



SAFETY GRAM

March 2020

As spring approaches, some of us still haven't dusted off the cobwebs from the long winter. Perhaps now would be a good time to schedule an instructor and hit the pattern for an hour or so – and look for some crosswinds to practice in. Know your personal limits and live with them!

CROSS WIND LANDINGS

Robert N. Rossier

One of the trickiest skills to learn in flying is the fine art of the crosswind landing. More than one pilot has exceeded his personal safety envelope when tangling with a gusty crosswind and found himself (or herself) off the runway and upside down. For those who may be a bit rusty on the technique, here are a few tips, pointers, and reminders.

The most commonly taught crosswind landing technique is the cross-control, or wing-low landing. The pilot slips the airplane to the runway with just enough cross control to keep the aircraft aligned with the centerline. Remember that the ailerons control the airplane's lateral movement. Use them to counteract the downwind drift caused by the crosswind and put the airplane on the runway centerline. Use the rudder to align the airplane's longitudinal axis with the runway centerline -- keep the nose pointed straight down the runway.

Remember that all control forces will change during the transition from final approach to the end of the roll out. Wind direction and speed often change with altitude, and the control deflections required to maneuver the aircraft will increase as the aircraft's speed decreases. In general, you'll need to increase the aileron and rudder deflection as the aircraft speed decreases. Don't release your control inputs once the wheels are on the runway. The wind still affects the airplane, and you need to use the appropriate control inputs all the way to the tie down.

A good way to practice crosswind landings is by making a series of low approaches to a long runway. For the first few, overfly the runway at approach speed, with perhaps the first notch of flaps. Using the ailerons, practice moving the aircraft from one side of the runway, to the centerline, to the other side of the runway (not too far!), and back to centerline. After a few passes, you should get the aileron control part down. On the next series of low passes, use the rudder to keep the nose parallel to the centerline as you maneuver the aircraft. Once you've got these basics down, you're ready to practice a full crosswind landing.

Stacey Farland, Aero Club Program Manager, USAF Aero Clubs
Stacey.farland@us.af.mil; DSN 969-7240, (210) 395-7240

Downdrafts, Shears, and Gusts

Wind gusts, downdrafts, and wind shear often are part of a crosswind landing. These factors require a pilot to adjust his approach path, speed, configuration, and technique. For gusty conditions or wind shear, increase the approach speed by one half the gust factor, or one half the reported airspeed loss due to wind shear. If the wind is 8 gusting 20 knots, the gust factor is 12 knots, and you should add half the gust factor -- 6 knots -- to your normal approach speed. If other pilots report a 10-knot loss of airspeed on final due to wind shear, add half that loss -- 5 knots -- to your approach speed.

If you're landing in turbulent conditions, flying a steeper approach path may be a good idea. Terrain surrounding the runway causes turbulence sometimes, and a steeper approach will help you avoid this mechanical turbulence. Besides, having some extra altitude as you approach the runway can be a life saver if you encounter a downdraft or wind shear.

Finally, consider using less than full flaps when landing in a gusty crosswind. Remember, the headwind component reduces the airplane's ground speed accordingly, so you may not need full flaps to achieve a slow touchdown speed. Also, full flaps can make some aircraft more prone to weathervaning (turning into the wind) or lifting a wing because of a wind gust.

Limits For Landing

One factor to consider when making a crosswind landing is the airplane's demonstrated crosswind capability, which is published in the pilots operating handbook (POH). Not a true "limitation" in the vein of VNE, for example, an airplane's demonstrated crosswind capability is the limit to which the manufacturer's test pilot flew the aircraft during the certification process. It is, however, a good, practical limit.

When the crosswind exceeds your personal limits or the aircraft limits, your best option is to divert to an airport where the wind is more favorable. If this isn't an option and you have to land in a strong crosswind, remember that you don't have to land on the runway centerline. By slightly angling the aircraft across the runway, you can effectively reduce the crosswind component. However, this is not a technique for the new pilot.

Unfortunately, crosswinds are a fact of life. By understanding the principles of crosswind landings and practicing the techniques, we can improve our odds of successfully accomplishing this sometimes ticklish task.

Use the general strategies presented as a starting point to develop strategies that consider personal capabilities and the actual airplane being flown to have a good plan before the flight even starts. Following the plan will go a long way toward avoiding the accident scenarios and help you avoid becoming one of the accident statistics.

References:

Gusty Crosswind Landings – MzeroA Flight Training
<https://www.youtube.com/watch?v=oCTOeTqeXvk&spfreload=10>

CONTINUE TO FLY SAFE!

Stacey Farland, Aero Club Program Manager, USAF Aero Clubs
Stacey.farland@us.af.mil; DSN 969-7240, (210) 395-7240