PIREPS

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NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

Calendar of events:

Third Thursday Pilot Lunch
88 Tactical
15350 Shepard St., Suite 1 Omaha
11am, December 19th, 2024

EAA 569 Breakfast Fly-In
KCEK, 8am – 10am
December 21st, 2024

Third Thursday Pilot Lunch
88 Tactical
15350 Shepard St. Suite 1 Omaha,
11am, January 16th, 2025

EAA 569 Breakfast Fly-In KCEK
8am – 10am
January 18th, 2025

Nebraska State Fly-In
KGRN (Gordon)
June 7th, 2025

Final Rule for Powered Lift

By Jeremy Borrell


Jeremy Borrell

FAA Publishes Final Rule for Powered Lift

The Federal Aviation Administration (FAA) has introduced a new final rule that outlines how pilots get certified and how operations are conducted for powered-lift aircraft—an emerging category of vehicles that includes electric vertical takeoff and landing (eVTOL) aircraft. By setting these guidelines, the FAA aims to ensure that current and future aviation professionals are ready to handle the unique challenges and opportunities these aircraft bring.

What the Rule Covers:

- New Pilot Certification Pathways: Pilots of powered-lift aircraft will now have their own set of training and certification requirements. Because these vehicles blend vertical takeoff capabilities with forward-flight efficiency, the FAA wants to be sure pilots are prepared to handle operations that differ from traditional airplanes or helicopters.
- Clear Operational Standards: Beyond certification, the new rule lays out expectations for how powered-lift aircraft will be flown, maintained, and integrated into our existing airspace system. This helps ensure that as these aircraft become more common, they can safely share the skies with airplanes, helicopters, and other vehicles.
- Consistency with Existing Regulations: The FAA has aligned these new requirements with existing rules that govern other aircraft, making it easier for everyone—pilots, operators, and regulators—to adapt as powered-lift technology matures.

Art Contest

The 2025 Aviation Art Contest for kids ages 6-17 deadline is coming up. All submissions must be postmarked by January 7th, 2025.

More information can be found online at https://dot.nebraska.gov/aeronautics/art-contest/

Nebraska Aviation Symposium

The Nebraska Aviation Symposium is January 29-30, 2025 in Kearney for airport managers, pilots, consultants, and state and federal officials. There will also be a FAA-approved IA Renewal Seminar on January 31-February 1, 2025.

For more information, go to
https://nebraskaaviationcouncil.org/aviation-symposium/

Final Rule Continued

Why It Matters for Nebraska:

With growing interest in advanced air mobility (AAM), Nebraska's airports, training centers, and aviation-related businesses may soon find themselves on the cutting edge of this next generation of flight. By having clear rules in place, our aviation community can confidently invest in training, equipment, and infrastructure that support powered-lift operations. In the long run, this could mean fresh job opportunities, new services for travelers, and an even stronger local aviation sector.

Looking Ahead:

The FAA's final rule on powered-lift serves as a roadmap for anyone involved in this exciting aviation segment. As powered-lift aircraft evolve—from small personal transports to larger passenger carriers—these new guidelines help ensure that the growth happens safely and responsibly. For Nebraska's aviation community, it's a chance to embrace a new era, equip the next generation of pilots, and keep our state at the forefront of innovation in the skies. ■

Aerodynamics Revisited

David Morris

Knowing that most pilots are thoroughly familiar with flight aerodynamics, and for the benefit of those of us that do not think about aerodynamics on a daily basis, I thought perhaps we could do a quick revisit on the topic.

Two great scientists never flew, but they unlocked the secret of flight. One of these individuals was a Dutch-born man by the name of Daniel Bernoulli.

His discovery of the relationship between pressure and fluids in motion became the cornerstone of the theory of airfoil lift. He found that a fluid, like air in motion, has a constant pressure. However, when that fluid is accelerated, the pressure drops. Therefore Bernoulli's Principle states as the velocity of a fluid increases, the pressure decreases. Utilizing this principle, wings are designed to make air flow go faster on the top. This in turn causes the pressure to drop and the wing moves upward, against gravity. This secret of flight eluded mankind for centuries.

HOW DOES BERNOULLI'S PRINCIPLE WORK ON THE REAL AIRPLANE?

The upper surface of an airplane's wing is designed to have a greater curvature, or camber. This greater curvature causes the oncoming air to flow much faster over the curved upper surface. As the airflow speeds up, the pressure drops on top of the wing and this creates a "suction." This means that there is high pressure below and low pressure above the wing. With low pressure on top and high pressure underneath, the wing has nowhere to go but up!

By increasing the speed of the airplane, more lift will occur. This stands to reason because more air molecules are flowing over the wing and air molecules contain energy.

Perhaps in the next issue we can revisit a second great scientist that never flew, but gave the world a mathematical explanation of gravity and how forces and motion are related to matter. This individual is known as Sir Isaac Newton. ■

FAA Updates BasicMed Program

David Morris

The Federal Aviation Administration (FAA) updated its BasicMed program as per the FAA Reauthorization Act of 2024 allowing pilots to operate larger aircraft and carry more passengers.

The update includes the following changes:

- Increase the number of allowable passengers to from five to six, and the number of occupants to seven from six.
- Increase the maximum aircraft takeoff weight to 12,500 lbs. from 6,000 lbs., excluding transport category helicopters.
- Allow pilot examiners to conduct flight checks using BasicMed in aircraft that are covered by the BasicMed rule.

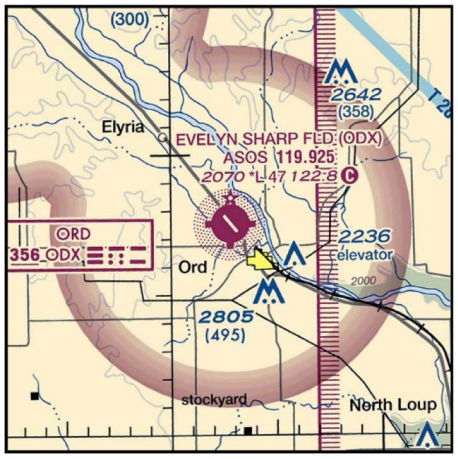
Pilots must meet specific conditions to operate under BasicMed. Among other things, pilots must have held a valid medical certificate at some point after July 14, 2006; the most recent medical certificate cannot have been denied, revoked, or suspended; also required is a complete medical exam by a state-licensed physician within the past 48 calendar months, and also an online medical education course must have been completed within the past 24 calendar months, as well as the individual must hold a valid U.S. driver's license.

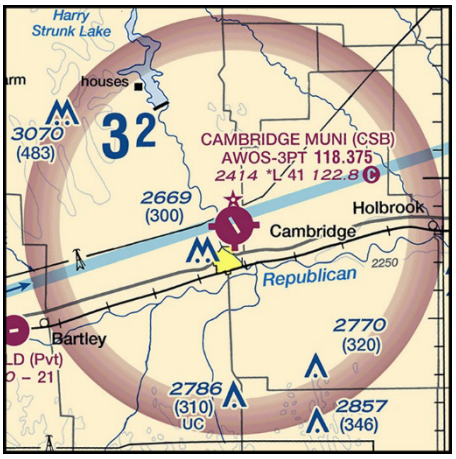
Pilots cannot fly for compensation or hire and are restricted to flying at or below 18,000 feet altitude and at a speed no greater than 250 knots.

These updates to the BasicMed program became effective November 12, 2024. Examiners may refer to FAA Document 8000.386 dated November 14, 2024, BasicMed for Examiners. ■

AWOS (and its many variants) vs ASOS

by Mark Langrud, Cheif Pilot

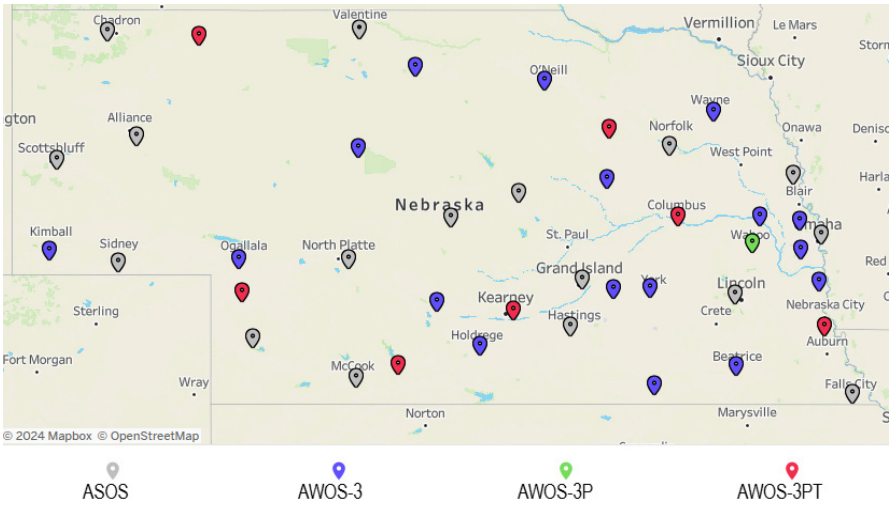




A quick look at the sectional map for Evelyn Sharp Field (ODX) and Cambridge Municipal (CSB) reveals that both airports have Surface Weather Observation Stations. Ord has ASOS (Automated Surface Observation System) on 119.925 and Cambridge has AWOS-3PT (Automated Weather Observation System) on 118.375. Even though one is a ASOS station, and one is a AWOS-3PT station, they both provide the same data:.

Type	Description	Nebraska Ct
AWOS-A	Altimeter only	0
AWOS-AV	Altimeter & Visibility only	0
AWOS-1	Altimeter, Wind, Temperature, Dew Point, Density Altitude	0
AWOS-2	Same as AWOS-1 plus Visibility	0
AWOS-3	Same as AWOS-2 plus Cloud Coverage & Ceiling	17
AWOS-3P	Same as AWOS-3 plus Precipitation Type	1
AWOS-3T	Same as AWOS-3 plus Thunderstorm & Lightning reports	0
AWOS-3PT	Same as AWOS-3 plus Precipitation Type, Thunderstorm, & Lightning reports	7
ASOS	Same as AWOS-3PT	17
AWOS-4	Same as AWOS-3PT plus Freezing Rain & Runway Surface conditions	0

The FAA has an online map that displays types and locations of Surface Weather Observation Systems (https://www.faa.gov/air_traffic/weather/asos). The map for Nebraska Automated Weather Station is displayed below.



ASOS and AWOS both provide automated weather. ASOS is primarily managed by the National Weather Service (NWS) while AWOS is managed by the Federal Aviation Administration (FAA). Both systems support the reporting of accurate meteorological data for both NWS and FAA for the purpose of weather forecasting and real-time data for aviation safety.

Photo Contest Winners for the 2025-2026 Airport Directory

Mark Langrud, Chief Pilot

In November, Aeronautics conducted a Facebook photo contest to highlight Nebraska aviation photography. The most-liked photos were selected for the front and back cover of the 2025-2026 airport directory that will be printed in the next few weeks. Copies will be available January 2025 at airports around the state and the Nebraska Aviation Symposium in Kearney.

The first-place photo was submitted by Cam Walther. This photo is of his airplane on Runway 32 at Beatrice in May 2024 with northern lights in the background.

The second-place photo was submitted by Paige Higgins. This photo shows 3 airplanes in formation overhead.

Thanks to all pilots and aviation enthusiasts who submitted photos.

GPS Approach Procedure

David Morris

SITUATION:

You are executing a GPS approach. You are established inbound on the final approach course. As you cross the Final Approach Way Point, you observe the GPS did not sequence from "Armed" to "Approach". You have not received a RAIM flag/nor status annunciation.

QUESTION:

How do the procedures differ when suspecting a RAIM loss prior to the Final Approach Way Point versus after passing the Final Approach Way Point?

If a RAIM failure occurs after the Final Approach Way Point (FAWP), the receiver is allowed to continue operating without an annunciation for up to 5 minutes to allow completion of the approach. If the RAIM flag/ status annunciation appears after the F.A.W.P., the missed approach should be executed immediately.

If a RAIM failure/status annunciation occurs prior to the final approach waypoint (FAWP), the approach should not be completed since GPS may no longer provide the required accuracy. The receiver performs a RAIM prediction by 2 NM prior to the FAWP to ensure that RAIM is available at the FAWP as a condition for entering the approach mode. The pilot should ensure that the receiver has sequenced from "Armed" to "Approach" prior to the FAWP (normally occurs 2 NM prior). Failure to sequence may be an indication of the detection of a satellite anomaly, failure to arm the receiver (if required), or other problems which preclude completing the approach.

If the receiver does not sequence into the approach mode or a RAIM failure/ status annunciation occurs prior to the FAWP, the pilot should not descend to Minimum Descent Altitude (MDA), but should proceed to the missed approach waypoint (MAWP) via the FAWP, perform a missed approach, and contact ATC as soon as practical. ■

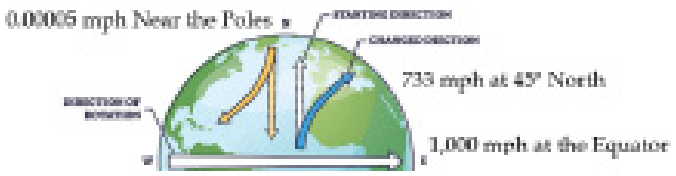
What Makes the Wind Blow?

By Mark A. Sheldon, University of Nebraska-Omaha, Aviation Institute

As you see from the name line under the title, I am an instructor in the Aviation Institute at UNO. My background is in aviation weather. I spent 23 of my 27 years in the Air Force as a weather observer, forecaster, and officer. Although I have no experience as a pilot, I of course have worked with thousands of pilots over my career. In my position at UNO, I am trying to learn the basics of being a pilot, and the process for which they need to go through to get their different licenses. To help with this endeavor, this semester I have been attending the Flight Lab class. In one of the classes the instructor, a former Air Force pilot, talked about books to help students prepare for their Commercial Pilot tests. I was interested to see what was in the book for weather. As I read through the weather section, I was somewhat surprised at how many questions there were about wind. From how it is initiated, to what forces act upon it. So, I thought, this might be a good subject for an article for the NE DOT PIREPS publication.

Let's start off with the definition of wind. Wind is the horizontal movement of air caused by pressure differences. As you know, the Earth is not heated evenly. Some areas receive more heating, so areas of low pressure will form. And some areas receive less heating, so areas of high pressure will form. As these areas of high and low pressure set up, the wind starts to flow and move from the high pressure toward the area of low pressure. The speed at which it does this will depend on the pressure difference between the two, this is called the Pressure Gradient Force (PGF). The greater the difference in pressure, the greater the PGF, and the stronger the wind will be. So initially, the wind will move perpendicular to the PGF. But as you are probably aware, wind does not flow straight from a high into a low. The flow is more curved. The reason for this is the Coriolis Force. As the air starts to move, Coriolis Force will turn the wind to the right in the northern hemisphere. The effect is strongest at the poles and weakest at the equator. Coriolis Force is inversely proportional to the speed of rotation. The slower rotation, the more dramatic the effect. The faster rotation, the less dramatic the effect.

Figure 1 - Coriolis Effect. Source: worldatlas.com



Here are examples of how this looks. (See Figure 1) Let's say you are standing in Mississippi and threw a ball to the north. You would think the ball will land in Illinois, but it actually lands in Ohio. Why? In MS, you are moving east faster than places north of you. So, when you throw the ball, the ball is also moving faster to the east than the places north of you, and the ball will appear to move to the right and land in OH.

The opposite effect occurs when you are in IL and threw a ball toward the south. You might think the ball will land in MS, but it actually lands in Texas. Why? You are moving slower to the east in IL than the places south of you. So, when you through the ball, the ball is also moving slower to the east than the places south of you, and the ball will appear to move to the right and land in TX.

At the Earth's surface, PGF and Coriolis are not the only forces acting on the wind, friction will also affect wind speed and direction. As the wind flows across the Earth's surface, friction will cause the wind to slow down and turn to the left, causing the wind to flow across the isobars toward low pressure. See Figure 2. As you go up in the altitude, the effect of friction decreases. Friction stops effecting the wind at about 2,000 feet. We call this the Boundary Layer. Above this height, PGF and Coriolis Force are equal to each other, making the winds flow parallel to the contours. This is known as a Geostrophic Wind. See Figure 3.

Figure 2 - Effect of Friction on the Wind. Source: Weather.gov

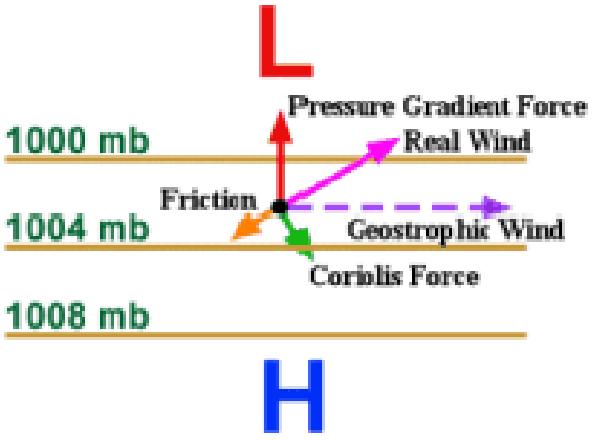
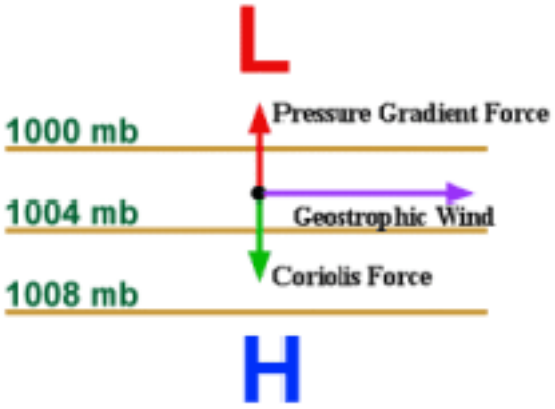


Figure 3 - Winds above the Boundary Level.
Source: Weather.gov



The effect of friction will also cause wind gusts. Gusts are created as wind moves through or around buildings, trees, hilly terrain, or any obstacle. Friction will cause the wind to slow and change directions erratically. This effect will also create Mechanical Turbulence.

The last item I would like to include in this article is about the flow with regards to areas of high and low pressure. In the northern hemisphere, wind will flow clockwise, or anticyclonically, around areas of high pressure. The airflow in the center of high pressure is downward and will move outward as it reaches the Earth's surface. Winds flow counterclockwise, or cyclonically, around areas of low pressure. Winds flow into areas of low pressure and will move upward as they get to the center. The descending air within a high-pressure area will lead to generally clear skies, while the ascending air within a low-pressure area can result in substantial cloud cover. See Figure 4.

Figure 4 - High- & Low-Pressure Flow.
Source: cimss.ssec.wisc.edu

I understand that you may have already passed your Commercial Pilot exam and probably were excited when you did so you did not have to think about Coriolis Force again (LOL). But after reading through the test prep book for the exam, I thought at the least this information would be a good review for everyone, or at least give you some additional knowledge for your next weather trivia night down at the local airport. As always, safe flying!! ■