July/August 2022

FAA Safety BRIEFING

All About AIR SHOWS!

Federal Aviation Administration

U.S. Department
of Transportation

**Federal Aviation
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Published six times a year, *FAA Safety Briefing*, formerly *FAA Aviation News*, promotes aviation safety by discussing current technical, regulatory, and procedural aspects affecting the safe operation and maintenance of aircraft. Although based on current FAA policy and rule interpretations, all material is advisory or informational in nature and should not be construed to have regulatory effect. Certain details of accidents described herein may have been altered to protect the privacy of those involved.

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ABOUT THIS ISSUE…

The July/August 2022 issue of *FAA Safety Briefing* focuses on the FAA's role at air shows and aviation events. Feature articles take you behind the scenes to meet some of the many safety professionals from different areas of the FAA whose hard work helps keep air shows both entertaining and extremely safe. We also explore several ways you can sharpen your skills when attending an air show/event and provide some important arrival and departure safety tips.

Contact Information
The magazine is available on the internet at:
www.faa.gov/safety_briefing

Comments or questions should be directed to the staff by:

- **Emailing:** SafetyBriefing@faa.gov
- **Calling:** (202) 267-1100
- **Tweeting:** @FAASafetyBrief

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FAA Safety BRIEFING

The FAA Safety Policy Voice of Non-commercial General Aviation

DEPARTMENTS

IT'S ABOUT PEOPLE

When you read about any of the many recurring air shows that take place around the country each year, there's always plenty of enthusiasm for the aircraft and, yes, the air show itself. But if you ask people why they come at all, much less as repeat visitors, you will hear a recurring phrase: I really come for the people!

> THERE IS GREAT POWER IN DIVERSE TEAMS WITH MEMBERS WHO CAN BRING A VARIETY OF INTERESTS, KNOWLEDGE, SKILLS, AND PERSPECTIVES TO ANY ENDEAVOR.

That rings true because air shows have the near-magical power to bring all kinds of people together in a harmonious way. When you are with people who share your love for aviation, the only disagreements worth discussing are a preference for high-wing versus low-wing or maybe the old chestnut about whether pitch controls altitude or airspeed. But we all put even these good-natured debates aside to watch every takeoff, assign a friendly "grade" to every landing, and watch the air show aerobatics with awe. We also take the opportunity these gatherings provide to reconnect with far-flung flying friends. It really *is* all about the people.

People Make It Work

Please keep that in mind as you read the articles in this issue's "All About Air Shows" theme. People working together for a common purpose are the only way anything gets done. There is great power in diverse teams with members who can bring a variety of interests, knowledge, skills, and perspectives to any endeavor.

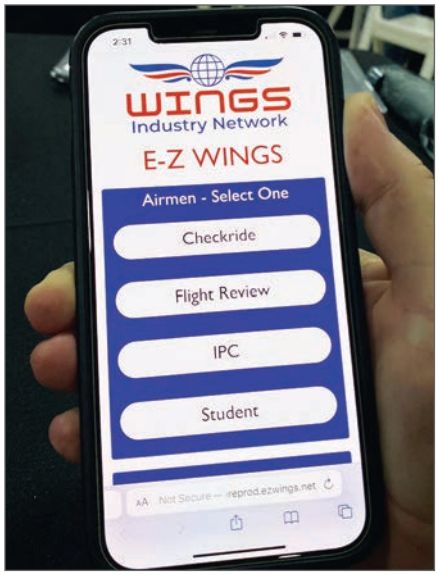
The work and dedication of such teams are exactly what it takes to make the magic of fly-ins and air shows happen safely. In this issue of *FAA Safety Briefing*, the magazine team takes you behind the curtain to meet some of the people whose painstaking work is essential. FAA employees assigned to air show duties, from preparation to execution to follow-up, come from a wide range of specialties and backgrounds. Event organizer staff are similarly diverse. Events themselves are becoming more diverse as well, especially with the advent of activities like drone racing.

Don't Be *That* Person …

Especially after the pandemic-related shutdowns, attendance at air shows is up. That's great. But if you are flying your own airplane to the event, your vigilance needs to go up as well. Unless you found a way to personal frequent flying during that time, you are likely to be a bit rusty. Even if your own skills are sharp, be mindful that you may be sharing both the skies and the show grounds with a few out-of-practice pilots. To avoid falling into that category yourself, hire an instructor for some refresher training before you go, and take a look at the tips the magazine team has assembled in this issue.

The bottom line is simple. If every pilot who takes part in these events does their part to make it all work, we can all enjoy everything an air show has to offer — including the people!

AVIATION NEWS ROUNDUP



New E-Z WINGS App Coming Soon

Want an easier way to reach a higher level of pilot proficiency and earn your WINGS? The WINGS Industry Network (WIN) is developing E-Z WINGS, an app that makes earning WINGS credit and phases substantially easier. Available on your cell phone, tablet, and desktop, the app features a wide array of options to access the FAA Safety Team's (FAASTeam) WINGS Pilot Proficiency Program. Flight instructors, DPEs, and aviators of all kinds can use the app for WINGS and more easily search for activities, courses, and seminars on FAASafety.gov.

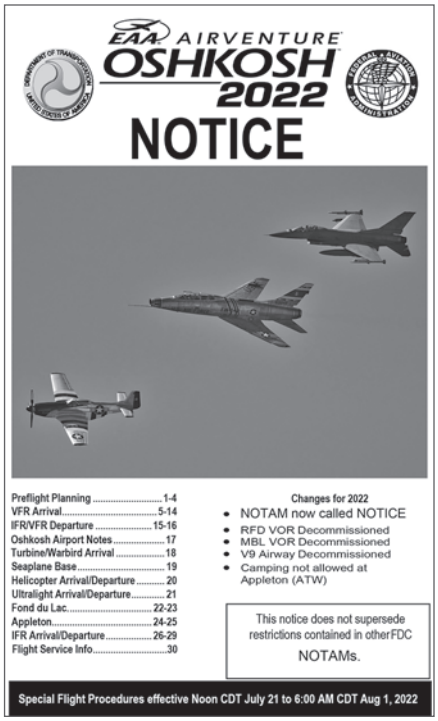
WIN is a coalition of industry members, the FAASTeam, and expert individuals devoted to aviation safety and proficiency with the goal of zero fatalities. WIN directs its efforts on behalf of the FAASTeam WINGS Pilot Proficiency Program, a learning management system available to all aviators that offers specified curricula to reach the highest levels of proficiency.

The new E-Z WINGS app will be formally unveiled at the 2022 EAA AirVenture in Oshkosh, Wisc., at the National Association of Flight Instructors' Professional Development Center on Tuesday, July 26 at 2:45 p.m. central time and at various other venues.

For more information on WIN and the EZ WINGS program, visit wingsindustry.net.

Changes to EAA AirVenture Outlined in New Notice

This year's EAA AirVenture Notice contains several FAA-approved changes for arrival and departure procedures and is an absolute must if you're flying an aircraft to the event in Oshkosh, Wisc. this July. The document is in effect from noon CDT on Thursday, July 21, until 6 a.m. CDT on Monday, August 1. The Notice was designed by the FAA to assist pilots in their EAA AirVenture flight planning. It is now known as the Oshkosh Notice instead of a NOTAM. Among the other changes this year include two VORs that have been decommissioned (RFD and MBL), changes to several IFR routings, and no aircraft camping at Appleton International Airport (ATW).



SAFETY ENHANCEMENT TOPICS

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

JULY

Stabilized Approach — Maintaining a stabilized approach and landing is a great way to avoid a loss of control situation.

AUGUST

Use of Weather Information — A review of best practices on obtaining and using weather information for your flight.

The EAA AirVenture NOTAM is required reading and should be part of a pilot's pre-flight preparation. Go to bit.ly/OSHnotice for the latest information.

FAA Begins Investing $1B into Air Traffic Control System

The FAA has started investing the first $1 billion of $5 billion into the country's air traffic control system. The funding — made possible through President Biden's Bipartisan Infrastructure Law — will sustain, repair, or replace hundreds of buildings and pieces of equipment that make flying in the United States the safest in the world.

The FAA controls more than 5 million square miles of airspace in the U.S. and more than 24 million square miles over oceans. The air traffic system includes hundreds of towers at airports and terminal approach control facilities, which provide air traffic services to aircraft approaching and leaving busy airspace. It also includes 22 centers handling aircraft at high altitudes. These facilities depend on power systems, navigation and weather equipment, and radar and surveillance systems across the country.

For additional information, visit faa.gov/bil/air-traffic-facilities.

FAA Awards $4.4 Million in Drone Research Grants to 7 Universities

The FAA announced $4.4 million in drone research, education, and training grants to seven universities. The research will focus on electromagnetic compatibility, detect and avoid classifications, and cybersecurity oversight.

The universities receiving grants are the University of North Dakota, University of Kansas, Drexel University, The Ohio State University, Embry-Riddle Aeronautical University, Mississippi State University, and Oregon State University.

Learn more about programs, partnerships, and opportunities for drones at faa.gov/uas/programs_partnerships.

Pilots Now Able to Track Medical Applications in Real-time

The FAA added a new feature to MedXPress (medxpress.faa.gov) that allows pilots to track the status of their medical certificates online throughout the application and review process. Before adding this new feature, pilots had to call the Office of Aerospace Medicine to check their application status.

As soon as an application is submitted, it will appear in the pilot's MedXPress profile. Status updates will change as the application moves through the FAA's review process. If an application is deferred or denied, the applicant will receive detailed information through the mail.

The certification process itself does not change. You can learn more about FAA's medical certification process at bit.ly/FAAmed.

FAA Updates Airport Design Guidance

The FAA updated its advisory circular about airport design that guides airport sponsors and consultants in designing and developing airports around the country.

This advisory circular outlines the FAA's recommended standards for an acceptable level of safety, efficiency, and capacity when designing and implementing projects at airports to meet the requirements of 14 CFR part 139 certification of airports. Airport sponsors that receive federal funding from the Airport Improvement Program and the Passenger Facility Charge Program must fully comply with the advisory circular.

The updates to the advisory circular include restructuring the document, explaining the meaning of terms used, expanding information in specific chapters, and adding graphics to support information in the circular.

This advisory circular takes effect immediately and is online at bit.ly/AC150-5300-13B.

Air Charter Safety Course for DPEs and CFIs

An Advanced WINGS-credit course about air charter safety helps you understand the federal regulations and definitions of private and commercial pilot privileges, charter operations, operational control, wet and dry leases, holding out, compensation, and expense sharing to help keep you out of legal trouble. It also illustrates the differences between 14 CFR part 61 pilot privileges and limitations and operating rules for part 91 and part 135.

The course has separate webinar-style videos for designated pilot examiners and flight instructors. Enroll in the course at bit.ly/697aircharter.

WELCOME BACK

As the world gets back to a more normal rhythm and we can again celebrate the magic of air shows, I want to share information on how the FAA's Office of Aerospace Medicine (AAM) supports large events like AirVenture and Sun 'n Fun. There are three major areas in which AAM brings its expertise to the pilot community.

Educational Experiences

We have the ability to give pilots classroom training and firsthand experience of some of the potentially dangerous conditions encountered in flight, but while safely on the ground. The Aerospace Medical Education Division, part of the Civil Aerospace Medical Institute (CAMI) in Oklahoma City, Okla., takes training events on the road in addition to the training provided at CAMI. The Portable Reduced Oxygen Training Enclosure (PROTE) system, is a "portable room" that allows one to experience a low oxygen environment similar to that obtained in an altitude chamber or at altitude. To help ensure safety, we require participants hold a current FAA medical certificate (Class I, II, or III) or BasicMed qualification. PROTE allows users to experience hypoxia at ambient pressure and avoid the risk from an ear block, sinus block, or decompression sickness. While the early warning signs of hypoxia are common, there is variation among individuals in terms of which warning signs present first. It is best to learn how your body reacts to hypoxia while safely on the ground. In fact, the military requires this during initial and recurrent training for its aircrew members.

This training for PROTE is very popular and typically all the slots fill early. The demand is so high that it is the only training that we have taken on the road since 2015. We do offer a number of other courses at CAMI though, as well as PROTE.

The Doctor is In

What if you have a specific question about your medical certification? At large events, we have a booth in the FAA exhibit area where pilots can stop by to talk to an AAM doctor and review their medical file. This is a great way to check on the status of your medical, see if information is missing, and even ask how to speed up the process. If all the needed information has been submitted and is favorable, we have been able to issue a medical certificate right there.

Remember that it's not uncommon for a condition to be acceptable even while the treatment is not. We can advise if there is an alternative that is acceptable aeromedically. You can have a more educated discussion with your personal physician in either event. Don't forget though, that your health is always the priority. Compromising it in order to fly will almost certainly have a cost at some point.

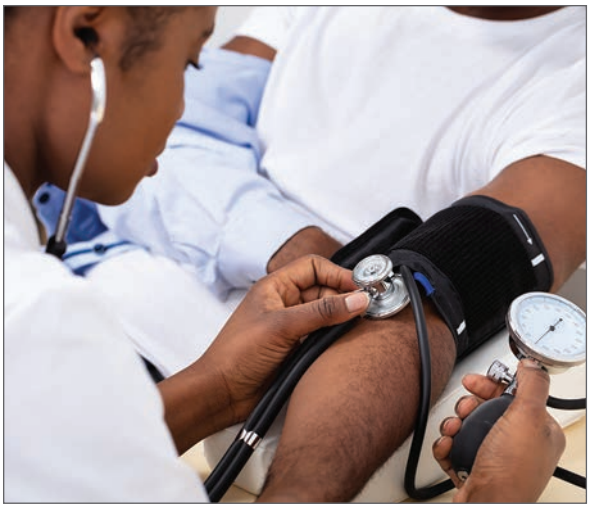
See You in the Forum

In addition to answering medical certification questions and providing training, we also have experts who present on a number of topics (and at other aviation events, not just air shows). In my talk this year, I plan to address a new online series called the pilot minute, mental health, and the new dashboard in MedXPress to allow tracking of your medical. I will also address some of the steps that we are taking to reduce processing time; and, steps that you can take yourself. Hope to see you there.

Dr. Susan Northrup received a bachelor's degree in chemistry, a medical degree from The Ohio State University, and a master's degree in public health from the University of Texas. She is double board-certified by the American Board of Preventive Medicine in Aerospace Medicine and Occupational Medicine. She is a retired U.S. Air Force colonel and a former regional medical director for Delta Air Lines. She is also an active private pilot.

DR. PENNY GIOVANETTI, DIRECTOR, MEDICAL SPECIALTIES DIVISION

HYPERTENSION



Hypertension (high blood pressure) is one of the most common conditions faced by pilots seeking medical certification.

Blood pressure is the measurement of the force of the blood pushing against the walls of the arteries as the heart pumps blood. The measurement is presented as two numbers: the systolic (top number) over the diastolic (bottom number) in millimeters of mercury (mmHg).

The American College of Cardiology's published hypertension guidelines are as follows:

Blood Pressure	Systolic Reading (mmHg)	Diastolic Reading (mmHg)
Normal	lower than 120	lower than 80
Elevated/Pre-hypertension	120-129	lower than 80
Stage 1 hypertension	130-139	80-89
Stage 2 hypertension	140 or higher	90 or higher

A doctor should not diagnose hypertension based on a single reading or at one point in time. If your blood pressure is elevated on an examination, your doctor may schedule follow up readings to determine if you have hypertension or not. Your Aviation Medical Examiner (AME) is not required to follow up on your elevated blood pressure unless the systolic reading is higher than 155 or the diastolic reading is higher than 95 on the FAA medical examination. However, he or she may recommend that you follow up with your personal physician for an elevated blood pressure even if it is within FAA limits.

Frequently Asked Questions

I have hypertension. What should I do?

You should determine an appropriate treatment plan with your physician. Uncontrolled hypertension significantly increases your risk of stroke, heart attack, kidney failure, and other vascular diseases. Remember though, that the FAA evaluation is only to determine if you can safely fly for the duration of your medical. While values under 155/95 are acceptable for FAA medical certification, you should not think that these are acceptable for long term health. If you have elevated blood pressure levels, do yourself a favor and get treated, even if you still qualify for a medical without medications. Certifying a pilot with well-treated hypertension is very straightforward. While we do certify individuals after a heart attack or stroke, it is much more involved. Why risk this or, more importantly, the possibility of permanent impairment?

Can I get treatment that is acceptable to the FAA?

Lifestyle changes such as weight loss, exercise, and a healthy diet are highly encouraged whether you have hypertension or not. Nearly all anti-hypertensive medications are acceptable to the FAA. Combinations of up to three medication components may be considered under the CACI program. The one exception is the class of drugs known as "centrally acting," e.g., Catapres (clonidine), but this class is generally avoided in current practice. More than three drugs (not pills, as one pill may contain 2 or 3 drugs) will require a special issuance.

How long will it take to get my medical certificate?

If you meet all the criteria listed in the Conditions AMEs Can Issue (CACI) worksheet, your AME can issue a medical certificate at the time of your exam. You can view that worksheet at bit.ly/CACIWorksheets or simply Google "FAA CACI Hypertension." Make sure that you bring the current, detailed progress note and have been stable on your medications at least seven days. Otherwise, issuance of your medical could be delayed. If you have any questions, contact your AME or Regional Flight Surgeon.

Penny Giovanetti, D.O., received a bachelor's degree from Stanford, a master's in Environmental Health and Preventive Medicine from the University of Iowa, and a doctorate from Des Moines University. She completed a 27-year career as an Air Force flight surgeon. She is board certified in aerospace medicine, occupational medicine, and physical medicine/rehabilitation. She is also a Fellow of the Aerospace Medical Association and a private pilot.

EAA AIRVENTURE OSHKOSH 2022

FAA Safety Center Forums

July 25 – 30, 2022

	08:30 – 09:45	10:15 – 11:30	12:00 – 13:30	2:00 – 3:30	4:00 – 5:15	
Monday July 25	**What's Your Attitude** Bruce Webb ***WINGS*: BK2** AFS0112519	**Colorado Mountain Flying** Bill Standerfer ***WINGS*: BK3** AFS0112520	**Approaches That Kill-VFR** Ray Heyde ***WINGS*: BK2** AFS0112524	**Airline to GA Flying** Gary Schank ***WINGS*: BK3** AFS0112525	**How to Talk to ATC** Heather McNevin ***WINGS*: BK3** AFS0112527	**Be sure to join us for daily forums at the Seaplane Base**
Tuesday July 26	**Decision Making in a Crisis** Kirk Lippold ***WINGS*: BK1** AFS0112568	**Getting "Weather Ready" for Winter Flying** Dr. Ian Johnson ***WINGS*: BK3** AFS0112569	**Aviation Medical Implications of CBD & THC** Pierre Moeser, M.D. and The Office of Aerospace Medicine ***WINGS*: BK3** AFS0112570	**Avoiding Loss of Control** Catherine Cavagnaro ***WINGS*: AK2** AFS0112571	**Weather Reports and Forecasts: Myths & Misconceptions** Terry Lankford ***WINGS*: MK2** AFS0112572	**See you tomorrow!**
Wednesday July 27	**Approaches That Kill-IFR** Ray Heyde ***WINGS*: AK2** AFS0112573	**Leading Causes of Aviation Insurance Claims** Sarah Rovner ***WINGS*: MK2** AFS0112574	**Vertical Aviation Safety Team (VAST) & SMS** James Viola and Greg Brown ***WINGS*: BK3** AFS01122575	**The Kings on Straight Talk About Aviation Safety** John and Martha King ***WINGS*: BK2** AFS0112576	**The Office of Aerospace Medicine and You** Susan Northrup, M.D. Fed Air Surgeon ***WINGS*: BK3** AFS0112577	**More with Greg Feith after the break!!**
Wednesday July 27	**Special Evening Presentation "Safety, A Lifelong Commitment to Doing it Right"** Greg Feith • **6:00 PM – 7:15 PM** • **WINGS: BK1** AFS0112721					
Thursday July 28	**General Aviation Awards** **CFI of the Year** **AT of the Year** **FAASTeam Rep of the Year**	**Loss of Control Avoidance** Parvez Dara ***WINGS*: BK2** AFS0112591	***No Session*** Meet the FAA Administrator @ Theater in the Woods ***No Session***	**Preventing Runway Incursions** Margit McKee and Jenny Settle ***WINGS*: BK2** AFS0112592	**Overview of FAA Enforcement Hot Topics** Katherine Schoon ***WINGS*: BK3** AFS0112593	**Have a great evening!**
Friday July 29	**Secrets Only Pilots Know About Airports** Tom Slater ***WINGS*: BK3** AFS0112596	**Safety, A Lifelong Commitment to Doing it Right Pt 2** Greg Feith ***WINGS*: BK3** AFS0112747	**Lessons Learned: Three Accidents, Many Choices** Thomas Turner ***WINGS*: BK3** AFS0112607	**Flying Blind** Bruce Webb ***WINGS*: MK2** AFS0112608	**NORAD** Trevor Boswell ***WINGS*: AK2** AFS0112611	**Still time tomorrow to see some great presentations**
Saturday July 30	**Calabasas, S-76B Loss of Control Accident Lessons Learned** Michael Folkerts ***WINGS*: BK2** AFS0112609	**The Most Common Cause of Fatal Accidents: Loss of Control** Ed Verville ***WINGS*: AK2** AFS0112612	**Medical Aspects of LOC** Michael Stretanski, M.D. Senior AME ***WINGS*: BK3** AFS0112613	**Weather Reports and Forecasts: Myths & Misconceptions** Terry Lankford ***WINGS*: AK1** AFS0112614	**VOR MON** Dr. Vince Massimini ***WINGS*: BK3** AFS0112731	**Thank you for spending the week with us! Fly Safe!**
Sunday July 31	**Closed** Find a WINGS programs in your area all year long at: **www.FAASafety.gov**					

Access FAASTeam safety brochures here: https://bit.ly/3lB1v80

FAA Forum & FAA Exhibit Hall Opens Daily at 8:30 a.m.
Schedule is subject to change, for updates check the QR code to the right or go to: bit.ly/FAAForums22

Appropriate **AMT / WINGS** credit will apply to events by using the associated **#AFS011XXXX** listed in each box

Getting There Safely *is Just Part of the Fun!*

Your Pilot Safety Checklist to Fly In and Out of an Air Show with Success

By Jennifer Caron

Who doesn't dream of flying their aircraft to one of the happiest places on earth — an air show! It's an aviator's playground of just *plane* fun — chock full of cool and fun activities to learn new stuff, feast your eyes on some incredible flying machines, swap "so there I was" stories, and uncover a treasure trove of the latest and greatest technology to trick out your bird.

Let's not forget the food — the incredible food that fuels your fun on the flightline as you gaze at the amazing feats of aerobatic wonders.

The Journey Matters as Much as the Destination

But all that anticipation and excitement can make us vulnerable to destination-focused "get-there-itis" — the desire to get airborne and get there — even if things have changed, such as a clear-sky VFR flight that deteriorates into a bad IMC scenario.

"Simply put, get-there-itis is a pilot killer!" observes Allan Kash, an aviation safety inspector (ASI) in the FAA's General Aviation and Commercial Division. "It's a classic behavioral trap, which is an accident-inducing, operational pitfall a pilot may encounter as a result of poor decision making."

The closer to the destination, the worse the all-or-nothing "itis" gets. You've already invested emotions, finances, and time to get to the air show, so why not "shoot the gap" and risk those low ceilings and reduced visibility and complete the flight? Resist the temptation!

Eager passengers, intent on getting to the air show, can also unduly influence your go/no-go decision. They tend not to understand the intricacies of GA flying. "The biggest external pressures I've experienced are non-pilot passengers," notes Kevin Clover, an ASI and FAA Safety Team (FAASTeam) operations program manager. "Their general expectation is that an airplane ride is going to go like a car ride. They can become irritated and even bored by all the things that have to be done or considered to get the airplane in the air."

The key is to reset your passengers' expectations early and let them know a diversion or interruption may be necessary. Assign tasks. A busy passenger is a happy passenger spotting planes and reading charts.

Don't become a victim of get-there-itis. As with any flight or aviation event, preparation, thorough preflight planning, and being conscious of your skillset and experience level goes a long way to preventing the deadly VFR into IMC scenarios and having a safe and successful flight.

Here are some additional tips and tools for air shows and aviation fly-in events in general that you can use to help you make the right go/no-go decision and arrive safely at your destination.

> **A contributing factor to air show accidents is insufficient preparation in reviewing the NOTAMS before the show.**

Go/No-Go to the Air Show? 3 Tips You Can Use to Make a Safe Decision

#1 "Check Yourself Before You Wreck Yourself."

You may recognize this snappy lyric, and it's a helpful mantra you can use as a reminder to perform a self-assessment to fly.

- **Am I Rusty or Ready?**
  Speed, altitude, and power. Practice flying at different airspeeds and altitudes, know your power settings and your personal minimums. You may have to fly faster or slower than normal to mix safely with so many different aircraft arriving at the show. If you're rusty, get ready. Sharpen your turn skills, short finals, short field landings, and go-arounds, refresh your stall recovery skills, and practice your emergency procedures.
  X marks the spot. Many air shows convert taxiways into runways, and you'll have to land on the spot — literally — on a colored dot on the runway surface. Practice landing on a designated spot before you go.
  Head on a swivel. You'll be flying close to other airplanes in busy, high-traffic airspace. Are you comfortable flying with other aircraft around you? How are your collision avoidance skills?

It's important to brush up on hand signals before arriving to an event.

Keep those hand signals handy. You'll see ground personnel directing you to aircraft parking by hand signals as you leave the active runway. Check out the Aeronautical Information Manual (AIM), Chapter 4-3-25 at bit.ly/AIMweb to refresh your memory.

A member of the Air Operations crew provides guidance to an arriving pilot at Sun 'n Fun.

Buddy-up. If you haven't flown in a while, invite a qualified instructor or a pilot buddy along for the ride. Even a non-pilot friend can help decrease your overall task workload by watching for traffic, reading the NOTAM, or monitoring the radio.
See it before you fly it. Practice in a flight training device or with a flight simulation program on your computer. A simulated practice run will help you learn the basic procedures before you do it for real. Google Earth is a good alternative if flight sims are not an option. You can also talk to pilots who have already made the trip. Plus, there are plenty of YouTube videos to preview the arrival process. EAA AirVenture has a five-part video series on VFR arrivals and departures on their website: bit.ly/VFREAA.

- **FRAT Risk**
  Use a Flight Risk Assessment Tool (FRAT) to proactively assess your flight risk. They're available as apps on your smartphone or tablet.

- **PAVE The Way**
  Follow the framework of the PAVE Checklist. Ask yourself:
  P*ilot* — Am I becoming fatigued? Am I within my personal minimums? Do I know my experience level flying this type of aircraft? Perform an internal assessment of your readiness to fly using the I'MSAFE checklist (Chapter 8 of the AIM at bit.ly/AIMChp8).
  A*ircraft* — Is my aircraft maintained and serviced? Do I know my aircraft's performance abilities and limitations? What are my fuel reserves, and what will be my fuel status when I get there? Do I know how much my camping gear weighs, for example, for an accurate weight and balance calculation?
  *En****V****ironment* — Did I perform a thorough weather briefing? Do I know how density altitude on a hot, humid summer day will affect my takeoff and landing distances?
  E*xternal Pressures* — Am I making decisions based solely on flight safety, or am I feeling pressure to arrive as planned?

#2 Is My Aircraft Right for Flight?

Preflight preparation of your aircraft is one of the most important steps you can take. Don't rush it. Your haste to take off can result in something as simple as forgetting to release the tiedown straps to something more serious such as failing to check for contaminants in the fuel (a commonly overlooked item), and can result in a loss of power or engine failure.

- **Change it, check it, top it off.** Check your service bulletins, airworthiness directives, maps, charts, and tire pressure. Change and top off your oil and clean your windshield.
- **Know before you go.** Review your aircraft's systems and emergency checklists.

A pilot checking fuel as part of a preflight inspection while at an airshow.

- **Preflight checklists are your friends!** Use a physical preflight checklist. Never work from memory so that you won't skip over anything. Always exit the aircraft, move around it methodically, allow plenty of time, and avoid interruptions and distractions.
- **Hush the Rushers.** Let your passengers know upfront that it will take some time to do the preflight.

#3 Build a Plan A, a Plan B, and maybe even a Plan C Before You Fly.

Pressures such as get-there-itis will tempt you to delay your recourse to Plan B until you've already entered IMC while trying to maintain VFR. It's also contributed to pilots overflying enroute fueling opportunities and running short of fuel at the destination. Think about what would happen if the "go-to" option is no longer available. Have a backup plan and decide to reach for it before an emergency is underway.

- **Don't Fly on Fumes**
  Leave early and plan to arrive before the airport closes for the afternoon air show. Build time into your plan for an extra fuel stop or to make an unexpected landing. A flight to an air show requires careful fuel calculations and reserve decisions to avoid arriving on fumes.
  - ➢ ***More fuel means more options.*** Plan to have extra fuel on board in case of landing delays, holding, or a diversion to another airport. What would you do if the airfield was congested or closed? ***Tip:*** refuel when you arrive at the show, or you'll be waiting behind pilots anxious to fuel up and fly out when the show is over.
  - ➢ ***Know where to find nearby airports*** where you could get some lunch, explore, or perhaps even take a short nap in the pilot's lounge until conditions improve.
- **Clip This to Your Kneeboard**
  - ➢ ***Documents current?*** Do you have your pilot and medical certificates, and are your VFR/IFR currencies up to date? How about your aircraft insurance?
  - ➢ ***Know the NOTAM***. Download it and print out a copy or two for your cockpit. Air show flight restrictions and schedules can change before kick-off. Check NOTAM effective dates in advance.
  - ➢ ***Visit air show websites*** to find out what to bring, opening/closing flight plans, aircraft parking, hours, and locations for weather briefing and flight planning services.

An airplane taxiing with a parking sign in the windshield.

- ➢ ***Print out your aircraft parking sig***n. Tablets are not an option for windshield display.

A pilot installs a tie down stake to secure his airplane during an air show.

- ➢ ***Bring tiedown gear and covers!*** Summer weather can be unpredictable with high winds, rain, and mud. The FAA recommends tiedown anchors — Single-engine:

resist 3,000 pounds. Multiengine: 4,000 pounds. You can buy them onsite, but better to be prepared and bring them with you.

➢ ***Bring batteries.*** Carry extra power for your headsets, iPad, EFB, and ADS-B. Are you running the latest software update? Download it now.

➢ ***Don't forget your prescription meds.***

The AirVenture NOTAM displayed on a tablet.

Take the No Out of NOTAMs

NOTAMs are your ticket to flying in and out of an air show safely and successfully. Your arrival/departure and landing and taxi procedures, radio frequencies, the different airspeeds and altitudes you'll need, airport details (such as the hours it's closed for the daily air show and special flight procedures in effect at nearby airports), safety notes, and temporary flight restrictions are all found in the NOTAM.

Don't just glance at the NOTAM. Immerse yourself in it before you fly. A contributing factor to air show accidents is insufficient preparation in reviewing the NOTAMs before the show.

Print copies for your kneeboard, keep a spare copy for your right seat, and sign up for arrival text alerts (if available). Air shows change their NOTAMs from year to year, so grab the most current copy. For example, last year, the FAA updated EAA AirVenture's NOTAM to include ATC-assigned transition points for GA arrivals to reduce holding and manage increased traffic.

Fly-in, Touchdown, and Fly Away

Confidently fly the approach into any air show by following all published arrival and departure procedures and instructions from air traffic control (ATC).

- ***Be on the lookout.*** You'll have traffic all around you from all directions, so be vigilant. Do not fly side by side or overtake other aircraft — fly nose to tail and single file. Prepare for VFR holding if the airspace goes IFR.
- ***Hang up the mic.*** Respect and follow the ATC procedures in place, which may require you to communicate solely by rocking your wings.
- ***Practice makes perfect.*** Here's where your pattern prep pays off as you maneuver with short approaches. Be prepared for specific landing instructions.
- ***Go around for safety.*** If you cannot comply with ATC instructions, say "unable" and ask for alternate instructions on frequency. Yes, everyone's watching, but don't be pressured to continue an approach you cannot do. It's better to land and walk away.
- ***Touchdown.*** Once you land, monitor the ground frequency, display your windshield parking sign, and watch for ground staff volunteers to direct you to aircraft parking. Keep your eyes peeled for conflicting traffic, including pedestrians. Stay alert until your aircraft is safely parked and tied down. Perform a thorough postflight inspection to spot any obvious damage, deflated tires, or unexplained fluids.
- ***Fly Away Day.*** Check the weather. Review the NOTAM departure procedures. Monitor departure ATIS or AWOS/ASOS before taxiing, and watch for traffic. Listen only, follow the runway signs and ground staff to the active runway, and pack your patience to line up and wait for clearance. ATC may call you by color and type or by your call sign so check the NOTAM for details.

Follow ATC instructions until you leave the airspace and continue on your way with a flight bag full of safe, fun, and unforgettable air show memories to last a lifetime. See you at the next air show!

Jennifer Caron is *FAA Safety Briefing*'s copy editor and quality assurance lead. She is a certified technical writer-editor in the FAA's Flight Standards Service.

A volunteer parks an arriving airplane.

There's No Business

A Behind-The-Curtain Look at Air Show Safety

By Tom Hoffmann

A view of the air show control point at AirVenture 2021. This unique vantage point allows the air boss, the FAA, and event staff to observe and safely manage the event.

Who doesn't love the sights, sounds, and even smells of a good air show? A staple in this nation's culture for over 110 years, air shows have become as American as apple pie, pick-up trucks, and venti vanilla lattes. It doesn't matter if you're two or 92; airshows have a certain magical appeal to all walks of life. Even those who have never flown or been to an airport come away with a new appreciation for the wonder of flight and the vitality of aviation.

While you're busy marveling at all of the jaw-dropping performances at an air show, it's easy to overlook all the hard work and planning that goes on behind the curtain to keep these events amazingly entertaining yet extremely safe. With so many Mach-1 moving parts and pieces, it's a tall order to strike that balance. The FAA has a large role in that duty, but it's by no means a solo act. The FAA works alongside dozens of different individuals, organizations, and agencies and relies upon detailed policy and guidance materials to orchestrate a safe air show. Let's take a peek behind the "showline" to see what goes into ensuring the safety and success of these events.

The Leading Role

Although air shows in the United States come in all shapes and sizes — none as large or complex as EAA's AirVenture in Oshkosh, Wisc. — safety guidelines are consistently applied and scaled appropriately for every event. The FAA's Flight Standards Service is tasked with regulatory oversight and enforcement during these and other aviation events, a responsibility it takes very seriously.

This work is carried out at the local Flight Standards District Office (FSDO) level, where a qualified safety inspector is chosen to be the Inspector in Charge (IIC) for the event. The IIC is the FAA focal point for the event sponsor and performers and will liaise with other parts of the FAA as needed. Depending on the size of the event, an IIC may lead a team of inspectors to assist with compliance and surveillance duties. Within Flight Standards, there is also a team of Aviation Event Specialists assigned to each FSDO to assist the IIC with any policy concerns for a certain event. Other areas of FAA involvement during an air show may include the Air Traffic Organization, Airports, Commercial Space, and the UAS Integration Office.

FAA ASI and AirVenture 2021 Inspector-In-Charge Joe Saunders meeting with air show performers after a daily briefing.

Preshow Prep

The multi-part process for getting an air show approved starts with a Certificate of Waiver or Authorization (CoW). If approved, it is issued to the event sponsor to allow participants to perform certain activities or maneuvers outside of the normal part 91 requirements but under conditions

Like Air Show Business!

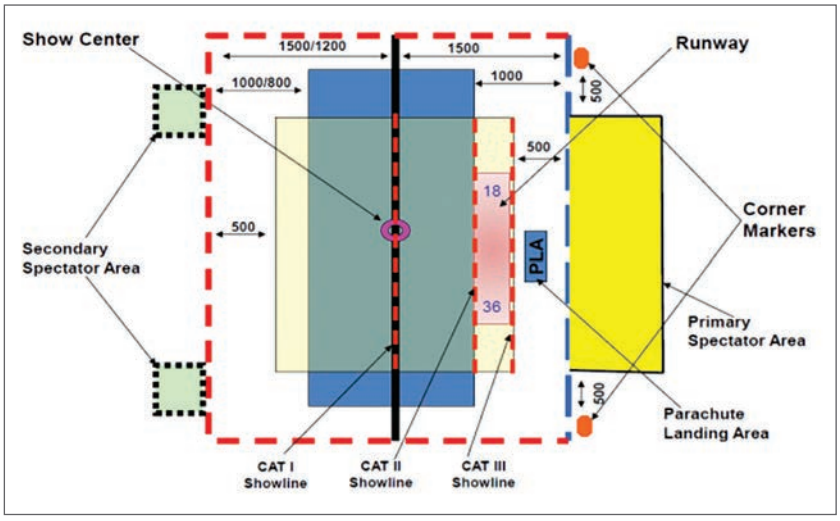
that ensure an acceptable level of safety. A good example of a commonly waived regulation at an air show would be allowing performers to "zero-out" their altimeters when on the ground to more easily gauge altitude during aerobatic maneuvers (14 CFR section 91.121). Other regulations commonly waived pertain to airspeeds, minimum safe altitudes, and aerobatic flight at less than 1,500 feet above the surface. The waivers required depend on the types of operations that will be conducted at the show.

The CoW process is accomplished via two forms, FAA Form 7711-1 and 7711-2. The latter is what an air show sponsor or organizer uses to apply for the CoW. The former is the actual certificate issued by the FAA with any special provisions the agency determines necessary to carry out the event safely. In addition to capturing the event details (date, location, regulations waived, the scope of planned operations, etc.), the CoW process also allows the IIC and the event sponsor to thoroughly evaluate risks and hash out any necessary mitigations. For example, as part of their review, an IIC will want to see if the event has sufficient fire-fighting and rescue capabilities or if the waivered maneuvers can be performed safely. More on that later.

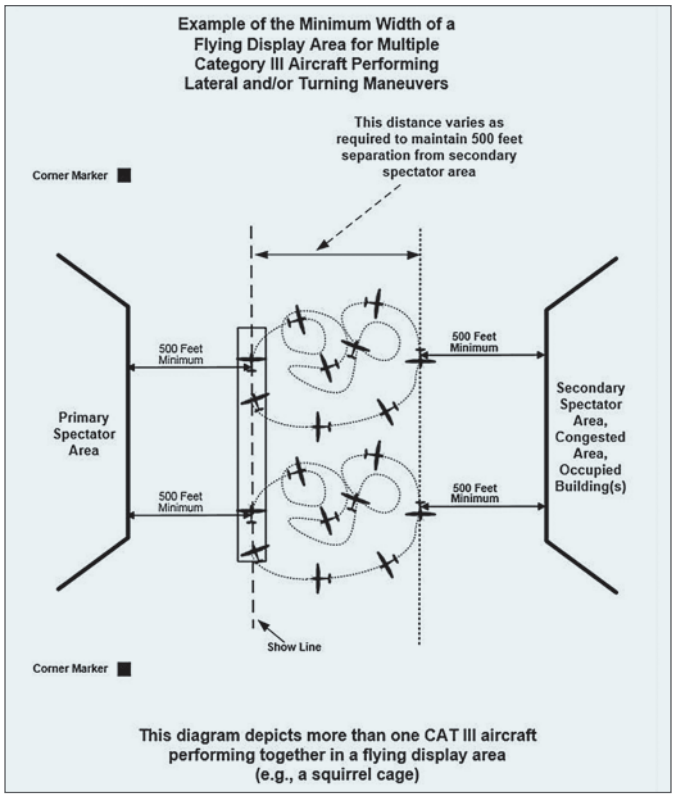
One side note on getting a CoW issued: if the air show is held at an airport certificated under part 139, the FAA's regional airports division must first review and approve a ground operations plan. The plan must address the part 139-related requirements impacted by the airshow and be approved by an airport safety certification inspector. Among the key areas of consideration for the ground operations plan are runway and taxiway closures, the impact on navaids, and safety precautions for any pyrotechnic devices. It's also not uncommon to see an airport district office lend their expertise during the planning stages at some larger or complex air shows located at a non-part 139 airport. For more details and resources on coordinating a ground operations plan for an air show, see faa.gov/airports/airport_safety/airshows.

Drawing the Line, Literally

With a new air show or an IIC unfamiliar with the location, an onsite visit with the event sponsor is necessary to get a first-hand look at the grounds and validate certain aspects of the operations plan. Armed with a laser measuring device, the IIC will verify the location and distances



Air show fly zones relative to airspace, including the CAT I, II, and III showlines.



Example of flying display area for multiple CAT III aircraft.

of the showline, crowd line, and race course if applicable. For example, the IIC will check if the minimum horizontal distance required by policy exists between the showline and spectators. This depends on the type and speed of the aircraft used. The minimum distance ranges from 500 feet for category three aircraft (less than 156 knots) to 1,500 feet for category one aircraft (more than 245 knots). An event waiver will not be considered if these distances cannot be met. Note that a category one or two aircraft may still use the 500-foot showline distance provided they fly non-aerobatically and parallel to the spectator areas.

The IIC will also visit secondary spectator areas, which could be outside the airport, and decide if any type of crowd control or road closures are needed to protect the public. The same may apply to homes or buildings under the aerobatic maneuver area (aerobatic box). In some cases, it may be necessary to close or evacuate these areas during the performance. This is all part of the security plan discussed next.

There's A Plan for That

An important element of air show planning (and CoW approval) involves reviewing emergency preparedness and security at the event. The event organizer must present to the FAA an Emergency Response Plan (ERP) that establishes procedures (who does what and how) for any emergency that could affect performers, essential personnel, and spectators. The ERP must be risk-based, scaled to the scope and complexity of the event, and coordinated with local emergency response officials. The Incident Action Plan (IAP) that outlines the tactical deployment of resources for specific incidents is a required companion document to the ERP.

There is also a required Security Plan that shows how areas outside the designated spectator area(s), especially under the aerobatic box, are secure and, if needed, kept clear of non-participants. The Security Plan will need to account for how this is accomplished. It requires diagrams, descriptions, and sufficient staffing to ensure the plan's integrity and ability to handle a breach effectively.

As the waiver approval process requires, these plans are all put to the test prior to the event via scenario-based tabletop exercises and an on-site emergency drill. "The practice drills are important to ensure that the emergency response — equipment and personnel — can rapidly react and reach a downed aircraft anywhere in the sterile aerobatic box," says FAA aviation safety inspector and former AirVenture IIC Joe Saunders. "They also help identify if equipment has to be moved or if more equipment is needed in order to respond." He adds that additional response resources could include boats, ATVs, fire trucks, and possibly helicopters. It goes without saying that effective and well-executed emergency plans can go a long way to improving safety for performers and spectators alike.

> **Effective and well-executed emergency plans can go a long way to improving air show safety for performers and spectators alike.**

There's a Tool for That

Luckily for Joe and other IICs out there, the FAA has developed some excellent tools to assist both the IICs and the event organizers with emergency planning and other critical risk assessment processes. Of note is AvERT, the Aviation Event Risk Tool, which is listed on the FAA's National Aviation Events Program page at faa.gov/about/initiatives/airshow. AvERT reflects the concepts of safety risk management and provides a structured approach toward identifying site-specific hazards and addressing the risks they pose at an airshow event. It covers everything from bird strikes to hail storms to a rocket launch mishap and provides an effective way to assess risk acceptability and develop management strategies.

The CoW process for an aviation event is also laid out in exceptional detail in FAA Order 8900.1, Volume 3, Chapter 6 (bit.ly/8900V3C6), complete with flowcharts, checklists, diagrams, and sample forms. It's a great resource for both the IIC and the event organizers to ensure everything is covered. The order outlines many of the additional efforts

required for an IIC not yet mentioned, like verifying the event NOTAM and coordinating the use of controlled airspace with the local ATC facility. This establishes the procedures for transitioning the airspace from ATC to the air boss during the air show. The air boss, besides having the coolest title in aviation, is delegated authority to control air show operations. You can find more about air traffic's role in air shows by reading the article "Thinking Outside and Inside the Box" in this issue.

The Magnificent Men and Women and Their Flying Machines

What's an air show without pilots performing acts of derring-do in their majestic, spectacular, and sometimes outlandish aerial steeds? Probably one you'll want to skip! To help put the "show" in air show requires due diligence on the part of the performers, the organizers, and the FAA.

Before each air show, the IIC, with help from other ASIs, will perform a check of each performer and aircraft scheduled to participate. They'll verify the validity of airman certificates and necessary type ratings, medical certificates, formation flying cards, and/or statements of aerobatic competency (if required). Inspectors also review the participating aircraft's paperwork (e.g., registration, airworthiness certificate, operating limitations, weight and balance, last condition/annual inspection). As part of the security plan, performers must also demonstrate and document emergency extraction procedures for their aircraft. This step is to alert emergency personnel of any special requirements like an ejection system or any onboard hazardous materials.

Photo by Brian O'Brien

Aerobatic pilot Vicky Benzing greets her fans after an air show performance.

For aerobatic and air race pilot Vicky Benzing, preparation for an air show begins months in advance. This includes assembling a special binder with all her required pilot credentials and documents verifying that her aircraft is safe and legal. An airshow performer is also required to practice their performance within 45 days of the airshow. "That is not usually an issue for me," explains Vicky, "since I practice regularly and will have practiced the week of an upcoming show." In fact, Vicky practices her routine so often that she rarely has to think much about the mechanics of her flying. "That frees me up to focus on monitoring airspeeds, critical altitude gates, and maintaining my position in the aerobatic box."

Beyond keeping her airplane and her flying skills in the best condition, Vicky also works hard to keep herself in top shape too. "I try to be in the best health possible," she says. "I lift weights regularly to help my g-tolerance and make sure I'm well hydrated and get plenty of sleep before a show."

It's Show Time

If the IIC finds all parts of the waiver application process satisfactory, the air show is a go! But the work doesn't stop there. The FAA will continue to work with the organizer as needed and provide onsite surveillance of the event. That includes conducting any necessary ramp checks of performance aircraft and attending various meetings and briefings, none more important than the daily performer briefing. "The daily briefings are vital to ensure everyone involved in the airshow understands their role and the terms of the CoW," says Joe. "It is the place to de-conflict and resolve any confusion."

During the air show, the IIC will usually monitor the performances from what's called the control point, a designated area where the air boss directs operations. That's followed by a debrief with the FSDO and responsible parties to review what went well and what areas need improvement. "To be an effective IIC at any air show, it is vital to know the guidance, be agile to the events happening around you, and exhibit professionalism," says Joe. He recalls his time as an IIC for AirVenture as an honor and a privilege. "I was humbled and awed by everyone's willingness to pull in the same direction to have a safe outcome. It is truly a collaborative effort."

Vicky couldn't agree more, adding that the inspectors chosen to work the air shows are some of the FAA's most friendly and helpful people. "We are all in this together to make the air shows safe and entertaining."

Going forward, the FAA recognizes the air show and aviation event industry is evolving rapidly with a constant stream of innovative technologies. To match that innovation, the FAA continues to develop new processes and procedures to ensure safety remains consistent at any event. "Safety is a continuous improvement," says Joe, "and it's constantly evolving as new risks are identified." That's a wrap!

LEARN MORE

Air Show Calendar
airshows.aero/Page/AirShowsCalendar

FAA National Aviation Event page
faa.gov/about/initiatives/airshow

Thinking Outside and Inside the Box

How Coordination and Teamwork are Critical to the Flow of an Air Show

By James Williams

A Mobile Operating and Communications Workstation (MOOCOW) is a mobile tower setup that allows controllers to get closer to the action at AirVenture.

Air shows were a staple of my childhood. Our local U.S. Air Force base would put on its open house complete with a major air show every May. It was an air show all-star game, with many of the most renowned civilian performers and demonstrations of all the latest military aircraft capped off with a stunning display by either the U.S Air Force Thunderbirds or U.S. Navy Blue Angels.

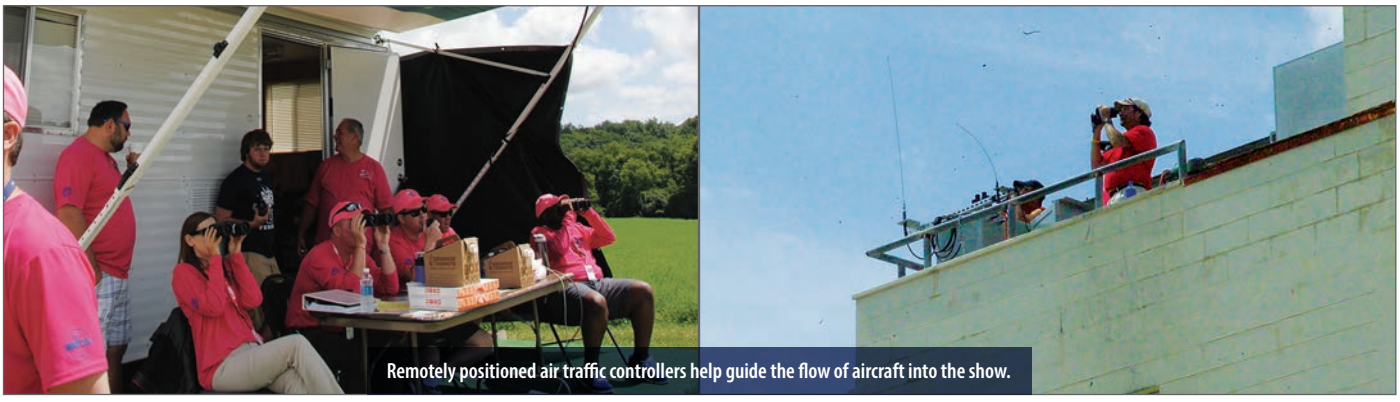
The scale of the event was because the base (Joint Base Andrews), home of Air Force One, is located beside the national capital. But as I grew up, I visited other air shows and eventually made it to Sun 'n Fun as a volunteer and pilot. Later, I joined the FAA and began attending these events professionally. From this angle, you can see that these gatherings are not just an incredible show, but an impressive fete of logistics, teamwork, and careful risk mitigation.

Getting into the Box

Not all air shows are the same, but fly-in conventions like Sun 'n Fun and AirVenture have added marquee acts like the aforementioned U.S. military display teams to attract a broader audience. These large fly-ins have a significant challenge: how do you get thousands of GA aircraft into an airport that may only handle a dozen or so at a time in everyday operations?

> **At aviation events, teamwork is critical to allow for a safe, fun experience for everyone involved.**

It starts with teamwork. "The greatest challenge is the logistics required to ensure all the necessary coordination has taken place between all parties involved," explains Jay McKinty, an Air Traffic Controller joining the team headed to AirVenture this summer. During this year's Sun 'n Fun, the FAA temporarily assigned 62 controllers from more than 39 different facilities. This additional workforce allows for not just controllers in the tower as usual but also controllers staged near the active runways and in outposts along the


Remotely positioned air traffic controllers help guide the flow of aircraft into the show.

approaches to help sequence the additional traffic. This tactic is used at events like AirVenture and Sun 'n Fun, where they take advantage of NOTAMs for special arrival procedures.

For Sun 'n Fun, a fire tower located several miles northeast of the field gives controllers excellent visibility of the approaches. But in most cases, no such happy coincidences of geography exist, and the remote locations don't enjoy such an advantageous perch. It requires a lot of coordination and communication.

Aiding in that effort is an additional set of FAA employees required to provide the proper support to controllers both on the field and in remote locations. The Air Traffic Organization's (ATO) Technical Operations (Tech Ops) group is tasked with ensuring all the proper equipment is in place and working properly to handle the massive increase in traffic. This includes everything from radios to lighted signage and even generator capacity to support all those systems where power isn't readily available. The technicians' focus then turns to keeping all those systems running properly throughout the event.

Defining the Boundary

The FAA's first priority at any air show is audience protection. We'll cover more on this and the waiver process in the article "There's No Business Like Air Show Business" in this issue. In general, audience safety is accomplished by restricting access to portions of the airspace around the airport to ensure there is a sufficient safety margin. This area is usually referred to as the aerobatic box.

(Left and right image) The communication between airshow organizers, air bosses, IICs, ATC, and performers is constant throughout an event and critical to a safe experience.

The area directly within and adjacent to the box should be clear of non-participants. Meeting this requirement can include actually evacuating homes and businesses near the airport. Of course, things can change during an event.

"In my experience, last-minute changes usually revolve around weather and the need to balance the desire to have the performance while ensuring the safety of all involved (spectators, performers, employees, etc.)," McKinty says.

"The best part of any air show is seeing all the people excited by aviation. The impact that airshows have on our industry can't be quantified. Whether it's a young person dreaming about learning to fly a fighter jet, an 'old-timer' rehashing glory days as a crop duster, and everything in-between, air shows spark something in all of us.

"I think one thing the public doesn't understand is what takes place during the air show demonstrations," says McKinty. "I don't think the public differentiates between what air traffic control does pre-and post-demonstration and what the Air Boss does during the actual demonstration. The two are separate entities but equally dependent upon each other."

Meet the Boss

Once it's showtime, the regular air traffic controllers hand off immediate responsibility for the box to the air boss. "The easiest way to describe the air boss is that he/she is similar to the conductor of a large orchestra," explains Jim Tucciarone, an experienced air boss. He is the Chairman of the International Council of Air Shows (ICAS) Air Boss Recognition Program Review Committee and an instructor for air boss training. "Just as a musician has their music, every pilot has their routine. Everyone has practiced and memorized the program. The air boss pulls together all of the pieces of the airshow like the conductor does with an orchestra."

Tucciarone elaborated, "The air boss usually writes and choreographs the schedule for the show ... that is their sheet music. When the Boss is ready for the B-25, he/she clears him into the aerobatic box." He notes that the B-25 is ready and has taxied because he has read the schedule and knows when they will be queued. The air boss uses a headset and mic like a conductor uses a baton.

"I was fortunate enough to work as a guest controller at Oshkosh for the fly-in for ten years. I met some amazing people and performers," Tucciarone explains when asked how he got into working as an air boss. "After moving to a staff support position at Oshkosh, coordinating between the control tower and the rooftop controller (air boss) on the field, I found it fascinating, and I wanted in," says Tucciarone. After one of his fellow controllers asked him to

form an air boss company, Tucciarone did his first show in Gary, Ind., in the late 80s. "After a while, I became dormant until another Boss called and got me back in during 2002. I have been around the country (and Costa Rica and the Bahamas) doing shows ever since.

"Most spectators are under the impression that the planes are given a sequence and just take off when it's their turn. There is so much more that goes into show prep," Tucciarone explains. "We have jets followed by quiet acts, parachute jumpers taking off during other acts, air starts, ground starts, no jumpers with any props turning, over water coordination, acts departing a remote airport, pilots flying more than once during the day, weather forecast and weather/wind minimums." He added that the "the daily air boss briefing covers all safety information concerning the show, followed by a review of the entire day's act by act, minute by minute, including sequences and on the spot changes." All these tasks aim to provide a smooth, well-run, safe, and entertaining air show.

Find and Fix

An old proverb credited to Prussian commander Helmuth von Moltke says: "No plan survives first contact with the enemy." As we've seen, this applies to both the air show itself and the air traffic flow into and out of it. The best-laid plans sometimes need adjustments.

I once had the opportunity to watch this adjustment process at the Reno Air Races. Upon arrival, one of the military jet teams was slightly outside the approved boundary of the aerobatic box for one maneuver. To resolve this issue,

A meeting with an air boss, IIC, and military display team to work through potential issues with the show.

Air show performer briefing.

The FAA's first priority at any air show is audience protection.

representatives from the team, the organizers, and the FAA all sat down to look at options to protect the public and allow the show to go on. After some discussion, a few slight adjustments were made, and things were back on track.

While this meeting was meant to deal with a specific issue, there are standard briefings each day where all participants can work through any problems they may have encountered on the previous day. No matter how perfect a plan may seem, reality often finds a flaw. So having a process to adapt to and overcome challenges is key to a successful and safe event.

Photo of the Sun 'n Fun accident mentioned below.

Oops Happens

No human endeavor is perfect. So it stands to reason that when bringing potentially thousands of aircraft into a small airport, something might go wrong. I've been on hand for a few of those situations. You can read one of those stories about the time when a tornado hit a fly-in in the article "Teamwork at Its Best" in our July/August 2011 issue.

On another occasion, we shadowed some air traffic controllers working a Sun 'n Fun show. During an arrival period one morning, we spotted a light twin airplane on approach with its gear not completely down. Moments later, the plane touched down, settled onto the two extended wheels and a wingtip, and slid down the runway, eventually exiting off the side of the runway. Within seconds the EMS crews arrived, followed by members of the ATC and aviation safety inspector (ASI) teams. Luckily the occupants were largely unscathed. Attention quickly turned from the initial response to aid the pilot to documentation and recovery of the airport. The ASIs handled the situation in very short order. Meantime, controllers were working to reopen the runway.

For sure, aviation events (both fly-in and general air shows) are team efforts between performers, organizers, ATC, ASIs, local communities, and all those attending. Teamwork is critical to allow for a safe, fun experience for everyone involved.

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

Sharpen Your Skills

Don't Fly Past the Educational Benefits of Air Shows and Aviation Events

By Paul Cianciolo

Big or small, it doesn't matter. Anywhere airplanes congregate is an opportunity to learn new skills. Whether you are visiting the aviation mecca at Oshkosh or flying somewhere just for free pancakes, take the time to meet other people, network, learn something new, and become a better pilot or mechanic. Air shows, fly-ins, and air races are more than a place to gawk at pretty planes — and everything else that flies. Let's take a look at what else you can do.

Gamify Your Learning

Attending an air show, especially one where you can fly in, provides many opportunities to learn. Our FAASTeam mantra is "safer skies through education."

You have most likely heard of WINGS. If not, it's the FAA Safety Team's (FAASTeam) pilot proficiency program, which operates on the premise that pilots who maintain currency and proficiency in the basics of flight enjoy a safer and more stress-free flying experience. Who wouldn't want that, right? WINGS credits for attending educational courses, seminars, and webinars are the currency of aviation safety. To learn more about getting started with WINGS, go to bit.ly/WINGSPPP.

When you see a seminar at an air show or other aviation event that says WINGS credit offered (or #WINGScredit on social media), you know that you will get FAA-vetted safety knowledge. However, that doesn't mean the FAA conducts all of those presentations. Many of our training providers and partners are other names you know and trust — like the National Association of Flight Instructors (NAFI), General Aviation Manufacturers Association (GAMA), Experimental Aircraft Association (EAA), Civil Air Patrol (CAP), Helicopter Association International (HAI), Aircraft Owners and Pilots Association (AOPA), Soaring Society of America (SSA), Balloon Federation of America (BFA), Sporty's Pilot Shop, and Leidos Flight Service, to name a few.

A Flight Standards booth at an airshow where pilots can ask questions and discuss issues with the FAA.

The FAASTeam attends aviation events to assist with questions on the WINGS program and FAASafety.gov.

The largest concentration of aviation knowledge happens at EAA AirVenture every summer. We are back this year after a two-year hiatus due to COVID-19. With an average of 36 seminars at the FAA Safety Center and Seaplane Base, and more than 200 presentations elsewhere providing WINGS credit from various experts around the aviation community, everyone has an opportunity to sharpen their aeronautical skills.

Even though earning knowledge credits is only half the WINGS game, that doesn't mean you can't level up your play and be the world's safest pilot superstar. Have some fun and gamify those credits! If you are part of a flying club or chapter of an aviation organization, start a competition to see who can earn the most WINGS credits at an air show or during a certain period of time. Maybe that superstar earns a prize like full tanks of avgas or an extra hour of flight time.

We want to hear from you if you have a fun way to gamify WINGS credits. Drop us an email at safetybriefing@faa.gov.

Swipe Right for Safe Flight

There's an app for that. A new partnership with SocialFlight — the free web and mobile app for finding events, airport restaurants, and exciting places to fly — now offers WINGS credits as part of a new FAASTeam learning system. There is a library of educational videos that stop and ask questions throughout the video and often include links to additional reference materials. The content is expanding every day.

Look for the menu item labeled "FAAST FAA Credits" to explore. In order to get WINGS credit linked to your FAASafety.gov account, the email address you used to log into both accounts must match.

The SocialFlight app is best known for showing you all the aviation events near you, including any online webinars for those who fly in cyberspace. Local events range from fly-ins to open houses, pancake breakfasts, plane washes, air shows, and whatever else interests our community.

Get Your Hands Dirty

Many *big* air shows, like AirVenture or Sun 'n Fun, also have an app that helps you navigate the grounds. Use them to help you find presentations, forums, and workshops that anyone can attend throughout the day. Some air show apps can even be customized to alert you to a particular event.

Opportunity knocks at many larger air shows to get hands-on experience with skills needed to build or maintain an airplane. At AirVenture, the daily training is patterned after the EAA's SportAir Workshops. The experience covers a range of tasks, including sheet metal construction and riveting, fabric covering, building wood truss wing ribs, welding, and composite lay-up. Skilled volunteers and industry experts lead you step-by-step through hands-on lessons, giving you the necessary skills and info to get started or take the next step in your home-building aircraft project.

After all that hard work, stop by the FAA Safety Center's exhibit area at AirVenture and Sun'n Fun. There, you can ask questions directly to the FAA subject matter experts in many fields, like Aerospace Medicine, Runway Safety, or Flight Standards. You can even check the latest local

Some air shows offer opportunities to learn new skills like welding.

Want to test your flying skills in the WILD? Take a virtual flight in the Weather Information Latency Demonstrator (WILD), where you can navigate hazardous weather in the safety of a simulator.

weather and pick up a free copy of this magazine. You can also learn some new skills.

Want to test your flying skills in the WILD? You can do that too in the FAA exhibit area by taking a virtual flight in the Weather Information Latency Demonstrator (WILD), where you can navigate hazardous weather in the safety of a simulator. Weather experts are there to answer questions as well.

Another rare opportunity for general aviation pilots is to take a turn inside the FAA's Portable Reduced Oxygen Training Enclosure (PROTE). Hypoxia presents a real danger, especially when it creeps up unexpectedly. The PROTE provides a safe, controlled setting to train how to recognize and cope with low oxygen situations such as hypoxia, night vision deficiency, and rapid decompression. If you don't know your personal signs of hypoxia, this one is a must.

Learning skills like riveting can give you a chance to test whether you might want to build your own aircraft.

The Latest and Greatest Tech

Air shows are also a great place to stay up to speed with the latest in aviation technology. You can play with and test out new gadgets and maybe grab some good deals with an air show discount. I bet you didn't think you wanted that angle of attack indicator with the heads-up display. Do you need to ask an industry rep how to make your new multi-function display work just the right way? Or maybe you need to get a set of earmuffs for your dog, which ensures your fur baby is comfortable and won't disturb you in flight. (Yes, they really do work). Something as simple as reducing distractions during a critical phase of flight can save your life.

Airshows can be a great place to check out the latest tech and practice some maneuvers.

Buzz the Career Deck

Are you thinking of a career change or a new job? Many companies conduct interviews and do on-the-spot hiring at significant events like air shows. If you are starting out flying, you can talk to several schools and universities that offer flight training and beyond. You can talk to real people and get first-hand knowledge to choose the right path for you. The opportunity to ask questions and get answers is there for the taking.

Another fun thing to do is explore all the STEM activities available at air shows. These exhibits and hands-on projects are a great place to bring your younger self and encourage others to consider aviation as their future path.

Enjoy Yourself

The most important part of every air show is, simply, to enjoy yourself. Flying is fun, and there's no better way to celebrate the joy and diversity of aviation than attending an air show or aviation event with family, friends, or fellow aviation enthusiasts. But be sure not to overlook the many unique educational opportunities these events provide, which can sharpen your flying skills and help make you a safer pilot. Hop in those simulators, test out the latest tech, get out of the hot sun and join the FAA in air-conditioned bliss during a safety seminar, network with fellow pilots, talk to the experts, level up your WINGS game, and come say hi to us — we are the FAA, and we *are* here to help.

We will see you out there. If you want to chat or get our attention, send us a message on Twitter @FAASafetyBrief.

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.

Up Close *with the* Gentle Giants

What it Takes to Launch a Safe Balloon Event

By Adam Magee

Ask most people when the aviation age began, and you're likely to hear about the Wright brothers at Kitty Hawk in 1903. However, human flight actually started 120 years earlier, in 1783 to be exact, when two Frenchmen traveled five miles in a hot air balloon invented by the Montgolfier brothers. Back then, Ben Franklin was present to witness the first flight and wrote in his journal about the majestic manner in which the balloon took flight.

Today, balloons remain iconic in the eyes of the public. For many, balloon events provide the first incentive to obtain lighter-than-air pilot certification. Every year, hundreds of balloon events occur across the United States, ranging in size from less than a dozen balloons to more than 650 at the Albuquerque International Balloon Fiesta (AIBF), the largest balloon event in the world. There's a lot happening behind the scenes to keep pilots, crews, and spectators safe at balloon events.

Pre-event Prep

Just as preflight prep is important to pilots, pre-event prep is vital to safety at a balloon event. Like other aviation events, such as air races or shows, balloon events fall under the National Aviation Events Program maintained by the FAA's General Aviation and Commercial Division. In coordination with the FAA's local Flight Standards District Offices (FSDOs), balloon event sponsors can apply for a Certificate of Waiver (CoW) for an aviation event.

A CoW allows for certain 14 CFR part 91 regulations to be waived. With a waiver for 14 CFR section 91.119 (b) and (c), minimum safe altitude, balloon pilots can benefit from more favorable winds and a greater level of freedom in flight to maneuver safely. From the FAA's perspective, the CoW provides risk management, coordination, and surveillance. Balloon events flying under a CoW allow the local FSDO a better opportunity to conduct surveillance and safety outreach within the community.

"Weather" or Not to Fly

Safety at a balloon event begins well before a balloon is ever unpacked. Not only do pilots complete their own pre-flight weather checks, but they also attend event-hosted pilot briefings. Since weather conditions are critical to a safe

launch, balloon events often have their own meteorologist who gathers data from the National Weather Service and on-field weather stations. The meteorologist reviews the weather data, which is then communicated to all pilots by the event weather officer, balloonmeister, or event director at the flight briefing. Based on the weather information, the balloonmeister, with input from the weather officer and safety officer, makes the launch decision.

As a general rule, winds faster than 10 knots, visibility less than three miles, clouds below 1,500 feet, or rain will postpone or cancel any scheduled balloon launches. On morning flights, with such a short window of time before the sun's heat can diminish "ideal" flying conditions, many pilots find themselves in a race against time to get airborne, especially during competition events when the distinct wind layers will merge. "Hurry up and wait" is a common phrase said by pilots and crews.

There's a lot happening behind the scenes to keep pilots, crews, and spectators safe at balloon events

It's important to remember to use checklists and not fall victim to impulsivity during these time-critical periods. Completing checklist items and not hurrying inspections is crucial to safety. It's also important for a balloon pilot to be proficient and not simply current. Pilots who haven't accrued much flying time between events may be rusty with procedures, increasing the risk of the flight in hurried conditions.

Coordination

All balloon events, from large to small, require some degree of coordination with other aircraft in the National Airspace System (NAS). Through the CoW process, the FAA coordinates with Air Traffic Control to ensure NAS safety. This might involve communicating across different FAA lines of business and/or issuing TFRs and NOTAMs.

At balloon events, operational responsibility is delegated to the Balloonmeister. The Balloonmeister, together with a team of safety professionals, including a weather officer and safety officer, coordinates all balloon activities. Balloon events flying within or nearby controlled airspace require coordination with appropriate personnel. Communication or equipment requirements are often waived in these cases, and safety mitigation procedures are put in place through the CoW. This ensures safety, but in the case of the AIBF, where 650 balloons might be inside Class C airspace, it also provides for the efficiency of resources. That would be a lot of talk on the radio and many dots on the screen!

For balloon pilots, these events can create rare opportunities to experience flight in areas you would otherwise only dream about. For example, balloon pilots participating in the Great Forest Park Balloon Race in September have the opportunity to launch from the heart of downtown St. Louis inside the Class B airspace. Numerous regulations are waived, including communication and equipment requirements within the Class B and minimum safe altitudes. This rare opportunity is only made possible through a CoW. If you're lucky, and the winds are just right, you can float across downtown St. Louis toward the Gateway Arch, as I was able to do a few years ago!

At some events, such as EAA AirVenture in Oshkosh, Wisc., or Battle Creek Field of Flight in Battle Creek, Mich., balloon operations occur around other airshow events. Given the narrow time frame for suitable balloon flights (usually two hours after sunrise and two hours before sunset), balloons often take precedence during these times, and no other aircraft are in flight over the site grounds.

Balloon glows, like the one shown here at AirVenture, can uniquely complement a night air show taking place in the background.

There is a balloon glow at some events, where balloons are inflated and light up the night sky. Balloon glows can uniquely complement a night air show taking place in the background. However, event coordinators must ensure the balloons are properly distanced from the performers to avoid unwanted wake turbulence.

Safety at a balloon event begins well before a balloon is ever unpacked.

Balloons rarely take off and land at airports. More often than not, balloons are taking off and landing at parks, schools, or private property. For FAA aviation safety inspectors, this presents a unique challenge in conducting surveillance and safety outreach of balloon operators during daily operations. Very few FSDO offices have inspectors who are rated in balloons. The opportunity for these inspectors to see the aircraft and interact with the pilots builds knowledge and trust, which improves communication and safety.

As fickle as flying a balloon seems with the strict weather requirements, it's the wind that provides a balloon pilot's only form of steerage. In the northern hemisphere, the winds shift to the right with altitude due to the Coriolis Effect. So to steer a balloon, the pilot would ascend to turn right and descend to turn back left. Local microclimates provide various wind phenomena, which makes flying a balloon fun.

In Albuquerque, the Sandia mountains contribute to a "box" wind which allows the balloons to take off heading south with the drainage winds and then climb to an altitude where the winds take them back to the north. When the pilot descends again, they can take advantage of the south drainage winds to box back over their launch spot and even land in the same spot they launched. That's quite a rare occasion for balloonists.

"X" Marks the Spot

Easily the most exhilarating aspect of a balloon event is the competition element. In a balloon competition, a pilot's

flying precision is tested. A large fabric X is placed in a field, and the pilot must navigate the winds to fly as close as possible to the X and drop a marker. The marker closest to the center of the X wins.

Routine balloon ascensions can usually be conducted in accordance with the provisions of part 91, and no waiver is required. However, balloon competitions will likely require a CoW with appropriate special provisions to maintain the safety of the non-participating public.

Balloon competitions often involve operations at horizontal and vertical distances less than those required by 14 CFR sections 91.119 (b) and (c). Operations at these altitudes are necessary to take advantage of varying wind conditions present at different altitudes. Winds are the balloonist's only means of directional control. These operations are acceptable when appropriate limitations are developed to ensure public safety and the safety of the participants.

If you have the opportunity to attend balloon events focused heavily on competition, such as the National Balloon Classic in Indianola, Iowa, the Flag City Balloonfest in Findlay, Ohio, or the Great Texas Balloon Race in Longview, Texas, you'll find many of the same pilots accumulating points to attend the U.S. National Championship events. From there, pilots qualify for international competition and the world championships held every two years.

Getting Involved

Depending on the various risk assessments, some balloon events require spectators to remain behind a barrier while the balloons are setting up and launching. Other events, like the AIBF, allow for spectators to be with the action. This provides an opportunity for the public to get up close to the gentle giants. With every balloon pilot, there are equally dedicated crewmembers that help prepare for launch and follow the balloon in a support vehicle to then help pack it away upon landing. This team keeps spectators safe.

At larger balloon events, you'll find launch directors, or "zebras," coordinating the launch activities to allow for safe operations. You can't miss the zebras, wearing black and white striped shirts, and sometimes pants and hats too. No balloon can launch without getting a "thumbs up" from a zebra. Zebras also perform crowd control and convey any concerns about airworthiness or airmanship to the proper authorities.

If you're interested in getting involved with balloon flight, joining the chase crew is a great opportunity to build some sweat equity to earn a free flight. Be warned; it's often said that the first ride is the most expensive, as you will want to buy a balloon afterward.

Adam Magee is a commercial hot air balloon pilot/flight instructor, designated pilot examiner, and FAA Safety Team (FAASTeam) Representative. He was named 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 industry member of the FAASTeam.

LEARN MORE

FAA National Aviation Event page
faa.gov/about/initiatives/airshow

Balloon Event Guidelines
bfa.net/images/documents/ballooneventguidelines.pdf (PDF)

Balloon Competition Manual (sample)
bit.ly/3kCkkHB

The 2022 National GA Award Honorees

Every year for more than 50 years, the General Aviation Awards program and the FAA have recognized aviation professionals for their contributions to GA in the fields of flight instruction, aviation maintenance/avionics, and safety.

The FAA and the General Aviation Awards Committee plan to present individual plaques to the 2022 recipients at EAA AirVenture in Oshkosh, Wis. Names of the honorees will be added to the permanent plaque in the lobby of the EAA AirVenture Museum.

Nominations and applications for the 2023 General Aviation Awards will be accepted starting July 1, 2022. If you know of a flight instructor, AMT, or FAASTeam Rep whom you think is deserving of an award at the local, regional, or national level, we encourage you to nominate them. If you are an aviation professional with a distinguished career in one of these categories, we encourage you to apply. For more information about nominating or applying, please go to GeneralAviationAwards.com/Nominations.

2022 National Flight Instructor of the Year

Dr. Amy Hoover of Ellensburg, Wash., is the 2022 National Certified Flight Instructor of the Year. Amy graduated from Texas Christian University with a B.S. in geology (1983) and completed her Master's in geology (1987) and her Ph.D. in Education (2005) at Oregon State University. Amy has dedicated over three decades of her life to advancing aviation education, providing 3,000-plus hours of aircraft instruction time and an astounding 15,000-plus hours of ground instruction. She specializes in teaching tailwheel and mountain flying and is the primary author of the book *Mountain, Canyon, and Backcountry Flying,* which sold over 5,000 copies.

Amy has served in many professional capacities during her career. She is a full professor in the Aviation Department at Central Washington University, where she serves as a flight check instructor and assistant chief ground instructor. Amy has mentored new pilots through the 99s International, Women in Aviation, ALPA ACE, Alpha Eta Rho, and the FAA's ACE Academy. Students of Amy's have commented she makes many complex courses and subjects fun, interesting, and easy to understand.

In conjunction with her experience as an instructor, author, and educator, Amy has also served on several national and international panels in the last five years and has taught numerous FAA WINGS seminars. Amy often drives or flies at her own expense to provide these key education seminars and panels.

Amy's experience reaches far beyond the flight deck. During the last five years, she has provided over 400 hours of instrument instruction in simulators, has developed and taught over a dozen different aviation subjects at the collegiate level, and has conducted more than 40 presentations on various aviation subjects.

Amy's dedication, steadfastness, and passion for aviation exceed that of many in our industry. Today, Amy is a member and avid contributor to various aviation organizations, including AOPA, EAA, Idaho Aviation Association, 99s International, NAFI, and many more. Amy received several letters of recommendation from professionals across the industry for this award. Each recommendation mentioned Amy's dedication to her craft, her passion for aviation and her students, and her desire to advance aviation education into the modern era. Congratulations, Amy! (info@canyonflying.com)

2022 Aviation Technician of the Year

Michael Everhart of Charlotte, N.C., is the 2022 National Aviation Technician of the Year. Mike's passion for aviation started at an early age while watching his father, an engineer, fix anything and everything around the house. Mike's professional aviation maintenance career began in 1981 as an aviation machinist mate while serving in the United States Navy.

While serving in the reserves, Mike looked to his longtime mentor and friend Dave Harmon for his first civilian role in aviation maintenance. He later received his A&P Certification in 1989 and his Inspection Authorization in 1994.

In 2010, Mike accepted a job with Belle Aircraft Maintenance in Hendersonville, N.C. A year later, he was promoted to Director of Maintenance, a position he held for just shy of 11 years before accepting a new role as the Director of Maintenance with Fenix Air Charter in Spartanburg, S.C. Mike is currently part of the Stevens Aerospace and Defense Systems team, where he performs maintenance on Beechcraft King Airs.

Mike is described as a "hands-on" director of maintenance who runs a professional and smooth shop, ensuring the fleet of Beechcraft Barons, Cessna 402s, and King Airs are all in airworthy condition.

Outside the workplace, Mike has represented his trade and the industry well. He currently serves as a FAASTeam Lead Representative, conducting in-person and virtual training events for the aviation community. He mentors newly licensed A&Ps and serves as the maintenance liaison for the Western North Carolina Pilots Association, delivering crucial advice and updates on what's happening in the aviation maintenance sector. In addition to all of this, Mike also makes hangar space available to local middle and high school students to discuss career opportunities in the aviation industry. Mike is also a Merit Badge Counselor for the Western North Carolina Council and assists the scouts in achieving their Aviation Merit Badge.

For the last three years, Mike has been recognized as Regional Aviation Technician of the Year, and in 2018 he received the FAASTeam "Rising Star Representative" award.

Mike is an avid volunteer and supporter of the Western North Carolina Air Museum in Henderson and the Western North Carolina Pilot's Association. Mike is described in his letters of recommendation as a safety-conscious aviation professional with a deep dedication to aviation education, mentorship, and excellence. Congratulations, Mike! (mecoh48thnc@wmconnect.com)

2022 National FAA Safety Team Representative of the Year

Laura Herrmann of St. Bonifacius, Minn., is the 2022 FAA Safety Team Representative of the Year. Laura is currently an instructor at the Hennepin County Medical Center, where she conducts lecture and scenario-based training for paramedic students. She also instructs nurses, doctors, and others in advanced adult and pediatric life support techniques. Laura earned her B.S. in nursing from St. Olaf College, graduating cum laude. She went on to earn her Masters of Science in nursing from the Minneapolis Veterans Administration School of Anesthesia at the University of Minnesota.

Laura is actively involved in many humanitarian causes outside the workplace, such as Pilots and Paws, where she flies animals to their new forever homes or foster families. She's also a volunteer at the Golden Valley Animal Humane Society, working as a surgical assistant. She does all of this while still being an active supporter and contributor to the Minnesota 99s.

Since 2014, Laura has served as a FAASTeam Representative and has been holding weekly Saturday morning seminars and webinars for her local aviation community for nearly eight years. When COVID-19 struck, Laura transitioned her weekly seminars to all virtual, finding creative ways to keep attendees interested.

Laura is heavily involved in a monthly FAASTeam "Pro-Tips" series of presentations. She writes articles for the Minnesota Flyer Magazine and her local EAA newsletter. She's also a founding member of the Minnesota Pilots Association and the local IMC Club. Laura enjoys putting her plane on display for aviation events and speaking to girls and young women about the joy of aviation at events such as the annual Girls in Aviation Day. You'll find Laura presenting at the local Runway Safety Advisory Team meetings, and she never misses a chance to relay information from her sessions to other pilots.

Back in the workplace, Laura's work as a trained Nurse Anesthetist has played an essential role in the lives of many. She's been described as someone who "radiates aviation safety" and "sets the bar unbelievably high." She is humble and ready to work with the newest pilots and aviation community members.

Laura's involvement in aviation safety activities and her work in the medical profession are guiding examples for her peers. Congratulations, Laura! (ljherrmann@yahoo.com)

Air shows and aviation events are the perfect medium to showcase the beauty, splendor, and vitality of aviation. Here are some of our favorite photos of events over the last several years. Enjoy!

– FAA Safety Briefing Team


NITED
Lines


YANKEE Lady

SUSAN K. PARSON

KNOW BEFORE YOU GO

Thankfully for those who love aviation, air shows pop up all over the country and at various times of the year. Even better, most of these events accommodate (even encourage) fly-in visitors. Though few aviation gatherings could rival the size and complexity of events like EAA AirVenture or Sun 'n Fun, any gathering of airplanes at a specific time and place ups the ante for safety risk management. You really, really, *really* need to bring your "A" game to every aspect of a fly-in.

Here are just a few safety-related things to keep in mind.

Know the NOTAM(s)!

Most fly-in events, especially those featuring air shows, have an associated NOTAM. It's essential reading, and it will likely require multiple readings until you know it cold, which is the level of knowledge you should have well before you even leave for the airport. Yes, you can have it with you in the airplane. But searching for critical information while maneuvering in congested airspace is not a good idea.

Know the Territory

There are multiple methods of virtually visiting an airport before you launch in real life. Perhaps the best way is to use flight simulation software to "fly" the entire trip at least once — but more is better. At a minimum, sit down with a platform like Google Earth or the mapping software in electronic flight bag (EFB) apps. Use these tools to virtually traverse the intended route and mentally practice procedures outlined in the NOTAM. Zoom in on reporting points, noting features

that will help you quickly identify those points when it counts. Check out the destination airport, noting runway and taxiway configurations, as well as any changes made from the NOTAM. Note where you might expect to park. Whether on an EFB app or an old-fashioned sheet of paper, highlight or write down critical information (e.g., frequencies) from the NOTAM.

> USE APPS OR SIMULATION PROGRAMS TO VIRTUALLY FLY THE INTENDED ROUTE IN ADVANCE AND MENTALLY PRACTICE PROCEDURES OUTLINED IN THE NOTAM.

Know the Knobology

If you are renting or borrowing an aircraft for this event, do whatever it takes to ensure that you are familiar and comfortable with its equipment. The busy airspace around a fly-in event or airshow is no place to be fumbling with knobs and buttons. Plan to spend some extra time before you launch ensuring that you have everything on the panel (e.g., navigation, communication) configured properly.

Know the Numbers

Be sure you know how to fly — and land! — the airplane at the speed(s) specified in the NOTAM. If it's been a while since you practiced high performance takeoffs and landings, it's a good idea to hire an instructor to sharpen those skills before you go.

Know the Passengers

At least half the fun of fly-in events is time with fellow enthusiasts, starting with the people you bring with you. Passengers who are pilots can be very helpful but be sure to clarify roles and responsibilities before you depart. You don't need surprises! You also need to clarify expectations for non-pilot passengers. It's a good idea to have everyone's eyes peeled for traffic, especially as you approach the fly-in site, but brief passengers on "sterile cockpit" procedures for non-essential conversation during critical phases of flight.

Know When to Go

However much fun it is to participate in a fly-in event, it can also be exhausting — especially for the pilot. Don't let anyone talk you into staying beyond your physical/mental limits or your capabilities. If you are too tired to fly home, find a place to stay overnight and depart when you're fresh. You might even plan that overnight stay right from the start.

For more air show safety tips, see the article "Getting There Safely is Just Part of the Fun" in this issue.

Susan K. Parson (susan.parson@faa.gov) is editor of *FAA Safety Briefing* and a Special Assistant in the FAA's Flight Standards Service. She is a general aviation pilot and flight instructor.

DRONES AT AIR SHOWS AND OTHER AVIATION EVENTS

Whether it is promoting the Super Bowl, a drone demonstration at an air show, or a drone racing event at the World Games, drones are making their way into aviation events all over the world. Drones can fly in formation to create amazing light shows, provide security, revolutionize live video coverage, and even serve as the main event. The use of drones in these events is a marvelous spectacle to watch, but the work behind the scenes to make these events successful gets little attention.

The FAA has implemented the National Aviation Events Program to ensure flight safety at air shows and events that feature drones. All such events undergo months of preparation and intense scrutiny to ensure that the necessary exemptions, waivers, and approvals can be fully evaluated to ensure an acceptable level of safety.

Under this program, drones can be approved under one of three pathways; 14 CFR part 107, 14 CFR part 91, or under Title 49 U.S.C. section 44809 if flown for recreational/educational purposes. As with all drone operations, the pathway is determined by the size of the aircraft and the nature of its use. Each pathway has its own set of requirements, but all center around establishing procedures that ensure flight safety.

Part 107 Operations

Operations under part 107 require an airspace authorization in accordance with section 107.41 and may also require several waivers based on the specifics of the operation. If the event includes any drones or pilots registered or certified in a foreign county, the review and approval process will involve coordination with the Department of Transportation to ensure the requirements of 14 CFR part 375 can be met. These operations also require a full safety risk analysis by the Flight Standards District Office (FSDO) to ensure the operation can be conducted with an acceptable level of safety.

Part 91 Operations

Drone operations under part 91 require a Certificate of Authorization, an airspace authorization (if in controlled airspace), and potentially several waivers based on the specifics of the operation. Exemptions to rules (e.g., part 61 pilot certification rules) may also be necessary. In addition, the same coordination will need to occur for any foreign aircraft or pilots to ensure compliance with part 375. These operations usually involve drones 55 pounds and above and require a full safety risk analysis by the FSDO.

Section 44809 Operations

Drone operations that can meet the requirements to operate as recreational flights under section 44809 do not have quite as many requirements as those conducted for commercial purposes, but the approval process still includes a significant level of safety assessment. These operations must follow section 44809 rules as well as the safety guidelines of a community-based organization and require an airspace authorization if operating in controlled airspace. The recreational flyer must complete The Recreational UAS Safety Test (TRUST). Similar to the other pathways to approval, these operations require a full safety risk analysis by the local FSDO.

You may have noticed that one of the common requirements of these pathways is a full safety risk analysis by the local FSDO. The FAA has created several tools to assist these professionals in evaluating and mitigating risk, including Safety Risk Management training and a detailed checklist to follow. This checklist is a tool to establish collaboration between drone aviation event applicants and FAA personnel. It helps inspectors make site-specific risk-based decisions for the integration of drones into these events by considering every detail of the operation.

The collaboration required by professionals across the FAA and the event organizers is a thorough process that covers every aspect of the event. This process also allows event sponsors to show FAA inspectors that the operation will comply with all applicable rules or that adequate mitigations will be in place to ensure a level of safety equivalent to that established by the regulations. This effort often takes months of intense work by numerous FAA offices, all initiated and led by the local FSDO.

So, the next time you see drones performing synchronized flying as part of a light show, providing live video coverage, or exciting a crowd with high-speed drone racing, you can rest assured that the FAA worked hard to ensure the level of safety the public demands.

John Sawyer is a program manager in the FAA's UAS Integration Office.

JENNIFER CARON

AIR SHOW BREAKDOWN? WHO YA GONNA CALL?

When you least expect or want it to happen, no matter how careful, caring, or cautious you are with your aircraft, Murphy's Law can rear its ugly head — things can break, and things can get damaged.

You know what to do on home turf with your favorite tools at the ready and your trusty mechanic just a phone call away. But "who ya gonna call" when you're far from home and enjoying what was, *until the unexpected happened*, a fun and otherwise uneventful air show? You aren't the first, and you won't be the last, which is why you'll find a staff of volunteers at many larger air shows, like EAA AirVenture and Sun 'n Fun, that are ready to assist.

> BE PREPARED FOR ANY EVENTUALITY. PACK "WHAT IF" ITEMS IN YOUR AIRCRAFT.

Call the show's main line, and you'll get directions to onsite aircraft assistance and repair. There you'll find volunteers, many who are certified aviation maintenance technicians (AMTs), stocked with tools and tech advice that you can borrow to DIY your repairs. Wing walkers are available when taxiing, or you can catch a lift to a shop for the parts you need. There's also help with ferry permits if you're facing more daunting issues. Keep in mind that any parts you use or repairs you make are your responsibility for airworthiness.

For remedies at smaller events and fly-ins, you may have to rely on the kindness (or tools kits) of strangers, and chances are you're pretty much on your own, so come prepared for any eventuality.

Stuff Happens, Be Prepared

Don't let your anticipation to get there distract you from a "hope for the best, prepare for the worst" mentality. Here's a brief list of "what if" items you should include in your aircraft.

- **Repair Kit:** avionics maintenance tools, hand tools, spark plugs, multi-tool or knife, safety wire/pliers, tire inflator, jacks, spare fuel filler cap, duct and electrical tape, work gloves, cleaners and rags, spare oil and funnel, and flashlights with extra batteries.
- **Tie Down and Survival Gear:** wheel chocks, tiedowns, covers, tow bar, first aid supplies, and rope.
- **Backup Power Supply:** charging cords, backup batteries, and power adapters.

After you land, it's tempting to tie down and tear out to enjoy the show. However, performing a thorough post-flight inspection is a much wiser choice. A walk around your aircraft goes a long way to help spot any obvious damage, deflating tires, unexplained fluids (or that fresh layer of windshield bugs) that you can *and should* address now instead of at the last minute when you're ready to take off at the end of the show.

Like a Good Neighbor

It goes without saying, but make sure your aircraft insurance policy is current. You'll want to have a safety net in place with the multiple aircraft, pilots with varying skills, and not-so-plane-savvy pedestrians you'll find at an air show. Also, consider the potential of flip overs from strong summer winds, damage from neighboring planes improperly secured, taxi/ground mishaps, and overly curious spectators who can't resist getting up close and personal with your aircraft. Steps you can take: lock your controls, immobilize your ailerons, and cordon off certain parts of your aircraft to deter unwanted looky-loos.

Photograph and report any personal injuries or physical damage, no matter how slight, even if there is no visible evidence. Coordinate with government officials (e.g., FAA, NTSB) depending on the severity.

In many cases, aircraft owners are responsible for any environmental issues created by their aircraft on air show grounds. That includes surplus or leaking fuel and oil spills. Don't dump fuel or oil on the ground, use fuel pans and proper disposal methods, and immediately report any spills to air show staff.

Also, consider where your prop wash will end up. Check the ground around and behind the propeller to keep from blowing debris and prop wash on people, tents, or airplanes nearby.

Jennifer Caron is *FAA Safety Briefing*'s copy editor and quality assurance lead. She is a certified technical writer-editor in the FAA's Flight Standards Service.

GOING YOUR SEPARATE WAYS

We all know the strengths and weaknesses of our aircraft, including the inevitability that what might be a clear advantage for one can be a complete detriment for another. Nowhere is this distinction more evident than in maintaining visual separation from other aircraft, aka, see-and-avoid. The near-polar opposite blind spots found on many high and low wing GA aircraft have all too often been a leading cause in mid-air or near mid-air collisions. However, staying safely separated really boils down to pilot know-how more than having any kind of built-in design advantage.

Plane-spotting can be a difficult task, even more so in the heavily congested environment of an air show or fly-in. Sound collision avoidance techniques require a more patient and methodical approach than the constantly moving, head-on-a-swivel tactic that some might think is required. According to the *Pilot's Handbook of Aeronautical Knowledge*, effective scanning is accomplished with a series of short, regularly spaced eye movements that bring successive areas of the sky into the central visual field. Each movement should not exceed 10 degrees, and each sky segment should be observed for at least one second to enable detection. This slow and steady approach helps compensate for the limitations the human eye has in being able to detect targets.

Since dozens of factors can affect your ability to track other aircraft while airborne, here is a list of Top 5 tips and best practices to maximize safety. It should serve you well whether you're on a local $100 hamburger run or following the railroad tracks on the Fisk VFR Arrival to OSH with several thousand fellow aviators!

- *Clean your windscreen.* This one is obvious, but it's often overlooked. Remember, it's the dot that's not moving that will eventually become a traffic conflict. If it's fast-moving and hiding behind a month-old bug splatter, you might not see it until it becomes a big problem. Also, take care of your plastic "glass." If the acrylic windscreen is old and crazed, the sun will cause additional glare looking through scores of micro cracks, making traffic spotting that much harder.
- *Take your favorite chair for a ride.* Study and chair fly any published procedures ahead of time so that when you actually need to fly it, your heads down time is minimal. Adhering to the appropriate procedure and strictly adhering to routes, altitudes, and airspeeds is the best way to de-conflict with other traffic in a heavy traffic environment. Dial in to the appropriate frequencies early if possible to monitor the flow and build a mental picture for situational awareness.
- *Keep your head up.* In cockpit traffic detection tools such as ADS-B In are great, but not if the pilot is heads down looking at a display rather than outside the cockpit. Whether it's another pilot or a keen non-pilot, an extra set of eyes is always super handy. You might want to assign ADS-B traffic monitoring to your in-cockpit helper so you can keep your eyes outside.
- *Don't block the view.* There's been a recent trend to add all sorts of gizmos into the cockpit. With little real estate in the panel of a typical GA cockpit, pilots have a habit of stowing these devices on the glare shield or suction-cupping them to windows. Technology is great; just make sure the devices and the mounts for them are not blocking your view outside the cockpit.
- *See, and be seen!* Make yourself as visible as possible. Turn your lights on. Switch to LEDs if you're concerned about burning out bulbs.

LEARN MORE

FAA Advisory Circular 90-48D, *Pilots' Role in Collision Avoidance (with Change 1)*
bit.ly/3LLX85p

FAASTeam Tip Sheet: Your Role in Mid-air Collision Avoidance (PDF)
bit.ly/38Mnbu0

JIM TISE

TACKLING ROTORCRAFT'S "DIRTY DOZEN"

The pilot of the Bell 206 helicopter was returning on a cross-country business trip, flying in good weather with visibility of at least 10 miles. At 4:12 p.m., the pilot called a local car rental agency. The rental car employee stated she could not tell that the caller was in a helicopter, but he seemed "busy or distracted" and that she was in "mid-sentence" when the line was disconnected.

During the last five minutes of the flight, the helicopter's GPS altitude varied between 6,200 and 6,456 ft. Mountains in the area stood at altitudes between 6,000 and 6,400 ft. The helicopter hit terrain at 6,330 ft. The pilot was killed. Based on the information available, the pilot was likely using his cell phone during the low-altitude flight and became distracted, which resulted in a fatal controlled flight into terrain.

A true story. A tragic scenario. And just one of many flying risks that the FAA hopes to mitigate with a webinar on helicopter safety focused on the "dirty dozen" common mistakes that can result in helicopter accidents.

James Dangerfield, FAASTeam manager at the Flight Standards District Office (FSDO) in South Carolina, created a presentation for mechanics and pilots detailing the "Dirty Dozen" safety issues. During the webinar, he discussed "safety nets," methods to avoid them from occurring.

"I've been doing 'The dirty dozen presentation' — which focuses on airplanes — for years and I realized there is a big gap out there for helicopter operators and their mechanics," said Dangerfield. The webinar is designed "to inform them about the areas they need to pay attention to and know the dirty dozen are out there to help mitigate their risk," he added.

Dangerfield is an expert on aviation safety. He was a helicopter mechanic in the U.S. Army working on *Cobras*, and in the National Guard working on *Apaches*.

In the presentation, he runs through 12 categories of mistakes made by helicopter operators including distraction fatigue; lack of knowledge, awareness, or assertiveness; complacency; stress and pressure.

Dangerfield and two FAA Safety Team (FAASTeam) managers in Greensboro and Charlotte, North Carolina, Tim Haley and Ed Shields, then present concrete ideas to avoid these potentially fatal pitfalls.

For example, he talks about the danger and the problems that can occur if the pilot is distracted. "Your mind has completely left the job that you've been tasked [with]," he explained. "I think it happens more than it gets discovered."

Dangerfield suggests using detailed checklists. And don't hesitate to go over old ground, "Going back three steps allows you to double check the last three steps you made without missing anything."

Dangerfield assembled this Dirty Dozen webinar with Haley and Shields. For the past three years, the trio have presented safety webinars on a dozen topics related to fixed-wing flight.

Even before the COVID-19 public health emergency forced many activities to go virtual, webinars offered advantages to in-person seminars. "We're getting a lot more people than you might see at an in-person seminar," reflected Dangerfield.

Haley also has noticed that some pilots and mechanics may be embarrassed to ask questions in front of their colleagues. "Low-time pilots are afraid to ask questions in front of more experienced pilots," he said. With the relative anonymity of a webinar, Haley also noticed higher quality questions coming in.

To view a recording of this Dirty Dozen presentation, go to bit.ly/Dirty12webinar. You can check out FAASTeam course ALC 107: *Dirty Dozen – Human Error in Aircraft Maintenance* here: bit.ly/ALC107.

Be sure to also check out the Rotorcraft Collective video featuring Dangerfield on the importance of preflight after maintenance here: bit.ly/PreflightAfterMx.

Jim Tise is an editor with the FAA's Office of Communications.

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 more than 15,000 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.

It's a Mechanic's Life

I enjoyed Jennifer Caron's "Not Just Your Average Mechanic" feature (bit.ly/3KWM0Cj). I lived her article. I started in my summer jobs in 1972. It was a lot of fun learning from some excellent mechanics. I also earned my pilot's licenses. The mechanic bug won out over the flying. Everything Jennifer talked about brought back some memories that, when I was making them, I wanted to forget — like stripping paint off a low wing Comanche. The things I saw and fixed could fill volumes for young mechanics on the strange things you run up against and have to solve. I wish the new techs a lot of luck. After 42 years, though, it was time to hang it up. Between parts getting so expensive and lawsuits, the fun disappeared. I still love aviation. The wages always were terrible. Thanks for the article, Jennifer.

Hello! Thank you for your note and kind feedback on my article. It was a fun piece to write, and I'm glad you enjoyed it. I can tell by your note that being a mechanic was a labor of love. And you're right — today's young mechanics do have a challenge ahead, but I too remain optimistic that, like yourself, their love of aviation will win out and keep them in the game for the long haul.

Are the Bolts Correct or Incorrect?

Great article (bit.ly/3Jn14IT *Understanding Owner-Performed Preventive Maintenance*, Mar/Apr 2022 issue). While the photos of the tire change showed one *correct/incorrect* installation, please note: the *correct* photo also has one oversight — the nuts are shown installed incorrectly (always refer to applicable maintenance manual(s)). — Byron

Hi Byron — Thank you for bringing this to our attention. That was a great observation. While the image was intended to show the correct/incorrect installation of a tire, you are right in that technically the bolts for the photo labeled "correct" should be installed in the other direction. We agree that the maintenance manual must be followed. However, in this particular case, the maintenance manual for Cleveland tires did not mention anything on which direction to install the bolts. In this case, you should then refer to the Illustrated Parts Catalog (IPC,) which indeed shows the bolts in the opposite direction than what was pictured. In general, bolts should be installed with threads downward, inward, or aft (p. 7-49 of the FAA General Handbook AMT General Handbook at faa.gov). But when installed on the centerline, as with a nose wheel, there is no general guidance on this. The maintenance manual and the IPC should be consulted in that case to confirm the correct direction of installation.

For more stories and news, check out our new 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 Twitter @FAASafetyBrief or on Facebook at facebook.com/FAA.

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.

SUSAN K. PARSON

SHOW BIZ – BEHIND THE CURTAIN

"The highest art form of all is a human being in control of himself and his airplane in flight, urging the spirit of a machine to match his own."

— Richard Bach, *A Gift of Wings*, 1974.

Air shows have been around — and popular — since the earliest days of aviation. What's not to like?

One thing not to like, at least in connection with the air shows in the first few decades after Kitty Hawk, was the danger. It wasn't unusual for pilots to perish in the course of death-defying stunts gone wrong. Before the introduction of aerobatic boxes and other such crowd-safety measures, there was also significant danger to those who came to watch.

As we have endeavored to explain in this issue of *FAA Safety Briefing* magazine, today's air shows are far safer for both participating pilots and the audience. However magical and danger-free the aerial action might seem, you now know more about what it takes to match reality with the perception. In collaboration with the sponsoring organization(s), aviation groups, local officials, and air show pilots, the FAA does a significant amount of behind-the-scenes — and thus largely unseen — work to ensure safety for everyone involved.

Also unsung are some of the people who keep things going smoothly (and safely) for the actual air show. You may already be familiar with the concept of the air boss, a term borrowed from U.S. Navy air carrier operations. In air show parlance, the air boss is like the director of a show biz event. The exact requirements and duties of the job vary according to the size, scope, and location of the event, but certainly a key responsibility is to plan and coordinate the aerobatic demonstration. That means consulting with the organizers, working with the FAA on waivers and ATC coordination, and conducting the mandatory preflight briefings for all participating pilots. As I learned in the process of preparing this issue of *FAA Safety Briefing* magazine, the "Balloonmeister" serves as air boss for lighter-than-air events.

Keep a lookout for these folks at the next air show you attend. They will likely be too busy to chat, but you might find it interesting to watch them work if the opportunity arises.

Since a simple internet search for "air boss" will take you to digital reams of interesting information, you might also enjoy learning more about some of the companies that specialize in providing air boss services to event organizers. Many employ former air traffic controllers for some of the functions they provide.

IN COLLABORATION WITH THE SPONSORING ORGANIZATION(S), AVIATION GROUPS, LOCAL OFFICIALS, AND AIR SHOW PILOTS, THE FAA DOES A SIGNIFICANT AMOUNT OF BEHIND-THE-SCENES AND THUS LARGELY UNSEEN WORK TO ENSURE SAFETY FOR EVERYONE INVOLVED.

The various unsung heroes in both government and the aviation community do all they can to assure everyone's safety at air shows, including those flying in to enjoy the event. But safety ultimately depends on the willingness and ability of aircraft operators to do their part. Did you study the NOTAM before arriving? Are you current and proficient (not necessarily the same thing)? Can you consistently fly your aircraft according to the speeds and other specifications (e.g., landing distance) required for this event? If you have any doubt, hire an instructor to help polish your skills. You'll be glad you did.

Susan K. Parson (susan.parson@faa.gov) is editor of *FAA Safety Briefing*. She is a general aviation pilot and flight instructor.

JOSEPH SAUNDERS

Aviation Event Specialist, FAA Flight Standards Service's General Aviation Operations Branch

Joe Saunders knew he wanted to fly at age 12. It all started with a trip from Milwaukee to Toronto on a McDonnell Douglas DC-9.

"Once the airplane throttled up, and the acceleration pushed me back into my seat, I was hooked," Joe recalled. "Then I realized that there were actual people up front *driving* this thing, and I was in awe. You can get paid for this — sign me up!"

At 15, Joe began flying lessons at Sheboygan County Memorial Airport in Wisconsin. He soloed at 16 and earned his private pilot certificate at 17. He also got a job as a ground handler at the fixed-base operator to further immerse himself in aviation. Refueling and cleaning airplanes helped pay for his flight training.

Though Joe started college at 18, he chose to focus on flying instead. At 21, he became a flight instructor and charter pilot. Two years later, he started flying a Beechcraft 1900 for Skyway Airlines out of Milwaukee. Then at 25, Joe moved up the line to fly for Midwest Airlines. He finished his bachelor's degree and went on to earn a master's.

Enticed by the job security of a civil service career, Joe shifted to the FAA in 2014, starting in Minneapolis as an aviation safety inspector (ASI) focused on general aviation operations. He transferred to the Milwaukee Flight Standards District Office (FSDO) the following year.

"The FAA has been a fantastic place to work, and I have grown in my aviation career beyond anything I could have imagined," Joe said. "Aviation continues to be my passion, and it needs to be nurtured and protected, which is where the FAA comes in."

While in Milwaukee, Joe was assigned as the inspector in charge of that *little* airshow in Oshkosh *(okay, more like the aviation mecca)* for five years running. His experience there allowed him to move up to the FAA headquarters in late 2021 as part of the General Aviation Operations Branch in the FAA's Flight Standards Service and serve as an aviation event specialist and subject matter expert for public aircraft operations.

The General Aviation Operations Branch is responsible for writing and maintaining policy, including policy for all the gray areas that air shows create. The branch also supports FSDOs with their air show oversight duties and helps them navigate questions that arise.

"As aviation events evolve, one of the challenges is remaining agile and flexible with new technologies and helping develop procedures to allow more participation," Joe notes. "It is imperative for the FAA to engage with stakeholders to foster a collaborative approach to aviation safety. The FAA must be a world leader in safely integrating these changes into the National Airspace System. The place where these innovations likely make their first appearance is at air shows. Fostering a collaborative approach to safety is how we look to develop new policies and procedures."

Joe's advice for safely arriving at an air show is to be prepared and thoroughly plan your flight, understand any NOTAMs, the route, and any restrictions, and have contingencies like airports to divert to if a change is quickly needed.

Experienced and dedicated people like Joe help ensure that everyone can enjoy a safe and efficient air show everywhere in our great nation. Be safe, and see you out there.

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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