Relax the back-pressure being held by moving the control to the approximate neutral position, allowing the tail to lift off the runway.

Keeping the tail low, with the tail wheel about 1 foot off the ground, the wing is in an ideal angle of attack position for generating lift. Maintain this attitude for several more seconds, and the aircraft will fly itself off the ground. There is no need to push the control forward, and then apply back-pressure to force the airplane into the air. Never once during this procedure is it necessary to take a second look at the airspeed indicator.

If flying a nosewheel aircraft under normal/no-crosswind conditions, I like to begin the takeoff roll with the elevator in a neutral position. As ground-speed increases, applying slight back-pressure raises the nose to a position tangent to the horizon. Adding slightly more back-pressure lifts the nose wheel off the runway.

Hold this attitude steady, and the aircraft will fly itself off the runway. There's no need to be yanking on the yoke or stick. Establish the proper attitude and let the airplane do the work to get you airborne. The most common mistake I've observed is watching pilots push

forward on the yoke and then yanking it back after reaching a certain indicated airspeed.

Once airborne, position the aircraft's nose in relation to the horizon. Using the J-3 Cub as an example, the nose (top of the engine cowling) needs to be about 2 inches above the horizon to establish and maintain a constant 60 mph climb attitude.

Every make of aircraft is different so you will need to practice establishing a nose attitude for the desired climb airspeed. A Cessna 170, for example, requires the nose to be placed about on the horizon line, while an Aeronca 7AC requires the nose to be just below the horizon line for a 60 mph climb.

The airspeed indicators on most of the general aviation pleasure flying aircraft are not calibrated. I've flown airplanes that have airspeed indicators off by as much as 10 mph. For the sake of safety, if you have access to a GPS, compare the two to determine accuracy on a light or no wind day. Use it to figure out the compensation you may need, if any, for the airspeed indicator in your aircraft. I've seen some pilots who have created an airspeed deviation card similar to a compass deviation card for their airplane.

Regardless of the aircraft in which you are training, you should know where to position the nose of the aircraft in relation to the horizon for every attitude power setting being flown.

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Establish the proper attitude and let the airplane do the work to get you airborne. The most common mistake I've observed is watching pilots push forward on the yoke and then yanking it back after reaching a certain indicated airspeed.

During the climb, hold the nose attitude constant. A quick glance at the airspeed indicator will confirm the proper nose attitude. If you see the airspeed indicator shows 5 mph less than desired for the V_Y climb, lower the nose on the horizon by a fraction of an inch, hold it steady for five to 10 seconds to let the airspeed indicator catch up to the airplane's attitude, and confirm the indicated airspeed.

The biggest mistake pilots make when climbing, cruising, or descending is chasing the airspeed. If flying with another pilot, quietly sit back and watch the nose attitude. If you observe the nose continuously moving slowly up and then down, the pilot is focusing on the airspeed indicator rather than looking at the horizon and establishing a constant nose attitude.

After reaching the desired cruising altitude and adjusting the power for cruise, do you fine-tune the trim for hands-off flight? I've flown with individuals during flight reviews who never once adjusted the trim for the attitude being flown. That can get tiring and lead to the altitude varying 200-300 feet. The trim was invented to allow the pilot to fly with a relaxed three-fingered grip on the control stick or wheel. Use it.

Another issue I've observed is the pilot never looking left to right to check if the wings are level. A safety-conscious pilot employs a good scan of the surrounding airspace to look for other traffic. Expand the scan to look at your wings to visibly ensure they are level with the horizon.

Students generally must be taught this expanded scan, or the sight picture, as they haven't yet flown enough to feel that one wing is lower than the other. Once students develop the idea of the sight picture, their flying becomes considerably more stable. The wings are held level, and the nose attitude doesn't fluctuate.

Before spending extended time in the traffic pattern with a student, I like to practice and perfect proper nose attitude descents. Beginning at a safe altitude, apply carburetor heat and reduce power as if you were setting up to land. If a 60 mph descent to land speed is recommended for your airplane, position the nose in relation to the horizon where you think it should be. Hold it steady for five to six seconds and then glance at the airspeed indicator. If you're 5 mph slow, lower the nose just a fraction of an inch, and again hold it steady for another five to six seconds.

Now you've established the correct attitude, so pay close attention to where the nose is in relation to the horizon. Imprint that picture on your brain. Practice this several times, and you will have the correct sight picture firmly in your mind for all future stabilized approaches to land.



One practice we use in our flight school to enforce attitude flying is covering up various instruments. The primary focus is on the airspeed indicator, then the tachometer, and finally the altimeter. Teaching a student to listen to the airplane and what it is telling you will significantly improve pilot efficiency. Developing a feel for the aircraft helps develop consistency and safety.

What if your airspeed indicator failed while in flight? Would you know how to safely get your airplane back on the ground — without bending anything? What if your tachometer cable decided it no longer wanted to work, causing the tach to show all kinds of unusual gyrations? Would you know where to set the power by sound to continue operating safely? Understanding and practicing attitude flying certainly improves your efficiency and safety.

Numerous NTSB reports have been filed over the past decade where pilots lost one or more instruments during a VFR day flight. Rather than practicing attitude flying, the safety chute was pulled or they opted to land in a field rather than proceeding to the next airport. Were the pilots at fault for taking these actions? In part, yes, but I also think their instructor did them a disservice by not teaching and emphasizing attitude flying.

Learning to fly by attitude and then practicing it will make each of us a better, safer pilot. Enjoy the 2024 flying season — but let's do it 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.