By Budd Davisson

A GREAT DAY TO FLY

WHY YOU SHOULD WELCOME THE WIND

Illustration by Daniel Hertzberg

“Hey, wanna go flying?” a friend asks.

“Maybe, what’s the wind?” A predictable response.

With the possible exception of clouds at treetop level, “too much wind” is the most common excuse for abandoning a trip to the airport. Before we starting getting philosophical, let’s make a flat statement: Yes, there are winds that exceed the capabilities of the airplane, the pilot, or both—and they are to be avoided. It’s important to know your own limitations and those of the airplane. However, the vast majority of winds are not truly threatening, if you have the understanding and the skill to deal with them. Properly flown, light aircraft can safely operate in much higher winds than is widely believed.

That said, we’re betting that a good percentage of those reading these words would, if asked, freely admit that they’d rather fly on a calm day and really don’t like wind—especially crosswinds. The rest of us would rather fly on a day with wind because, unless it’s exactly 90 degrees to the runway, at least some of that wind will be slowing down our landing and making everything easier. A few of us—mostly those born in places like Nebraska and Oklahoma—grew up thinking that every airport used log chains for windsocks. If you live in the plains states and don’t like flying in wind, you aren’t going to get much flying done. The trick is to first know that most winds can be tamed with average skills, and those skills are easily learned. The second trick is to read errant wind currents so you know which ones to avoid and which ones can be handled. And it’s not just the speed and gust spread that can make a wind too challenging. It’s the character of the wind that makes the nasty ones nasty.

10 tips for taming the wind

There are three critical components of wind: strength/velocity, direction relative to the runway, and the gust spread. Each of those elements, however, contains subsets of characteristics that can greatly alter the nasty quotient of a given wind.

VELOCITY. There are 10-knot winds, and then there are 10-knot winds. The velocity of the wind is nothing more than the opening gambit in measuring its difficulty. The velocity of a wind takes on increasing importance as it moves off the nose. The greater the angle, the greater the headache.

Even before that happens, there is something hidden within the velocity measurement itself that makes it much more insidious when the wind does become a crosswind.

The velocity of every wind starts at zero right in the boundary layer where it touches the pavement. It then increases in some sort of gradient to the height where it's officially measured at around 15 feet. The average wind builds up to that measured value in a fairly stable manner so that the closer you are to the ground, the slower the wind. That's why you may be fighting a crosswind at 10 feet with lots of control input, but it seems to almost disappear just before you touch the runway. Ninety percent of winds lose most of their energy as you get close to the ground. Those that don't are the ones to watch out for.

Sometimes the wind maintains almost all of its energy right down to the pavement, and that's when the wind can really be a challenge. Unfortunately, they don't give us many clues to let us know that the windsock may not be telling the entire story. About the best we can do is pay attention to low-level indicators: Is the grass next to the runway unusually active for the strength of wind? Are there any other wind-affected items such as bushes, short trees, or clotheslines close to the end of the runway that look as if they're getting more wind then they should, considering their low height?

When landing, if you don't have the benefit of those indications, you have to trust the sock. Only you can't trust the sock because it seldom tells the truth. The sock often is located midfield, far from the end of the runway, and it may not even come close to reflecting the wind you'll actually experience on touchdown. Also, a sock can't tell you anything about low-level winds. So, just assume the worse and be prepared to carry more correction than usual all the way to the pavement.

DIRECTION. Crosswinds are the bogeyman of aviation, with their fear factor being a function of velocity coupled with its direction relative to the runway. For a given velocity—say nine knots—15 degrees off heading is no big deal. However, the fear factor associated with 30 degrees off heading is much more than at 15 degrees. At 45 to 60 degrees, the fear meter is nearly pegged. Ninety degrees? Forget it! Even though the concern raised by that seemingly fearsome angle is generally unfounded, far too many pilots won't challenge a wind at 90 degrees, almost regardless of its strength. And this is unfortunate.

Most certified aircraft have a maximum demonstrated 90-degree crosswind component published in the pilot's operating handbook. However, like many things in aviation, it's not an absolute. We don't know what the actual limiting number is, but we do know one fact: The number in the POH or placarded on the panel is achievable for the average pilot—or the manufacturer wouldn't go out on a limb and say so.

There is, however, something about direction that is critical, and that is handling a wind that is slightly behind the wing. A tailwind of any kind adds to our groundspeed, and a quartering tailwind can have us really whistling on touchdown. But, that's not the real problem. The real difficulties come from the fact that a quartering tailwind changes the airplane's feel. It's no longer solid and reacting to the controls in the way that you're accustomed. As long as you trust your eyes and react to what you're seeing, as opposed to what you're feeling, you'll be doing the right thing.

GUST SPREAD. The gust spread is what makes any wind—but especially a crosswind—potentially dangerous. It must be carefully analyzed before takeoff and during the approach to the airport. The gust spread can take both the wind direction and velocity and combine them in such a way that they can become exceptionally challenging.

All significant gust spreads should command respect, but the gusts that are the most worrisome are those that change direction as they gust. The main wind may be at 20 degrees to the runway, but the gusts are coming from 50 degrees to the runway. If they are the kind of gusts that are very sharp in nature, as indicated by the windsock's snapping and whipping as it changes direction, they can cause lots of heartburn in the flare: Not only do they increase the crosswind correction needed for an instant or two, but they change the wind the aircraft is feeling on the nose, which can cause the aircraft to balloon—or cause it to fall when the gust dies.

The gusts that can absolutely eat an airplane are those that, when they snap around, instantly take the wind from in front of the wing tip to behind it. In that situation a headwind instantly becomes a tailwind, and it's not uncommon for an aircraft to suddenly fall out of the air in those conditions. It has the same effect as wind shear—which, in some ways, it is. Treat this kind of wind with care and, if flying a taildragger, just don't take off or land. Quartering tailwinds and taildraggers shouldn't be mixed. If caught in one, tell either the tower or unicom that you consider the wind to be dangerous and you're going to use another runway—even if doing so requires you to land at a different airport.

When the rubber Meets the runway. There are no wind indicators of any kind that are close enough to our airplane to tell us exactly what the wind is doing every moment. So, when it comes to controlling wind, we take under advisement the indications that the windsock and trees provide—but we don't hang our hat on them. We trust only what the airplane is telling us directly, what it is experiencing at that exact moment, and correct accordingly. If the airplane isn't doing what we want it to do, we do whatever is needed to make it go where we want it to go, regardless of what a windsock or control tower tells us. It comes back to the old axiom, "Fly the airplane."

Also remember that the goal in aviating is to touch down at the minimum speed and carry as little energy as possible onto the ground. The slower you're moving, the less energy there is to control. Any headwind at all helps cut down the energy that's associated with your speed. So, wind is your friend—really, it is!

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1. DON'T AVOID WINDS THAT WORRY YOU JUST BECAUSE THEY'RE AT THE TOP EDGE OF YOUR EXPERIENCE LEVEL. YOU'LL NEVER GET BETTER IF YOU KEEP AVOIDING THE PROBLEM.

2. GET A FLIGHT INSTRUCTOR AND LOG NO FEWER THAN THREE INSTRUCTIONAL HOPS IN THE TOUGHEST CROSSWINDS YOU CAN FIND. THE INSTRUCTOR ISN'T GOING TO LET YOU GET IN OVER YOUR HEAD.

3. BEFORE EACH TAKEOFF IN A QUESTIONABLE WIND, SIT AND STUDY THE SOCK'S BEHAVIOR. TRY TO READ HOW MUCH VIOLENCE IS CONTAINED IN THE GUSTS. SOME FLIGHTS DON'T NEED TO BE MADE.

4. DON'T OVER-INTELLECTUALIZE CROSSWINDS ("LEMME SEE, LEFT WIND, LEFT WING DOWN AND RIGHT RUDDER, OR IS IT…?"). CROSSWIND CONTROL REQUIRES STOPPING THE DRIFT AND KEEPING THE NOSE STRAIGHT, NOTHING MORE OR LESS.

5. KEEP THE NOSE STRAIGHT WITH YOUR FEET. DON'T THINK IN TERMS OF CROSS-CONTROLLING AHEAD OF TIME.

6. AT THE SAME TIME, KILL THE DRIFT WITH AILERON.

7. DO THE ABOVE AND YOU MAY BE CROSS-CONTROLLED, BUT YOU MAY NOT. JUST KEEP THE NOSE STRAIGHT AND KILL DRIFT WITH AILERON. EVERYTHING ELSE WILL TAKE CARE OF ITSELF.

8. IF IN A HARD, TURBULENT CROSSWIND, VISUALIZE THE BANK YOU WANT TO HOLD AND USE THE SMALLEST INPUTS POSSIBLE TO HOLD BOTH WING AND NOSE ATTITUDES.

9. DON'T BECOME PART OF THE PROBLEM BY WRESTLING WITH THE CONTROLS AND REACTING TO THE TURBULENCE BY MOVING THEM ERRATICALLY. KEEP THEM IN THE POSITION THAT WILL HOLD THE ATTITUDE AND MAKE SMALL CORRECTIONS.

10. AFTER TOUCHDOWN, CONTINUE TO HOLD THE AILERON CORRECTION.

What is AWOS?

One student pilot recalls her suspicion of wind being both caused and cured by AWOS—automatic weather observation systems. While still fearful, the first thing she'd do before showing up for a lesson was to call AWOS and get the wind speed. If reported at a certain level, she'd start figuring out ways to get out of flying. Later, when she'd tamed her fear and made peace with the wind, AWOS was her friend. Consisting of various sensors, a processor, a computer-generated voice system, and transmitter, these stations broadcast minute-by-minute, real-time local weather information. Frequencies for AWOS may be found near the airport data on the sectional chart.

There are four basic levels of AWOS:

AWOS-A. Reports only altimeter settings.
AWOS-1. Usually reports altimeter setting, wind data, temperature, dew point, and density altitude.
AWOS-2. Provides the information provided by AWOS-1 plus visibility.
AWOS-3. Provides the information provided by AWOS-2 plus cloud-ceiling data.

Writing letters of recommendation