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FAA Safety BRIEFING

THE WIDE WORLD of GA Flying

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ABOUT THIS ISSUE...

The September/October 2025 issue of *FAA Safety Briefing* explores the tremendous variety of general aviation and focuses on the new perspectives and skills you'll need to consider when moving on to a different type of flying.

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FAA Safety BRIEFING

The FAA Safety Policy Voice of Non-commercial General Aviation

DEPARTMENTS

THE WIDE WORLD OF GA FLYING

As the executive director for the FAA's Flight Standards Service, it's not uncommon for me to be asked: "What exactly is general aviation (GA)?" With the category being so large, I often feel it's easier to define what GA is not. The International Civil Aviation Organization (ICAO) has a similar stance and defines GA as "all civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire."

That broad definition allows GA to encompass a wide range of activities and aircraft types. Today's GA industry has progressed into a multi-billion-dollar enterprise consisting of business and leisure travel, search and rescue, agriculture operations, advertising, surveying, medical airlift, scientific endeavors, and, of course, flying for good old-fashioned pleasure. GA aircraft are just as varied: powered to non-powered, single-engine to multi-engine, turboprop to turbojet, rotorcraft, experimental, unmanned, and home-built.

Given the wide variety of activities that GA covers, it's logical that many pilots would be curious about exploring different avenues of aviation. Not only can it add to the adventure and enjoyment of flying, but finding a new niche can also be tremendously beneficial to safety and help you build up your base of aviation experience.

For example, learning the maneuvers required for a commercial pilot certificate can make you a more proficient pilot, even if you have no interest in flying for hire. Or you can try fine-tuning your flying skills by adding a glider rating to your pilot certificate. Not only is soaring educational, but it can be one of the most enjoyable and rewarding experiences aviation has to offer. Yet another option is to consider how basic aerobatic training can provide you with a lot more knowledge, confidence, and skill in handling your aircraft.

When it comes to learning opportunities in GA, the sky really is the limit. To help showcase this diversity, we've focused this magazine issue on exploring some of the many facets of GA. You'll learn about the challenges and the vital importance of the agricultural aviation industry, gain a better understanding of hot air balloon aerodynamics, explore the sheer excitement of parachuting operations, and discover some important safety insights with seaplane flying. We also look at some of the many honorable volunteer flying options that exist, including the safety implications those types of operations entail.

> **EARNING A PILOT CERTIFICATE MARKS THE BEGINNING OF A LIFELONG JOURNEY OF CONTINUOUS LEARNING AND SKILL ENHANCEMENT.**

While trying your hand at a new type of flying can be both educational and fun, it's important to recognize and train for any unique handling characteristics you might face. That's why we also look at the importance of transition training and how it can improve your confidence and competency when trying to understand a new cockpit layout, master a different type of control response, or simply gain a better understanding of performance capabilities.

As we often say in the industry, a pilot certificate is a "license to learn." It may signify you have met the requirements to operate a particular aircraft safely, but a pilot certificate also marks the beginning of a lifelong journey of continuous learning and skill enhancement. What better way to enhance those skills than with a variety of real-world flying experiences to present new challenges, expand your horizons, and supplement safety in all your aviation endeavors. Embrace the wide world of GA flying!

Safe flying!

AVIATION NEWS ROUNDUP

Spatial Disorientation: GA's Deadliest Threat

According to 2025 research from the FAA's Civil Aerospace Medical Institute (CAMI), general aviation accidents caused by spatial disorientation had a 94% fatality rate compared to the 19% fatality rate for all GA accidents.

The study, which looked at 367 fatal general aviation accidents in the National Transportation Safety Board (NTSB) database between 2003 and 2021, found that pilots with less than 500 hours were more likely to be in these accidents. The research also showed that VFR into IMC flights contributed to the high number of fatalities.

Researchers discovered that over the years, more spatial disorientation flights have been associated with positive toxicology findings, particularly for drugs that pose potentially impairing effects. These findings "highlight the necessity for continued education and awareness efforts for spatial disorientation within GA," the researchers noted.

An example of spatial disorientation, the inversion illusion.

Overall, the incidence of fatal GA accidents related to spatial disorientation has decreased since an initial CAMI analysis in 1978, likely associated with increased education and awareness efforts, but more research into spatial disorientation is necessary to understand the true incidence of spatial disorientation in GA and to tailor awareness and education efforts to this dangerous occurrence.

Visit bit.ly/3IhOOh4 to read the full CAMI report. You can also read the articles "Your Senses in the Shadows" (bit.ly/4jFnEhN) and "It's a Confusing World Up There" (bit.ly/4e31Cn5) to learn more about spatial disorientation and strategies for preventing incidents.

Outcomes of the ARC on Mental Health

Pilots may wonder what the outcome of the FAA Aviation Rulemaking Committee (ARC) on Mental Health was. In a recent episode of the *Pilot Minute* video series, Federal Air Surgeon Dr. Susan Northrop discussed the ARC and next steps.

The rulemaking committee collected input from aviation and medical experts around the world on the barriers preventing pilots from reporting and seeking treatment for mental health concerns. The seven barriers identified include:

- Culture of Wellness — normalize mental health care and reporting with industry-wide commitment using peer support programs and improved mental health literacy
- Trust — increase transparency in decision making, streamline the certification process, and improve AME consistency
- Fear — combat misinformation, improve transparency of the certification process, and minimize grounding time
- Stigma — encourage peer-led support and education initiatives
- Financial — minimize as much as possible required testing and evaluation for return to flying
- Process — modernize systems for electronic submissions and improved applicant experience, expand access to qualified professionals, improve feedback, and provide clear guidance for pre-flighting the medical exam
- Knowledge Gaps — expand health care literacy, capitalize on positive personal narratives, and dispel myths throughout the industry

To watch this and other videos, visit bit.ly/FAAPilotMinute. And for the complete ARC report, visit bit.ly/3TxBiZ7.

#FLYSAFE GA SAFETY ENHANCEMENT TOPICS

Please visit bit.ly/FlySafeMedium for more information on these and other topics.

SEPTEMBER

Safety Wire Best Practices

OCTOBER

Human Factors for Pilots

Tips to Safely Use a Smartwatch on the Flight Deck

A smartwatch is a great piece of technology for pilots, providing a wealth of health, weather, and flight information. A recent video from *The Rotorcraft Collective* explains the benefits and tips for safely using a smartwatch while flying. Some benefits include the ability to monitor your heart rate, blood oxygen level, stress level, and sleep quality. Some watches even provide an EKG and alerts that could let you know when you're getting hypoxic. With GPS capabilities, smart watches can record flight paths and even find the nearest airports, complete with maps, NEXRAD, current weather, and radio frequencies. Check it out and subscribe to the series at bit.ly/FAAsmartwatch.

TSA Flight Training Security Program (FTSP)

The TSA's Flight Training Security Program rule (formerly the Alien Flight Student Program) went into effect on July 30, 2024. TSA's Flight Training Security Program (FTSP) oversees implementation of the regulation, which requires candidates to establish an account on the FTSP Portal and apply for a security threat assessment (STA) in order to receive a Determination of Eligibility from TSA. The Determination of Eligibility allows the candidate to participate in multiple training events for as long as their Determination of Eligibility remains valid, up to five years.

All flight schools and individual flight instructors are "Flight Training Providers" under the rule. The rule applies to initial pilot certification, whether a private, recreational, or sport pilot certificate; instrument ratings; multiengine ratings; type ratings; and recurrent training to maintain or renew a type rating. Flight training providers must verify U.S. citizenship of trainees, give security awareness initial and biennial training to their employees, and designate a security coordinator with the TSA. Even those who train only U.S. citizens or nationals must follow these rules. When flight training providers are training non-citizen candidates, the student generally must undergo a security threat assessment before training can begin.

For general information about the FTSP, to apply for training, and to log in to your account, visit fts.tsa.dhs.gov. Flight training providers can also visit this site.

MOSAIC Final Rule

The Modernization of Special Airworthiness Certification (MOSAIC) final rule published on July 24, 2025. The final rule includes changes to pilot and repairman certification, maintenance requirements, and right-of-way rules, effective 90 days after final rule publication on Oct. 22, 2025. Changes to operations, airworthiness certification requirements, and removal of the "light-sport aircraft" definition from 14 CFR section 1.1 are effective 365 days after final rule publication on July 24, 2026. The following provides a summary overview of the final rule:

- Changes affect the manufacture, certification, operation, maintenance, and alteration of aircraft holding special airworthiness certificates to include light-sport category aircraft under 14 CFR part 21, a new part 22, and section 91.327.
- Adds aerial work operational privileges for certain light-sport category aircraft for compensation.
- Removes the "light-sport aircraft" definition from 14 CFR part 1.1, enabling separation of pilot certification and privileges from aircraft certification requirements.
- Performance and design limitations for aircraft that sport pilots can operate expand under the new 14 CFR section 61.316. Other new sport pilot privileges with training and endorsements include night operations, helicopters with simplified flight controls, aircraft with retractable landing gear, and airplanes with manual controllable pitch propellers.
- New model-specific training and endorsement requirements for pilots seeking to act as pilot-in-command of certain aircraft with the "simplified flight controls" designation.
- Revises maintenance requirements for light-sport category aircraft related to safety directive compliance and major and minor repairs and alterations.
- Expands light-sport repairman certificate privileges to include all aircraft included in the expanded light-sport category and performing the condition inspection on experimental amateur-built aircraft.
- Revises training standards for obtaining a light-sport repairman maintenance rating.
- Permits a person acceptable to the FAA for both major alterations and major repairs of light-sport category aircraft.
- Creates or revises operating limitations for certain experimental, restricted, and light-sport category aircraft.
- Expands area of operations and adds additional phases of flight over densely populated areas for certain experimental aircraft under 14 CFR section 91.319.
- Codifies Congressional mandate for space support vehicle operations.

For complete details, go to bit.ly/MOSAIC_rule.

DR. SUSAN NORTHRUP, FAA FEDERAL AIR SURGEON

UPDATES TO CONGRESSIONAL DIRECTIVES

Last issue, I addressed some of the changes we're developing in MedXPress, including the portal to upload documents. In this issue, I want to touch on some of the other initiatives that are underway. If you've looked at the most recent FAA Reauthorization Act of 2024, you'll note a significant overlap with the congressional directives found in sections 411 (discussed in this article) and 413 (the portal that was addressed last issue).

Section 411 established the Aeromedical Innovation and Modernization working group, of which I am a co-chair. The working group, which includes representatives from government agencies, allied civil aviation authorities, academic institutions, airlines and business aviation, unions, advocacy groups, and many experienced AMEs, is reviewing FAA processes and providing suggestions relative to the 2024 Reauthorization.

Many of the initiatives directed by the FAA Reauthorization Act are already ongoing. These include reviewing the medical conditions that the AME may issue. We already have disposition tables and CACIs (Conditions an AME Can Issue). We regularly review and expand the special issuance (SI) process, which includes protocols to authorize a medical certificate for different medical conditions, such as mental health conditions, neurological disorders, or cardiovascular disorders. A few years ago, we updated the follow-up protocols for the Human Intervention Motivation Study (HIMS), the program to allow pilots back into the cockpit once in stable remission from substance abuse, initiating the step-down process, which decreases monitoring over time in certain pilots.

The FAA Reauthorization directs a review of several specific conditions for potential changes in FAA policy. The first is treatment for red-green color blindness (sic, should refer to deficiency). As many of you are aware, the FAA does not currently authorize the use of "color enhancing" lenses for flight or color vision testing. The reason is that historically, these enhanced some color wavelengths by blocking others. Testing did not indicate a net improvement, even though, subjectively, some individuals reported improved color discrimination. Technology continues to improve, though, and we have ongoing research in cooperation with the Air Force to determine if any of the available enhancements are feasible in aviation, looking at both testing and operational use.

We are also specifically directed to review policy and guidance for attention deficit hyperactivity disorder (ADHD) and attention deficit disorder (ADD), as well as whether medications used for treatment can be safely prescribed to airmen. Several years ago, we developed a fast track for review of ADHD (now the accepted term) for those off medications for several years and asymptomatic. To date, this has been successful and expedited the medical authorization of many pilots. When we reviewed the medications used to treat ADHD, the side effect profile was not acceptable for aviation use. Individuals with ADHD may not realize they have channelized attention (they get so focused, they do not pay attention to anything else around them) or poor attention. Other concerns include whether they are medication dependent, and if they stop or forget their medication, how it will impact their performance. The working group will review the current literature to see if any medications can be used safely in some circumstances.

Another item is to review the appropriateness of SI renewal by the AME following a medical evaluation and treatment by a medical specialist. Currently, the AME Assisted special issuance (AASI) program for an AASI or SI condition is that the FAA grants the initial AASI/SI. The AME is then authorized to issue a medical certificate if specific criteria are met — determined by the condition with individual consideration. They include specific evaluation criteria from treating specialists. We will take this opportunity to evaluate the current program for efficacy as well as potential conditions for program expansion.

Congress also directed us to review current protocols regarding recertification following recovery from an illness or injury that resulted in a disability rating from the Department of Veterans Affairs. Currently, an applicant for a medical certificate must report receiving a disability rating on the application. Depending on the condition, the underlying condition(s) could delay issuance of the medical certificate. The working group will review current processes and protocols for both.

Finally, the working group will review the progress of implementing the recommendations of the Mental Health and Aviation Medical Clearance Rulemaking Committee, ICAO, and the Department of Transportation. Stand by for future updates!

Can a Balloon Stall?

Balloon Aerodynamics and the Importance of Transient Aerodynamic Lift

By Adam Magee

Lift, thrust, weight, drag: these four primary forces acting on an airplane during flight are drilled into the heads of aspiring aviators. As learners progress, they build upon this knowledge to understand stall dynamics of an airplane. As a balloon pilot, I'm often asked by those who fly fixed-wing: "Can a balloon stall?" Before we dive into that topic, let's begin with an undertaught topic, even in the lighter-than-air world: the aerodynamics of ballooning.

Lighter Than Air Dynamics

Balloon aerodynamics is often explained as hot air rises and cold air sinks. While that is true, this only brushes the surface of what is truly happening. Balloon flights are based on the laws of aerostatics and the buoyancy or displacement principle commonly referred to as Archimedes' principle. In hot air balloons, the warmer air will experience decreasing density (molecules of air are getting further from each other or pushing neighboring molecules away as temperature increases). Heat is added to a hot air balloon envelope through the operation of burners. This leads to the density of hot air decreasing by pushing air out of the mouth opening of the balloon and increasing the gross or effective lift.

There are three main factors that impact balloon performance: ambient temperature, altitude, and weight (payload). For the balloon to reach a state of positive buoyancy, the air inside the balloon must be heated above the ambient air temperature plus a temperature differential to lift the weight. What this means is that on a cooler day, the balloon would fly cooler than on a warmer day, given the same altitude and weight. Pilots often easily understand the relationship between ambient temperature and weight on the envelope temperature and balloon flight. There is a maximum gross weight for a balloon, so while the temperature might be cool enough to allow for the max payload to be exceeded as far as performance, the manufacturer's limitations on gross weight are still in force.

Pilots often struggle to understand the relationship between altitude and balloon performance. Altitude, and in its more complex form, density altitude, play a significant role in balloon performance. For a balloon to fly at a higher altitude, the density of the air inside the envelope must remain lower than that of the ambient atmosphere air outside the balloon. This is accomplished by maintaining a higher internal temperature through continuous heating,

compensating for the natural decrease in ambient temperature and density with altitude.

The Truth About Lift

Displacement or aerostatic lift (aka "true" lift) is the main force that creates upward lift in balloons. There's also lift, which balloon pilots commonly call "false" lift, and that is where our discussion on stall dynamics begins. Luckily, there are people much smarter than me, like fellow FAA Safety Team Representative Nihad Daidzic, a skilled aviator, professor at Minnesota State University, Mankato, and published author of works on mathematical models of balloon flight. His research and lengthy personal discussions on balloon flight aerodynamics have shaped the science and base of the safety knowledge I share.

Like airplanes, balloons also experience aerodynamic forces due to slip flow. Transient aerodynamic lift only exists during transient slip flow; this is what generates lift for an airplane and a decrease of lift that creates a stall. When a balloon transitions wind layers, it is affected by transient aerodynamic lift and is generating lift. Therefore, when the transient aerodynamic lift ceases (like an airplane stall), the balloon pilot is unaware that prior lift was transient aerodynamic lift and not lift due to Archimedes' principle. The pilot likely stopped adding heat, which is problematic when the lift ceases, resulting in an even more accelerated descent rate. So, can a balloon stall? Yeah, in a way it can! Even a nonpowered, non-winged aircraft can lose lift due to the exact same fluid dynamics.

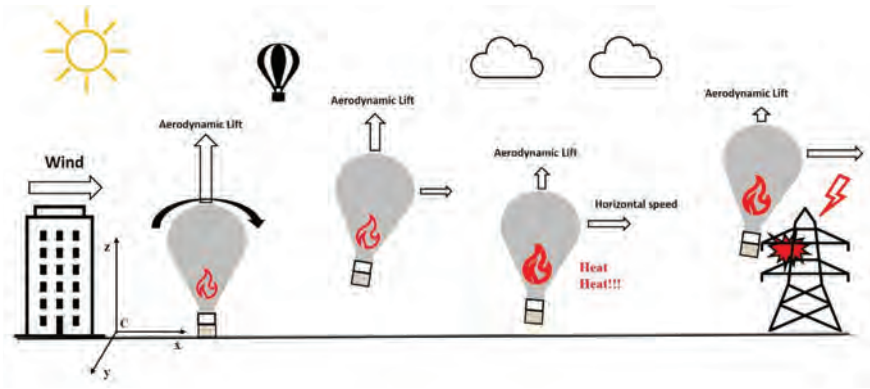
While balloon pilots call this phenomenon "false lift or false heavy," we should probably change the nomenclature to what the science really is; it represents creation of transient aerodynamic lift in an upward or downward direction as the balloon descends through the shear layer into a different airmass — slower, faster, or just different direction. Normally, winds decay closer to the ground due to friction in the Earth's boundary layer. Slip flow develops as the balloon descends through the shear layer, and the lower part of the envelope now acts as a lifting surface, developing transient aerodynamic lift downward. Unbeknownst to the balloon pilot, this can cause a balloon to suddenly steepen its descent path, accelerate its sink rate, and even start moving backward into an obstacle on the surface due to recirculating flow past the obstacle. It feels as if the balloon was "sucked" back by the obstacle. That often happens on approaches to landings into cavity-type fields or approaches over step-down obstacles, such as a line of trees, buildings, etc., in the presence of significant horizontal winds over the obstacles.

Fixed-wing pilots often think about emergency landings off field behind trees and the loss of lift generated on approach to landing. Downward acting transient aerodynamic lift is created by the lower part of the balloon envelope due to relative motion as the upper parts of the envelope are still in a different speed airmass dragging the lower envelope parts and the basket and creating slip flow. Transitioning wind layers may cause the simultaneous generation of upward and downward transient aerodynamic lift. Downward transient aerodynamic lift disappears as the balloon descends and settles into the new airmass, but that may be too late for the landing balloon as the flight path was already steepened, and the balloon accelerated downward significantly.

For balloon pilots, the easiest way to tell if you are flying in a transient aerodynamic lift situation is to feel the wind at your face. This telltale sign signals that slip flow aerodynamics are at play, but the wind on the face doesn't always occur.

Importance of Controlled Descents to Land

When transitioning wind layers upon approach to landing, it is imperative that a balloon pilot maintain a controlled descent rate. Too sharp of a descent rate could cause dishing of the envelope – when a side of the lower portion of the balloon is caved in – and an increased descent rate. The main issue is that if the pilot is in a steep descent upon encountering transient aerodynamic lift, the balloon's descent will slow, possibly even level out or ascend. If the pilot reacts to the aerodynamic lift by venting more heat, once the aerodynamic lift diminishes, the balloon will be even cooler and further accelerate the descent. The same problem occurs if the pilot simply doesn't operate



This illustration shows how a balloon would encounter transient aerodynamic lift (TAL) during ascent and not have enough true lift to clear downwind obstacles. (Illustration by Nihad Daidzic)

the burner and allows the balloon to cool. The cooler the envelope is from equilibrium temperature, the greater the risk of encountering a highly accelerated descent once the aerodynamic lift diminishes.

As the balloon descends through the layers and encounters transient aerodynamic lift, the pilot must remain in control of the balloon so that one standard burn can initiate an ascent, and a vent (or allowing to cool) can get you through the layer. To counter the transient aerodynamic lift, short, frequent burns can be used to maintain the balloon temperature slightly below equilibrium. The pilot wants to transition the wind layers as smoothly and as controlled as possible, which relies on keeping the balloon near equilibrium temperature. This technique also mitigates the challenges faced with dishing of the envelope if that also occurs during the descent to land.

Balloon pilots are aware of the need for larger take-off spots when transient aerodynamic lift could be present with high winds aloft and light winds near the surface, but I hope to make pilots better aware of this phenomenon upon descent to land. In these situations, larger landing sites are best. Often, the wind layer impacting transient aerodynamic lift on landings is slightly above obstacle height. Therefore, landing sites with obstacles on approach need to have enough depth so that the pilot can transition the wind layer after crossing over the obstacle. Landing sites that are too small will require the pilot to transition the layer while over obstacles, increasing the risk of collision.

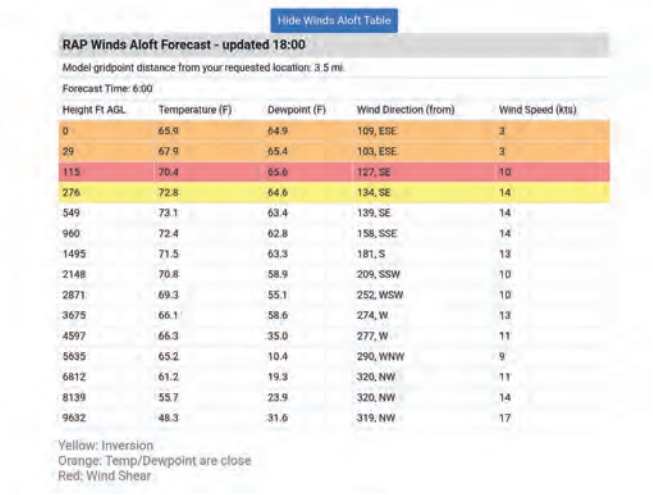
It is imperative that a balloon pilot's pre-flight planning involve careful analysis of the wind's speed and direction to ensure a launch site that will take them to suitable and appropriate landing areas.

Importance of Weather Awareness

Accident narratives show a common theme in pre-flight pilot decision-making. When faced with a temperature inversion and strong winds aloft, pilots fail to recognize, assess, and manage the risk associated with upward or downward transient aerodynamic lift.

Using vertical wind profiles, the pilot can also prepare for weather conditions that will create aerodynamic lift situations both on launch and descent to landing. The forecasted conditions should be incorporated into the pre-flight risk assessment and go/no-go decision.

An awesome forecasting tool built by balloonist Alex Norrie for weather awareness and risk management is the ballooning weather tool at bit.ly/balloonwx. If an inversion is forecasted, the cells are highlighted yellow. Orange highlights indicate the temperature and dew point are close, signaling fog or clouds. Red highlights indicate wind shear. The presence of red highlights, red highlights close to the surface, or too many red highlights can indicate increased transient aerodynamic forces present for balloon flights.


Hide Winds Aloft Table

RAP Winds Aloft Forecast - updated 18:00

Model gridpoint distance from your requested location: 3.5 mi.

Forecast Time: 6:00

Height Ft AGL	Temperature (F)	Dewpoint (F)	Wind Direction (from)	Wind Speed (kts)
0	65.9	64.9	109, ESE	3
29	67.9	65.4	103, ESE	3
115	70.4	65.6	127, SE	10
276	72.8	64.6	134, SE	14
549	73.1	63.4	139, SE	14
960	72.4	62.8	158, SSE	14
1495	71.5	63.3	181, S	13
2148	70.8	58.9	209, SSW	10
2871	69.3	55.1	252, WSW	10
3675	66.1	58.6	274, W	13
4597	66.3	35.0	277, W	11
5635	65.2	10.4	290, WNW	9
6812	61.2	19.3	320, NW	11
8139	55.7	23.9	320, NW	14
9632	48.3	31.6	319, NW	17

Yellow: Inversion
Orange: Temp/Dewpoint are close
Red: Wind Shear

Screenshot from a ballooning weather tool that shows a morning flight with a temperature inversion and low-level wind shear.

A Graceful Landing

Transient aerodynamic lift awareness and a lack of risk management are key contributors to hot air balloon accidents. Utilizing the weather awareness resources we've noted here is a huge step toward improving how we teach and train balloon aerodynamics. Unfortunately, transient aerodynamic lift encounters are quickly becoming more common. To stay safe, we need to be aware of this weather situation, know how to handle it, and exercise better risk management.

I wish you "gentle breezes and soft landings," with, of course, more knowledge of transient aerodynamic lift!

Adam Magee is a commercial hot air balloon pilot and flight instructor, designated pilot examiner, and FAASTeam Lead Representative. He was named the 2024 National FAA Flight Instructor of the Year and the 2021 National FAASTeam Representative of the Year. He is co-founder/president of The Balloon Training Academy, a 501(c)(3) nonprofit organization, and an industry member of the FAASTeam, as well as serving as a member of the board of directors and treasurer of the National Association of Flight Instructors (NAFI).

LEARN MORE

FAA Balloon Flying Handbook
bit.ly/faahandbooks

Seaplanes and Safety

RISK MANAGEMENT ESSENTIALS FOR AMPHIBIOUS AIRCRAFT

By Steve Guetter

There may not be anything quite as adventurous as seaplane flying. A seaplane makes you master of both sea and sky. Like seagulls or pelicans, when you fly a seaplane, you can both soar above the water and float on its surface. While this type of flying represents the ultimate in aviation freedom, which allows pilots to land in many remote and unique destinations, it also comes with unique risks and challenges that are not present in land-only operations.

According to the Seaplane Pilots Association (SPA) and the AOPA's Air Safety Institute (ASI) Seaplane Accident Analysis Report 2008-2022 (bit.ly/41y1ZRD), the percentage of seaplane accidents resulting in fatalities was slightly higher than that of their land-only counterparts. The report indicated the dominant cause of seaplane accidents was abnormal runway contact. Comparing this study to the most recent Richard G. McSpadden Report from 2022 (bit.ly/McSpaddenReport), it's possible to draw a few important comparisons between flying land planes and seaplanes.

According to the Seaplane Accident Analysis Report, aircraft control issues account for 40% of seaplane accidents, followed by accidents categorized as decision-making. While aircraft class doesn't seem to affect predominant accident causes, the addition of operations that include amphibious landing gear operations does increase accidents caused by gear position versus landing surface mismatch. In this article, I'll aim to break down these categories, see how they interrelate, and explore best practices to keep ourselves and our passengers safe.

Based on data from the aforementioned reports, here's what I noted as the top causes for seaplane accidents by phase of flight.

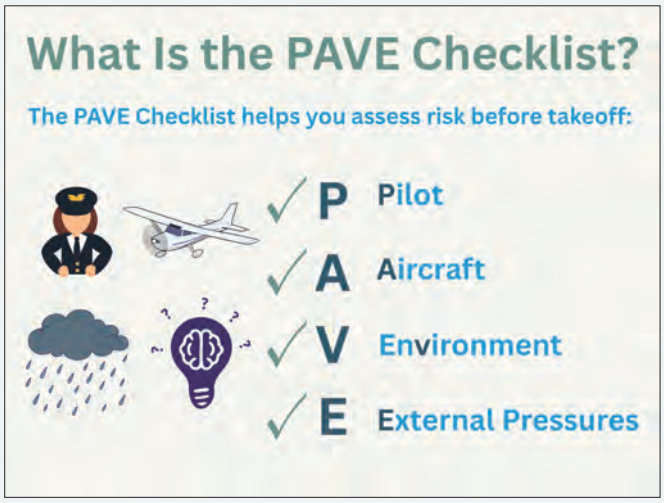
- With takeoff accidents, loss of directional control during the takeoff roll was the most common cause, but the category also includes pitch and roll excursions after liftoff. Departure stalls accounted for nearly one-third of the fatal accidents.
- During the maneuvering phase of flight, the most common cause was an unintentional stall at an altitude too low to allow for recovery. Nearly 60% of all maneuvering accidents and almost half of all accidents during descent and approach were fatal.
- Inadvertent stalls were implicated in over a third of descent and approach accidents.

This data indicates to me how important decision-making, training, and correct landing gear position selection are to safe seaplane operations.

Decision Making — Consistently Using ADM Tools

As previously mentioned, many of the accidents fall into the category of decision-making. Even events such as inadvertent stalls involve a series of decisions that lead to the moment the wing stops producing lift. Every flight we take, and even the ones we do not, involves a multitude of decisions. Having a standard aeronautical decision making, or ADM, process is critical when challenging and high-stress situations occur.

The FAA provides a suite of helpful decision-making tools, including the PAVE and IMSAFE checklists. As pilots, we have all been trained and tested on these tools, but individual results will, of course, vary. The key for all of us is to implement them consistently into our flying.



In addition to decision-making tools, having a strong network of fellow aviators is also important to assist you if challenging conditions or decisions are present before a flight. Though the decision is ultimately yours, getting perspectives from others that you trust can help you make the decision. This tool is also important after a flight. As hard as we try, none of us has flown the perfect flight. Sometimes the issues are small, other times they are added to our list of "most uncomfortable moments as a pilot." A post-flight debrief with a trusted advisor can go a long way toward understanding the decision-making process that was used and how it may be improved in the future.

Training — Provider and Aircraft; Currency, Proficiency, and Class

Regular training that improves and expands our pilot skillset can lower the risk of aircraft control issues. Training should be a standard and welcome event in our aviation journey. When evaluating training and what is right for you, look at the three Rs of recurrent training. What is required, what is relevant, and how recently was it performed?

The FAA and certain insurance companies may require recurrent training. In some cases, the training has explicit minimum requirements. Other times, you and your flight instructor can customize the training.

When evaluating your recurrent training needs, be sure to look at both relevance and recency. A flight review or yearly recurrent training in your Beechcraft *Baron* or a Boeing 737 may meet the requirements evaluated above, but is it relevant to the operation being conducted? Specifically looking at seaplanes, when was the last time you went out with a flight instructor to refine your water takeoffs and landings?

When looking for an instructor to hone your skills, seek someone who has operational-specific knowledge, the ability to challenge you, and who maintains a positive attitude. In addition to helping a pilot strive for safety, recurrent training should also challenge them to grow and evaluate their current practices for areas of improvement.

Gear Position — Amphibious Operations and Intended Landing Surface

One of the areas identified earlier, unique to seaplane accidents, was improper gear position. In an amphibious seaplane, the proper landing gear position is dependent on the intended landing surface: water or land. The GUMPS (Gas, Undercarriage, Mixture, Props, Switches/Seatbelts) flow that many of us develop in retractable gear land planes can have a negative transfer when transitioning to or flying amphibians. There is also a challenge for those of us who often fly both retractable gear land planes and amphibious aircraft. In these cases, pilots need to have procedures that allow them to configure the aircraft they are in properly and trap errors before they become an incident or accident.

Consistent procedures, regardless of aircraft, are key to assuring safety as we switch between aircraft. There is a large difference between the calls "gear is down and green for landing" and "we are landing on a runway; the gear is down and green for a runway landing."

If a pilot changes callouts as they switch between, say, a *Bonanza* and an amphibious *Caravan*, they miss an opportunity to trap potential errors and mitigate the risk of switching between two aircraft with different complexities. I advocate the latter of the previous verbiage, said out loud, regardless of whether the aircraft is capable of landing on water. Consistent procedures are one way we can mitigate the risk of switching aircraft.

The first step in assuring the aircraft is properly configured for the intended landing surface is to acknowledge to yourself and your crew (passengers and crew will be used interchangeably) where you will be landing. "There is a lake in front of us, landing gear will be up for a water landing." With that sentence, said out loud, you have committed to your mind as well as your crew where the aircraft will land and the desired gear state. Any deviation from this configuration or landing area is reason to take a moment and question your actions.

As part of the GUMPS check run on each leg of the traffic pattern, utilize the same verbiage that has already been used: "Gear is up and blue for a water landing." Also, look at the landing area, the gear indicators (lights and floats), and tacitly verify the gear handle position. I like to do one last glance at the gear lights on short final.

Use "positive rate, gear up" on every aircraft, every time. Although a gear-up runway landing will hit the pocketbook and the ego, a gear-down water landing can be deadly. The natural state for the amphibian is to have the gear tucked in the up position. After a land takeoff, the amphibious pilot's first action, after assuring a positive rate of climb, is to retract the gear and assure it is up. Saying "positive rate, gear up," along with the techniques to confirm and select proper gear position, can eliminate accidents related to amphibious gear position.

There may be no one better acquainted with the dangers of improper gear position than Russ Jeter. He shares the excruciating consequences of his own personal tragedy and the lessons we can learn from it in a video made in conjunction with Air Safety Institute. Go to bit.ly/3GOdlKb to see this special presentation and learn more about the importance of confirming and selecting proper gear position during every flight.

The Seaplane Operating Environment and CRM

One of the more challenging and rewarding aspects of seaplane flying is evaluating the landing area and the associated planning for our landings. Unlike a land airport, a water landing area has not been created and protected for us. The water landing environment is ever-changing with variables like obstacles, other traffic on the water, and weather conditions — adding to the complexity and importance of properly managing resources

When overflying an intended water destination, risks from all of the accident areas we identified are present. Executing a water landing requires a strong and standard decision-making process. While that evaluation and decision-making process is in progress, basic airmanship is critical. You should manage proper aircraft configuration, angle of attack, airspeed, and your position over the ground and in relation to other traffic. Try using the "Night Owl" checklist to help with this evaluation.

NTOWL

- Noise
- Terrain/Towers
- Obstacles in the water (boat wake is very dangerous for seaplanes)
- Wind/Water for the type of landing (glassy, rough, etc.)
- Landing lane selection

When evaluating an area for water landing, seaplane pilots should develop a standard practice that works for them and their aircraft. Don't forget to involve others who are on the plane, as appropriate. Brief the other sets of eyes on what you will be looking for and how to let you know if they see something concerning.

A Smooth Landing

Seaplane flying is rewarding and one of the ultimate freedoms available to aviators. However, flying an amphibious aircraft presents unique challenges and an added level of complexity when compared to its land-bound brethren. Pilots should be aware of the challenges in this environment and take the necessary steps to refine their skills, use consistent decision-making procedures, and seek out aircraft-specific training. These risk-reduction efforts will help keep you and your passengers safe as you explore the land, air, and sea!

Steve Guetter is a 3,000-hour commercial pilot and flight instructor with single and multi-engine land ratings as well as a single-engine sea rating. He has an bachelor's degree in mechanical engineering and a master's in business administration. He is the general manager of Wipaire's Advanced Flight Training and Leasing division and a SPA lifetime member who is dedicated to seaplane safety and the expansion of the seaplane pilot population. He and his wife own a Beech J35 Bonanza, which they fly throughout the country for personal travel.

PARACHUTE SAFETY UNPACKED

By Ed Goldstein

Mike Millard will never forget the heart-stopping moment when his third parachute training jump went awry.

"I left the aircraft, and I wasn't perfectly stable," the FAA aviation safety inspector recalled. "I was experiencing some tumbling in freefall, which was a disorienting moment where your body is not aligned with the airflow, and you're flipping end over end. In that situation, it's critical to stay calm and remember your training."

Millard received that training at the U.S. Air Force Academy, where he served as a quality assurance inspector. "That experience drove home how much control you need to have in freefall and how critical it is to stay calm and not panic," he said. "Even when things feel out of control, you focus on the process, regain stability, and move forward to a successful outcome."

Today, Millard leverages that valuable experience to help improve parachuting safety through his work as a subject matter expert on 14 CFR part 105 parachute operations. He and his colleagues in the FAA Flight Standards General Aviation Operations Section work closely with the 41,000-member U.S. Parachute Association (uspa.org) to support its

A Moment in History: How the Parachute Age Began

Parachuting began fairly early in the aviation age, when on March 1, 1912, a daredevil U.S. Army captain, Albert Berry, took a leap into the abyss.

In the skies over Jefferson Barracks Army Base near St. Louis, Missouri, Berry began his attempt by sitting on a trapeze bar dangling from the front of the Benoist pusher-type airplane piloted by Tony Jannus, who two years later became the first airline pilot. At an altitude of 1,500 feet, Berry grabbed a parachute from a cone-like contraption placed above his head, attached the parachute to a harness, and made his jump.

"Berry gave a quick jerk of a rope and with the parachute shot downward, while the airplane, first bouncing up like a cork, suddenly poised and steadied itself," wrote an eyewitness reporter. "Hundreds of watchers held their breath as Berry shot toward the earth, the parachute tailing after him in a long, snaky line. Suddenly the parachute opened, the rapidity of the descent was checked, and amid cheers, the first aviator to make such an attempt lightly reached the ground."

Mike Millard conducting an inspection. (Photo courtesy of Mike Millard)

Mike Millard with the Round Canopy Parachuting Team, which performs commemorative airborne demonstrations to increase awareness and educate the public about the sacrifices and heroism of Allied Paratroopers from WWII onward.

safety outreach with parachutists and parachute operators. That partnership is paying big safety dividends as parachute-related fatalities fell to a record low of nine last year out of an estimated 3.88 million skydives in the United States.

> **Even when things feel out of control, you focus on the process, regain stability, and move forward to a successful outcome.**

The FAA plays an important role in ensuring parachuting safety through oversight of aircraft, equipment, and personnel. The agency sets specific standards for aircraft maintenance and operation, pilot certification, and parachute system maintenance. The FAA works with drop zone operators and airport management to establish safe landing areas and address airspace concerns. And FAA Flight Standards District Offices periodically visit skydiving centers to audit operations and inspect aircraft and equipment.

From a safety perspective, parachuting poses unique risks, including those involving the operations of the aircraft (i.e., maintaining proper balance, pitch, and speed and avoiding other aircraft near airports), and the activity of the skydivers leaping out and deploying and handling their parachutes. The steady decrease in annual parachute-related fatalities from an average of 42.5 in the 1970s to single digits today is largely due to FAA safety measures, improved equipment and training, advances in emergency response techniques, and a strong safety culture in the parachuting community.

Millard said several safety advances are making a difference. These include simulators with virtual reality goggles that input wind and weather conditions at particular airports, parachutes that automatically open if a jumper blacks out, instructors on the ground talking parachutists through jumps with the aid of earbuds, and wind management apps that detail current wind conditions.

"Having an industry that is so active in safety is very valuable to us," said Millard. "Back in the 1970s, the skydiving community was a wilder group. Now you see a lot more professionalism. The industry is reaching out to me to say, 'How can we do this better?'"

Last year, the U.S. Parachute Association voluntarily adopted a safety management system (SMS) for its members who operate drop zones.

"Our SMS division said that it is pretty impressive," Millard added.

The FAA also does direct outreach with the Parachute Industry Association's (pia.com) annual symposium, which provides drop zone owners and participants in the parachute industry the opportunity to "receive training and safety briefings and communicate with the FAA as a group if they have concerns."

Millard, who earned his senior parachute rigger certificate at the Montana Smokejumpers facility, views one of his most important roles as serving as a resource for fellow aviation safety inspectors.

"I love taking calls to help educate our inspectors on how to show operators where items are in FAA guidance," he said. "Don't hesitate to reach out."

Visit the FAA Safety Team's online library for more information on parachute safety at bit.ly/FAAST_pamphlets or the online resources by type of operation at bit.ly/RBToO.

Ed Goldstein is a senior communications specialist with the FAA's Office of Communications.

Must-Know Rules and Regulations for Skydiving and Parachute Operations

For Everyone

From pilots to riggers, everyone involved in skydiving operations should be familiar with and comply with 14 CFR part 105. Advisory Circular (AC) 105-2E contains important safety guidance for everyone as well.

- **Part 105, *Parachute Operations* (bit.ly/CFR14Part105):** When it comes to skydiving, the FAA's primary responsibility is to ensure the safety of air traffic and to protect persons and property on the ground. Part 105 was developed for parachutists, parachute riggers, and pilots who fly parachutists, and contains regulations governing intentional parachute jumping.
- **AC 105-2E, *Sport Parachuting* (bit.ly/AC105):** This AC provides guidance to enhance sport parachuting safety and assist everyone associated with compliance to 14 CFR part 105. It also contains information for jumpers and riggers on parachuting equipment, airport parachuting operations, jump pilot training, aircraft maintenance programs, parachute rigging, and procedures for FAA authorization for flight operations with a removed or modified door.

For Parachute Riggers

To pack, maintain, or alter parachute systems used in skydiving operations, riggers must comply with 14 CFR part 65.

- **Part 65, *Certification: Airmen Other Than Flight Crew Members* (bit.ly/446k2yQ):** Subpart F concerns parachute riggers, their eligibility requirements, privileges, and performance standards.

For Jump Pilots

Skydiving flights are considered commercial operations — 14 CFR section 61.113 limitations state a private pilot may not act as pilot in command or second in command of an aircraft carrying persons or property for compensation or hire. Jump pilots must comply with all applicable regulations, including, but not limited to part 91 and 105, and are required to possess a commercial pilot certificate with appropriate ratings for the aircraft being flown, as well as have a current second-class medical certificate.

- **Part 91, *General Operation and Flight Rules* (bit.ly/4jSf12Q):** Parachute operators and jump pilots must comply with all applicable sections of part 91.
- **Part 119, *Certification: Air Carriers and Commercial Operators* (section 119.1(e)(6)) (bit.ly/3HMVXpm):** Pilots who conduct parachute operations within a 25-statute-mile radius of the airport of departure may conduct them as commercial operations under part 91.

Tackling Transition Training

THE IMPORTANCE OF FAMILIARIZING YOURSELF WITH UNFAMILIAR AIRCRAFT

By Tom Hoffmann

Imagine yourself sitting behind the wheel of a car that has a stick shift, but all you've ever driven is an automatic transmission. Sure, it's still a car, but if you're driving a vehicle with a stick shift, you'll need to know how to operate the gears and clutch. You'll need transition training from an automatic to a manual transmission. Similarly, pilots who are transitioning to unfamiliar aircraft require not only stick and rudder development, but also specific training in the new aircraft's systems and operating characteristics, including normal, abnormal, and emergency procedures.

Remember — skills learned in some aircraft don't directly translate to other aircraft. Your new aircraft may look and feel like the one you're used to flying, but subtle differences can exist, such as higher or lower performance, higher stall speeds, and variations in handling characteristics that could ultimately affect your reaction time and/or lead to loss of aircraft control in normal, adverse, and emergency conditions. Transition training is also important whenever you're operating an unfamiliar aircraft or avionics system.

Impetus for Instruction

Lack of transition training has been cited as a causal factor in many general aviation accidents. Accidents frequently result from pilots being unprepared for challenges presented by the new or different aircraft they are flying. Even when pilots are legally certificated to operate aircraft within a specific category and class, significant differences can exist among different types of aircraft within that category and class, thus necessitating the need for effective transition training.

The first 50 to 100 hours in a new aircraft type are particularly dangerous, especially when a formal transition training program isn't followed.

Stepping Down and Stepping Up

Transitioning to another aircraft works both ways — stepping down is just as important as stepping up. It's not just about learning how to fly a more complex airplane. It's also about learning to transition from high-performance aircraft to aircraft with lower performance and complexity, which can be equally challenging. The same rules apply when you're operating in unfamiliar environments — you need to train for your new surroundings.

Transition Training Program

Whether you're transitioning from higher- to lower-performance aircraft or even to a different model, you should follow these three steps to ensure a sound transition training program.

1. Hit the books

You can get a leg up on your transition if you study the pilot's operating handbook first, especially if you've flown similar aircraft before. Your study topics should include basic characteristics of the aircraft's systems (e.g., fuel, electrical, control, hydraulic, avionics, and environmental) and how characteristics of the new aircraft differ from aircraft you have already flown.

Get a feel for what you can and can't do with the aircraft. Focus on normal and abnormal procedures, performance characteristics, and what to expect on takeoff, landing, climb, cruise, descent, and glide. Also address the aircraft's limitations, such as weight and balance, speeds, and wind limits. Know your aircraft's emergency procedures, speeds, power setting, and configurations for normal operations.

2. Train with a qualified flight instructor

Finding the right flight instructor is key. Interview current owners, aircraft type clubs, or pilot organizations. They provide an excellent source of aircraft-specific information and a roster of flight instructors. Simulation training providers are another good source of information.

Talk to more than one flight instructor. They must be experienced with the make and model of your aircraft.

More importantly, they must have recent experience. Let them know about your experience and capabilities as well, and how you intend to use the aircraft. Assess their communication style. Are they clear and easy to understand? Would they be an effective teacher?

Make sure your flight instructor uses a syllabus — a training roadmap that should contain training events and schedules, completion standards, and established roles and responsibilities for you and the flight instructor.

The National Association of Flight Instructors advocates the ACE (***A**nalyze, **C**reate, **E**xecute*) training method. **Analyze** the aircraft's performance. **Create** your list of concerns about the new aircraft. And **Execute** several flights similar to the type of operation you plan to do in the aircraft.

3. And practice, practice, practice

It is important to practice with your flight instructor — twice a week is suggested to yield the best result — and in your operating environment. Develop personal performance figures and minimums, and develop your personal data at mission weights.

New avionics systems require practice too. Try logging some time on an avionics simulator to practice in a glass cockpit.

Practice slow speed maneuvering at altitude, manage distractions, seek regular refresher training, and document your achievement in the ***WINGS*** Pilot Proficiency Program! (bit.ly/WINGSPPP)

Transition Training with Modified Aircraft

Even aircraft that pilots have flown before may require transition training or at least thorough familiarization flights if they have been modified. Aircraft modifications not only increase utility and performance, but they may also alter flight characteristics. For example, vortex generators may decrease stall speed, but they may also reduce aerodynamic indications of approaching stalls. And aircraft with multiple alterations may exhibit flight characteristics that are different from those associated with single modifications. This means that pilots must be especially careful when transitioning to modified aircraft, even if they have extensive experience with the unmodified versions.

If you've got an aircraft that's been modified, here are some tips to consider when taking your first flight:

- Regardless of any testing the installer may have done, your first flight in a modified aircraft will be a test flight. Advisory Circular 90-89C, *Amateur-Built Aircraft and Ultralight Flight Testing Handbook*, section 4, provides excellent guidance on test flying (bit.ly/AC9089C). You may not be conducting a full test program, but a review of the content will give you some useful information on test flying.

- It's a good idea to engage a flight instructor who's familiar with the aircraft and its modifications to assist you in your transition.
- Give yourself plenty of altitude.
- Take it slowly — don't try to win a short-field landing contest or demonstrate ultimate performance right away. Ease into the altered performance envelope. Make sure you have good VFR weather, plenty of altitude, and long runways for the test flight(s).

The excitement of a new aircraft can make you feel like a kid on Christmas morning. Don't let that excitement make you forget the importance of transition training. Whether it's an entirely new aircraft, a new system, or a modification, always make time to familiarize yourself with the unfamiliar.

Tom Hoffmann is the editor of *FAA Safety Briefing*. He is a commercial pilot and holds an A&P certificate.

LEARN MORE

Advisory Circular 90-109A, *Transition to Unfamiliar Aircraft*
bit.ly/AC90-109A

"Shifting Gears: Tips for Transition Training," Page 26, *FAA Safety Briefing*, Sep/Oct 2017
bit.ly/4f0uxJ1

"What's Your Type, How Type Clubs Enhance Safety," *FAA Safety Briefing*, Jan/Feb 2023
bit.ly/3IDLLQo

AOPA Online Course: Transitioning to Other Airplanes
bit.ly/44Emm1G

FAA *Airplane Flying Handbook*, chapters 12 to 17
bit.ly/FAA-AH

Transition Training in 57 Seconds, FAA Video
bit.ly/3GVdDis

Training and Preparing for a New Flight Environment in 57 Seconds, FAA Video
bit.ly/57SecsExpand

Taking Transition Training Seriously

A Personal Account of Switching Seats Successfully

By Philip Mandel

There I was, attempting to schedule a night flight in one of the Grumman AA-1B low-wing trainers at the flight school where I had just obtained my private pilot certificate. It was August 1981, and the ink was barely dry on my temporary certificate. Even though he had just trained me and sent me for a check ride, which I passed with flying colors, the FBO manager wouldn't let me check out the aircraft. He told me he couldn't let a pilot with so few hours use one of their airplanes at night.

Now, don't get me wrong. A private enterprise, like a fixed-base operator, has the right to make any decision they want regarding the use of their aircraft. I just don't like being constrained, so I did the only logical thing I could think of — I bought an airplane. Now I could fly when and where I wanted, even at night, and I wouldn't have to bring the plane back at the end of the rental block.

The problem was that the airplane I bought was a 1964 Cessna 172E — an aircraft I had never flown. I had an hour in a Cessna 150 doing spins (my primary instructor was amazing), but that was certainly not a check-out or enough time to really know the new type of aircraft.

I'm embarrassed to say that I had not received any transition training before handing the seller a check and flying off. Even more embarrassing is that I hadn't even heard of "transition training" or the need to build familiarity before flying a new-to-me make and model aircraft.

While I studied the pilot operating handbook (POH) and managed to figure out the manual flaps, performance characteristics, and significantly different look and feel of the airplane, I had no business acting as pilot-in-command without a proper checkout. FAA Advisory Circular 90-109A, *Transition to Unfamiliar Aircraft*, warns: "Pilots transitioning to unfamiliar aircraft require specific training in the new aircraft's systems and operating characteristics to include normal, abnormal, and emergency procedures."

In other words, I got lucky. By the time I earned my instrument rating, commercial pilot certificate, flight instructor certificate, and instrument instructor rating in that old Cessna, I knew it pretty well. After I sold it, I went plane-less for a while, then bought a Piper PA28-140 *Cherokee*, skipping any transition training. But again, I figured it out and eventually flew it across the country in a move to California.

When I bought airplane number three, I smartened up. There I was, instructing at Palo Alto Airport (PAO), when the most stunning airplane I had ever seen taxied by. Once the pilot, Cloyce Fraser, shut down and exited the aircraft, I struck up a conversation. This was a Christen *Eagle II*, 200-horsepower, short-coupled, tail-dragging, full aerobatic biplane with a constant-speed propeller.

Fraser asked if I wanted to buy it, which I responded: "I don't have that kind of money." Fraser persisted and told me it was up for a silent auction. It had been built by students in the San Mateo Union High School District, with Fraser as the shop teacher and aircraft mechanic supervising the construction.

Philip Mandel in his Christen *Eagle II*.

Even with my added living expenses, I couldn't resist! I had to have that airplane. So, I asked how to bid, spoke with a friend who lent me half the money, and made my bid. Lo and behold, I had the winning bid.

With a fresh bill of sale and registration application in hand, I proudly announced to the others in the flight school that I had just purchased a Christen *Eagle*. I had no clue how different this airplane was from the others I had flown. Fortunately, one of my fellow instructors asked if I had any experience flying taildraggers.

This term was new to me. Shocked that I didn't know, he explained to me the differences between the other airplanes I had experience with and the one I had just acquired. Thank goodness he did. If he hadn't, I would have jumped in and flown it into a heap due to loss of control, probably on first takeoff. Several hours of dual instruction later, I was capable of handling that little monster. I flew it a lot, did some mild aerobatics, and took countless friends for rides. Keep in mind, all this happened before April 15, 1991, so tailwheel endorsement wasn't required.

Needless to say, I finally learned my lesson not to fly a new-to-me type of aircraft without "specific training in the new aircraft's systems and operating characteristics to include normal, abnormal, and emergency procedures."

Transition training should be taken seriously. As AC 90-109A states, "pilots should follow an organized methodology to become familiar and competent in the new airplane." So, please — don't count on luck when it comes to flying a new-to-you aircraft type ever! Insist on being trained, competent, and proficient. Fly safe!

Philip Mandel is a flight instructor with multi-engine and instrument ground ratings and an advanced ground instructor. He is an FAA Safety Team (FAASTeam) Lead Representative and WINGS Pro, as well as three-time Portland (Oregon) FSDO FAASTeam Representative of the Year.

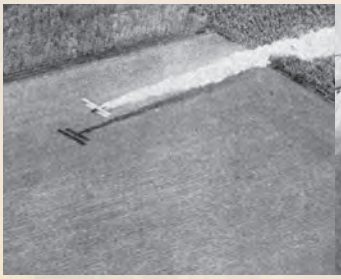
Harvesting Safety in the Skies

Navigating Risks in Agricultural Aviation

By Tom Hoffmann

It all started with a particularly nasty caterpillar infestation at a catalpa tree grove four miles outside of Troy, Ohio. Shortly after noon on Aug. 3, 1921, Army 1st Lt. John A. Macready made history when he departed in a Curtiss JN-6 "Jenny" outfitted with a 32-gallon hopper designed to dispense powdered lead arsenate and hopefully protect the besieged trees from further damage. Spreading 175 pounds of the insecticide during six low-altitude passes over the grove, Macready was successful in eradicating the greedy grubs that were quickly decimating a prime source of timber for posts and poles. It was estimated that 99% of the catalpa sphinx caterpillars were destroyed after the operation. With that flight, the agricultural aviation industry was born.

Fast-forward more than 100 years, and agricultural aviation has grown leaps and bounds to include more rugged, powerful, and purpose-built aircraft with payloads that far eclipse those of the early crop dusters. The largest of these boasts a 1,200-horsepower turbine engine and nearly 10,000 pounds of payload. The agricultural aviation industry has also grown to include helicopters, and more recently, an expanding array of unmanned aircraft systems (UAS), or drones. As of June 2025, there were more than 3,400 certificated part 137 operators (both crewed and unmanned).



World's first crop dusting experiment using an aircraft.

Etienne Dormoy and John A. Macready in front of the first crop dusting aircraft.

Providing aerial application of crop protection products has proven to be an invaluable tool for farmers in all 50 states. According to the National Agricultural Aviation Association (NAAA), aerial applicators treat 127 million acres of cropland annually, an estimated 28% of cropland in current production. The NAAA also estimates that an area the size of Tennessee would be needed to replace the yield lost if aerial application were not available for five commonly treated crops in the U.S. This greater crop yield results in less land needed for farming and, in turn, preserves more wetland and forest ecosystems.

High Stakes at Low Altitudes

While there are many clear benefits of using aircraft to treat crops, agricultural aircraft operations do present a multitude of risk factors for pilots. These pilots operate in a low-altitude environment with multiple terrain and obstruction hazards, deal with the complexities and nuances of loading and dispensing chemicals, and face the reality of fatigue from working 13-plus hour shifts. That's on top of having to deal with weather and wind constraints, the potential for mechanical difficulties, the constant monitoring of land

boundaries and GPS data, the cumulative effects of noise and vibration, dehydration — the list goes on.

In fiscal year 2024, there were 15 fatal accidents involving agricultural operations. Prior to that, the fatal accident rate has remained stubbornly consistent at 11 accidents in the previous four years. However, there are efforts by the FAA and industry to try to correct that trend by providing pilots with better educational resources and instilling safer practices. Let's take a closer look at some of these resources and how they can help you better navigate the challenges of aerial application.

Agricultural pilots should survey and perform a thorough reconnaissance of the area to be treated prior to flight, even if it's a field they're familiar with.

Sowing the Seeds for Safety

A good starting point for safety is with the regulations. Agricultural aircraft operations are covered under 14 CFR part 137, which defines it as *the operation of an aircraft for the purpose of (1) dispensing any economic poison, (2) dispensing any other substance intended for plant nourishment, soil treatment, propagation of plant life, or pest control, or (3) engaging in dispensing activities directly affecting agriculture, horticulture, or forest preservation, but not including the dispensing of live insects.*

Subpart B of this rule covers the certification requirements for obtaining an agricultural aircraft operating certificate, while subpart C covers the operating rules. Agricultural pilots must have a commercial certificate to work for hire and meet the requirements of part 137. That includes demonstrating to the operating certificate holder that they meet the knowledge and skill requirements prescribed in section 137.19 (e). In general, this ensures the pilot is familiar with safe handling of the economic poisons used, the aircraft's performance capabilities, and how to safely execute the maneuvers required for the operation. Typically, an agricultural operator will have a chief supervisor who, once they pass the FAA's knowledge and skills test, is issued an endorsement to supervise agricultural operations. The chief supervisor can also administer the knowledge and skills tests for pilots hired under that certificate. For more information on the test, see the NAAA's Agricultural Airman Guidelines at bit.ly/naaa-guide.

Keep in mind that while part 137 does offer some relief from part 91 to perform these specialized operations, part 91 still provides governing authority. For example, section 137.49 authorizes pilots to perform maneuvers below 500 feet above the surface that are necessary for the operation and that do not cause undue hazard to persons or property. However, 14 CFR section 91.303 restricts all pilots from performing aerobatic maneuvers below 1,500 feet (i.e., banks greater than or equal to 60 degrees, or nose up/down attitudes greater than or equal to 30 degrees relative to the horizon). Additionally, an agricultural aircraft pilot should pay particular attention to section 91.103 (*Preflight Action*), which requires them to be familiar with all available information concerning that flight. That includes everything from assessing runway lengths and weight and balance calculations to reviewing airspace restrictions and weather conditions.

Mapping Danger

"Preparation is important," says Charles Grabill, an aviation safety inspector and part 137 subject matter expert with the FAA's General Aviation and Commercial Division. Grabill suggests agricultural pilots survey and perform a thorough reconnaissance of the area to be treated prior to flight, even if it's a field they're familiar with. "Look carefully at the

Image courtesy of NAAA

environment for obstructions like towers, power lines, wind turbines, or any uncharted obstacles." This may involve both aerial and ground surveys.

Grabill recalls one accident investigation where an ag operator flying a rotorcraft saw and struck a wire he assumed was going in a different direction from a pole. The pilot involved in the accident survived but stated that if he had just made another pass and studied where that wire went from the pole, he would have been able to avoid it.

To supplement your situational awareness before flight, have a look at these resources:

- FAA SAFO 10015, *Flying in the Wire Environment:* bit.ly/SAFO_10015
- NTSB Safety Alert 35, *Preventing Obstacle Collision Accidents in Agricultural Aviation:* bit.ly/NTSB_SA35
- NTSB Safety Alert 16, *The Hazards of Unmarked Towers:* bit.ly/NTSB_SA16

Another excellent reference for shoring up safety practices and risk mitigation strategies is FAA Advisory Circular (AC) 137-1B on agricultural aviation operations (bit.ly/AC137-1B). One key pointer in the AC is to exercise caution when flying over sloping terrain: *Flying up the slope may result in stalling the aircraft before reaching the end of the swath run or contribute to an inadvertent stall during the pullup or turnaround.*

The AC also mentions the helpfulness of using a flight risk assessment tool (FRAT) during your preflight prep. Echoing the importance of this tool, NAAA recently released a FRAT specific to the agricultural aviation industry at bit.ly/NAAA_FRAT (PDF). The 24-question FRAT breaks down questions to be considered annually, monthly, daily, and before each flight. Answering "no" to any of the questions should be a hard stop for a pilot to either reconsider the flight or find ways to mitigate the risks identified.

Focus on Fatigue, Please

While fatigue is covered on the FRAT, it is a risk to the agricultural aviation industry that should be heeded with added attention. Beyond the accident risk factors mentioned earlier, agricultural pilots must also contend with having a finite "spray season" when almost all dispensing operations occur. This is typically June to August in the North and April to August in the South. These short windows of time to work in often mean long, grueling days. A 2019 survey conducted by NAAA reported that more than half of agricultural operators (55%) work 8 to 12 hours per day during the application season, with more than a third (35%) averaging 13 to 16 hours per day.

NAAA's new 24-question FRAT breaks down questions to be considered annually, monthly, daily, and before each flight.

Given the focus on fatigue, it's no surprise that the subject is front and center within many industry/government educational materials and reports, such as:

- NAAA's brochure on combating fatigue bit.ly/NAAA_fatigue
- Fly Safe messages (bit.ly/NAAAFlySafe) developed by NAAA's Professional Aerial Applicators' Support System (PAASS)
- NTSB special investigative report (SIR) 14/01 on the safety of agricultural aircraft operations (bit.ly/NTSB_SIR1401(PDF)). The report advocates for guidance that could "help operators and pilots develop effective strategies to reduce the likelihood of fatigue, dehydration, hunger, and other physiological factors that can negatively affect a pilot's concentration, decision-making, and performance."
- FAA Safety Alert for Operators (SAFO) 20004 on agricultural aviation safety (bit.ly/SAFO20004). The SAFO reinforces the importance of proper rest to combat fatigue and encourages agricultural pilots to establish a regular routine of uninterrupted sleep and to take breaks or 30-minute naps, if possible.
- FAA AC 120-100, *Basics of Aviation Fatigue* (bit.ly/AC120-100).

High-Tech Harvesting

With a recently streamlined certification process in place, the use of drones in the agricultural aviation industry has grown significantly. In fact, the number of unmanned part 137 operating certificates as of June 2025 is at 1,710, nearly equal to the number of crewed operators at 1,750. "This rapid growth has improved accessibility to aerial application services across a wider geographic and economic spectrum, providing more flexible and timely solutions for

growers of all sizes," says Ryan Smith, an aviation safety inspector with the FAA's Emerging Technologies Division. This versatility makes drone use particularly beneficial for small-scale farmers and niche markets that previously couldn't justify or afford manned aerial services.

Drones also offer some unique operational advantages, like performing precision spot treatments in sensitive or hard-to-reach areas, accessing narrow waterways, and navigating steep or technically challenging terrain that would be unsafe or impractical for manned aircraft. "These capabilities open the door to targeted applications, such as invasive species control and selective weed management in areas that were previously underserved or unreachable," adds Smith.

> **Agricultural pilots must stand committed to a culture that encourages continued learning and promotes safety above all else.**

Agricultural drones have had a stellar safety record with no fatalities or serious injuries reported to date. That's due in part to the FAA's robust authorization process and the conditions and limitations set forth in the operator's letter of exemption. These specific conditions and limitations (e.g., safe operating distances, weight limitations, flight planning requirements, lost link procedures, etc.) provide mitigations to maintain safety for operators, persons, property, and other aircraft. They also form the basis of the operations and training manual that all part 137 drone operators are required to have and comply with.

You Reap What You Sow

It's clear that agricultural aviation plays a vital role in modern farming and has a positive impact on many of the products we purchase and consume. However, the numerous unique hazards that exist with this type of operation make it an inherently risky activity. While advancements in technology, such as GPS navigation, collision-avoidance systems, and improved aircraft design, have greatly benefited operators in this environment, these tools alone can't guarantee safety. Agricultural pilots must also commit to a culture that encourages continued learning and promotes safety above all else. Together, these practices can establish a foundation for minimizing risk and keeping the agricultural aviation industry both prosperous and safe. That's certainly something to make hay about.

SAFETY TIPS FOR AERIAL APPLICATORS

- Focus on pre-flight decisions; assess hazards during takeoff and during application (e.g., wire hazards and towers).
- Become familiar with your field — do your reconnaissance prior to each application.
- Consider terrain, congested areas, and the applicable plans, type, and quantity of product being applied for proper weight and balance.
- Thoroughly assess the weather, including any potential changes to wind and density altitude.
- Use the IMSAFE checklist and consider any human factors that could impact safety (e.g., dehydration, fatigue, noise, complacency).
- Maintain constant communication with your ground crew and brief yourself as you go, even talking to yourself aloud.
- Be sure your aircraft is airworthy and is in compliance with all Airworthiness Directives, Service Bulletins, and required inspections.

Tom Hoffmann is the editor of *FAA Safety Briefing*. He is a commercial pilot and holds an A&P certificate.

LEARN MORE

14 CFR part 137, *Agricultural Aircraft Operations*
bit.ly/14CFR137

Dispensing Chemicals and Agricultural Products with UAS, FAA webpage
bit.ly/3TFHwWX

NAAA Professional Aerial Applicators' Support System (PAASS)
AgAviation.org/education/paass

PHILANTHROPIC FLYING

Giving Back with General Aviation

By Nicole Hartman

Making sure a burn patient is comfortable for the second flight of the day while traveling from New York City to Dayton Shriners for monthly care. (Air Care Alliance photos courtesy of Mark Hanson)

I firmly believe that an important component of achieving a fulfilling life is being of service to others. Nothing gets me out of my own head and gives my challenges some perspective like giving back. This is not a prescriptive element of living — there are countless "means of compliance" when it comes to donating your time and skills, and general aviation pilots are in a unique position to work on staying current and proficient while giving back to the community. Not to mention that volunteering for a worthwhile cause is a pretty sweet excuse to get up in the air. But a good deed is no good if it isn't done safely and legally. So, let's take a look at some of the volunteer opportunities available in general aviation and the requirements to fly these meaningful missions.

Varieties of Volunteering

When translating your passion for flying into compassion for a cause, it's important to align your skills as a pilot and your aircraft's capabilities with whatever volunteer work speaks to you. For example, if you're interested in doing medical transports, your plane must meet specific requirements to ensure patient safety and comfort. This might include having adequate seating for both the patient and an accompanying passenger (typically a caregiver such as a family member, doctor, or nurse). Disaster relief flying can be challenging, with high traffic and potentially difficult conditions (such as lack of food, water, and electricity at the destination) that pilots need to be prepared for.

If you're looking for volunteer opportunities, here are some options to consider:

Access to Medical Care
Volunteer pilots often transport patients to specialized medical facilities, especially for those who lack access to local care. This includes patients traveling for surgery, chemotherapy, dialysis, and other treatments.

> **When practicing general aviation generosity, it's crucial to prioritize safety and adhere to the regulations.**

Emergency Response
In the aftermath of natural disasters, general aviation pilots are often among the first to offer assistance. They can provide aerial assessment of damage, transport relief workers, deliver supplies, or help with evacuation efforts. It is vital to always work with an organized group and never self-deploy to provide assistance.

Delivering Precious Cargo
Pilots can assist with the transportation of blood and tissue; however, generally speaking, volunteers should not be engaged in time-critical operations without specialized training and

PALs SkyHope, part of ACA, helps remove the transportation barriers to health care for a young autistic girl traveling from Maine to Philadelphia with her mom and service dog for treatment for a rare illness.

PALs flight allows mother and baby to avoid eight-hour drive and overnight stay by flying them to and from treatments in Boston.

robust risk management efforts. Within the same category, but with a very different mission — many volunteer pilots help rescue animals from overcrowded or "kill" shelters, flying them to new homes or safer facilities.

Environmental/Educational Support
Pilots can aid with conservation efforts, such as aerial surveys of environmental damage, delivery of supplies for environmental projects, scientific studies/wildlife counts, and educational and introductory flights.

Civil Air Patrol
Civil Air Patrol (CAP) operates as the U.S. Air Force's civilian volunteer auxiliary, providing emergency services and disaster relief missions nationwide using its own airplanes and drones to support local, state, and federal authorities. Pilots also support youth aerospace education by providing orientation flights to CAP cadets, teachers, and ROTC students.

Regarding the Regs

So, you've made the decision to help others by becoming a volunteer pilot, and you're ready to take off on your first philanthropic flight. Not so fast. Just because you have good intentions doesn't give you a pass to disregard regulations or compromise safety. It's important to know the rules and fully understand what you can and can't do as a volunteer pilot conducting a public benefit flight.

A great place to start is by taking the Aircraft Owners and Pilots Association (AOPA) Air Safety Institute's 30-minute online course (bit.ly/3G2VXB6), "Public Benefit Flight: Balancing Safety and Compassion." The course helps explain the additional flight planning considerations required for public benefit flights, and completion earns one basic WINGS knowledge credit through FAASafety.gov.

Prohibition on Compensation
As the name suggests, public benefit flights are non-commercial and for the benefit of the public. In general, a pilot may donate their time and aircraft for public benefit. The pilot must pay for all expenses and aircraft operating costs. The pilot may not receive anything of value in compensation for the flight unless the organization they fly for has an FAA exemption. However, the pilot may be able to deduct direct operating expenses if flying for a qualified charitable organization.

Passenger-carrying Fundraising Flights
An exception to the prohibition on compensation is charitable and local event fundraising. Under 14 CFR section 91.146 (bit.ly/FAR91146), reimbursement of the operator of the aircraft is limited to that portion of the passenger payment for the flight that does not exceed the pro rata cost of owning, operating, and maintaining the aircraft for that flight, which may include fuel, oil, airport expenditures, and rental fees. Charitable fundraising flights are permitted under specific conditions. Some of these include:

- The flight is nonstop and begins and ends at the same airport and is conducted within a 25-statute-mile radius of that airport.
- Each flight is made during day VFR conditions.
- A private pilot acting as pilot in command has at least 500 hours of flight time.

Pilots must hold a private pilot certificate, be medically eligible to conduct the flight under 61.3(c), and be current

Charitable event means an event that raises funds for the benefit of a charitable organization recognized by the Department of the Treasury whose donors may deduct contributions under 26 U.S.C. section 170.

Community event means an event that raises funds for the benefit of any local or community cause that is not a charitable event or nonprofit event.

Nonprofit event means an event that raises funds for the benefit of a nonprofit organization recognized under state or federal law, as long as one of the organization's purposes is the promotion of aviation safety.

in accordance with 14 CFR sections 61.56 and 61.57 (bit.ly/FAR6156 and bit.ly/FAR6157). Events are limited to four charitable/nonprofit events per year, with no event lasting more than three consecutive days, and one community event per year.

Search and Location Operations

Another exception to the prohibition on compensation received for public benefit is found under 14 CFR section 61.113, where a private pilot may be reimbursed for aircraft operating expenses that directly relate to search and location operations. Compensation is limited to expenses involving only fuel, oil, airport expenditures, or rental fees, and the operation must be under the direction and control of a local, state, or federal agency, or an organization that conducts search and location operations.

Charitable Conduct

Most pilots pride themselves on being professional, and that's never more important than when providing volunteer services. Volunteer flying demands a high level of professionalism and responsibility, far beyond that of a leisurely personal flight, as you might be caring for your passengers' comfort and well-being in addition to their safety. Ultimately, volunteer pilots need to be able to show compassion towards their passengers without compromising safety.

Part of being professional is ensuring proper coordination before any public benefit flight. Disaster relief efforts over the last few years have highlighted the aviation community's eagerness to help, but unified communication and coordination with volunteers, government agencies, and response teams are vital to effectively helping the affected community. So, before you hop in your aircraft to lend your support, coordinate with an experienced charity flight program. Collaborating before you take off will ensure you're a help and not a hindrance.

Additionally, pressure and risk management should be carefully considered when conducting a public benefit flight. As rewarding as volunteer flying is, pilots may face

Veteran's Airlift Command provides free air transportation to wounded veterans like Travis Mills, founder of the Travis Mills Foundation, pictured here with Mark Hanson.

risks in the form of "perceived" pressure to complete a flight they have signed up for, believing it's imperative to do so for their passengers' sake. But while admirable, these are not medical emergencies or air ambulance flights, and volunteer pilots should always prioritize safety above reaching the planned destination.

So, push back on the pressure by relying on your preflight and personal minimums. Just as you evaluate the weather before a flight, pilots should make an honest assessment of their own capabilities — using the IMSAFE checklist to ensure they are in a safe and optimal mental and physical state before taking flight. Pilots should also consider their personal minimums, like experience/recency, to manage risk and inform their decision to fly. Incorporate the PAVE checklist (bit.ly/3qRBpjG (PDF)) as part of your comprehensive preflight planning. Note: Flying for organizations like CAP also has its own safety requirements due to the nature of volunteer flying.

Chances to Chip In

If you're just starting your search to be of service, the Air Care Alliance (ACA) is a good first stop. The ACA acts as an umbrella organization for public benefit flying groups and offers a directory of the groups on its website for patients, social workers, medical referral groups needing assistance, or pilots looking for volunteer opportunities. The website features an online automated referral system that connects volunteer pilots with the organizations that need assistance. After filling out an online form, all it takes is one click to send your information to any organization you wish to help. Check out the site yourself for opportunities to help at AirCareAlliance.org.

Another option, and one of the oldest organizations championing volunteer flights, is LightHawk, a nonprofit formed in 1979 to support environmental conservation efforts. From May 26 to July 14, it relaunched its second annual 50 in 50 Challenge, conducting 50 conservation flights across North America in 50 days. Using volunteer general aviation pilots and aircraft, the challenge supported efforts such as wildlife recovery, habitat protection, water quality monitoring, environmental research, and public education, delivering critical data and photos that inform decisions and accelerate progress on the ground. Using the challenge, LightHawk is connecting people, projects, and places to inspire action and drive real change across North America. You can learn more about the organization and how to volunteer at LightHawk.org.

If compassion flights are more your speed, Patient AirLift Services, or PALS, is a nonprofit that arranges free flights for medical patients requiring medical diagnosis, treatment, or follow-up who cannot afford or are unable to fly commercially. PALS assists military personnel and their families with free flights to aid in the recovery and rehabilitation process of wounded veterans. Last year, PALS celebrated its commitment to breaking down transportation barriers to essential medical treatment by serving more than 4,000 families and 33,000 flights. For additional information, including how to get involved, go to SkyHope.org.

And if four-legged friends tug on your heartstrings, Pilots N Paws is a nonprofit dedicated to rescuing, sheltering, and adopting animals. Volunteer pilots conduct rescue flights and provide overnight foster care or shelter. The Pilots N Paws website provides a discussion forum where pilots can easily search for volunteer opportunities and coordinate and schedule transports. Pilots have total control over who they reply to and the choice of days, times, number of animals, kinds of animals, distance, weather, etc. Learn more at PilotsNPaws.org.

Giving ≠ Giving Up Safety

When practicing general aviation generosity, it's crucial to prioritize safety and adhere to the regulations. If you decide to conduct public benefit flights, here are some key things to remember:

- Avoid overconfidence in your abilities. Even though it's for an admirable cause, pilots should be honest about their skill level, especially in challenging conditions or unfamiliar areas.
- Don't rush or skip your preflight inspection. Thorough preflight checks are crucial for identifying potential issues before they become hazards.
- Always use your checklists. They are essential tools for ensuring all critical steps are followed during all phases of flight.
- Don't let weather or terrain push you beyond your limits. Pilots should be prepared for potential weather delays and have contingency plans in place.
- Don't forget your passengers. Depending on your mission, you may be flying with passengers who are not used to general aviation. As a best practice supported by guidance (14 CFR section 91.107), be sure to brief passengers on preflight, cabin, and emergency procedures. Also, be sure to check in with them during the flight and address any discomfort they may be experiencing.
- Always adhere to the FAA's regulations regarding compensation and aircraft operation. Accepting reimbursement for flights that would be considered illegal charter flights is not permitted.
- Reference the Sharing Aircraft Operating Expenses AC for guidance on how a pilot may share flight expenses with passengers in a manner consistent with 14 CFR section 61.113(c).
- Avoid unnecessary flights, especially in disaster areas. This can strain resources and hinder relief efforts.
- Always practice effective communication. Clear and concise communication is vital for safety.
- Don't be afraid to ask questions and clarify anything you are unsure about. A safe pilot is a continuous learner.

I am not a pilot, so my acts of service are strictly limited to the ground, but giving back makes me feel like I'm soaring. By following these guidelines and prioritizing safety, volunteer pilots can soar (figuratively and literally), providing impactful flights while mitigating risks and complying with regulations.

Nicole Hartman is an *FAA Safety Briefing* associate editor and technical writer-editor in the FAA's Flight Standards Service.

LEARN MORE

14 CFR section 61.113, *Private pilot privileges and limitations: Pilot in command*
bit.ly/FAR61113

AC 61-142, *Sharing Aircraft Operating Expenses in Accordance with 14 CFR 61.113(c)*
bit.ly/AC61142

FAASTeam Course, ALC-697: *Air Charter Safety for CFIs and DPEs*
bit.ly/alc-697

FAASTeam Course, ALC-1093: *Cost Sharing, Time Building, and Posting on Social Media*
bit.ly/alc-1093

Civil Air Patrol
GoCivilAirPatrol.com/fly

Register for upcoming webinars: Volunteer Pilot - Safety Considerations and Scenario Review
bit.ly/45hWJnq

AN AVGAS TRANSITION FOR THE LAST FRONTIER

In February, a group of general aviation industry stakeholders from the Eliminate Aviation Gasoline Lead Emissions (EAGLE) initiative — representing manufacturers, aeronautical service providers, air carriers, and aircraft owners and pilots — visited Alaska to better understand the importance of piston-engine aircraft to remote communities and the intricacies of an unleaded fuel transition in such a vast state.

The EAGLE initiative brings together government and industry partners committed to finding a safe and reliable transition to lead-free aviation fuels for piston-engine aircraft without compromising the safety or economic health of the general aviation industry.

Alaska burns the fourth-largest quantity of 100LL by a single state with 8.5 million gallons consumed in 2024, while ranking first in 100LL usage per capita. The state has over 8,000 registered piston-engine aircraft with a wide array of engine types, including a significant commercial fleet that requires high-octane avgas.

Piston-engine aircraft are an essential lifeline to Alaska's communities as they provide passenger travel, air freight, and mail (which is essentially how most goods are transported), medical services, and other important missions to many remote areas throughout the state. Alaskan villages of all sizes are served by small aircraft on highly variable schedules, ranging from as infrequently as once a week to multiple flights per day, seven days a week.

To facilitate a better understanding of these dynamics, the Alaska Air Carriers Association (AACA) arranged a tour of the avgas distribution infrastructure in Bethel, as well as the remote outpost of St. Mary's on the Yukon Delta. Attendees learned first-hand the distinctive conditions fuel developers must consider as they make progress towards a high-octane unleaded solution. For example, piston-engine aircraft in Alaska provide essential services across vast spans of remote and unpopulated areas without infrastructure for alternate landings, ground services, or rescue — often under extreme weather conditions.

General aviation industry stakeholders from the EAGLE initiative visited Alaska to better understand the importance of piston-engine aircraft to remote communities.

The remoteness of Alaska and its communities presents unique infrastructure challenges that must be considered as part of a transition to unleaded fuel. A network of small airports across the state provides refueling services — most with extremely limited infrastructure and many with only a single tank for avgas. Delivering fuel is also a challenge. Most of the state's 100LL supply is delivered by barge from California. In meetings with EAGLE representatives, the distributor stressed that any fuel they deliver or sell must meet an ASTM specification standard — a critical factor for the entire aviation industry. (For more information on fuel specification standards, see: *Mar 2025: Clearing the Air: How Unleaded Aviation Fuel Is Gaining Approval - Part 3: The Role of Industry Consensus Standards in the Approval and Use of Unleaded Aviation Fuel* at flyeagle.org/updates)

A listening session in Anchorage later in the week brought EAGLE representatives together with over 25 Alaskan stakeholders, including air carriers, aircraft owners and pilots, airports, fuel distributors, and local governments. Operators expressed the critical need for transparency in testing and understanding of a fuel's durability and reliability, particularly in real-world experiences involving high-volume commercial operations, in extreme climates, and with limited infrastructure. Stakeholders also expressed concerns about costly engine or fuel system modifications that could adversely affect the cost of essentials, services, and necessary goods for Alaskan communities.

The Alaskan transition from leaded to unleaded avgas must be seamless, as any disruption to the fuel supply would have negative consequences. Additionally, Alaska's remoteness affects future business planning; investment decisions are made well in advance, often several years ahead, for planning in infrastructure, aircraft modifications, and fleet operations. While unleaded fuels are being developed, tested, and certified for use, Alaskans are relying on efforts like the EAGLE initiative to ensure the continued operation and safety of aviation, so critical services are not forgotten.

The time spent touring Alaskan infrastructure and engaging with aviation industry stakeholders left industry representatives with a clear understanding that any potentially viable unleaded replacement fuel will only be practical for use in Alaska once it has undergone comprehensive safety and performance testing — especially in conditions unique to Alaska's fleet and operating environment. The national transition must also account for potential safety risks, increased costs, and operational disruptions that could affect essential services.

The recent engagement in Alaska was enlightening for the EAGLE initiative, highlighting that beyond identifying a viable replacement fuel, many additional factors — unique to the state's operating environment — must be considered to ensure a safe, reliable, and economically viable transition to an unleaded avgas.

***Eliminate Aviation Gasoline Lead Emissions (EAGLE)* is a comprehensive government-industry initiative involving the aviation and petroleum industries, U.S. government stakeholders, and a wide range of other constituents and interested parties. Together, they are working toward the transition to lead-free aviation fuels for piston-engine aircraft by the end of 2030, without compromising the safety or economic health of the general aviation industry. To learn more, visit flyEAGLE.org.**

JAMES WILLIAMS

HANDBOOKS HELP YOU CHOOSE YOUR NEXT ADVENTURE

It's easy to think of your most recent airman certificate as a capping achievement, especially if you are a recreational flyer with no greater aspirations than an occasional $100 hamburger flight. However, staying proficient is a key factor in maintaining safe operations. Finding a new aviation adventure can be an excellent way to maintain proficiency and expand your world. But what should that next adventure be?

There are probably a million websites and YouTube videos that can help you make that decision, but one resource you may have overlooked is the FAA's handbook and manual library. This might seem like an odd choice at first glance, but the FAA has a surprisingly wide selection of handbooks that cover the basics of many different forms of flying.

There are a few key advantages to using these handbooks. First, the agency researched, wrote, and verified the handbooks, so they are entirely reliable. Second, building from the previous point, the FAA's focus is safety. There is no secondary motivation, sponsorship, or marketing deal to cloud any of the information. In fact, they're all free, online, and accessible at your convenience. So, where to start?

The First Hop

One of the best departure points is the *Airplane Flying Handbook* (AFH). The AFH covers everything from your first flight to higher-end transition training. Even if you've already earned your pilot certificate, it allows you to scout opportunities to transition to a new experience. For example, the AFH covers transitioning to multi-engine, complex, tailwheel, or light sport aircraft as well as turboprop or jet-powered aircraft.

Perusing these chapters can be a quick way to get a solid background on these topics and see if anything grabs your attention as a next possible adventure. Some will be simple challenges to improve your existing skills. Others could open new possibilities. Each adventure has the potential to make you a better pilot and give you something to work towards.

Another good starting point is the *Pilot's Handbook of Aeronautical Knowledge* (PHAK), which provides a broader range of basic aerodynamic principles relevant to both beginner and seasoned pilots.

And Now for Something Completely Different

The AFH and PHAK are departure points from which you will have many adventures to choose from in the rest of the library. Exploring different types of flying can be a good way to hone specific skills that can pay dividends across your piloting career. For example, glider flying is an excellent way to learn about energy management and aircraft control. The *Glider Flying Handbook* is the place to learn all there is about glider flying, from basic operations to regulatory requirements and everything in between.

The *Balloon Flying Handbook* provides a unique window into a slower-paced flying experience with some excellent benefits. Aeronauts must have excellent weather skills because their chosen aircraft require more environmental cooperation than others. All aircraft are at the mercy of their environment, but balloons require a greater focus on weather fundamentals to ensure a safe flight. They also allow a greater connection to the sky than most other forms of flying. And of course, being able to read and understand the weather better translates to any flying.

The options don't end there. Have you ever considered learning to fly a helicopter? There's a handbook for that, too. What about adding some new venues for future adventures? We also have a handbook that covers seaplanes and skiplanes. Who doesn't want to open up a new season or surface for extra flying?

Some of these new adventures may not appeal to you, and that's fine. The goal is to see what is out there and what you might want to investigate further. By no means will these handbooks teach you these new skills, but they can serve as an excellent jumping-off point. Having that next adventure to look forward to keeps you learning and growing along your aviation journey.

James Williams is an *FAA Safety Briefing* associate editor and photo editor. He is also a pilot and ground instructor.

LEARN MORE

FAA Aviation Handbooks and Manuals
bit.ly/faahandbooks

REBEKAH WATERS

THREE AIRSPACE MISTAKES DRONE PILOTS MAKE

Most people use Waze or Google Maps to check for traffic or road closures, even along familiar routes. It's gotten hard to imagine driving anywhere without this knowledge. Flying a drone without some basic airspace knowledge is kind of like driving without knowing the route or other factors that could impact your journey. Yet, drone pilots of every type continue to struggle with the topic of airspace. For example, questions about airspace remain the most consistently missed questions on the Part 107 knowledge test, and airspace violations are the most common enforcement actions taken against drone pilots. Here are three common airspace mistakes and information to help you avoid them.

1. Not Understanding Airspace

All airspace is regulated. FAA rules apply to both controlled and uncontrolled airspace. Controlled airspace is usually found around airports with air traffic control (ATC) towers and locations and altitudes where ATC directs traffic, ensuring separation and safety. Remember, regardless of where you fly, the FAA regulates the airspace from the ground up.

In the United States, airspace is divided into six classes. The five classes of airspace important to drone pilots are Class B, C, D, E, and G. The first four classes are controlled, meaning you'll need an airspace authorization before flying in them. Class G is uncontrolled airspace where you may generally fly your drone at or below 400 feet above ground level (AGL). Understanding airspace keeps you from accidentally flying where you shouldn't. Check out this FAA playlist on YouTube about understanding the National Airspace System (NAS) at bit.ly/3G6DC6g.

2. Not Using Airspace Tools

With an improved understanding of airspace, you should know where you can and can't fly. The sky, however, doesn't have "yield" or "do not enter" signs to make it obvious. Luckily, there are airspace tools that can help drone pilots with this.

B4UFLY (an FAA service) shows drone pilots where they can and can't fly or if an airspace authorization may be needed. FAA-approved companies provide this service through desktop and mobile apps. These apps provide situational awareness and links to other FAA drone resources. (bit.ly/b4ufly)

FAA Sectional Charts show airport locations and frequencies, airspace boundaries, and other navigational information. If you're planning to fly under Part 107, you'll need to know how to read these charts. (bit.ly/45GcSUv)

UAS Facility Maps are a must-have when planning a flight in controlled airspace. Before submitting your airspace authorization request, consult these maps to determine locations and maximum altitudes where operations can be approved quickly. Remember, you'll still need an airspace authorization, even if flying below a maximum altitude. (bit.ly/3FULurx)

3. Not Applying for Airspace Authorizations

Drone pilots planning to fly in controlled airspace must get authorization from the FAA. There are two ways to apply for an airspace authorization: the FAA's Low Altitude Authorization and Notification Capability (LAANC), which can be found in any B4UFLY app, and through the FAADroneZone. In LAANC-enabled areas, applications can be processed in near-real-time. Some applications may take slightly longer to process, but LAANC is the fastest way to receive airspace authorizations. The FAADroneZone provides authorizations for airports that are not LAANC-enabled, but requests should be submitted at least 60 days before your proposed flight. To ensure faster processing, only apply for an authorization at or below maximum altitudes on the UAS Facility Maps. Check out "The Fast Pass for Drones," *FAA Safety Briefing*, May/Jun 2025 for more information about LAANC and Drone Zone (bit.ly/45BIWsJ).

If you're flying outdoors, no matter how low or far you are from a city or an airport, you must understand and comply with all FAA regulations. Understanding airspace and how to operate safely in it is the foundation of all safe drone flights.

LEARN MORE

Airspace 101 — Rules of the Sky
bit.ly/Airspace101

Part 107 Airspace Authorizations
bit.ly/44xJFKq

UAS Data Exchange (LAANC)
bit.ly/UASLAANC

Airports Participating in LAANC
bit.ly/LAANCairports

Video: How to Use the Unmanned Aircraft Systems Facilities Maps
bit.ly/3TLfqJC

REBEKAH WATERS

THE 411 ON FORM 337

There are plenty of reasons to pursue a career in aircraft maintenance. Maybe you have a knack for fixing things. Maybe you enjoy working with your hands. Maybe you want to play an important role in flight safety. Whatever it is, I bet it isn't a love of paperwork! Regardless, paperwork, in the form of maintenance records, is important to safety and is a requirement of the job. Proper documentation also helps ensure each aircraft you work on stays airworthy. Undocumented repairs and alterations could lead to conflicts in the aircraft that create dangerous situations for pilots and passengers. This is especially true when you perform a major repair or alteration. That's why the FAA created Form 337 to ensure standard and efficient documentation. Let's look at what it is and when to use it.

When you perform or supervise any major repair or alteration, you must fill out Form 337. This form serves three main purposes. First, it provides aircraft owners and operators with a record of major repairs and major alterations, indicating the details and approvals. Secondly, it provides the FAA with a copy for inclusion in the aircraft records at the FAA's Aircraft Registration Branch. Finally, it documents and records that you conducted a compatibility assessment in accordance with the Form 337 NOTICE, which states:

> *Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.*

This notice is included for a good reason — if you sign off on the work, you are responsible.

An important part of using this form is knowing when to use it. Form 337 must be used when you perform or supervise any major repairs or alterations. But what is considered a major repair or alteration? 14 CFR part 1 defines a major alteration as an alteration not listed in the aircraft, engine, or propeller specifications that might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness, or is not done according to accepted practices or cannot be done by elementary operations. It defines a major repair as a repair that, if improperly done, might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness, or that is not done according to accepted practices or cannot be done by elementary operations.

Whether you're documenting a major repair or a major alteration, it is important to make sure you enter a clear, concise, and legible statement that describes the work you completed. Keep in mind, the description should be sufficiently detailed so that a person unfamiliar with the work can still understand what was done, and what methods and procedures you used to do it. If required to adequately explain the location and details of the repair or alteration, you can include diagrams and drawings. Before signing off on Form 337 and approving the aircraft for return to service, it is your responsibility to ensure that all the work described in item 8 on the

form matches approved data and that all the information presented on the form is complete.

Remember, you must complete the form in duplicate. Give one copy to the owner or operator and send one to the FAA Aircraft Registration Branch, P.O. Box 25504, Oklahoma City, OK 73125. Not documenting major repairs and alterations is more than just a violation. It's a breach of both safety and trust that can have serious consequences. Form 337 isn't just paperwork — it's a key part of aviation safety!

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LEARN MORE

FAA Order 8300.16A CHG 1, *Major Repair and Alteration Data Approval*
bit.ly/830016A

AC 43.9-1G, *Instructions for Completion of FAA Form 337*
bit.ly/AC4391G

AC 43-210A, *Standardized Procedures for Obtaining Approval of Data Used in Performance of Major Repairs and Major Alterations*
bit.ly/AC43210A

LEAH MURPHY

A SMOOTH AND SAFE TRANSITION

Helicopter pilots often transition between aircraft makes and models throughout their careers. Rotorcraft can vary dramatically between models and across manufacturers. Differences in rotor systems, flight controls, engine management, avionics, and automation can affect how a pilot handles both routine and non-routine situations.

Helicopter accident data reveals a trend that pilots with limited experience in a specific airframe are more prone to accidents. A lack of familiarity with the aircraft or the installed equipment is a key contributing factor.

To help prevent similar accidents from occurring, the U.S. Helicopter Safety Team (USHST) developed a training syllabus guide — a helicopter safety enhancement — to assist operators in providing effective aircraft transition training. The guide is geared towards private owners and operators who might not have the same educational resources as commercial operators and flight schools. It provides guidelines for the considerations and implementation of a training event where a pilot should receive training from a qualified flight instructor anytime there are operational differences between the aircraft they are accustomed to flying and any new aircraft that they will be flying. This is applicable to both differences (variations of the same type certificate) and transition (different type certificate) training.

Transition and differences training should begin with a thorough ground school phase. This includes reviewing aircraft systems, limitations, performance charts, weight and balance, emergency procedures, and any new avionics or autopilot features. The goal is not to solely memorize procedures but to understand how and why the aircraft responds in specific ways.

Flight training should be conducted by a qualified flight instructor who has recent experience in the make/model. Hands-on practice should include startup/shutdown procedures, inflight maneuvers, and emergency procedures. Equally important is time spent developing new habits, learning where switches are located, how information is displayed, and how the aircraft behaves in different configurations.

Where available, flight simulators offer the opportunity to practice high-risk scenarios, such as engine fires, hydraulic failure, or inadvertent instrument meteorological condition (IMC) encounters, without real-world consequences. This type of training allows pilots to explore the limits of the aircraft's envelope and build confidence in a safe and controlled environment.

In 2022, I had the opportunity to attend FlightSafety International's transition training for the Bell 407. Prior to this course, my professional experience was entirely in piston aircraft, primarily Robinson helicopters. I learned to fly in both the R22 and R44, so my exposure to those aircraft took place over the course of years of instruction, rather than a five-day course. It was incredibly daunting to approach an aircraft so different and with what felt like a short amount of time. The most humbling part of the course was realizing how much I did not know. Fortunately, my instructor knew the questions I should be asking and was proactive in identifying areas of weakness I had not considered.

All flight instructors should consider how their students might not recognize something that is unfamiliar to them. It will certainly help with making a smooth, successful, and safe transition from one helicopter to another.

Leah Murphy is a dual-rated flight instructor and helicopter air ambulance pilot. She is also an FAA Safety Team Representative in Cleveland, Ohio.

LEARN MORE

USHST Helicopter Safety Enhancements
ushst.org/h-se-details

Helicopter Make/Model Transition and Differences Training Syllabus
bit.ly/heli116 (PDF download)

Check out our GA Safety Facebook page at **Facebook.com/groups/GASafety.**

If you're not a member, we encourage you to join the group of nearly 17,000 participants in the GA community who share safety principles and best practices, participate in positive and safe engagement with the FAA Safety Team (FAASTeam), and post relevant GA content that makes the National Airspace System safer.

Control Cable Commendations

The FAA recently posted a video (bit.ly/FAAcables) discussing the risk posed by damaged flight control cables due to chaffing, misrouting, using unapproved parts, or improper inspection procedures. These failures directly affect the pilot's ability to control various flight surfaces, such as ailerons, elevators, and rudders. Viewers expressed their appreciation for the maintenance video and shared some of their own experiences. Be sure to check out the video for yourself to understand the potential causes, signs, and prevention strategies of control cable issues.

As an A&P apprentice, I appreciate this video. I'm looking at cables daily. I've never found a damaged cable yet, but loose cables, yes.
— @hondaxl250k0

Paint stripper will eat up a galvanized cable within a couple years. I had 1953 Cessna 180 I was rebuilding and got stripper on a cable, wrapped it in a 6" circle and nailed the baggie I put it in to the wall. Within 2 years it was fraying bad! I was making new cables anyway so I didn't care about the old cable. But I've seen so many cables that people got stripper on when repainting a metal plane. Pay attention to it!
— @mikeskupniewitz8057

This reminds me of inspecting several Cessna 310/320 aircraft 20 years ago. They were found to have loose aileron cables! You could move the aileron itself without moving the wheel. The turnbuckles were lying on the fuselage in the cabin. Since you had to remove the seats and floor to access the cables, it was obvious why they were loose!!
— @larrythomas3460

My first flight instructor and a student pilot both lost their lives because of a corroded aileron cable. Let's make sure that proper action is taken when necessary to ensure that it doesn't happen again.
*— @jamesthepilot_*

Differentiating Drone Operations

I recently read the article "The Fast Pass for Drones" in the May/Jun 2025 issue of the magazine (bit.ly/45BIWsJ). *When and where are authorizations and waivers used and what is the biggest/major difference between the two? How should I use each of them?*
—Dirkhopstein

Thanks for reading, and great question! Part 107 authorizations are used to grant drone pilots permission to fly in controlled airspace for a certain period, whereas waivers allow certain operations outside of the limitations of Part 107. Think about it this way: if it's about where you fly, you might need an authorization. If it's about how you want to fly, you might need a waiver.

The federal government uses waivers and authorizations to provide flexibility and adaptability in regulatory enforcement. Here's the regulatory view of waivers and authorizations:

- If the rule says something such as, "A person operating a civil small unmanned aircraft system for the purpose of flight must…," and you have an acceptable way to comply, do that. In other cases:
  - **Authorizations:** If the rule says, "unless that person has prior authorization," then that enables the FAA to create streamlined "authorization" processes, such as LAANC, that allow you to otherwise comply with the rule. (authorization)
  - **Waivers:** If the rule is listed as a regulation that is also subject to waiver, then for more complex or unique circumstances, the FAA can issue a certificate of waiver with special provisions that must be complied with as an alternative to the rule(s). This is how air shows or drone light shows get approved.

For more information about waivers, visit bit.ly/107waiver, and for more information about authorizations and LAANC, visit bit.ly/107auth.

For more stories and news, check out our blog "Cleared for Takeoff" at medium.com/FAA.

Let us hear from you! Send your comments, suggestions, and questions to SafetyBriefing@faa.gov. You can also reach us on X (formerly known as Twitter) @FAASafetyBrief.

We may edit letters for style and/or length. Due to our publishing schedule, responses may not appear for several issues. While we do not print anonymous letters, we will withhold names or send personal replies upon request. If you have a concern with an immediate FAA operational issue, contact your local Flight Standards Office or air traffic facility.

A LITTLE BIT OF EVERYTHING

If you're like many nascent or prospective flyers (myself included at the time), you're likely to be drawn to the glamor and excitement that a professional airline pilot career offers. Many an aviator has caught the airline flying "bug" at an early age, watching in awe, a 400-ton aluminum giant depart as gracefully as a swan. Or maybe it was during one of your very first commercial flights while catching a glimpse of a uniformed crew member calmly attending to a maddening array of buttons and switches on the flight deck. It's a natural fascination.

I, for one, am grateful for having such inspirational aviation experiences early in life that would later steer both my education and career choices. And while there is a lot to be said for our compatriots flying heavy metal to destinations far and wide, let's not forget there are literally hundreds of other flying career options out there, no less important, and certainly no less exciting — and maybe a few you never knew existed. Let's take a brief look at some of the many general aviation (GA) flying career options out there.

Aviation Education

The role of a certificated flight instructor (CFI) is undoubtedly the initial go-to career path for aspiring aviators, no matter what their aviation end game may be. In addition to providing a sound foundation of aviation knowledge and airmanship, being a CFI also provides the opportunity to sharpen your people skills and gain experience in a variety of aircraft. Read this article (bit.ly/4lzpW2U) for some additional insight on a flight instructor career.

While some may regard teaching merely as an inescapable means of gaining the hours needed to hop to the next flying job, others regard this noble profession as a rewarding and personally satisfying career. At some larger flying schools, like many university flight programs, CFIs have opportunities for advancement, including roles as chief flight instructor or director of flight operations. Another appealing aspect of being a CFI is the flexibility to work full- or part-time and sometimes just on the weekends. Whatever your motivation is, flight instructing is truly a rewarding craft that can help mold safe practices and decision-making skills for generations of future pilots.

Flying for Hire

If you don't see an instructional career in your future, there are a slew of other commercial flying activities that can help you pay the bills. Examples include aerial photography, surveying, banner towing, glider towing, skydiving operations, aerial fish spotting, and sightseeing tours. Agricultural aviation is another commercial endeavor — also covered in this issue's feature "Harvesting Safety in the Skies" — that plays a vital role in protecting and aiding the production of food, fiber, and biofuel. Agricultural pilots must have a commercial certificate to work for hire and meet the requirements of 14 CFR part 137, which allows for more risky, low-level operations. If being a flying crop doctor piques your interest, the National Agricultural Aviation Association (NAAA) offers several great resources for aspiring ag pilots (agaviation.org/career).

"Chartering" Your Next Career

Another avenue for pilot careers is corporate or charter flying. This type of "on-demand" flying requires some schedule flexibility and can involve short hops or multi-day layovers. The aircraft used could vary from a light single-engine plane to a large business or commercial jet. Depending on how the fleet's ownership is set up, you could find yourself flying under parts 91 (and section 91k), 125, or 135 regulations. See faa.gov/charter for more resources.

Just Because …

Although volunteer pilot operations are typically unpaid, there are numerous non-monetary benefits you can gain through flying for a good cause. In addition to providing direct value to the organization you're flying for, volunteer flying can also help sharpen your skills, expand your aeronautical experience, and enhance the public's perception of general aviation. Examples of service-oriented flying include disaster relief, Civil Air Patrol search and rescue, missionary support, animal rescue, and transporting medical patients. For more on volunteer flying, including many of the associated safety and regulatory concerns, see this issue's feature, "Philanthropic Flying."

It's clear to see that the availability and vast diversity of GA operations here in the U.S. provide a lot to think about when choosing a flying career. So, whether you're just getting started in aviation, or have been flying for years and are considering a change, take a look at what the wide world of GA offers.

Tom Hoffmann is the editor of *FAA Safety Briefing*. He is a commercial pilot and holds an A&P certificate.

PAUL CIANCIOLO

CHARLES GRABILL

Aviation Safety Inspector, FAA's Authorized and Certificated Operations Section

Growing up on the family farm in Iowa, Charles Grabill didn't have much exposure to aviation. It wasn't until community college, where he studied machine tool technology and worked as a farmhand, that he became hooked on flying. The spark was when his boss and a family member bought a 1975 Piper *Warrior* together.

"That was my first time at the controls of an aircraft," Charles recalls. "I began flight training under part 61, initially thinking flying would be a hobby. As I progressed through training, I realized I wanted to pursue aviation as a career."

After completing his associate degree in machine tool technology, he moved to Grand Forks and earned a bachelor's degree in commercial aviation from the University of North Dakota in 2012. During and after academics, Charles provided instruction at several flight schools. He also moved around where his wife's helicopter flying took her. Yes, she's a pilot too.

"Following a serious farm accident involving my father, I stepped away from aviation temporarily to help with the family farm operations. But my passion for both agriculture and aviation never waned. I hoped to become an aerial applicator back in the Midwest," he notes.

In 2018, Charles took up loading aircraft for a part 137 agricultural operation back in Iowa. His goal was to eventually pilot an agricultural aircraft. This is also where his wife started work as an aviation safety inspector at the local Flight Standards District Office.

"My wife became more familiar with the safety challenges, accident rates, and accident investigations in ag aviation, and her concerns about the associated risks ultimately led me to join the FAA in 2019," he explains. "This also provided more stability and time for family life with our six children."

Charles worked at the Des Moines FSDO until recently transitioning to the FAA Flight Standards Service's Authorized and Certificated Operations Section. The section is responsible for many aspects of general aviation policy, including part 91 business and fractional ownership operations, restricted category aircraft operations, investigation process, runway safety initiatives, part 133 rotorcraft external load flights, and part 137 agricultural aircraft operations.

The section recently helped to make the process for using drones in agricultural operations more efficient. Because of this milestone achievement, drone pilots applying for a part 137 certificate or exemption can now email their documentation to UAS137Certificates@faa.gov instead of applying at their local FSDO.

As a subject matter expert in part 137 ag ops policy development, Charles isn't simply "flying a desk." Instead, he is always asking questions to learn, gain perspective, and help others in the process. For him, that curiosity is more than just a learning style; it's a personal value.

Charles also notes that, unlike commercial air carriers, general aviation often lacks the same level of regulatory oversight, which can lead to gaps in pilot training and proficiency. Many GA pilots meet only the minimum legal requirements for currency, but safety demands more. His advice: "Avoid complacency by flying with a flight instructor more often and asking questions. Engage in continuing education. And always be thorough, consistently using checklists."

Don't be afraid to step outside your comfort zone to ask a question.

Paul Cianciolo is an associate editor and the social media lead for *FAA Safety Briefing*. He is a U.S. Air Force veteran and an auxiliary airman with Civil Air Patrol.

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"Lifelong learning is the eye of a strong safety culture for our Hurricane Hunters and our many other missions."

— Ensign Mikasha Dye
Aviation Safety Officer
NOAA Aircraft Operations Center
omao.noaa.gov