July/August 2023

FLYING Companions



Federal Aviation Administration The Art of Airplane Introductions

Bring Your "A" Game

17 Why Gravity is Undefeated – Understanding Weight & Balance



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ABOUT THIS ISSUE ...



The July/August 2023 issue of *FAA Safety Briefing* focuses on flying companions. Building on our previous companion-based editions, this issue is designed for the friends and loved ones who join us in the air or might have an interest in doing so. Feature articles help regular or prospective passengers gain a better understanding of general aviation and offer tips, techniques, and resources to take a more active role during flight.

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FAA) Safety

The FAA Safety Policy Voice of Non-commercial General Aviation



The Art of Airplane Introductions How to Make a Good First Impression with a Proper Preflight Inspection









Soar as a Safety Superhero Use Your Superpowers to Support the FAA Safety Team

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COME FLY WITH ME

You may recall the tale of a Florida man, Darren Harrison, who last year made a rather unexpected transition from passenger to pilot aboard a Cessna 208. Darren was returning from a fishing trip in the Bahamas when his pilot began to feel ill, lost consciousness, and slumped over the controls. Despite a lack of flying experience, Darren sprang into action when the single-engine aircraft went into a nosedive and turned sharply over the Florida coast. He first steadied the aircraft and then radioed Fort Pierce tower at Treasure Coast International Airport to let them know the situation ... and that he was *not* a pilot.

The air traffic controllers did an amazing job helping Darren maintain control and navigate the airplane toward Palm Beach International Airport. Assisted by a printout of the Cessna 208's flight deck, controllers



Air Traffic Manager Ryan Warren (left) and controller Robert Morgan (center) show Darren Harrison (far right) printouts of the Cessna 208 flight deck they used to help him land safely after an in-flight emergency.

gave Darren clear and short directions on power and flap settings to get correctly configured for a landing. They talked him through the approach with Darren making a successful and safe touchdown. You can read more about this amazing feat on the FAA's blog (bit.ly/424oCeY) and *The Air Up There* podcast (bit.ly/3nu3QGn).

While situations like this are rare, they reinforce the importance for pilots and their non-flying passengers to discuss potential "what if" scenarios so they can be prepared for an abnormal or emergency event. With that in mind, we're pleased to present an updated version of our cockpit companion-themed issue of FAA Safety Briefing magazine designed for the family members and friends who share the skies with us in the wonderful world of GA flying. We hope the articles here provide a better understanding of GA, answer some of the pressing questions on the minds of our non-flying friends, and provide some encouragement to those seeking to take a more active role during flight - or better yet - embark on their own aviation pursuits!

In the "Bring Your 'A' Game" feature, we cover every pilot's wellknown order of operations during flight (aviate, navigate, communicate), with emphasis on what it actually means to "aviate." In "PilotSpeak," we note that communication (as evidenced with Darren's flight) is the appropriate second priority for a "pinch-hitting" pilot, and we do our best to demystify aviation jargon. In "The Art of Airplane Introductions," we bring you along for an up-close look at an airplane during a typical preflight inspection, the perfect time and place to discuss

the basic parts and components of an aircraft and how they all work together. Other articles cover the importance of weight and balance (why four seats don't always equal four passengers) and why pilots interpret the weather and forecasts differently than a non-aviator might expect. Finally, we make pilots aware of a critical safety superhero at their disposal, the FAA Safety Team (FAASTeam), and stress how getting involved — within a variety of capacities - can help you pay-itforward in safety dividends to your fellow aviators.

There's potential for a remarkable level of symbiosis in the flight deck when pilots and flying companions more clearly understand their roles and responsibilities. Pilots benefit by having a more well-informed passenger while gaining a better sense of their passenger's needs and comfort levels. Passengers benefit by having clearer expectations of the trip (including what might delay or cancel the flight), a better understanding of the overall rules and procedures to expect (e.g., sterile cockpit), and learning some basic skills they can use to ensure a safe outcome should a situation or need arise.

We hope that flying companions will eagerly read this passenger-focused issue and take it to heart. We are also confident that pilots will find many useful tips and "talking points" to answer or even anticipate their flying companion's questions.

We look forward to your feedback and any passenger-care tips you care to share with us may be published in a future issue.

AVIATION NEWS ROUNDUP

2023 FAA Drone Symposium and Advanced Air Mobility Summit

The FAA and the Association for Uncrewed Vehicle Systems International (AUVSI) will co-host the 8th Annual FAA Drone Symposium and the first-ever Advanced Air Mobility Summit this summer.

The two events, from Aug. 1-3 at the Baltimore Convention Center in Maryland, will bring together representatives from the FAA, other government agencies, international aviation experts, industry leaders, and academia. The presenters and panelists will discuss the latest information and advancements related to the diverse uses of drones and the safe integration of Advanced Air Mobility (AAM) aircraft, like air taxis, into the national airspace system.

You can register for these events at <u>faadronesymposium.org</u> and <u>aamsummit.org</u>.





Future site locations of new sustainable control tower designs.

Sustainable Design for New Control Towers at Airports

The FAA has selected a sustainable design for new air traffic control towers that will be used primarily at municipal and smaller airports. The design by Practice for Architecture and Urbanism (PAU) of New York meets key sustainability requirements and can adjust the tower height to meet each airport's traffic and sightline requirements, while also reducing construction and operational costs.

The design incorporates key sustainability elements, including all-electric building systems; materials, and products free from chemicals known to pose health risks; thermally efficient facades; high-recycled steel and metal products; renewable mass timber when usable; and ground-source heating and cooling in some environments.

The initial set of 31 control towers at candidate airports would replace towers that are functioning beyond their intended design life. These towers will range in height from 60 to 119 feet. The FAA has set aside more than \$500 million from the Bipartisan Infrastructure Law to support site evaluation, preparation, and early construction activities.

#FLYSAFE GA SAFETY ENHANCEMENT TOPICS



JULY

Fly the Aircraft First — The importance of maintaining control of the aircraft at all times.



Please visit <u>bit.ly/GAFactSheets</u> for more information on these and other topics.

Personal Weather Minimums and Weather Cameras —

AUGUST

A review of best practices on obtaining and using weather information for your flight. The first groundbreaking could begin in 2024.

For more information about the FAA's sustainability efforts, go to <u>faa.gov/sustainability</u>.

New VFR Charting Changes for Wind Turbines Take Effect in August

Effective on or around August 10, 2023, the FAA's Aeronautical Information Services (AIS) Visual Charting Team will begin implementing charting enhancements to Sectional Aeronautical, VFR Terminal Area Charts, and Helicopter Route Charts to more clearly depict the location of wind turbine farms. This change will also be published in the Aeronautical Chart User's Guide at <u>bit.ly/FAAChartGuide</u>.

The VFR charting changes will:

- Replace the current dashed line border with a zipper border (aviation blue) for easier identification of the boundaries of the wind turbine farm.
- 2. Add 45-degree (diagonal) cross-hatching lines within all wind turbine farms for increased conspicuity.
- 3. Revise the masked elevation box to include a white background and include the mean sea level (MSL) elevation figure of the highest obstruction (wind turbine rotating blade tip at the 12 o'clock position) within the wind turbine farm.

Pilots are reminded that wind turbine blades and/or blade tips are not lighted. Wind turbine obstruction lights are located on top of the nacelle (generator) at the hub of wind turbines, which in some cases can be 200-300 feet below the rotating blade tips. In accordance with 14 CFR section 91.119, pilots must maintain the appropriate separation (laterally and/or vertically) from



wind turbines. Additionally, pilots are reminded to check for other obstacles, such as antenna towers, that may be taller than the turbines located within (or adjacent to) the wind turbine farm. Finally, pilots are reminded of the basic VFR weather minimums contained in 14 CFR section 91.155 and that some wind turbines may significantly exceed 499 feet above ground level (AGL) and extend into Class E airspace (700 feet AGL floor and greater).



2023 AirVenture Procedures

The FAA published the 32-page EAA AirVenture Oshkosh 2023 Notice (formerly known as the AirVenture NOTAM). Changes from previous years include a change in the ultralight pattern at Wittman Regional Airport; guidance regarding aircraft parking areas, including North 40/South 40 designation; elimination of the Fond du Lac diversion procedure; and the start time of the daily airshows. Go to <u>bit.</u> <u>lyOSHnotice</u> to download the booklet.

NTSB Safety Alert: Mechanics, The "B" Nut Can Be Deadly!

A "B-nut" is a common term for a nut that provides the clamping force to

create a reliable seal in lines (fuel, oil, or air, and lines on a reciprocating or turbine engine) installed on an aircraft. If a B-nut is improperly secured (either torqued too much or insufficiently), a loss of engine power or an engine fire could result.

Improperly-torqued B-nuts could cause fuel, oil, or air leaks depending on where the B-nuts are installed; over-torqued B-nuts could also result in deformation and damage to a line. Fuel or oil that leaks onto a hot engine could result in a fire.

B-nuts are exposed to vibration and thermal expansion and contraction during aircraft operations; therefore, maintenance personnel must ensure that the B-nuts are properly secured.

Download NTSB Safety Alert SA-086 at <u>bit.ly/B-nut</u>.

Weather Cameras in Maine Online

The FAA's Weather Camera Program has expanded to the northeast coast of the United States for the first time. The FAA is hosting 18 camera sites in Maine on its weather camera site, with more locations to be added through 2023. The cameras provide pilots with better weather information, especially in terrain with scarce radar coverage. LifeFlight of Maine, which provides medical evacuation services to the state, operates the camera sites.

The FAA's Weather Camera Program has been a tremendous success during the past decade. It began in Alaska and has expanded to Hawaii and select sites within the contiguous United States. Among new states discussing weather cameras with the FAA, are California, Idaho, Massachusetts, Minnesota, and North Dakota. On the tech side, the program is exploring adding a 360-degree camera to each of its sites to enhance safety margins for pilots further.

Go to <u>weathercams.faa.gov</u> to view all cameras in the program.



FAA SAFETY CENTER FORUMS July 24 – 29, 2023

	08:30 - 09:45	10:00 – 11:30	Noon – 13:30	14:00 – 15:30	16:00 – 17:15	
MONDAY JULY 24	Flying Blind Bruce Webb Dir. Educ. Airbus WINGS: BK2	Cross Border Operations Kim Miller & Jacques Astre <i>WINGS:</i> BK3	Adverse WX: Perception vs Reality Dr. Ian Johnson & Danny Sims FAA WINGS: BK1	No Session	How to Co-Exist with Weather Jeff Arnold Leidos FS WINGS: BK1	Join us for daily forums at the FAA Safety Center
TUESDAY JULY 25	No Session	Check Ride Threat and Error Management Sara Rovner DPE WINGS: AK1	Hope is Not a Strategyy Bruce Webb Dir. Educ. Airbus WINGS: AK1	Professionalism: Small Changes Can Make a Big Impact Dr. "Kat" Wilson NTSB <i>WINGS</i> : BK1	Colorado Mountain Flying Bill Standerfer Prof. of Aviation WINGS: BK3	Seaplane Base Forums? Use the QR Code below
WEDNESDAY JULY 26	E-Z WINGS Ron Timmermans Master CFI <i>WINGS:</i> NA	Benefits of Home- Based Simulators Gary Schank Retired Airline Cpt. WINGS: BK3	Navigation During a GPS Outage Dr. Vince Massimini Joann Ford, & Rick Niles FAA WINGS: BK1	Straight Talk About Aviation Safety John & Martha King King Schools WINGS: BK3	No Session	CAMI will be our late afternoon star tomorrow!
THURSDAY JULY 27	General Aviation Awards CFI of the Year Av Tech of the Year FAASTeam Rep of the Year	Aviation Safety A Life Lesson Greg Feith Retired NTSB WINGS: AK2	*No Session* Meet the FAA Administrator @ Theater in the Woods *No Session*	Aerospace Medicine and You Dr. Brett Wyrick FAA WINGS: BK3	Airline Procedures for the GA Pilot Gary Schank Retired Airline Cpt. <i>WINGS:</i> BK1	GA Awards and Meet the FAA today!
FRIDAY JULY 28	CFIs in the Accident World Greg Feith, Retired NTSB WINGS: AK2	No Session	How to Talk to ATC Heather McNevin FAA/ATO <i>WINGS:</i> BK3	Loss of Control Based on Illusions Dr. Michael Stretanski AME WINGS: BK2	Experimental Aircraft MX for the A&P Joseph Norris DAR AMT: 1	CFI Education most of the day today!
SATURDAY JULY 29	Secrets Only Pilots Know About Airports Tom Slater Airport Engineer WINGS: BK3	Common Cause of Fatal Accidents Ed Verville DPE WINGS: BK2	Avoiding Turbulence Tammy Flowe Gary Pokodner FAA <i>WINGS:</i> BK1	No Session	Getting Started with Basic Med Dr. Michael Stretanski AME WINGS: BK3	Seaplane Base Forums Monday thru Friday ONLY!



Access FAASTeam Safety Brochures here: bit.ly/FAAST_pamphlets FAA Forums Open Daily at 8:30 a.m. unless otherwise noted. Schedule is subject to change. For updates, check the QR code to the right or go to AirVenture Forums: bit.ly/FAA_Forums



EASING BARRIERS TO GETTING HELP: MENTAL HEALTH UPDATE

Mental health is a topic that seems to be on everyone's mind (pun intended) and, therefore timely. I want to update you on recent changes.

As you know, our concern is safety, both for the individual pilot and for the general public. A missed or unreported diagnosis can lead to a catastrophe such as Germanwings Flight 9525, where the co-pilot deliberately crashed the airplane, or tragedy such as a solo suicide. The purpose of our policies is to prevent accidents like these and mishaps due to performance impairment. Regardless of the severity of a person's mental health condition, we are concerned about cognitive and vigilance impairment as well as sedation that may result from either the condition or possible treatments. We are cognizant that a review of these conditions, although necessary for safety, burdens the applicant and delays certification.

For several years, we have noticed a significant increase in the percentage of airmen medical applicants who report a mental health condition including substance abuse, depression, anxiety, and attention deficit hyperactivity disorder (ADHD). In fact, we estimate more than 30% of general aviation applicants reviewed for a special issuance have a mental health condition as one of their diagnoses. Although some of this is due to the recent pandemic, for decades there has also been an increase in medication use for depression, anxiety, and ADHD. Post-traumatic stress disorder (PTSD) is also diagnosed more frequently now than in decades past. Many more individuals with these conditions are now requesting medical certification. Altogether, our workload has greatly

increased and a backlog developed. We have taken steps to address this.

First, we have increased the number of psychiatrists from one to four over the past four years. We also have three psychologists on staff, two of whom are trained as neuro-psychologists. Second, we have prepared decision tools for the AMEs (aviation medical examiners) to use for situational depression and PTSD. If asymptomatic and off treatment (five and two years respectively), the AME generally can issue a medical certificate. This is outlined in the AME Guide and is a change from the previous requirement for all cases to be reviewed by FAA medical staff before certification. We are evaluating other conditions for similar decision tools.

I would also like to report on several additional initiatives. During the pandemic, in-person evaluations became difficult and we allowed increased use of virtual appointments. While this certainly made it easier for the individual pilot, a virtual evaluation is inferior to in-person. We are evaluating how well these worked over the past few years to determine the ideal balance going forward. In the meantime, we are continuing the virtual evaluation policy adopted during the COVID-19 public health emergency.

Last fall we reviewed the records of more than 400 pilots on the SSRI (selective serotonin reuptake inhibitor) program. We determined that for the vast majority of pilots, routine follow up cognitive testing did not identify a safety concern. Accordingly, we have discontinued this requirement for 97% of the applicants for recertification. Finally, we recently approved extended release bupropion (Wellbutrin©) SR and XL formulations, for use in pilots



under the special issuance program. (This is also approved for air traffic controllers.) We are also looking at other anti-depressants for inclusion, but are carefully scrutinizing the side effect profile.

We introduced the substance abuse/ dependence programs decades ago and began allowing the use of SSRIs in 2010. Both programs have been successful. Recent data shows that 574 pilots were flying with a Special Issuance (SI) for a SSRI and, in 2022, 2,213 pilots had a SI for substance abuse/dependence. These are pilots that would have been grounded, often permanently, at one time. While many pilots with a mental health diagnosis face an initial disqualification (around 20%), most will be certificated once stable and satisfactorily controlled with an acceptable medication. Note also that while some mental health diagnoses, such as schizophrenia, may not be compatible with flight safety, most are.

Recently, we received an inquiry asking for our policy letter regarding the 10-year wait after a suicide attempt. There is no such policy. We do not know if anyone delayed a certification request due to this, but even one unnecessary delay is too many. Please encourage your colleagues to get treatment (if needed) and seek certification. As medicine advances, we are able to certify more and more conditions.





Experience a New Level of Safety

Visit the Equip ADS-B Website to:

- Find out if your ADS-B Out equipment is working properly
- Review the top five things pilots should know about their ADS-B system
- Learn more about the FAA's Privacy ICAO Address program
- See aircraft equipage levels by category
- Report an issue with TIS-B, FIS-B, or other aspect of the ADS-B system



FOR MORE INFORMATION: WWW.FAA.GOV/GO/EQUIPADSB **#ADSB**



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An airplane stands for freedom, for joy, for the power to understand, and to demonstrate that understanding.

— Richard Bach, author

hen it comes to introducing our friends and loved ones to the world of general aviation flying, there's no better opportunity to make a good and lasting impression than during the preflight inspection. In addition to assuaging any fears or apprehension some passengers might feel about flying in a small aircraft, having them follow you through a sound preflight inspection can provide travelers with a truly hands-on approach to unraveling the mystery of flight. Arming them with some basic knowledge of airframe design elements and system functionality can go a long way in helping a flying companion feel more comfortable and more aware of what to expect during the flight. Let's take a closer look at some ways you can make your next companion preflight both an enjoyable and educational experience.

Planning the Flight

The preflight planning process is something you'll likely want to start with your passenger well before arriving to the airport. Go through the PAVE (**P**assenger, **A**ircraft, enVironment, External pressures) checklist with them, and talk through the time and route of flight and whether any fuel or rest stops might be necessary. This is particularly important when traveling with young children (If you've ever taken a long road trip with kids, you know what I'm saying!)

By Tom Hoffmann

Before you begin your walk around inspection, point out safety concerns like any tripping hazards, sharp edges or protrusions, and staying a safe distance away from the propeller.

Hydration and nutrition are important for pilot and passengers, especially for fighting fatigue, so be sure to bring plenty of water and snacks. It's also good to discuss



Landing gear, including tires and brakes, are an important component of any preflight inspection.

what to wear — plan for attire that's both comfortable and weather appropriate, including hats, sunglasses, and a blanket. If it's more than a day trip, be upfront about baggage amount, size and weight limitations, and how you might need to distribute the weight of passengers and bags within the airplane.

Passenger, Meet Plane

Now that you have the planning logistics completed, it's time to introduce your companions to your trusty aerial steed. For starters, you might want to consider reviewing a few essentials about the aircraft, including its type and some basic performance capabilities like cruising speed and range. Some non-flyers are understandably surprised, and maybe a little concerned, to realize the average GA aircraft is about 30 years old. Be prepared to explain how meticulous maintenance requirements (like an annual inspection) and FAA airworthiness standards allow planes to fly safely for many decades. You may even want to show them the documents that help keep your airplane in airworthy condition during the cabin-check portion of the preflight.

Before you begin your walk-around inspection, point out any safety concerns like tripping hazards, sharp edges



Checking fuel is a process that most non-pilots won't be familiar with.

or protrusions, and staying a safe distance away from the propeller. Be sure to show them the proper places to step or climb into the aircraft, where to avoid any leaning, pushing, or pulling, and how to operate the doors or canopy, both from the outside and the inside.

Read out loud your aircraft's preflight inspection checklist and explain to your companion each item you're inspecting, what you're looking for, and why it matters. This gives you time to explain some of the aerodynamic principles and system properties that provide for a safe flight. Items like static wicks, trim tabs, pitot tubes, and even the corrugated construction of some flight controls may pique their curiosity. A more eagle-eyed companion might notice the slight twist in some wings, which gives you the chance to explain the safety benefits of wing washout.

Take the time to answer questions and provide basic explanations on how all of these items contribute to the flight. They'll appreciate the insight, and for some nervous fliers, it may instill a greater sense of security and confidence knowing the great lengths taken to ensure safety before the engine even starts. Additionally, it's a lot easier to explain some of these concepts on the ramp than in the much nosier and busier environment of the cockpit during flight. Just be sure not to let any of these explanations or personal conversations distract you from completing a thorough inspection.

Plane, Meet Passenger

With your walk-around completed, and your aircraft positioned for taxi, have your companion help you check that all safety covers, tie-downs, and wheel chocks are removed before entering the cabin. This might also be a good time to cover your safety briefing responsibilities per 14 CFR section 91.107. This regulation requires you to brief your passengers on how and when to fasten and unfasten seat belts and (if installed) safety harnesses.

There are several other components you'll want to consider covering here too, including emergency equipment locations and exit procedures. We suggest using the SAFETY checklist, which covers:

- Seatbelts Review seat belt operation and how to adjust and lock the seats.
- ✓ Air Review how to open/adjust air vents and the location of airsickness bags.
- Fire Extinguisher Review its location and basic operation.
- Exit, Emergencies, & Equipment Include a review of door operation and exits.
- Traffic and Talking Review communication expectations and sterile cockpit.
- ✓ Your Questions Invite questions to help clarify any confusion.

For more about the SAFETY checklist, see the passenger briefing article on page 16 of the July/Aug 2013 issue of *FAA Safety Briefing* magazine (bit.ly/FAASB-JulAug2013). You may also want to use this emergency equipment checklist (download the file at bit.ly/PaxBrief) from the Aircraft Owners and Pilots Association that helps you see where equipment is located along with basic operating instructions.

Read out loud your aircraft's preflight inspection checklist and explain to your companion each item you're inspecting, what you're looking for, and why it matters.

Once your passenger briefing is done, proceed with your pre- and post-engine startup checklists and consider having your co-pilot companion help verify these items are completed. When the engine gets started and the radios are turned on, explain how the headsets operate, including volume control and how to best adjust the boom. If you have traffic and weather information available on a display or portable device, explain to them how it works and when to alert you if traffic is nearby. Let them listen with you to ATIS and tell them how this information gives you the basics on local weather and expected runway use.

While taxiing, and workload permitting, point out some of the taxiway and runway signs and markings along the way that help guide you around the airport and keep you safely separated from other operators. Have your companion also look out for other aircraft or any other possible hazards. Just be clear on how you'll want your passenger to communicate with you both on the ground and in the air.



Using a checklist during preflight is a good idea regardless of how many times you've flown a specific airplane. Having your passenger read out the items can be a good way to involve them in the process.



Teaching companions to respect the propeller is a great safety improvement.

Preparing for Departure

As you get near the runway and enter the run-up area, give your passenger a heads up on what's involved during the before-takeoff checklist. Throttling up to 1800 RPMs while staring down at an airport fence 100 feet away might feel a bit unsettling for the first-timer. Some reassurance on how these steps aid in confirming the health of the engine may prove helpful. To keep them engaged while performing the run-up, have your passenger assist with noting the cylinder head temperatures or verifying proper RPM loss during the magneto and carburetor heat checks.

If everything checks out, you and your flying companion are now ready to enjoy your aerial adventure. Hopefully these pointers can help pilots and first-time fliers alike better understand the importance of preflight responsibilities, identify some key focus areas, and highlight the need for open dialogue to properly set expectations for a safe and successful flight.

Tom Hoffmann is the editor of *FAA Safety Briefing* magazine. He is a commercial pilot and holds an Airframe and Powerplant certificate.

LEARN MORE

Flying Companion's Guide to GA, Part II, *FAA Safety Briefing*, Mar/Apr 2018 <u>bit.ly/FAASB-MarApr18</u>

AOPA's Companion Co-pilot video series aopa.org/training-and-safety/air-safety-institute/companion-copilot

AOPA Air Safety Institute's Passenger Safety Briefing video youtu.be/C86am84XMVM

Fly the Airplane, First and Always

Contes on a stall like a sure water a station of

Light Sport 20

By Susan K. Parson

July/August 2023 **11**

(*Editor's note: The original version of this article appeared in the Mar/Apr 2018 issue of* FAA Safety Briefing *magazine.*)

o adapt the standard airline announcement, "in the unlikely event" that you, the right-seat occupant in a general aviation (GA) airplane, are required to take over for an incapacitated pilot, your first thoughts (and, likely, your first words) might not be suitable for this publication. But somewhere in that thought-bubble cloud of words is a very important and very urgent thought: WHAT ON EARTH DO I DO NOW?!

Flying the airplane is about bringing your "A game." To aviate means using the flight controls and instruments to direct the airplane's attitude, airspeed, and altitude.

There will be several tasks ahead of you, but let's focus here on the most important job — staying alive.

Triple-A Trifecta

Early in training, pilots are taught to fly the airplane first, last, and always. This idea is formalized in the "aviate-navigate-communicate" mantra presented during the very first flight lesson, if not before.

In a "well, DUH" sort of way, it intuitively makes sense that a pilot's top priority, both in normal operations and in not-so-normal times, is to fly the airplane before tending to any other task. However, those of us whose four-part Myers-Briggs Type Indicator includes an "S" for sensor (versus an "N" for intuitive) have a strong need to know what that means in very practical and very specific terms.

I eventually came to understand that it's about bringing your "A game." To aviate — to fly the airplane — means using the flight controls and flight instruments to direct and control the airplane's attitude, airspeed, and altitude. So let's get straight on the As.

Attitude

The term attitude refers to the aircraft's orientation with respect to the horizon — is the nose up or down, or tilted left or right?



In flight under visual flight rules (VFR), weather conditions are good enough for the pilot to see and use the natural horizon as a reference point

for what pilots call the four fundamentals: straight and level flight, climbs, turns, and descents.



A chart showing how airplane attitude is depicted on an attitude indicator.

To learn what the right attitude looks like for various phases of flight, look outside. Pay close attention to how the airplane's nose and wingtips look relative to the horizon in each of the four fundamental maneuvers. Take a mental snapshot and, for later study, a snapshot on your smartphone (in airplane mode).

If the weather is not good enough to see outside, the flight occurs in instrument meteorological conditions (IMC), using instrument flight rules (IFR). In this case, the pilot uses an instrument called the attitude indicator, or "artificial horizon," to establish and maintain the right attitude for the phase of flight.

It takes specific training and lots of practice for a pilot to be proficient in IFR flying. Chances are good that a non-pilot flying companion will never need to take over the flying at all — much less in IMC. If you want to "get the picture," though, first master outside references for attitude flying, and then start comparing them to how they are depicted on the attitude indicator.

Airspeed

Before we talk about airspeed, I need to briefly introduce another "A" term: aerodynamics. Aerodynamics deals with the motion of air, which is a gas, and the forces that act on solid objects, like airplanes, that move through it. To



put it (very) simply, an airplane flies because air moving over the wings generates a force called lift.

Airspeed is the measure of how fast that air is moving. An airplane needs a certain minimum airspeed to take off and fly. You might hear pilots talk about "true" airspeed and "calibrated" airspeed, but the one that matters for this discussion is "indicated" airspeed (IAS), as shown on the airspeed indicator (ASI).

The values for the necessary IAS differ from one airplane to another. A flying companion can certainly memorize numerical airspeed values for the various phases of flight, but it's a lot easier to use the color coding on the ASI.

As with attitude flying, start paying attention to the placement of the ASI pointer during various phases of flight. Generally, pilots use an airspeed in the white arc for takeoff/ climb and descent/landing. An airspeed in the green arc is used for normal cruise flying. Yellow is for smooth air only, and the red line is the "never exceed" speed. Don't go there!

In airplanes with "glass cockpit" (i.e., video screen)



instruments, the ASI is located on the left side of the screen and is displayed as a moving "tape." As the aircraft increases in speed, the larger numbers descend from the top of the tape.

A Primary Flight Display (PFD) that combines many of the older round dial instrument displays.

Altitude

As with airspeed, aviation uses several kinds of altitude. Most people think first about height above ground level (AGL). AGL is important, but the altimeter displays the altitude that really counts for flying: height above mean sea level (MSL).



The grid on aeronautical charts shows the MSL value for the minimum safe altitude (MSA) in each square, or block of airspace. In the unlikely event that a flying companion needs to take over from an incapacitated pilot, the trick is to use the altimeter to verify that you are at or above the MSA for the airspace you occupy. So, part of your "A game" is knowing how to read the altimeter.

In airplanes with "glass cockpits," the altimeter is displayed on a moving tape similar to the airspeed indicator, but on the right side of the screen. As the altitude increases, the larger numbers descend from the top, with the current altitude being displayed in the black box in the center of the display tape. In older airplanes with "round dial" instruments, you might first think the altimeter is a distorted clock from a Salvador Dali painting. You will see numbers from 0–9, and three pointers that indicate height in hundreds, thousands, and tens of thousands. It takes a bit of practice to learn to read this kind of altimeter quickly and accurately, but your pilot can help — and there are lots of YouTube videos that show it in action.

Getting Straight on the A's

You need not be a pilot to benefit from the resources that the FAA and the aviation training community have on these topics, so check them out. Aim to get straight on these three important "A's" so your "A game" will be ready if ever you need to fly the airplane.

Susan K. Parson was editor of *FAA Safety Briefing* magazine until she retired from the FAA in January 2023.

LEARN MORE

Pilot's Handbook of Aeronautical Knowledge, Chapter 8, Flight Instruments <u>bit.ly/2nBxvNT</u>

2023 National General Aviation Awards

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Robert Raskey Certificated Flight Instructor of the Year



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Dennis Miller FAASTeam Representative of the Year

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PilotSpeak

A Beginner's Guide to the Aviation Lexicon

By Susan K. Parson

(*Editor's note: The original version of this article appeared in the Jul/Aug 2014 issue of* FAA Safety Briefing *magazine.*)

s noted in this issue's "Bring Your 'A' Game" article, one of the first things that pilots in training learn is the aviation safety "trifecta" of aviate (fly the airplane), navigate (point it in the right direction), and communicate (talk to air traffic control). Flight instructors tend to take a military drill instructor's approach to stressing the importance of the sequence, and a somewhat clichéd bit of advice cautions that pilots should never "drop the airplane to pick up the mic."

There is no question that aviating — maintaining proper attitude, airspeed, and altitude — is also the top priority for a pinch-hitting pilot. But I would suggest that if you do wind up in that position, it is both appropriate and wise to make communication your second priority. You're going to need help to navigate and land, so it's best to speak up as soon as you are reasonably sure you have the airplane flying straight and level.

If you don't remember anything else from this article, the two most important items to recall are the emergency radio frequency (121.5) and the word "mayday," which means emergency. If your pilot has already been talking to ATC, you can start by clicking the mic on whatever frequency is tuned and uttering the magic "mayday" word. But since not all GA flights involve communication with ATC, you might want to use the next flight you take to learn how to tune the radio to 121.5. Someone is always listening to the emergency frequency, sometimes known as "guard." It's always a good idea to monitor 121.5.

Once you have made contact, whether on 121.5 or another channel, you need not worry about proper phraseology — just say what you need to say. But you might feel more comfortable, both as

emergency prepa-





Examples of older system and more modern communication and navigation radios.

ration and just to know what's going on, if you learn at least a little of the lingo. Here are a few tips that can help you decipher PilotSpeak.

The Ws

For safety reasons, the language of aviation is highly precise in both its "grammar" (structure) and its vocabulary. In fact, there is a dictionary of aviation terms and phrases called the Pilot/Controller Glossary to ensure that pilots and controllers assign the same meaning to the same words and phrases.

If you don't remember anything else from this article, the two most important items to recall are the emergency radio frequency — 121.5 — and the word "mayday," which means emergency.

When a pilot makes a transmission, they follow a specific structure. The script calls for the pilot to say something like: "Phoenix Approach, Skyhawk 1359T, twenty miles west at five thousand five-hundred feet, landing Falcon Field." Now let's look at the individual elements:

- Whom you are calling. "Phoenix Approach" or "Richmond Tower"
- Who you are, using the aircraft's make, model, and tail number: "Skyhawk 1359 Tango"
- Where you are: "Twenty miles west" at "5,500 feet" (read from the altimeter)
- What you want to do: "Landing Falcon Field."

The controller will use a similar sequence to respond:

- Whom ATC is calling: "Skyhawk 1359 Tango"
- Who is calling you: "Phoenix Approach"
- Where ATC thinks you are (sometimes based on radar): "Radar contact, twenty miles west "5,500 feet"
- What ATC wants you to do: "Maintain present heading; descend and maintain 3,500 feet."

Depending on the situation, there are obviously many variations in terms of words and phrases that pilots and controllers use. Still, the structural sequence is the same.

The Alphabet

To help avoid confusion with similar sounding consonants and numbers, in March 1956 the International Civil Aviation Organization (ICAO) adopted a standard phonetic alphabet for aviation use:

Alpha Bravo Charlie Delta Echo Foxtrot Golf Hotel India Juliett Kilo Lima Mike November Oscar Papa Quebec Romeo Sierra Tango Uniform Victor Whiskey X-ray Yankee Zulu

PilotSpeak numbers are pronounced mostly the same as they are in regular English, with just a few exceptions:

- The number three (3) becomes "tree."
- The number five (5) becomes "fife."
- The number nine (9) becomes "niner."



Air traffic controllers working at a tower.

Using the made-up tail number in the previous example, both the pilot and the controller will pronounce the airplane's call sign as: "one-tree-fife-niner Tango." You may or may not hear the call sign start with "November," but if you look at the tail number of any U.S.-registered aircraft, you will see that it begins with "N" — November. Other countries use a different starting letter (or a combination of letters and numbers) to denote an aircraft on their registry.

For safety reasons, the language of aviation is highly precise in both its "grammar" (structure) and its vocabulary.

Useful Words & Phrases

Now let's decode some of the words and phrases you might hear:

ATIS: Automatic Terminal Information Service is recorded information on current weather and airport information, such as runways in use. Each successive ATIS recording has an alphanumeric designator to distinguish it from previous ones. For example, "ATIS Information Foxtrot is current."

Squawk: This word refers to the aircraft's transponder code, which can be either a standard code (1200 for visual flight rules — VFR) or a discrete code assigned by ATC. Squawk can be a noun ("say assigned squawk"), an adjective ("squawk code is 2345"), or a verb ("squawk 5423").

Mayday: Hopefully, you will never have to use this one, but "mayday" means emergency. In case you're wondering, the word is a corruption of the French term for "help me" (*maidez*).

Who's Roger?!

Last but not least: Did you ever wonder why aviators say "roger?" The definitive answer seems to be lost in the mists of time. Still, a plausible explanation arises from aviation's early days, when the industry adopted customs, procedures, and terms from established industries like the telegraph business. Given the uncertain quality and reliability of Morse code telegraph transmissions, the receiver would transmit a single letter "R" upon successful receipt of a message to signify that "I have received and understood your transmission."

Early aviators needed a similar protocol. As it was not possible to transmit a Morse-coded "R," they did the next best thing by transmitting the word "roger," which was at that time the spelling ("phonetic") alphabet version of the letter "R." Then, as now, it was simply an acknowledgment that "I have received and understood your last transmission." So, assuming this explanation has legs, be grateful that aviation adopted this practice before the phonetic alphabet changed from "roger" to "romeo!" **)**

Susan K. Parson was editor of FAA Safety Briefing until she retired from the FAA in January 2023.

LEARN MORE

FAA's Pilot/Controller Glossary bit.ly/AirTrafficPubs



is Undefeated

Why Weight and Balance is Critical to Flight Safety By James Williams

s loading an aircraft like loading a car, i.e., if it fits, it goes? Not quite. And while this isn't entirely true about a car either, it usually does work — you load it until there's no room left. The idea that you're only limited by volume doesn't work for small aircraft. It's tempting, and frankly understandable, to think that because the airplane has four seats, you can take four people and their bags. But that scenario may be optimistic, to put it mildly. In logistics, running out of space/volume before running out of payload capacity/weight is called cube out. The reverse situation, running out of payload before volume, is called weigh out. In a perfect world, your point of weigh and cube out would be the same, meaning you are using both all available space and payload. But in our imperfect world, passenger cars usually cube out, and small aircraft almost always weigh out.

Where's the Weight?

An aircraft must generate lift to counter the force of gravity acting on its weight — and that includes everything you loaded on board. This means having at least one pound of lift for every pound the aircraft weighs. So if we have a 2,000-pound airplane loaded with 500 pounds of fuel, people, and baggage, we would need to generate 2,500 pounds of lift to stay in the air. We generate that lift by pulling an airfoil (the wing) through the air with enough velocity to produce the required lift. The heavier the aircraft, the more lift you have to generate, and pilots are very careful not to overload an aircraft.

How weight is distributed in an airplane is critical to flight safety because it determines the aircraft's center of gravity (CG).

The total amount of weight isn't the only issue. How the weight is distributed in the airplane can also be critical to flight safety because it determines the aircraft's center of gravity (CG). You can visualize the CG by thinking of a model airplane hanging from a string. If the string is attached at the CG, the model hangs perfectly level. If you move the weight around within the aircraft, the location of the CG changes. You may have experienced this in a car if you were carrying a heavy load in the trunk and noticed that it's harder to steer, or the rear feels like it wants to turn faster or slide. Moving the CG in an airplane is even more critical as you don't have the luxury of a firm connection to the ground.

This is particularly true when you move the CG fore and aft. Think of it like a lever or a see-saw. Archimedes is often quoted as saying, "Give me a lever long enough and a fulcrum on which to place it, and I shall move the world." Meaning that the further from the fulcrum, or in this case, the CG, you put a weight, the more effect it will have. This is why you might notice pilots being very particular about putting seemingly insignificant items in a specific place in the aircraft.

As we discussed, the aircraft's CG moves depending on loading. In aviation, we have developed



Charts showing how to calculate a moment and how it would apply to an airplane.

practical ways of calculating how each load affects an aircraft to ensure we are within safe limits. We do this by computing a "moment" for objects or people placed at several assigned "stations" within the fuselage. We use something called a datum as a reference point in the aircraft to measure from. For example, there are stations for the front seats, the rear seats and the baggage compartment. The moment is computed by multiplying the weight at that station by the distance from a certain location (this is referred to as the arm). The total of all the weights and all the moments has to be within certain limits for the aircraft to operate safely.

The first step is to calculate the moment of each station. You can think of the moment as the total effect of each weighted item (including the aircraft itself) on the CG. So *weight* times *arm* equals moment. For many GA airplanes, it would be the total weight in the front seats times the front seat arm, plus the total weight in the back seats times the back seat arm, plus the total weight in the baggage compartment times the baggage compartment arm. That combined total would be the total moment, which is then divided by the total weight to get the CG. However, there's one quirk with certain GA airplanes that feature a front baggage compartment forward of the firewall. The arm for that station will be negative in most cases as the datum is usually located near the firewall. That moment will be subtracted from the total rather than added in your calculations.

You can then use a chart to determine the acceptable CG limits for that weight. The larger the total moment, the further back the CG will be. In many cases, when traveling in GA airplanes, our primary concern is keeping the CG within the rear limit because we know we will have a certain amount of weight in passengers and cargo that will be aft of the datum. If we are under maximum takeoff weight, we may need to move weight forward to stay in the appropriate CG envelope. This is why airplanes with





It is helpful to discuss loading the airplane before you get started.

forward baggage compartments generally load those areas first, as they counterbalance the weight behind the datum, hence the negative arm. But most small GA airplanes don't have forward baggage compartments, so the next best thing would be to move items forward in the cabin. For example, if we had a 20-pound item in the rear baggage compartment of a generic 1975 Cessna 172 (the airplane I happen to have an owner's manual for at hand), that item would have a moment of 2,460 (20 x 123). Moving the same item to the rear seat would be 1,460 (20 x 73). Moving it to the front seat would be 740 (20 x 37). You can see what a difference that arm makes.

There's no pause or respawn in real life, so taking unnecessary risks with weight and balance isn't a good strategy.

Hard Mode

So what does all of this mean when you go flying? Generally speaking, the lighter the aircraft, the better it will perform and the less fuel it will consume. Heavier aircraft accelerate more slowly, take longer to take off, and have less range. This can be compounded by environmental factors like high temperatures and high airport elevation. Because of that, even if you are within weight limits, you might not have enough performance to get off the ground or clear obstacles on departure.

It gets worse if you exceed the aircraft's maximum allowable weight. At a certain point, you won't be able to take off, but far more dangerous is being able to get off the ground and not able to climb or clear obstacles. In the air, the aircraft will be less maneuverable, and stall speed and landing speeds may be higher than normal.

If the CG is outside of the approved envelope, you can have many of the same problems as when the weight is over limits but with the addition of some serious control issues. An extreme forward CG (too much weight too close to the nose of the aircraft) can cause a nose-heavy condition and difficulty raising the nose for takeoff or landing. By contrast, a rear CG can affect longitudinal stability and reduce the capability to recover from stalls and spins.

By failing to adhere to proper weight and balance, you are intentionally increasing risk and cranking up a flight's difficulty level. In a game, turning up the difficulty can create a fun challenge, but it increases the risk of disaster in real life. There's no pause or respawn in real life, so taking unnecessary risks with weight and balance isn't a good strategy.

Understanding some of the complexities of weight and balance will help you help your pilot, especially during the planning stages of a flight. You'll understand why you need to rearrange things and, if the weight and balance can't be adjusted, even possibly leave behind some items. Your advance knowledge and understanding can help reduce any self-imposed pressure the pilot may feel to make everything fit.

At the end of the day everyone wants a safe flight, and having a proper weight and balance is an easy way to improve the odds.

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

LEARN MORE

Pilot's Handbook of Aeronautical Knowledge, Chapter 10: Weight and Balance <u>bit.ly/2nBxvNT</u>

"You Can't Take All That!" FAA Safety Briefing, Mar/Apr 2018 adobe.ly/2FDYUXD

SOAR AS A Safety superhero



Use Your Superpowers to Support the FAA Safety Team

By Paul Cianciolo

n 1970, a new breed of safety superheroes appeared in the skies above Washington, D.C. when the FAA's General Aviation Accident Prevention Program was born. Its ultimate goal was to prevent GA accidents by improving aviators' attitudes, knowledge, and proficiency — and it worked initially.

By 1985, the program had faded into aviation folklore. The FAA rebranded the effort as the Aviation Safety Program, hoping to revitalize the original function. This attempt had a minimal effect because it lacked the necessary conceptual and structural changes and did not use risk management and system safety principles or new technology concepts.

They say the third time's the charm, and in 2006 the new and improved "FAA Safety Team" (aka, the

FAASTeam) emerged. The team's mission was to improve the nation's aviation safety record by conveying safety principles and practices through training, outreach, and education, which is similar to the FAASTeam's current mission statement. A dedicated group of FAA employees and an extensive network of volunteer superheroes from the aviation community set forth to accomplish this quest. FAASTeam program managers (FPMs) became part of each Flight Standards District Office (FSDO) to establish meaningful aviation industry alliances and encourage the continual growth of a positive safety culture. The FAASTeam falls under the FAA's Flight Standards Service General Aviation and Commercial Division and works closely with the Aircraft Maintenance Division.

FAASTeam Mission Statement

Lower the nation's aviation accident rate by conveying safety principles and practices through training, outreach, and education while establishing partnerships and encouraging the continual growth of a positive safety culture within the aviation community.

The FAASTeam could not function without its volunteer superhero force. They are the unsung heroes that keep many accidents at bay. These superheroes stem from all segments of the aviation community, including GA, air carriers, corporate and business aviation, repair facilities, flight and mechanic schools, fixed-base operators, and other aviation entities.

Keep reading if you want to use your superpowers to pay it forward and be a force for good. These are our different types of safety superheroes.

816,592 FAASTeam Members

The largest group of safety-minded aviators and mechanics are our FAASTeam Members. This includes anyone who makes a conscious effort to promote aviation safety and become part of the shift in safety culture.

To make the transition and hone your safety powers, you must create a user account on FAASafety.gov. It's not just for pilots — anyone can sign up and participate. The website offers online courses, webinars, local in-person seminars, awards programs, and email notifications. Test your skills, and enhance your situational awareness of all things aviation.

1,728 FAASTeam Representatives

Without the FAASTeam Representative (aka, the Rep), the team would not succeed in its mission. These card-carrying superheroes are the backbone for promoting and fostering aviation safety. Reps provide outreach to the aviation community and share their technical expertise and professional knowledge.

The Rep works closely with an FPM actively promoting aviation safety. They receive training and support and can even ride in the "gov-mobile" with an FPM.

Reps are responsible for assisting the FPM in promoting and fostering aviation safety. They serve as volunteers who work directly with or under the local FPM's guidance in various program activities. They also serve as safety advisors for the aviation community, advise individuals concerning safety issues, direct individuals to appropriate FAA personnel for additional help, and, if qualified, may counsel pilots or aviation maintenance technicians in need of assistance with specific aviation safety concerns.

The FSDO may call on Reps to conduct remedial training events, such as ground or flight training for pilots and training for aviation maintenance technicians and repairmen. Only Reps with current and valid ground or flight instructor certificates, a mechanic certificate with airframe and powerplant ratings, and an Inspection Authorization, if appropriate, can provide remedial training.

A Rep's primary responsibility is to plan and conduct events that earn WINGS or AMT training credit or awards, including the Wright Brothers Master Pilot and Charles Taylor Master Mechanic awards and the annual General Aviation Awards (generalaviationawards.com). The Rep can also play a significant role in helping to maintain a safe operating environment by facilitating a positive working relationship with airport personnel, airport users, the FAA, and the local community.



Each FSDO may designate Lead Reps to help manage the local program. Reps are further specialized in working with the WINGS program or operating drones. There are currently 185 WINGSPros and 243 DronePros available through the online FAASTeam directory to assist the aviation community.

Become a Rep by logging into FAASafety.gov, clicking *About the FAASTeam* at the

top-right of the page, then clicking *Join the FAASTeam*. First, speak with a local FPM and complete two online courses — ALC-270, *Representative Training: Representative Manual*, and ALC-297, *Representative Training: IT Security*. To find these courses, click on the *Activities, Courses*, *Seminars & Webinars* tab, click on *Courses*, then *View All Available Courses*, then scroll to the bottom and click on *Show Courses Without Credit*.

2,123 FAASTeam Service Providers

Just because you are not a certificated pilot or mechanic does not mean you can't be an aviation superhero too. Our FAASTeam Service Providers are often safety sidekicks to our Reps.

Anyone who contributes essential program-related support to the FAASTeam can be of service — including a presentation as a subject matter expert, providing meeting space for a seminar, offering equipment



like chairs and tables, assisting with video editing and production, supplying donuts and coffee, or any other type of support. No formal training is required, and the appointment doesn't expire. Reps that no longer meet annual training requirements convert automatically to this role.

Become a Service Provider by logging into <u>FAASafety.gov</u>, clicking *About the FAASTeam* at the top-right of the page, then clicking *Join the FAASTeam*.

44 FAASTeam Industry Members

These safety sidekicks are companies that have a vested interest in aviation safety. National Industry Members are national-level organizations, businesses, associations, and industries that support the FAASTeam at FAA headquarters. Local Industry Members are state aviation departments, local industry or governmental entities, local chapters of national organizations, and businesses that support the FAASTeam locally.

Each member organization has a formal agreement in place with the FAA. Examples include the Academy of Model Aeronautics (AMA), Avemco Insurance Company (provider of the WINGS pins), Balloon Federation of America (BFA), Civil Air Patrol (CAP), King Schools, National Agriculture Aviation Association (NAAA), National Association of Flight Instructors (NAFI), Ninety-Nines, Pilot Institute, SocialFlight, and Sporty's.

Become an Industry Member by speaking with a local FPM or the national FAASTeam (NFM on the search page). Go to FAASafety.gov, click the Resources tab, then *Directory* to search for an FPM or NFM.

279 FAASTeam Training Providers

A person or an organization can be a FAASTeam Training Provider. These superhero teachers conduct accredited training under the WINGS Pilot Proficiency Program or AMT Awards Program and provide online validation of training completed. However, this designation does not apply to FAA-certificated instructors with the authority to conduct accredited flight activities as part of WINGS.

Training Providers may also conduct FAA-accepted Inspection Authorization (IA) refresher training provided they receive additional authorization from the FAA.

Employers are training providers that employ FAAcertificated pilots, mechanics, repairmen, or non-certificated maintenance personnel to perform maintenance or inspect U.S.-registered aircraft or components. In-house training of aviation personnel may streamline their participation in the AMT Awards Program by registering as an *Employer*.

Become a Training Provider by logging into FAASafety.gov, clicking on the *Resources Tab*, then clicking on *Training Providers*, and looking for the form link.

With our powers combined, we can help maintain and improve what is already the safest, most efficient aerospace system in the world!

(*Editor's note: The number of each type of FAASTeam volunteer used in the subheads is from April 28, 2023.*)

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.

A TALE OF TWO CLOUDS

It was the best of weather, it was the worst of weather. Okay, maybe it wasn't the worst weather ever, but it definitely wasn't great either. And it definitely wasn't the best, that's for sure. As a non-aviator, do you ever feel like your friendly neighborhood pilot doesn't define good weather in the same language as you? Well, that's because pilots have a different view of all things weather, especially around what constitutes good flying weather.

Know Your Ocean

The best analogy I have to explain how a pilot looks at the weather is how a scuba diver looks at the ocean. If either aren't treated with due respect, both diving and flying represent rather serious challenges to survival. When your life depends on it, and you are actively engaged in the process, you tend to focus on the subject much more than a casual observer would.

For example, a scuba diver will track how tidal and temperature changes impact diving conditions, much like a pilot gauges flying conditions by paying close attention to incoming fronts and shifting weather patterns. This would be much different than your average flier who might rely solely on the weather outside their window, or the average beachgoer who probably only checks for an acceptable water temperature.



Since it isn't likely to have a big effect on your day, it makes sense that you wouldn't waste your mental bandwidth thinking about it. People use mental shortcuts like these to simplify decision-making – a concept that psychology calls heuristics.

So how does a pilot look at weather differently? The general answer is, it depends. Just like the ocean surrounding a scuba diver, the conditions of the sky surrounding the pilot have particular problem areas. To the average person, a breezy day might not even be worth noting, while a pilot could consider it cause to scrub a flight. On the other hand, a rainy day may be enough to cancel a person's daily activities, but be of little concern to a pilot. A blazing hot summer day may be perfect for a trip to the beach, but it could also leave a pilot unable to fly.

Here's a heuristic to help understand weather decisions by pilots: think about how the weather impacts the plane and the pilot in each of these ways: 1) wind/turbulence, 2) ceiling/ visibility, and 3) performance.

Practice Makes Perfect

Let's put that heuristic into practice. On our breezy day example, the wind speed and direction could create a dangerous crosswind that exceeds our pilot's or aircraft's capabilities. That would mean a no-go from our aviator despite otherwise favorable conditions in the other heuristic metrics. A rainy day might cancel a ball game, but, assuming reasonable visibility and/ or an instrument rating, your general aviation flight can go ahead with no problem (it might even be surprisingly smooth). That bright blazing summer day may present a performance obstacle for our flight thanks to density altitude that decreases performance below acceptable limits. In these examples, you can see the weather interpretation misalignment. Many times, good weather in your daily life will also be perfect flying weather. But there is a chance it might not be perfect. It's even true that not all clouds are the same. Instrument-rated pilots learn what clouds you can smoothly sail through and what should be avoided. Ironically, those white puffy "happy" clouds are often more trouble than their long gray counterparts.

When looking at weather, consider these three areas and start building your shortcuts. Ask your pilot friends about weather, and see what they say. This may vary by the pilot's ratings, skills, and preferred aircraft. By talking to them, you can see how they approach weather. You might also serve as an excellent sounding board for making a go/no-go decision. If you want to learn more, check out the free resources below.

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

LEARN MORE

I've Got Weather! (... Now What Do I Do with It?), FAA Safety Briefing, Mar/Apr 2015, Page 26 bit.ly/FAASB-MarApr15

Advisory Circular 91-92, *Pilot's Guide to a Preflight Weather Briefing* <u>bit.ly/3qQRAhh</u>

FAA Aviation Weather Handbook bit.ly/AviationWx

Online Course: ALC-683, Conducting Preflight Self-Briefings for Student & VFR Pilots bit.ly/CourseALC683

EVERYONE IS A DRONE'S COMPANION

This issue is dedicated to "flying companions," but when it comes to drones, there are no right-hand seats — drones don't carry passengers (at least not yet!). So, who is the flying companion of a drone pilot? If you think about it, it's anyone nearby your flight. Let's look at how communication and education make your flying companions more comfortable with your drone operation and why doing so is important for you, the general public, and the entire drone industry.

As drones continue to evolve, people tend to have a lot of strong feelings about them. The people who fly drones love to see them in the air, but many others have a "not in my neighborhood" attitude about these aircraft. The FAA's UAS Support Center receives many calls from people complaining about drones flying in their neighborhood. These complaints range from issues with the noise, confusion about who owns the airspace above a property, and even fear of being spied on and other privacy concerns. It's important to be a good ambassador for the drone community to help dispel some common myths and misconceptions about drones, which can have a positive effect on future integration efforts.

Be a Good Neighbor

The FAA regulates and ensures the safety of the national airspace system (NAS), but there can be many other



considerations that impact the way others feel about your flight and drones in general. Some things to consider are local and state laws regarding noise and privacy. Before you plan your flight, check to see if there are any local noise ordinances that you should be aware of, and make sure your flight is in compliance with any allowable noise levels. If you think you will be flying over, or even appear to be flying over, a neighbor's property, it might be a good idea to let them know in advance. A friendly explanation can go a long way toward peace and harmony with your neighbor, and it can help foster a better reputation for the entire drone community. You may even end up sparking an interest in drones and encouraging someone new to engage with this technology.

Play it Safe

If you have friends and family watching your flight, make sure they know how to play it safe around drones. Remind them that, even if it looks like a toy, your drone is an aircraft. Teach them to never reach for a flying drone and to stay well clear of the drone any time it's activated. Let them know that while you are flying, you need to devote all your attention to the flight. Make sure they know to save all questions and comments until after you've landed your drone safely on the ground. Keeping everyone safe around your drone is your top priority.

Just Because You Can

Remember that just because you can doesn't mean you should. While the FAA has authority over the airspace, takeoffs and landings from certain properties can be restricted by state, local, territorial, or tribal government agencies. The FAA provides No Drone Zone signs that can be used by agencies



to identify areas with local restrictions (to view these, go to: <u>bit.ly/41U8z2w</u>). While these zones only restrict the takeoff and landing of a drone, and don't restrict the flight in airspace above these areas, it might still be a good idea to avoid flying over these areas. Local restrictions may exist because of serious concerns about the negative impact that drones can have on the safety of visitors, staff, and wildlife in parks and sanctuaries. So, while you technically could launch your drone across the street from a park and fly over it, it may not be the "good neighbor" thing to do.

The first time I saw a drone "in the wild" was at my brother's wedding in 2016. The photographer got some amazing shots and video footage. After he landed the drone, he took time to answer my questions and even pulled up some of the footage captured for me to see. Before this, I couldn't have imagined having a drone at a wedding, but that drone captured memories in a way that conventional photography couldn't. Now my brother and sister-in-law have unique and beautiful imagery shot from above. Taking the time to treat me like his flying companion helped me have a positive first experience with drones. Like this photographer, be aware of your flying companions, and make sure you give them a great experience with drones. It's up to all of us to make sure we give drones a good buzz!

Rebekah Waters is an *FAA Safety Briefing* associate editor. She is a technical writer-editor in the FAA's Flight Standards Service.

FLYING COMPANIONS ON THE GROUND

General aviation (GA) pilots may have no better flying companion than their FAA certificated mechanic. Although this companion may keep their feet firmly on the ground, they are the one who helps make sure the aircraft is safe for flight after each maintenance action and/or inspection. Aircraft mechanics play an important role in aviation safety by performing inspections and maintenance, which takes place in the hangar. If you've always been interested in the mechanics of flight, and you have a knack for fixing things, becoming an "on the ground flying companion" may be a good way to join the wonderful world of aviation.

There are two paths to becoming a aircraft mechanic — attending an aircraft maintenance technical school (AMTS), or working as a mechanic helper to receive on-the-job training (OJT) for civil aircraft experience. An AMTS is an educational facility certificated by the FAA. These schools offer training to prepare you for different types of aircraft mechanic careers. Most of these schools require you to have a high school diploma or GED. The program takes about 18 to 24 months, depending on the rating(s) you want, and when you graduate, you



should be prepared for the applicable airman knowledge and skills tests.

Not everyone learns best in a classroom, and you may not live close to an AMTS. If either is the case, or you prefer hands-on learning, working as a mechanic's helper to receive experience and OJT is another path. OJT provides experience with the procedures, practices, materials, tools, machines, and equipment generally used in constructing, maintaining, or altering airframes and powerplants. While completing OJT, you are responsible for documenting all your experience. To do this correctly, have the FAA certificated mechanic sign off for the work you do, and have them sign your work experience document. Because consistent documentation is so important, the FAA recommends that you use an aviation maintenance technician (AMT) log. Instead of a graduation certificate, you will present your signed log as proof of your eligibility to test for your mechanic certificate. The FAA has more information about this and what details you should capture in your log online at <u>bit.ly/3BFE7hF</u>. You may gain this experience working or volunteering at a maintenance facility, like your local flying club or fixed-base operator. Knowing someone who works at a maintenance facility can make entry into this path even easier.

The aviation mechanic certificate has two ratings — the Airframe (A) and the Powerplant (P). Getting both ratings together is commonly referred to as an "A&P" certificate. Whether you decide to get one or both ratings, you will need to pass the knowledge or written test, then oral and practical tests. Make sure that the person who is supervising you holds an A&P certificate.

THE FAA WILL BEGIN USING THE MECHANIC ACS FOR ANYONE WHO TESTS FOR A MECHANICS CERTIFICATE STARTING ON AUG. 1, 2023.

Also, make sure that this person knows how to teach using the FAA's Airman Certification Standards (ACS). On Sept. 21, 2022, a revised 14 CFR part 147 rule went into effect. For more information about this rule, see A New Dawn for Aviation Maintenance Training online at bit.ly/3OjNWts. The FAA will begin using the mechanic ACS for anyone who tests for a mechanics certificate starting on Aug. 1, 2023. The FAA certificated mechanic you choose needs to use the ACS concepts to prepare you for the written and oral knowledge tests and the practical skill elements. So, before you start your training, ask your mechanic mentor if they are up to date on these new testing standards.

Whether you decided to attend an AMTS or pursue civil aircraft OJT, becoming an aircraft mechanic will prepare you to make a positive contribution to aviation safety on the ground. If you would like more information on how you can become an "on the ground flying companion" go to <u>faa.gov/mechanics</u>.

Rebekah Waters is an *FAA Safety Briefing* associate editor. She is a technical writer-editor in the FAA's Flight Standards Service.

PREFLIGHT YOUR PASSENGERS

For many helicopter pilots, flying with passengers is part of the job. That means these pilots must heed the importance of an effective passenger preflight briefing to help ensure everyone remains safe before, during, and after the flight.

This rang true for Chris Baur, who, while flying helicopters for the U.S. Coast Guard in the 1980s, was also a charter captain, flying passengers between Coast Guard missions. Baur, now president and CEO of Hughes Aerospace and the industry co-chair of the United States Helicopter Safety Team, recalls a flight that required some action to keep his passenger safe. The flight landed safely at John F. Kennedy International Airport in New York after picking up a famous comedian and Saturday Night Live alum from a northern New Jersey heliport at night. The passenger exited the rear of the helicopter while it was still running and before the arrival of a marshaller - a person designated to open aircraft doors and escort passengers to the terminal. This passenger had flown many times with Baur and was briefed and

familiar with

especially

disembark-

ing from the

front of the

helicopter.

the controls

and jumped

out of the

helicopter,

passenger just in time

stopping the

from walking

Baur locked

the procedures,

embarking and



Rotorcraft pilot Chris Baur in April 1989.

into the spinning tail rotor that was invisible in the darkness. The passenger turned to him with the look of "why did you just grab me?" Because of the noise, Baur then pointed to the tail rotor and ran his finger across his throat to indicate to the startled passenger that he could have been killed.

"He looked at me again, and gave me a big hug," Baur said. "I pulled him away, and said, 'Let's go farther away from the tail rotor,' and then sent him on his way."

To help keep your passengers safe and prepare them on what to expect during a helicopter flight, watch the FAA's Rotorcraft Collective video called Preflighting Your Passengers at <u>youtu.be/xpMQNHvxC7c</u>.

The FAA-industry produced video advises pilots to conduct passenger briefings in an office or another quiet room before approaching the helicopter. Pilots should be frank with passengers about helicopter hazards and safety precautions. Here are some key takeaways to pass on to passengers:

- 1. Always be in an area where the pilot can see you.
- 2. Never approach the tail boom.
- 3. Enter the helicopter only as briefed. Passengers should approach a helicopter in a crouching manner.
- 4. Never drop anything from a helicopter.
- 5. Seatbelts must remain fastened.
- 6. In an emergency, only exit a helicopter after the rotors have stopped spinning. The only exception is if the helicopter has smoke or fire.
- 7. Know all fire extinguisher locations and how to use them.

- 8. Know all life preserver locations and how to use them.
- Know how to use a headset and be aware of the sterile cockpit concept — only flight relevant conversation is allowed during parts of the flight.
- When exiting a helicopter, only marshalling personnel should be allowed to open helicopter doors, release safety belts, and escort people out.

Once at the helicopter, wait for any noise to subside before resuming the passenger briefing. Emphasize that any item that blows away must be retrieved by marshalling personnel only. Make sure they know how to properly use the seatbelts, retrieve the life vests, and secure their items. Ask questions to verify their understanding.

Pilots should record themselves or have another pilot listen to their briefings to provide feedback. And as the video states, use checklists to ensure you provide all of the necessary information.

Always provide passenger briefings to your passengers, no matter how many times they have flown with you. And be ready to take some dramatic actions to save a life if needed.

The bottom line is that everyone aboard a helicopter has a role to play to help ensure a safe flight. Educating passengers to take an active role in their safety helps raise the public's awareness that we all have a stake in aviation safety.

Gene Trainor is an FAA communications specialist and Rotorcraft Collective member.



www.Facebook.com/groups/GASafety

6

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 16,000 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.

Glide Speed

As an active glider pilot and CFI-G I have an issue with this article [Best Glide Speed bit.ly/FlySafe-BestGlide]. The statement "Flying either faster or slower than the best glide speed will result in less distance traveled over the ground "is incorrect." This is the most distance traveled through the air. If your best glide speed is 60 kts, for example, and you're flying into a 60 kt. headwind, the only place you're going is straight down. Conversely, when you have a strong tail wind, you'll cover more ground by flying below your best glide speed.

— Tony

Hi Tony. Thanks for your feedback. We made a few adjustments to this article

to note that best glide speed is the speed and configuration that will get you the most distance forward for each increment of altitude lost in still air. We also added that flying either faster or slower than the best glide speed will result in lessening the glide ratio.

The No Smoking Sign is Illuminated

This was a great article ["No Air Up There," Mar/Apr 2023 <u>bit.ly/3LwaAgt</u>]. I'm not an active pilot anymore, but I remember reading an article back in the 60s or 70s regarding hypoxia. It stated that if you were a two-packa-day smoker, you were effectively at 8,000 feet when you were at sea level. I wonder if additional research has been done on that. Smoking isn't as common as it was several years ago, but there are still pilots who indulge. Thanks for the publication. Even though I don't fly, I still enjoy keeping up to date.

- Howard

Hi Howard. Thanks so much for the feedback! The FAA's aeromedical safety brochure on hypoxia (faa.gov/pilots/safety/pilotsafetybrochures) has some good information on this subject and mentions the dangerous effect smoking has when flying at altitude. There is also an FAA study that looked at the effects of hypoxia to smokers and non-smokers here bit.lv/AM97-07 (PDF).

Lessons Learned

One contributor to the Facebook group relayed a harrowing experience that he hopes other can learn from.

In usual fashion, the group rallied around this contributor with support and gratitude for sharing this mistake.

Stephania Thanks for the video. We all make mistakes and we as pilots accept that risk. But when family is involved it's an all new ball game. Glad everything turned out well.

Every Dog Has Its Day

Another top contributor relayed this humorous tale when transporting a wounded U.S. Army veteran and her new service dog on a Patient Airlift Services (PALS) flight.

Well, we were taking off in Pennsylvania and the controller asked if we had "Oscar." It was the hour's name for ATIS, automatic terminal information service. I said yes. And the lady, my passenger, asked me, how did he (the controller) know the name of my dog??



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

Let us hear from you! Send your comments, suggestions, and questions to <u>SafetyBriefing@faa.gov</u>. You can also reach us on Twitter @FAASafetyBrief or on Facebook at <u>facebook.com/FAA</u>.

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.

OF LOBSTER, LAWNMOWERS, AND LOVED ONES

"Can the magic of flight ever be carried by words? I think not."

 Michael Parfit, pilot, writer, filmmaker, photographer

One of the many highlights of getting my private pilot certificate at age 17 was the opportunity to share the joy of flight with others. Proud of my accomplishment and eager to show off my flying skills, I wasted no time in recruiting several friends and family members for day trips in and around the Long Island area. Not only did this flying help me build up time, experience, and confidence in the busy New York airspace, but it also regularly "wowed" my passengers with the sheer fun and freedom provided by general aviation.

I recall impressing one friend on a trip to the beach at Montauk Point, where, after landing, we hopped in an airport courtesy car and easily made our way to a nearly secluded beach. It made for an amazing summer afternoon to a place that otherwise would have taken an agonizing four-hour drive to reach. Another memorable first flight was with my dad on a quick jaunt to Martha's Vineyard. Neither of us being big talkers, we enjoyed the beauty and serenity of the flight in relative silence. Seeing his ear-to-ear grin was all the conversation I needed.

On a much more recent trip, I was able to take my seven-year-old daughter for her first flight in a friend's Cessna 182, complete with a stop for ice cream in Fredericksburg, Va., and a few turns over our house in Northern Virginia to wave "hi" to mommy and her younger sister who were waving back from the front yard. A couple of years before that, my wife got her turn to experience GA on a surprise birthday flight to Cape May, N.J. for some seriously good seafood and a leisurely stroll through the delightful Victorian town.

Making each of these flights an enjoyable and positive experience required some advanced legwork. In addition to a mandatory bathroom break for my daughter, before departing I made sure to introduce her to the airplane, get her comfortably adjusted in her seat, and explained what to expect during the flight that might be different from an airliner. Water, snacks, and her favorite stuffed animal also helped keep her in her comfort zone for the flight.

My wife is a tad prone to motion sickness, so I made sure to pick a day for Cape May that was calm and kept the control inputs as smooth as possible. That was particularly vital on the return leg given the copious amounts of lobster and crab we consumed!

As pilots, our idea of comfort can be quite different than that of our passengers. It's always a good idea to gather as much information as we can on passenger preferences, tolerance levels, and comfort, and to realize how that might also change mid-flight. This happened unexpectedly on a flight with one of my more adventurous friends. After a few steep bank turns, he got real quiet and turned about fifty shades of green. Not wanting him to feel embarrassed, I casually mentioned that I needed to land to avoid having too much sun glare during landing. He gladly concurred.

Pilots may be accustomed to the sometimes crowded, cramped, and



noisy environment of a GA cabin - but passengers may not. There's also the fatigue factor caused by engine vibration, analogous to using a lawnmower for several hours. If possible, try to introduce your flying companion to the airplane before your flight to manage expectations and acquaint them with your airplane's different features, including how to wear and operate headsets. Take time to listen to their concerns and explain how you'll address them. You should also agree on what you'd like them to help you with (and refrain from doing) during the flight. Your passenger will come away with a better understanding of what to expect, as well as a few ways they can meaningfully contribute to this flight, and future flights.

What are some tips and best practices you've discovered for taking friends or loved ones on a first flight? Share your ideas with us at <u>safetybriefing@faa.gov</u> or @FAASafetyBrief on Twitter.

Tom Hoffmann is the editor of *FAA Safety Briefing* magazine. He is a commercial pilot and holds an Airframe and Powerplant certificate.

MARK GIRON

Operations Group Manager, FAA General Aviation and Commercial Division



The allure of air shows inspired Mark Giron's interest in flight from a young age. His father, an Air Force veteran who served during the Vietnam War, strategically placed aviation books around the house to nurture that passion. However, Mark made the leap into space first.

After earning a bachelor's degree in mechanical engineering from Penn State University, Mark became a commercial and military satellite designer for Hughes Space and Communication Company in Los Angeles. Later, he worked as an engineering designer and manager of aerospace products for PerkinElmer Fluid Sciences in Maryland. After that, it was time to soar!

Mark took his passion for aviation to the next level by pursuing a flying career. He quit his engineering job and became a flight instructor at the nearby Freeway Airport (W00). Eventually, Mark became a first officer for Air Wisconsin, flying the Bombardier CRJ200 regional jet. In 2009, he joined the FAA as an aviation safety inspector (ASI) for general aviation operations in the General Aviation and Commercial Division.

"With a two-year-old and a weak economy, I wanted more time at home and job stability," Mark noted. "The FAA was the perfect opportunity." Mark then became the manager of the General Aviation Operations Branch. He also spent time detailed to the Flight Standards Service working with unmanned aircraft systems (UAS). He returned to the General Aviation and Commercial Division as an acting manager, and now he is the division's Operations Group manager.

"Our team is responsible for developing policy and regulation for almost anything you do with an aircraft, big and small, once you leave the ground," Mark explains. "Our ranks are filled with passionate aviators and aviation enthusiasts who attempt to create smart policies that impart safety where it's needed yet allow the exploration of the freedoms of flight."

He notes that finding the right balance between regulation and no regulation is the biggest challenge to those freedoms of flight.

"The team has been working hard on the MOSAIC [modernization of special airworthiness certificates] rulemaking effort, and we look forward to sharing the details soon," he said. "The cost of aviation is grow-

ing increasingly more expensive, which makes accessibility difficult. The FAA has been entrusted with our airspace, that's here for all of us and should be made reasonably available to use safely. Some of today's experiments in electric flight and flight instrumentation systems look

promising to deliver aircraft that are more reliable and built to fit the recreational side of GA at a price point that will give generations in the future the same opportunities I've had."

Even with his busy schedule, Mark continues to fly at least a few times a month. He is part owner of a Beechcraft Baron 58 and flies to AirVenture to spend time with the GA community.

Mark's advice: *Train. Fly. Reflect. Repeat.* Mark uses this mantra when he flies. He notes that as a pilot, there is always more to learn about yourself and your aircraft. Moreover, when you have family and friends aboard, ensure your preparation is evident.

"Sharing the gift of flight is something many will carry with them all their lives," Mark explains. "Be responsible with how you share that gift, and understand and stay within the limits of your own personal skill set. Be prepared and allow them to focus on the beauty of flight."

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.



Mark Giron, with his sons Eli and Brady, record a safety video before departing Oshkosh to wrap up AirVenture 2022.



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