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The Power-Off 180 Approach and Landing

A lost art

BY STEVE KROG

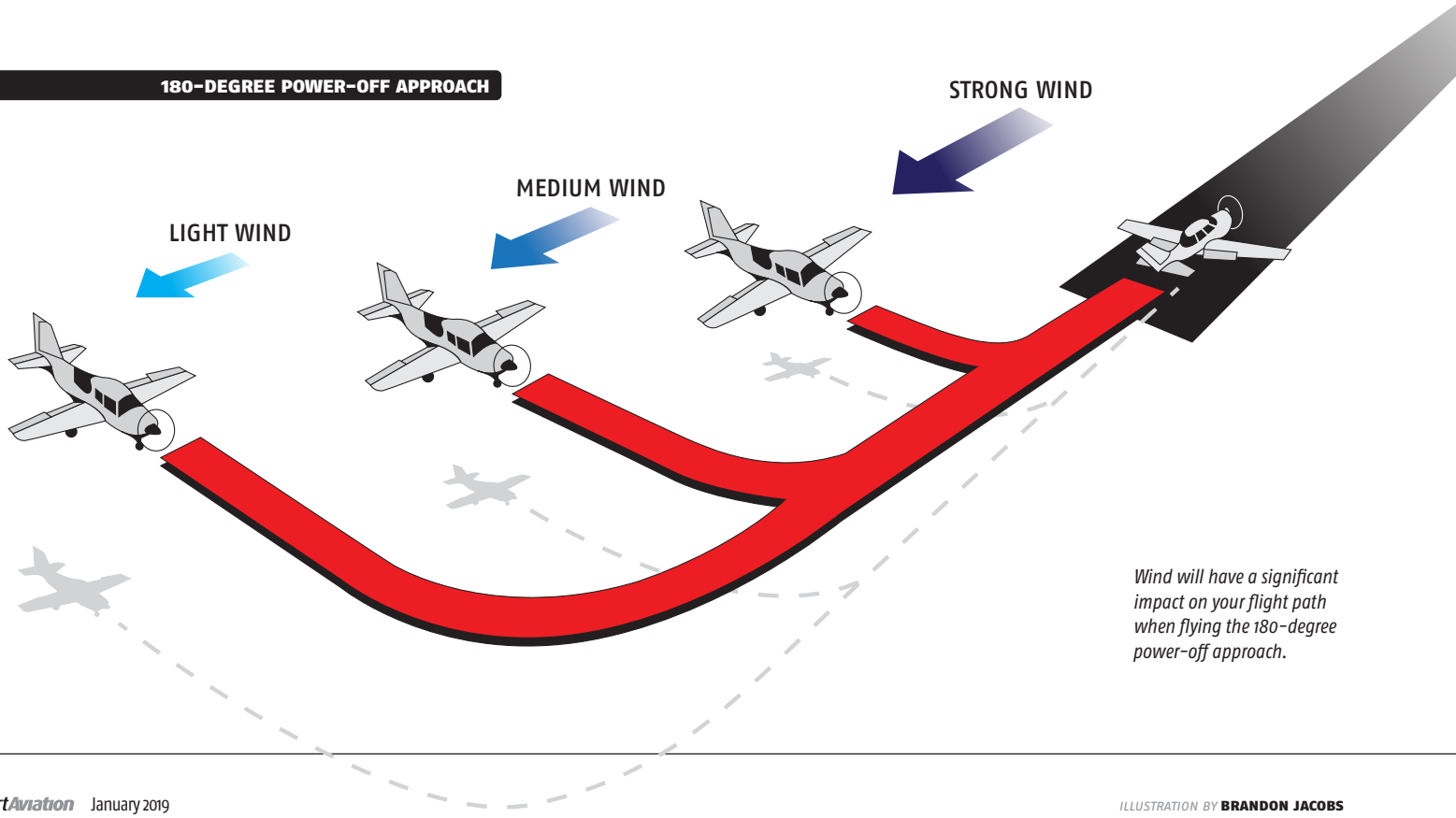
YEARS AGO, every young pilot wannabe had to learn and perform the 180-degree power-off approach and landing to pass the private pilot checkride. It took a bit of practice, but most young pilots mastered the maneuver. Today, this approach and landing are no longer required for meeting either the sport or private pilot requirements. You need only satisfactorily perform this maneuver for the commercial pilot checkride.

The FAA defines the power-off 180 approach and landing as an approach and landing made by gliding with the engine idling from downwind to a touchdown beyond and within 200 feet of a designated line or mark on the runway.

Today, this maneuver is all but forgotten. Personally, I teach the technique to all students because I truly believe they will be better, safer pilots as an end result. What better way is there to teach a student pilot to see, feel, interpret, understand, and act on what the airplane is telling you, as well as how the wind is affecting your flight path?

Once students have satisfactorily demonstrated the ability to fly a traditional rectangular traffic pattern, adjust power correctly, and stabilize the approach to land consistently, it is time to introduce variables. In preparation for the first solo flight, a good deal of time is spent on "what if" situations where the simulated loss of engine power is done at different points within the pattern. Showing good decision-making skills and being able to safely get the aircraft on the ground at the airport prepares students for that first solo flight.

180-DEGREE POWER-OFF APPROACH



Wind will have a significant impact on your flight path when flying the 180-degree power-off approach.

ILLUSTRATION BY **BRANDON JACOBS**

TEACHING THE POWER-OFF 180 APPROACH

My first challenge to students when practicing this maneuver is to have them select a landing spot on the runway, usually about one-third of the runway length beyond the threshold and numbers. Then I tell them that on the next time around the traffic pattern, at the point abeam their preselected spot, to apply carb heat, reduce power to idle, and adjust their traffic pattern flight path in whatever manner is needed to safely fly the approach and land on, or just beyond, the point they selected. As an instructor, this can get quite interesting observing the many inputs and gyrations, or lack thereof, students attempt to use to fly the approach and land on the desired spot. I've experienced everything from hard skidding turns with faces smashed against the side window to near vertical dives at the runway and runway alignment somewhere in the next county. After allowing students to administer these gyrations for 10-20 seconds, it's time for executing a go-around and discussing what we just experienced. At this point, students usually become quite attentive and ready to observe, listen, and learn, as they have doubts the maneuver can be done!

The discussion includes best glide speed, rate of descent, and what tools are available to complete the 180-degree approach and landing. Isn't it better to arrive at the approach end of the runway with excess altitude rather than a shortage? Then why didn't we establish the best glide speed from the start to preserve the altitude we had, assuring ourselves the spot on the runway can be reached? Don't forget excess energy (5 mph faster than best glide speed) can significantly add to the float and landing distance. If we are to land at or less than 200 feet beyond the targeted touchdown point, we need to dissipate this excess energy just before reaching our targeted touchdown point.

DETERMINING RATE OF DESCENT

Do we know the approximate rate of descent for the aircraft we are flying? This often-overlooked fact can play a vital role in whether a safe approach and landing can be made. If you do not know the rate of descent of your aircraft, you should climb to a safe altitude, adjust your power to idle, and then establish the recommended glide speed and time the descent for one minute. Now you have a base point from which to operate and make your calculations for the 180-degree power-off approach.

Tools available for controlling the rate of descent include the slip, S-turns, and the use of flaps (if your aircraft is so equipped) while flying the final approach leg. Slips can be varied from flying with the wing just a few degrees down, to adding opposite rudder inputs to lose small amounts of altitude, to using full aileron and rudder deflection if significant altitude must be dissipated. S-turns can also be used, but they are difficult to execute if flying a short, tight pattern. Flaps are a great tool. However, do not make the mistake of employing full flaps the instant the power is reduced. Rather, apply a few degrees at a time to help control your glide. Excess flap usage too soon will cause you to land short of your desired spot and probably well short of the runway.

If you're using flaps, don't retract them once they've been applied as doing so reconfigures the wing at or below the no-flap stall speed and a stall can occur.

STEVE KROG

WIND, A MISUNDERSTOOD FACTOR

Wind direction and velocity must be taken into consideration when executing the 180-degree power-off approach. This is a factor often overlooked or not taught at all in primary training. What is the wind doing to affect the flight pattern in the traffic pattern and on the final approach? If we are planning to land on Runway 29 and the wind is 280 degrees at 12 knots, what can we anticipate? What must we do to compensate for the wind?

We can expect a good tailwind while on the downwind leg. If we're practicing this maneuver in a J-3 Cub, the airspeed will be 70 mph and our groundspeed will approach 85 mph. It's easy to forget the push we're getting and unintentionally extend our downwind leg beyond the point where the turn should be made onto the base leg. Now established on base, the wind is pushing us away from the runway unless a crab angle to the left is initiated, which offsets the sideward push of the crosswind.

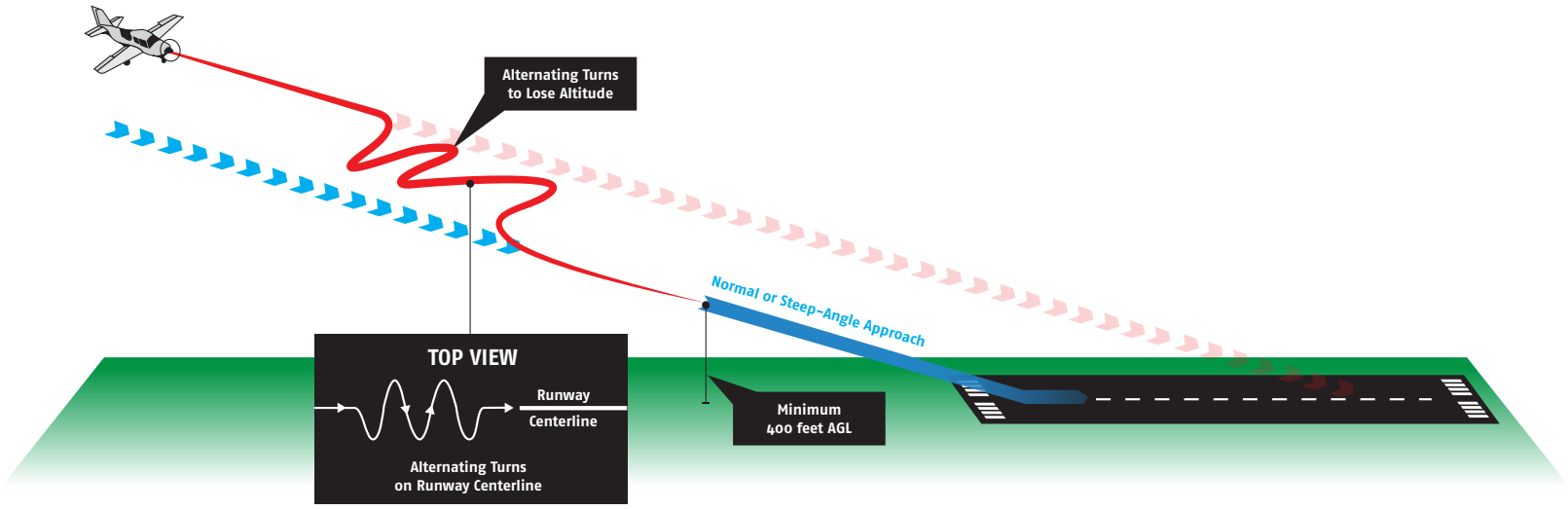
Continuing the 180-degree turn onto final, it almost feels as if we've flown into a wall as the wind is now on our nose and groundspeed is reduced to about 45 mph. Visually, it appears as if we're descending more rapidly than anticipated, even though we're holding a steady best glide speed.

As an instructor, this can get quite interesting observing the many inputs and gyrations, or lack thereof, students attempt to use to fly the approach and land on the desired spot.

After allowing students to experience this approach and its shortcomings, we'll execute a go-around. This time, selecting the same target on the runway, we will make corrections for the wind influence. After reducing power to idle, the turn to the base leg portion is initiated almost immediately, including a leftward crab angle preventing the wind from pushing us away from the runway. I like to make the turn onto the final approach a bit earlier than some, but I do so using a very shallow bank, which allows me to keep an open line of sight on my target touchdown spot on the runway and make bank adjustments as needed to align the aircraft with the runway centerline.

While maintaining a constant glide speed, altitude adjustments are made as necessary to reach and touch down on, or just beyond, the target point. Learning to interpret altitude is an acquired skill achieved through practice and repetition. I like to have students establish the best glide speed, then, while looking over the nose, pick a spot on the runway and glide to it. If the runway appears to be dropping down and moving toward you, the glide path is too high. If the runway appears to be moving upward and away from you, the glide path is too low.

I tell students, "Pretend you're a lawn dart. If corrective action to make the landing wasn't made, we would stab the runway at exactly the point where you are aiming!"



S-turns on the final approach can be used to eliminate excess altitude but may not be ideal. A slip is more commonly used.

Practicing the 180-degree power-off approach can be fun and challenging. In the end, when mastered, you'll be a much safer pilot as well. Should the day ever occur when you do experience a power loss and must make an unscheduled landing, you'll know how to do so without damage to yourself or your airplane. 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.

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